



2017 Updated Multi-Jurisdictional Hazard Mitigation Plan for Bremer County, Iowa



Adopted By:

Bremer County (1/30/2017)
City of Denver (6/19/2017)
City of Frederika (2/15/17)
City of Readlyn (3/13/17)
City of Janesville (3/13/17)
City of Plainfield (3/13/17)
City of Sumner (3/20/17)
City of Tripoli (2/20/2017)
City of Waverly (3/6/2017)

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Prepared by:

Iowa Northland Regional Council of Governments (INRCOG)



INRCOG

ACKNOWLEDGEMENTS

HAZARD MITIGATION PLANNING COMMITTEE

Over the course of the planning process a number of individuals donated their time and efforts for the successful completion of this plan. This includes those who attended planning meetings as well as the city, county and educational staff and elected officials that spent time updating and reviewing the plan outside of meetings. The following is a list of people who participated in the hazard mitigation plan meetings:

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Supervisor Ken Kammeyer
Kip Ladage
Randy McKenzie
Susan Burton
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Brock Farley
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SECTION I – INTRODUCTION

INTRODUCTION

Natural hazards have the potential to cause property loss, loss of life, economic hardship, and threats to public health and safety. While an important aspect of emergency management deals with disaster recovery – those actions that a community must take to repair damages and make itself whole in the wake of a natural disaster – an equally important aspect of emergency management involves hazard mitigation. Hazard mitigation measures are efforts taken before a disaster happens to lessen the impact that future disasters of that type will have on people and property in the community. They are things you do today to be more protected in the future. Hazard mitigation actions taken in advance of a hazard event are essential to breaking the typical disaster cycle of damage, reconstruction, and repeated damage. With careful selection, hazard mitigation actions can be long-term, cost-effective means of reducing the risk of loss and help create a more disaster-resistant and sustainable community.

The 2017 Bremer County Multi-Jurisdictional Hazard Mitigation Plan (M-J HMP) was developed to assist in making the entire planning area (Bremer County unincorporated and incorporated areas) less susceptible to these hazards. The planning area includes the cities of Denver, Frederika, Janesville, Plainfield, Readlyn, Sumner, Tripoli, and Waverly as well as unincorporated Bremer County. Waverly-Shell Rock schools was engaged in the planning process but deferred their official district plan to the Butler County (home county of Shell Rock) 2015 MJ-HMP which the school district participated in and adopted.

What is a Hazard Mitigation Plan?

Generally the first question asked when communities begin the process of preparing a Hazard Mitigation Plan (HMP) is very simply “What is a Hazard Mitigation Plan and what is its intended purpose?” First, it is imperative to define what precisely the term mitigation entails. One definition of the term is stated most effectively by the Federal Emergency Management Agency (FEMA) and is as follows: *“Mitigation is defined as any sustained action taken to reduce or eliminate long-term risk to human life and property from a hazard event. Mitigation, also known as prevention (when done before a disaster), encourages long-term reduction of hazard vulnerability. The goal of mitigation is to decrease the need for response as opposed to simply increasing the response capability.”* (www.fema.gov).

A hazard mitigation plan is developed by local government(s) before a disaster strikes. The plan identifies local community policies, actions, and tools for on-going, short-, mid-, and long-term implementation to reduce risk and potential future losses of property and lives.

Purposes of Hazard Mitigation Planning

The following list identifies reasons to conduct hazard mitigation planning:

- To facilitate the protection of the health, safety and economic security of residents, workers, visitors and property owners by mitigating the impacts of natural and manmade hazards.
- Influence decision making in both the public and private sectors.
- Fulfill statutory requirements of the Disaster Mitigation Act of 2000 – as of November 1, 2004 a community must have a FEMA-approved hazard mitigation plan in order to be eligible for FEMA project grant monies under programs such as the Flood Mitigation Assistance Grant program (FMA), Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation Grant program (PDM), Severe Repetitive Loss Grant program (SRL), Repetitive Flood Claims Grant program (RFC), and certain categories of aid under the Public Assistance Grant program (PA).
- Fulfill contractual obligations under the Hazard Mitigation Grant Program (HMGP).
- Receive credit under the Community Rating System (CRS).

Requirement §201.6(b): In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning shall include: 1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval; 2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have authority to regulate development, as well as businesses, academia and other private non-profit interests to be involved in the planning process; and 3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

Requirement §201.6(c)(1): [The plan shall document} the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

WHAT IS A MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN?

A multi-jurisdictional hazard mitigation plan is a plan jointly prepared by more than one local government or jurisdiction. Local jurisdictions have the option to participate in a multi-jurisdictional hazard mitigation plan under the Disaster Mitigation Action of 2000 (DMA 2000). A local government is defined by Title 44 Part 201 Mitigation Planning in the Code of Federal Regulations (CFR) as “any county, municipality, city, town, township, public authority, school district, special district, intrastate district, council of governments (regardless of whether the council of governments is incorporated as a nonprofit corporation under State law), regional or interstate government entity, or agency or instrumentality of a local government; any Indian tribe or authorized tribal organization, or Alaska Native village or organization; and any rural community, unincorporated town or village, or other public entity.”

Requirement §201.6(a)(3): Multi-jurisdictional plans (e.g., watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process... Statewide plans will not be accepted as multi-jurisdictional plans.

Benefits of Multi-Jurisdictional Mitigation Planning

The following bulleted statements identify the many benefits for jurisdictions that participate in the multi-jurisdictional mitigation planning:

- Enables comprehensive approaches to mitigation of hazards that affect multiple jurisdictions
- Allows economies of scale by leveraging individual capabilities and sharing costs and resources
- Avoids duplication of efforts
- Imposes an external discipline on the process.

PLANNING PROCESS

With support of the Bremer County Board of Supervisors and participating City Councils, Bremer County applied for, and received, a FEMA HMGP Grant for the development of this updated Multi-Jurisdictional Hazard Mitigation Plan (M-J HMP).

The planning process for this HMP involved a variety of local decision makers and stakeholders within the planning area. The planning leaders were able to customize the process to meeting the needs of the municipalities. The process was developed around the requirements laid out in FEMA's *Local Mitigation Planning Handbook* (March 2013) and *Local Mitigation Plan Review Guide* (October 2011). Figure 1 illustrates the key steps in the hazard mitigation planning process and the specifics of each planning step are provided below.

Step One: Organize Resources

The first step in developing the Multi-Jurisdictional HMP was to bring together a group of people with a variety of knowledge and backgrounds from all jurisdictions within the planning area, including the County itself, yet all having some connection to the goal of hazard mitigation.

Multi-Jurisdictional Planning Participation

Working in conjunction with the planning agency, Iowa Northland Regional Council of Governments (INRCOG), Bremer County and the other communities of developed a list of departments and positions they determined would best represent the knowledge base required to begin the planning process. The idea was



Figure 1: Hazard Mitigation Planning Process

2017 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

to first establish a base committee and then invite other organizations and/or individuals as necessary. Table 1.1 displays the name, jurisdiction, and position of the planning committee members.

TABLE 1.1: BREMER COUNTY MJ-HMP PLANNING COMMITTEE MEMBERS					
Name	Jurisdiction	Position	Name	Jurisdiction	Position
Dewey Hildebrandt	Bremer County	Supervisor	Black Franzen	Plainfield	City Council
Ken Kammeyer	Bremer County	Supervisor	David Lehman	Plainfield	City Council
Kip Ladage	Bremer County	EMA Coordinator	Tom Geise	Plainfield	Mayor
Randy McKenzie	Bremer County	Building Official	Barry Fortsch	Readlyn	City Council
Susan Burton	Bremer County	EMA Intern	Dan Blaylock	Readlyn	
Tim Neil	Bremer County	Supervisor	James Bisbee	Readlyn	City Superintendent
Brock Farley	Denver	Student/citizen	Louis Buhr	Readlyn	City Clerk
Joel Wikner	Denver	City Council	Sherry Sommerfeldt	Readlyn	
Larry Farley	Denver	City Administrator	Allan Junkers	Sumner	Sumner Light & Power
Cindy Asmus	Frederika	City Clerk	Billy Lehmkuhl	Sumner	City Council
Neil Whitney	Frederika	Mayor	Cody Freese	Sumner	Police Department
Sylvan Mutschler	Frederika	Volunteer Fire Dept.	Dave Waskow	Sumner	Mayor
Bryan Destival	Janesville	Fire Chief	David Lease	Sumner	
Chris Robinson	Janesville		Maddi Frizdrich	Sumner	Police Department
Doug Bettis	Janesville		Tim Duhrkopf	Sumner	Fire Chief
Dustin Mooty	Janesville	Police	Brendt Bernard	Tripoli	Mayor
Randy Samec	Janesville	Police Chief	DeAnn Lahmann	Tripoli	City Clerk
Sandi Carroll	Janesville	Mayor	Jordan Ladage	Tripoli	City Council
Sue Stapleton	Janesville	City Council	Bill Werger	Waverly	Economic Development
Traci Beery	Janesville		Mike Cherry	Waverly	Director of Public Works
Andy Lunk	Plainfield		Tab Ray	Waverly	Director of Leisure Services

This initial group of people invited to the planning meetings encompassed individuals representing local government, law enforcement, fire and rescue, public utilities, local schools, local non-profits and service providers, and citizen volunteers. Others invited to the meetings were surrounding county emergency management administrators, state officials from Iowa Homeland Security and the Department of Transportation and an official from FEMA Region 7. Once established, this assembly was considered the Hazard Mitigation Planning Committee.

Additionally, Brian Schoon and Jacob Tjaden from INRCOG organized the meetings in conjunction with the County Emergency Management Coordinator and

County Auditor. All sequential meetings were determined at committee meetings. INRCOG was also responsible for compiling information and writing the final document.

Beyond this core group of individuals, public notices for all committee meetings were published in three newspapers, within the planning area, to inform neighboring communities, agencies, businesses, academia, nonprofits, and other interested parties and residents of the planning process and to invite all interested parties to attend and contribute to the development of the plan. Prior to the adoption of the MJ HMP, each jurisdiction advertised and held public hearings. Public notices and public involvement materials can be found in Attachment 4.

Committee Meetings

Five public planning meetings were held at the Tripoli City Hall and Waverly City Hall on various dates, during the HMP planning process. Each meeting was open to all residents and stakeholders in the planning area, as well as neighboring communities. Attendance for each meeting was documented and can be found in Attachment 4. Table 1.2 provides a list of the public meetings. All meetings, except for the Frederika, Sumner, Board of Supervisors and City Council meetings, started at 7:00 pm.

TABLE 1.2: MEETINGS SUMMARY			
Location	Group	Date	Topic
Tripoli City Hall	Participating jurisdictions from 2012 MJ-HMP	11/4/2015	Introductions, Purpose of HMP, Community Profile, Explain Hazard Analysis/Risk Assessment, Conduct Hazard Analysis/Risk Assessment
Waverly City Hall	Planning Committee	12/15/2015	Review Hazard Analysis/Risk Assessment, Establish Goals, Start Mitigation Action/Activity Development
Tripoli City Hall	Planning Committee	4/20/2016	Finish Mitigation Action/Activity Development
Tripoli City Hall	Planning Committee	5/9/2016	Review Mitigation Action/Activities, Prioritize Action / Activities
Tripoli City Hall	Planning Committee	11/22/2016	Finalize mitigation actions, Review HMP Draft Document
Bremer County Courthouse	Board of Supervisors	1/30/2017	Public Hearing for Adoption of M-J HMP
Various City Halls	City Councils	Various	Public Hearing and Adoption of MJ-HMP

Requirement §201.6(c)(5): For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.

Multi-Jurisdictional Plan Adoption

Once the Committee's feedback was addressed, a final draft HMP was prepared and sent to the County Board of Supervisors along with a resolution for adoption. Upon County adoption, the final draft HMP was submitted to Iowa Homeland Security and FEMA for their review and feedback; at which time the draft was presented to local City Councils for their adoption as well. Resolutions can be found in Attachment 2.

Current & Previous Planning Documents Used

In addition to information obtained through the series of Committee Meetings, INRCOG also investigated other previously prepared documents in order to garner supplementary relevant information and contacted each jurisdiction for relevant information. Information and data about emergency services, mitigation activities and response procedures are described in various levels of detail within these documents. These documents and data include:

- Bremer County Comprehensive Countywide Emergency Management Plan
- Previous Hazard Mitigation Plans for Denver, Janesville, Plainfield, Readlyn, Sumner and Tripoli, and Waverly
- Comprehensive Plans for Bremer County, Denver, Janesville, Readlyn, Sumner and Tripoli, and Waverly
- Housing Needs Assessments for Denver, Frederika, Janesville, Plainfield, Readlyn, Sumner and Tripoli, Waverly
- 2013 Iowa Hazard Mitigation Plan and Comprehensive Emergency Plan
- Plans, studies, reports, maps and technical information that were not available five years ago, including updated Flood Insurance Rate Maps and data
- Documentation of communities current status in the National Flood Insurance Program (NFIP) and Community Rating System (CRS)
- Repetitive Loss Properties and /or Severe Repetitive Loss Properties information
- Reports of disaster and other hazard events that occurred within the past 5 years
- Documentation of changes in the communities that impact vulnerability of structures and populations
- Documentation of mitigation projects and activities undertaken over the past 5 years

Step Two: Identify & Assess Hazards

Identify and Profile Hazards

Through the planning process the hazards that pose a risk to the entire planning area, as well as unique hazards for each jurisdiction, were reviewed and updated. The identified hazards in this plan update have changed slightly from the 2010 plan. The committee elected to use the same set of hazards as identified in the State of Iowa's 2013 Hazard Mitigation Plan. Second, an updated assessment of the hazards was conducted that took into account historic occurrence, the number of people that would be or were impacted, the area of the planning area that was or would be affected, potential costs that the planning area, individuals, and organization have or may incur, the likelihood of future occurrence, and the amount of warning time before and event occurs. An updated composite score for each hazard was developed based on these factors. This process used information from previous and current hazard mitigation plans within the planning area, as well as the State of Iowa's hazard mitigation plan.

Vulnerability Assessment

An updated vulnerability assessment was conducted to identify: repetitive loss structures, properties and population located in the identified hazard areas; inventory of existing and proposed buildings, infrastructure, and critical facilities located within identified hazard area boundaries; estimating potential losses; and analysis of development trends.

Step Three: Establish Mitigation Goals & Actions (Action Plan)

Once Step Two was completed, a capability assessment was conducted on the planning area's existing policies, practices, programs, regulations, and activities that either increase or decrease the planning area vulnerability to the identified hazards. Through this assessment, areas that can be improved upon were identified and developed into "action steps". Early in the planning process meeting attendees identify broad goals that briefly stated what the plan should attempt to accomplish. Every action step should, if implemented, work toward one or more of the goals of the plan. An action step may suggest continuing a current mitigation effort or propose a new project altogether.

Many of the identified action steps were projects that the local jurisdictions could independently accomplish. Other identified projects included efforts that either require the cooperation of two or more jurisdictions, or would not include the local jurisdiction at all. The intention is that each action step is considered at least on an annual basis. Early in the planning process meeting attendees reconfirmed the 2012 plan goals. In order to increase the likelihood that the entire planning area implements the plan, each action step identifies the parties that would most likely be responsible for completing an annual review of that step.

Step Four: Implement the Plan and Monitor its Progress

Finally, once the hazards have been assessed, mitigation steps identified, and the action steps have been prioritized the plan makes some suggestions for implementation and makes estimates as to the costs of implementation. Some proposed projects are small in scope and thus relatively low cost. However, other projects are broad in nature and would require more funding than the one jurisdiction can reasonably provide. Therefore, the final piece of the plan suggests methods to implement the plan, how to keep the public involved, and what steps should be taken by the planning area to ensure that the concept of hazard mitigation is always a priority.

When implemented appropriately, mitigation projects can save lives, reduce property damage, is cost-effective, and environmentally sound. This, in turn, can reduce the enormous cost of disasters to property owners and all levels of government. In addition, mitigation can protect critical community facilities, reduce exposure to liability, and minimize community disruption.

SECTION 2 – COMPOSITE COMMUNITY PROFILE

PHYSICAL ATTRIBUTES

Location of Bremer County

Bremer County is located in the Northeastern quadrant of the State of Iowa. The county includes a number of incorporated cities including, in alphabetical order: Denver, Frederika, Janesville, Plainfield, Readlyn, Sumner, Tripoli and Waverly. Bremer County is divided into fourteen townships including, in alphabetical order: Dayton, Douglas, Franklin, Frederika, Fremont, Jackson, Jefferson, Lafayette, Le Roy, Maxfield, Polk, Sumner, Warren and Washington. The County itself encompasses a total area of approximately 440 square miles (438 sq mi land, 2 sq mi water). The population is the twenty-sixth largest in the state with 24,276 residents (2010 Census). Waverly is the county seat. It is near the southwest corner of the county, along US Highway 218 and bisected by State Highway 3. Please refer to *Attachment #1: Location Map of the County*, which includes the locations of the aforementioned communities.

History¹

The first white man came to Bremer County in 1845 and settled about two miles southwest of Denver. At that time, this area was a Native American Reservation belonging to the Winnebago Tribe, numbering about 300 people. Later the reservation was purchased by the government, and the Native Americans were moved to the Crow River area of Minnesota, about 150 miles north of St. Paul.

Bremer County had been named in 1850 by Governor Stephen Hempstead, who was an admirer of the Swedish poet, Frederika Bremer. Bremer County is thought to be the only Iowa county named after a person eminent in literature.

Townships were named for famous people also: Washington, Jefferson, Jackson and Polk, four U.S. Presidents. Fremont and Douglas were named after candidates for U.S. President. Dayton was named for a Vice-Presidential candidate in 1856. Lafayette and Warren were named after two famous soldiers of the American Revolution. Frederika was named after Frederika Bremer, Maxfield after Judge Maxfield, and Sumner for Charles Sumner who was a U.S. Senator from Massachusetts from 1851 to 1874.

Waverly was first settled in 1850, and it soon grew to importance due to its waterpower that was used by the flour and saw mills. On January 24, 1853, Waverly was designated the county seat, and unlike numerous counties, the county seat has remained unchanged. Waverly was selected because of its growth, commercial position, and railroad facilities.

Bremer County was permanently organized in August 1853, with the election of county officers. The first courthouse was erected one year later by Richard Miles at a cost of \$147.50. The small frame building was used for only three years, and then it was replaced by a brick and stone two-story structure that cost \$23,000

¹ *Bremer County Atlas, 1965 and Kathy Thoms, Bremer County Director of Finance & Management, 2002.*

to complete. None of the materials used in its construction-brick, stone, and lumber were from outside of the county. This 43' x 63' building was dedicated on January 1, 1858 at a grand ball and reception that was held in the new building.

This second courthouse did not contain a vault for the safekeeping of county records, so in the summer of 1870, a small brick building was constructed adjacent to the courthouse. The \$5,000 building was used to store all of the county records.

These two buildings were torn down in 1937 in order to make room for the third and present courthouse. The county used a Works Progress Administration (WPA) grant of more than \$60,000 to construct a \$139,000 courthouse. Several bands were on hand to celebrate the dedication and open house of the new courthouse on June 10, 1937.

On July 2, 1975 a joint law enforcement building was erected to be shared by the Waverly Police Department and The Bremer County Sheriff Department. At this time the Sheriff's housing quarters, office, and jail were removed from the courthouse building. In 2003, Bremer County celebrated its 150th year from the election of county officers.

Government Structure

Bremer County is governed by a 3-member Board of Supervisors. Figure 2 is a map of the Supervisor jurisdictions.

District 1 (purple) includes the City of Waverly and sections of Washington Township east of the city. District 1 is currently represented by Ken Kammeyer.

District 2 (blue) includes the townships of: Polk, Douglas, Fremont, Warrant, Lafayette, and Jackson. The district also includes a small section of the City of Waverly as well as the cities of Plainfield, Tripoli, and Janesville. District 2 is currently represented by Tim Neil.

District 3 (green) includes the townships of Frederika, LeRoy, Sumner, Dayton, Jefferson, Maxfield, and Franklin as well as the cities of Frederika, Sumner, Denver, and Readlyn. District 3 is currently represented by Duane

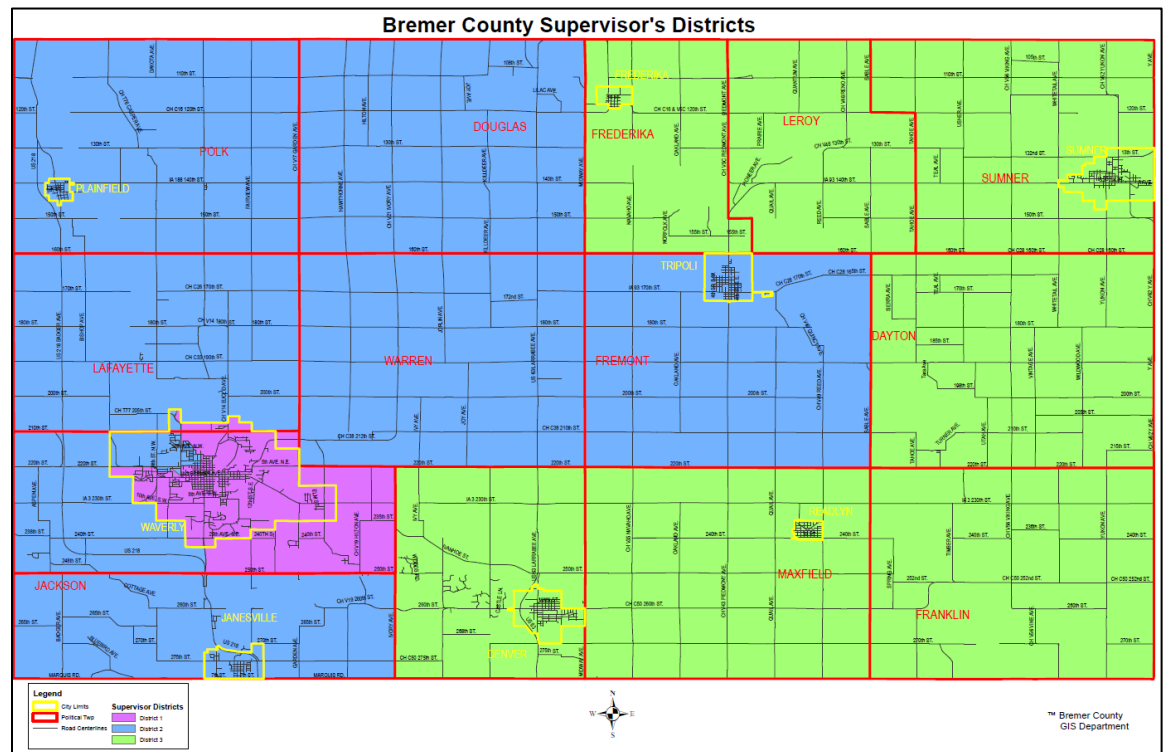


Figure 2.1: Bremer County Board of Supervisors District Map

Hildebrandt.

The eight incorporated cities in the county are represented by Mayor-City Council forms of government.

NATURAL ENVIRONMENT

The planning area's terrain is generally a flat to rolling slope topography that characterizes the agricultural areas of northeast Iowa. There are several areas of steeper than normal slope with these being dispersed throughout the county adjacent to watercourses. The highest elevation in the county, is 1,169 feet above mean sea level, is north of Sumner, located in the extreme northeast corner of the county. The lowest elevation is 865 feet above mean sea level, is found in the southwestern corner of the county, a few miles west of Janesville. The most visible geographic features within the county are the Cedar and Wapsipinicon Rivers. The Cedar River flows through Waverly and Janesville. The Wapsipinicon flows through Frederika and mainly unincorporated areas. See *Attachment 3: Topographic Map of the County*.

Soils

Ninety-two (92) percent of the planning area has soils with slopes of 5 percent or less. The planning area is abundantly supplied with a variety of soils other than productive agricultural soils. There are seven soil classifications for the planning area²:

- **Floyd-Clyde-Kenyon** – Level to moderately sloping, dark-colored loamy soils that are moderately well drained, poorly drained, and somewhat poorly drained.
- **Tripoli-Readlyn** – Nearly level, dark-colored loamy soils that are somewhat poorly drained and poorly drained.
- **Klinger-Maxfield** – Level to moderately sloping, dark-colored silty soils that are somewhat poorly drained, poorly drained, and well drained.
- **Spillville-Waukee-Coland** – Level to gently sloping, dark-colored loamy soils that are well drained to poorly drained.
- **Marshan-Sigglekov-Hayfield** – Nearly level to steep, well drained and poorly drained soils that formed in loess; on uplands.
- **Sparta-Rockton-Kenyon** – Nearly level to steep, dark-colored and light colored loamy soils that are well drained and are moderately deep to shallow over limestone.
- **Seaton-Port Byron** – Level to moderately sloping, dark-colored silty soils that are somewhat poorly drained, poorly drained, and well drained.

Climate

² United States Department of Agriculture, Soil Conservation Service; [Soil Survey of Bremer County Iowa](#).

The climate is identified as having cold, snowy winters with hot, humid summers. The climate is located in the polar front zone, the battleground of polar and tropical air masses. Being far removed from moderating influences of a large body of water, seasonal contrasts are quite distinctive and weather highly variable. Ample precipitation throughout the year is increased in the summer by invading maritime tropical air masses from the Gulf of Mexico. Cold winters are dominated by continental polar masses from the arctic regions.

The annual precipitation totals approximately 36 inches. Approximately 71 percent of a year's precipitation falls during the months of April to September. Precipitation can be expected to exceed one-half inch or more 20 days per year, or one-tenth inch or more 56 days a year. Precipitation can occur in amounts of multiple inches within one hour or less during intense rainstorms. These storms, usually associated with extreme humidity, are capable of causing extensive damage to infrastructure. Often times it is the intensity of these rainstorms that are as telling as the frequency or duration. An extremely intense rainfall can overload detention basins and small streams due to the extreme speed of onset of surface flow, thus causing flash flooding and potentially sewer backups into homes and businesses.

The annual temperature range is large, typical of a continental climate, with January, the coldest month, averaging 13.8 degrees Fahrenheit. July is the warmest month averaging 72.1 degrees Fahrenheit.

TABLE 2.1 : AVERAGE MONTHLY PRECIPITATION													
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Inches	1.00	0.93	2.15	3.71	4.40	4.95	4.51	5.17	3.18	2.61	2.41	1.25	36.27
Source: www.idcide.com (Tripoli Weather Station)													

TABLE 2.2 : AVERAGE MONTHLY TEMPERATURE RANGES													
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Max °F	23.1	29.5	42.4	57.4	70.1	79.7	82.9	80.9	73.2	60.9	42.4	28.2	55.9
Mean °F	13.8	20.4	33.0	46.5	58.7	68.6	72.1	69.9	61.3	49.4	33.5	19.8	45.6
Min °F	4.4	11.2	23.6	35.6	47.3	57.4	61.2	58.8	49.3	37.8	24.6	11.3	35.2
Source: www.idcide.com (Tripoli Weather Station)													

Vegetation

The vast majority of rural Bremer County is planted or sowed for corn and soybeans. Grass and brush are present in uncultivated and undeveloped areas of the county. Trees and grasses are often incorporated with otherwise urbanized areas in the county for aesthetics, shade, or erosion control. There are problems associated with cultivation methods used in the rural areas of the county. The high percentage of cultivated land and the relatively low percentage of conservation methods used in farming cause excessive runoff to occur during rain events. This can lead to problems that are discussed later in this plan, specifically erosion and silting in and around bridges and drainage ditches.

Surface Water Systems

There are three watersheds that fall within the planning area borders. These watersheds, as defined by the United States Geological Survey, include the following:

- **Shell Rock River** – The Shell Rock watershed is present in the extreme western portion of Bremer County. The watershed is approximately 102 miles long and encompasses two states, Iowa and Minnesota. The Shell Rock River eventually flows into the Cedar River.
- **Upper Cedar River** – The Upper Cedar watershed flows from north to south through Bremer County. The Cedar River flows through Waverly and eventually down through Cedar Falls/Waterloo in neighboring Black Hawk County.
- **Upper Wapsipinicon River** – The Wapsipinicon River flows north-south through Bremer County and this watershed covers approximately 50 percent of the county.

INFRASTRUCTURE

Transportation Systems

Bremer County has within its boundaries a variety of transportation systems. These systems include highways, gravel roads, blacktop roads, railway systems & transit. Access to bike and pedestrian trails for transportation is becoming more prevalent in the planning area. Additional efforts are being made to plan and extend recreational trails throughout the area.

Two U.S. Highways run through Bremer County: 63 and 218. Construction on U.S. Highway 63 was recently completed making the route's entire length through Bremer County a four-lane divided highway. U.S. Highway 218 was widened and realigned in the 1990s to bypass Plainfield, Waverly and Janesville. State Highways present in Bremer County include: Iowa 3, 93, and 188. In addition to the State Highway systems, the County maintains a total of 130 miles of paved roads, 590 miles of granular surfaced roads, and 225 bridges greater than 20 feet long.

Air travel is an important form of transportation and one airport is available in the county, which is the Waverly Municipal Airport. The airport is publicly-owned but does not provide commercial service.

There are 27 miles of railway lines throughout the county, which includes routes owned by Canadian National and the Iowa Northern Railroad. The Canadian National route runs north-south through Plainfield, Waverly and Janesville while the Iowa Northern Railroad route runs northwest-southeast through unincorporated Waverly Junction.

The Iowa Northland Regional Transit Commission (RTC) offers limited transit service to residents of Bremer County. Currently, demand response service, which requires 24-hour notice, is offered in Waverly. The remainder of the County is served by RTC on a case-by-case basis depending on space and service timing considerations.

Potable Water Systems

Water service in the planning area is typically provided by private, individual or common wells. The wells tap rechargeable groundwater aquifers for water. In terms of need, the county does not foresee the need for a common or public water system. However, the county does want to protect the groundwater from depletion or contamination in order to maintain its supply of potable water.

Although not thoroughly developed, large rural water mains and storage facilities have the potential to supply water for purposes of fire fighting. It is estimated that the water line would need to be at least six inches in order to supply effective pressure for actual fire fighting. Smaller lines could serve as potential fill locations for tanker trucks. Further information for each community system can be in the Appendices.

Wastewater Treatment Facility and Collection System

All of the incorporated cities within county have wastewater treatment facilities. These include the cities of Denver, Frederika, Janesville, Plainfield, Readlyn, Sumner, Tripoli, and Waverly.

In the rural part of the County, the primary means of disposing of sewage in the county is by individual, on-site septic systems. These on-site systems include tanks and septic fields for disposal of household sewage. As with water service, the county does not envision the need for a common public sewage system. The County, however, does regulate on-site systems through ordinances, inspections and its Board of Health. Further information for each system can be in the Appendices.

See Attachment 1 for a location map of sanitary sewer treatment facilities within Bremer County.

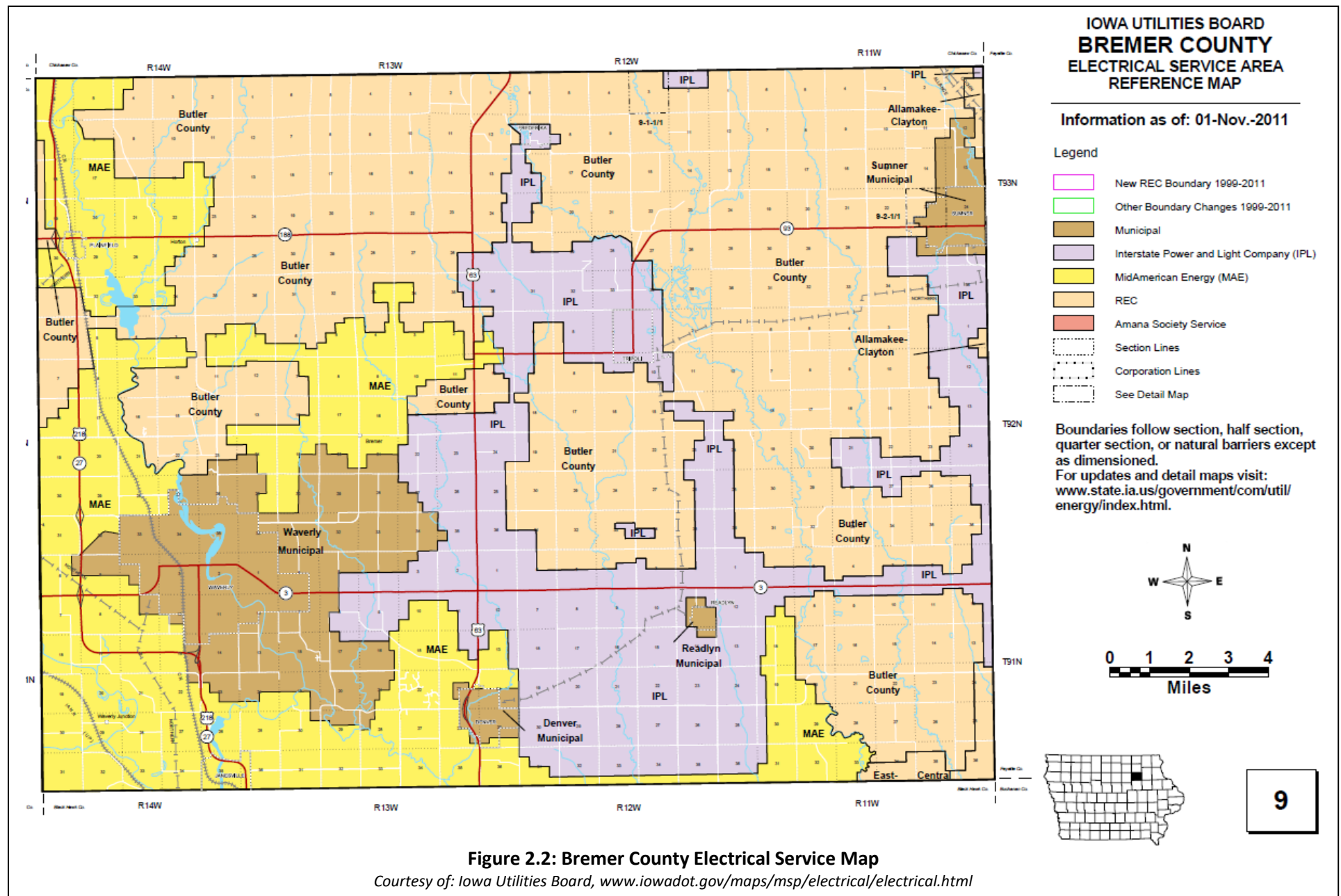
Storm Water Systems

There are no established storm water systems in the planning area. Each city is in charge of its own program for managing storm water and pollution. Rural and unincorporated areas of the county often rely on open ditches to handle storm water.

Other Utilities

The planning area is serviced by numerous utilities. Table 2.3 on the next page lists the utility providers for each jurisdiction. Figure 2.2 is an electrical service map of Bremer County.

TABLE 2.3: PRIMARY PROVIDERS FOR COMMUNITY UTILITIES WITHIN BREMER COUNTY							
Community	Electric	Natural Gas	Telephone/ Internet	Cable TV	Water	Sewer	Sanitation
Bremer County (unincorporated)	MidAmerican Energy, Alliant Energy, REC	MidAmerican Energy; Black Hills Energy;	Butler-Bremer Communications	Butler-Bremer Communications	Iowa Rural Water Association; Private Wells	Private Systems	Private Systems
City of Denver	City of Denver	MidAmerican Energy	Qwest	Mediacom	City of Denver	City of Denver	City of Denver
City of Frederika	Alliant Energy		Butler-Bremer Communications	Butler-Bremer Communications	NA (Individual Wells)	City of Frederika	City of Frederika
City of Janesville	MidAmerican Energy		Windstream	Windstream	City of Janesville	City of Janesville	City of Janesville
City of Plainfield	MidAmerican Energy	MidAmerican Energy	Butler-Bremer Communications	Butler-Bremer Communications	City of Plainfield	City of Plainfield	Jendro Sanitation
City of Readlyn	City of Readlyn	Black Hills Energy	Readlyn Telephone Co.	Readlyn Telephone Co.	City of Readlyn	City of Readlyn	Tripoli-Readlyn Sanitation
City of Sumner	Sumner Municipal Light & Power	Black Hills Energy	Windstream/Mediacom	Mediacom	City of Sumner	City of Sumner	City of Sumner
City of Tripoli	Alliant Energy	Black Hills Energy	Butler-Bremer Communications	Butler-Bremer Communications	City of Tripoli	City of Tripoli	Tripoli-Readlyn Sanitation
City of Waverly	Waverly Utilities	MidAmerican Energy	Waverly Utilities; Mediacom; Century Link	Waverly Utilities; Mediacom	City of Waverly	City of Waverly	City of Waverly
Source: Communities							



Communication

Websites

Bremer County, the participating school districts, and several of the cities have websites to provide the public with information. Many of the jurisdictions also have social media accounts.

- Bremer County: <http://www.co.bremer.ia.us>
- Denver: <http://www.cityofdenveriowa.com>
- Frederika: N/A
- Janesville: <http://www.janesvilleia.com/>
- Plainfield: <http://sites.butler-bremer.com/web/plainfieldia/>
- Readlyn: <http://www.readlyn.com>
- Sumner <http://www.mysumneriowa.com>
- Tripoli <http://www.tripoliowa.com>
- Waverly: <http://www.waverlyia.com>

Newspapers

There are four newspapers published in Bremer County which residents follow for local news and announcements. These newspapers are:

- Denver Forum
- Sumner Gazette
- Tripoli Leader
- Waverly Democrat

Other regional newspapers, published outside of the planning area, include:

- Waterloo-Cedar Falls Courier
- The Charles City Press

DEMOGRAPHICS

Population

Table 2.4 illustrates the population trends for Bremer County, its incorporated communities, and the State of Iowa for the past 30 years. As is evident in the table, the planning area has seen an overall decrease in population since 1980, but the County and many communities have recovered some population since 1990 after the population losses suffered during the 1980s farm crisis.

Population Projections

Projections are only estimates of future population, and many factors have an effect on the future population, such as employment, housing, and educational opportunities. While some projections use some of this data in order to estimate future population, they cannot plan for unknown events, such as drastic changes in employment opportunities or the perilous effects of natural disasters.

The following projections are based on the linear and geometric methods, which assume that future population will continue to change based on past trends. The linear method adds or subtracts from the population the average number from each ten-year period since 1950, while the geometric method uses an average growth or decline rate. Table 2.5 shows the actual number change and the growth or decline rate for each decade and their averages.

Using the numbers derived in Table 2.5, population projections can be estimated using the two methods (Linear and Geometric). These projections are listed in Table 2.6 on the next page. It is important to note that these projections are just estimates based on past trends.

Many variables can affect a county's growth and/or decline in population. Nevertheless, projecting population can give some idea as to how to plan for the future.

TABLE 2.4: POPULATION TRENDS FOR SELECTED COMMUNITIES IN BREMER COUNTY, IOWA

Community	1980 Population	1990 Population	2000 Population	2010 Population	% Change 1980-2010
City of Denver, IA	1,647	1,600	1,627	1,780	8.1
City of Frederika, IA	223	188	199	183	-17.9
City of Janesville, IA	840	822	829	930	10.7
City of Plainfield, IA	469	455	438	436	-7.0
City of Readlyn, IA	858	773	786	808	-5.8
City of Sumner, IA	2,335	2,078	2,106	2,028	-13.1
City of Tripoli, IA	1,280	1,188	1,310	1,313	2.6
City of Waverly, IA	8,444	8,539	8,968	9,874	16.9
Bremer County (Unincorporated Area)	8,724	7,170	7,062	6,924	-20.6
Bremer County (total)	24,820	22,813	23,325	24,276	-2.2
State of Iowa	2,913,808	2,776,755	2,926,324	3,046,355	4.5
Source: U.S. Census Bureau and Iowa Data Center					

TABLE 2.5: HISTORIC POPULATION CHANGES FOR BREMER COUNTY, IA

Year	Population	Number Change (Linear Method)	Growth/Decline Rate (Geometric Method)
1950	18,884	--	0.0
1960	21,108	2,224	11.8
1970	22,737	1,629	7.7
1980	24,820	2,083	9.2
1990	22,813	-2,007	-8.1
2000	23,325	512	2.2
2010	24,276	951	4.1
Average (1950-2010)		4,441 / 6.0 = 740.2	26.9/6.0 = 4.5%
Source: U.S. Census Bureau and Iowa Data Center			

Housing and Development Trends

According to 2010 Census data, there are 9,915 total housing units in the County (Table 2.7). More recent data indicate a total of 9,939 housing units (Table 2.7). Of these housing units, 7,604 are owner-occupied, 1,706 are renter-occupied, and 629 are vacant. Mobile homes make up 2.9 percent of the county's housing units. This is slightly less than the State's figure of 4.1 percent. Besides the unincorporated area, the communities of Janesville, Sumner, Tripoli, and Waverly have a large number of mobile homes within their jurisdiction (Table 2.8). Bremer County's total household population is 22,558, with an additional 1,718 in group quarters. Average household size for Bremer County is 2.40 persons.

Age of Housing

Approximately 32 percent of the housing units in Bremer County were built in 1939 or earlier. In the decades following 1940, the largest numbers of housing units were built in the 1970s. The 1980's and 1990's witnessed a dramatic decline in the number of houses being built. Table 2.9 shows the number of structures built in each decade since 1939 and the number built before that time. The numbers represented in the following table encompass all houses within the county, including incorporated areas.

Year	Bremer County	State of Iowa
2020	24,633	3,172,237
2030	25,534	3,328,308
2040	26,462	3,487,942

Source: U.S. Census Bureau, Iowa Data Center, and Woods & Poole Economics

Community	2010
City of Denver, IA	0
City of Frederika, IA	0
City of Janesville, IA	45
City of Plainfield, IA	3
City of Readlyn, IA	0
City of Sumner, IA	13
City of Tripoli, IA	17
City of Waverly, IA	139
Unincorporated Area	67
Bremer County (total)	284

Community	1980	1990	2000	2010
City of Denver, IA	590	622	672	731
City of Frederika, IA	110	113	122	118
City of Janesville, IA	307	343	359	409
City of Plainfield, IA	203	193	202	197
City of Readlyn, IA	309	317	326	346
City of Sumner, IA	945	900	930	944
City of Tripoli, IA	536	546	561	568
City of Waverly, IA	2,985	3,160	3,383	3,732
Unincorporated Area	2,826	2,653	2,771	2,870
Bremer County (Total)	8,811	8,847	9,337	9,915
State of Iowa	1,121,314	1,143,669	1,232,511	1,336,417

Source: U.S. Census Bureau

Year Built	Bremer County		Iowa Percent (%)
	Number	Percent (%)	
2010 or later	36	0.4	0.3
2000-2009	986	9.9	11.3
1990-1999	862	8.7	10.8
1980-1989	605	6.1	7.2
1970-1979	1,515	15.2	15.0
1960-1969	1,191	12.0	10.6
1950-1959	1,061	10.7	11.1
1940-1949	507	5.1	6.4
1939 or earlier	3,176	32.0	27.3
Total	9,939	100.0	100.0

Source: U.S. Census Bureau (2008-2012 5-Year Estimates)

Value of Housing

Housing value within Bremer County has dramatically increased since that of the previous decennial census. According to 2010 Census, the median value for an owner occupied unit in the county was \$139,300.00. While this value is higher than the State average, most individual communities within the county still remain relatively low compared to State averages for owner occupied housing units.

The State of Iowa had a median housing value of \$123,000 in 2010 according to Table 2.10.

Table 2.11 shows the number and percent of housing units in the county by type.

Table 2.12 provides a list of median gross rent for each community. Bremer County's median gross rent is \$78 less than the State's. Of Bremer County's jurisdictions, Frederika has the lowest median gross rent, at \$475.

TABLE 2.10: MEDIAN VALUE OF A SPECIFIED OWNER-OCCUPIED UNITS IN SELECTED COMMUNITIES				
Community	1980	1990	2000	2010
City of Denver, IA	\$ 56,600	\$ 53,900	\$ 92,900	\$ 147,500
City of Frederika, IA	29,200	27,900	60,900	82,800
City of Janesville, IA	45,400	38,000	77,600	120,800
City of Plainfield, IA	34,300	28,600	66,100	90,700
City of Readlyn, IA	44,900	39,000	78,200	110,400
City of Sumner, IA	33,500	30,100	68,100	78,000
City of Tripoli, IA	35,000	29,200	64,800	90,000
City of Waverly, IA	50,800	53,100	95,800	142,800
Bremer County (total)	46,800	45,900	88,000	139,300
State of Iowa	40,600	45,500	82,500	123,000
Source: U.S. Census Bureau				

TABLE 2.11: HOUSING UNITS BY TYPE IN BREMER COUNTY		
Units in Structure	Number of Units	Percent
1-unit, detached	8,322	83.7%
1-unit, attached	143	1.4%
2 units	276	2.8%
3 or 4 units	355	3.6%
5 to 9 units	290	2.9%
10 to 19 units	130	1.3%
20 or more units	222	2.2%
Mobile Home	205	2.1%
Total Housing Units	9,943	100.0%
Source: 2009-2013 5-year ACS		

TABLE 2.12: MEDIAN GROSS RENT FOR SELECTED COMMUNITIES				
Community	1980	1990	2000	2010
City of Denver, IA	\$202	\$167	\$451	571
City of Frederika, IA	140	203	288	475
City of Janesville, IA	178	262	358	518
City of Plainfield, IA	145	309	450	650
City of Readlyn, IA	159	256	360	525
City of Sumner, IA	128	257	351	505
City of Tripoli, IA	130	264	405	521
City of Waverly, IA	169	298	418	599
Bremer County(total)	161	288	400	577
State of Iowa	226	336	470	655
Source: U.S. Census Bureau				

TABLE 2.13: PER CAPITA & MEDIAN HOUSEHOLD INCOME FOR SELECTED COMMUNITIES

Community	Per Capita Income			Median Household Income		
	1990	2000	2010	1990	2000	2010
City of Denver, IA	\$13,538	\$20,791	26,978	\$29,292	\$44,375	61,042
City of Frederika, IA	9,817	20,224	34,968	17,500	36,250	54,000
City of Janesville, IA	11,077	18,878	26,549	26,538	40,060	53,102
City of Plainfield, IA	10,177	18,156	24,786	23,092	39,688	52,969
City of Readlyn, IA	11,508	17,721	27,907	30,043	41,625	57,083
City of Sumner, IA	10,969	18,029	25,419	20,885	33,417	47,768
City of Tripoli, IA	11,135	16,882	19,734	21,893	34,444	45,724
City of Waverly, IA	11,942	18,285	26,007	28,312	39,587	61,308
Bremer County(total)	11,626	19,199	28,276	27,326	40,826	60,193
State of Iowa	12,422	19,674	26,545	26,229	39,469	51,129

Source: U.S. Census Bureau

Economy

Income

The per capita and median household income for the county and its communities are listed in Table 2.13. The county, as a whole, has a per capita income in 2009 dollars of \$28,276. The median household income for the entire county, in 2009 dollars, is \$60,193. The City of Tripoli has both the smallest per capita income, \$19,734, as well as the smallest median household income, \$33,417.

Employment Sectors

As Table 2.14 reveals, Bremer County has a large percentage of its residents employed in the education, health and social services, similar to the State. Manufacturing is the second highest industry employing 17.5% of the county. The table also shows the rural environment of the county, with 4.4% employment in the agricultural, forestry, fishing and hunting, and mining industry. The retail trade sector is also a higher percentage due to the concentration of retail businesses in Waverly.

TABLE 2.14: NUMBER OF EMPLOYEES BY EMPLOYMENT SECTOR/INDUSTRY

Industry	Bremer County		State of Iowa	
	#	%	#	%
Agriculture, Forestry, Fishing & Hunting, and Mining	551	4.4%	62,188	4.0%
Construction	634	5.0	95,581	6.1
Manufacturing	2,205	17.5	229,557	14.7
Wholesale Trade	326	2.6	46,372	3.0
Retail Trade	1,443	11.4	181,666	11.7
Transportation & Warehousing, and Utilities	384	3.0	73,661	4.7
Information	137	1.1	30,862	2.0
Finance, Insurance, Real Estate, and Rental & Leasing	1,024	8.1	119,357	7.7
Professional, Scientific, Management, Administrative, and Waste Management Services	700	5.5	106,174	6.8
Education, Health and Social Services	3,544	28.1	372,756	23.9
Arts, Entertainment, Recreation, Accommodations and Food Services	798	6.3	118,557	7.6
Other Services (except public administration)	583	4.6	68,747	4.4
Public Administration	298	2.4	51,853	3.3

Source: U.S. Census Bureau (2008-2012 5-Year Estimates)

Agriculture, crops and livestock are major components of the Bremer County economy. According to a Study by Iowa State University Extension Service³, Bremer County had 995 farms and over 243,000,000 acres of farm land. Farm land occupies more than 86 percent of the surface land in the county. In 2007 Bremer County farmers harvested 134,932 acres of corn and 69,094 acres of soybeans. The corn and soybean harvest produced over 23 million bushels of corn and 3.5 million bushels of beans. All crop production in the county contributed \$121.4 million in economic output. In 2007 farmers sold 298,884 hogs and 19,775 heads of cattle. The total crop and livestock economic output was estimated to be \$192 million in Bremer County.

Major Employers

Wartburg College is the largest employer in Bremer County. The college is located in Waverly with 1,320 employees, 500 regular employees and 820 student employees. Local school districts, CUNA Mutual Life Insurance, Waverly Health Center, Nestle Beverage, and GMT Corporation are also major employers within the county.

Bremer County has six school districts providing K-12 education and employment. These districts include: Waverly-Shell Rock Community School (member of Butler County 2015 MJ-HMP), Denver Community School, Janesville Consolidated School (member of this MJ-HMP), Sumner Community School, Tripoli Community School, Wapsie Valley Community School,

There are industrial parks located in Waverly (70 acres), Sumner (15 acres), and Denver has some acreage available as well.

³ <http://www.extension.iastate.edu/bremer/crops>

SECTION 3 –RISK ASSESSMENT

This updated risk assessment process identifies and profiles relevant hazards and assesses the exposure of lives, property, and infrastructure to these hazards. The goal of the risk assessment is to estimate the potential loss in Bremer County, including loss of life, personal injury, property damage, and economic loss, from a hazard event. The risk assessment process allows the community to better understand their potential risk to various hazards and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

The risk assessment for Bremer County follows the methodology described in the FEMA publication 386-2, *Understanding Your Risks: Identifying Hazards and Estimating Losses* (2002), which includes a four-step process:

- Identify Hazards
- Profile Hazard Events
- Inventory Assets
- Estimate Losses

This section is divided into three parts: hazard identification, hazard profiles, and vulnerability assessment:

- **Hazard Identification** identifies the hazards that threaten the planning area and describes why some hazards have been omitted from further consideration.
- **Hazard Profiles** discusses the threat to the planning area and describes previous occurrences of hazard events and the probability of future occurrence.
- **Vulnerability Assessment** assesses the County's total exposure to natural hazards, considering critical facilities and other community assets at risk, and assessing growth and development trends. Hazards that vary geographically across the planning area are addressed in greater detail. This section includes steps 3 and 4 from above.

Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the ...location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and the probability of future hazard events.

Requirement §201.6(c)(2)(iii): For multi-jurisdictional plans, the risk assessment must assess each jurisdiction's risks where they vary from the risks facing the entire planning area.

Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the type...of all natural hazards that can affect the jurisdiction.

HAZARD IDENTIFICATION

In order to properly identify mitigation strategies and projects, the hazards that may affect the planning area must be identified and/or updated. The following section lists the potential hazards to the planning area that were identified by the Planning Committee. This section also discusses previous occurrences of the hazards, the areas of the planning area most at risk from each hazard, and the populations most at risk. By identifying the hazards and quantifying the risks, the planning area can better assess current mitigation strategies, develop future mitigation strategies and identify needed mitigation projects.

The hazard analysis identifies potential hazards that could affect the planning area for the purposes of mitigation planning. It is important to note that the focus of mitigation is on reducing long-term risks of damage or threats to public health and safety caused by hazards and their effects. Thus, in some cases the hazards identified for mitigation may not include all of or the same hazards identified for preparedness, response or recovery.

The Committee reviewed the recognized hazards in the 2012 Bremer County Multi-Jurisdictional Hazard Mitigation Plan, the 2013 Iowa Hazard Mitigation Plan, and the contractual agreement between the County and FEMA. After review, the committee elected to use the same list of hazards as those identified in the 2013 Iowa Hazard Mitigation Plan. The terminology of these hazards varied slightly from the County's 2012 plan, but the committee believed the list used by the state covered all the hazards the planning area could anticipate a need to address.

The Iowa 2013 Hazards List has three categories of hazards: Natural, Technological, and Human Caused. The planning committee used the hazards identified in the Iowa plan, as well as evaluating the planning area to see if there were any circumstances that called for additional hazards to be identified. No additional hazards were identified. Hazards identified for Bremer County and its communities are listed in Table 3.1.

The identified hazards are discussed at length on the following pages. The discussion will include known historical occurrence, probability of future occurrence, magnitude/severity, warning time, and duration. The overall average results of the Committee's scoring efforts will be provided following this discussion, under Vulnerability Assessment. The individual community scores can be found in each respective appendix.

TABLE 3.1: BREMER COUNTY HAZARD LIST	
Natural	Technological
Animal/Plant/Crop Disease	HAZMAT Incident
Drought	Infrastructure Failure
Earthquake	Levee/Dam Failure
Expansive Soils	Radiological Incident
Extreme Heat	Transportation Incident
Flash Flood	
Grass/Wild Land Fire	Human Caused
Human Disease	Terrorism
Landslide	
River Flooding	
Severe Winter Storm	
Sinkholes	
Thunderstorm/Lighting/Hail	
Tornado/Windstorm	

A large portion of a communities risk and vulnerability to a specific hazard is affected by the geographic location of that community. In fact, some of the 20 hazards from the state's 2013 plan may not be applicable to certain communities. However, to be sure a comprehensive approach was undertaken, all

communities conducted a hazard assessment for each of the 20 hazards.

Disaster Declaration History

One method used by the planning committee to identify hazards was to examine events that triggered federal and/or state disaster declarations. Federal and/or state declarations may be granted when the severity and magnitude of an event surpasses the ability of the local government to respond and recover. Disaster assistance is supplemental and sequential. When the local government's capacity has been surpassed, a state disaster declaration may be issued, allowing for the provision of state assistance. Should the disaster be so severe that both the local and state governments' capacities are exceeded; a federal emergency or disaster declaration may be issued allowing for the provision of federal assistance.

Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the type... of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

The federal government may issue a disaster declaration through FEMA, the U.S. Department of Agriculture (USDA), and/or the Small Business Administration (SBA). FEMA also issues emergency declarations, which are more limited in scope and without the long-term federal recovery programs of major disaster declarations. The quantity and types of damage are the determining factors.

Table 3.2 lists state and federal disaster declarations received by Bremer County. Many of the disaster events were regional or statewide; therefore, reported costs are not accurate reflections of losses to Bremer County and its jurisdictions.

HAZARD PROFILES

Once hazards were identified and profiled, a vulnerability assessment was conducted. The vulnerability assessment identifies how people, properties, and structures will be damaged by the event. If the hazard can harm people or damage their homes and other structures, they are vulnerable. Finding the weak points in the system, for example, identifying building types that are vulnerable to damage and anticipating the loss in high risk areas, will help the planning area decide what mitigation measure should be undertaken and how to implement the activities they select.

TABLE 3.2: PRESIDENTIAL DISASTER DECLARATION HISTORY FOR BREMER COUNTY		
Declared Date	Type	Declaration #
July 1991	Severe Weather	DR-911-IA
April 1993	Flooding	DR-986-IA
June 1993	Flooding	DR-996-IA
July 1998	Severe Weather	DR-1230-IA
May 1999	Severe Storms, Flooding & Tornadoes	DR-1277-IA
July 1999	Flooding	DR-1282-IA
May 25, 2004	Severe Storms, Tornadoes & Flooding	DR-1518
September 2005	Hurricane Katrina	EM-3239
March 14, 2007	Severe Winter Storms	DR-1688
May 27, 2008	Severe Storms, Tornadoes, and Flooding	DR-1763
Source: FEMA, as of 8/31/2015		

Methodology

The risk assessment identifies how people, properties, and structures could be damaged by the event. If the hazard can harm people or damage their homes and other structures, they are vulnerable. Finding the weak points in the system, for example, identifying building types that are vulnerable to damage and anticipating the loss in high risk areas, will help the community decide what mitigation measure should be undertaken and how to implement the activities they select.

The Hazard Mitigation Planning Committee used the following updated factors in determining the hazard risk assessment (as used by the State of Iowa in their HMP Update). The Planning Committee considered the following for each identified hazard:

- Probability
- Magnitude / Severity
- Warning Time
- Duration

$$(\text{Probability} \times .45) + (\text{Magnitude/Severity} \times .30) + (\text{Warning Time} \times .15) + (\text{Duration} \times .10) = \text{Final Hazard Assessment Score}$$

Each hazard identified in this section is profiled individually. The level of information presented in the profiles varies by hazard based on the information available. With each update of this plan, new information will be incorporated to provide for better evaluation and prioritization of the hazards that affect the planning area.

The sources used to collect information for these profiles included previous and current hazard mitigation plan, available data from the National Climatic Data Center, the State of Iowa updated HMP and other available data from the County and incorporated communities. Detailed profiles for each of the identified hazards include information categorized as follows.

TABLE 3.3 : PROBABILITY		
Score	Description	
1	Unlikely	Less than 10% probability in any given year (up to 1 in 10 chance of occurring), history of events is less than 10% likely or the event is unlikely but there is a possibility of its occurrence.
2	Occasional	Between 10% and 20% probability in any given year (up to 1 in 5 chance of occurring), history of events is greater than 10% but less than 20% or the event could possibly occur.
3	Likely	Between 20% and 33% probability in any given year (up to 1 in 3 chance of occurring), history of events if greater than 20% but less than 33% or the event is likely to occur.
4	Highly Likely	More than 33% probability in any given year (event has up to a 1 in 1 chance of occurring), history of events is greater than 33% likely or the event is highly likely to occur.

Probability

The probability score reflects the likelihood of the hazard occurring again in the future, considering both the hazard's historical occurrence and the projected likelihood of the hazard occurring in any given year. Many times the historical occurrence can be extrapolated into the future using best available data, but

others, due to the nature of the hazard are more difficult to estimate the probability of future occurrence. If a hazard or its impacts have been mitigated against, the probability of future occurrences decreases. Conversely, hazards that have not occurred in the past may present themselves to the community in the future. Table 3.3 shows the probability scoring criteria.

Magnitude / Severity

The impact severity of a hazard event (past and perceived) is related to the vulnerability. Relevant factors include when the event occurs (year-round, seasonal), the location affected, community resilience, and the effectiveness of the emergency response and disaster recovery efforts. Quantifying impact severity is difficult to address at multiple levels simultaneously. Table 3.4 shows the Magnitude / Severity scoring criteria.

TABLE 3.4 : MAGNITUDE / SEVERITY		
Rating	Description	
1	Negligible	Less than 10% of property severely damaged, shutdown of facilities and services for less than 24 hours, and/or injuries/illnesses treatable with first aid
2	Limited	10% to 25% of property severely damaged, shutdown of facilities and service for more than a week, and/or injuries/illnesses that do not result in permanent disability.
3	Critical	25% to 50% of property severely damaged, shutdown of facilities and services for at least two weeks, and/or injuries/illnesses that result in permanent disability.
4	Catastrophic	More than 50% of property severely damaged, shutdown of facilities and services for more than 30 days, and/or multiple deaths.

Warning Time

The speed of onset is the amount of warning time available before the hazard occurs. This should be taken as an average warning time. For many of the atmospheric natural hazards there is a considerable amount of warning time as opposed to the human caused accidental hazards that occur instantaneously or without any significant warning time. Table 3.5 shows the warning time criteria.

TABLE 3.5: WARNING TIME	
Score	Description
1	More than 24 hours warning time.
2	12 to 24 hours warning time.
3	6 to 12 hours warning time
4	Minimal or no warning time (up to 6 hours warning)

Duration

This consists of the typical amount of time that the jurisdiction is impacted by the hazard. As an example, a snowstorm will likely last several hours, whereas a lightning strike would last less than a second. Table 3.6 shows the duration scoring criteria.

Table 3.7 lists the average scores for all jurisdictions in the planning area. Individual assessment scores for each jurisdiction can be found in their respective appendix.

The hazard assessment scores for unincorporated Buchanan County, whose appendix is served by this section of the plan's overview of the county, is shown in Table 3.8.

TABLE 3.6 : DURATION	
Score	Description
1	Less than 6 hours
2	Less than 1 day
3	Less than 1 week
4	More than 1 week

Certain hazard rankings are different depending upon the jurisdiction affected, due to different topography, historical occurrences, vulnerability, severity of impact, and probability to that community. The identified hazards are discussed at length on the following pages, in alphabetical order.

TABLE 3.7: COMPOSITE HAZARD ASSESSMENT SCORES OF ALL JURISDICTIONS						
Hazard Rank	Hazard	Probability	Magnitude/Severity	Warning Time	Duration	Final Score
1	Thunderstorm/Lightning/Hail	3.22	2.00	2.78	1.67	2.63
2	Severe Winter Storm	3.33	2.00	1.44	2.89	2.61
3	Tornado/Windstorm	2.00	3.00	3.67	2.11	2.56
4	River Flooding	2.44	2.33	1.22	3.33	2.32
5	Flash Flood	2.33	1.67	2.78	2.22	2.19
6	Transportation Incident	2.11	1.89	2.89	2.11	2.16
7	Infrastructure Failure	1.44	2.33	3.22	2.89	2.12
8	Extreme Heat	1.89	1.56	1.11	3.22	1.81
8	Human Disease	1.56	1.44	1.78	3.67	1.77
10	Terrorism	1.22	1.56	3.22	2.67	1.77
11	Grass/Wild Fire	1.33	1.44	3.67	1.78	1.76
12	HAZMAT Incident	1.22	1.44	3.11	2.67	1.72
13	Drought	1.67	1.56	1.11	3.22	1.71
14	Animal/Plant/Crop Disease	1.89	1.00	0.89	2.89	1.57
15	Sinkholes	1.11	1.11	2.67	2.22	1.46
16	Radiological Incident	1.00	1.56	2.00	2.11	1.43
17	Landslide	1.11	1.00	2.67	2.22	1.42
18	Earthquake	1.00	1.11	2.67	1.33	1.32
19	Dam / Levee Failure	1.00	1.00	2.22	2.22	1.31
20	Expansive Soils	1.22	1.11	1.11	2.44	1.29

TABLE 3.8: HAZARD ASSESSMENT SCORES FOR UNINCORPORATED BREMER COUNTY						
Hazard Rank	Hazard	Probability	Magnitude/Severity	Warning Time	Duration	Final Score
1	Flash Flood	4	2	3	3	3.15
2	Transportation Incident	3	3	4	1	2.95
2	Thunderstorm/Lightning/Hail	4	2	3	1	2.95
4	Severe Winter Storm	4	2	1	3	2.85
5	River Flooding	3	3	1	4	2.80
6	Sinkholes	2	2	4	4	2.50
6	Tornado/Windstorm	2	3	4	1	2.50
6	Infrastructure Failure	2	2	4	4	2.50
9	Expansive Soils	3	1	1	4	2.20
9	Terrorism	2	1	4	4	2.20
11	Extreme Heat	3	1	1	3	2.10
12	Drought	2	2	1	4	2.05
12	Human Disease	2	2	1	4	2.05
14	HAZMAT Incident	2	1	4	2	2.00
15	Grass/Wild Land Fire	2	1	4	1	1.90
16	Radiological Incident	1	2	4	2	1.85
17	Animal/Plant/Crop Disease	2	1	1	4	1.75
17	Dam / Levee Failure	1	1	4	4	1.75
19	Landslide	1	1	4	3	1.65
20	Earthquake	1	1	4	1	1.45

HAZARD PROFILES

Animal / Plant / Crop Disease

Definition and Description

Disease is any impairment of normal physiological function affecting all or part of an organism, esp. a specific pathological change caused by infection, stress, etc., producing characteristic symptoms; illness or sickness in general (*Collins*). Also it is any medical, health, or sanitation threat to plants, wildlife, domestic animals. For purposes of this discussion the topic will be contained to only communicable diseases and will largely deal with generalities.

Communicable diseases can have devastating effects on a health of the population of a community, the health of wild and domestic animals, and on the wide variety of plant life that is present in and around the community. Some of these diseases are considered to be a greater risk to the community than others.

Some diseases that affect livestock may include (but not limited to) West Nile Virus, Equine Infectious Anemia, Johne's Disease, Foot Rot, Coccidiosis, Pinkeye, Anaplasmosis, Anthrax, Bluetongue, Brucellosis, Trichomoniasis, Tuberculosis, Pseudorabies, Brucellosis, Porcine Reproductive Respiratory Syndrome, Brucella ovis, Ovine Progressive Pneumonia, Scrapie, Micoplasma, Newcastle, Vesicular Stomatitis, Chronic Wasting Disease (CWD), Exotic Newcastle Disease and Rabbit calicivirus disease. In recent years, Avian Bird Flu has shown up throughout the state.

Some common plant diseases include cedar-apple and related rusts, anthracnose, oak wilt, Verticillium wilt, ash decline, Sphaeropsis blight of pine, Rhizosphaera of spruce, Cytospora of spruce, black knot of plum, and environmental or abiotic disease, and Dutch Elm disease among others.

Lastly, though not technically a disease, the threat from the Emerald Ash Borer poses an ever-increasing threat to ash trees in Bremer County and many of its cities. According to the Iowa Department of Natural Resources, Bremer County has confirmed Emerald Ash Borer infestations. The damage caused by this invasive species is comparable to diseases such as Dutch elm disease.

Historical Occurrence

Instances of plant, crop, or animal disease are common across Iowa and Bremer County. However, according to available data and input, there have been no widespread recorded occurrences of plant, crop, or animal diseases having a long-term significant impact in the planning area.

Probability

Due to the lack of widespread diseases in the past, it is unlikely that a major animal, plant, or crop disease will develop in the future. That being the case, there is a much greater likelihood of complications, such as foodborne illness in humans, resulting from bacteria and viruses originating in livestock and crops.

In addition, the presence of pests, weeds, and fungi poses another threat because organisms have the potential to develop resistances against chemical sprays (e.g. pesticides, herbicides, fungicides) which, in turn, could result in widespread crop damage. The Iowa Hazard Mitigation Plan determined that though it

would have a high impact, the probability of this hazard occurring is low. The composite score (Table 3.7) determined the probability of this hazard event to be between unlikely and occasional (up to 1 in 5 chance occurring). Unincorporated Bremer County concluded the probability of this hazard to occasional – representing a 10-20 percent chance of occurring each year.

Magnitude / Severity

As discussed earlier in the profile, agriculture, primarily corn, soybeans, and livestock, is a major contributor to Bremer County's economy. An Iowa State University Extension study determined that in 2007, agriculture attributed over \$259 million in economic output and provided 1,570 jobs throughout Bremer County, which makes up 11.9 percent of the county's workforce.⁴

The severity of a plant, crop, or animal disease depends largely on the disease itself. Effects from a widespread crop disease in Butler County or the state could result in unprecedented crop damage. The same is true for livestock. This damage to plants, crops, and livestock could have devastating effects on the local and state-wide economy.

Warning Time

It is unlikely that there would be any warning before a plant, crop, or animal disease develops. However, it is possible that a small, localized discovery of a new disease could prevent the spread of that disease if properly contained and managed.

Duration

The duration of a plant, crop, or animal disease is likely to last weeks, months, or even years. This is because of the time required to first discover the disease and then develop methods to treat the disease and prevent it from spreading.

⁴ <http://www.extension.iastate.edu/bremer/crops>

Dam / Levee Failure

Definition and Description

A dam is defined as an artificial barrier with the ability to impound water, wastewater, or any liquid-borne material, for the purpose of storage or control of water. Dams are constructed for a variety of uses, including flood control, erosion control, water supply impoundment, hydroelectric power generation, and recreation. A dam failure is a break in, or imposed threat from, any water retention fixture which may endanger population downstream of the containment area.

According to the Federal Emergency Management Agency, dams can fail for one or a combination of the following reason: Overtopping caused by floods that exceed the dam capacity; Deliberate acts of sabotage; Structural failure of materials used in dam construction; Movement and/or failure of the foundation supporting the dam; Settlement and cracking of concrete or embankment dams; Piping and internal erosion of soil in embankment dams; and Inadequate maintenance and upkeep.

The Iowa Department of Natural Resources tracks all dams in the state of Iowa with a height of at least 25 feet or a total storage of at least 50 acre feet of water. The inventory excludes all dams less than six feet high regardless of storage capacity and dams less than 15 acre feet of storage regardless of height.

The Army Corps of Engineers classify dams into three categories based on the potential risk to people and property should a failure occur. Table 3.9 shows these classifications.

TABLE 3.9: DAM HAZARD POTENTIAL CLASSIFICATION	
High Hazard Potential	Dams assigned the high hazard potential classification are those where failure or mis-operation will probably cause loss of human life.
Significant Hazard Potential	Dams assigned the significant hazard potential classification are those dams where failure or mis-operation results in no probable loss of human life but can cause economic loss, environment damage, disruption of lifeline facilities, or impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure
Low Hazard Potential	Dams where failure or mis-operation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.
<i>Source: Army Corps of Engineers National Inventory of Dams</i>	

The classification may change over time because of development downstream from the dam since its construction. Older dams may not have been built to the standards of its new classification. Dam hazard potential classifications have nothing to do with the material condition of a dam, only the potential for death or destruction due to the size of the dam, the size of the impoundment, and the characteristics of the area downstream of the dam.

According to data from the National Inventory of Dams and the Iowa Department of Natural Resources, there are six dams in Bremer County, as shown in Table 3.10. See Attachment 1 for a map of the locations of these dams.

TABLE 3.10: DAMS IN BREMER COUNTY			
Dam Name	River	Owner Name	Type & Purpose
Waverly Mill Dam	Cedar River	City of Waverly	Gravity – Hydroelectric and Recreation
Bremer County Road Grade Dam	Quarter Section Run Creek	Bremer County	Earth – Fire Protection, Stock or Small Fish Pond and Other
Denver Dam	Quarter Section Run Creek	City of Denver	Rock Dam – Recreation
Frederika Dam (Alcock Park)	Wapsipinicon River	Bremer County	Low-head – Recreation
Sweet Marsh Dam	Wapsipinicon River (East Fork)	Iowa DNR	Seasonal Wetland – Fish and Wildlife Pond
Janesville Rock Dam	Cedar River	N/A	Rock Dam – Recreation
Source: U.S. Army Corps of Engineers, National Inventory of Dams & Iowa DNR			

A levee is a man-made low ridge or embankment built along the edge of a stream or river channel to prevent flooding of the adjacent land. Artificial levees are typically needed to control the flow of rivers meandering through broad, flat floodplains. Levees are usually embankments of dirt built wide enough so that they will not collapse or be eroded when saturated with moisture from rivers running at usually high levels. Grass or some other dense vegetation is planted on the top of the levee's bank so erosion is kept to a minimum.

A levee failure is the loss of structural integrity of a wall, dike, berm, or elevated soil by erosion, piping, saturation, or under seepage causing water to inundate normally dry areas.

Levees constructed of compacted clay with a high plasticity tend to crack during cycles of long dry spells. During heavy rainfalls that follow the dry spells, water fills the cracks and fissures. In addition to increasing the hydrostatics forces, the water is slowly absorbed by the clay. The effect of the absorbed water is an increase in the unit weight of the clay as well as a decrease in its shear strength. This results in a simultaneous increase of the slide (driving) forces and a decrease of the resisting (shear strength) forces. Furthermore, the cyclic shrink / swell behavior of the cracked clay zone results in a progressive reduction of the shear strength of the clay, perhaps approaching its residual strength. It also results in deepening of the cracked clay zone, which may eventually reach a depth of 9 ft. or more, especially for clays with a plasticity index greater than 40. The end result may be a sloughing failure following a heavy rainfall. It is believed that fast removal of the runoff water from the interconnected network of cracks could alleviate this surface instability problem.

According to information available from the Army Corps of Engineers National Levee Database, there are no levees, registered with the agency, within the planning area.

Historical Occurrence

There have been no documented dam or levee failures in the planning area.

According to information available from the Army Corps of Engineers National Levee Database, there are no levees, registered with the agency, within the planning area. However, the planning area likely has numerous rural, agricultural-related man-made levees, dikes, or berms to protection primary agricultural lands and communities.

Probability

For dams, with the increased attention to sound design, quality construction, and continued maintenance and inspection, dam failure probability is low across the planning area. The probability of a dam failure due to a breach in the structural integrity of the system is also minimal. The hazard risk for the dams in Bremer County was considered low. The probability of a catastrophic dam failure or other dam-related hazard was determined to be unlikely.

There are likely additional levees and berms in the planning area which are not listed in the Army Corps of Engineers database. The likelihood of these levees and berms failing may be higher since there is no official inspection, maintenance, or design on record. These levees and berms are likely built by landowners and farmers.

The Frederika Dam is located in the county owned Alcock Park. The park offers open space, recreational activities, shelters, picnic tables, boat ramp, camp ground, drinking wells, as well as a shower house and restroom. Alcock Park is also the location of a low-head dam that has been determined by the county to pose a potentially fatal risk. The parks webpage contains the following warning:

Alcock Park has a low-head dam within the park. Improper and unsafe activities can result in fatalities. The following information was written by Kip Ladage of Tripoli, Iowa. Low-head dams can look pleasant and relaxing with the water gently falling over them. However, the dams become dangerous with thousands of gallons of water pouring over the dams and creating a churning current, often called a "hydraulic." The water will take any object, large or small, wearing a Personal Flotation Device (PFD) or not, and slam it to the bottom of the dam, release it to the surface, and again slam it to the bottom. The cycle can continue indefinitely. You will not have the strength to fight the force of the water should you be caught in the backwash of the low-head dam. Do not attempt a rescue. Call in a trained rescue squad. Low-head dam accidents become multiple victim incidents when rescues are attempted by individuals lacking proper training. With these thoughts in mind, consider very carefully your activities around the dam so we can see you enjoying another day on the Wapsipinicon.

Magnitude Severity

Dams are classified into three categories based on the potential risk to people and property should a failure occur; High, Significant, and Low, see Table 25. The planning area's vulnerability and severity of a dam failure is considered low.

All levees, dikes, berms, and floodwalls give a false sense of security. People feel that these devices will protect them and their property against any future

flooding. While this is usually true, the hazard is only temporarily contained. Therefore, people, property, and utilities located on the other side of the levee are most at risk. The residents of Aplington's nursing home would be vulnerable if that levee failed; however, this levee is not constructed around the entire facility so it wouldn't keep all floodwaters off the property to begin with.

Floodwaters breaching a levee are usually contained in the historic floodplain. Interestingly enough, levee failure in one area may prevent flooding in another area. A levee breach or overtopping occurring along one segment may drop the level of water along other segments of the stream. As mentioned previously under vulnerability, only a small portion of Aplington and Clarksville would be affected by a levee failure; whereas the entire community of New Hartford would be affected.

Water bursting through a narrow levee breach is moving much faster than the floodwaters in the main channel. The breaking out of this front of water and its fast flow can cause more destruction to structures behind the levee than floodwaters in the main channel would have caused. A failed levee continues to cause damage long after it breaks. The breach allows large volumes of water to enter formerly dry areas, forming temporary lakes. Such lakes do not go away immediately, because the lake is blocked from returning to the main channel by levee segments that were not destroyed. Consequently, the water level drops along the main river days before it drops behind breached levees. Often, pumps behind the levees are needed to remove floodwaters that breach the levees. This alleviates some of the impacts associated with levee failures. This alleviates some of the impacts associated with levee failures. Sudden failure in an urban setting could cause a catastrophe. In an urban setting the severity and duration may be important for health reasons, but in an agricultural area for economic reasons. Impacts would be similar to those experienced during a river or flash flood.

Warning Time

A dam failure can be immediate, leaving little or no time to warn those downstream of the imminent hazard. The conditions that may bring about a dam failure, i.e. heavy rains and river flooding, can be forecasted days in advance. However, there is no real way to predict at which point a dam will fail until just before the event occurs.

The amount of warning time depends on the type of levee failure. Local flood warning systems can help in determining the maximum water surface and the timing of a flood situation. Hours or days of warning may be available for high water that may overtop levees, but this does not provide complete security from a rupture in the levee itself. A sudden failure of a portion of the levee may send floodwaters gushing from this break within seconds. Normally, occupants of the floodplain can be warned about potential levee breaches or breaks when high water encroaches upon the levee.

Duration

The length of time that a dam or levee failure would impact the surrounding area depends largely on the amount of water the specific dam or levee held back. The duration of a failure's impact could feasibly range from hours to months.

Drought

Definition and Description

A drought is defined as a period of prolonged abnormally low precipitation producing severe dry conditions. There are four (4) types of drought conditions relevant to Iowa:

- Meteorological drought, which refers to precipitation deficiency;
- Hydrological drought, which refers to declining surface and groundwater supplies;
- Agricultural drought, which refers to soil moisture deficiencies; and
- Socioeconomic drought, which refers to when physical water shortages begin to affect people.

The highest occurrences of drought conditions with recorded events in Iowa are associated with agricultural and meteorological drought as a result of either low soil moisture or a decline in recorded precipitation.

Droughts can be spotty or widespread and last from a few weeks to a period of years. A prolonged drought can have a serious impact on a community's water supply and economy. Increased demand for water and electricity may result in shortages of resources. Moreover, food shortages may occur if agricultural production is damaged or destroyed by a loss of crops or livestock. While droughts are generally associated with extreme heat, droughts can and do occur during cooler months.

Historical Occurrence

National Climatic Data Center has recorded drought since 1996. In that time, there have been three years with a recorded drought. These drought events were in August 2001, August 2003, as well as a registered drought July-October 2012. There was also a drought in 1995 affecting the whole state. A brief summary of these droughts are below.

August 1995 - This particular drought affected the entire state of Iowa. Precipitation was confined to widely scattered thunderstorm activity, which produced a wide variation of monthly rainfall amounts. The highest of these was 9.23 inches at Bondurant in central Iowa (details on that below) to .29 inches at Dubuque for the 4th driest August on record at Dubuque. Statewide rainfall distribution was highest over northwest and north central Iowa, and lowest over the south central counties. The dry weather conditions combined with well above normal temperatures translated to the warmest month recorded in Iowa since July 1988 and the 4th warmest August of record. The summer months of June through August of 1995 ranked 14th warmest in the 123 years data has been collected. The dry conditions resulted in deterioration of Iowa's corn and soybean crops. Yield losses were greatest over southern Iowa where plantings were delayed by excessive spring rainfall. Reports indicate losses in the corn of between five and 25 bushels per acre with the greatest over the south. Soybean losses were not that great and were generally 5% or less. In dollars this translates to about \$420 million in corn and \$116 million in soybeans.

August 2001 - Beginning on August 1, 2001 through August 23, 2001, a portion of Iowa (including Butler County and 50 additional counties) experienced a record drought. In what became a rather tough growing season, drought developed in Iowa during the month of July, and became serious in August. During the early part of the growing season, excessive rainfall caused significant planting delays across the state. Once the crop was planted, cool and cloudy weather settled into the state slowing crop maturation. Once the warm weather finally arrived, rainfall tailed off significantly. Very little rainfall was reported during the month of July; however, crops flourished with the moisture that was available. During the last half of July, temperatures began to soar into the 90s quite regularly. Temperatures were in the 90s to around 100 for most of the first 10 to 12 days of August with virtually no rainfall. Moisture reserves ran out during the critical time of pod filling for the soybeans and at the tasseling for the corn. Another factor that complicated the situation was the soil moisture profile over central and southwest Iowa. After two years of drought, rain began falling during the last fall of 2000 and continued into the spring of 2001. Though soil moisture was replenished in part, a layer of dry soil remained below the moistened layer, preventing root development below the moist layer. Reports indicate losses estimated between one third and one half in parts of central and southwest Iowa. A few locations had verifiable corn crop losses approaching 80%. Overall, losses for the season were closer to the 15% range. Damage to the corn crop was a little over \$350 million, with about \$225 million in losses to the soybean crop, and about a two million dollar loss to the oat crop.⁵

TABLE 3.11: BREMER COUNTY DROUGHT EVENTS, 2001-2014				
Month/Year of Declaration	Deaths	Injuries	Property Damage	Crop Damage
August 2001	0	0	12.65M	107.350M
August 2003	0	0	0	11.35M
July 2012	0	0	0	90M
August 2012	0	0	0	6M
September 2012	0	0	0	0
October 2012	0	0	0	0
<i>Source: National Climatic Data Center, retrieved 9/1/2015 Note: Damage amount includes areas outside Bremer County</i>				

August 2003 - Dry weather settled again over Iowa and Butler County during August 2003. The last widespread rain occurred on July 9th. An extended period of heat and humidity from the 15th to 25th saw highs into the 90s to over 100 degrees Fahrenheit (F) in some areas. By month's end drought indices had worsened to severe to extreme drought across south central Iowa (52 counties) and at least moderate drought over the remainder of the state. Waterloo had its driest August on record, Des Moines its 3rd driest and Ottumwa its 8th driest. A cold front brought only a brief respite from the intense heat, as temperatures rebounded into the 90s to near 100 degrees F. on the 24-26th. Des Moines Airport reached the century mark for the first time since July 29, 1999, reaching 100 F. on the 24th and 101 F. on the 25th. This was followed by a slow cool down as several pushes of cooler air traversed the state. Unfortunately there was only widely scattered convection across the state on the 27th and 28th, providing little significant drought relief. Light to moderate rainfall on the 31st fell across primarily the southern one half of the state, with the heaviest amounts in the southeast. The end of the month saw numerous records approached or established for an all-time record dry August. In Waterloo, the 0.08" broke the previous dry August record of 0.37" set in 1955, while Des Moines had its 3rd driest August ever with 0.31" (driest 0.14" in 1909). Many stations had from 10 to 25 percent of normal rainfall. The drought in south central Iowa as shown by the Palmer Drought Index reached the Extreme category (-4.09) for the first time in this event by August 30th. Statewide NWS Cooperative station data compiled by the Iowa State Climatologist's office showed August temperatures averaged 74.3 F. or 3.0 degrees above the 30-year (1971-2000) mean, ranking as the 18th warmest in 131 years. Precipitation statewide was 0.96" or 3.23" below than normal, ranking as the driest August on record. June through August was the 65th warmest (72.0 F. or 0.4 degrees above normal) and the 18th driest (9.55" or 1.93" below normal) months. The dry conditions caused deterioration in the states

⁵National Climatic Data Center, U.S. Department of Commerce, <http://www4.ncdc.noaa.gov/cgi-win/wwwcgi.dll?wwevent~ShowEvent~422598>, Retrieved December 4, 2009.

crops. Estimates place yield reductions of about 10% on the corn crop, or a loss of about \$210 million. Losses on the soybean crop were around 30%, or a loss of about \$435 million.

July-October 2012 – Very warm and dry weather that began in the spring continued into the summer. Temperatures warmed sharply the last few days of June. The heat persisted into July. Temperatures for the month of July were a month the warmest on record. Much of the state recorded less than 50% of normal rainfall for the month, with a few locations under 10% of normal. In addition, extended periods of temperatures above 95 F resulted in problems with pollination of the crops. The rapid deterioration of the corn and soybean crop that took place in July slowed as much of the damage had already occurred in July. By the end of the month, officials estimated that 15% of the soybean crop and 20% of the corn crop yield had been lost to the drought. At the current price, the loss total was in excess of \$2.6 billion. For the month of September, temperature averaged fairly close to normal. Rainfall was in short supply across the state. Much of the state recorded less than 50% of normal rainfall for the month, with a few locations under 25% of normal. No significant damage occurred in September in spite of the dry conditions and early freeze of much of the state on the 23rd. Harvest activities were more than 2 weeks ahead of normal. Indications were that yields of the corn crop were around 140 bu/ac and 43/5 bu/ac for the bean crop. Temperatures cooled in October with the month averaging near to a little below normal. It was the first cooler than normal month in 13 months across the CWA. More widespread rainfall began by the middle of the month with fairly widespread even on the 13th. The rapid detrition of the corn and soybean crop that took place in July slowed as much of the damage had already occurred. No significant damage occurred in September in spite of the dry conditions and early freeze across much of the state on the 23rd. In the four months of recorded drought, there was a total estimated \$96 million in crop damage.

Table 27 displays drought events in Butler County from 2001-2014 as recorded by the National Climatic Data Center.

Probability

From 2001-2014 there 3 years when a drought occurred spanning a total of six months. Based on the historical occurrence, the probability of a drought in a given year is occasional – with a 10 to 20 percent chance of occurring.

Magnitude / Severity

While the entire planning area would be affected by a drought, those dependent (persons, animals, and crops) on rain would be the most vulnerable. This means that agriculture, agribusiness, and consumers (if the drought lasted long enough or impacted a large area) would be impacted. A drought limits the ability to produce goods and provide services. Because the jurisdictions and rural residents draw their drinking water from groundwater sources, a prolonged severe drought may impact all county residents if there were to be a dramatic drop in the stream flow coupled with the drop in the water table. In addition, while a drought may not cause structural damage to properties, a drought could cause damage to the city utilities, especially the water and well system. Fire suppression can also become a problem due to the dryness of the vegetation and possible lack of water.

A drought in Bremer County would likely also be affecting most of Iowa if not the Midwest as a whole. Because of the dependence on precipitation and water, the agricultural community would be impacted the most. The agricultural areas would be most adversely impacted, but the entire state would likely feel at least some impact.

Drought in the U.S. seldom results directly in the loss of life. Deaths associated with drought are usually related to a heat wave. Drought more directly affects agricultural crops, livestock, natural vegetation, wildlife, and stream flows (fish and aquatic vegetation). Impacts are costly economically, environmentally, and socially. Due to Bremer County's strong agriculture based economy, including row crops and livestock, the impact of a drought could be critical.

Warning Time

Drought warning is based on a complex interaction of many different variables, water uses, and consumer needs. Drought warning is directly related to the ability to predict the occurrence of atmospheric conditions that produce the physical aspects of drought, primarily precipitation and temperature. There are so many variables that can affect the outcome of climatic interactions, and it is difficult to predict a drought in advance. In fact, an area may already be in a drought before it is even recognized. While the warning of the drought may not come until the drought is already occurring, the secondary effects of a drought may be predicted and warned against weeks in advance.

Duration

The duration of a drought can affect the planning area for days and weeks, months, or longer.

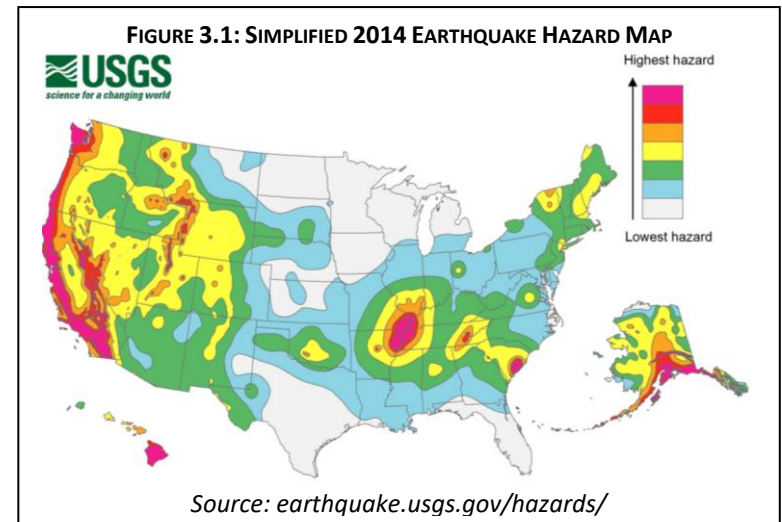
Earthquake

Definition and Description

An earthquake is any shaking or vibration of the earth caused by the sudden release of energy that may impose a direct threat on life and property. Ground shaking from earthquakes can collapse buildings and bridges; disrupt gas, electric, and phone service; and sometimes trigger flash floods and fires. Buildings with foundations resting on unconsolidated landfill and other unstable soil, and trailers and homes not tied to their foundations are at risk because they can be shaken off their mountings during an earthquake.

Earthquakes are generally associated with plate tectonics or volcanic activity, but a third type includes artificial earthquakes. In other words, a large explosion can cause the earth to quake resulting in substantial damage.

According to the Iowa Geological Survey, Plum Creek River Fault Zone and Structural and Stratigraphic Framework of Eastern Iowa study volume Number 13, printed in 1985, there are several areas with faults in Iowa. The two that appear to be closest and could affect the community in this plan are the Plum River Fault Zone and the Fayette Structural Zone. The Fayette Structural Zone runs through the planning area starting north of the City of Waterloo, through the very southeast tip of Butler County and into Fayette County towards the City of



Oelwein, at a diagonal from the southwest to the northeast. The Plum River Fault Zone can be found south of Cedar Rapids and running east towards Rockford, Illinois.

Historical Occurrence

Iowa as a whole has experienced the effects of only a few earthquakes in the past 175 years. The epicenters of 12 earthquakes have been located in the state. The first known occurrence was in 1867 near Sidney in southwest Iowa; the most recent occurrence was in 2004 near Shenandoah in southwest Iowa. The largest Iowa earthquake (Mercalli magnitude VI) occurred near Davenport in southeast Iowa in 1934. None of these events were instrumentally recorded.

On January 26, 1925 an earthquake occurred with a reported epicenter near Waterloo, Iowa (within an adjacent county). The event registered a magnitude of II (2) on the Mercalli Scale. Modified Mercalli Intensity Scale is commonly used in the United States by seismologists seeking information on the severity of earthquake effects. Intensity ratings are expressed as Roman numerals between I, at the low end, and XII at the high end. According to FEMA when a Mercalli magnitude II earthquake occurs only a few people might notice movement if they are at rest and/or on the upper floors of tall buildings.

While no other earthquakes with epicenters in Iowa have been recorded, earthquakes with far away epicenters can have minor affects on the region. For example, in 2002 an earthquake with an epicenter in Alaska caused temporary “black water” to occur in area wells.

Probability

Historic seismicity in the planning area in relation to the regional structural geology from 1800 to present has been slight. Assuming historic trends remain unchanged the likelihood of an earthquake causing any substantial damage to Bremer County and its jurisdictions is unlikely, less than 10%. Figure 3.1 illustrates the probability of an earthquake occurring in Iowa and the planning area. The committee determined the probability of an earthquake in Iowa to be unlikely.

Magnitude / Severity

Even though most of Iowa is in Seismic Zone 0, the lowest risk zone in the country, if an earthquake were to occur, the entire planning would be vulnerable to damage. The structures most at risk for damage would be those structures built on poor soil, such as a floodplain. It is expected that if an earthquake were to occur, the damage would be limited to the shifting of buildings off of their foundations, cracked plaster on walls and ceilings, and perhaps some bowed walls. Underground utilities would be at greater risk of damage during the winter season if the ground were frozen to depths of four feet or greater.

The damages associated with an earthquake would likely be relatively low. However, when considering the highly unlikely worst-case scenario, a larger earthquake would have catastrophic effects on the planning area should it occur.

Warning Time

Earthquake prediction is an inexact science. Even in areas that are well monitored with instruments, such as California's San Andreas Fault Zone, scientists only very rarely predict earthquakes. There would be little warning time if an earthquake were to take place.

Duration

The duration of an earthquake would be minutes; however, if the earthquake was large enough, the planning area would feel aftershocks for hours – even days later.

Expansive Soils

Definition and Description

As defined in the State of Iowa Hazard Mitigation Plan, expansive soils are soils and soft rock that tend to swell or shrink excessively due to changes in moisture content. The effects of expansive soils are most prevalent in regions of moderate to high precipitation, where prolonged periods of drought are followed by long periods of rainfall. The hazard occurs in many parts of the Southern Central, and Western United States. Recent estimates put the annual damage from expansive soils as high as \$7 billion. However, because the hazard develops gradually and seldom presents a threat to life, expansive soils have received limited attention, despite their costly effects.

Historical Occurrence

Historical records of damage due to expansive soils are not kept on a county-wide scale. Likewise, there are no historical records for the planning area for major expansive soil events.

Probability

Given the historical occurrences of severe winter storms and the annual spring thaw cycle in the planning area, the probability of minor expansive soil events that affect roads and sidewalks is high. The composite probability score of a large expansive soil event, affecting buildings and major infrastructure, was determined to be between Unlikely (up to 10 percent chance of occurring in a given year) and Occasional (10 to 20 percent chance of occurring in a given year). unlikely for the planning area. Expansive soils occur slowly over time.

Magnitude / Severity

The availability of data on expansive soils varies greatly. In our near metropolitan area and at dam sites, abundant information on the amount of clay generally is available. However, little information is reported other than field observations of the physical characteristics of clay.

Expansive soils have little if any direct human impacts. Impacts commonly involve swelling clays beneath areas covered by buildings and slabs of concrete and asphalt, such as those used in construction of highways, walkways, and airport runways. Expansive soils can also contribute to or cause damage to roadways, bridges, pipelines, and other infrastructure. Local jurisdictions are burden with the responsibility to repair the damage to roadways.

Houses and one-story commercial buildings are more apt to be damaged by the expansion of swelling than are multi-story buildings, which usually are heavy enough to counter swelling pressures. The most obvious manifestations of damage to buildings are sticking doors, uneven floors, and cracked foundations, floors, walls, ceilings, and windows.

Warning Time

The speed of onset is very slow, and is consistent with other geological hazards that occur over time. However, there are few warning signs of expansive soils until after structural damage becomes apparent, and that structural damage may occur slowly or extremely quickly.

Duration

The duration of an expansive soil event can be over within hours, days, or weeks depending up on the severity and location of the occurrence. Recovery is also depending upon the impact area.

Extreme Heat

Definition and Description

Extreme Heat happens when summertime weather is substantially hotter and/or more humid than average for a given location at that time of the year. This includes temperatures (including heat index) in excess of 100 degrees Fahrenheit or at least three successive days of 90+ degrees Fahrenheit.

A heat advisory is issued when temperatures reach 105 degrees and a warning is issued at 115 degrees. When these extreme heat events occur, and even more so when they are prolonged, people, livestock, pets, wild animals and plant life are all affected to some degree.

In humans, extreme heat events make individuals much more susceptible to such heat related illnesses as heat cramps, heat exhaustion, heat rash, and heat stroke. Several factors affect the body's ability to cool itself during extremely hot weather. When the humidity is high, sweat will not evaporate as quickly, preventing the body from releasing heat quickly. Other conditions related to risk include age (the elderly and young children), obesity, fever, dehydration, heart disease, mental illness, poor circulation, sunburn, and prescription drug use and alcohol use.

Many similar physical reactions occur in animals during extreme heat events, but can go unnoticed by an unobservant caretaker. The susceptibility to heat varies on the type of animal and whether or not they have access to water to avoid dehydration.

Plant life can also suffer substantially during prolonged heat waves, especially if they occur in conjunction with moderately dry conditions or even drought. This is of substantial concern to the community as the area is surrounded by primarily agricultural uses. Any negative effects on the surrounding farm economy would undoubtedly have some impact on the communities' well-being.

Historical Occurrence

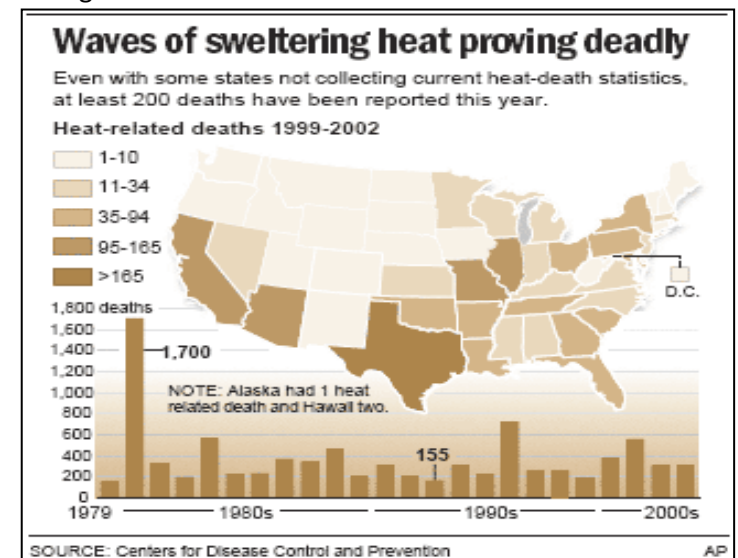


Figure 3.2: Heat Related Deaths, 1999-2002

Heat kills by taxing the human body beyond its abilities. In a normal year, about 175 Americans succumb to the demands of summer heat. Among the large continental family of natural hazards, only the cold of winter -- not lightning, hurricanes, tornadoes, floods, or earthquakes -- takes a greater toll. In the 40-year period from 1936 through 1975, nearly 20,000 people were killed in the United States by the effects of heat and solar radiation. In the disastrous heat wave of 1980, more than 1,250 people died (Source: NOAA).

The State of Iowa was impacted by a significant heat wave that occurred in the summer of 1995. In July of that year temperatures and dew point soared to new record levels across the State. The heat wave took a dramatic toll on the State as well as three human fatalities were attributed to the event. A significant loss occurred in livestock. Statewide figures indicate that there were property losses of approximately \$3.8 million. Losses included 4,000 head of cattle, 370 hogs, 1,250,000 chickens, and 250,000 turkeys. On one farm alone 250,000 laying hens perished on the 2nd day of the heat. Another egg producer had 1.5 million laying hens on two farms. They reported a loss of at least 500,000 hens. Disposal became a serious problem as rendering plants were overwhelmed. In addition to problems caused to humans and livestock, there were numerous heat buckles reported on streets and highways around the state (Source: NCDC).

The National Climatic Data Center Storm Events Database indicates only one recorded Excessive Heat event in Bremer County since 1996; an extreme heat event was recorded beginning on July 15, 2011 and ending July 28, 2011. No injuries or deaths as a result, but there was an estimated \$135,000 worth of property damage across several Iowa counties. In mid-July, a high pressure system developed that placed temperatures above 90 degrees Fahrenheit for several days. Most nightly lows did not fall below the mid-70s. These conditions caused considerable stress on livestock. Since 2009, there have been 15 days with an Excessive Heat event in Iowa.

Probability

Based on historical Excessive Heat events that were recorded, the probability of another heat wave affecting the planning area is relatively low. However, temperatures and heat index can still have an effect without reaching the threshold to be recognized as an event by NOAA. Because of this and that extreme heat can effect some members of communities more than others (such as elderly persons or households without air conditioning), some jurisdictions considered extreme heat to be more probable despite few historical occurrences. However, based on NOAA criteria, the probability is unlikely.

Magnitude / Severity

All persons in the planning area is susceptible to the impacts of a heat wave/extreme heat event. Those who have an elevated risk include the elderly, young children, chronic invalids, those on certain medications or drugs, persons who are over their recommended weight, alcoholics, and individuals who work outdoors or in confined spaces without air conditioning. Furthermore, class can figure into the vulnerability. Those individuals or families who cannot afford air conditioning or do not have access to air conditioning are also more susceptible to the effects of elevated temperatures. Unfortunately, it is unknown how many of Butler County's population would fall into this category.

The amount of vulnerability can be greatly reduced by taking certain precautionary measures. Such measure include, but are not limited to drinking plenty of water to stay hydrated, staying in air conditioned areas, using sun block, reducing the amount of physical exertion normally expended, etc.

The impacts of extreme heat events have historically been known to cause death. This possibility remains today. The severity of a heat wave event would likely be multiplied if it occurred in conjunction with other events such as a drought or a power failure. If the air were extremely dry this would increase the rate of dehydration among plants and animals. If a power failure were to occur, air conditioners, fans, freezers, and refrigerators would cease to operate. As these are items used to alleviate the stresses of heat waves, their loss would contribute to the severity of the disaster.

Within the planning area, it is anticipated that the actual impacts of a heat or excessive heat event would be less severe than what could potentially happen. More likely, a heat wave would likely result in increased energy consumption as a result of more air conditioning units operating. Increased numbers of people at public places such as malls, movie theaters, and swimming pools is also anticipated. Companies and organizations that rely on outdoor labor would likely see a reduction in productivity. Plant life would suffer severe stress possibly stunting growth, hurting crop yields, and thereby affecting the local economy.

Costs to the planning area directly may occur if roads, sidewalks, and foundations expanded enough to cause structural damage.

Warning Time

Heat waves are generally well forecasted; therefore, the onset speed is at least 24 hours. When temperatures or heat indices rise to dangerous levels, the National Weather Service will initiate alert procedures.

Duration

Extreme heat conditions have been known to last days and even weeks with little to no relief.

Flash Flood

Definition and Description

A flash flood is an event that occurs with little or no warning where water levels rise at an extremely fast rate. Flash flooding results from intense rainfall over a brief period, sometimes combined with rapid snowmelt, ice jam release, frozen ground, saturated soil, or impermeable surfaces. Most flash flooding is caused by slow-moving thunderstorms or thunderstorms repeatedly moving over the same area. Even with information on soil saturation and predicted rainfalls flash floods can still catch people by surprise. Flash flooding is an extremely dangerous form of flooding which can reach full peak in only a few minutes and allows little or no time for protective measures to be taken by those in its path. Flash flood waters move at very fast speeds and can move boulders, tear out trees, scour channels, destroy buildings, and obliterate bridges. Flash flooding often results in higher loss of life, both human and animal, than slower developing river and stream flooding.

Historical Occurrence

According to data from the National Climatic Data Center (NCDC) there have been 12 reported flash floods in Bremer County from 1996 through 2014. These floods caused an estimated \$2.57 million in property damage and \$270,000 in crop damage.

It should be noted that there can be several flood events that go unrecorded for several reasons. Either they do not cause substantial damage to houses or structures or they may occur around the same time of a larger, more publicized event. Nevertheless, these events do result in flood costs that the county taxpayers and individual property owners must finance.

Probability

The probability of a flash flood varies between communities. Even within those communities, some areas have much higher likelihood of experiencing flash flooding than other areas.

Overall, the average jurisdictional flash flooding probability was between occasional and likely (10 to 33 percent chance of event happening each year.) See appendixes for details on the probability of flash flooding for each community.

.Flooding is an annual problem throughout the planning area. While the planning area can experience some degree of flooding throughout the year, the threat of flash flooding is compounded in the late winter and early spring months, as melting snow can overflow streams, rivers, and tributaries. Bremer County has three primary rivers that flow through, including the Shell Rock River, Cedar River, and the Wapsipinicon River. However, flash flooding can also happen in developed areas that do not have proper drainage systems to carry the melted snow and rainfall away from homes and businesses. The committee determined the probability of a flash flooding event in the planning area to be likely.

Magnitude / Severity

Flash flooding in the incorporated areas can vary substantially. Homes, businesses, and infrastructure that remain near or in the floodway and 100-year floodplain will be flooded again. In addition to those low-lying areas in each jurisdiction can be vulnerable to flooding. All incorporated jurisdictions are vulnerable to flash flooding. See each communities respective appendix for specific information on previous and potential flash flooding impacts.

TABLE 3.12: HISTORICAL OCCURRENCES OF FLASH FLOODING IN BREMER COUNTY, 1996-2014

Location	Date	Time	Deaths or Injuries	Property Damage	Crop Damage
Waverly	5/16/1999	18:30	0	\$750,000	\$0
Waverly	7/20/1999	19:00	0	\$75,000	\$25,000
Waverly	7/27/1999	22:00	0	\$25,000	\$20,000
Countywide	7/10/2000	00:30	0	\$50,000	\$75,000
Countywide	5/21/2004	19:35	0	\$100,000	\$50,000
Waverly	4/24/2008	21:30	0	\$100,000	\$0
Denver	4/25/2008	05:00	0	\$100,000	\$0
Waverly	6/07/2008	21:15	0	\$10,000	\$0
Waverly	6/08/2008	01:26	0	\$10,000	\$0
Denver	7/23/2010	02:25	0	\$1,000,000	\$100,000
Waverly	8/10/2010	20:23	0	\$50,000	\$0
Waverly	5/29/2013	16:00	0	\$300,000	\$0
Total			0	\$2,570,000	\$270,000

Source: National Climatic Data Center; retrieved 4/19/2016

Warning Time

Flash flood warnings are disseminated from the National Weather Service, IAWAS, and local officials, who then, in turn, distribute warnings to the affected areas of the city and county. The new AlertIowa program can also provide notification of flash floods. Flash floods can result in a matter of tens of minutes. The warning time for a flash flood is considered to be minimal (less than 6 hours of warning).

Duration

The duration of flash flooding is dependent on the severity of the flooding event. The duration of a flash flooding event would likely be under one day. However, damage, and cleanup from an event may take several days to recover from.

Grass and Wildland Fire

Definition and Description

A grass or wild-land fire is an uncontrolled fire that threatens life and property in a rural or a wooded area. Grass and wild-land fires are more likely to occur when conditions are favorable, such as during periods of drought when natural vegetation is drier and more combustible.

Historical Occurrence

According to the communities, the National Climatic Data Center and 2013 Iowa Hazard Mitigation plan, there have been no events with significant impact that have been reported. According to data from the National Interagency Coordination Center Wildland Summary and Statistics Annual Report 2013, there were 433 wild land fires affecting 14,558 acres in Iowa in 2013.

Probability

Although much effort has been put into fire prevention in the community, based on historical occurrence, it is highly likely that numerous fires will occur in the community in the next year. There is no central database that records grass/wild land fires. However, grass and wildland fires do occur within the county and fire departments are called out on an annual basis.

Probability for grass or wild land fires increase during the dry seasons or when the area is experiencing a drought. Controlled burns, that have the potential of becoming out of control, pose a threat as well. Given the historical occurrence of grass or wildfires in Bremer County and the state, it is likely that the county will face threat of additional fires in the future, from both grass and wildland fires.

Magnitude / Severity

Grass and wildfires spread quickly; therefore, they require immediate attention from first responders. Those most vulnerable include residents in housing structures near these fields and grasses, typically lying just outside or on the out rim of the community.

Combustible building materials obviously are more vulnerable than structures constructed of steel or concrete. Structures without early detection devices are more likely to be completely destroyed before containment by response agencies. Structures in areas served by older, smaller, or otherwise inadequate water distribution infrastructure such as water mains and hydrants are also at significant risk. Problems vary from region to region, often as a result of climate, poverty, education, and demographics, but Iowa has about 13.4 fire related deaths per million annually.

The severity of impact would largely depend on how quickly the emergency agencies, fire, police, and ambulance, became aware that a fire had occurred. The worst-case scenario would occur if the responsive agencies had a delayed response or was not aware of the fire until it had spread to a larger area. A fire of this magnitude could cause drastic losses to crops and potentially rural homesteads. Bremer County has over 240,000 acres in farmland, over 85% of the area of the county, with majority which is dedicated to row crop production.

Warning Time

Wildland and grass provides little warning before their onset. In addition, fire spreads very rapidly especially in dry, hot, and windy conditions. However, all communities in Butler County have mutual aid agreements to assist if the need arises.

Duration

The area immediately impacted by a grass or wildland fire will be impacted during the duration of the fire. Based on previous experience of fires, likely hours, but depending on size could be days.

Hazardous Materials / HAZMAT Incident

Definition and Description

A HAZMAT (hazardous materials) incident is the accidental release of chemical substances or mixtures which presents a danger to the public health or safety during production or handling at a fixed facility. Fixed hazardous material incidents usually affect a localized area, and the use of planning and zoning can minimize the area of impact.

This hazard includes fixed hazardous materials, pipeline transportation, and transportation of hazardous materials. A HAZMAT or Radiological Transportation Incident is the accidental release of chemical substances or mixtures that presents danger to the public health or safety during transportation. A hazardous substance is one that may cause damage to persons, property, or the environment when released to soil, water, or air. Chemicals are manufactured and used in ever increasing types and quantities. As many as 500,000 products pose physical or health hazards and can be defined as “hazardous chemicals.” Each year, over 1,000 new synthetic chemicals are introduced and transported across the county via semi-truck and train. Hazardous substances are categorized as toxic, corrosive, flammable, irritant, or explosive. Hazardous materials incidents generally affect a localized area, and the use of planning and zoning can minimize the area of impact.

A pipeline transportation incident occurs when a break in a pipeline creates the potential for an explosion or leak of a dangerous substance (oil, gas, etc.) possibly requiring evacuation. A pipeline incident can be caused by environmental disruption, accidental damage, or sabotage. Incidents can range from a small slow leak to a large rupture where an explosion is possible. Inspection and maintenance of the pipeline system along with marked gas line locations and an early warning and response procedure can lessen the risk to those near to the pipelines.

Figure 3.3 shows the Iowa Hazardous Materials Teams of Iowa.

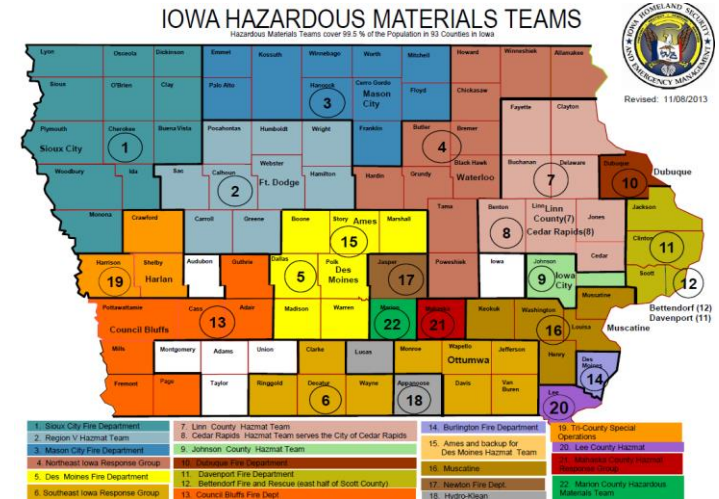


FIGURE 3.3: IOWA HAZARDOUS MATERIALS TEAMS

Courtesy of Iowa Homeland Security⁶

⁶ http://homelandsecurity.iowa.gov/documents/maps/MAP_HazMatTeams.pdf

Historical Occurrence

According to data from the Iowa Department of Natural Resources Hazardous Material Release Database⁷, there have been 30 hazardous material spills or incidents in Bremer County from January 1, 2011 through December 31, 2015. Table 3.13 shows hazardous spill by type. The most frequent types of spills were petroleum and fertilizer/pesticides. Table 3.14 displays how each spill occurred based on data from the Iowa DNR Hazardous Material Release Database. The two most popular modes of spilling were from Handling and Storage and Transportation.

Probability

Bremer County averaged six hazardous spill incidents per year from 2011 through 2015.

Hazardous materials are transported on roadways and railways, both common sites for the release of hazardous materials. The Department of Transportation regulates routes and speed limits used by carriers and monitor the types of hazardous materials crossing state lines. Despite increasing safeguards, more and more potentially hazardous materials are being used in commercial, agriculture, and domestic uses and are being transported on neighboring roads.

The Environmental Protection Agency manages a Toxics Release Inventory (TRI) dataset for communities to learn about toxic chemicals that industrial facilities are using and releasing into the environment. TRI database tracks the management of certain toxic chemicals that may pose a threat to human health and the environment. According to the EPA's 2013 National Analysis dataset, there are 440 TRI facilities in Iowa and 21,930 TRI sites across the United States. However, Bremer County does not have any TRI facilities.⁸

Due to the historical data and the planning area's diverse array of industrial and agricultural activities, the probability of a HAZMAT incident occurring is highly likely. An average of all of the community's hazard assessment scores determined that the probability of this hazard taking place is between unlikely and occasional (0 – 20 percent chance of occurring in a given year. The committee's review compared to historical differences is due to the consideration that many of the recorded events are small, localized spills which are not probable to affect the public in a meaningful way.

Magnitude/Severity

Most of the hazardous materials incidents are localized and are quickly contained or stabilized by the highly trained fire departments and hazardous materials teams. Depending on the characteristic of the hazardous material or the volume of product involved, the affected area can be as small as a room in a building or

Table 3.13: HAZARD SPILLS BY MODE
January 1, 2011 – December 31, 2015

Mode of Spill	Quantity
Handling and Storage	15
Transportation	9
Transformer	2
Manure	2
Pipeline	1
Vandalism	1
Total	30
<i>Source: Iowa DNR Hazardous Material Release Database</i>	

Table 3.14 HAZARD SPILLS BY TYPE
January 1, 2011 – December 31, 2015

Type of Spill	Quantity
Petroleum	11
Fertilizer/Pesticide	10
Transformer oil/PCB	2
Inorganic Chemical	2
Manure	2
Acids/Bases	1
Organic Chemical	1
Propane/LPG/Natural Gas	1
Total	30
<i>Source: Iowa DNR Hazardous Material Release Database</i>	

⁷ <https://programs.iowadnr.gov/hazardousspill/Reports/SpillSummary.aspx>

⁸ http://iaspub.epa.gov/triexplorer/tri_factsheet.factsheet?pDataSet=TRI1Q1&pyear=2013&pstate=IA&pcounty=Bremer%20County

as large as five square miles or more. Many times, additional regions outside the immediately affected area are evacuated for precautionary reasons. More widespread effects occur when the product contaminates the municipal water supply or water system such as a river, lake, or aquifer.

A hazardous materials accident can occur almost anywhere, so any area is considered vulnerable to an accident. People, pets, livestock, and vegetation within approximately 3-4 blocks of facilities producing, storing, or transporting hazardous substances are at higher risk. Populations downstream, downwind, and downhill of a released substance are particularly vulnerable.

Depending on the characteristics of the substance released, a larger area may be in danger from explosion, absorption, injection, ingestion, or inhalation. Occupants of areas previously contaminated by a persistent material may also be harmed either directly or through consumption of contaminated food and water.

Facilities are required to have an off-site consequence plan that addresses the population of the surrounding area. Responding personnel are required to be trained to HAZMAT Operations Level to respond to the scene, and those personnel that come into direct contact with the substances released are required to have HAZMAT Technician level training.

The close proximity and continued mutual aid agreement with the Northeast Iowa Response Group, located in northern Waterloo, will improve the likelihood of a quick response. Figure 3.3 (two pages back) shows the 20 Iowa Hazardous Materials Teams.

Warning Time

When managed properly under current regulations, hazardous materials pose little risk. However, when handled improperly or in the event of an accident, hazardous materials can pose a significant risk to the population. HAZMAT incidents usually occur very rapidly with little or no warning. Even if reported immediately, people in the area of the release have very little time. The AlertIowa system the County has recently implemented would alert affected populations.

Duration

The duration of a HAZMAT incident is dependent upon the amount, type of hazardous material, and location of the release. A small release of gasoline or agricultural chemical on a roadway could close the road for a few hours to clean up. However, a large spill in a populated area or near a body of water would impact that area and possibly the area downstream for days or weeks – depending on several factors of the type of release.

Human Disease

Definition and Description

Disease is any impairment of normal physiological function affecting all or part of an organism, esp. a specific pathological change caused by infection, stress, etc., producing characteristic symptoms; illness or sickness in general (*Collins*). Also it is any medical, health, or sanitation threat to humans, plants, wildlife, domestic animals. For purposes of this discussion the topic will be contained to only communicable diseases and will largely with generalities.

According to the Iowa Department of Public Health website there are eleven “Emergency Reportable Diseases or Conditions” that are to be reported by telephone immediately should they be detected. These diseases include Botulism, Cholera, Diphtheria, Haemophilus influenza type b invasive disease, Measles, Meningococcal invasive disease, Plague, Polio, Rabies (human), Vancomycin-resistant Staph aureus, and Yellow fever. Other events that should be immediately reported by telephone include outbreaks of any kind, unusual syndromes, uncommon diseases, or agents of terrorism such as anthrax, mustard gas, sarin gas, ricin, tularemia, and smallpox.

Other diseases of recent concern include SARS, Monkey pox, and West Nile Virus. Also, there are a variety of sexually transmitted diseases that are monitored and treated by the medical community. These diseases include chlamydia, syphilis, gonorrhea, and HIV/AIDS. In the past year, Ebola and the Zika Virus have both become concerning public health threats.

Historical Occurrences

The historical occurrence of the outbreak of communicable diseases in the planning area is difficult to determine. There were no known historical occurrences of the outbreak of communicable diseases in Bremer County that are what can be reasonably expected. However, there are the typical seasonal episodes of influenza, also known as the flu, within the county. Influenza is spread or transmitted, when a person who has the flu coughs, sneezes, or speaks and sends flu virus into the air, and other people inhale the virus. The virus enters the nose, throat, or lungs of a person and begins to multiply, causing symptoms of influenza. Influenza may, less often, be spread when a person touches a surface that has flu viruses on it – a door handle, for instance – and then touches his or her nose or mouth.

According to the Center for Disease Control (CDC), West Nile Virus has been found in the state for several years, including confirmed cases in neighboring counties, including: Black Hawk, Grundy, and Buchanan. First reported in the United States in 1999, the virus is most often transmitted to humans via mosquitoes. The CDC recommends taking preventative measures, including insect repellent and protective clothing. Less than 1 percent of infected individuals develop serious, potentially fatal, neurologic illness from the virus.⁹

⁹ <http://www.cdc.gov/westnile/index.html>

Probability

It is highly likely human disease as defined will affect Bremer County residents on an annual basis. However, there is a far less likely probability of a human disease event making a severe impact on the county-wide level. Many safeguards from the Department of Public Health and other agencies are in place that mitigates the occurrence of a human disease epidemic. Numerous hospitals and clinics in Butler County are available to provide care as well. Balancing the array of type of disease and impact, the probability has determined to be occasional.

Magnitude / Severity

The severity of a human disease outbreak depends entirely on the disease itself. There are numerous safeguards that have been put into place to help deter an event before it begins, respond to an event once it does occur, and recover from an event as quickly as possible. Examples of such precautions include measures by service agencies (i.e. American Red Cross), government agencies (i.e. Butler County EMA, State Veterinarian, USDA, etc.), and private medical facilities (i.e. hospitals and clinics) to detect and respond to an event before it becomes an epidemic.

Warning Time

Warning time for a human disease event ranges from just a few days to no time at all. The onset of a regional or county-wide epidemic could provide minimal or no warning time due to the nature of human diseases in our globalized society. Because of air travel, a disease that spawns in another part of the world could easily reach Butler County in a matter of days.

Duration

The duration of a human disease incident in the planning area would be dependent on the type of disease, notification and containment of said disease, and treatment.

Infrastructure Failure

Definition and Description

This hazard includes communication failure, energy failure, structural failure, and structural fire.

Energy Failure or disruption is the loss of power as a result of a natural, man-made, or technological disaster or failure. Energy, for purposes of this plan, can also be described as a loss of power. For example, electricity is lost because a power line was accidentally cut; there was a malfunction at the power plant, etc. Another scenario would include the loss of natural gas, a fuel used by most in the community for purposes of heating and occasionally cooking.

Communication failure is the widespread breakdown or disruption of normal communication capabilities. This could include major telephone outages, loss of local government radio facilities, and long-term interruption of electronic broadcast services, language barriers, and unfamiliarity with common emergency response terminology. AlertIowa, law enforcement, fire, emergency medical services, public works, and emergency warning systems are just a few of the vital

services which rely on communication systems to effectively protect citizens. Businesses and industry also rely heavily on various communication media. Mechanical failure, traffic accidents, power failure, line severance, and weather can affect communication systems and disrupt service. Disruptions and failure can range from localized and temporary to widespread and long-term. If switching stations are affected, outage could be more widespread. Communications failure can also be realized when individuals who speak different languages try to communicate, or when people use unfamiliar terminology. These types of communications failure are exacerbated during times of disaster.

Structural Failure is the collapse (part or all) of any public or private structure including roads, bridges, towers, and buildings. A road, bridge, or building may collapse due to the failure of the structural components or because the structure was overloaded. Natural events such as heavy snow may cause a roof of a building to collapse under the weight of the snow. Heavy rains and flooding can undercut and washout a road or bridge. The age of the structure is sometimes independent of the cause of the failure.

Enforcement of building codes can better guarantee that structures are designed to hold up under normal conditions. Routine inspection of older structures may alert inspectors to “weak” points. The level of damage and severity of the failure is dependent on factors such as the size of the building or bridge, the number of occupants of the building, the time of day, day of week, amount of traffic on the road or bridge, and the type and amount of products stored in the structure.

For this profile, fire is an uncontrolled fire in populated area that threatens life and property and is beyond normal day-to-day response capabilities. Structural fires present a far greater threat to life and property and the potential for much larger economic losses. Modern fire codes and fire suppression requirements in new construction and building renovations, coupled with improved firefighting equipment, training, and techniques, lessen the chance and impact of a major urban fire. Most structural fire occur in residential structures, but the occurrence of a fire in a commercial or industrial facility could affect more people and pose a greater threat to those near the fire or fighting the fire because the volume or type of the material involved.

According to the National Fire Protection Association (NFPA), eighty-five percent of fire deaths occur in the home (one-or two-family dwellings, apartments or manufactured housing). 72% of all fire deaths result from fires in one- and two-family dwellings, including manufactured homes.

Most fires occur as a result of natural causes (i.e. lightning), accidents (i.e. gas leaks), carelessness (i.e. smoking in close proximity to combustibles), or criminal (i.e. arson) reasons. According to statistics obtained from the NFPA Iowa ranked 13th out of the 50 states in the number of deaths per million in 1999.

Cooking is the leading cause of home fires in the U.S. It is also the leading cause of home fire injuries. Cooking fires often result from unattended cooking and human error, rather than mechanical failure of stoves or ovens. Careless smoking is the leading cause of fire deaths. Smoke alarms and smolder-resistant bedding and upholstered furniture are significant fire deterrents. Arson is both the second leading cause of residential fires and residential fire deaths. In commercial properties, arson is the major cause of deaths, injuries and dollar loss. Heating is the third leading cause of residential fires. Heating fires are a larger problem in single-family homes than in apartments. Unlike apartments, the heating systems in single-family homes are often not professionally maintained.

Historical Occurrences

On numerous occasions there has been localized loss of telephone service, generally due to some type of weather phenomenon (e.g. high winds, ice). There have also been short-term instances of power failure, most commonly occurring during thunderstorm and high wind events. In addition, winter ice events have caused power failures in communities in the past.

The county is not immune to structural and residential fires. Through not a central database to record previous events, jurisdictions can expect to face fire and energy outages each year.

Figure 3.4 shows the historic data of deaths caused by fires throughout the entire State of Iowa. The data is courtesy of the State Fire Marshall.

Probability

Although much effort has been put into fire prevention in the community, based on historical occurrence, it is highly likely that numerous fires will occur in the county and its jurisdictions in the next year. The average probability score of all nine jurisdictions determined the likelihood of infrastructure failure to be occasional.

Magnitude / Severity

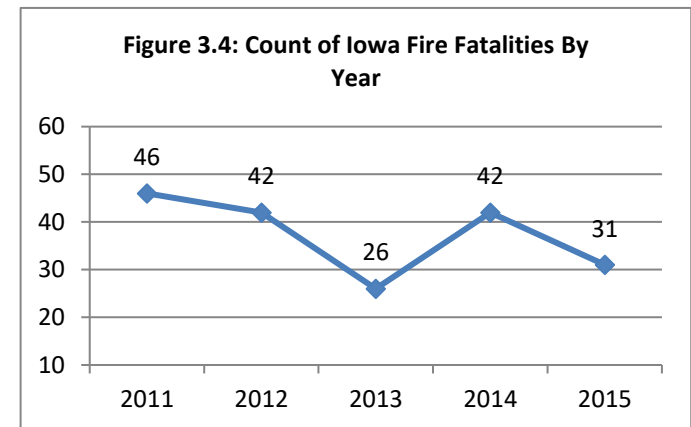
The magnitude and severity of an infrastructure failure ranges from trivial to catastrophic. Regarding power outage caused by a thunderstorm, the effects would be relatively insignificant. However, if a major structural failure event occurred, such as a building or bridge collapse, the magnitude of such an event would be unprecedented considering the scope of the property damage, personal injury, and likely fatalities that would ensue.

Warning Time

The warning time for the conditions that bring about infrastructure failures, such as a severe thunderstorm which could potentially cause a power outage, is relatively long and could be longer than a day. However, the warning time for the event itself, rather than the conditions that could cause an event, is very little to nonexistent. For example, structural engineers might know that a structure is in critical condition for months. However, it's impossible to predict at what time that structure would ultimately fail.

Duration

Just as the magnitude of an infrastructure failure can vary from trivial to catastrophic, the duration of such an event can also vary tremendously depending on the type of event.



Landslides

Definition and Description

A landslide is a downward and outward movement of slope-forming materials reacting under the force of gravity. Landslides occur when masses of rock, earth, or debris move down a slope. Although gravity acting on an over-steepened slope is the primary reason for a landslide, there are other contributing factors:

- Erosion by rivers, glaciers, or ocean waves create oversteepened slopes
- Rock and soil slopes are weakened through saturation by snowmelt or heavy rains
- Earthquakes create stresses that make weak slopes fail
- Earthquakes of magnitude 4.0 and greater have been known to trigger landslides
- Volcanic eruptions produce loose ash deposits, heavy rain, and debris flows
- Excess weight from accumulation of rain or snow, stockpiling of rock or ore, from waste piles, or from man-made structures may stress weak slopes to failure and other structures

Slope material that becomes saturated with water may develop a debris flow or mud flow. The resulting slurry of rock and mud may pick up trees, houses, and cars, thus blocking bridges and tributaries causing flooding along its path (USGS). Landslides commonly occur in connection with other major natural disasters such as earthquakes, volcanoes, wildfires, and floods. (USGS)

Historical Occurrence

In a search of national databases,, there was no discovery of recorded landslides in Bremer County. It is possible that landslides have and were not reported; however there is no data available to determine this.

Probability

Based on the lack of reported landslides in the past, the probability of a landslides occurring in Bremer County is unlikely. Figure 3.5 shows the general risk landslides pose throughout Iowa. All of Bremer County is within the “low” risk category. Steep sloping areas, especially along waterways as well as areas that have been cleared of shrubbery or timber may have an increased probability. The topography map of the planning area is located in Attachment 1.

Magnitude / Severity

Maximum threat exists to those property owners located at the top or bottom of steep sloping areas without trees or shrubbery to absorb excessive amount of moisture. For

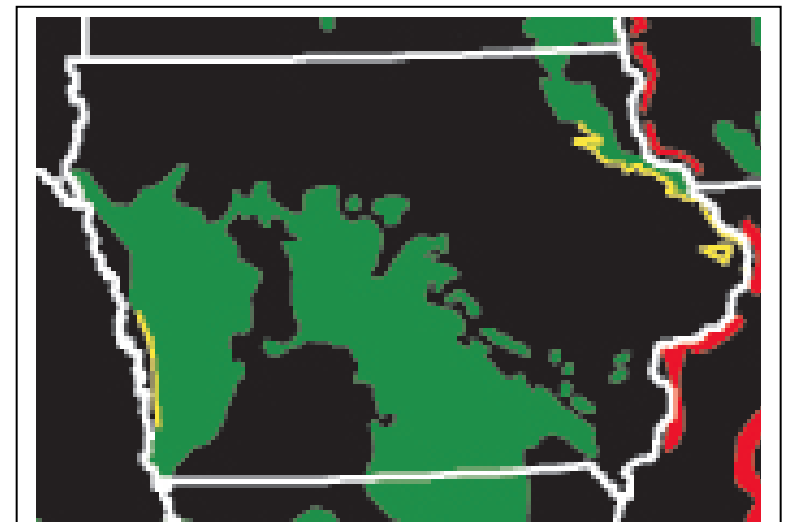


Figure 3.5: Landslide Potential

Red = Very High Potential; Yellow = High Potential; Green = Moderate Potential; Black = Low Potential

Courtesy of US Geological Survey, www.usgs.gov

structures located at the top or bottom of a landslide the severity of impact could be devastating. Earth giving way from underneath a structure could result in the structure giving way also. All ground that does give way will then topple onto the anything located below.

Landslides can damage structures and disrupted electricity, water service, communications, and transportation routes in some areas along river banks or in areas where impair development has occurred. Injuries and deaths are very unlikely except in the case of undetected slope failure warning signs in structures overlooking steep slopes.

According to a 2005 publication by the Us Geological Survey¹⁰ landslides:

- Cause damage in all 50 states
- Cost \$3.5 billion per year, in 2005, in damage repair
- Reduce real-estate values and tourist revenue
- Lead to lost human, industrial, agricultural, and forestry production
- Cause damage to the natural environment.

In general, the areas of the county most susceptible to a landslide include the Appalachian Mountains, Rocky Mountains, and the west coast. The Midwest, with a relative flat terrain, experiences very landslides compared to these other areas.

Warning Time

Great amounts of precipitation and moisture over time will greatly increase the warning time of a landslide event; however, there is no official warning system in place, thus the warning time would be short.

Duration

Landslides are typically over within hours of occurring.

¹⁰ <https://pubs.usgs.gov/fs/2005/3156/>

Radiological Incident

Definition and Description

A radiological incident is an occurrence resulting in a release of radiological material at a fixed facility or in transit. An incident resulting in a release of radiological material at a fixed facility includes, but is not limited to, power plants, hospitals, and laboratories. Although the term "nuclear accident" has no strict technical definition, it generally refers to events involving the release of significant levels of radiation. Most commercial nuclear facilities in the United States were developed in the mid-1960s and are designed to withstand an aircraft attack. Therefore, they should withstand most hazards even though they may not have been designed for those particular forces.

“Radioactive materials are composed of atoms that are unstable. An unstable atom gives off its excess energy until it becomes stable. The energy emitted is radiation. Each of us is exposed to radiation daily from natural sources, including the Sun and the Earth. Small traces of radiation are present in food and water. Radiation also is released from man-made sources such as X-ray machines, television sets and microwave ovens. Radiation has a cumulative effect. The longer a person is exposed to radiation, the greater the effect. A high exposure to radiation can cause serious illness or death”¹¹

The United States Nuclear Regulatory Commission (NRC) identifies four types of emergency classifications for nuclear power plants. Table 3.15 provides a brief description of these types of emergencies.

TABLE 3.15: UN NRC EMERGENCY CLASSIFICATIONS

Unusual Event	Events are in progress or have occurred which indicate potential degradation of the level of safety of the plant or indicate security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety system occurs,
Alert	Events are in the progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of Hostile Action. Any releases are expected to be limited to small fraction of the EPA protection action guides (PAGs)
Site Area Emergency	Events are in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or hostile action that resulted in intentional damage or malicious acts; 1) toward site personnel or equipment that could lead to the likely failure or; 2) that prevent effective access to, equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA PAG exposure levels beyond the site boundary.
General Emergency	Events are in progress or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity or hostile action that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA PAG exposure levels offsite for more than the immediate site area.

Source: US Nuclear Regulatory Commission, "Emergency Classification"

¹¹ <https://www.ready.gov/nuclear-power-plants>

Historical Occurrence

There is only one nuclear power plant in the state of Iowa, the Duane Arnold Energy Center, which is located 9 miles northwest of Cedar Rapids. The plant began construction in 1970 and became operational in 1974. From 1990 through 2014, the Duane Arnold Energy Center has had 7 Unusual Events, one Alert, no Site Area Emergencies and no General Emergencies.

Figure 3.6 shows the location of the two nuclear power plants in eastern Iowa.

According to the state's 2013 Hazard Mitigation Plan, there have been no occurrences of transportation radiological incidents in Iowa.

Transportation of radiological materials is licensed and regulated by the federal government. According to the state's 2013 Hazard Mitigation Plan, there have been no occurrences of transportation radiological incidents in Iowa.

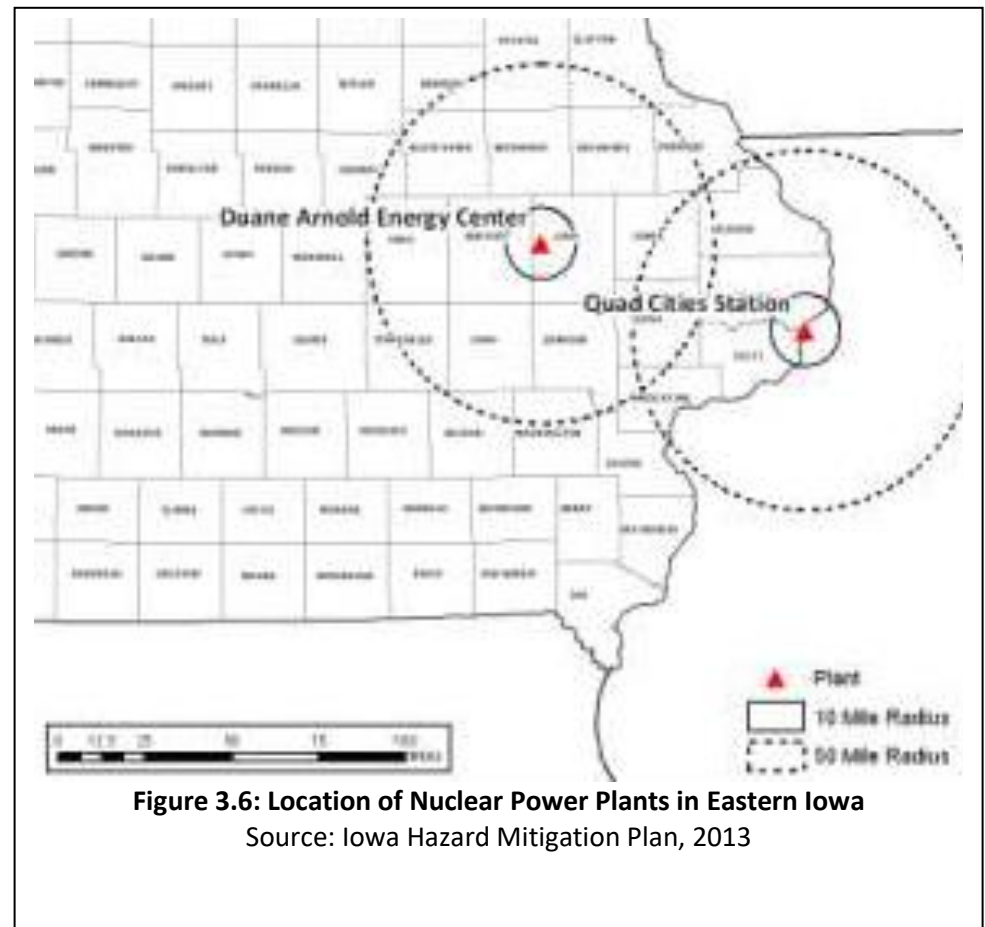
Probability

Operators of facilities that use radioactive materials and transporters of radioactive waste are circumspect in the packaging, handling, and shipment of the radioactive waste; and are closely regulated by a variety of federal, state, and local organizations. Based on the minimal history of radiological incidents affecting the planning area, the probability of an incident is unlikely. A radiological incident may be triggered by one of other identified hazards, including: terrorism, earthquake, or structural failure.

Magnitude / Severity

Three nuclear facilities are located near the Iowa border. These are the Ft. Calhoun Nuclear Power Plant located north of Omaha, NE. The Cooper Nuclear Power Plant south of Nebraska City, NE, and across the Mississippi River at the Quad Cities Nuclear Power Plant.

Time, distance, and shielding minimize radiation exposure to the body. Nuclear radiation above normal levels could be a health and safety consideration because of its ability to damage human cells biologically as well as its long-lasting effect on the environment. Depending on the level of exposure, radiation can cause loss of life, long- and short-term health effects, and property damage from contamination, and disruption of business because of potential evacuations.



Therefore, multiple deaths could occur, thereby affecting the operation of essential facilities throughout the community, at least temporarily.

According to Ready.gov there are, “two ‘emergency planning zones.’ One zone covers an area within a 10-mile radius of the plant, where it is possible that people could be harmed by direct radiation exposures. The second zone covers a broader area, usually up to a 50-mile radius from the plant, where radioactive materials could contaminate water supplies, food crops, and livestock”¹²

The 50 mile radius of the nuclear plant covers the southeastern portions of Bremer County, including the rural area southeast of Janesville. The cities of, and their surrounding areas, Denver and Readlyn are also within the 50-mile radius of the plant.

Radiation exposure can happen two different ways, including: exposure from a release of radioactive material from the plant, such as a plume of radioactive gases and particles. However, the greatest risk to people in the area around a plume is the body’s radiation exposure from the cloud and particles deposited on the ground, inhalation of radioactive material, and ingestion of radioactive materials.¹³

Although it is determined that the probability of an event was limited, it is recognized that if an event were to occur in, or in close proximity, to the community that the entire area would be vulnerable to the radiation.

Warning Time

Ionizing radiation cannot be seen, smelled, heard, or detected with human senses. Detection instruments are needed to indicate the existence of dangerous radiation. Distance from the incident would dictate the amount of time needed to avoid exposure from damaging radiation. Protective actions directed by state and county officials, will depend upon weather conditions and developments at the power plant. In an actual emergency, the public can turn to their local Emergency Alert System Station, NOAA Weather Radios, or through AlertIowa notifications.

Duration

Depending upon the severity of a radiological event, the planning area would be impacted from a few hours to possibly a day or two. In a worst case scenario event, the duration of the ensuing fallout could last decades.

¹² <https://www.ready.gov/nuclear-power-plants>

¹³ <https://www.ready.gov/nuclear-power-plants>

River Flooding

Definition and Description

River flooding is a rising or overflowing of a tributary or body of water that covers adjacent land not usually covered by water when the volume of water in a stream exceeds the channel's capacity.

River floods are the most common and widespread of all natural disasters, except fire. Most communities in the U.S. can experience some kind of flooding after spring rains, heavy thunderstorms, winter storm thaws, waterway obstructions, or levee or dam failures. Often it is a combination of these elements that causes damaging floods. Floodwaters can be extremely dangerous. The force of six inches of swiftly moving water can knock people off their feet and two feet of water can float a car. Floods can be slow-, or fast-rising but generally develop over a period of days. Flooding is a natural and expected phenomenon that occurs annually, usually restricted to specific streams, rivers or watershed areas.

Historical Occurrence

According to the National Climatic Data Center (NCDC), there have been 26 recorded flood events within Bremer County from 1996 through 2016. Table 3.16 displays the date, general location, and impact of these floods. Since 1996, floods have caused over \$20 million in property and crop damage in the area. The following is not intended to be complete historical records of every flood event to have occurred within the planning area, but rather a brief summary of some of the more severe events that have taken place.

Floods of 1993 – Following a record winter snow accumulation and temperatures above normal, a major flooding event occurred in Iowa. Flood warnings were issued for a large part of the Iowa and Cedar River Basins. On March 30th and 31st, widespread 0.5 to 1 inch rains blanketed the state. To add insult to injury, thunderstorms dropped a large area of 1 to 2 inch rainfall over the area that needed it the least, upper portions of the Iowa and Cedar River Basins. By early May, eight counties had received the federal disaster declaration from the late March and early April flooding. These counties were Black Hawk, Butler, Linn, and Muscatine in the Cedar River basin; Tama and Benton in the Iowa River basin, Buchanan in the Wapsipinicon River basin, and Webster County in the Des Moines River basin. A record crest was observed on the Iowa River at Marshalltown, and initial indications were that Beaver Creek at New Hartford tied the record crest. Several state highways were closed by high water as well as countless county roads. Many of the rivers in the state crested as much as 4 to 8 feet over flood stage. Damage was quite extensive; however, it will be some time before assessments are completed. A few towns became isolated and were only accessible by boat. For example, water flooded the downtown areas of Algona, Chelsea, and New Hartford. Governor Branstad declared 11 Iowa counties disaster areas and several received federal disaster declaration. Property damages totaled over \$50 million, with crop damage totaling over \$10 million.

Flood of 1999 – A Mesoscale Convective Complex developed over north central and northeast Iowa during the overnight and early morning hours of the 18th and 19th of July. The first flash flood warnings were issued during the wee hours after midnight. The most intense rainfall, estimated by WSR-88D radar at 6 to 10 inches, fell over a relatively small area of Cerro Gordo and southern Worth Counties. The hardest hit area was around Manly, where unofficial rainfall totals of at least 13 inches were received from within the town. There was extensive flooding of homes, roads, and businesses from small streams and creeks. A tragedy was barely averted in the town of Rock Falls, when a sudden rise in flood waters on the Shell Rock River swept a number of camping vehicles downstream, requiring rescues from atop the campers. In the town of Nora Springs, downstream from Rock Falls, there was a small earthen dam break on the Shell Rock River, which may have increased flows downstream. The dam was already being significantly overtopped at the time of failure, so it was difficult to determine the exact impact on the flows downstream. A flash flood watch was issued early on the 19th for much of western, central, and north central Iowa. Significant storms did develop overnight, but the heaviest rains fell in the western parts of the Des Moines HSA and fortunately there was only scattered light activity over northeast Iowa. Urban and small stream advisories were issued for Emmet and northern Palo Alto Counties, where radar estimated 2 to 4 inches of rainfall. The heaviest 24-hour gage report however was in Carroll, in the Middle Racoon basin, with 2.96 inches. Another flash flood watch was issued early on the 20th for roughly the north half of Iowa. Factors cited in discussions about the potential for heavy rainfall included the presence of a very slow moving cold front, combined with 30 to 45 MPH low level winds feeding abundant moisture into the boundary. The forecasts for extreme rainfall were verified by tremendous rains which began late on the afternoon of the 20th. A flash flood warning was already issued by the early evening hours for southern Worth County, with radar estimated rainfall at 2 inches per hour. Storms continued to develop and train over the same areas during the evening hours, causing additional flash flood warnings in both Bremer and Butler Counties. Rainfall was heaviest in the cedar and Shell Rock River basin, as the band of intense rainfall sank slowly southward with the frontal boundary. Unofficial reports of 7 to 8 inches of rain were reported near Clarksville, located along the Cedar River in Butler County. River flood warnings were issued before midnight, late on the 20th, for the Cedar River from the Bremer County line southward into the Waterloo area. As additional rainfall reports were received early on Wednesday the 21st, the extent and degree of possible river flooding became evident. Radar estimated rainfall indicated a large area of greater than 6 inches of rainfall centered over Floyd County, with a center of 8 to 11 inches stretching from just south of Charles City westward to Rockford. The highest 24-hour gage report within the Cedar basin was at Charles City, with 6.65 inches. According to the Rainfall Frequency Atlas of the Midwest (Midwestern Climate Center - 1992), the 100-year, 24-hour rainfall in this part of northeast Iowa is around 6 inches, meaning that 2 out of 3 nights the rain gage at Charles City had rains at or in excess of the 100-year frequency at 2 hours. Consider that this rain fell in much less time than 24 hours, and it was likely not at the most intense rainfall center! With all of this new rain falling within the same basins as the two nights previous, new flood warnings for yet higher crests were issued for the Winnebago, Shell Rock, and Cedar Rivers. Forecasts predicted several record flood levels along these rivers, with lead times to crest from 8 hours to several days. Near record flooding occurred along the Shell Rock River at Marble Rock with the 2nd highest crest on record, while record floods occurred further downstream at Shell Rock and on the Cedar River at Janesville. At Waterloo, rainfall over the West Fork Cedar River, Beaver Creek, and Black Hawk basin was much lower than in the Shell Rock and Cedar basins, reducing the inflows to the Cedar in Waterloo. Local officials in Cedar Falls, just upstream of Waterloo, stated that the crest exceeded the 1961 flood. The return frequency data for these river floods presents some interesting numbers. The most extreme flood in terms of return frequency was on the Cedar River at Janesville, where the discharge of 41,000 cubic feet per second (cfs) on July 22 made this about a 75-year flood (.015 exceedance probability). The stage at Janesville reached the highest stage on record. At Waterloo on the Cedar, the peak discharge of 65,700 cfs on July 23 was about a 20-year flood event (.05 exceedance probability). This stage was the 3rd highest on record. This highlights the importance of contributions from other tributaries to produce a major flood at Waterloo. On the Shell Rock River at Shell Rock, the peak discharge of 28,500 cfs on July 22 represented about a 25-year return frequency (.04 exceedance probability). Impacts from the flooding were extensive in terms of damaged infrastructure such as bridges and

roads, flooded homes, and disruptions to normal life. There were no injuries or deaths in the Des Moines HSA, although several rescues and many evacuations were performed. Extensive sandbagging efforts saved important facilities in some towns, but others lost the battle. Some of the worst flooding took place in Waverly on the Cedar River, where about 1500 people were evacuated. A total of at least 600 homes in the town of Waverly had to be evacuated due to the high water. Extensive flooding also occurred in Rockford and Greene on the Shell Rock River. Part of the downtown area and several neighborhoods in Cedar Falls were saved from flooding only by the emergency completion of a levee which was already in the process of being built by the U.S. Army Corps of Engineers. In addition, the Presidential Disaster Declaration for the July 2-3 Flooding was extended to include the July 18-22 flooding.

Floods of 2008 – Although the greatest impact from the flood of 2008 was in the City of Waverly, all areas of the county were impacted, resulting in FEMA registrations county-wide. FEMA housing (trailers) was used in Waverly and Plainfield. Outside of the City of Waverly, flooding damaged residences, primarily in basements. There were no FEMA buy-out projects in the areas of Bremer County outside of the City of Waverly.

Table 3.16 shows the recorded flooding events in Bremer County over a ten year span, from January 1, 1996 through December 31, 2015.

Probability

Considering the historical occurrence of flooding events and the number of streams and rivers located in planning area, the probability of future river flooding remains high. Flooding is an annual problem throughout the planning area.

As part of three watersheds (Shell Rock River, Upper Cedar River, and Upper Wapsipinicon), areas adjacent to the rivers and

TABLE 3.16: RIVER FLOODING EVENTS IN BREMER COUNTY, 1996-2015					
Location	Date	Time	Death or Injuries	Property Damage (\$)	Crop Damage (\$)
WAVERLY	6/20/1998	16:15	0	50.00K	5.00K
WAVERLY	6/27/1998	22:30	0	50.00K	10.00K
WAVERLY	8/20/1998	16:15	0	25.00K	0.00K
BREMER (ZONE)	5/16/1999	21:00	0	500.00K	50.00K
BREMER (ZONE)	5/21/1999	15:00	0	50.00K	10.00K
BREMER (ZONE)	6/9/1999	6:00	0	50.00K	75.00K
BREMER (ZONE)	7/19/1999	6:00	0	100.00K	150.00K
BREMER (ZONE)	7/10/2000	6:00	0	50.00K	25.00K
BREMER (ZONE)	3/23/2001	18:00	0	7.50K	0.00K
BREMER (ZONE)	4/7/2001	21:00	0	150.00K	0.00K
BREMER (ZONE)	5/22/2004	18:00	0	100.00K	298.04K
BREMER (ZONE)	9/15/2004	5:00	0	50.00K	100.00K
BREMER (ZONE)	6/26/2005	0:00	0	74.07K	50.00K
COUNTYWIDE	4/1/2006	0:00	0	5.00K	0.00K
PLAINFIELD	4/25/2008	10:00	0	200.00K	0.00K
PLAINFIELD	4/25/2008	16:45	0	10.00K	0.00K
PLAINFIELD	6/8/2008	10:20	0	250.00K	500.00K
PLAINFIELD	3/13/2010	8:30	0	50.00K	0.00K
BABCOCK	3/14/2010	0:40	0	25.00K	0.00K
PLAINFIELD	6/12/2010	12:00	0	0.00K	20.000M
BABCOCK	3/25/2011	7:15	0	25.00K	0.00K
BABCOCK	5/21/2013	22:30	0	250.00K	0.00K
PLAINFIELD	9/22/2016	5:30	0	50.00K	0.00K
FREDERIKA	9/22/2016	13:24	0	100.00K	0.00K
WAVERLY	9/23/2016	3:45	0	100.00K	0.00K
READLYN	9/23/2016	12:17	0	20.00K	100.00K
Total			0	2.292M	21.373M
<i>Source: National Climatic Data Center, retrieved 4/14/2016</i>					

creeks, and its main tributaries are at significantly higher risk than those areas located away from these features. The jurisdictions of Denver, Frederika, Janesville, Plainfield, Sumner, Tripoli, Waverly, and unincorporated areas along the Shell Rock River, Cedar River, and the Wapsipinicon River can see a high probability of future river flooding.

While the planning area can experience some degree of flooding throughout the year, the threat of river flooding is compounded in the late winter and early spring months, as melting snow can overflow streams, rivers, and tributaries. See each jurisdiction's individual appendixes for additional details on previous flood events and probability of future flooding events.

Magnitude / Severity

While there are substantial areas of floodplain (see floodplain maps of unincorporated area as well as each city in Attachment 1) in the planning area, as a percentage of the entire county, these areas are considered to be limited. As mentioned previously, areas along rivers, creeks, and other tributaries are vulnerable to flooding, as well as developed jurisdictions that do not have proper drainage systems. Fortunately, the unincorporated area is mainly agricultural land with sporadic residential land use.

Potential flooding impacts range from very low to catastrophic depending on the type and location of flooding. Flooding impacts include loss of life; property damage and destruction; damage and disruption of communications, transportation, electric service, and community services; crop and livestock damage and loss and interruption of business. Risks of fire, health and transportation accidents, and contamination of water supplies are increased during flooding situations

Tables 3.17 & 3.18 displays the value of land, buildings, and dwellings in the 1.0% (100-year) , 0.2% (500-year) floodplains for the combined incorporated areas and the unincorporated areas of county. The parcel information is current as of 11/23/2015. The FEMA Digital FIRM data for Bremer County was completed on 03/04/2008. The incorporated boundaries are current as of 7/21/2016. Individual floodplain land, building, and dwelling values for each jurisdiction can be found in their respective appendixes.

TABLE 3.17: FLOODPLAIN VALUES OF ALL INCORPORATED CITIES IN BREMER COUNTY					
	# of Parcels	Land Value	Building Value	Dwelling Value	Total Value
1.0% Annual Chance Floodplain Values	1,227	\$25,523,110	\$27,161,390	\$70,087,620	\$122,772,120
0.2% Annual Chance Floodplain Values	359	\$7,393,030	\$4,417,075	\$25,339,265	\$37,149,370
Total Incorporated Floodplain Value	1,586	\$32,916,140	\$31,578,465	\$95,426,885	\$159,921,490
Total Incorporated Value	8,494	\$194,206,750	\$157,723,250	\$716,538,040	\$1,068,468,040
<i>Figures calculated using data from Bremer County GIS Department; Parcel data current as of 11/23/2015</i>					

TABLE 3.18 FLOODPLAIN VALUES OF UNINCORPORATED BREMER COUNTY					
	# of Parcels	Land Value	Building Value	Dwelling Value	Total Value
1.0% Annual Chance Floodplain Values	3,791	\$194,915,420	\$10,054,090	\$93,301,030	\$298,270,540
0.2% Annual Chance Floodplain Values	11	\$310,590	\$0	\$872,420	\$1,183,010
Total Unincorporated Floodplain Value	370	\$ 7,703,620.00	\$ 4,417,075.00	\$ 26,211,685.00	\$38,332,380.00
Total Unincorporated Value	11,038	\$672,490,090	\$37,744,628	\$434,439,382	\$1,144,674,100
<i>Figures calculated using data from Bremer County GIS Department; Parcel data current as of 11/23/2015</i>					

Warning Time

People in the path of river floods may have time to take appropriate actions to limit harm to themselves and their property. River flooding can be forecasted to allow for several hours, perhaps even days notification.

Duration

The duration of a flooding event varies based on the severity and location of the flooding event. Duration can range from a few hours to several days or longer.

Severe Winter Storm

Definition and Description

Severe winter storms are weather conditions that affect day-to-day activities. A brief description of various types of severe winter storms is described in Table 3.19. Winter storms are common during the winter months of October through April. The various types of extreme winter weather cause considerable damage. Heavy snows cause immobilized transportation systems, downed trees and power lines, collapsed buildings, and loss of livestock and wildlife. Loose snow begins to drift when the wind speed reaches 9 to 10 mph under freezing conditions. The potential for some drifting is substantially higher in open country than in urban areas where buildings, trees, and other features obstruct the wind. Frigid temperatures and wind chills are dangerous to people, particularly the elderly and the very young. Dangers include frostbite or hypothermia. Water pipes, livestock, fish and wildlife, and pets are also at risk from extreme cold and severe winter weather.

TABLE 3.19: SEVERE WINTER STORM TERMS	
Storm Event Type	Description
Blizzard	A winter storm last at least 3 hours which produces sustained winds or frequent gusts 35 mph or greater and falling and/or blowing snow reducing visibility to less than ¼ mile
Cold/wind Chill	A period of low temperatures or wind chill temperatures reaching or exceeding locally/regionally defined advisory (typically value is -18°F or colder).
Heavy Snow	Snow accumulation meeting or exceeding the locally/regionally defined 12 and 24 hours warning criteria
Ice Storm	Ice accretion meeting or exceeding locally/regionally defined warning criteria (typical value is ¼ or ½ inch or more)
Winter Storm	A weather event which contains more than one significant hazard (i.e. heavy snow and blowing snow; snow and ice; snow and sleet) and meets or exceeds the locally/regionally defined 12 and/or 24 warning criteria
<i>Source: "National Weather Service Instruction 10-1605" courtesy of the National Climatic Data Center</i>	

Historical Occurrence

The planning area has experienced winter storms of some type every winter on record. According to the National Climatic Data Center, from 1996 through 2015 there were 56 winter storm events, including: Blizzard (12), Cold/Wind Chill (4), Heavy Snow (14), Ice Storm (9), and Winter Storm (17). According to this data, there have been no fatalities or injuries resulting in from these hazard events. However, it is estimated that these 56 winter storm events have caused an nearly \$1.5 million in property and crop damage.

Table 3.20 displays the reported storm events in Bremer County, according to the National Climatic Data Center for reported Blizzards, Cold/Wind Chill, Heavy Snow, Ice Storms, and Winter Weather. The timeframe covered by the data is from January 1, 2016 through December 31, 2015.

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TABLE 3.20 WINTER STORM EVENTS IN BREMER COUNTY, 1996-2015

Date	Type	Property Damage (\$)	Crop Damage (\$)	Date	Type	Property Damage (\$)	Crop Damage (\$)
1/18/1996	Cold/wind Chill	0.00K	0.00K	1/4/2005	Heavy Snow	10.00K	0.00K
1/18/1996	Blizzard	0.00K	0.00K	1/22/2005	Blizzard	5.00K	0.00K
1/18/1996	Heavy Snow	0.00K	0.00K	1/20/2007	Heavy Snow	0.00K	0.00K
1/26/1996	Heavy Snow	0.00K	0.00K	2/24/2007	Winter Storm	250.00K	0.00K
1/26/1996	Blizzard	0.00K	0.00K	12/1/2007	Winter Storm	10.00K	0.00K
1/28/1996	Blizzard	0.00K	0.00K	2/10/2008	Cold/wind Chill	0.00K	0.00K
2/1/1996	Cold/wind Chill	0.00K	0.00K	12/8/2008	Winter Storm	10.00K	0.00K
3/24/1996	Blizzard	0.00K	0.00K	12/18/2008	Winter Storm	5.00K	0.00K
5/1/1996	Cold/wind Chill	0.00K	0.00K	12/20/2008	Blizzard	0.00K	0.00K
11/14/1996	Ice Storm	0.00K	0.00K	12/27/2008	Ice Storm	5.00K	0.00K
1/9/1997	Cold/wind Chill	0.00K	0.00K	1/13/2009	Heavy Snow	0.00K	0.00K
1/15/1997	Cold/wind Chill	0.00K	0.00K	4/5/2009	Winter Storm	0.00K	0.00K
2/3/1997	Heavy Snow	0.00K	0.00K	12/8/2009	Heavy Snow	10.00K	0.00K
11/14/1997	Heavy Snow	4.55K	0.00K	12/9/2009	Blizzard	50.00K	0.00K
12/21/1997	Ice Storm	2.05K	0.00K	1/6/2010	Winter Storm	25.00K	0.00K
1/4/1998	Ice Storm	20.40K	0.00K	1/25/2010	Blizzard	75.00K	0.00K
3/7/1998	Heavy Snow	50.00K	0.00K	12/11/2010	Blizzard	75.00K	0.00K
3/17/1998	Ice Storm	5.88K	0.00K	12/23/2010	Heavy Snow	0.00K	0.00K
1/1/1999	Winter Storm	10.00K	0.00K	2/1/2011	Blizzard	25.00K	0.00K
2/11/1999	Ice Storm	5.00K	0.00K	1/20/2012	Heavy Snow	0.00K	0.00K
9/21/1999	Cold/wind Chill	0.00K	294.12K	12/19/2012	Winter Storm	25.00K	0.00K
1/19/2000	Winter Storm	1.00K	0.00K	12/20/2012	Blizzard	100.00K	0.00K
2/17/2000	Winter Storm	10.00K	0.00K	1/27/2013	Ice Storm	50.00K	0.00K
12/10/2000	Winter Storm	24.90K	0.00K	1/30/2013	Winter Storm	25.00K	0.00K
12/18/2000	Blizzard	25.00K	0.00K	2/21/2013	Heavy Snow	0.00K	0.00K
12/21/2000	Blizzard	20.00K	0.00K	1/26/2014	Blizzard	10.00K	0.00K
12/28/2000	Heavy Snow	5.00K	0.00K	2/20/2014	Blizzard	25.00K	0.00K
2/8/2001	Ice Storm	75.00K	0.00K	1/8/2015	Blizzard	0.00K	0.00K
2/8/2001	Winter Storm	50.00K	0.00K	2/1/2015	Winter Storm	50.00K	0.00K
3/1/2002	Heavy Snow	5.00K	0.00K	2/25/2015	Heavy Snow	0.00K	0.00K
3/4/2003	Heavy Snow	1.00K	0.00K	11/20/2015	Winter Storm	0.00K	0.00K
4/4/2003	Ice Storm	5.00K	0.00K	12/28/2015	Winter Storm	0.00K	0.00K
4/6/2003	Winter Storm	5.00K	0.00K		Total	1.170M	294.12K
1/1/2005	Ice Storm	5.00K	0.00K	Source: National Climatic Data Center; Damage estimates include areas outside of Bremer County			

Probability

From 1996 through 2015 there have been 66 recorded storm events in Bremer County. This includes 40 days with an event resulting in property damage and one day with an event resulting in crop damage. The frequency and impact of severe winter storm events varies from year to year. Bremer County did not record any events in 2004 and 2006 and only one event in 2011. However, based on historical occurrences it is highly likely a severe winter storm will affect Bremer County on an annual basis, likely multiple times in a year. As can be seen in Table 3.21, in the past 20 years Bremer County has averaged almost three winter storm events per year.

TABLE 3.21: Annual Average of Winter Storm Events in Bremer County, 1996-2015		
Storm Event	Total Events	Events Per Year
Blizzard	16	1.6
Cold/wind Chill	7	0.7
Heavy Snow	16	1.6
Ice Storm	10	1.0
Winter Storm	17	1.7
Total	66	6.6
<i>Source: National Climatic Data Center, retrieved on 9/22/2016</i>		

Magnitude/Severity

Those most vulnerable to the effects of a winter storm are those who cannot fend for themselves in times of severe weather. The planning area's elderly, youth, and disabled populations who rely on outside entities for delivery of food or medicine are highly vulnerable to winter storms. People, such as farmers, who work outdoors, are also at greater risk of being affected by wind chill, extreme low temperature, and wet winter conditions. Unfortunately, based on the large area that these storms can cover and the cascading effects that can accompany them, the entire population and planning area are vulnerable to some type of impact from a winter storm. The committee recognized this as fact and scored it accordingly.

Although the developments in technology have been very beneficial in reducing the long-term negative effects of winter storms, certain dangers still exist. The maximum threat of winter conditions would be realized if it was accompanied by power outages and elimination of travel due to hampered road conditions. This could result in the inability for some of the population to maintain temperatures necessary for the body. In addition, long winter events that eliminate communication could result in the reduction of adequate medical response time.

Warning Time

The National Weather Service has developed effective weather advisories, which are promptly and widely distributed. Radio, TV, and Weather Alert Radios provide the most immediate means to do this. Accurate information is made available to public officials and the public up to days in advance. Again, weather prediction capabilities have made significant improvements in the past few years. There are several notifications made by the National Weather Service. These include winter storm watch, winter storm warning, blizzard warning, winter weather advisory, and a frost/freeze advisory. Despite the advancements in technology, there have been several instances where the actual winter storm event was much more severe than what was actually forecasted to occur.

Duration

Depending on the type, duration, and the size of the event the entire population could feel the effect of a winter storm. Generally, due to existing snow removal services and other community services the effects of winter storms on incorporated communities in Bremer County are short term; however, the more rural, unincorporated areas tend to be impacted longer due to rural nature of the county. Although more of an inconvenience, and somewhat more dangerous, travel and communication are usually an option in less than 24 hours of any given event.

implications for groundwater quality.¹⁴

According to the Iowa Department of Natural Resource's Natural Resources Geographic Information Systems Library, there have been 122 recorded sinkholes in Bremer County. Their locations are displayed in Figure 3.7. See Map 2b, included in Attachment 1, for a historical map of Bremer County sinkholes.

According to the Iowa Department of Natural Resource's Coal Mine Map¹⁵ there are no abandoned coal mines in Bremer County.

Probability

Bremer County consists of several different soil types, a high prevalence of precipitation and current agricultural practices which focus on re-directing natural water flow. As is shown in Figure 3.7, Bremer County has experienced a number of sinkholes historically. The vast majority of the sinkholes are in the western half of the county. The cities of Waverly and Janesville and areas along the Shell Rock and Cedar Rivers are the most likely to experience a sinkhole event.

Sinkhole probability varies by jurisdiction. Cumulatively, the committee determined the probability of a major sinkhole event to be between Unlikely and Occasional (0 to 20 percent chance of occurring in a given year)

Magnitude / Severity

The planning area's vulnerability to property damage, injury and loss of life as a result of a sink hole is small. Sinkhole damage is usually contained to a structure. The onset of sink holes is typically slow and can resemble the normal settling of a structure. However, failure to identify a sink hole could increase the homeowner's vulnerability. Building near and or around soils that have the potential to cause sinkholes is highly discouraged to limit future vulnerability.

Maximum threat exists to those property owners located at the top of bottom of steep sloping areas without trees or shrubbery to absorb excessive amounts of moisture. For structures located at the top or bottom of a landslide the severity of impact could be devastating. Earth giving way from underneath a structure could result in the structure giving away also. All ground that does give way will then topple onto anything located below.

Unknown sink holes on property located near and around a structure could have a significant impact on the structures in the area if the sink hole were to collapse. Personal property located near the sink hole would also be consumed in the event of a collapse.

Warning time

Sink holes growing in mass is a slow yet gradual process. Land use practices in the area, soil type in addition to a number of other factors will impact the speed of onset. By identifying these areas city agencies and property owners will be able to implement the necessary precautions to slow and potentially eliminate the development of a sink hole. Catastrophic sinkholes can provide little visible warning, setting in in as little as a few minutes.

¹⁴ Iowa Department of Natural Resources, Geological Survey, <http://www.iqsb.uiowa.edu/service/hazards.htm>

¹⁵ Iowa Department of Natural Resources, <http://programs.iowadnr.gov/maps/coalmines/>,

Duration

A sinkhole can affect the location in which it occurred for weeks.

Terrorism

Definition and Description

Terrorism is the unlawful use of force or violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives (*Federal Bureau of Investigation*). The Federal Bureau of Investigation (FBI) categorizes terrorism in the United States as one of two types--domestic terrorism or international terrorism. Domestic terrorism involves groups or individuals whose terrorist activities are directed at elements of our government or population without foreign direction.

International terrorism involves groups or individuals whose terrorist activities are foreign-based and/or directed by countries or groups outside the United States or whose activities transcend national boundaries. A terrorist attack can take several forms, depending on the technological means available to the terrorist, the nature of the political issue motivating the attack, and the points of weakness of the terrorist's target. Bombings have been the most frequently used terrorist method in the United States. Other possibilities include an attack at transportation facilities, an attack against utilities or other public services or an incident involving chemical or biological agents.

Historical Occurrences

To date, there have been no known or reported instances of any terrorist attacks having been perpetrated in the planning area, as defined by the State of Iowa. However, in 2002 an animal rights group, known as the Animal Liberation Front, claimed responsibility of the releasing of more than 1,200 domesticated minks from a fur farm in Bremer County. The Bremer County Sheriff's Department, Federal Bureau of Investigation, Iowa State Patrol, and the Iowa Department of Natural Resources were involved in the investigation. A similar animal release took place in neighboring Chickasaw County in 2000.

Outside of the event mentioned above, there have been no known or reported instances of any terrorist attacks having been perpetrated in the planning area.

Probability

No other events, which could be considered terrorism, are known of. Overall, the probability of terrorist event occurring in the planning area is unlikely (less than 10 percent probability in a given year). The type of terrorist attacks that have the highest probability are those involving small-arms fire at community events of public facilities, such as schools, city halls, and other-like organizations.

Magnitude / Severity

Potential vulnerabilities for terrorist attacks may include: danger to the water supply, bio-terrorism, and an attack on a nearby

nuclear facility. The severity of impact would largely depend on how quickly the planning area became aware that an event had occurred. The worst-case scenario would occur if the public had no knowledge until all or most of the population had been contaminated or poisoned before a proper response could be made. This could result in widespread sickness and potentially death.

Warning Time

Depending on the type of event to occur the speed of onset could vary from immediate (no time) to days, weeks, even years (poisoned water, poisoned food, financial impacts). In the event of the mink release, it took dozens of volunteers to retrieve the remaining living minks over the following days.

Duration

The duration of an incident on the planning area would be dependent upon the type and size of the event. A small, remote/isolated incident would have a smaller duration than a large, urban-centered incident which could last for days or even weeks.

Thunderstorm / Lightning / Hail

Definition and Description

Thunderstorms are common in Iowa and can occur singly, in clusters, or in lines. Thunderstorms can result in heavy rains, high winds (reaching or exceeding 58 mph), tornados, or hail. Thunderstorms are created from a combination of moisture, rapidly raising warm air, and the lifting mechanism such as that caused when warm and cold air masses collide. The SHMT chose to combine previously separated hazards of Thunderstorm/Lightning and Hail. The combined hazard was then scored with lower of the two values for magnitude as well as warning time. The magnitude reduction was due to the fact that a majority of thunderstorms don't cause state level response, and tracking and prediction of thunderstorms is quite sophisticated.

Associated hazards related to thunderstorms are discussed further as individual hazards (tornado/windstorm and various kinds of flooding). Most thunderstorms produce thunder, lightning, and rain. Severe storms can also produce tornadoes, straight-line winds with microburst above 58 mph, hailstorms, and flooding. The National Weather Service (NWS) considers a thunderstorm severe if it produces hail at least 1-inch in diameter, wind 58 mph or higher, or tornadoes. Straight-line winds that exceed 60 mph are often mistaken for tornadoes.

TABLE 3.21: HAILSTONE SIZE CODES		
Size code	Maximum Diameter mm	Description
0	5-9	Pea
1	10-15	Mothball
2	16-20	Marble, grape
3	21-30	Walnut
4	31-40	Pigeon's egg, squash ball
5	41-50	Golf ball, pullet's egg
6	51-60	Hen's egg
7	61-75	Tennis ball, cricket ball
8	76-90	Large orange, soft ball
9	91-100	Grapefruit
10	>100	Melon
Source: The Tornado and Storm Research Organization		

Lightning is an electrical discharge that results from the buildup of positive and negative charges within a thunderstorm. When the buildup becomes strong enough, lightning appears as a “bolt” or flash of light that occurs within the clouds or between the clouds and the ground. A bolt of lightning reaches temperatures approaching 50,000 degrees Fahrenheit in a split second. This rapid heating, expansion, and cooling of air near the lightning bolt creates thunder.

Hailstorms are a product of a severe thunderstorm in which pellets or lumps of ice (of most concern when greater than 1 inch in diameter) fall with rain. Hail is produced in many strong thunderstorms by strong rising currents of air carrying water droplets to a height where freezing occurs, the ice particles grow in size until they are too heavy to be supported by the updraft and fall back to earth. Hail can be smaller than a pea or as large as a softball and can be very destructive to plants and crops. Pets and livestock are particularly vulnerable to hail. Table 3.21 outlines the different sizes of hail and Table 3.22 describes the categories used to classify hailstorms.

TABLE 3.22: TORRO HAILSTORM INTENSITY SCALE			
	Intensity Category	Typical Hail Diameter (mm)*	Typical Damage Impacts
H0	Hard Hail	5	No damage
H1	Potentially Damaging	5-15	Slight general damage to plants, crops
H2	Significant	10-20	Significant damage to fruit, crops, vegetation
H3	Severe	20-30	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
H4	Severe	25-40	Widespread glass damage, vehicle bodywork damage
H5	Destructive	30-50	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	40-60	Bodywork of grounded aircraft dented, brick walls pitted
H7	Destructive	50-75	Severe roof damage, risk of serious injuries
H8	Destructive	60-90	(Severest recorded in the British Isles) Severe damage to aircraft bodywork
H9	Super Hailstorms	75-100	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	>100	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

Source: The Tornado and Storm Research Organization

Historical Occurrence

Thunderstorms are common events in Bremer County. Each spring and summer bring many thunderstorms, often accompanied by rain, lightning, high winds, hail, funnel clouds, and tornadoes. This document discusses hazards of Tornadoes / Windstorms, River Flooding, and Flash Flooding in their respective sections.

Table 3.23 depicts the historical occurrences of Thunderstorm Wind events, as recorded by the National Climatic Data Center, for the past ten years, from 1/1/2006 – 12/31/2015. While this is far from a comprehensive list of all thunderstorms in the planning area, and does cross over with Tornado / Windstorm hazard, the data provides an indication of the frequency and impact that can be associated with thunderstorms. A Thunderstorm Wind event is defined as: “Winds, arising from convection (occurring within 30 minutes of lighting being observed or detected), with speeds of at least 50 knots (58 mph) or winds of any

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speed producing a fatality, injury, or damage...”¹⁶ NOAA reports, from 2006-2015, Bremer County experienced 41 Thunderstorm Wind events over 20 days. Based on this average, Bremer County should expect Thunderstorm Wind Events an average of twice per year.

TABLE 3.23: HISTORIC THUNDERSTORM WIND EVENTS IN BREMER COUNTY. 2006-2015

Location	Date	Wind Speed (knots)	Property Damage	Crop Damage	Location	Date	Wind Speed (knots)	Property Damage	Crop Damage
SUMNER	7/20/2006	57 kts. EG	10.00K	0.00K	WAVERLY	7/10/2009	65 kts. EG	50.00K	200.00K
HORTON	3/31/2007	52 kts. EG	3.00K	0.00K	SUMNER	7/10/2009	52 kts. EG	5.00K	25.00K
SUMNER	7/17/2007	52 kts. EG	5.00K	0.00K	SUMNER	7/10/2009	52 kts. EG	10.00K	0.00K
READLYN	7/17/2007	52 kts. EG	5.00K	0.00K	TRIPOLI	6/23/2010	83 kts. EG	50.00K	0.00K
PLAINFIELD	8/15/2007	70 kts. EG	75.00K	25.00K	BREMER	6/23/2010	83 kts. EG	350.00K	0.00K
PLAINFIELD	8/15/2007	65 kts. EG	75.00K	50.00K	TRIPOLI	6/23/2010	87 kts. EG	50.00K	0.00K
BREMER	8/15/2007	52 kts. EG	5.00K	0.00K	SUMNER	6/23/2010	74 kts. EG	50.00K	0.00K
WAVERLY	8/15/2007	52 kts. EG	10.00K	0.00K	SUMNER	6/23/2010	65 kts. EG	20.00K	0.00K
TRIPOLI	8/15/2007	61 kts. EG	10.00K	0.00K	PLAINFIELD	8/8/2010	56 kts. MG	0.00K	0.00K
WAVERLY	9/21/2007	52 kts. EG	5.00K	0.00K	TRIPOLI	8/8/2010	52 kts. EG	2.00K	0.00K
JANESVILLE	9/21/2007	70 kts. EG	5.00K	5.00K	SUMNER	5/24/2012	57 kts. EG	15.00K	0.00K
WAVERLY	5/6/2008	57 kts. EG	50.00K	0.00K	WAVERLY AIRPORT	6/20/2012	52 kts. EG	5.00K	0.00K
TRIPOLI	6/6/2008	51 kts. MG	0.00K	0.00K	PLAINFIELD	5/19/2013	52 kts. EG	2.00K	0.00K
JANESVILLE	6/7/2008	65 kts. EG	50.00K	0.00K	WAVERLY	5/19/2013	52 kts. EG	2.00K	0.00K
PLAINFIELD	7/7/2008	52 kts. EG	3.00K	0.00K	PLAINFIELD	8/22/2013	51 kts. MG	0.00K	0.00K
WAVERLY	7/7/2008	52 kts. EG	5.00K	0.00K	PLAINFIELD	8/22/2013	61 kts. EG	25.00K	0.00K
WAVERLY	7/7/2008	52 kts. EG	5.00K	5.00K	HORTON	8/22/2013	56 kts. EG	25.00K	5.00K
JANESVILLE	6/23/2009	56 kts. EG	25.00K	0.00K	BUCK CREEK	6/16/2014	83 kts. EG	200.00K	0.00K
JANESVILLE	6/23/2009	57 kts. EG	25.00K	0.00K	PLAINFIELD	8/29/2014	56 kts. MG	10.00K	0.00K
TRIPOLI	6/23/2009	61 kts. EG	40.00K	10.00K	Janesville	6/22/2016	65 kts. MG	50.00K	0.00K
TRIPOLI	6/23/2009	57 kts. EG	25.00K	0.00K	Total			1.347M	325.00K

Source: National Climatic Data Center, retrieved 4/14/2016

Since January 1993, the National Climatic Data Center reports that there has been one recorded lightning strike in the County. There have been four lightning strikes recorded in Bremer County from 1993-2015. In 1997, lightning struck and blew up the chimney of a home in Waverly. Other lightning strikes have included antennas, trees, and homes.

Data from NOAA, compiled using National Lighting Detection Network, found that the state of Iowa averaged 645,685 cloud-to-ground lighting flashes between

¹⁶ National Weather Service Instruction 10-1605 <http://www.ncdc.noaa.gov/stormevents/pd01016005curr.pdf>

1997 and 2011; equating to an average of 11.4 flashes per square mile¹⁷. Therefore Bremer County, which is approximately 440 square miles, should anticipate 5,016 lighting flashes annually.

Table 3.24 shows the recorded hailstorm events in Bremer County from 2006-2015. In the previous 10 years, 54 hail events have been recorded over the course of seven days. From 1981-2015 there were 36 days which in hailed in Bremer County. Of these days, 23 resulted in property damage and 17 caused crop damage. The largest hail size recorded in the previous 35 years was hail stones reported to be 2.75 inches in magnitude. This has occurred on two occasions in 1987 and 1999.

¹⁷ http://www.lightningsafety.noaa.gov/stats/Table-Flashes_by_State_1997-2011.pdf

TABLE 3.24: HISTORIC HAILSTORMS IN BREMER COUNTY, 2006-2015

City/Township	Date	Magnitude (inches)	Property Damage	Crop Damage	City/Township	Date	Magnitude (inches)	Property Damage	Crop Damage
JANESVILLE	5/25/2008	1.75 in.	312.00K	306.00K	TRIPOLI	6/12/2013	1.00 in.	0.00K	5.00K
DENVER	5/25/2008	1.75 in.	10.00K	0.00K	TRIPOLI	6/12/2013	1.25 in.	3.00K	10.00K
WAVERLY	5/25/2008	0.88 in.	10.00K	0.00K	KNITTEL	6/12/2013	1.75 in.	10.00K	10.00K
DENVER	4/6/2010	0.88 in.	1.00K	0.00K	READLYN	6/12/2013	1.00 in.	3.00K	10.00K
READLYN	4/6/2010	1.00 in.	0.00K	0.00K	KNITTEL	6/12/2013	2.00 in.	15.00K	10.00K
TRIPOLI	5/22/2011	1.00 in.	1.00K	0.00K	READLYN	6/12/2013	1.75 in.	10.00K	10.00K
TRIPOLI	5/22/2011	1.00 in.	3.00K	5.00K	BUCK CREEK	6/12/2013	1.75 in.	10.00K	15.00K
SUMNER	5/22/2011	2.00 in.	3.00K	3.00K	TRIPOLI	6/12/2013	0.88 in.	0.00K	5.00K
SUMNER	5/22/2011	1.00 in.	10.00K	3.00K	BUCK CREEK	6/12/2013	1.75 in.	10.00K	10.00K
DENVER	4/9/2013	1.00 in.	3.00K	5.00K	BUCK CREEK	6/12/2013	1.75 in.	10.00K	15.00K
PLAINFIELD	5/19/2013	1.00 in.	1.00K	0.00K	READLYN	6/12/2013	2.75 in.	25.00K	15.00K
JANESVILLE	6/12/2013	1.00 in.	1.00K	0.00K	READLYN	6/12/2013	2.00 in.	15.00K	10.00K
PLAINFIELD	6/12/2013	1.75 in.	1.00K	5.00K	BUCK CREEK	6/12/2013	1.75 in.	10.00K	10.00K
PLAINFIELD	6/12/2013	1.50 in.	5.00K	10.00K	READLYN	6/12/2013	1.50 in.	5.00K	15.00K
BREMER	6/12/2013	1.50 in.	5.00K	0.00K	TRIPOLI	6/12/2013	0.88 in.	0.00K	5.00K
BREMER	6/12/2013	1.00 in.	5.00K	10.00K	BUCK CREEK	6/12/2013	1.00 in.	2.00K	10.00K
BREMER	6/12/2013	1.00 in.	0.00K	5.00K	SUMNER	4/12/2014	1.25 in.	3.00K	0.00K
TRIPOLI	6/12/2013	1.00 in.	0.00K	5.00K	PLAINFIELD	4/12/2014	1.00 in.	0.00K	0.00K
FREDERIKA	6/12/2013	0.75 in.	0.00K	5.00K	WAVERLY	4/12/2014	0.88 in.	0.00K	0.00K
ARTESIAN	6/12/2013	1.75 in.	0.00K	5.00K	WAVERLY	4/12/2014	1.00 in.	2.00K	0.00K
ARTESIAN	6/12/2013	1.75 in.	5.00K	10.00K	WAVERLY	4/12/2014	0.88 in.	0.00K	0.00K
KNITTEL	6/12/2013	1.75 in.	5.00K	10.00K	DENVER	4/12/2014	1.25 in.	3.00K	0.00K
ARTESIAN	6/12/2013	1.75 in.	10.00K	10.00K	DENVER	4/12/2014	2.00 in.	30.00K	0.00K
KNITTEL	6/12/2013	1.75 in.	5.00K	10.00K	READLYN	4/12/2014	1.75 in.	15.00K	0.00K
BREMER	6/12/2013	0.75 in.	5.00K	10.00K	READLYN	4/12/2014	1.75 in.	10.00K	0.00K
TRIPOLI	6/12/2013	1.75 in.	0.00K	5.00K	WAVERLY	4/12/2014	1.25 in.	2.00K	0.00K
READLYN	6/12/2013	1.75 in.	5.00K	10.00K	WAVERLY	4/12/2014	1.75 in.	15.00K	0.00K
					Total			312.00K	306.00K

Source: National Climatic Data Center, retrieved 4/14/2016

Probability

The probability of a Thunderstorm/Lightning/Hail event occurring in the planning area and having an impact on some property in the next five years is high. Based off of data from the last 10 years, it is estimated that the planning area will experience approximately two thunderstorms per year that result in wind damage. Thunderstorms without measureable impacts are likely to occur as well. This conclusion is based on the historical occurrences of thunderstorms in the area and the fact that the climate in the area is very conducive to the development of thunderstorms. The climate in the area is of humid continental variety and therefore there is generally enough moisture to form clouds and rain, relatively warm and unstable air that can rise quickly, and fluctuating weather fronts that work to cause uplift in air masses.

As previously mentioned, based on Iowa's 1997-2011 average of cloud-to-ground lighting flashes of 645,685 flashes per year. Based on it's size (439 square miles) Bremer County should anticipate approximately 5,000 lighting flashes annually. However, reported lighting strikes have a low probability.

There is a high probability of hailstorms affecting part or all of the planning area. Based on the historical occurrence of hail events from 2006-2015, the entire planning area can expect to average approximately five to six hail events per year. However, many of these hail events occurred on the same day as a result of the same storm. The 54 hail events in the past 10 years have occurred over the course of seven days. From 1981-2015, 35 years, there were 36 days of hail falling in the county. Therefore, based on historic data, Bremer County should anticipate multiple hail events (4-5) occurring one day a year.

Magnitude / Impact

It is anticipated that a severe thunderstorm could impact 100% of the population (currently 24,276 persons) in the planning area. Those individuals most at risk would include:

1. People in automobiles (unable to determine),
2. People in mobile homes: (222 persons)
3. People in group quarters (1,718 persons),
4. Persons who speak English less than "very well" (244)
5. Elderly persons 65 years or older (4,192) and young persons, less than 18 years old (5,513)

Other persons at risk include those people outdoors, either working or camping. Pets and livestock are particularly vulnerable to hail. The incorporated jurisdictions are also impacted by a hailstorm since they are burdened with hail damage to trees and branches that have fallen. Critical infrastructure, power lines, is also vulnerable to hail damage.

Because of the elements involved with a thunderstorm (tornados, hail, high wind, lightning, heavy rain) those vulnerable are very similar to what was identified in the tornado event analysis (see Tornado/Windstorm Hazard Profile).

Thunderstorms affect relatively small areas when compared to winter storms. The typical thunderstorm is 15 miles in diameter and lasts an average of 20 to 30 minutes. Of the estimated 100,000 thunderstorms that occur each year in the United States, only about 10% are classified as severe. Despite their relatively

small size, thunderstorms are large enough to impact the entire community. The severity of the storm would likely determine the extent of any associated damage.

Thunderstorms may occur singly, in clusters, or in lines. Some of the most severe weather occurs when a single thunderstorm affects one location for an extended time. Lightning is a major threat during a thunderstorm. It is the lightning that produces thunder in a thunderstorm. Lightning is very unpredictable, which increases the risk to individuals and property.

In the United States, 75 to 100 people are killed each year by lightning, although most lightning victims do survive. Persons struck by lightning often report a variety of long-term, debilitating symptoms, including memory loss, attention deficits, sleep disorders, numbness, dizziness, stiffness in joints, irritability, fatigue, weakness, muscle spasms, depression, and an inability to sit for long periods. It is a myth that lightning never strikes the same place twice. In fact, lightning will strike several times in the same place in the course of one discharge.

The most severe impacts with a thunderstorm would be realized when cascading events occurred as a result of the storm. For example, multiple lightning strikes may result in death, fire, destruction of infrastructure, loss of power, communications failure, etc.

The severity of a hailstorm depends on the size and amount of hail. Hail several inches in diameter can cause severe damage to an urbanized area (broken windows, down trees and power lines, and automobile damage). Hail as small as 0.5 inch diameter can cause damage to crops and other plants.

Warning Time

The National Weather Service has developed effective weather advisories, which are promptly and widely distributed. Radio, TV, and Weather Alert Radios provide the most immediate means to do this. Accurate information is made available to public officials and the public in advance of the storm. Again, weather prediction capabilities have made significant improvements in the past few years. There are several notifications made by the National Weather Service. These include severe thunderstorm watch, severe thunderstorm warning, tornado watch, tornado warning, flash flood watch, and flash flood warning.

Despite these advancements in technology, the potential for a storm to form quickly and without warning still exists. Therefore the committee staggered the score for the speed of onset. This allowed for the possibility of minimal or no warning time, but also acknowledged that there is generally some warning time before an event occurs.

The National Weather Service has developed effective weather advisories, which are promptly and widely distributed. Radio, TV, and Weather Alert Radios provide the most immediate means to do this. Accurate information is made available to public officials and the public in advance of the storm. The county's use of the state-wide Alert Iowa program also provides an additional way to notify the public of warnings.

Duration

This hazard typically stays in a given area a relatively short time, depending on wind speeds. The duration of an event in one location is likely less than 6 hours.

Tornado / Windstorm

Definition and Description

A tornado is a violent whirling wind characteristically accompanied by a funnel shaped cloud extending down from a cumulonimbus cloud that progress in a narrow, erratic path. Rotating wind speeds can exceed 300 mph and travel across the ground at average speeds of 25-30 mph. A tornado can be a few yards to around a mile wide where it touches the ground. An average tornado is a few hundred yards wide. A tornado can move over land for distances ranging from short hops to many miles, causing damage and destruction wherever it descends. The funnel is made visible by the dust sucked up and condensation of water droplets in the center of the funnel.

The tornado funnel is made visible by the dust sucked up and by condensation of water droplets in the center of the funnel. The rating scale used to rate tornado intensity is the Fujita Scale. The Fajita Scale categorizes tornado

severity based on observed damage. The six-step scales ranges from F0 (light damage) to F5 (incredible damage). As of February 2007, the National Weather Service uses the Enhanced Fujita Scale (EF Scale). This new scale ranges from EF0-EF5 and is shown in Table 39

Windstorms are extreme winds associated with severe winter storms, severe thunderstorms, downbursts, and very steep pressure gradients. Windstorms, other than tornados, are experienced in all regions of the United States. It is difficult to separate the various wind components that cause damage from other wind-related natural events that often occur with or generate windstorms. Although Iowa does not experience direct impacts from hurricanes, the state is no stranger to strong, damaging winds. Unlike tornadoes, windstorms may have a destructive path that is miles wide and duration of the event could range from hours to days. These events can produce straight line winds in excess of 64 knots (73 mph) causing power outages, property damage, impaired visibility, and crop damage. It is often difficult to separate windstorms and tornado damage when winds get above 64 knots.

TABLE 3.25: ENHANCED FUJITA SCALES FOR TORNADOS

Fujita Scale		Enhanced Fujita Scale		Type of Tornado	Description of Damage
Scale	3-Second Gust Speed (mph)	Scale	3-Second Gust Speed (mph)		
F0	45-78	EF0	65-85	Gale	Some damage to chimneys, broken tree branches, push over shallow rooted trees, damage to sign boards
F1	79-117	EF1	86-109	Moderate	The lower limit is the beginning of hurricane wind speed, peel surface off roofs, mobile homes pushed off foundations or overturned, moving automobiles pushed off roads
F2	118-161	EF2	110-137	Significant	Considerable damage: roofs torn off frame homes, mobile homes demolished, boxcars pushed over, large trees snapped or uprooted, light object missiles generated
F3	162-209	EF3	138-167	Severe	Severe damage: roofs and some walls torn off well-constructed houses, trains overturned, most trees in forest uprooted, heavy cars lifted off ground and thrown
F4	210-261	EF4	168-199	Devastating	Devastating damage: well-constructed houses leveled, structure with weak foundation blown off some distance, cars thrown and large missiles generated
F5	262-317	EF5	200-234	Incredible	Incredible damage: strong frame houses lifted off foundations and carried considerable distance to disintegrate, automobile sized missiles fly through the air in excess of 100 yards, trees debarked, incredible phenomena will occur.

Historical Occurrence

Since 1960 there have been 23 recorded occurrences of tornado events in the planning area. The estimated total of property damage from these tornadoes is \$6.524 million while crop damage totals to \$4,000. The recorded tornado events for the entire planning area can be referenced for detail in Table 3.24. The first column in Table indicates the location where the tornado touched down, it does not include the communities impacted or where it ended. Data used in this table was collected from the National Climatic Data Center and the private website TornadoProject.com. The data gathered indicates reported tornados only, and does not account for unreported or misreported information. Accordingly, this information is intended for reference only, and not as a true and accurate historical account. A graphic representation of historic tornado events and the rough path they traveled can be found in Attachment 1.

Windstorms occur in the planning area on an annual basis. High winds are often associated with thunderstorms, but can be produced during severe snow storms or tornados.

According to the National Climatic Data Center, the County the county experienced 70 Thunderstorm wind events between 1/1/2002 and 12/31/2016. Winds resulted in estimated \$3.19 million in property damage and \$390,000 in crop damage.

Table 3.23 in the Thunderstorm / Lighting / Hail hazard section includes a table of historical Thunderstorm Wind events from 2006 through 2015.

Probability

There have been 23 recorded tornados in the planning area since 1960.

That averages, roughly, to a tornado every 2-3 years. Because tornadoes are sporadic, there cannot be a reliable long-term prediction made as to when or if they may occur. In the past 15 years, 2001-2015, Bremer County has experienced five tornadoes. The committee determined the probability of a Tornado/Windstorm event to be occasional (10 to 20 percent probability in a given year).

If the historical average holds, it is highly likely the planning area will likely experience multiple tornados within the next five years. Also, given the historical

TABLE 3.24: HISTORICAL OCCURRENCES OF TORNADOES IN BREMER COUNTY, 1960-2015

Touch Down Location	Date	Deaths/Injuries	Property Damage (\$)	Crop Damage (\$)	Fujita Scale
BREMER CO.	5/14/1961	0	25.00K	18.50K	F1
BREMER CO.	9/1/1961	0	2.500M	0.00K	F4
BREMER CO.	5/29/1962	0	25.00K	0.00K	F0
BREMER CO.	8/20/1964	0	25.00K	0.00K	F0
BREMER CO.	4/19/1966	0	25.00K	0.00K	F2
BREMER CO.	9/9/1970	0	25.00K	0.00K	F2
BREMER CO.	7/12/1971	0	250.00K	0.00K	F2
BREMER CO.	6/4/1973	0	2.50K	0.00K	F1
BREMER CO.	11/9/1975	0	250.00K	0.00K	F1
BREMER CO.	6/7/1977	0	0.00K	0.00K	F0
BREMER CO.	7/16/1977	0	250.00K	0.00K	F2
BREMER CO.	4/10/1981	0	2.500M	0.00K	F2
BREMER CO.	7/5/1985	0	0.00K	0.00K	F0
BREMER CO.	5/8/1988	0	250.00K	0.00K	F1
BREMER CO.	11/15/1988	0	250.00K	0.00K	F1
BREMER CO.	6/14/1991	0	2.50K	0.00K	F0
WAVERLY	6/16/1996	0	1.00K	0.00K	F0
WAVERLY	6/27/1998	0	3.00K	1.00K	F2
JANESVILLE	6/1/2001	0	30.00K	0.50K	F1
WAVERLY	9/6/2001	0	100.00K	3.00K	F2
TRIPOLI	6/23/2010	0	10.00K	10.00K	EF1
TRIPOLI	5/22/2011	0	0.00K	0.00K	EF0
TRIPOLI	6/16/2014	0	0.00K	0.00K	EF0
Totals	-	0	6.524M	4.00K	-
<i>Source: Tornado Project and National Climatic Data Center, retrieved 4/14/2016</i>					

paths of tornadoes (Attachment 1) in the planning area, it is likely that future events could impact the same areas.

The probability of a windstorm occurring in the planning area and having an impact on said area in the next year is likely. This conclusion is based on the historical occurrences of winds associated with thunderstorms in the area and the fact that the climate in the county is very conducive to the development of thunderstorms and high winds. The climate in the area is of humid continental variety and therefore there is generally enough moisture to form clouds and rain, relatively warm and unstable air that can rise quickly, and fluctuating weather fronts that work to cause uplift in air masses.

Magnitude / Severity

Tornadoes consist of strong, often destructive, winds. The winds in the strongest tornadoes are the fastest winds experienced anywhere on Earth, with rotation velocities up to 300 mph. Generally, the damage associated with a tornado is greatest within several hundred feet of the column. The maximum threat of a tornado occurs when a tornado stays on the ground for an extended period of time. The risk becomes even greater when the tornado event is accompanied by hail, heavy rain, and lightning.

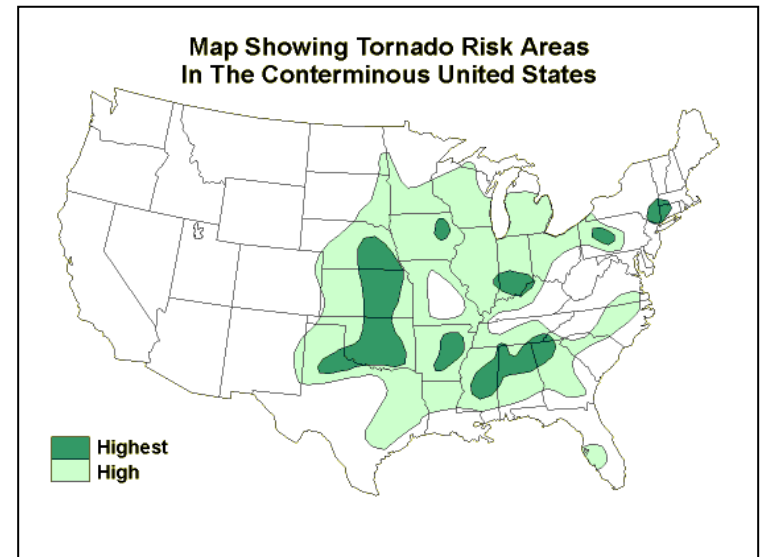
The maximum threat of a windstorm is usually several hundred or thousand feet wide, as they are often associated with large thunderstorm cells. Much of the damage incurred during a windstorm event is often due to the accompanying hail, lightning, and wind shear.

The severity of a tornado event would likely be determined by five primary components: 1) the size of the tornado (see Table 18), with an EF5 posing the most severe risk to the community; 2) the time the tornado stayed in or around the community; 3) the time of day would be a major factor; 4) the density of the population at the point of impact; and 5) the area of the community that was directly impacted (i.e. a mobile home park or an undeveloped portion of the community). The worst case scenario would be an EF5 through one or more incorporated jurisdictions in the planning area.

In the event of a tornado, the entire planning area has an extensive network of outdoor warning sirens that, given enough time, allow people to search for suitable shelter. All jurisdictions in the planning area have been active in upgrading these sirens, as many of them are old and unreliable. Bremer County Emergency Management Agency routinely tests warning sirens.

For windstorms, Impacts can vary from broken tree limbs, broken corn stocks, to the total destruction of buildings and other structures depending upon the built environment and the speed of the winds.

FIGURE 3.8: TORNADO RISK



As Figure 3.8 shows, northeast Iowa is considered one of the highest risk locations for tornadoes. According the meteorologists with KGAN CBS2 in Cedar Rapids, Iowa northeast Iowa is, "...one of the most fertile breeding grounds in the nation for violent tornadoes. Since 1965 Iowa has experienced five of the country's 42 EF-5 tornadoes. In addition, since 1965, 33 of Iowa's 75 related deaths were within a 55 mile radius of Parkersburg, Iowa. Located in Butler County, which borders the western edge of Bremer County, the entire county falls within this 55 mile radius around the City of Parkersburg.¹⁸

Using available data, a tornado scenario was developed for each city. These scenarios estimates the potential damage on an EF0 through EF tornado impacting each city. See each city's respective appendix for the estimated impact of tornadoes. Maps of the tornado scenarios are included for each jurisdiction in Attachment 1.

Warning Time

Although the advancement in radar and forecasting has improved and continues to improve it cannot predict when and where a tornado may strike. They can however inform a community of when the conditions are right for an event to occur. In fact, it is estimated that approximately 95 percent of all tornadoes occur in areas where a tornado watch has been issued. Nevertheless, the five percent of the time that they do not accurately predict, or someone is simply uninformed can result in an almost immediate onset, with little or no warning time.

Tornado and thunderstorm watches can warn of likely conditions hours in advance of an upcoming storm. Although significant advances in meteorological technology has allowed for more effective forecasting, it is impossible to predict, in advance, when and where a windstorm will strike. A windstorm's rapid change in direction makes it difficult to say with certainty, the path the windstorm will continue on after it has been identified. Therefore, warning time is often very short or occasionally non-existent.

Duration

Duration of the actual event of a tornado or windstorm can range from a few minutes to several hours. However considering the the resulting damage, and the threat this damage poses, some jurisdictions deemed the duration could last up to a week or longer in the case of major infrastructure damage

¹⁸ <http://www.cbs2iowa.com/news/features/top-stories/stories/NE-Iowa-Prone-to-Violent-Tornadoes-126215.shtml>

Transportation Incident

Definition and Description

This hazard includes all modes of transportation - air, highway, railway, and waterway. Thus, transportation includes any incident involving a military, commercial, or private aircraft; single-multi-vehicle incident which requires responses exceeding normal day-to-day capabilities; derailment or a train accident which directly threatens life or property, or which adversely impacts a community's capabilities to provide emergency services; and an event involving any vessel that threatens life or which adversely impacts a community's capability to provide emergency services.

Air

An air transportation incident may involve a military, commercial, or private aircraft. Airplanes, helicopters, and other modes of air transportation are used to transport passengers for business and recreation as well as thousands of tons of cargo. A variety of circumstances can result in an air transportation incident including mechanical failure, pilot error, weather conditions, or an on-board fire could all lead to an incident at or near the airport. Air transportation incidents can occur in remote unpopulated areas, residential areas, or downtown business districts, incidents involving military, commercial, or private locations. An aircraft incident can also occur while the aircraft is on the ground.

The sole airport in the county is the Waverly Municipal Airport (C25), located two miles northwest of Waverly's central business district. The facility is classified as a local service airport offering a 2,800 foot long and 50 foot wide paved asphalt runway. In 2010 there were 23 aircraft based at the airport generating approximately 5,750 annual operations. These figures are projected to increase to 29 aircraft and 7,250 annual operations by 2030. The closest major airport is the Waterloo Regional Airport (ALO), less than 10 miles from the southern border of Bremer County. This public airport is owned and operated by the City of Waterloo and overseen by an Airport Commission appointed by the Mayor. The primary runway is 8,400 foot long, 150 foot wide, and has a grooved asphalt surface. The airport is classified as a non-hub primary commercial service airport, offering general aviation and commercial service.

Year	Number of Crashes	Total Fatalities	Total Injuries
2007	279	3	93
2008	271	1	79
2009	258	1	91
2010	255	2	102
2011	213	1	73
5-year Total	1,276	8	438
Annual Average	255.2	1.6	87.6

Source: Iowa Department of Transportation, retrieved 9/3/2015

Roads and Bridges

A highway transportation incident can be single or multi-vehicle requiring responses exceeding normal day-to-day capabilities. An extensive surface transportation network exists in Iowa; local residents, travelers, business, and industry rely on this network on a daily basis. Thousands of trips a day are made on the streets, roads, highways, and interstates of the county. If the designed capacity of the roadway is exceeded, the potential for a major highway incident increases. Weather conditions play a major factor in the ability of traffic to flow safely in and through the state as does the time of day and week. Incidents involving buses and other high-occupancy vehicles could trigger a response that exceeds the normal day-to-day capabilities of response agencies.

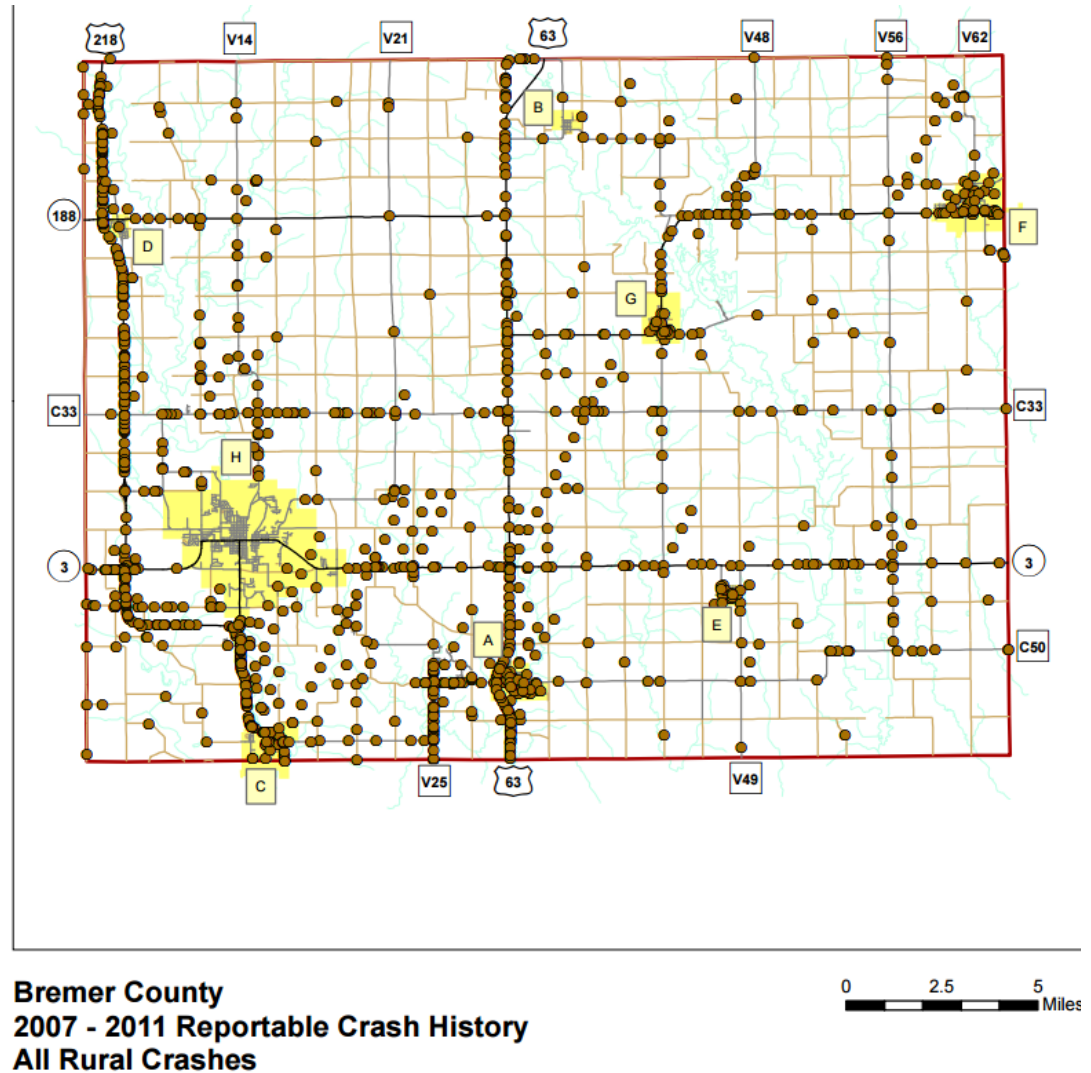
An ongoing initiative that will impact the region involves upgrading a portion of U.S. 218 in Black Hawk and Bremer Counties to a fully controlled-access highway. U.S. 218 was originally opened as a partial controlled-access facility from Cedar Falls to Waverly in 1995. This segment is designated as a part of the Avenue of Saints which is a four-lane route linking St. Paul, Minnesota to St. Louis, Missouri. Completion of this stretch of U.S. 218 resulted in substantial traffic growth as well as significant safety and operational issues. In 2005, the Iowa DOT initiated a Corridor Study to identify potential safety improvements and options for access control. Three projects that were identified include the construction of interchanges at the intersections of U.S. 218 and C-50 in Janesville, C-57 north of Cedar Falls, and 260th Street north of Janesville. As part of the proposed and completed improvements, all at-grade intersections within the corridor will be permanently closed. Construction of the interchange at C-50 was completed in 2012. Construction of the C-57 interchange began in 2015 and is anticipated to be complete by 2016. While funding has not been identified for the interchange at 260th Street, it is anticipated that this project will be constructed within the life of this Plan.

Rail Transportation

Two railroads travel through the western portion of the county. The Canadian National Railway Company enters the southern portion of the county, from Cedar Falls, before traveling through Waverly and then north through Plainfield before exiting the county. Figure 3.10 is a map of rail lines in Bremer County and the surrounding areas.

Iowa Northern Railway Company owns and operates tracks that pass through the southwestern portion of the county. This

FIGURE 3.9: Map of Crash Locations



Courtesy of Iowa Department of Transportation
<http://www.iowadot.gov/crashanalysis/data/county/bremer.htm>

section of rail connects Shell Rock (in Butler County) to Cedar Falls (Black Hawk County)

Waterways

A waterway incident is an accident involving any water vessel that threatens life, property, or adversely affects a community's capability to provide emergency services. Waterway incidents primarily involve pleasure craft on rivers and lakes. In the event of an incident involving a water vessel, the greatest threat would be drowning, fuel spillage, and/or property damage. Water rescue events are largely handled by first responding agencies. Waterway incidents may also include events in which a person, persons, or object falls through the ice on partially frozen bodies of water.

Historical Occurrence

Traffic accidents are fairly common occurrences in the county. According to the Iowa Department of Transportation¹⁹, rural Bremer County experience 1,276 reported vehicular crashes from 2007 to 2011.

As shown in Table 3.26, from 2000-2013 there were ten train-vehicles accidents in the planning area, resulting in an average of 0.71 train crashes per year. No data sources indicating trail derailments in Bremer County were identified.

According the Des Moines Register's DataCentral there were only two boating accidents in Bremer County from 2006-2014. In 2012 there was a single boat accident at the Sweet Marsh waterbody near Tripoli. In 2008 there was a two-boat crash in the Wapsipicon River.²⁰

FIGURE 3.10: RAIL ROUTES THROUGH BREMER COUNTY



Courtesy of the Iowa Department of Transportation
<http://www.iowadot.gov/iowarail/railroads/maps/maphome.htm>

¹⁹ Iowa Department of Transportation, Iowa Crash Data for Butler County, <http://www.iowadot.gov/crashanalysis/data/county/bremer.htm>, Retrieved September 2015.

²⁰ <http://db.desmoinesregister.com/iowa-boating-accidents>

Probability

Based on historic crash data shown in Table 3.25 and Figure 3.9, the County should expect several crashes each year, likely more than 200. Probability of a railway or air transportation events remain relatively low.

Magnitude / Severity

Due to the large volume of roadway and intersections located in the planning area, there is a chance of a traffic accident, especially with large farm equipment entering and leaving agricultural lands. Persons driving on major thoroughfares are more vulnerable to traffic accidents due to the increase number of drivers on these roads and the corresponding speed limits. However, motorists on the county's rural roadways are also vulnerable to traffic incidents with farm equipment and just the rural nature of the roadway.

Jurisdictions (Janesville, Waverly and Plainfield) in close proximity to local rail lines are more vulnerable to be harmed in the event of a train derailment. Furthermore, at locations where local roadways intersect with the railroad the potential for an accident is higher.

All residents of the planning area have the potential to be vulnerable to an air traffic event. Most at risk to air traffic events are those who live or work in flight paths originating from the Waverly Municipal Airport or Waterloo Regional Airport or those near farms that use crop duster airplanes. Although this hazard is high, the number of people and amount of property directly affected is relatively low.

The exact areas that will be affected by a traffic event will likely be small, concentrated, and have a minimal impact on the residents as a whole, unless a large or extremely dangerous hazardous material spill should result from the event. The same can be said for a rail disaster. An air disaster may impact a larger portion of the county, depending on where the impact occurred and what type of aircraft actually wrecked. But for the most part, due to the planning area's rural environment, impact would be minimal.

Warning Time

Transportation incidents occur within seconds; therefore, there is no time to warn those in the pathway of the harmful effects.

Duration

The duration of time a transportation incident would impact the planning area is dependent upon the type and severity of the incident. For instance, a multiple-car incident could impact the surrounding community for a few hours, whereas a derailment blocking numerous crossings could impact the immediate area for a few days.

TABLE 3.26: TRAIN CRASHES IN BREMER COUNTY, 2007-2011

Date	Railroad	Location	# of Rail Cars	# of Injuries
12/12/2000	CEDR	Unincorporated	86	0
4/29/2003	CEDR	Waverly	44	1
12/2/2004	CEDR	Waverly	2	0
2/7/2005	CEDR	Waverly	6	0
11/2/2007	IANR	Shell Rock	1	0
10/28/2008	CEDR	Waverly	2	1
4/29/2009	CC	Unincorporated	21	1
9/5/2009	CC	Waverly	27	1
1/7/2011	CC	Unincorporated	101	0
7/27/2011	CC	Unincorporated	120	0

Source: Iowa Department of Transportation, retrieved 9/3/2015

SECTION 4 – MITIGATION STRATEGY

COUNTYWIDE HAZARD MITIGATION PLAN GOALS

Broad-based goals were developed to address a multitude of hazards and encompass a variety of mitigation activities. The hazard mitigation plan goals identified are as follows:

1. Minimize to the greatest possible extent the number of injuries and/or loss of life associated with all identified hazards.
2. Reduce or eliminate property damage due to the occurrence of disasters.
3. Identify ways that response operations, in the event of a disaster, can be improved.
4. Return the community to either pre-disaster or improved conditions in a timely manner in the wake of a disaster.
5. Develop strategies that can be used to reduce the community's overall risk to the negative effects of natural, technological, and man-made disasters.
6. Reconvene the planning committee on an annual basis to review the plan document, check for compliance with the plan goals, and track progress in achieving the mitigation strategies.
7. Maintain the Countywide Multi-Jurisdictional format for future plan updates.

Requirement §201.6(c)(3)(ii): [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

Requirement §201.6(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Requirement §201.6(c)(3)(iv): For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.

CURRENT HAZARD MITIGATION ACTIVITIES

Mitigation actions are grouped into six broad categories: prevention, property protection, public education and awareness, natural resource protection, emergency services, and structural projects.

The text box to the right provides clarification on these categories. Detailed information for each incorporated community can be found in their respective appendix.

Prevention Mitigation Actions

Bremer County currently has a Floodplain Management Ordinance which is administered by the County Zoning Administrator. All inquiries pertaining to construction areas in a floodplain are directed to the Administrator's Office and follow NFIP guidelines. The Iowa Department of Natural Resources and the Iowa Flood Center plan to have new flood maps available for Bremer County in 2012-2013. Bremer County has and enforces Zoning Ordinances. They issue building permits for the communities of Denver, Janesville, Tripoli and Readlyn. The County does issue Zoning Certificates for land areas under 35 acres. The Zoning and Subdivision Ordinance was adopted by the Bremer County Board of Supervisors in 1994 and is administrated by the County Zoning Administrator, Doug Bird.

Table 4.1, provides a compilation of the current planning and regulatory documents currently in place for each jurisdiction in Bremer County.



Mitigation actions can be grouped into six broad categories:

- 1. 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 storm water management regulations.
- 2. 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, relocation, structural retrofits, storm shutters, and shatter-resistant glass.
- 3. 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.
- 4. Natural Resource Protection.** Actions that, in addition to minimizing hazard losses, also 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.
- 5. 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.
- 6. 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.

Figure 11: Six Broad Categories for Mitigation Actions

Source: FEMA

TABLE 4.1: CURRENT PLANNING AND REGULATORY DOCUMENTS FOR SELECTED COMMUNITIES

Community	Previous HMP	Comprehensive Plan	Building Code	Zoning Ordinance	Subdivision Regulations	Floodplain Management Ordinance	Tree-Trimming Ordinance	Storm Water Ordinance	Snow Removal Ordinance
City of Denver, IA	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City of Frederika, IA	No	No	No	No	No	Yes	Yes	Yes	Yes
City of Janesville, IA	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
City of Plainfield, IA	Yes	No	No	No	No	Yes	Yes	Yes	Yes
City of Readlyn, IA	Yes	Yes	Yes	Yes – RR	Yes	Yes	Yes	Yes	Yes
City of Sumner, IA	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
City of Tripoli, IA	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
City of Waverly, IA	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bremer County, IA	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes

Source: Local Communities

Notes: RR = Restricted Residential

Property Protection Mitigation Actions and Floodplain Management

On July 16th, 1990 Bremer County became active members in the National Flood Insurance Program (NFIP) by adopting its initial floodplain ordinance. The Federal Insurance Administration manages the insurance component of the NFIP, and works closely with FEMA’s Mitigation Directorate, which oversees the floodplain management aspect of the program.

The study looked at the risk of having a 10, 50, 100, and 500 year flood event for both the unincorporated areas of the county and the communities of Denver, Frederika, Plainfield, Sumner, Tripoli and Waverly. A hydraulic analysis was conducted to establish the peak discharge-frequency relationships for each river in the study area. The county continues to enforce this ordinance in order to remain in good standing with the National Flood Insurance Program and to protect citizens and property from flooding. Bremer County has not participated in any buyout program. The only city that has participated in a FEMA buy-out program is Waverly (see Appendix H for additional information).

TABLE 4.2 NFIP STATISTICS IN BREMER COUNTY				
Community	Participates in NFIP?	CID #	# of NFIP Policies	NFIP Insurance in Force (\$)
Denver	Yes	190026	13	\$1,812,200
Frederika	Yes	190027	2	\$210,000
Janesville	Yes	190023	0	\$0
Plainfield	Yes	190327	4	\$370,800
Readlyn	Yes	190645	0	\$0
Sumner	Yes	190029	15	\$1,772,200
Tripoli	Yes	190669	3	\$254,000
Waverly	Yes	190030	254	\$38,810,000
Bremer County	Yes	190847	47	\$5,655,000
Total	-	-	338	\$48,884,200
<i>Source: Federal Emergency Management Agency (FEMA); NFIP Statistics as of 12/31/2016</i>				

Table 4.2 lists the flood insurance information for the county and cities. All nine jurisdictions participate in the NFIP and have floodplain ordinances in place.

Table 4.3 displays the repetitive loss information for the county. As is apparent, the vast majority of the repetitive loss properties and damages are within the City of Waverly. Waverly is responsible for 84 percent of all repetitive loss instances and 91 percent of total losses.

TABLE 4.3: BREMER COUNTY REPETITIVE LOSS PROPERTIES						
Community	Total number of RL Buildings	RL Buildings Insured	Total number of RL Instances	RL Instances Insured	Total RL Losses(\$)	RL Losses Insured (\$)
Denver	1	1	2	2	\$17,715.66	\$17,715.66
Frederika	-	-	-	-	-	-
Janesville	2	1	5	3	\$29,886.75	\$18,652.30
Plainfield	1	0	2	0	\$22,511.90	\$0.00
Readlyn	-	-	-	-	-	-
Sumner	2	1	4	2	\$43,111.24	\$39,735.45
Tripoli	1	0	2	0	\$40,926.91	\$0.00
Waverly	59	39	120	80	\$2,500,017.12	\$1,513,150.33
Bremer County	3	1	8	2	\$87,047.84	\$12,273.56
TOTAL	69	43	143	89	\$2,741,217.42	\$1,601,527.30

Source: Iowa Department of Natural Resources; Data does not include properties that have been mitigate; RL = Repetitive Loss; Data as of 11/30/2014

Public Education and Awareness Mitigation Actions

Information regarding how to protect oneself in the event of a tornado is largely publicized in the form of flyers, radio, newspaper, and television announcements. The County provides basic safety information for various hazard events (i.e., tornados) and what to do before, during, and after an event.

The county also participates in the Alert Iowa notification program which allows citizens to sign up for the types of alerts they would like to receive. The best way to receive messages is via text message. Messages may contain photo, video and audio attachments to help subscribers better understand the situation at hand, or where to find additional information.²¹

Emergency Services Mitigation Actions

Bremer County's Emergency Management Coordinator is based out of the City of Waverly, the county seat. The Emergency Management Coordinator works in conjunction with local fire, rescue, police, and government officials to draft and implement workable emergency action plans in the community. The current Emergency Management Coordinator is Kip Ladage and current contact information is as follows: Bremer County Emergency Management Agency, 111 4th St. NE, Bremer-Waverly LEC, Waverly, Iowa 50677, (319) 352-0133, email: kladage@co.bremer.ia.us

²¹ http://homelandsecurity.iowa.gov/about_HSEMD/alert_iowa.html

Law Enforcement

The Bremer County Sheriff's Office provides law enforcement for all of the unincorporated areas of the County along with providing assistance to the cities that have their own police force. The Bremer County Sheriff's Office has service contracts to provide law enforcement patrols with the communities of Frederika and Plainfield.

Fire Protection

Bremer County is divided into Fire Districts with 8 Fire Departments having coverage for every square mile of the County. Fire Departments serving Bremer County are Denver, Frederika, Janesville, Plainfield, Readlyn, Sumner, Tripoli and Waverly.

Ambulance

Much like the Fire Departments, the entire county is divided into Ambulance Districts. The entire county is covered just like with fire districts. Ambulance providers for Bremer County are: Denver Ambulance, Frederika Ambulance, Plainfield First Responders, Readlyn Ambulance, Sumner Ambulance, Tripoli Ambulance, and Waverly Ambulance. The County also receives Mutual Aid from Paramedic/Ambulance services from: Covenant Medical Center Ambulance Service, Sartori Ambulance Service, AMR Ambulance Service in Charles City, and Mason City Fire Department.

Medical Facilities

Bremer County has only one hospital within its boundaries – Waverly Health Center in Waverly; otherwise, residents go to neighboring counties for medical attention.

HAZMAT

All Bremer County jurisdictions contract with the Northeast Iowa Response Group for response to hazardous material spills. The Northeast Iowa Response Group is a division of Waterloo Fire Rescue as is the Hazardous Materials Regional Training Center. The Training Center provides training to fire departments and companies from around the state and country. Not only is this a training center it also serves as a hazardous materials quick response unit to Black Hawk County, surrounding counties, and many municipalities in a ten county region. The Unit provides local fire departments with hazard materials emergency procedures thus reducing additional contamination. An evacuation plan is also in place in conjunction with the activities with the local department. Contact information for the facility is as follows: Hazardous Materials Regional Training Center, 1925 Newell Street, Waterloo, Iowa 50707, Phone: (319) 291-4275, Toll Free: (800) 291-4682, Fax: (319) 291-4285

The jurisdictions also partners the Northeast Iowa Response Group for assistance in responding to any methamphetamine labs located in the city limits. The Response Group assists the Police Departments in containment of the site and disposal of the hazardous chemicals.

County Engineer and Secondary Roads Department

The Bremer County Engineer's Office is tasked with the maintenance of all roads within Bremer County. It is managed by Todd Fonkert, County Engineer, and the Secondary Roads Department is supervised by David Sharp and the shop equipment supervisor is Arlan Thoms. Bremer County has the following assets and in the Engineers/Secondary Roads Department: 12 motor graders, 15 dump trucks, 2 end loaders, 2 dozers, 1 semi-tractor/lowboy, 10 pickup trucks, and 2 rubber tire excavators.

Natural Resource Protection Mitigation Actions

The County currently does not have any projects underway.

Structural Projects Mitigation Actions

The County currently does not have any projects underway, but the County responds to natural disasters by checking roads and bridges for damage, providing traffic control and road closure if roadway facilities are damaged, and repairs minor damage as soon as possible. They also provide resources and transportation of materials to protect public infrastructure.

FUTURE HAZARD MITIGATION ACTIVITIES

While the existing mitigation activities discussed above detail the County's efforts to mitigate hazards when possible and to respond to hazards in a timely and efficient manner, the Committee also recognizes that there are many more mitigation activities and projects that would benefit residents. Thus, the Committee developed a list of future hazard mitigation activities that, if accomplished, would serve to further reduce the risk of hazards to the community. The list may include a combination of projects the Committee determined the community should try to accomplish and mitigation efforts that are ongoing that the Committee view as vital to the continued well-being of the public.

To prioritize the mitigation actions, the Committee discussed the STAPLEE prioritization criteria recommended by FEMA. STAPLEE is a tool used to assess the costs and benefits, and overall feasibility of mitigation actions. STAPLEE stands for the following: **S**ocial, **T**echnical, **A**ministrative, **P**olitical, **L**egal, **E**conomic, and **E**nvironmental. Based on this analysis, each activity was ranked as High (H), Medium (M) or Low (L).

The STAPLEE criteria were discussed during the meeting and the Committee was asked to complete a scoring worksheet for the actions they would provide for inclusion in the plan. This process of identification and analysis of mitigation options allowed the Committee to come to consensus and to prioritize recommended mitigation actions. Emphasis was placed on the importance of a benefit-cost analysis in determining project priority; however, this was not a quantitative analysis. The Disaster Mitigation Act regulations state that benefit-cost review is the primary method by which mitigation projects should be prioritized. Recognizing the federal regulatory requirement to prioritize by benefit-cost, and the need for any publicly funded project to be cost-effective, the Committee decided to pursue implementation according to when and where damage occurs, available funding, political will, jurisdictional priority, and priorities identified in the Iowa Hazard Mitigation Plan. Cost-effectiveness will be considered in additional detail when seeking FEMA mitigation grant funding for eligible projects identified in this plan.

Based on the order in which they would like to see the actions implemented, committee members assigned a priority ranking of high, medium, or low. This ranking does not necessarily correspond to the results of the STAPLEE scoring system as the STAPLEE system considers all elements to be weighted the same; whereas, at the local level, in many cases, one or more elements may be more important to the Committee and the city driving certain projects to be ranked higher than others.

To prioritize the mitigation actions, the HMPC discussed the STAPLEE prioritization criteria recommended by FEMA. STAPLEE is a tool used to assess the costs and benefits, and overall feasibility of mitigation actions. STAPLEE stands for the following:

- **Social:** Will the action be acceptable to the community? Could it have an unfair effect on a particular segment of the population?
- **Technical:** Is the action technically feasible? Are there secondary impacts? Does it offer a long-term solution?
- **Administrative:** Are there adequate staffing, funding, and maintenance capabilities to implement the project?
- **Political:** Will there be adequate political and public support for the project?
- **Legal:** Does your jurisdiction have the legal authority to implement the action?
- **Economic:** Is the action cost-beneficial? Is there funding available? Will the action contribute to the local economy?
- **Environmental:** Will there be negative environmental consequences from the action? Does it comply with environmental regulations? Is it consistent with community environmental goals?

Committee members were asked to think about these questions while determining the priority for each action step. If the answer was “yes” to many of the above questions, then the action might take higher priority since it will have fewer complications, higher community support and the highest net beneficial impact on the community. INRCOG staff asked the committee to think about prioritization qualitatively, rather than quantitatively. Applying a score or number to each action may not provide an accurate gauge since an action could score highly on many criteria, but in reality is a low priority since it’s not socially acceptable to the community.

Emergency management activities are action steps devised by the jurisdiction (s) that do not apply to any single hazard or hazards, per se. Rather, these steps advance the all or a majority of the plan goals and enhance the general safety of the community before and after a disaster. The steps identified are at the recommendation of the County Emergency Management Office and offer a general support function in disaster preparedness and recovery. Therefore, “Emergency Management” is not a profiled hazard, such as those found in Table 17. But they are action steps the jurisdictions currently engage in and are considered relevant mitigation activities.

Requirement §201.6(c)(3)(iii): [The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

ACTION PLAN FOR COUNTY

Funding

Although in the long-term hazard mitigation actions will save money by avoiding the loss of lives or property damages, in the short-term each action will have an associated cost. The County and its municipalities will rely heavily on local funding sources to fulfill most of the plan obligations; however, they will also seek funds from State and Federal agencies for both pre- and post-disaster mitigation activities.

The estimated cost(s) for each mitigation action, program, or project is either: Minimal, Low, Moderate, or High depending upon various factors.

- Minimal: Cost estimate is \$10,000 or less based on using current staff, time commitment, continuous of current duties, proposed action/program/project, and funding sources.
- Low: Cost estimate for project range from \$10,001 - \$99,999 based on existing proposed treatment, time commitment, any further study that is needed, and level of engineering, and project components (permits, acquisition, coordination, etc.).
- Moderate: Cost estimate for project range from \$100,000 - \$299,999 based on existing conditions, time commitment, proposed action/program/project, any further study that is needed, and level of engineering, and project components (permits, acquisition, coordination, etc.), and funding sources.
- High: Cost estimate for project range is \$300,000 or higher based on existing conditions, time commitment, proposed action/ program/project, any further study that is needed, and level of engineering, project components (permits, acquisition, coordination, etc.), and funding sources.

Implementation Strategy

Once the Committee identified and ranked the future hazard mitigation activities, the activities were then analyzed. In addition, the Committee identified a time line for each activity, identified the responsible party (ies) for each activity and finally related each activity to at least one of the five Hazard Mitigation Plan Goals listed above. Table 4.4 below is Bremer County's Implementation Strategy. Implementation Strategies / Action Plans for each municipality can be found in their respective appendix.

TABLE 4.4: BREMER COUNTY'S IMPLEMENTATION STRATEGY (UNINCORPORATED AREA)						
Priority	Mitigation Action/Program/Project	Associated Hazard	Primary Agency Responsible for Implementation	Date for Completion	Estimated Cost (\$)	Funding Source
Education/Public Awareness						
M	Educate the public	All	Bremer County EMA	On-Going	Minimal	Local
M	Implement early warning notification system, Alert Iowa	All	EMA, IHSEM	Active	Low	County, State
M	Encourage lead based paint and asbestos removal	HAZMAT	Building Department	On-Going	Minimal	Local
M	Encourage and maintain enrollment in emergency notification system	Thunderstorm/Lightning, Windstorm, Tornado, Communication Failure	Bremer County EMA	On-Going	Minimal	Local
M	Encourage home owners to keep emergency kits	Windstorm, Tornado	Bremer County EMA	On-Going	Minimal	Local
M	Encourage use of Iowa One call before digging	Communications Failure, Explosion	Building Department	On-Going	Minimal	Local
M	Encourage residents to keep smoke detectors, sprinkler systems and fire extinguishers maintained in their homes	Fire	Bremer County EMA	On-Going	Minimal	Local
M	Educate the public on maintaining their sump pumps	Flash Flood	County Roads Department	On-Going	Minimal	Local
M	Encourage the public to receive vaccinations	Disease	Bremer County EMA, Health Dept.	On-Going	Minimal	Local
M	Inform the public of reputable and ill reputable contractors following disasters	Emergency Management	Building Department	On-Going	Minimal	Local
M	Maintain the county website as a source of public information	Emergency Management	Staff	On-Going	Minimal to Low	Local
L	Notify the media on shelter locations	Severe Winter Storm, Extreme Heat, Tornado	Sheriff, EMA	On-Going	Minimal	Local
Emergency Services						
M	Continue training and education for fire departments, law enforcement agencies and ambulance crew personnel	All	Bremer County Supervisors and Roads Depts.	On-Going	Moderate	Local, State
M	Maintain and acquire materials and equipment for fire departments, law enforcement agencies and ambulance crew personnel	All	Bremer County Supervisors	On-Going	Minimal	Local, State
M	Maintain storm spotter training for local fire departments/deputies and EMS crews	Thunderstorm/Lightning, Windstorm, Tornado, Hailstorm	Bremer County EMA	On-Going	Minimal	Local
M	Make available a cleanup crew for after a storm	Thunderstorm/Lightning	Bremer County Supervisors, EMA	On-Going	Minimal to Low	Local
M	Acquire necessary response and detection equipment for	HAZMAT	Bremer County EMA	On-Going	Minimal	Local,

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	city/county employees					State
M	Keep HAZMAT manuals/information current and easily accessible	HAZMAT	All County Departments	On-Going	Minimal	Local
M	Maintain list of potential translators to be called upon in case of an emergency	Communications Failure	Staff	On-Going	Low	Local
M	Maintain or install GPS units in all emergency service and city/county vehicles	Communications Failure	Staff	On-Going	Minimal	Local
M	Maintain automatic TTY TDD machines for emergency personnel and city/county employees	Communications Failure	Staff	On-Going	Minimal	Local
M	Maintain list of county emergency contacts	Communications Failure	Staff	On-Going	Minimal	Local
M	Continue cooperation between county roads department and local fire departments during snow emergencies	Severe Winter Storm	Roads Department	On-Going	Minimal	Local
M	Cooperate with any countywide mass vaccination plan	Disease	Bremer County EMA	On-Going	Minimal	Local
M	Develop and maintain staging area for dumping during cleanup	River Flood	Board of Supervisors, Public Works	On-Going	Minimal	Local
M	Set a designated number of people to be trained in post-disaster record keeping/damage assessments	Emergency Management	Board of Supervisors, EMA	On-Going	Minimal	Local
M	Maintain and update emergency response plans	Emergency Management	Board of Supervisors, EMA	On-Going	Low to Moderate	Local
M	Maintain lists of personnel and equipment available to use with response plans	Emergency Management	Board of Supervisors, Staff	On-Going	Minimal	Local
L	Provide emergency shelters for evacuees	All	Bremer County EMA	On-Going	Minimal	Local
L	Provide fans and/or cooling shelter	Extreme Heat	County EMA	On-Going	Minimal to Low	Local
Natural Resource Protection						
M	Participate in Watershed Management Authority	Flash Flooding, River Flooding	Engineer, EMA	Active	Minimal	County
M	Participate in and cooperate with other jurisdictions in improving watersheds, including Watershed Management Authorities and Drainage Districts	Flash Flooding, River Flooding	EMA, Individual cities	Active	Minimal	County, State, Federal
M	Mitigate erosion along waterways and ditches through vegetation management	Landslide, Flash Flood, River Flooding	County IRVM	Active	Low	County
M	Maintain tree trimming program	Severe Winter Storm, Windstorm, Hailstorm	Bremer County Supervisors	On-Going	Low	Local
M	Maintain and/or develop a wellhead protection program	Groundwater Contamination	Board of Supervisors, Sheriff	On-Going	Low	Local, State
M	Monitor wells in areas of identified contamination	Groundwater Contamination	Board of Supervisors, EMA	On-Going	Low	Local
M	Monitor the drinking water supply	Groundwater Contamination, Disease	Board of Supervisors	On-Going	Moderate	Local
M	Identify and map areas of past contamination	Groundwater Contamination	Board of Supervisors	On-Going	Low	Local
M	Follow monitoring requirements set forth by the Iowa DNR	Groundwater Contamination	Board of Supervisors, Engineer	On-Going	Low	Local
M	Carry out conservation measures such as erosion control and work with the following organizations: Extension, NRCS, Farm Bureau, EPA, DNR, and Soil and water Conservation District	Terrorism	Board of Supervisors, Engineer	On-Going	Moderate	Local, State, Federal
M	Clear ditches, streams, and waterways on a regular basis	River Flood	Board of Supervisors, Public Works	On-Going	Minimal	Local
M	Purchase additional parkland in order to increase greens	River Flood	Board of Supervisors	On-Going	Minimal	Local

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	space and reducing surface flow					
L	Restrict water usage should it be necessary	Drought	Board of Supervisors	On-Going	Minimal to Low	Local
L	Plant trees along water bodies and slopes	Landslides/Mudflows	Board of Supervisors, Public Works	On-Going	Minimal	Local
Prevention						
H	Maintain mutual aid agreements with the Northeast Iowa response Group	HAZMAT	Board County Supervisors	On-Going	Minimal	Local
H	Complete continuity of government plan	Communications Failure	Board of Supervisors	On-Going	Minimal	Local
M	Maintain mutual aid agreements	All	Bremer County EMA, Supervisors	On-Going	Minimal	Local
M	Maintain county roads department	Severe Winter Storm, Transportation	Bremer County Supervisors	On-Going	Minimal	Local
M	Determine locations for potential heating shelters and volunteer organization	Severe Winter Storm	Bremer County EMA	On-Going	Minimal	Local
M	Purchase and maintain backup generators	Severe Winter Storm, Thunderstorm/Lightning, Tornado, Emergency Management	Bremer County EMA	On-Going	Minimal	Local
M	Maintain public works equipment	Severe Winter Storm	Public Works	On-Going	Minimal	Local
M	Backup all digital data	Thunderstorm/Lightning	Staff	On-Going	Minimal	Local
M	Purchase NOAA weather radios	Thunderstorm/Lightning, Windstorm, Tornado, Radiological/Nuclear Event	Bremer County EMA	On-Going	Minimal	Local, State
M	Place alarms on storage facilities containing hazardous materials	Hazardous Materials (HAZMAT)	Bremer County EMA	On-Going	Minimal	Local
M	Maintain law enforcement monitoring of large storage supplies	HAZMAT	Sheriff	On-Going	Minimal	Local
M	Provide a local hazardous waste dropoff site	HAZMAT	Board of Supervisors	On-Going	Minimal to Low	Local
M	Maintain, test, and replace warning sirens	Windstorm, Tornado, Hailstorm, Thunderstorm/Lightning, Communications Failure	Bremer County EMA	On-Going	Minimal to Low	Local, State
M	Identify areas throughout the county that would substantially benefit from outdoor warning sirens	Windstorm, Tornado	Bremer County EMA	On-Going	Moderate	Local, State
M	Encourage backup power generation for local telephone systems and cellular operations	Communications Failure	Bremer County EMA	On-Going	Minimal	Local
M	Enhance Standard Operating Procedures for dissemination of information/press releases in the event of a disaster	Communications Failure	Bremer County EMA	On-Going	Minimal	Local
M	Continue training and promotion of the Incident Command System	Communications Failure	Bremer County EMA	On-Going	Minimal	Local, State
M	Upgrade radio communications equipment as needed	Communications Failure	Bremer County EMA	On-Going	Minimal	Local
M	Regularly review and amend fire and medical HAZMAT response standard operating procedures	Communications Failure	Bremer County EMA	On-Going	Minimal	Local
M	Improve standard operating procedures for schools	Communications Failure	Bremer County EMA, Schools	On-Going	Minimal	Local
M	Seek to improve communications with other agencies	Communications Failure, Terrorism	Bremer County Supervisors	On-Going	Minimal	Local
M	Keep supply of backup radios and cellphones	Communications Failure	Staff	On-Going	Minimal to Low	Local
M	Keep the county updated on personnel changes	Communications Failure	Staff	On-Going	Minimal to Low	Local

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M	Stockpile sand and sandbags	Flash Flood, River Flood	Bremer County EMA	On-Going	Minimal to Low	Local
M	Maintain and improve signals/signage along roadways and at railroad crossings	Transportation	Roads Department, Sheriff	On-Going	Minimal	Local, State
M	Establish alternative transportation routes should a road need to be closed	Transportation	Bremer County EMA, Sheriff	On-Going	Minimal	Local
M	Ensure that all county road maintenance personnel are trained in the proper procedures for road preparation and repair	Transportation	Board of Supervisors, Roads Department	On-Going	Minimal	Local
M	Purchase emergency signs to be used in case of an incident	Transportation	Board of Supervisors, Sheriff, EMA	On-Going	Minimal	Local
M	Enforce no parking designations at special events	Transportation	Sheriff	On-Going	Low	Local
M	Identify fallout shelter locations	Radiological/Nuclear Event	Board of Supervisors	On-Going	Low	Local
M	Keep communication lines open with Nuclear Plant in Palo, IA	Radiological/Nuclear Event	Board of Supervisors, EMA	On-Going	Minimal	Local
M	Maintain and update anti-virus software	Terrorism	Staff	On-Going	Minimal	Local
M	Secure vulnerable targets, as identified by the LEPC and County EMA with alarms, security cameras and fences	Fire, Explosion	Sheriff	On-Going	Minimal	Local
M	Continue contract with county public health nursing agency	Extreme Heat	Bremer County EMA, Health Dept.	On-Going	Minimal	Local
M	Monitor disease outbreak news from the CDC and Iowa Department of Public Health	Disease	Bremer County EMA, Sheriff	On-Going	Low to Moderate	Local
M	Initiate and enforce burn ban in times of drought or as needed	Drought	Board of Supervisors	On-Going	Minimal to Low	Local
M	Enforce a curfew	Riot/Violent Demonstration	Sheriff	On-Going	Minimal to Low	Local, State
M	Establish detour routes	Bridge Failure, Flash Flood, River Flood	Board of Supervisors, Sheriff	On-Going	Min. to Low	Local
M	Enforce the local zoning ordinances	Landslides/Mudflows	Building Department	On-Going	Minimal	Local
M	Update flood maps/flood studies for areas throughout the county	River Flood	Board of Supervisors	On-Going	Minimal	Local
M	Establish transportation evacuation routes and protocols	River Flood	Board of Supervisors, EMA, Sheriff	On-Going	Minimal	Local
M	Develop sandbagging procedures for the community	River Flood	Board of Supervisors, EMA	On-Going	Minimal	Local
M	Continue cooperation with county in developing flood mitigation efforts	Flash Flood, River Flood	Board of Supervisors, EMA	On-Going	Minimal	Local
M	Continue working with the Bremer County Recovery Coalition	Flash Flood, River Flood	Board of Supervisors, Health Department, EMA, Sheriff	On-Going	Minimal	Local
M	Encourage all communities to participate in their Local Emergency Planning Commission (LEPC)	Emergency Management	Board of Supervisors, EMA	On-Going	Minimal	Local
M	Maintain communication with county contacts	Emergency Management	Board of Supervisors, Staff	On-Going	Moderate	Local
M	Maintain NIMS compliance	Emergency Management	Board of Supervisors, EMA	On-Going	Moderate	Local, State, Federal
L	Maintain air conditioner(s) in community buildings	Extreme Heat	Public Works	On-Going	Minimal	Local
L	Keep a supply of drinking water to distribute	Extreme Heat	Bremer County EMA	On-Going	Low	Local
L	Develop rationing procedures	Drought	Board of Supervisors	On-Going	Minimal	Local

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Property Protection						
M	Maintain use of snow fences in the city/county	Severe Winter Storm	Public Works	On-Going	Minimal	Local
M	Use surge protectors to prevent electrical damage to critical and sensitive equipment	Thunderstorm/Lightning	Staff	On-Going	Minimal	Local
M	Enforce and update building codes, as needed	Thunderstorm/Lightning, Windstorm, Tornado, Hailstorm, Expansive Soils, Earthquake	Building Department	On-Going	Minimal	Local
M	Continue fire prevention program	Fire	Bremer County EMA	On-Going	Minimal	Local
M	Maintain membership in the NFIP	Flash Flood, River Flood	Board of Supervisors, EMA	On-Going	Minimal	Local
M	Maintain, enforce and update floodplain ordinance	Flash Flood, River Flood	Board of Supervisors	On-Going	Minimal	Local
M	Maintain and keep storm drains clear of debris	Flash Flood	Public Works	On-Going	Minimal	Local
M	Identify, purchase and remove structures from flood hazard areas	Flash Flood, River Flood	Bremer County EMA, Building Department	On-Going	Moderate	Local, Federal
M	Review and update fire codes as necessary	Fire, Explosion	Building Department	On-Going	Minimal	Local
M	Continue to cooperate with pipeline owners and operators to ensure locations are marked	Fire, Explosion	Board of Supervisors	On-Going	Minimal	Local
M	Encourage the use of proper materials and construction techniques	Expansive Soils	County Building Department	On-Going	Minimal to Low	Local
M	Place barricades to close dangerous bridges	Bridge Failure	Board of Supervisors, Sheriff	On-Going	Minimal to Low	Local
M	Identify and inventory potential sinkhole sites	Sinkholes	Public Works	On-Going	Minimal to Low	Local
M	Encourage floodproofing/elevating structures in the floodplain	River Flood	Board of Supervisors, Building Department, EMA	On-Going	Minimal	Local
M	Encourage construction of dikes, levees, dams, and retention ponds	River Flood	Board of Supervisors, Engineer	On-Going	Minimal	Local
L	Encourage utility providers and developers to place all utilities underground	Severe Winter Storm, Communications Failure, Thunderstorm/Lightning	Bremer County Supervisors	On-Going	Moderate	Local
L	Secure the area (around a sinkhole)	Sinkholes	Public Works	On-Going	Minimal	Local
L	Inspect any utility lines that are near a sinkhole	Sinkholes	Public Works	On-Going	Minimal	Local
Structural Projects						
H	Elevate roads and bridges to mitigate flooding	River Flooding, Flash Flooding, Infrastructure Failure	County Engineering	Short-Term	Medium	County
M	Acquire property, as needed, to implement capital improvement plan infrastructure mitigation actions	Infrastructure Failure	County Engineering	Active	Medium	County
M	Mitigate threats of low-head dams	Infrastructure Failure	County Engineering	Long-Term	Medium	County, State
M	Construct or designate a safe room or storm shelter	Windstorm, Tornado, Hailstorm	Bremer County EMA	On-Going	High	Local, State, Federal
M	Pursue partnership with rural water as the system expands	Fire, Explosion	Board of Supervisors	On-Going	Minimal	Local
M	Install tiling to help water move away from structures	Expansive Soils	County Building Department	On-Going	Minimal to Low	Local

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M	Continue regular bridge inspections	Bridge Failure	Board of Supervisors, Engineer	On-Going	Minimal to Low	Local
M	Maintain embargos/weight limits as necessary	Bridge Failure	Board of Supervisors, Engineer	On-Going	Minimal to Low	Local, State
M	Receive education/training from DOT on the subject	Bridge Failure	Board of Supervisors, Building Department	On-Going	Minimal to Low	Local, State
M	Identify bridges and culverts than can cost effectively be reengineered to reduce future flooding	River Flood	Board of Supervisors, Engineer	On-Going	Minimal	Local
M	Regularly inspect dams and levees	Dam/Levee Failure	Board of Supervisors, Engineer	On-Going	Minimal to Low	Local
L	Acquire more water pumps	Flash Flood, River Flood, Dam Failure, Levee Failure	Bremer County EMA, Public Works	On-Going	Minimal	Local
L	Purchase additional trash pumps	Flash Flood, River Flood	Board of Supervisors	On-Going	Minimal	Local
L	Establish backup plan in case levees fail	Levee Failure	Board of Supervisors, EMA, Engineer	On-Going	Minimal	Local

SECTION 5 – PLAN MAINTENANCE

MONITORING, EVALUATING, AND UPDATING THE PLAN

Amendment

This is a five-year plan, commencing upon FEMA Certification, and any future amendments to the plan shall occur only after an official Public Notice has been posted in a local publication announcing a Public Hearing on the matter. After the public has had the opportunity to review the proposed amendments the Board of Supervisors may, by resolution, choose to accept any amendment to the plan. Once the Bremer County Board of Supervisors has adopted the amendment, the elected board of each participating municipality shall hold a public hearing to receive public input on the amendment prior to local adoption. Any and all amendments made to this plan should be shared with the Bremer County Emergency Management Agency and the Iowa Department of Homeland Security and Emergency Management Division. At a minimum, this Plan will be evaluated for consistency with FEMA and IHSEMD requirements and formally updated every five (5) years.

Phasing & Incorporation into Other Planning Mechanisms

Phasing is a process by which the completion of a project occurs over several budget cycles. It is recommended that this review be incorporated into the City's or County's annual Capital Improvements Program update procedure. For projects that require a local match commitment, the Council or Board of Supervisors should begin setting aside appropriate resources to meet their match liability.

Each jurisdiction will consider the findings from this document when updating other planning documents in the future. Examples of planning documents that would benefit from information provided in this plan include, but are not limited to: Comprehensive Land-Use Plans and Urban Renewal Plans. Existing and future Zoning and Subdivision Ordinances as well as Building Codes should consider the goals, guidelines, and actions presented in this Plan. In addition, the projects defined herein may be prioritized for funding through the jurisdictions' budgeting process. Finally, the information presented in the Plan may be used as documentation for grant and/or loan programs, including the Hazard Mitigation Grant Program (HMGP).

Requirement §201.6(c)(4)(i): [The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

Requirement §201.6(c)(4)(ii): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive plans or capital improvement plans, when appropriate.

Requirement §201.6(c)(4)(ii): [The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.

Each of the jurisdictions with previous HMPs (excludes Frederika) have incorporated their plans into their comprehensive land use plans. Although the wording differs in each plan, all the land use plans state the jurisdiction will protect the general health, safety and welfare of the community, adhere to the NFIP, avoid development in the floodplain, work with neighboring jurisdictions on planning issues of common interest. INRCOG develops transportation plans for the entire planning region and many jurisdictions include projects in the plan that will make the roadways safer and reduce accidents. The County Emergency Management Office works on disaster response and preparedness plans and regularly holds meetings with the jurisdictions.

Evaluation & Review Process

Ultimately, the Bremer County Emergency Management Coordinator and City Councils from all jurisdictions are responsible for the Hazard Mitigation Plan and implementation of the goals and actions contained herein, and they may seek assistance from other city or county staff, Council of Governments, and consultants in order to accomplish mitigation projects. To assist in the review process, the Hazard Mitigation Committee (as mentioned in Section 1) may reconvene annually upon the request of the Bremer County Emergency Management Coordinator. As mentioned in Section 1, said Committee will be comprised of representatives from each participating jurisdiction as well as from neighboring communities, schools, businesses, nonprofits, agencies, academia, and other interested parties and together they will be charged with reviewing and evaluating implementation progress of the mitigation plan. In addition, a public notice will be posted at all city and county government buildings, on jurisdictional websites, and in the local newspapers inviting the general public to participate as members of the Committee and/or to review the Plan and provide comments. Copies of the Plan and the Committee's review will be available at all government offices (city halls and courthouse). Following the Committee's completion of the annual review process, the findings of the review and recommended changes, if applicable, will be presented during a City Council and Board of Supervisors meeting, which is a public meeting. Evaluation forms to assist in the review, evaluation, and updating process can be found in Appendix M.

Appendix L details the progress each jurisdiction has made since the adoption of their previous plans. Since many activities fall under the normal duties of most city governments (e.g. funding and maintaining emergency services), not many activities were deleted.

INCORPORATION INTO OTHER PLANNING MECHANISMS

Each county and city department will consider the findings from this document when updating other planning and operating documents in the future. Examples of planning documents that would benefit from information provided in this plan include, but are not limited to: Comprehensive Land-Use Plans and Urban Renewal Plans. Existing and future Zoning and Subdivision Ordinances as well as Building Codes should consider the goals, guidelines, and actions presented in this Plan.

Continued Public Participation

Bremer County is fortunate to have one of the most enthusiastic and experienced coordinators in Iowa. The cities typically do not initiate meetings with the public to discuss hazard mitigation issues, the Emergency Management Office conducts meetings, whereby the cities and public are invited to cover disaster response and recovery issues. The coordinator attends city council meetings in every jurisdiction to discuss and inform on these issues. The most common issues discussed include, tornado sirens, safe rooms, generators, storm spotter training and other training issues. The coordinator also ensures each jurisdiction regularly refers to their HMP, participate in any HMP development meetings and to monitor the plan expiration dates. The coordinator also sends each jurisdiction updates in the mail and email, regularly updates the county website and maintains an active Facebook account.

In order to ensure that the public remains involved in the future implementation of this Plan, it shall remain on hand at all participating city halls and the county courthouse. This Plan shall be made available to any party who requests to see it. If a jurisdiction intends to make or discuss amendments to the plan, a meeting with corresponding agenda shall be developed and posted; a newspaper notice shall be submitted and if necessary a legal notice will be published; and the Hazard Mitigation Committee members will be notified of the meeting via email, telephone, or regular mail. Also, the amendments shall also be made available prior to a City Council or Board of Supervisors action so that the public may be made aware. Consistent with the Iowa Open Meeting and Records Laws (Iowa Code Chapters 21 and 22), said meetings will be open to the public and all records shall be available for inspection. The coordinator will continue to work with each participating jurisdiction in ensuring the plan goals are followed and that these jurisdictions are properly prepared for any disaster that may come.

APPENDIX A: CITY OF DENVER

COMMUNITY PROFILE

Location

Denver is located in south-central Bremer County, in the northeastern quadrant of Iowa, at latitude 42.67 N x longitude 92.33 W and elevations ranging from 940 to 1,010 feet.

Natural Environment

The City of Denver is located between the Cedar River to the west and the Wapsipinicon River to the east. Two major highways serve the community. U.S. Highway 63 is a north-south route, which now bypasses the City to the west. The second is County Road C50, which is an east west route through the community.

The terrain on which Denver is built is generally the undulating topography that characterizes the agricultural areas of northeast Iowa. There are a few areas of steeper than normal slope with these being dispersed throughout the community adjacent to watercourses. The highest point in the community lies at approximately 1,010 feet above sea level and is located in the southeast are of town.

History

The City of Denver is located in Jefferson Township, which was originally inhabited by various tribes of Winnebago, Mesquakie, and Pottowattamie Indians. Many of these tribes camped near the Big Woods west of town along Quarter Section Run Creek.

In the spring of 1845, Charles McCaffree became the first white settler in the territory. He claimed an entire section within Jefferson Township, and raised 50 acres of sod corn in the first year.

TABLE A1: CITY OF DENVER DEMOGRAPHICS

<i>Government Framework</i>	Mayor – City Council
<i>General Population, 2010 Census</i>	
Total Population	1,780
Total Males	848
Total Females	932
Median Age	38.5
At-Risk Population, <18 Yrs	472
At-Risk Population, >64 Yrs	298
One Race-White	1,759
Black or African American	2
American Indian and Alaskan Native	1
Asian)	5
Other Race	5
Two or More Races	8
Hispanic or Latino	10
Total Household Population	1,749
Total Population in Group Quarters	31
Persons in Group Quarters – Institutionalized	31
Persons in Group Quarters – Noninstitutionalized	0
<i>Housing Characteristics, 2009-2013 ACS</i>	
Total Housing Units	742
Total Owner-Occupied Housing Units	549
Total Renter-Occupied Housing Units	152
Total Vacant Housing Units	30
Total 1-Unit Detached and Attached Structures	607
Total 2, 3, and 4-Unit Structures	59
Total 5 to 19-Unit Structures	73
Total Mobile Homes	3
Year Majority of Housing Units were Built	1939 or earlier (40%)
Average Household Size	2.50
Average Family Size	2.97

The major business at this time was the steam powered saw and gristmill located on Washington Street. The mill was grossing \$100 to \$125 a day at the height of its operation. A general mercantile store was established in 1855 that supplied settlers with the necessities of day-to-day life. Other businesses established from 1855 to 1900 included a lumber and grain mill, blacksmith shop, farmer's produce, livery stable, insurance company, and various bars and cafes.

Denver became incorporated in 1896 and the first Mayor, H. Braun, and City Council, composed of six members were elected. In 1902, the Waterloo-Cedar Falls Rail Transit extended service into Denver. The rail line ran where present day Transit Street lies. The new transportation facility made it possible for persons to ride from Denver to as far as Iowa City. However, in 1955, the passenger service was abandoned and the line was later dismantled. Nevertheless, the extension of the rail line in 1902 brought electrical service into the community from Waterloo, which enhanced the quality of life both socially and economically.

From 1906 to 1917, Denver was supplied with public facilities. On August 2, 1906, waterworks bonds were issued in the sum of \$5,000 in order to build a water tower on the northeast corner of Main and Russell, with a reservoir capacity of 50,000 gallons. Denver bonded again in 1917 to install a sewage disposal system.

From 1960 on, Denver experienced accelerated economic and population growth and greater demands were placed on public facilities. In order to meet these demands, the city purchased a site in 1965 on the northeast corner of Fairview and Lincoln for the construction of a new water tower with a storage capacity of 250,000 gallons. This same year construction began on a new sewage disposal system located south of the city at a cost of \$100,000.

A detailed early history of Denver may be found in the [History of Butler and Bremer Counties, Iowa](#), published by the Union Publishing Company, Springfield, Illinois, 1983. Additional information can be found in the Denver Public Library.

TABLE A1.1: CITY OF DENVER DEMOGRAPHICS	
<i>Economics Characteristics, 2010-2014 ACS</i>	
Population 16 years and over	1,386
Population In Labor Force (16 yrs and over)	1,002
Persons Employed	983
Persons Unemployed	19
Persons Employed in Management, Business, Science, and Arts Occupations	323
Persons Employed in Service Occupations	205
Persons Employed in Sales and Office Occupations	230
Persons Employed in Natural Resources, Construction, and Maintenance Occupations	63
Persons Employed in Production, Transportation, and Material Moving Occupations	162
Median Household Income	\$57,688
Median Family Income	\$67,830
Percent of Persons < 18 yrs. Below Poverty Level	8.0%
Percent of Persons 18-64 Yrs. Below Poverty Level	4.9%
Percent of Persons >65 Yrs. Below Poverty Level	2.5
<i>Social Characteristics, 2010-2014 ACS</i>	
School Enrollment (3 yrs and over)	473
Nursery School, Preschool	45
Kindergarten and Elementary School (grades 1-8)	182
High School (grades 9-12)	138
College or Graduate School	74
Education Attainment: Population 25 Years and Over	1,219
Less than High School Graduate	2.6%
High School Graduate (includes equivalency)	34.6%
Some College, Associate's Degree	35.5%
Bachelor's Degree or Higher	27.3%

Demographics

Population

Denver’s demographic data is outlined in Tables A1 and A1.1. In the recent 2010 U.S. Census, Denver’s population grew to 1,780, an increase of 9.4 percent over ten years. The previous U.S. Census, taken in 2000, recorded a population figure of 1,627 for Denver.

Community Services

The City of Denver has a municipal water supply with an elevated storage capacity of 576,000 gallons with an average capacity of 180,000 gallons. The peak demand is 285,000 gallons per day (gpd).

A primary sewer treatment plant serves Denver. Average load is 240,000 (gpd) with a peak load of 780,000 (gpd). The rated capacity of the sewer treatment plant is 2,500,000 gallons and is more than sufficient to handle Denver’s current development as well as future development.

Table A2 shows the primary utility providers for the City of Denver

TABLE A2: DENVER UTILITY PROVIDERS						
Electric	Natural Gas	Telephone/Internet	Cable	Water	Sewer	Sanitation
City of Denver	MidAmerican Energy	Qwest	Mediacom	City of Denver	City of Denver	City of Denver

HAZARDS & RISK ASSESSMENT

Hazard Analysis

Section 3 identified and profiled the hazards for the entire planning area. However, each community analyzed their own vulnerability to those hazards applicable to their jurisdiction. Using the methodology outlined in Section 3 (Vulnerability Assessment), the City of Denver evaluated the risk associated with a specific hazard, defined by probability and frequency of occurrence, magnitude, severity, exposures, and consequences. Denver’s vulnerability assessment provides in-depth knowledge of the hazards and vulnerabilities that affect the community. This analysis provides an all-hazard approach when evaluating the hazards of that affect the city, and the associated risks and impacts each hazard presents.

As mentioned previously in Section 3, the vulnerability assessment requires a five-year review with periodic updates, as needed. Potential future hazards and impacts may result from changing technology, new critical facilities, infrastructures, and development patterns, as well as demographic and socioeconomic

changes that occur within or outside the area.

Disaster frequency and its effects or severity are important as a basis for planning emergency response and mitigation. Natural hazards tend to reoccur on a predictable seasonal basis, whereas manmade or technological events tend to change over time with advancement in technology and methods of operation. Five criteria were used by the Committee to assure a systematic and comprehensive approach to hazard analysis for their individual jurisdictions included: Historical Occurrence, Probability, Vulnerability, Maximum Geographic Extent, Severity of Impact, and Speed of Onset. Due to recent disasters and events that have impacted the planning area, Denver determined that even though the historical occurrences were low for certain hazards, the probability ranking for future occurrences should be higher.

Table A3 is the hazard analysis scores for the City of Denver.

As seen in Table A3, the top three hazards for Denver are Tornado/Windstorm, Severe Winter storm, and Thunderstorm/Lightning/Hail.

TABLE A3: CITY OF DENVER HAZARD RISK ASSESSMENT						
Hazard Rank	Hazard	Probability	Magnitude/ Severity	Warning Time	Duration	Hazard Score
1	Tornado/Windstorm	3	4	4	4	3.55
2	Severe Winter Storm	4	3	3	3	3.45
3	Thunderstorm/Lightning/Hail	4	3	3	2	3.35
4	Flash Flood	3	3	3	2	2.9
5	Infrastructure Failure	2	4	4	1	2.8
6	HAZMAT Incident	2	2	4	4	2.5
7	River Flooding	2	3	2	2	2.3
8	Extreme Heat	2	3	1	3	2.25
9	Animal/Plant/Crop Disease	3	1	1	4	2.2
9	Grass/Wild Fire	2	2	4	1	2.2
9	Transportation Incident	3	2	1	1	2.2
12	Human Disease	2	2	3	2	2.15
13	Sinkholes	2	2	2	2	2
14	Terrorism	1	2	4	3	1.95
15	Landslide	1	1	4	3	1.65
16	Drought	1	2	1	4	1.6
17	Dam / Levee Failure	1	1	3	3	1.5
18	Earthquake	1	1	1	1	1
18	Expansive Soils	1	1	1	1	1
18	Radiological Incident	1	1	1	1	1

Vulnerability – Identifying Assets (Critical Facilities)

This section will describe the vulnerability for existing and future buildings, infrastructure, and critical facilities in those areas that can be impacted by the prioritized hazards. Since the majority of the hazards have an undefined hazard area (i.e., affecting an entire community or larger area) the following vulnerability assessment will only address those hazards that affect a specified area – flooding (river and flash). However, due to the community’s historical occurrences of tornadoes and the ability of them to result from the community’s top natural hazards (thunderstorms and lightning), this hazard was added to the assessment. The following discussion only considers the assets in the community of Denver.

Identifying the location of critical facilities and designated shelters (see Table A3) in Denver is important in order to assess their vulnerability to hazards since these facilities are important to the community’s operations, quality of life, and are key components of the economic sector. For instance, high-density residential or commercial development, schools, police stations, government buildings, hospitals and care facilities, airports, gas stations, hardware stores, grocery stores, and water supply systems. It is important to know the threats each hazard poses to these facilities. Map 6B illustrates the location of identified critical facilities throughout Denver.

According to the available data sources, Denver is projected to see an increase in population over the next thirty years. This population increase will most likely result in a greater need for additional critical facilities. However, the need for more critical facilities should be closely monitored these next 5-years and readdressed when this HMP is updated.

Previously, the city has utilized the Community Center as a cooling center during extreme heat events.

Flooding

A facility vulnerable to flooding is normally low, since these structures are not often constructed within the 100-year floodplain. According to the information provided, bridges and roadways would be impacted by flooding. This disruption in the transportation infrastructure would create a longer time period to receive and provide services and supplies to an area if a bridge was washed away due to flooding.

According to the data provided by INRCOG, Bremer County, and FEMA, there is approximately 215 acres of land within the 100-year floodplain. As shown on *Attachment 5A: Flood Scenario Map of the City*, this land is along a small creek on the west side of the community. Much of the community is located outside the floodplain to the east. However, flash flooding within the built areas of the community can cause property and potential injuries if the flash flood event is large. Measures should be taken to ensure problematic areas are dealt with to reduce future flash flooding events. According the *Flood Scenario Map*, there are

TABLE A3: CRITICAL FACILITIES IN DENVER

Denver Elementary School	Denver Middle School
Denver High School	St. John’s Church
St. Paul’s Church	Denver Baptist Church
St. Peter’s Church	American Legion Post
Denver City Hall and Library	Water Tower and Treatment Plant

Source: Community

**TABLE A4: CITY OF DENVER
100-YEAR FLOODPLAIN PROPERTIES**

Number of Structures	109
Building Value	\$ 2,984,910
Dwelling Value	\$ 2,508,140
Total Value	\$ 5,403,050

Source: INRCOG & Bremer County Assessor (2011 Values)

28 dwellings and 81 buildings located within the identified floodplain. The total value of these structures is given in Table A4. Using the average household size figure (2.46) from the 2000 Census for Denver, approximately 69 people are living in dwellings within the floodplain.

Tornadoes

As stated on the FEMA website²², mobile homes are highly vulnerable to tornadoes. Even mobile homes that are tied down, offer little protection from tornadoes.

According to Census information and the Bremer County Treasurer's office, there are 2 mobile homes located in the City of Denver. General observation would suggest a recent increase in the number of manufactured homes in the area. This increased popularity has the potential to increase the potential risk of damage to people and property in the community. Currently, no FEMA certified tornado safe shelters are known to exist in the community.

The primary reason for the increased popularity of mobile and manufactured homes is affordability. Although HUD regulations and local building codes have increased the safety components of these types of houses significantly in recent history, this affordability has often been accompanied with a reduced level of safety. Based on national data on circumstance of tornado fatalities between 1985 and 1997, it was found that 38% of fatalities were occupants of mobile or manufactured homes, 27% were in permanent homes, 11% in vehicles, 9% outdoors (open), 4% in businesses, 4% in structures with long-span roofs, and 2% in schools. These data highlight the high exposure of occupants of mobile and manufactured homes (*AR State Hazard Mitigation Plan, 1999*).

Nursing homes or skilled living centers are also highly vulnerable to tornadoes. These facilities are designed for caring for the elderly population, majority of which use wheelchairs or other assistance devices, limiting mobility. Also, the majority of nursing homes are constructed as a single-level building with or without basements. Therefore, additional attention needs to be taken to ensure the safety of the residents and employees before, during, and after a tornado event. Denver Sunset Nursing Home has a capacity of 31 patients.

²² Federal Emergency Management Agency (FEMA), <http://www.fema.gov/areyouready/tornadoes.shtm>

Vulnerability – Social Assets (Populations)

The social vulnerability assessment identified how the hazards affect the population of Denver and it is assumed that the identified populations are more likely to require assistance during times of disaster; therefore, are considered, generally speaking, more “at-risk” than the remaining population. The “at-risk” population must be identified and targeted in successful mitigation efforts. Table A5 presents an overview of the at-risk population in Denver according to information retrieved from the 2010 U.S. Census and Iowa Data Center.

According to Table A5, 15 percent of residents are 65 years and older. There are also 31 persons living in group quarters or nursing or skilled health facilities in the community. Denver Sunset Home, located in the northern part of the city, is the only group care facility in the community. St., Paul United Church in Denver is designated as a Sunset Home Shelter if residents must be moved out of the facility. In addition, Sunset Home has agreements with

Persons under the age of 18 are also at higher risk during some disasters. This is mostly due to the fact that young persons often are not aware of the proper actions to take in the event of a disaster. In addition, very young children would be more susceptible to a disaster such as a disease epidemic simply due to their age. In 2000, there was 24% of the city’s total population under the age of 18.

In addition, persons living in mobile homes, also known as manufactured housing may also be at risk from tornadoes or high winds. According to American Community Survey (ACS) data, there are three mobile homes in the community; however, these units are not within a mobile home park, but as standalone units on parcels located throughout the city. Based on the average household size (2.50 persons), it can be estimated that approximately eight persons live in mobile homes within the city.

TABLE A5: CITY OF DENVER’S “AT-RISK” POPULATION	
	2010
Total Community Population (2010)	1,780
Elderly (65 yrs and older)	298
Youth (under 18 yrs old)	472
Householder Living Alone	167
Non-English Speaking Population (speaks English less than ‘very well’)	1.2%
Population Living in Poverty	5.4%
Population in Mobile Homes	8
Group Quarters Population	31
<i>Source: U.S. Census, 2010, Iowa Data Center, and 2014 ACS 5-Year Averages</i>	

TABLE A6: CITY OF DENVER VALUATIONS		
Land Use Types	Total Valuation 100%	Average Valuation per Unit or Parcel
Residential Property	\$86,794,100	\$145,384 / parcel
Commercial Property	\$8,159,030	\$138,289 / parcel
Industrial Property	\$3,501,400	\$583,567 / parcel
Agricultural Buildings	\$316,870	\$105,623 / unit
Agricultural Land	\$358,230	\$1,119 / acre
Exemptions (military)	\$203,720	
Gross Valuation	\$98,925,910	

The planning committee identified the Denver Sunset Home, Denver Community Schools, and the Denver Public Library as facilities that may be more vulnerable due to gatherings and age groups of attendees (school-aged children or elderly persons).

Source: City of Denver and Bremer County Assessor, as of 1/1/2010

Vulnerability – Estimating Potential Property Losses

Valuations are an important component of hazard mitigation planning inasmuch as it provides measurable data that can be used to form some type of estimate as to the potential losses a community could face in the event of a catastrophic disaster.

The valuations for the City of Denver are available from the County Assessors and Auditors offices. It should be noted however that these dollar amounts do not include gas and electric utility valuations. City of Denver's property valuations are in Table A6.

Future Development

Future development within identified hazard areas can change the threat level of an area by placing critical facilities, businesses, transportation networks, utilities, and populations within vulnerable areas. While it can be difficult to curb development in the planning area, it is the jurisdiction's advantage to be aware of development trends in order to successfully mitigate future hazards as risks increase. However, continued conformity with the State Building Codes and local land use ordinances and regulations (zoning, subdivision, floodplain management, etc.) will help to mitigate the effects hazards have on new and future development.

National Flood Insurance Program/Repetitive Loss Properties

The city participates in the National Flood Insurance Program (NFIP) and has a flood ordinance in place. As Table A7 shows, there are currently there a dozen NFIP policies in place within the city.

FEMA defines a repetitive loss property as an insurable building that has experienced two losses in a 10-year period in which each loss is \$1,000 or more. River flooding is the most common cause of repetitive loss in Bremer County. Table A7 illustrates the number of repetitive loss properties in the city. Currently (as of 11/30/2014) there is one active repetitive loss building in the city.

TABLE A7: NFIP AND REPETITIVE LOSS DATA FOR DENVER							
CID #	# of NFIP Policies	NFIP Insurance in Force (\$)	Total # of RLB	RLB Insured	RLB Not Insured	Total RLB Losses (\$)	RLB Losses Insured (\$)
190026	12	\$1,321,500	1	1	0	\$17,725	\$17,725

Source: Federal Emergency Management Agency (FEMA); Note: RLB = Repetitive Loss Building; NFIP data current as of 9/30/2016; Repetitive

loss data current as of 11/30/2014

This HMP attempts to reduce loss by identifying potential natural and manmade hazards. As a result of many natural and manmade hazards, repairs and reconstruction area often completed in a way that returns the structure to pre-disaster condition yet does little to prevent a reoccurrence of damage. Replication of the pre-disaster conditions allows for the repetitive cycle of property damage, reconstruction, and re-damage. Hazard mitigation is needed to ensure that such cycles are broken, that post-disaster repairs and reconstruction are analyzed, and sound, less vulnerable conditions are produced. Additionally, other mitigation strategies may be considered, such as voluntary property buy-outs.

MITIGATION STRATEGY

Hazard Mitigation Plan Goals

The hazard mitigation plan goals were reviewed by the Hazard Mitigation Planning Committee at their second committee meeting. The committee set as a priority the development of broad-based goals that would address a multitude of hazards and encompass a variety of mitigation activities. The hazard mitigation plan goals identified are as follows:

1. Reduce the chance of and impact of flooding in the community.
2. Take measures to minimize the occurrence of injuries and loss of life due to hazards.
3. Take measures to minimize or eliminate damages that may occur as a result of hazards.
4. Increase the city's ability to respond to natural disasters and man-made hazards.
5. Return to the community to similar or improved pre-event conditions as quickly as possible following a disaster event.
6. Incorporate the City Plan into the proposed Multi-Jurisdictional Plan.
7. Continually re-assess and re-evaluate the plan and mitigation activities.

Current Mitigation Actions

Prevention Mitigation Actions

The city and Quarter Section Run Creek that flows through the city are the subjects of a 1999 Department of Agriculture Natural Resources Conservation Service resource assessment and flood study, after a 1999 heavy rainfall event caused a 250-year flood in the city. The study concluded the embankment constructed

for the Highway 63 bypass cut off a large portion of the floodway, causing water moving through it to "back up" during the 1999 rainfall event. Reconstruction of the bridge and embankment was necessary to prevent future flooding.

There is a snow removal policy which states snow must be removed from city sidewalks within 25-hours of a snowfall. Any snow removed from the sidewalks or drives shall be placed on the property owner's property, not on others or the streets, excluding Main Street, if necessary. Table A7 summarizes the current planning and regulatory documents for the City of Denver.

TABLE A7: CURRENT PLANNING AND REGULATORY DOCUMENTS FOR DENVER								
Previous HMP	Comprehensive Plan	Building Code	Zoning Ordinance	Subdivision Regulations	Floodplain Management Ordinance	Tree-Trimming Ordinance	Storm Water Ordinance	Snow Removal Ordinance
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Source: Local Community								

Property Protection Mitigation Actions

Denver has not participated in any buyout or similar program. No actions or plans of property mitigation are planned under the city's jurisdiction.

Public Education and Awareness Mitigation Actions

The city publishes seasonal information such as instructions on what to do in case of tornadoes. The public is informed about any hazard or program for cleaning up after storms, etc. in the local newspaper.

On an annual basis, the visiting nurses provide flu shots to residents at the Community Center.

Emergency Services Mitigation Actions

The action to mitigate a natural disaster is communication first, following the chain of command: Mayor to Fire Chief, Ambulance, City Clerk, and Public Works. The EMS Departments of the City have written plans of action for natural disasters. The city has an outdoor warning siren. The siren is activated at the site of a tornado, or in case of an imminent threat of any kind. The fire department sounds a warning at the first fire meeting each month. The fire chief sends a crew of firefighters out at the request of the sheriff if the National Weather Forecasts a chance of severe weather. The sheriff and fire chief communicate by radio and does the team sent out to spot.

Denver works with the Bremer County Emergency Management Coordinator, based out of the City of Waverly, on various safety and emergency events. The Emergency Management Coordinator works in conjunction with local fire, rescue, police, and government officials to draft and implement workable emergency action plans in the community. The current Emergency Management Coordinator is Kip Ladage and current contact information is as follows: Bremer County Emergency Management Agency, 111 4th St. NE, Bremer-Waverly LEC, Waverly, Iowa 50677, (319) 352-0133, email: kladage@co.bremer.ia.us

Law Enforcement

Police protection is provided by the Denver Police Department, Bremer County Sheriff, and the Iowa State Patrol. Currently, there are a total of 3 officers serving the Police Department. The department currently operates 2 squad cars. Gary Everding is the current Police Chief for the department.

Fire Protection

Fire protection is provided for Denver by a force of 29 volunteer firemen. All of these firemen are HAZMAT operational. The fire station is located in the western portion of the City on Transit Street. Denver's fire insurance rating is six (6).

Equipment used by the Denver Fire Department includes the following: two tankers, three pumpers, eight total trucks, two "jaws of life", chains saws, air bags, tripod, and stabilizing jacks.

The City of Denver Fire Department has mutual aid agreements with every fire department in Bremer and Black Hawk Counties.

Ambulance & First Responders

Denver has a volunteer ambulance service that provides emergency rescue and ambulance services to the community. It is staffed by EMTs, with approximately 12 volunteers on staff. The department has two ambulances and uses Waverly Paramedics for mutual aid.

Medical Facilities

Denver has a medical clinic located at 160 E Main Street. The medical staff is comprised of a Physician, a nurse practitioner, and receptionist. There are three hospitals within 20 miles of the city: Waverly Health Clinic and Waterloo Allen and Covenant Hospitals. Covenant and Allen Memorial Hospital in Waterloo are within a half hour to forty-five minute drive from Denver. Rochester's Mayo Clinic is 90 miles.

HAZMAT

Denver contracts with Northeast Iowa Response Group for response to hazardous material spills. The Northeast Iowa Response Group is a division of Waterloo Fire Rescue as is the Hazardous Materials Regional Training Center. The Training Center provides training to fire departments and companies from around the state and country. Not only is this a training center it also serves as a hazardous materials quick response unit to Black Hawk County, surrounding counties, and many municipalities in a ten county region. The Unit provides local fire departments with hazard materials emergency procedures thus reducing additional contamination. An evacuation plan is also in place in conjunction with the activities with the local department. Contact information for the facility is as follows: Hazardous Materials Regional Training Center, 1925 Newell Street, Waterloo, Iowa 50707, Phone: (319) 291-4275, Toll Free: (800) 291-4682, Fax: (319) 291-4285

The jurisdictions also partners the Northeast Iowa Response Group for assistance in responding to any methamphetamine labs located in the city limits. The Response Group assists the Police Departments in containment of the site and disposal of the hazardous chemicals.

Public Works / Street Department

Denver has approximately 13 miles of streets and alleys. Snow and ice removal are considered essential in mitigation negatives of winter storms. The public works and street department employs five people. The department has several trucks, mowers, a street sweeper, chain saws, street painter, street saw, water/sewer samplers, water pumps, generators, two tractors and a trencher.

Warning Systems

The city has two warning sirens which are tested on a monthly basis. The city also participates in the ALERT IOWA program.

Natural Resource Protection Mitigation Actions

In response to Emerald Ash Borer, the city conducted a tree study, which identified Ash trees throughout the community. Some of the Ash trees will be treated while others will likely be removed. The city intends to replace trees with a diverse mix.

Structural Projects Mitigation Actions

The city is in the process of removing, or having removed, buildings that have been determined to be dangerous. A new dangerous building ordinance has recently been adopted as part of the nuisance ordinances. There are no additional structural projects or construction projects at this time.

Future Mitigation Actions

While the existing mitigation activities discussed above detail the City's efforts to mitigate hazards when possible and to respond to hazards in a timely and efficient manner, the Committee also recognizes that there are many more mitigation activities and projects that would benefit county residents. Thus, the Committee developed a list of future hazard mitigation activities that, if accomplished, would serve to further reduce the risk of hazards to the community. The list may include a combination of projects the Committee feels the community should try to accomplish and mitigation efforts that are ongoing that the Committee view as vital to the continued well-being of the public.

The Committee analyzed the potential mitigation activities. This analysis included a discussion of the potential benefits of implementing the activity, some hurdles that the community may face in implementing the action step, and the drawbacks of implementation. The analysis utilized the STAPLEE feasibility criteria. The STAPLEE technique is a FEMA suggested method of evaluation. The STAPLEE approach assesses both positive and negative impacts on the following aspects of a county: Social, Technical, Addministrative, Political, Legal, Economic, and Environmental. Based on this analysis, each activity was ranked as High (H), Medium (M) or Low (L). However, not all identified activities are applicable to all jurisdictions and is marked as such in Table A9.

Funding

Although in the long-term hazard mitigation actions will save money by avoiding the loss of lives or property damages, in the short-term each action will have an associated cost. The City will rely heavily on local funding sources to fulfill most of the plan obligations; however, they will also seek funds from State and Federal agencies for both pre- and post-disaster mitigation activities.

The estimated cost(s) for each mitigation action, program, or project is either: Minimal, Low, Moderate, or High depending upon various factors.

- Minimal: Cost estimate is \$10,000 or less based on using current staff, time commitment, continuous of current duties, proposed action/program/project, and funding sources.
- Low: Cost estimate for project range from \$10,001 - \$99,999 based on existing proposed treatment, time commitment, any further study that is needed, and level of engineering, and project components (permits, acquisition, coordination, etc.).
- Moderate : Cost estimate for project range from \$100,000 - \$299,999 based on existing conditions, time commitment, proposed action/program/project, any further study that is needed, and level of engineering, and project components (permits, acquisition, coordination, etc.), and funding sources.
- High : Cost estimate for project range is \$300,000 or higher based on existing conditions, time commitment, proposed action/ program/project, any further study that is needed, and level of engineering, project components (permits, acquisition, coordination, etc.), and funding sources.

Implementation Strategy

Once the Committee identified and ranked the future hazard mitigation activities, the activities were then analyzed. In addition, the Committee identified a time line for each activity, identified the responsible party (ies) for each activity and finally related each activity to at least one of the five Hazard Mitigation Plan Goals listed above. Table A9 below is the City of Denver's Implementation Strategy.

TABLE A9: CITY OF DENVER'S IMPLEMENTATION STRATEGY						
Priority	Mitigation Action/Program/Project	Associated Hazard	Primary Agency Responsible for Implementation	Date for Completion	Estimated Cost	Funding Source
Education/Public Awareness						
H	Educate the public	All	City Council, Staff	On-Going	Minimal	Local
H	Maintain storm spotter training for local fire departments/deputies and EMS crews	Thunderstorm/Lightning, Windstorm, Tornado, Hailstorm	Fire Department	On-Going	Minimal	Local
H	Enhance Standard Operating Procedures for dissemination of information/press releases in the event of a disaster	Communications Failure	City Council, School Board	On-Going	Minimal	Local
H	Encourage use of Iowa One call before digging	Communications Failure, Explosion	City Council, Staff	On-Going	Minimal	Local
H	Encourage residents to keep smoke detectors, sprinkler systems and fire extinguishers maintained in their homes	Fire	City Council	On-Going	Minimal	Local
H	Cooperate with any countywide mass vaccination plan	Disease	City Council	On-Going	Minimal	Local
H	Educate city personnel to identify risk areas	Expansive Soils	Public Works	On-Going	Minimal to Low	Local
H	Educate city personnel to handle a sinkhole situation	Sinkholes	City Council	On-Going	Minimal to Low	Local
H	Inform the public of reputable and ill reputable contractors following disasters	Emergency Management	Building and Zoning	On-Going	Minimal	Local
M	Notify the media on shelter locations	Severe Winter Storm, Extreme Heat, Tornado	City Council	On-Going	Minimal	Local
M	Encourage and maintain enrollment in emergency notification system	Thunderstorm/Lightning, Windstorm, Tornado, Communication Failure	City Council, Fire Department	On-going	Minimal	Local
M	Encourage home owners to keep emergency kits	Windstorm, Tornado	City Council	On-Going	Moderate	Local
M	Encourage community to plant shade trees	Extreme Heat	City staff	On-Going	Minimal to Low	Local
M	Encourage the public to receive vaccinations	Disease	City Council, Fire Department	On-Going	Low	Local
M	Encourage all communities to participate in their Local Emergency Planning Commission (LEPC)	Emergency Management	City Council	On-Going	Minimal	Local
L	Encourage lead based paint and asbestos removal	HAZMAT	City Council, Police	On-Going	Minimal	Local
L	Educate the public on maintaining their sump pumps	Flash Flood	Fire Department, Public Works	On-Going	Minimal	Local

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<i>Emergency Services</i>						
H	Continue training and education for fire departments, law enforcement agencies and ambulance crew personnel	All	City Council	On-Going	Moderate	Local
H	Provide emergency shelters for evacuees	All	City Council	On-Going	Low	Local
H	Determine locations for potential heating shelters and volunteer organization	Severe Winter Storm	City Council	On-Going	Minimal	Local
H	Make available a cleanup crew for after a storm	Thunderstorm/Lightning	City Council, EMA	On-Going	Minimal to Low	Local
H	Continue training and promotion of the Incident Command System	Communications Failure	City Council	On-Going	Minimal	Local
H	Complete continuity of government plan	Communications Failure	City Council, Staff	On-Going	Minimal	Local
H	Maintain list of county emergency contacts	Communications Failure	All City Departments	On-Going	Minimal	Local
H	Develop and maintain staging area for dumping during cleanup	River Flood	City Council	On-Going	Minimal	Local
H	Set a designated number of people to be trained in post-disaster record keeping/damage assessments	Emergency Management	City Council	On-Going	Minimal	Local
H	Maintain lists of personnel and equipment available to use with response plans	Emergency Management	City Council, Staff	On-Going	Minimal	Local
M	Maintain or install GPS units in all emergency service and city/county vehicles	Communications Failure	City Council	On-Going	Minimal	Local
M	Purchase emergency signs to be used in case of an incident	Transportation	City Council	On-Going	Minimal	Local
L	Maintain automatic TTY TDD machines for emergency personnel and city/county employees	Communications Failure	City Council, EMA	On-Going	Minimal	Local
<i>Natural Resource Protection</i>						
H	Treat and/or remove Ash trees in response to Emerald Ash Borer Disease	Animal/Plant/Crop Disease	Mayor	Short-Term	Low	Local
H	Maintain tree trimming program	Severe Winter Storm, Windstorm, Hailstorm	City Council	On-Going	Minimal	Local
H	Monitor the drinking water supply	Groundwater Contamination, Disease	City Council, City Staff	On-Going	Moderate	Local
H	Maintain and/or develop storm water management program	Groundwater Contamination, Flash Flood	City Council, Public Works	On-Going	Low	Local, State
H	Eliminate and cap private and abandoned wells in the city	Groundwater Contamination	City Council, Police	On-Going	Moderate	Local, Federal
H	Eliminate the use of septic tank systems in the city limits	Groundwater Contamination	City Council	On-Going	Low	Local
H	Follow monitoring requirements set forth by the Iowa DNR	Groundwater Contamination	City Council	On-Going	Low	Local
H	Clear ditches, streams, and waterways on a regular basis	River Flood	City Council, Public Works	On-Going	Minimal	Local
M	Maintain and/or develop a wellhead protection program	Groundwater Contamination	City Council	On-Going	Low	Local
M	Monitor wells in areas of identified contamination	Groundwater Contamination	City Council	On-Going	Low	Local
M	Identify and map areas of past contamination	Groundwater Contamination	City Council, Public Works	On-Going	Low	Local

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M	Carry out conservation measures such as erosion control and work with the following organizations: Extension, NRCS, Farm Bureau, EPA, DNR, and Soil and water Conservation District	Groundwater Contamination	City Council	On-Going	Minimal	Local, State, Federal
L	Plant trees along water bodies and slopes	Landslides/Mudflows	City Council, Staff	On-Going	Minimal	Local
L	Purchase additional parkland in order to increase greens space and reducing surface flow	River Flood	City Council	On-Going	Minimal	Local
Prevention						
H	Maintain and acquire materials and equipment for fire departments, law enforcement agencies and ambulance crew personnel	All	City Council	On-Going	Moderate	Local
H	Maintain mutual aid agreements	All	City Council	On-Going	Minimal	Local
H	Purchase and maintain backup generators	Severe Winter Storm, Thunderstorm/Lightning, Tornado, Emergency Management	City Council	On-Going	Moderate	Local
H	Maintain public works equipment	Severe Winter Storm	City Council	On-Going	Minimal	Local
H	Purchase NOAA weather radios	Thunderstorm/Lightning, Windstorm, Tornado, Radiological/Nuclear Event	City Council, Fire Department	On-Going	Minimal	Local
H	Maintain mutual aid agreements with the Northeast Iowa response Group	HAZMAT	City Council	On-Going	Minimal	Local
H	Keep HAZMAT manuals/information current and easily accessible	HAZMAT	All City personnel	On-Going	Minimal	Local
H	Regularly review and amend fire and medical HAZMAT response standard operating procedures	Communications Failure	Fire Department	On-Going	Minimal	Local
H	Seek to improve communications with other agencies	Communications Failure, Terrorism	City Council	On-Going	Minimal	Local
H	Keep the county updated on personnel changes	Communications Failure	City Staff, Council	On-Going	Minimal	Local
H	Continue cooperation between county roads department and local fire departments during snow emergencies	Severe Winter Storm	Staff	On-Going	Minimal to Low	Local
H	Maintain membership in the NFIP	Flash Flood, River Flood	City Council, Staff	On-Going	Minimal	Local
H	Maintain and keep storm drains clear of debris	Flash Flood	City Council	On-Going	Minimal	Local
H	Stockpile sand and sandbags	Flash Flood, River Flood	Fire Department, Police	On-Going	Minimal to Low	Local
H	Initiate and enforce burn ban in times of drought or as needed	Grass/Wildfire, Drought	City Council	On-Going	Minimal	Local
H	Establish alternative transportation routes should a road need to be closed	Transportation	City Council	On-Going	Minimal	Local
H	Identify fallout shelter locations	Radiological/Nuclear Event	City Council	On-Going	Minimal	Local
H	Maintain and update anti-virus software	Terrorism	City Council, Staff	On-Going	Low	Local
H	Provide fans and/or cooling shelter	Extreme Heat	City Council	On-Going	Minimal	Local
H	Maintain air conditioner(s) in community buildings	Extreme Heat	City Council, Public Works	On-Going	Minimal	Local
H	Develop rationing procedures	Drought	City Council	On-Going	Minimal	Local
H	Initiate and enforce burn ban in times of drought or	Drought	City Council, Fire Department	On-Going	Low to Moderate	Local

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	as needed					
H	Restrict water usage should it be necessary	Drought	City Council, Zoning Administrator	On-Going	Minimal	Local
H	Secure the area (around a sinkhole)	Sinkholes	City Council, Police	On-Going	Minimal	Local
H	Inspect any utility lines that are near a sinkhole	Sinkholes	City Council, Staff	On-Going	Minimal	Local
H	Update flood maps/flood studies for areas throughout the county	River Flood	City Council	On-Going	Minimal	Local
H	Develop sandbagging procedures for the community	River Flood	City Council, Staff	On-Going	Minimal	Local
H	Maintain and update emergency response plans	Emergency Management	Staff	On-Going	Minimal	Local
H	Maintain communication with county contacts	Emergency Management	Staff	On-Going	Minimal	Local
H	Maintain NIMS compliance	Emergency Management	City Council, Staff	On-Going	Minimal	Local
M	Acquire necessary response and detection equipment for city/county employees	HAZMAT	City Council	On-Going	Minimal	Local
M	Maintain, test, and replace warning sirens	Windstorm, Tornado, Hailstorm, Thunderstorm/Lightning, Communications Failure	County EMA	On-Going	Minimal to Low	Local
M	Upgrade radio communications equipment as needed	Communications Failure	City Staff	On-Going	Minimal	Local
M	Maintain and improve signals/signage along roadways and at railroad crossings	Transportation	City staff	On-Going	Minimal	Local
M	Keep communication lines open with Nuclear Plant in Palo, IA	Radiological/Nuclear Event	City Council	On-Going	Low	Local
M	Continue to cooperate with pipeline owners and operators to ensure locations are marked	Fire, Explosion	City Council, Public Works	On-Going	Minimal	Local
M	Purchase a new tanker and/or pumper	Fire, Explosion	City Council	On-Going	Minimal	Local
M	Monitor disease outbreak news from the CDC and Iowa Department of Public Health	Disease	City Council	On-Going	Minimal	Local
M	Establish detour routes	Bridge Failure, Flash Flood, River Flood	Public Works	On-Going	Minimal to Low	Local
M	Enforce the local zoning ordinances	Landslides/Mudflows	City Council, Staff	On-Going	Minimal	Local
M	Establish transportation evacuation routes and protocols	River Flood	City Council	On-Going	Minimal	Local
M	Continue cooperation with county in developing flood mitigation efforts	Flash Flood, River Flood	City Council	On-Going	Minimal	Local
M	Continue working with the Bremer County Recovery Coalition	Flash Flood, River Flood	City Council	On-Going	Minimal	Local
L	Enforce sidewalk clearance ordinance	Severe Winter Storm	City Council	On-Going	Minimal	Local
L	Maintain use of snow fences in the city/county	Severe Winter Storm	City Staff	On-Going	Minimal	Local
L	Backup all digital data	Thunderstorm/Lightning	Staff	On-Going	Minimal	Local
L	Place alarms on storage facilities containing hazardous materials	Hazardous Materials (HAZMAT)	City Council	On-Going	Minimal	Local
L	Maintain law enforcement monitoring of large storage supplies	HAZMAT	City Council, Police	On-Going	Minimal	Local
L	Provide a local hazardous waste dropoff site	HAZMAT	City Council	On-Going	Minimal to Low	Local, State
L	Identify areas throughout the county that would substantially benefit from outdoor warning sirens	Windstorm, Tornado	City Council, Staff	On-Going	Moderate	Local, State
L	Maintain list of potential translators to be called upon	Communications Failure	City Council, Staff	On-Going	Minimal	Local

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	in case of an emergency					
L	Improve standard operating procedures for schools	Communications Failure	City Council, Staff	On-Going	Minimal	Local
L	Keep supply of backup radios and cellphones	Communications Failure	Staff	On-Going	Minimal	Local
L	Enforce no parking designations at special events	Transportation	Police Department	On-Going	Minimal	Local
L	Secure vulnerable targets, as identified by the LEPC and County EMA with alarms, security cameras and fences	Terrorism	City staff, Police	On-Going	Moderate	Local
L	Keep a supply of drinking water to distribute	Extreme Heat	Staff	On-Going	Minimal	Local
L	Enforce a curfew	Riot/Violent Demonstration	Public Works	On-Going	Minimal to Low	Local
L	Identify and inventory potential sinkhole sites	Sinkholes	City Council	On-Going	Minimal to Low	Local
Property Protection						
H	Use surge protectors to prevent electrical damage to critical and sensitive equipment	Thunderstorm/Lightning	Staff	On-Going	Minimal	Local
H	Placement of lighting arrestors on power lines	Thunderstorm/Lightning	City Council	On-Going	Minimal	Local
H	Encourage backup power generation for local telephone systems and cellular operations	Communications Failure	City Council	On-Going	Minimal	Local
H	Continue an annual inspection program for commercial and industrial properties	Fire	City Council	On-Going	Low to Moderate	Local
H	Continue fire prevention program	Fire	City Council, Staff	On-Going	Minimal	Local
H	Maintain, enforce and update floodplain ordinance	Flash Flood, River Flood	City Staff	On-Going	Minimal	Local
H	Acquire more water pumps	Flash Flood, River Flood, Dam Failure, Levee Failure	City Staff	On-Going	Minimal	Local
H	Purchase additional trash pumps	Flash Flood, River Flood	All City Departments	On-Going	Minimal	Local
H	Continue regular bridge inspections	Bridge Failure	City Council	On-Going	Minimal to Low	Local, State
H	Place barricades to close dangerous bridges	Bridge Failure	City Council	On-Going	Minimal to Low	Local
H	Maintain pump station	River Flood	City Council, Staff	On-Going	Minimal	Local
H	Regularly inspect levees	Levee Failure	City Council, Staff	On-Going	Minimal	Local
M	Review and update fire codes as necessary	Fire, Explosion	City staff	On-Going	Minimal	Local
M	Maintain embargos/weight limits as necessary	Bridge Failure	Police	On-Going	Minimal to Low	Local
M	Regularly inspect dams	Dam Failure	City Council, Staff	On-Going	Minimal	Local
L	Install a snow fence around the wastewater treatment facility	Severe Winter Storm	City Council	On-Going	Minimal	Local
L	Identify, purchase and remove structures from flood hazard areas	Flash Flood, River Flood	City Council, staff	On-Going	Moderate	Local, Federal
L	Install rip rap around wastewater treatment facility	Flash Flood	City Council	On-Going	Minimal	Local
L	Receive education/training from DOT on embargos/weight limits	Bridge Failure	Police	On-Going	Minimal to Low	Local, State
L	Encourage floodproofing/elevating structures in the floodplain	River Flood	City Council	On-Going	Minimal	Local
L	Establish backup plan in case levees fail	Levee Failure	City Council, Public Works	On-Going	Minimal to Low	Local
Structural Projects						
H	Continue enforcement of city sump pump discharge ordinance	Thunderstorm/Lightning	City Council	On-Going	Minimal	Local
H	Maintain a list of potential storm sewer projects	Thunderstorm/Lightning	City Council, Staff	On-Going	Minimal	Local

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H	Construct or designate a safe room or storm shelter	Windstorm, Tornado, Hailstorm	City Council	On-Going	High	Local, State, Federal
H	Continue with improvement to the storm water system	Flash Flood	City Council	On-Going	Minimal	Local, State
H	Prevent inflow and infiltration into the sanitary sewer	Flash Flood, River Flood	City Council	On-Going	Minimal to low	Local
H	Encourage the use of proper materials and construction techniques	Expansive Soils	City Council, Police	On-Going	Minimal to Low	Local
H	Install tiling to help water move away from structures	Expansive Soils	Public Works	On-Going	Minimal to Low	Local
M	Encourage utility providers and developers to place all utilities underground	Severe Winter Storm, Communications Failure, Thunderstorm/Lightning	City Council	On-Going	Minimal	Local
M	Enforce and update building codes, as needed	Thunderstorm/Lightning, Windstorm, Tornado, Hailstorm, Expansive Soils, Earthquake	City Council, City Staff	On-Going	Minimal	Local
M	Improve water system to enhance firefighting capacity/ability	Fire	City Staff	On-Going	Minimal	Local
L	Pursue partnership with rural water as the system expands	Fire, Explosion	City Council	On-Going	Minimal	Local
L	Encourage construction of dikes, levees, dams, and retention ponds	River Flood	City Council	On-Going	Minimal	Local

APPENDIX B: CITY OF FREDERIKA

COMMUNITY PROFILE

Location

Frederika is located in north-central Bremer County, in the northeastern quadrant of Iowa, at latitude 42.88 N x longitude 92.30 W and elevations ranging from 950 to 1,030.

Geography

The City is bordered on all sides by farmland and the Wapsipinicon River runs along its western border. The land within the City is gently sloping with a few areas of steeper grade near the river, but is generally flat. Two highways serve the City of Frederika; County Road C16, which leads to Highway 63, and County Road V5C, which leads to Highway 93.

History

The area around present-day Frederika was settled by two families in 1852. They built a saw mill and a grist mill on the Wapsipinicon River. The demand for lumber and flour by surrounding settlers allowed both mills to prosper. Soon after, a limestone quarry was established which provided stone for construction of homes, businesses and infrastructure.

In 1868, the land was surveyed and soon after a post office was established and by 1896 the town was officially incorporated. Various settlers over the years had established a variety of businesses, some of which still exist today, although ownership has changed several times. Before refrigeration, a successful ice mill operated on the Wapsipinicon River.

Today, Frederika remains as a rural, farming community, with a Farmers Coop and grain storage bins serving nearby farmers. The city serves as a bedroom community for residents who enjoy a close-knit community, but want the benefits of a secluded, small-town atmosphere. Many residents find work in the Waterloo-Cedar Falls metro or in cities such as Charles City and New Hampton.

TABLE B1: CITY OF FREDERIKA DEMOGRAPHICS

Government Framework	Mayor – City Council
General Population, 2010 Census	
Total Population	183
Median Age	49.9
At-Risk Population, <18 Years	20
At-Risk Population, >64 Years	44
Total Males	98
Total Females	85
One Race-White	180
Black or African American	0
American Indian and Alaskan Native	1
Asian	1
Two or More Races	0
Housing Characteristics, 2010 Census	
Total Households	96
Households with children <18 Yrs.	12
Households with persons >65 Yrs.	33
Average Household Size	1.91
Average Family Size	2.42
Total Housing Units	118
Occupied Housing Units	96
Vacant Housing Units	22
Owner-Occupied Housing Units	78
Renter-Occupied Housing Units	18
Persons Living in Group Quarters	0

Demographics

Population

Frederika's demographic data is outlined in Tables B1 and B1.1. In the recent 2010 U.S. Census, Frederika's population declined to 183, a decrease of 8 percent over ten years. The previous U.S. Census, taken in 2000, recorded a population figure of 199 for Frederika. Much of the data included in the tables are from the 2000 U.S. Census, since detailed data from the 2010 Census is not yet available.

Community Services

The City of Frederika does not have a municipal water supply as each resident has their own well as a source of water.

A primary sewer treatment plant serves Frederika. Average load is 16,000 (gpd) with a peak load of 20,000 (gpd). The rated capacity of the sewer treatment plant is 25,000 gallons and is more than sufficient to handle Frederika's current development as well as future development.

HAZARDS & RISK ASSESSMENT

Hazard Analysis

Section 3 identified and profiled the hazards for the entire planning area. However, each community analyzed their own vulnerability to those hazards applicable to their jurisdiction. Using the methodology outlined in Section 3 (Vulnerability Assessment), the City of Frederika evaluated the risk associated with a specific hazard, defined by probability and frequency of occurrence, magnitude, severity, exposures, and consequences. Frederika's vulnerability assessment provides in-depth knowledge of the hazards and vulnerabilities that affect the community. This analysis provides an all-hazard approach when evaluating the hazards of that affect the city, and the associated risks and impacts each hazard presents.

As mentioned previously in Section 3, the vulnerability assessment requires a five-year review with periodic updates, as needed. Potential future hazards and impacts may result from changing technology, new critical facilities, infrastructures, and development patterns, as well as demographic and socioeconomic changes that occur within or outside the area.

Disaster frequency and its effects or severity are important as a basis for planning emergency response and mitigation. Natural hazards tend to reoccur on a predictable seasonal basis, whereas manmade or technological events tend to change over time with advancement in technology and methods of operation.

TABLE B1.1: CITY OF FREDERIKA DEMOGRAPHICS	
<i>Government Framework</i>	Mayor – City Council
<i>General Population, 2010 Census</i>	
Total Population	183
Median Age	49.9
At-Risk Population, <18 Yrs	23
At-Risk Population, >64 Yrs	44
Total Males	98
Total Females	85
One Race-White	180
Black of African American	0
American Indian and Alaskan Native	1
Asian	2
Two or More Races	0
Total Households	96
Households with children <18 Yrs.	12
Households with persons >65 Yrs.	33
Average Household Size	1.91
Average Family Size	2.42
Total Housing Units	118
Occupied Housing Units	96
Vacant Housing Units	22
Owner-Occupied Housing Units	78
Renter-Occupied Housing Units	18
Persons Living in Group Quarters	0

Five criteria were used by the Committee to assure a systematic and comprehensive approach to hazard analysis for their individual jurisdictions including: Historical Occurrence, Probability, Magnitude or Severity, Warning Time, and Duration.

The Committee assessed the defined hazards relevant to potential impact on the city. Using the scoring criteria previously defined (Tables 19-22) the city assessed each of the identified hazards based on probability, magnitude/severity, warning time, and duration. The scores for each of the factors were weighted using the formula below to develop the final hazard assessment score.

$$(\text{Probability} \times .45) + (\text{Magnitude/Severity} \times .30) + (\text{Warning Time} \times .15) + (\text{Duration} \times .10) = \text{Final Hazard Assessment Score}$$

Table B2 is the analysis scores for the City of Frederika. As shown in the table, the top four hazards for the city are: River flooding, Thunderstorm/Lightning/Hail, Tornado/Windstorm, and Severe Winter Storm.

TABLE B2: CITY OF FREDERIKA'S HAZARD RISK ASSESSMENT						
Hazard Rank	Hazard	Probability	Magnitude/ Severity	Warning Time	Duration	Hazard Score
1	River Flooding	3	3	1	3	2.7
2	Thunderstorm/Lightning/Hail	3	2	2	3	2.55
2	Tornado/Windstorm	2	3	3	3	2.55
2	Severe Winter Storm	3	2	2	3	2.55
5	Flash Flood	2	2	4	1	2.2
6	Animal/Plant/Crop Disease	3	1	1	2	2
7	Transportation Incident	2	2	1	1	1.75
8	Extreme Heat	2	1	1	3	1.65
8	Landslide	2	1	1	3	1.65
10	Infrastructure Failure	1	2	1	3	1.5
11	Grass/Wild Fire	1	2	1	2	1.4
12	Drought	1	1	1	4	1.3
12	Earthquake	1	1	1	4	1.3
12	Human Disease	1	1	1	4	1.3
15	Dam / Levee Failure	1	1	1	3	1.2
15	Expansive Soils	1	1	1	3	1.2
15	Sinkholes	1	1	1	3	1.2
15	HAZMAT Incident	1	1	1	3	1.2
15	Radiological Incident	1	1	1	3	1.2
15	Terrorism	1	1	1	3	1.2

Disaster frequency and its effects or severity are important as a basis for planning emergency response and mitigation. Natural hazards tend to reoccur on a predictable seasonal basis, whereas manmade or technological events tend to change over time with advancement in technology and methods of operation. Five criteria were used by the Committee to assure a systematic and comprehensive approach to hazard analysis for their individual jurisdictions included: Historical Occurrence, Probability, Vulnerability, Maximum Geographic Extent, Severity of Impact, and Speed of Onset. Due to recent disasters and events that have impacted the planning area, Frederika determined that even though the historical occurrences were low for certain hazards, the probability ranking for future occurrences should be higher.

Table B2 is the analysis scores for the City of Frederika. As seen in Table B2, the top natural hazards (using the analysis scores) for Frederika are Severe Winter Storms and Thunderstorms and Lightning.

Vulnerability – Identifying Assets (Critical Facilities)

This section will describe the vulnerability for existing and future buildings, infrastructure, and critical facilities in those areas that can be impacted by the prioritized hazards. Since the majority of the hazards have an undefined hazard area (i.e., affecting an entire community or larger area) the following vulnerability assessment will only address those hazards that affect a specified area – flooding (river and flash). However, due to the historical occurrences of thunderstorms and lightning, and tornadoes, this hazard was added to the assessment. The following discussion only considers the assets in the community of Frederika.

Identifying the location of critical facilities and designated shelters (see Table B3) in Frederika is important in order to assess their vulnerability to hazards since these facilities are important to the community’s operations and are key components of the economic sector. For instance, high-density residential or commercial development, schools, police stations, government buildings, hospitals and care facilities, airports, gas stations, hardware stores, grocery stores, and water supply systems.

It is important to know the threats each hazard poses to these facilities. *Attachment 6C* illustrates the location of identified critical facilities throughout the city.

The highest risk of mass injury and/or casualty would be in homes without basements, inhabited by the elderly and/or those with small children. The Frederika Haven is a small apartment complex for families and is the only multi-family complex in the city.

While there are no facilities officially designated as shelters, there are two local churches and City Hall could also be used in an emergency.

According available data, Frederika is projected to see a decrease in population over the next thirty years. This population decrease most likely result in a lesser need for additional critical facilities such as schools, daycare centers, or healthcare centers. However, the need for more critical facilities should be closely monitored these next 5-years and readdressed when this HMP is updated.

TABLE B3: CRITICAL FACILITIES IN FREDERIKA	
St. John’s Lutheran Church (Shelter)	Frederika Methodist Church (Shelter)
City Hall (Shelter)	Fire Station
Wastewater Treatment Plant	Farmer’s Co-op
<i>Source: Community</i>	

TABLE B4: CITY OF FREDERIKA 100-YEAR FLOODPLAIN PROPERTIES	
Number of Structures	9
Building Value	\$ 239,660
Dwelling Value	\$ 62,000
Total Value	\$ 301,660
<i>Source: INRCOG & Bremer County Assessor</i>	

Flooding

A facility vulnerable to flooding is normally low, since these structures are not often constructed within the 100-year floodplain. According to the information provided, bridges and roadways was be impacted by flooding. This disruption in the transportation infrastructure would create a longer time period to receive and provide services and supplies to an area if a bridge was washed away due to flooding.

Approximately 64 acres of land is located within the 100-year floodplain. Table B4 provides a breakdown for those acres. As shown on *Attachment 5C: Flood Scenario Map of City*, the eastern portion of the community is along the Wapsipinicon River. According to the data provided by INRCOG, Bremer County, and FEMA, there is approximately 215 acres of land within the 100-year floodplain. As shown on *Attachment 5C: Flood Scenario Map of the City*, this land is along the Wapsipinicon River on the west side of the community. Much of the community is located outside the floodplain to the east. However, flash flooding within the built areas of the community can cause property and potential injuries if the flash flood event is large. Measures should be taken to ensure problematic areas are dealt with to reduce future flash flooding events. According the *Flood Scenario Map*, there is one dwelling and 8 buildings located within the identified floodplain. The total value of these structures is given in Table B4. Using the average household size figure (2.07) from the 2000 Census for Frederika, approximately 2 people are living in dwellings within the floodplain.

Tornadoes

As stated on the FEMA website²³, mobile homes are highly vulnerable to tornadoes. Even mobile homes that are tied down, offer little protection from tornadoes.

According to Census, there are no mobile homes located in Frederika. General observation would suggest a recent increase in the number of manufactured homes in the area. This increased popularity has the potential to increase the potential risk of damage to people and property in the community. Currently, no FEMA certified tornado safe shelters are known to exist in the community.

The primary reason for the increased popularity of mobile and manufactured homes is affordability. Although HUD regulations and local building codes have increased the safety components of these types of houses significantly in recent history, this affordability has often been accompanied with a reduced level of safety. Based on national data on circumstance of tornado fatalities between 1985 and 1997, it was found that 38% of fatalities were occupants of mobile or manufactured homes, 27% were in permanent homes, 11% in vehicles, 9% outdoors (open), 4% in businesses, 4% in structures with long-span roofs, and 2% in schools. These data highlight the high exposure of occupants of mobile and manufactured homes (*AR State Hazard Mitigation Plan, 1999*).

²³ Federal Emergency Management Agency (FEMA), <http://www.fema.gov/areyouready/tornadoes.shtm>

Nursing homes or skilled living centers are also highly vulnerable to tornadoes. These facilities are designed for caring for the elderly population, majority of which use wheelchairs or other assistance devices, limiting mobility. Also, the majority of nursing homes are constructed as a single-level building with or without basements. Therefore, additional attention needs to be taken to ensure the safety of the residents and employees before, during, and after a tornado event.

Vulnerability – Social Assets (Populations)

The social vulnerability assessment identified how the hazards affect the population of Frederika and it is assumed that the identified populations are more likely to require assistance during times of disaster; therefore, are considered, generally speaking, more “at-risk” than the remaining population. The “at-risk” population must be identified and targeted in successful mitigation efforts. Table B5 presents an overview of the at-risk population in Frederika according to information retrieved from the 2000 U.S. Census and Iowa Data Center.

TABLE B5: CITY OF FREDERIKA “AT-RISK” POPULATION	
	2010
Total Community Population (2010)	183
Elderly (65 yrs and older)	58
Youth (under 18 yrs old)	32
Householder Living Alone	35
Non-English Speaking Population (speaks English less than ‘very well’)	0
Population Living in Poverty	26
Population in Mobile Homes	0
Group Quarters Population	0
Source: U.S. Census, 2000 and Iowa Data Center	

According to Table B5, 32% of rural residents are 65 years and older. There are no persons in the community living in group quarters. As mentioned previously, nursing homes and similar institutions are vulnerable to tornados, as well as other hazards.

Persons under the age of 18 are also at higher risk during some disasters. This is mostly due to the fact that young persons often are not aware of the proper actions to take in the event of a disaster. In addition, very young children would be more susceptible to a disaster such as a disease epidemic simply due to their age. In 2000, there was 17% of Frederika’s total population under the age of 18.

In addition, persons living in mobile homes, also known as manufactured housing may also be at risk from tornadoes or high winds. At the time of the 2000 Census, there were no mobile homes in the city.

As mentioned earlier, approximately 64 acres of Frederika are highly vulnerable to floods (within the 100-year floodplain) along the Wapsipinicon River. Flooding puts the entire population at some level of risk, whether through the flooding of their homes, businesses, or places of employment, or the road, sewer, and water infrastructure that serve them daily. High floodwaters can devastate homeowners with property damage, property loss, and extensive, time-consuming cleanup. Secondary effects caused by flooding can add to the property damage. Power loss can leave citizens without heat or air conditioning for extended periods of time. The transportation infrastructure of the community can be impacted by flooding events, which can endanger citizens attempting to travel or evacuate the area, as well as leave those remaining without goods and services.

Persons living in the 100-year floodplain are also at risk of sustaining personal injury or property damage. As mentioned previously, there is one dwelling within the 100-year floodplain. In a worst case scenario, if the identified dwelling was flooded and using the average persons per household, 2.07, approximately 2 persons could be living in the floodplain.

Vulnerability – Estimating Potential Property Losses

Valuations are an important component of hazard mitigation planning inasmuch as it provides measurable data that can be used to form some type of estimate as to the potential losses a community could face in the event of a catastrophic disaster.

The valuations for the City of Frederika are available from the County Assessors and Auditors offices. City of Frederika's property valuations are in Table B6.

TABLE B6: CITY OF FREDERIKA'S VALUATION AS OF JANUARY 1, 2010		
	Total Valuation	Average Valuation per Unit or Parcel
Residential Property	\$ 7,801,530	\$ 82,121 per unit
Commercial Property	\$ 689,440	\$ 86,180 per unit
Industrial Property	\$ 38,180	\$ 19,090 per unit
Agricultural Buildings	\$ 69,680	\$ 69,680 per unit
Agricultural Land	\$ 106,680	\$ 1,189 per acre
Utilities	\$ 151,134	n/a
Railroads	n/a	n/a
Exemptions (military)	\$ 40,744	n/a
Gross Valuation	\$ 8,856,644	n/a
Total Net Valuation	\$ 8,815,900	n/a

Source: City of Frederika & Bremer County Assessor

Future Development

Future development within identified hazard areas can change the threat level of an area by placing critical facilities, businesses, transportation networks, utilities, and populations within vulnerable areas. While it can be difficult to curb development in the planning area, it is the jurisdiction's advantage to be aware of development trends in order to successfully mitigation future hazards as risks increase. However, continued conformity with the State Building Codes and local land use ordinances and regulations (zoning, subdivision, floodplain management, etc.) will help to mitigate the effects hazards have on new and future development.

National Flood Insurance Program/Repetitive Loss Properties

The city participates in the National Flood Insurance Program (NFIP) and has a flood ordinance in place. As Table B7 shows, there are currently two NFIP policies in place within the city.

FEMA defines a repetitive loss property as an insurable building that has experienced two losses in a 10-year period in which each loss is \$1,000 or more. According to FEMA's data, Frederika participates in the National Flood Insurance Program. However, Frederika does not have any repetitive loss properties.

TABLE B7: NFIP AND REPETITIVE LOSS DATA FOR FREDERIKA							
CID #	# of NFIP Policies	NFIP Insurance in Force (\$)	Total # of RLB	RLB Insured	# of Active RLB	Total RLB Losses (\$)	RLB Losses Insured (\$)
190027	2	\$210,000	0	0	0	\$0	\$0

Source: Federal Emergency Management Agency (FEMA); Note: RLB = Repetitive Loss Building; NFIP data current as of 9/30/2016; Repetitive loss data current as of 11/30/2014

This HMP attempts to reduce loss by identifying potential natural and manmade hazards. As a result of many natural and manmade hazards, repairs and reconstruction area often completed in a way that returns the structure to pre-disaster condition yet does little to prevent a reoccurrence of damage. Replication of the pre-disaster conditions allows for the repetitive cycle of property damage, reconstruction, and re-damage. Hazard mitigation is needed to ensure that such cycles are broken, that post-disaster repairs and reconstruction are analyzed, and sound, less vulnerable conditions are produced. Additionally, other mitigation strategies may be considered, such as voluntary property buy-outs.

MITIGATION STRATEGY

Hazard Mitigation Plan Goals

The hazard mitigation plan goals were reviewed by the Hazard Mitigation Planning Committee at their second committee meeting. The committee set as a priority the development of broad-based goals that would address a multitude of hazards and encompass a variety of mitigation activities. The hazard mitigation plan goals identified are as follows:

1. Reduce the chance of and impact of flooding in the community.
2. Take measures to minimize the occurrence of injuries and loss of life due to hazards.
3. Take measures to minimize or eliminate damages that may occur as a result of hazards.
4. Increase the city's ability to respond to natural disasters and man-made hazards.
5. Return to the community to similar or improved pre-event conditions as quickly as possible following a disaster event.
6. Incorporate the City Plan into the proposed Multi-Jurisdictional Plan.
7. Continually re-assess and re-evaluate the plan and mitigation activities.

Current Mitigation Actions

Prevention Mitigation Actions

The City of Frederika has several planning and regulatory ordinances to assist with prevention mitigation. Table B7 summarizes these documents.

TABLE B7: FREDERIKA'S CURRENT PLANNING AND REGULATORY DOCUMENTS								
Previous HMP	Comprehensive Plan	Building Code	Zoning Ordinance	Subdivision Regulations	Floodplain Management Ordinance	Tree-Trimming Ordinance	Storm Water Ordinance	Snow Removal Ordinance
No	No	No	No	No	Yes	Yes	Yes	Yes

Source: Community

Property Protection Mitigation Actions

None

Public Education & Awareness Mitigation Actions

Information regarding how to protect citizens in the event of a tornado or other weather event is largely publicized in the form of flyers, radio, newspaper, and television announcements. The City of Frederika provides basic safety information for various hazard events (i.e., tornados) and what to do before, during, and after an event.

Natural Resource Protection Mitigation Actions

Frederika currently has no natural resource protection mitigation activities.

Emergency Services Mitigation Actions

Warning Systems & Communication

Frederika currently does not have a warning siren to notify the public of potentially dangerous weather conditions. Volunteer fire and local law enforcement personnel serve as weather spotters. Frederika also utilizes early warning communication methods via pagers, hand-held radios, cellular and land-line telephones, and local radio and television media. Frederika also participates in E-911 Emergency Assistance.

Frederika works with the Bremer County Emergency Management Coordinator, based out of the City of Waverly, on various safety and emergency events. The Emergency Management Coordinator works in conjunction with local fire, rescue, police, and government officials to draft and implement workable emergency action plans in the community. The current Emergency Management Coordinator is Kip Ladage and current contact information is as follows: Bremer County Emergency Management Agency, 111 4th St. NE, Bremer-Waverly LEC, Waverly, Iowa 50677, (319) 352-0133, email: kladage@co.bremer.ia.us

Fire Department

The city currently operates a small, all-volunteer fire department. The number of volunteers serving the city and equipment used is not currently available.

Law Enforcement Department

Frederika does not have an established police force and currently contracts with the Bremer County Sheriff for law enforcement.

HAZMAT

Frederika contracts with Northeast Iowa Response Group for response to hazardous material spills. The Northeast Iowa Response Group is a division of Waterloo Fire Rescue as is the Hazardous Materials Regional Training Center. The Training Center provides training to fire departments and companies from around the state and country. Not only is this a training center it also serves as a hazardous materials quick response unit to Black Hawk County, surrounding counties, and many municipalities in a ten county region. The Unit provides local fire departments with hazard materials emergency procedures thus reducing additional contamination. An evacuation plan is also in place in conjunction with the activities with the local department. Contact information for the facility is as follows: Hazardous Materials Regional Training Center, 1925 Newell Street, Waterloo, Iowa 50707, Phone: (319) 291-4275, Toll Free: (800) 291-4682, Fax: (319) 291-4285

The jurisdictions also partners the Northeast Iowa Response Group for assistance in responding to any methamphetamine labs located in the city limits. The Response Group assists the Police Departments in containment of the site and disposal of the hazardous chemicals.

Public Works / Streets Department

The city currently operates a small public works department. The number of employees serving the city and equipment used is not currently available.

Ambulance and First Responders

The city currently operates a small, all-volunteer ambulance service. The number of volunteers serving the city and equipment used is not currently available.

Medical Facilities

There are currently no medical facilities within the community.

Structural Projects Mitigation Actions

None

Future Mitigation Actions

While the existing mitigation activities discussed above detail the City's efforts to mitigate hazards when possible and to respond to hazards in a timely and efficient manner, the Committee also recognizes that there are many more mitigation activities and projects that would benefit county residents. Thus, the Committee developed a list of future hazard mitigation activities that, if accomplished, would serve to further reduce the risk of hazards to the community. The list may include a combination of projects the Committee feels the community should try to accomplish and mitigation efforts that are ongoing that the Committee view as vital to the continued well-being of the public.

The Committee analyzed the potential mitigation activities. This analysis included a discussion of the potential benefits of implementing the activity, some hurdles that the community may face in implementing the action step, and the drawbacks of implementation. The analysis utilized the STAPLEE feasibility criteria. The STAPLEE technique is a FEMA suggested method of evaluation. The STAPLEE approach assesses both positive and negative impacts on the following aspects of a county: Social, Technical, Addministrative, Political, Legal, Economic, and Environmental. Based on this analysis, each activity was ranked as High (H), Medium (M) or Low (L). However, not all identified activities are applicable to all jurisdictions and is marked as such in Table B9.

Funding

Although in the long-term hazard mitigation actions will save money by avoiding the loss of lives or property damages, in the short-term each action will have an associated cost. The City will rely heavily on local funding sources to fulfill most of the plan obligations; however, they will also seek funds from State and Federal agencies for both pre- and post-disaster mitigation activities.

The estimated cost(s) for each mitigation action, program, or project is either: Minimal, Low, Moderate, or High depending upon various factors.

- Minimal: Cost estimate is \$10,000 or less based on using current staff, time commitment, continuous of current duties, proposed action/program/project, and funding sources.
- Low: Cost estimate for project range from \$10,001 - \$99,999 based on existing proposed treatment, time commitment, any further study that is needed, and level of engineering, and project components (permits, acquisition, coordination, etc.).
- Moderate : Cost estimate for project range from \$100,000 - \$299,999 based on existing conditions, time commitment, proposed action/program/project, any further study that is needed, and level of engineering, and project components (permits, acquisition, coordination, etc.), and funding sources.
- High : Cost estimate for project range is \$300,000 or higher based on existing conditions, time commitment, proposed action/ program/project, any further study that is needed, and level of engineering, project components (permits, acquisition, coordination, etc.), and funding sources.

Implementation Strategy

Once the Committee identified and ranked the future hazard mitigation activities, the activities were then analyzed. In addition, the Committee identified a time line for each activity, identified the responsible party (ies) for each activity and finally related each activity to at least one of the five Hazard Mitigation Plan Goals listed above. Table B9 below is the City of Frederika's Implementation Strategy.

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TABLE B9: CITY OF FREDERIKA'S IMPLEMENTATION STRATEGY

Priority	Mitigation Action/Program/Project	Associated Hazard	Primary Agency Responsible for Implementation	Date for Completion	Estimated Cost (s)	Funding Source
Education/Public Awareness						
H	Educate the public	All	City Council, Staff	On-Going	Minimal	Local
H	Notify the media on shelter locations	Severe Winter Storm, Extreme Heat, Tornado	City Council	On-Going	Minimal	Local
H	Encourage use of Iowa One call before digging	Communications Failure, Explosion	City Council, Staff	On-Going	Minimal	Local
H	Encourage residents to keep smoke detectors, sprinkler systems and fire extinguishers maintained in their homes	Fire	City Council	On-Going	Minimal	Local
H	Educate the public on maintaining their sump pumps	Flash Flood	City Council	On-Going	Minimal to low	Local
H	Encourage the public to receive vaccinations	Disease	City Council	On-Going	Minimal	Local
H	Encourage the use of proper materials and construction techniques	Expansive Soils	City Council, Fire Department	On-Going	Low to Moderate	Local
H	Set a designated number of people to be trained in post-disaster record keeping/damage assessments	Emergency Management	City Council	On-Going	Minimal	Local
M	Encourage utility providers and developers to place all utilities underground	Severe Winter Storm, Communications Failure, Thunderstorm/Lightning	City Council	On-Going	Minimal	Local
M	Encourage and maintain enrollment in emergency notification system	Thunderstorm/Lightning, Windstorm, Tornado, Communication Failure	City Council, Staff	On-Going	Moderate	Local, State
M	Encourage home owners to keep emergency kits	Windstorm, Tornado	City Council	On-Going	Minimal	Local
M	Encourage community to plant shade trees	Extreme Heat	City Council	On-Going	Minimal	Local
M	Educate city personnel to identify risk areas	Expansive Soils	City Council, Zoning Administrator	On-Going	Minimal	Local
M	Educate city personnel to handle a sinkhole situation	Sinkholes	Public Works	On-Going	Minimal to Low	Local
M	Inform the public of reputable and ill reputable contractors following disasters	Emergency Management	City Council, Staff	On-Going	Minimal	Local
L	Encourage lead based paint and asbestos removal	HAZMAT	City Council	On-Going	Minimal	Local
Emergency Services						
H	Continue training and education for fire departments, law enforcement agencies and ambulance crew personnel	All	City Council	On-Going	Moderate	Local
H	Purchase emergency signs to be used in case of an incident	Transportation	City staff	On-Going	Minimal	Local
H	Maintain and update emergency response plans	Emergency Management	City Council, staff	On-Going	Minimal to Low	Local
H	Maintain lists of personnel and equipment available to use with response plans	Emergency Management	City Council	On-Going	Minimal	Local
M	Maintain and acquire materials and equipment for fire departments, law enforcement agencies and ambulance crew personnel	All	City Council	On-Going	Moderate	Local
M	Provide emergency shelters for evacuees	All	City Council	On-Going	Low	Local

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M	Determine locations for potential heating shelters and volunteer organization	Severe Winter Storm	City Council	On-Going	Minimal	Local
M	Maintain storm spotter training for local fire departments/deputies and EMS crews	Thunderstorm/Lightning, Windstorm, Tornado, Hailstorm	City Council, City Staff	On-Going	Minimal	Local
M	Make available a cleanup crew for after a storm	Thunderstorm/Lightning	City Council, Staff	On-Going	Minimal	Local
M	Acquire necessary response and detection equipment for city/county employees	HAZMAT	City Council, Police	On-Going	Minimal	Local
M	Maintain or install GPS units in all emergency service and city/county vehicles	Communications Failure	City Council, Staff	On-Going	Minimal	Local
M	Maintain automatic TTY TDD machines for emergency personnel and city/county employees	Communications Failure	City Council	On-Going	Minimal	Local
M	Enhance Standard Operating Procedures for dissemination of information/press releases in the event of a disaster	Communications Failure	City Council, EMA	On-Going	Minimal	Local
M	Continue training and promotion of the Incident Command System	Communications Failure	City Council, School Board	On-Going	Minimal	Local
M	Complete continuity of government plan	Communications Failure	City Council	On-Going	Minimal	Local
M	Maintain list of county emergency contacts	Communications Failure	Staff	On-Going	Minimal	Local
M	Develop and maintain staging area for dumping during cleanup	River Flood	City Council	On-Going	Minimal	Local
L	Maintain list of potential translators to be called upon in case of an emergency	Communications Failure	City Council	On-Going	Minimal	Local
Natural Resource Protection						
H	Monitor wells in areas of identified contamination	Groundwater Contamination	City Council	On-Going	Low	Local
H	Monitor the drinking water supply	Groundwater Contamination, Disease	City Council	On-Going	Low	Local
H	Follow monitoring requirements set forth by the Iowa DNR	Groundwater Contamination	City Council, Public Works	On-Going	Moderate	Local, Federal
M	Maintain and/or develop a wellhead protection program	Groundwater Contamination	City Council	On-Going	Minimal	Local
M	Identify and map areas of past contamination	Groundwater Contamination	City Council	On-Going	Low	Local
M	Maintain and/or develop storm water management program	Groundwater Contamination, Flash Flood	City Council, City Staff	On-Going	Moderate	Local
M	Carry out conservation measures such as erosion control and work with the following organizations: Extension, NRCS, Farm Bureau, EPA, DNR, and Soil and water Conservation District	Groundwater Contamination	City Council	On-Going	Low	Local, State, Federal
M	Restrict water usage should it be necessary	Drought	City Council	On-Going	Minimal	Local
M	Plant trees along water bodies and slopes	Landslides/Mudflows	City Council, Staff	On-Going	Minimal	Local
M	Clear ditches, streams, and waterways on a regular basis	River Flood	City Council, Staff	On-Going	Minimal	Local
L	Eliminate and cap private and abandoned wells in the city	Groundwater Contamination	City Council, Public Works	On-Going	Low	Local
L	Eliminate the use of septic tank systems in the city	Groundwater Contamination	City Council, Public Works	On-Going	Low	Local, State

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	limits					
L	Purchase additional parkland in order to increase greens space and reducing surface flow	River Flood	City Council	On-Going	Minimal	Local
Prevention						
H	Maintain mutual aid agreements	All	City Council	On-Going	Minimal	Local
H	Purchase and maintain backup generators	Severe Winter Storm, Thunderstorm/Lightning, Tornado, Emergency Management	City Council	On-Going	Moderate	Local
H	Maintain mutual aid agreements with the Northeast Iowa response Group	HAZMAT	City Council	On-Going	Minimal to Low	Local, State
H	Keep HAZMAT manuals/information current and easily accessible	HAZMAT	City Council	On-Going	Minimal	Local
H	Maintain, test, and replace warning sirens	Windstorm, Tornado, Hailstorm, Thunderstorm/Lightning, Communications Failure	City staff	On-Going	Minimal	Local
H	Encourage backup power generation for local telephone systems and cellular operations	Communications Failure	City Council	On-Going	Moderate	Local
H	Upgrade radio communications equipment as needed	Communications Failure	City Council, Staff	On-Going	Minimal	Local
H	Regularly review and amend fire and medical HAZMAT response standard operating procedures	Communications Failure	City Staff	On-Going	Minimal	Local
H	Keep the county updated on personnel changes	Communications Failure	All City Departments	On-Going	Minimal	Local
H	Continue cooperation between county roads department and local fire departments during snow emergencies	Severe Winter Storm	City Staff, Council	On-Going	Minimal	Local
H	Establish alternative transportation routes should a road need to be closed	Transportation	City Council	On-Going	Minimal	Local
H	Identify fallout shelter locations	Radiological/Nuclear Event	City Council	On-Going	Minimal	Local
H	Keep communication lines open with Nuclear Plant in Palo, IA	Radiological/Nuclear Event	City Council	On-Going	Minimal	Local
H	Provide fans and/or cooling shelter	Extreme Heat	City Council, Public Works	On-Going	Minimal	Local
H	Maintain air conditioner(s) in community buildings	Extreme Heat	City Council	On-Going	Minimal	Local
H	Keep a supply of drinking water to distribute	Extreme Heat	City staff	On-Going	Minimal to Low	Local
H	Cooperate with any countywide mass vaccination plan	Disease	City Council	On-Going	Minimal	Local
H	Monitor disease outbreak news from the CDC and Iowa Department of Public Health	Disease	City Council, Fire Department	On-Going	Low	Local
H	Establish detour routes	Bridge Failure, Flash Flood, River Flood	Police	On-Going	Minimal to Low	Local
H	Establish transportation evacuation routes and protocols	River Flood	City Council	On-Going	Minimal	Local
H	Continue cooperation with county in developing flood mitigation efforts	Flash Flood, River Flood	City Council	On-Going	Minimal	Local
H	Maintain communication with county contacts	Emergency Management	Building and Zoning	On-Going	Minimal	Local

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H	Maintain NIMS compliance	Emergency Management	City Council	On-Going	Minimal	Local
M	Purchase NOAA weather radios	Thunderstorm/Lightning, Windstorm, Tornado, Radiological/Nuclear Event	City Council, Fire Department	On-Going	Minimal	Local
M	Provide a local hazardous waste dropoff site	HAZMAT	City Council, Police	On-Going	Minimal	Local
M	Identify areas throughout the county that would substantially benefit from outdoor warning sirens	Windstorm, Tornado	County EMA	On-Going	Minimal to Low	Local
M	Seek to improve communications with other agencies	Communications Failure, Terrorism	City Council, Staff	On-Going	Minimal	Local
M	Keep supply of backup radios and cellphones	Communications Failure	City Council	On-Going	Minimal	Local
M	Stockpile sand and sandbags	Flash Flood, River Flood	City Council	On-Going	Minimal	Local
M	Maintain and improve signals/signage along roadways and at railroad crossings	Transportation	City Council	On-Going	Minimal	Local
M	Enforce no parking designations at special events	Transportation	City Council	On-Going	Minimal	Local
M	Develop rationing procedures	Drought	City Council	On-Going	Minimal	Local
M	Enforce the local zoning ordinances	Landslides/Mudflows	City Council, Police	On-Going	Minimal	Local
M	Develop sandbagging procedures for the community	River Flood	City Council, Staff	On-Going	Minimal	Local
L	Maintain public works equipment	Severe Winter Storm	City Council	On-Going	Minimal	Local
L	Enforce sidewalk clearance ordinance	Severe Winter Storm	City Council	On-Going	Minimal	Local
L	Backup all digital data	Thunderstorm/Lightning	Staff	On-Going	Minimal	Local
L	Place alarms on storage facilities containing hazardous materials	Hazardous Materials (HAZMAT)	City Council	On-Going	Minimal	Local
L	Maintain law enforcement monitoring of large storage supplies	HAZMAT	City Council	On-Going	Minimal	Local
L	Improve standard operating procedures for schools	Communications Failure	Fire Department	On-Going	Minimal	Local
L	Maintain and update anti-virus software	Terrorism	City Council	On-Going	Low	Local
L	Secure vulnerable targets, as identified by the LEPC and County EMA with alarms, security cameras and fences	Terrorism	City Council	On-Going	Minimal	Local, State, Federal
L	Purchase a new tanker and/or pumper	Fire, Explosion	City staff	On-Going	Minimal	Local
L	Enforce a curfew	Riot/Violent Demonstration	Public Works	On-Going	Minimal to Low	Local
L	Update flood maps/flood studies for areas throughout the county	River Flood	City Council	On-Going	Minimal	Local
L	Continue working with the Bremer County Recovery Coalition	Flash Flood, River Flood	City Council, Staff	On-Going	Minimal	Local
L	Encourage all communities to participate in their Local Emergency Planning Commission (LEPC)	Emergency Management	City Council, Staff	On-Going	Minimal	Local
Property Protection						
H	Continue enforcement of city sump pump discharge ordinance	Thunderstorm/Lightning	Fire Department	On-Going	Minimal	Local
H	Continue fire prevention program	Fire	City Council	On-Going	Low to Moderate	Local,
H	Maintain membership in the NFIP	Flash Flood, River Flood	City Staff	On-Going	Minimal	Local
H	Maintain, enforce and update floodplain ordinance	Flash Flood, River Flood	City Council, Staff	On-Going	Minimal	Local
H	Initiate and enforce burn ban in times of drought or as needed	Grass/Wildfire, Drought	City Council	On-Going	Minimal	Local

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H	Initiate and enforce burn ban in times of drought or as needed	Drought	City Council	On-Going	Minimal	Local
H	Place barricades to close dangerous bridges	Bridge Failure	Public Works	On-Going	Minimal to Low	Local
H	Secure the area (around a sinkhole)	Sinkholes	City Council	On-Going	Minimal to Low	Local
H	Inspect any utility lines that are near a sinkhole	Sinkholes	City Council	On-Going	Minimal to Low	Local
M	Maintain tree trimming program	Severe Winter Storm, Windstorm, Hailstorm	City Council	On-Going	Minimal	Local
M	Placement of lighting arrestors on power lines	Thunderstorm/Lightning	City Council, EMA	On-Going	Minimal to Low	Local
M	Continue an annual inspection program for commercial and industrial properties	Fire	City Council	On-Going	Minimal	Local
M	Review and update fire codes as necessary	Fire, Explosion	City Council, Staff	On-Going	Low	Local
M	Identify and inventory potential sinkhole sites	Sinkholes	Police, Fire Department	On-Going	Minimal to Low	Local
L	Install a snow fence around the wastewater treatment facility	Severe Winter Storm	City Council	On-Going	Minimal	Local
L	Maintain use of snow fences in the city/county	Severe Winter Storm	City Staff	On-Going	Minimal	Local
L	Use surge protectors to prevent electrical damage to critical and sensitive equipment	Thunderstorm/Lightning	Staff	On-Going	Minimal	Local
L	Identify, purchase and remove structures from flood hazard areas	Flash Flood, River Flood	City Council, Staff	On-Going	Moderate	Local, Federal
L	Purchase additional trash pumps	Flash Flood, River Flood	City Council, staff	On-Going	Low	Local
L	Continue to cooperate with pipeline owners and operators to ensure locations are marked	Fire, Explosion	City staff	On-Going	Low	Local
L	Encourage floodproofing/elevating structures in the floodplain	River Flood	City Council, Staff	On-Going	Minimal	Local
Structural Projects						
H	Maintain a list of potential storm sewer projects	Thunderstorm/Lightning	City Council	On-Going	Minimal	Local
H	Acquire more water pumps	Flash Flood, River Flood, Dam Failure, Levee Failure	City Staff	On-Going	Minimal	Local
H	Continue with improvement to the storm water system	Flash Flood	City Staff	On-Going	Minimal	Local
H	Maintain and keep storm drains clear of debris	Flash Flood	Fire Department, Public Works	On-Going	Minimal	Local
H	Maintain pump station	River Flood	City Council, Staff	On-Going	Minimal	Local
M	Construct or designate a safe room or storm shelter	Windstorm, Tornado, Hailstorm	City Council, Fire Department	On-going	Minimal	Local
M	Pursue partnership with rural water as the system expands	Fire, Explosion	Staff	On-Going	Minimal to Low	Local
M	Improve water system to enhance firefighting capacity/ability	Fire	City Council, Staff	On-Going	Minimal	Local
M	Install tiling to help water move away from structures	Expansive Soils	City Council, Police	On-Going	Minimal to Low	Local
M	Continue regular bridge inspections	Bridge Failure	Public Works	On-Going	Minimal to Low	Local
M	Maintain embargos/weight limits as necessary	Bridge Failure	City Council	On-Going	Minimal to Low	Local, State
M	Encourage construction of dikes, levees, dams, and retention ponds	River Flood	City Council, Public Works	On-Going	Minimal	Local
M	Regularly inspect dams	Dam Failure	City Council	On-Going	Minimal	Local
L	Prevent inflow and infiltration into the sanitary sewer	Flash Flood, River Flood	City Council	On-Going	Minimal	Local, State

L	Identify bridges and culverts than can cost effectively be reengineered to reduce future flooding	River Flood	City Council	On-Going	Minimal	Local
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APPENDIX C: CITY OF JANESVILLE

COMMUNITY PROFILE

Location

Janesville is located in southwest Bremer County (with a small portion within Black Hawk County), in the northeastern quadrant of Iowa, at latitude 42.64 N x longitude 92.46 W and elevations ranging from 950 to 1,020.

Natural Environment

The city is bisected by the Cedar River, which flows from north to south, with the east side of the community having been developed earlier. U.S. Highway 218 is the primary transportation route to and from the City of Janesville. The city is situated approximately 4.5 miles north-northwest of the Waterloo/Cedar Falls metropolitan area and approximately three miles south of the City of Waverly. These distances are calculated from city limit lines as opposed to developed area measurements.

History

Janesville was incorporated in 1854, five years after its founder John T. Barrick laid out the area. Janesville is the oldest town in Bremer County. The land that Janesville is located on is part of 17,780 acres that was purchased from the Sauk and Fox Indians in 1842.

In 1849, John Barrick and his family moved from Sturgis Falls (now known as Cedar Falls) up the Cedar River to an undeveloped area that would eventually become the City of Janesville. According to historical accounts, at times there were as many as 1,700 Indian warriors who made camp next to the Barrick farmstead. Barrick, who was a carpenter by trade, is credited with building the first mill in Bremer County and the first farmhouse in Janesville. Barrick had aspirations of making Janesville the Bremer County seat, but land grabbing by political figures in Black Hawk County dashed his hopes. However, Barrick took solace in the fact that he was able to name the city after his beloved wife, Jane.

TABLE C1: CITY OF JANESVILLE DEMOGRAPHICS

Government Framework	Mayor – City Council
General Population, 2010 Census	
Total Population	930
Median Age	40.2
At-Risk Population, <18 Yrs	225
At-Risk Population, >64 Yrs	175
Total Males	461
Total Females	469
One Race-White	915
Black or African American	6
American Indian and Alaskan Native	0
Asian	2
Two or More Races	7
Housing Characteristics, 2010 Census	
Total Households	398
Households with children <18 Yrs.	116
Households with persons >65 Yrs.	126
Average Household Size	2.34
Average Family Size	2.90
Total Housing Units	409
Occupied Housing Units	398
Vacant Housing Units	11
Owner-Occupied Housing Units	324
Renter-Occupied Housing Units	74
Persons Living in Group Quarters	0

The first schoolhouse in the City of Janesville was built in 1851. It was a log cabin and the first classes were taught by Reverend S.T. Vail

As a means of proportion, the largest single disaster to have ever struck the City of Janesville occurred in 1856. That year an epidemic of typhoid fever spread throughout the community and eventually claimed approximately one third of the population of the city.

The City of Janesville experienced a substantial change when, between the years of 1993 and 1995, U.S. Highway 218 was rebuilt to expressway status. This stretch of highway now provides four lane access from the City of Janesville to points in the neighboring larger communities of Waverly (to the north) and the Waterloo/Cedar Falls metropolitan area (to the south). The highway has also been designated/marketed as the “Avenue of the Saints”, which is a 600 mile corridor extending from the north side of St. Paul Minnesota to the south side of St. Louis, Missouri. From a development standpoint, perhaps the largest impact that the completed expressway may have in the future is the easy access to the federal Interstate system.

While the community no doubt serves as a residential midpoint for the larger surrounding communities, they also maintain their own manufacturing base. Furthermore, the town boasts a successful school system, and a surviving central business district.

Demographics

Population

Janesville’s demographic data is outlined in Tables C1 and C1.1. In the recent 2010 U.S. Census, Janesville’s population grew to 930, an increase of 12 percent over ten years. The previous U.S. Census, taken in 2000, recorded a population figure of 829 for Janesville. Much of the data included in the tables are from the 2000 U.S. Census, since detailed data from the 2010 Census is not yet available.

Community Services

The City of Janesville has a municipal water supply with an elevated storage capacity of 200,000 gallons with an average capacity of 75,000 gallons. The rated capacity of the overall system is 480,000 gallons per day (gpd). The peak demand is 90,000 gpd.

A primary sewer treatment plant serves Janesville. Average load is 100,000 (gpd) with a peak load of 150,000 (gpd). The rated capacity of the sewer treatment plant is 165,000 gpd and is more than sufficient to handle Janesville’s current development as well as future development.

TABLE C1.1: CITY OF JANESVILLE DEMOGRAPHICS	
<i>Economics Characteristics, 2010-2014 ACS</i>	
Population 16 years and over	718
Population In Labor Force (16 yrs and over)	513
Persons Employed	481
Persons Unemployed	32
Persons Employed in Management, Business, Science, and Arts Occupations	102
Persons Employed in Service Occupations	106
Persons Employed in Sales and Office Occupations	102
Persons Employed in Natural Resources, Construction, and Maintenance Occupations	36
Persons Employed in Production, Transportation, and Material Moving Occupations	135
Median Household Income	\$53,542
Median Family Income	\$57,498
Percent of Persons < 18 yrs. Below Poverty Level	2.9%
Percent of Persons 18-64 Yrs. Below Poverty Level	2.3%
Percent of Persons >65 Yrs. Below Poverty Level	7.1%
<i>Social Characteristics, 2010-2014 ACS</i>	
School Enrollment (3 yrs and over)	244
Nursery School, Preschool	12
Kindergarten and Elementary School (grades 1-8)	109
High School (grades 9-12)	67
College or Graduate School	46
Education Attainment: Population 25 Years and Over	600
Less than High School Graduate	31
High School Graduate (includes equivalency)	234
Some College, Associate’s Degree	214
Bachelor’s Degree or Higher	121

Table C2 shows the primary utility providers for the city.

TABLE C2: JANESVILLE UTILITY PROVIDERS						
Electric	Natural Gas	Telephone/Internet	Cable	Water	Sewer	Sanitation
MidAmerican Energy		Windstream	Windstream	City of Janesville	City of Janesville	City of Janesville

HAZARDS & RISK ASSESSMENT

Hazard Analysis

Section 3 identified and profiled the hazards for the entire planning area. However, each community analyzed their own vulnerability to those hazards applicable to their jurisdiction. Using the methodology outlined in Section 3 (Vulnerability Assessment), the City of Janesville evaluated the risk associated with a specific hazard, defined by probability and frequency of occurrence, magnitude, severity, exposures, and consequences. Janesville's vulnerability assessment provides in-depth knowledge of the hazards and vulnerabilities that affect the community. This analysis provides an all-hazard approach when evaluating the hazards of that affect the city, and the associated risks and impacts each hazard presents. As mentioned previously in Section 3, the vulnerability assessment requires a five-year review with periodic updates, as needed. Potential future hazards and impacts may result from changing technology, new critical facilities, infrastructures, and development patterns, as well as demographic and socioeconomic changes that occur within or outside the area.

Disaster frequency and its effects or severity are important as a basis for planning emergency response and mitigation. Natural hazards tend to reoccur on a predictable seasonal basis, whereas manmade or technological events tend to change over time with advancement in technology and methods of operation. Five criteria were used by the Committee to assure a systematic and comprehensive approach to hazard analysis for their individual jurisdictions including: Historical Occurrence, Probability, Magnitude or Severity, Warning Time, and Duration.

The Committee assessed the defined hazards relevant to potential impact on the city. Using the scoring criteria previously defined (Tables 19-22) the city assessed each of the identified hazards based on probability, magnitude/severity, warning time, and duration. The scores for each of the factors were weighted using the formula below to develop the final hazard assessment score.

$$(\text{Probability} \times .45) + (\text{Magnitude/Severity} \times .30) + (\text{Warning Time} \times .15) + (\text{Duration} \times .10) = \text{Final Hazard Assessment Score}$$

Table C3 is the analysis scores for the City of Janesville. As shown in the table, the five hazards for the city are: Infrastructure Failure, Thunderstorm/Lightning/Hail, Radiological Incident, Tornado/Windstorm, and Transportation Incident.

TABLE C3: CITY OF JANESVILLE HAZARD RISK ASSESSMENT						
Hazard Rank	Hazard	Probability	Magnitude/ Severity	Warning Time	Duration	Hazard Score
1	Infrastructure Failure	1	4	4	4	2.65
2	Thunderstorm/Lightning/Hail	2	3	4	1	2.50
3	Radiological Incident	1	3	4	4	2.35
4	Tornado/Windstorm	2	2	4	1	2.20
4	Transportation Incident	3	2	1	1	2.20
6	River Flooding	2	2	1	3	1.95
6	Severe Winter Storm	2	2	1	3	1.95
8	Grass/Wild Land Fire	1	1	4	4	1.75
8	Sinkholes	1	1	4	4	1.75
8	Drought	2	1	1	4	1.75
11	Dam / Levee Failure	1	1	4	3	1.65
11	Landslide	1	1	4	3	1.65
11	HAZMAT Incident	1	1	4	3	1.65
11	Extreme Heat	2	1	1	3	1.65
11	Flash Flood	2	1	1	3	1.65
16	Terrorism	1	1	4	2	1.55
17	Human Disease	1	1	1	4	1.30
18	Animal/Plant/Crop Disease	1	1		4	1.15
19	Earthquake	1	1	1	1	1.00
19	Expansive Soils	1	1	1	1	1.00

Vulnerability – Identifying Assets (Critical Facilities)

This section will describe the vulnerability for existing and future buildings, infrastructure, and critical facilities in those areas that can be impacted by the prioritized hazards. Since the majority of the hazards have an undefined hazard area (i.e., affecting an entire community or larger area) the following vulnerability assessment will only address those hazards that affect a specified area – flooding (river and flash). However, due to the historical occurrences of tornadoes, this hazard was added to the assessment. The following discussion only considers the assets in the community only.

Identifying the location of critical facilities and designated shelters (see TableC3) in Janesville is important in order to assess their vulnerability to hazards since these facilities are important to the community’s operations and are key components of the economic sector. For instance, high-density residential or commercial development, schools, police stations, government buildings, hospitals and care facilities, airports, gas stations, hardware stores, grocery stores, and water supply systems. It is important to know the threats each hazard poses to these facilities. *Attachment 6D* illustrates the location of identified critical facilities throughout the city.

According to available data, Janesville is projected to see an increase in population over the next thirty years. This population increase most likely result in a greater need for additional critical facilities such as schools, daycare centers, or healthcare centers. However, the need for more critical facilities should be closely monitored these next 5-years and readdressed when this HMP is updated.

Flooding

A facility vulnerable to flooding is normally low, since these structures are not often constructed within the 100-year floodplain. According to the information provided, bridges and roadways was be impacted by flooding. This disruption in the transportation infrastructure would create a longer time period to receive and provide services and supplies to an area if a bridge was washed away due to flooding.

Table C4 lists the number properties in Janesville that are located within the 100-year floodplain. According to staff map analysis, Janesville has 32 dwellings and approximately 76 persons living within the flood hazard area (estimating using 2000 Census Average Household Size Data). According to the data provided by INRCOG and Bremer County, there are 55 structures located within the 100-year floodplain. See *Attachment 5D: Flood Scenario Map of the City* and Table C4.

TABLE C3: CRITICAL FACILITIES IN JANESVILLE	
Janesville Library	City Hall
Fire Station	Wastewater Treatment Plant
Janesville Community School (Shelter)	Janesville Methodist Church (Shelter)
Messiah Lutheran Church (shelter)	Ohler Pump (shelter)
Source: Community	

TABLE C4: CITY OF JANESVILLE 100-YEAR FLOODPLAIN PROPERTIES	
Number of Structures	55
Building Value	\$ 1,682,070
Dwelling Value	\$ 1,022,460
Total Value	\$ 2,704,530
Source: INRCOG & Bremer County Assessor (2011 \$)	

Tornadoes

As stated on the FEMA website²⁴, mobile homes are highly vulnerable to tornadoes. Even mobile homes that are tied down, offer little protection from tornadoes.

According to Census information, there are 27 mobile homes located in Janesville. General observation would suggest a recent increase in the number of manufactured homes in the area. This increased popularity has the potential to increase the potential risk of damage to people and property in the community. Currently, no FEMA certified tornado safe shelters are known to exist in the community.

The primary reason for the increased popularity of mobile and manufactured homes is affordability. Although HUD regulations and local building codes have increased the safety components of these types of houses significantly in recent history, this affordability has often been accompanied with a reduced level of safety. Based on national data on circumstance of tornado fatalities between 1985 and 1997, it was found that 38% of fatalities were occupants of mobile or manufactured homes, 27% were in permanent homes, 11% in vehicles, 9% outdoors (open), 4% in businesses, 4% in structures with long-span roofs, and 2% in schools. These data highlight the high exposure of occupants of mobile and manufactured homes (*AR State Hazard Mitigation Plan, 1999*).

Vulnerability – Social Assets (Populations)

The social vulnerability assessment identified how the hazards affect the population of Janesville and it is assumes that the identified populations are more likely to require assistance during times of disaster; therefore, are considered, generally speaking, more “at-risk” than the remaining population. The “at-risk” population must be identified and targeted in successful mitigation efforts. Table C5 presents an overview of the at-risk population in Janesville according to information retrieved from the 2000 U.S. Census and Iowa Data Center.

According to Table C5, 14% of Janesville residents are 65 years and older. There are no persons in the community living in group quarters.

Persons under the age of 18 are also at higher risk during some disasters. This is mostly due to the fact that young persons often are not aware of the proper actions to take in the event of a disaster. In addition, very young children would be more susceptible to a disaster such as a disease epidemic simply due to their age. In 2000, there was 20% of the county’s total population under the age of 18.

TABLE C5: CITY OF JANESVILLE “AT-RISK” POPULATION	
	2010
Total City Population (2010)	930
Elderly (65 yrs and older)	132
Youth (under 18 yrs old)	188
Householder Living Alone	90
Non-English Speaking Population (speaks English less than ‘very well’)	2
Population Living in Poverty	29
Population in Mobile Homes	53
Group Quarters Population	0
Persons with Disabilities (age 5+)	184
Source: U.S. Census, 2000 and Iowa Data Center	

²⁴ Federal Emergency Management Agency (FEMA), <http://www.fema.gov/areyouready/tornadoes.shtml>

In addition, persons living in mobile homes, also known as manufactured housing may also be at risk from tornadoes or high winds brought on by thunderstorms. At the time of the 2000 Census, there were 27 mobile homes in the city. Using the 2000 Census sampling data, there are 53 people residing in mobile homes in Janesville.

Flooding

Portions of Janesville are highly vulnerable to floods. Flooding puts the entire population at some level of risk, whether through the flooding of their homes, businesses, or places of employment, or the road, sewer, and water infrastructure that serve them daily. High floodwaters can devastate homeowners with property damage, property loss, and extensive, time-consuming cleanup. Secondary effects caused by flooding can add to the property damage. Power loss can leave citizens without heat or air conditioning for extended periods of time. The transportation infrastructure of the community can be impacted by flooding events, which can endanger citizens attempting to travel or evacuate the area, as well as leave those remaining without goods and services.

Relying on aerial map analysis, Janesville has approximately 76 persons located in the flood hazard area. Populations living in the 100-year floodplain are also at risk of sustaining personal injury or property damage. As mentioned previously, there are 32 dwellings in the community within the 100-year floodplain. In a worst case scenario, if all the identified dwellings were flooded and using the average persons per household, 2.38, approximately 76 persons could be living in the floodplain.

Vulnerability – Estimating Potential Property Losses

Valuations are an important component of hazard mitigation planning insomuch as it provides measurable data that can be used to form some type of estimate as to the potential losses a community could face in the event of a catastrophic disaster.

The valuations for the City of Janesville are available from the County Assessors and Auditors offices. City of Janesville’s property valuations are in Table C6. Future Development

Future development within identified hazard areas can change the threat level of an area by placing critical facilities, businesses, transportation networks, utilities, and populations within vulnerable areas. While it can be difficult to curb development in the planning area, it is the jurisdiction’s advantage to be aware of development trends in order to successfully mitigation future hazards as risks increase. However, continued conformity with the State Building Codes and local land use ordinances and regulations (zoning, subdivision, floodplain management, etc.) will help to mitigate the effects hazards have on new and future development.

TABLE C6: CITY OF JANESVILLE’S VALUATION		
	Total Valuation	Average Valuation per Unit or Parcel
Residential Property	\$ 34,511,080	\$ 119,416 /parcel
Commercial Property	\$ 2,055,990	\$ 85,666/unit
Industrial Property	\$ 2,566,320	\$ 427,720/unit
Agricultural Buildings	\$ 288,020	\$ 96,007/unit
Agricultural Land	\$ 199,500	\$ 926/acre
Utilities, G & E	\$ 1,088,955	N/A
Railroads	\$ 54,598	N/A
Exemptions (military)	\$ 137,048	N/A
Gross Valuation	\$ 40,764,463	N/A
Total Valuation	\$ 40,627,415	
<i>Source: Bremer County Assessor, as of 1/1/2010</i>		

National Flood Insurance Program/Repetitive Loss Properties

The city participates in the National Flood Insurance Program (NFIP) and has a flood ordinance in place. As Table C7 shows, there are three NFIP policies in place within the city.

FEMA defines a repetitive loss property as an insurable building that has experienced two losses in a 10-year period in which each loss is \$1,000 or more. There is one repetitive loss property in the city.

River flooding is the most common cause of repetitive loss in Bremer County. According to the FEMA NFIP Policy Statistics, as of 3/31/2017 no NFIP policies were in force within the City of Janesville. The City does not have any repetitive loss properties.

This HMP attempts to reduce loss by identifying potential natural and manmade hazards. As a result of many natural and manmade hazards, repairs and reconstruction area often completed in a way that returns the structure to pre-disaster condition yet does little to prevent a reoccurrence of damage. Replication of the pre-disaster conditions allows for the repetitive cycle of property damage, reconstruction, and re-damage. Hazard mitigation is needed to ensure that such cycles are broken, that post-disaster repairs and reconstruction are analyzed, and sound, less vulnerable conditions are produced. Additionally, other mitigation strategies may be considered, such as voluntary property buy-outs.

MITIGATION STRATEGY

Hazard Mitigation Plan Goals

The hazard mitigation plan goals were reviewed by the Hazard Mitigation Planning Committee at their second committee meeting. The committee set as a priority the development of broad-based goals that would address a multitude of hazards and encompass a variety of mitigation activities. The hazard mitigation plan goals identified are as follows:

1. Reduce the chance of and impact of flooding in the community.
2. Take measures to minimize the occurrence of injuries and loss of life due to hazards.
3. Take measures to minimize or eliminate damages that may occur as a result of hazards.
4. Increase the city's ability to respond to natural disasters and man-made hazards.
5. Return to the community to similar or improved pre-event conditions as quickly as possible following a disaster event.
6. Incorporate the City Plan into the proposed Multi-Jurisdictional Plan.
7. Continually re-assess and re-evaluate the plan and mitigation activities.

Current Mitigation Actions

Prevention Mitigation Actions

The City of Janesville has and enforces a Flood Plain Ordinance. In accordance with NFIP guidelines, the ordinance does not allow for new construction within the floodplain without approval from the Department of Natural Resources and the Janesville City Council. In addition, it requires those structures within the floodway fringe to: (a.) “be adequately anchored to prevent flotation, collapse or lateral movement of the structure”; (b.) “use construction methods and practices that will minimize flood damage” and; (c) “use construction materials and utility equipment that are resistant to flood damage.”

The Federal Insurance Administration manages the insurance component of the NFIP, and works closely with FEMA’s Mitigation Directorate, which oversees the floodplain management aspect of the program. Janesville remains in good standing with the National Flood Insurance Program.

Table C7 summarizes Janesville’s preventive mitigation actions.

TABLE C7: CURRENT PLANNING AND REGULATORY DOCUMENTS FOR JANESVILLE								
Previous HMP	Comprehensive Plan	Building Code	Zoning Ordinance	Subdivision Regulations	Floodplain Management Ordinance	Tree-Trimming Ordinance	Storm Water Ordinance	Snow Removal Ordinance
Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes

Source: City, Note: RR=Restricted Residential

Property Protection Mitigation Actions

Janesville has not participated in any buyout program. However, the city participates in the National Flood Insurance Program and remains in good standing. Nonstructural methods of flood protection in the form of land use regulations are being utilized to aid in the prevention of future flood damage. The city provides sandbags to citizens wishing to make personnel efforts to preserve their property during high water events. No other flood protection measures are known to exist within the city.

Public Education and Awareness Mitigation Actions

Information regarding protecting oneself is highly publicized in flyers, billboards, and on the radio.

Emergency Services Mitigation Actions

Janesville works with the Bremer County Emergency Management Coordinator, based out of the City of Waverly, on various safety and emergency events. The Emergency Management Coordinator works in conjunction with local fire, rescue, police, and government officials to draft and implement workable emergency action plans in the community. The current Emergency Management Coordinator is Kip Ladage and current contact information is as follows: Bremer County

Emergency Management Agency, 111 4th St. NE, Bremer-Waverly LEC, Waverly, Iowa 50677, (319) 352-0133, email: kladage@co.bremer.ia.us

Law Enforcement

Police protection is provided by the Janesville Police Department, Black Hawk County Sheriff's Department, Bremer County Sheriff's Department, and the Iowa State Patrol. Currently, there are two full time officers and one part time officer on staff in the Janesville Police Department.

The Police Department is created as an executive branch of the City Government by City Ordinance.

The approach of the Janesville Police Department is intended to be proactive rather than reactive, with police managers anticipating events through planning, and delivering a whole range of police services to the community.

Fire Protection

The Janesville Fire Department is a volunteer force that currently includes 25 members and has six vehicles to protect the community. The vehicles currently owned and operated by the department include the following:

- 2000 Pierce Tanker
- 2010 Class A Pumper
- 1987 Chevy Mini-Pumper
- 2011 Tanker (2000 Gallon Capacity)
- 1990 Dodge 4x4 Grass Rig

The Department takes pride in being an efficient, well-trained, and equipped organization. It provides fire and rescue services from one main station, which is connected to the City Library and City Hall. The fire department has in place 28E agreements with surrounding communities to provide and receive assistance as needed on a mutual aid basis. The communities that the Janesville Volunteer Fire Department maintains 28E agreements include all communities in Black Hawk and Bremer Counties and Waterloo HAZMAT Response Team.

In addition to firefighting services, the department provides light rescue service, vehicle rescue, operations hazmat, structure fire suppression, and grass fire suppression.

Ambulance

The city currently operates a small ambulance service, but the number of volunteers serving the city and equipment used is not available at this time.

Medical Facilities

December of 2015, the new Janesville Clinic opened in the city. Prior to this clinic, no primary care facility existed within the city. The 3,400 square foot clinic is part of the Waverly Health Center network. The clinic is part of a new 23-acre development in the northeast quadrant of the city and is conveniently located less

than 0.25 miles off of Highway 218.

HAZMAT

Janesville contracts with Northeast Iowa Response Group for response to hazardous material spills. The Northeast Iowa Response Group is a division of Waterloo Fire Rescue as is the Hazardous Materials Regional Training Center. The Training Center provides training to fire departments and companies from around the state and country. Not only is this a training center it also serves as a hazardous materials quick response unit to Black Hawk County, surrounding counties, and many municipalities in a ten-county region. The Unit provides local fire departments with hazard materials emergency procedures thus reducing additional contamination. An evacuation plan is also in place in conjunction with the activities with the local department.

Contact information for the facility is as follows: Hazardous Materials Regional Training Center, 1925 Newell Street, Waterloo, Iowa 50707, Phone: (319) 291-4275, Toll Free: (800) 291-4682, Fax: (319) 291-4285

The jurisdictions also partners the Northeast Iowa Response Group for assistance in responding to any methamphetamine labs located in the city limits. The Response Group assists the Police Departments in containment of the site and disposal of the hazardous chemicals.

Public Works / Street Department

The City of Janesville contracts for snow removal. The Town Council oversees all snow removal and ice prevention. The city does employ a small public works department for routine maintenance of city property. Information on the number of employees and equipment used is not available at this time.

Natural Resource Protection Mitigation Actions

Janesville does not have nor done any natural resource protection mitigation actions.

Structural Projects Mitigation Actions

Janesville does not have nor done any structural projects.

Future Mitigation Actions

While the existing mitigation activities discussed above detail the city's efforts to mitigate hazards when possible and to respond to hazards in a timely and efficient manner, the Committee also recognizes that there are many more mitigation activities and projects that would benefit county residents. Thus, the Committee developed a list of future hazard mitigation activities that, if accomplished, would serve to further reduce the risk of hazards to the community. The list may include a combination of projects the Committee feels the community should try to accomplish and mitigation efforts that are ongoing that the Committee view as vital to the continued well-being of the public.

The Committee analyzed the potential mitigation activities. This analysis included a discussion of the potential benefits of implementing the activity, some

hurdles that the community may face in implementing the action step, and the drawbacks of implementation. The analysis utilized the STAPLEE feasibility criteria. The STAPLEE technique is a FEMA suggested method of evaluation. The STAPLEE approach assesses both positive and negative impacts on the following aspects of a county: Social, Technical, Aministrative, Political, Legal, Economic, and Environmental. Based on this analysis, each activity was ranked as High (H), Medium (M) or Low (L). However, not all identified activities are applicable to all jurisdictions and is marked as such in Table C10.

Funding

Although in the long-term hazard mitigation actions will save money by avoiding the loss of lives or property damages, in the short-term each action will have an associated cost. The City will rely heavily on local funding sources to fulfill most of the plan obligations; however, they will also seek funds from State and Federal agencies for both pre- and post-disaster mitigation activities.

The estimated cost(s) for each mitigation action, program, or project is either: Minimal, Low, Moderate, or High depending upon various factors.

- Minimal: Cost estimate is \$10,000 or less based on using current staff, time commitment, continuous of current duties, proposed action/program/project, and funding sources.
- Low: Cost estimate for project range from \$10,001 - \$99,999 based on existing proposed treatment, time commitment, any further study that is needed, and level of engineering, and project components (permits, acquisition, coordination, etc.).
- Moderate : Cost estimate for project range from \$100,000 - \$299,999 based on existing conditions, time commitment, proposed action/program/project, any further study that is needed, and level of engineering, and project components (permits, acquisition, coordination, etc.), and funding sources.
- High : Cost estimate for project range is \$300,000 or higher based on existing conditions, time commitment, proposed action/ program/project, any further study that is needed, and level of engineering, project components (permits, acquisition, coordination, etc.), and funding sources.

Implementation Strategy

Once the Committee identified and ranked the future hazard mitigation activities, the activities were then analyzed. In addition, the Committee identified a time line for each activity, identified the responsible party (ies) for each activity and finally related each activity to at least one of the five Hazard Mitigation Plan Goals listed above. Table C9 below is the City of Janesville's Implementation Strategy.

TABLE C9: CITY OF JANESVILLE'S IMPLEMENTATION STRATEGY

Priority	Mitigation Action/Program/Project	Associated Hazard	Primary Agency Responsible for Implementation	Date for Completion	Estimated Cost (s)	Funding Source
Education/Public Awareness						
H	Educate the public	All	City Council, Staff	On-Going	Minimal	Local
H	Notify the media on shelter locations	Severe Winter Storm, Extreme Heat, Tornado	City Council	On-Going	Minimal	Local
H	Keep HAZMAT manuals/information current and easily accessible	HAZMAT	City Council	On-Going	Minimal	Local
H	Encourage use of Iowa One call before digging	Communications Failure, Explosion	City Council, Staff	On-Going	Minimal	Local
H	Encourage residents to keep smoke detectors, sprinkler systems and fire extinguishers maintained in their homes	Fire	City Council, Fire Department	On-Going	Minimal	Local
H	Encourage the public to receive vaccinations	Disease	City Council, County	On-Going	Minimal	Local
H	Educate city personnel to identify risk areas	Expansive Soils	City Council	On-Going	Low	Local
H	Inform the public of reputable and ill reputable contractors following disasters	Emergency Management	City Council	On-Going	Minimal	Local
M	Encourage lead based paint and asbestos removal	HAZMAT	City Staff	On-Going	Minimal	Local
M	Encourage and maintain enrollment in emergency notification system	Thunderstorm/Lightning, Windstorm, Tornado, Communication Failure	City Council	On-Going	Low	Local
M	Encourage home owners to keep emergency kits	Windstorm, Tornado	City Staff	On-Going	Minimal	Local
M	Educate the public on maintaining their sump pumps	Flash Flood	City Council, Fire Department	On-Going	Minimal	Local
M	Encourage community to plant shade trees	Extreme Heat	City Council	On-Going	Minimal	Local
Emergency Services						
H	Continue training and education for fire departments, law enforcement agencies and ambulance crew personnel	All	City Council	On-Going	Moderate	Local
H	Maintain and acquire materials and equipment for fire departments, law enforcement agencies and ambulance crew personnel	All	City Council	On-Going	Moderate	Local
H	Provide emergency shelters for evacuees	All	City Council	On-Going	Minimal	Local
H	Maintain storm spotter training for local fire departments/deputies and EMS crews	Thunderstorm/Lightning, Windstorm, Tornado, Hailstorm	Fire Department	On-Going	Minimal	Local
H	Enhance Standard Operating Procedures for dissemination of information/press releases in the event of a disaster	Communications Failure	City Council, Schools	On-Going	Minimal	Local
H	Maintain list of county emergency contacts	Communications Failure	City Council, Staff	On-Going	Minimal	Local
H	Set a designated number of people to be trained in post-disaster record keeping/damage assessments	Emergency Management	City Council	On-Going	Minimal	Local

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H	Maintain and update emergency response plans	Emergency Management	City Council, Staff	On-Going	Minimal	Local
H	Maintain lists of personnel and equipment available to use with response plans	Emergency Management	City Council, Public Works	On-Going	Minimal to Low	Local
M	Make available a cleanup crew for after a storm	Thunderstorm/Lightning	City Council, Staff	On-Going	Minimal	Local
M	Continue training and promotion of the Incident Command System	Communications Failure	City Council, EMA	On-Going	Minimal	Local
M	Keep a supply of drinking water to distribute	Extreme Heat	City Council, Staff	On-Going	Minimal	Local
M	Cooperate with any countywide mass vaccination plan	Disease	City Council, County	On-Going	Minimal	Local
L	Maintain list of potential translators to be called upon in case of an emergency	Communications Failure	Bremer County EMA, Staff	On-Going	Minimal	Local
L	Maintain or install GPS units in all emergency service and city/county vehicles	Communications Failure	Staff	On-Going	Minimal	Local
L	Maintain automatic TTY TDD machines for emergency personnel and city/county employees	Communications Failure	Bremer County EMA, Staff	On-Going	Low	Local
L	Complete continuity of government plan	Communications Failure	City Council	On-Going	Minimal	Local
Natural Resource Protection						
H	Maintain and/or develop a wellhead protection program	Groundwater Contamination	City Council	On-Going	Low	Local
H	Monitor wells in areas of identified contamination	Groundwater Contamination	City Council	On-Going	Low	Local
H	Monitor the drinking water supply	Groundwater Contamination, Disease	City Council, Public Works	On-Going	Low	Local
H	Identify and map areas of past contamination	Groundwater Contamination	City Council, City Staff	On-Going	Minimal	Local
H	Maintain and/or develop storm water management program	Groundwater Contamination, Flash Flood	City Council, Public Works	On-Going	Low	Local
H	Eliminate and cap private and abandoned wells in the city	Groundwater Contamination	City Council, Public Works	On-Going	Low	Local
H	Follow monitoring requirements set forth by the Iowa DNR	Groundwater Contamination	City Council	On-Going	Low	Local
H	Restrict water usage should it be necessary	Drought	City Council	On-Going	Minimal	Local
H	Clear ditches, streams, and waterways on a regular basis	River Flood	Public Works	On-Going	Minimal	Local
M	Eliminate the use of septic tank systems in the city limits	Groundwater Contamination	City Council	On-Going	Moderate	Local, Federal
M	Carry out conservation measures such as erosion control and work with the following organizations: Extension, NRCS, Farm Bureau, EPA, DNR, and Soil and water Conservation District	Groundwater Contamination	City Council	On-Going	Low	Local, State, Federal
M	Plant trees along water bodies and slopes	Landslides/Mudflows	City Council, Staff	On-Going	Minimal	Local
L	Purchase additional parkland in order to increase greens space and reducing surface flow	River Flood	City Council, Staff	On-Going	Moderate	Local

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Prevention						
H	Maintain mutual aid agreements	All	City Council	On-Going	Minimal	Local
H	Determine locations for potential heating shelters and volunteer organization	Severe Winter Storm	Bremer County EMA, City Council	On-Going	Minimal	Local
H	Purchase and maintain backup generators	Severe Winter Storm, Thunderstorm/Lightning, Tornado, Emergency Management	City Council	On-Going	Low	Local
H	Maintain public works equipment	Severe Winter Storm	City Council	On-Going	Low	Local
H	Purchase NOAA weather radios	Thunderstorm/Lightning, Windstorm, Tornado, Radiological/Nuclear Event	City Council	On-Going	Minimal	Local
H	Place alarms on storage facilities containing hazardous materials	Hazardous Materials (HAZMAT)	City Council	On-Going	Minimal	Local
H	Maintain law enforcement monitoring of large storage supplies	HAZMAT	City Council, Police	On-Going	Minimal	Local
H	Maintain mutual aid agreements with the Northeast Iowa response Group	HAZMAT	City Council, Fire Department	On-Going	Minimal to Low	Local
H	Maintain, test, and replace warning sirens	Windstorm, Tornado, Hailstorm, Thunderstorm/Lightning, Communications Failure	Staff, EMA	On-Going	Minimal to Low	Local
H	Upgrade radio communications equipment as needed	Communications Failure	City Council, Staff	On-Going	Minimal to Low	Local
H	Regularly review and amend fire and medical HAZMAT response standard operating procedures	Communications Failure	City Staff	On-Going	Minimal	Local
H	Seek to improve communications with other agencies	Communications Failure, Terrorism	City Council, Staff	On-Going	Minimal	Local
H	Keep the county updated on personnel changes	Communications Failure	All City Departments	On-Going	Minimal	Local
H	Continue cooperation between county roads department and local fire departments during snow emergencies	Severe Winter Storm	City Staff, Council	On-Going	Minimal	Local
H	Pursue partnership with rural water as the system expands	Fire, Explosion	City Council, Staff	On-Going	Minimal to Low	Local
H	Maintain and update anti-virus software	Terrorism	Staff	On-Going	Minimal	Local
H	Secure vulnerable targets, as identified by the LEPC and County EMA with alarms, security cameras and fences	Terrorism	City Council, Fire Department, Police	On-Going	Minimal	Local
H	Provide fans and/or cooling shelter	Extreme Heat	City Council, Staff	On-Going	Minimal	Local
H	Develop rationing procedures	Drought	City Council	On-Going	Minimal	Local
H	Establish detour routes	Bridge Failure, Flash Flood, River Flood	City Council	On-Going	Minimal to Low	Local
H	Update flood maps/flood studies for areas throughout the county	River Flood	City Council, Staff	On-Going	Minimal	Local
H	Establish transportation evacuation routes and	River Flood	City Council, Police	On-Going	Minimal	Local

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	protocols					
H	Develop sandbagging procedures for the community	River Flood	City Council, Fire Department	On-Going	Minimal	Local
H	Develop and maintain staging area for dumping during cleanup	River Flood	City Council, Staff	On-Going	Minimal	Local
H	Continue cooperation with county in developing flood mitigation efforts	Flash Flood, River Flood	City Council, Staff	On-Going	Minimal	Local
H	Continue working with the Bremer County Recovery Coalition	Flash Flood, River Flood	City Council	On-Going	Minimal	Local
H	Encourage all communities to participate in their Local Emergency Planning Commission (LEPC)	Emergency Management	City Council, Staff	On-Going	Minimal	Local
H	Maintain communication with county contacts	Emergency Management	City Council	On-Going	Minimal	Local
H	Maintain NIMS compliance	Emergency Management	City Council, Fire Department	On-Going	Minimal	Local
M	Acquire necessary response and detection equipment for city/county employees	HAZMAT	City Council	On-Going	Minimal	Local
M	Provide a local hazardous waste dropoff site	HAZMAT	City Council	On-Going	Minimal	Local
M	Identify areas throughout the county that would substantially benefit from outdoor warning sirens	Windstorm, Tornado	Staff, EMA	On-Going	Minimal to Low	Local
M	Improve standard operating procedures for schools	Communications Failure	City Council, Schools, Staff	On-Going	Minimal	Local
M	Keep supply of backup radios and cellphones	Communications Failure	Bremer County EMA, City	On-Going	Minimal	Local
M	Stockpile sand and sandbags	Flash Flood, River Flood	City Council	On-Going	Minimal	Local
M	Maintain and improve signals/signage along roadways and at railroad crossings	Transportation	Police Department	On-Going	Minimal	Local
M	Establish alternative transportation routes should a road need to be closed	Transportation	Fire Department, Police	On-Going	Minimal	Local
M	Purchase emergency signs to be used in case of an incident	Transportation	City Council	On-Going	Low	Local
M	Enforce no parking designations at special events	Transportation	City Council, Police	On-Going	Minimal	Local
M	Keep communication lines open with Nuclear Plant in Palo, IA	Radiological/Nuclear Event	City Council	On-Going	Minimal	Local
M	Maintain air conditioner(s) in community buildings	Extreme Heat	City Council	On-going	Minimal	Local
M	Monitor disease outbreak news from the CDC and Iowa Department of Public Health	Disease	City Council, County	On-Going	Minimal	Local
M	Enforce a curfew	Riot/Violent Demonstration	City Council, Police	On-Going	Minimal to Low	Local
M	Enforce the local zoning ordinances	Landslides/Mudflows	City Council, Zoning Admin	On-Going	Minimal to Low	Local
L	Enforce sidewalk clearance ordinance	Severe Winter Storm	City Council	On-Going	Minimal	Local
L	Backup all digital data	Thunderstorm/Lightning	Staff	On-Going	Minimal	Local
L	Identify fallout shelter locations	Radiological/Nuclear Event	City Council	On-Going	Minimal	Local
L	Purchase a new tanker and/or pumper	Fire, Explosion	Council, Fire Dept.	On-Going	Moderate	Local
Property Protection						
H	Use surge protectors to prevent electrical damage to critical and sensitive equipment	Thunderstorm/Lightning	City Council, Staff	On-Going	Minimal	Local
H	Continue an annual inspection program for commercial and industrial properties	Fire	Staff, Council	On-Going	Minimal to Low	Local
H	Continue fire prevention program	Fire	City Council, Fire Department	On-Going	Low to Moderate	Local, State
H	Improve water system to enhance firefighting	Fire	City Council, Fire Department	On-Going	Moderate	Local

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	capacity/ability					
H	Maintain membership in the NFIP	Flash Flood, River Flood	City Staff	On-Going	Minimal	Local
H	Maintain, enforce and update floodplain ordinance	Flash Flood, River Flood	City Staff	On-Going	Minimal	Local
H	Initiate and enforce burn ban in times of drought or as needed	Grass/Wildfire, Drought	Fire Department	On-Going	Minimal	Local
H	Initiate and enforce burn ban in times of drought or as needed	Drought	Fire Department	On-Going	Minimal	Local
H	Encourage the use of proper materials and construction techniques	Expansive Soils	City Staff	On-Going	Minimal	Local
H	Place barricades to close dangerous bridges	Bridge Failure	Public Works	On-Going	Minimal to Low	Local
H	Maintain embargos/weight limits as necessary	Bridge Failure	Public Works	On-Going	Minimal to Low	Local
H	Receive education/training from DOT on the subject	Bridge Failure	City Council	On-Going	Minimal to Low	Local, State
H	Secure the area (around a sinkhole)	Sinkholes	City Council, Police, Fire Dept.	On-Going	Minimal	Local
H	Inspect any utility lines that are near a sinkhole	Sinkholes	City Council, Public Works	On-Going	Minimal	Local
H	Maintain pump station	River Flood	City Council, Public Works	On-Going	Minimal	Local
M	Encourage utility providers and developers to place all utilities underground	Severe Winter Storm, Communications Failure, Thunderstorm/Lightning	City Council	On-Going	Minimal	Local
M	Continue enforcement of city sump pump discharge ordinance	Thunderstorm/Lightning	City Council	On-Going	Minimal	Local
M	Encourage backup power generation for local telephone systems and cellular operations	Communications Failure	Bremer County EMA	On-Going	Moderate	Local, State, Federal
M	Identify, purchase and remove structures from flood hazard areas	Flash Flood, River Flood	City Council, Staff	On-Going	Moderate	Local, Federal
M	Install rip rap around wastewater treatment facility	Flash Flood	All City Departments	On-Going	Minimal	Local
M	Review and update fire codes as necessary	Fire, Explosion	City Council, Fire Dept.	On-Going	Low	Local
M	Continue to cooperate with pipeline owners and operators to ensure locations are marked	Fire, Explosion	City Council	On-Going	Low	Local
M	Identify and inventory potential sinkhole sites	Sinkholes	City Council	On-Going	Minimal to Low	Local
M	Educate city personnel to handle a sinkhole situation	Sinkholes	City Council	On-Going	Minimal to Low	Local
M	Encourage floodproofing/elevating structures in the floodplain	River Flood	All City Departments	On-Going	Minimal	Local
L	Install a snow fence around the wastewater treatment facility	Severe Winter Storm	City Council	On-Going	Minimal	Local
L	Maintain use of snow fences in the city/county	Severe Winter Storm	Public Works	On-Going	Minimal	Local
L	Placement of lighting arrestors on power lines	Thunderstorm/Lightning	City Council	On-Going	Minimal to Low	Local
Structural Projects						
H	Prevent inflow and infiltration into the sanitary sewer	Flash Flood, River Flood	City Council, Fire Department	On-Going	Moderate	Local
H	Continue regular bridge inspections	Bridge Failure	Public Works	On-Going	Minimal to Low	Local
H	Identify bridges and culverts than can cost effectively be reengineered to reduce future flooding	River Flood	City Council, Staff	On-Going	Minimal	Local
H	Regularly inspect dams	Dam Failure	City Council, Staff	On-Going	Minimal	Local
M	Maintain a list of potential storm sewer projects	Thunderstorm/Lightning	City Council	On-Going	Minimal	Local
M	Construct or designate a safe room or storm shelter	Windstorm, Tornado, Hailstorm	City Council	On-going	High	Local, State, Federal

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M	Acquire more water pumps	Flash Flood, River Flood, Dam Failure, Levee Failure	City Staff	On-Going	Minimal to Low	Local
M	Continue with improvement to the storm water system	Flash Flood	City Staff	On-Going	Low to Moderate	Local
M	Maintain and keep storm drains clear of debris	Flash Flood	Fire Department, Public Works	On-Going	Minimal	Local
M	Purchase additional trash pumps	Flash Flood, River Flood	City Council, Fire Department	On-Going	Minimal to Low	Local
M	Install tiling to help water move away from structures	Expansive Soils	City Council, Zoning Administrator	On-Going	Minimal	Local, State
M	Encourage construction of dikes, levees, dams, and retention ponds	River Flood	City Council, Staff	On-Going	Minimal	Local

APPENDIX D: CITY OF PLAINFIELD

COMMUNITY PROFILE

Geography

Plainfield is located in northwest Bremer County, in the northeastern quadrant of Iowa, at latitude 42.84 N x longitude 92.53 W. The majority of Plainfield lies at an elevation of between 940 and 950 feet, *see Attachment 1: Topographic Map of the City*. The Cedar River runs to the east of the community, which is served by two major highways, U.S. Highway 218 and State Highway 188.

The terrain on which Plainfield is built is generally flat topography due to the city's location within a basin. There are very few areas of steeper than normal slope with these being dispersed throughout the community. The highest points of the community lie at approximately 950 feet above sea level.

History

The earliest non-American Indians to settle in the Plainfield area arrived in 1854. Five settlers originally founded the settlement, the first in Polk Township. The Town of Plainfield was platted in 1866, with the Post Office established in the same year. In the two years following the establishment of the Post Office, Plainfield would experience significant development. This included the construction of the first school, the Cedar Falls Minnesota Railroad depot, and a telegraph station.

Plainfield was incorporated in 1895. This was followed shortly thereafter by the establishment of the Plainfield Savings Bank. In 1904 the community hired the first mail carriers that were designated to serve the rural areas outside of Plainfield. Another date of significance was the dedication of the new brick High School and Gymnasium in 1934.

The City of Plainfield has been no stranger to disaster throughout its history, suggesting the importance of hazard mitigation efforts. The history of such events in Plainfield is as follows:

TABLE D1: CITY OF PLAINFIELD DEMOGRAPHICS

Government Framework	Mayor – City Council
General Population, 2010 Census	
Total Population	436
Median Age	37.8
At-Risk Population, <18 Yrs	118
At-Risk Population, >64 Yrs	67
Total Males	219
Total Females	217
Housing Characteristics, 2010 Census	
Total Households	185
Households with children <18 Yrs.	56
Households with persons >65 Yrs.	48
Average Household Size	2.36
Average Family Size	2.90
Total Housing Units	197
Occupied Housing Units	185
Vacant Housing Units	12
Owner-Occupied Housing Units	149
Renter-Occupied Housing Units	36
Persons Living in Group Quarters	0

1871: A large prairie fire burns through the Plainfield area.
 1893: The west side of Main Street is destroyed by fire.
 1905: A tornado of significant strength hits town.
 1918: The Pearl Rock tornado sweeps through town, destroying several
 1936: A major snow storm buries the town, during a record winter for snowfall.
 1943: Downtown Plainfield is destroyed by fire.
 1962-63: Plainfield savings bank is robbed on three occasions.

Demographics

Population

Plainfield's demographic data is outlined in Tables D1 and D1.1. In the recent 2010 U.S. Census, Plainfield's population declined to 436, a decrease of 0.46% percent over ten years. The previous U.S. Census, taken in 2000, recorded a population figure of 438 for Plainfield. Much of the data included in the tables are from the 2000 U.S. Census, since detailed data from the 2010 Census is not yet available.

Community Services

The City of Plainfield has a municipal water supply with an elevated storage capacity of 50,000 gallons with an average capacity of 50,000 gallons. The rated capacity of the overall system is 50,000 gallons per day (gpd). The peak demand is 35,000 gpd.

A primary sewer treatment plant serves Plainfield. Average load is 35,000 (gpd) with a peak load of 40,000 (gpd). The rated capacity of the sewer treatment plant is 50,000 gpd and is more than sufficient to handle Plainfield's current level of development as well as future development.

Table D2 shows the primary utility providers for the city.

TABLE D1.1: CITY OF PLAINFIELD DEMOGRAPHICS	
<i>Economics Characteristics, 2010-2014 ACS</i>	
Population 16 years and over	343
Population In Labor Force (16 yrs and over)	238
Persons Employed	227
Persons Unemployed	11
Persons Employed in Management, Business, Science, and Arts Occupations	44
Persons Employed in Service Occupations	25
Persons Employed in Sales and Office Occupations	60
Persons Employed in Natural Resources, Construction, and Maintenance Occupations	45
Persons Employed in Production, Transportation, and Material Moving Occupations	53
Median Family Income	\$67,083
Mean Family Income	\$67,560
Percent of Persons < 18 yrs. Below Poverty Level	2.8%
Percent of Persons 18-64 Yrs. Below Poverty Level	5.1%
Percent of Persons >65 Yrs. Below Poverty Level	2.5%
School Enrollment (3 yrs and over)	103
Nursery School, Preschool	13
Kindergarten and Elementary School (grades 1-8)	62
High School (grades 9-12)	16
College or Graduate School	12
Education Attainment: Population 25 Years and Over	306
Less than High School Graduate	5.9%
High School Graduate (includes equivalency)	50.7%
Some College, Associate's Degree	20.4%
Bachelor's Degree or Higher	13.1%

TABLE C2: PLAINFIELD UTILITY PROVIDERS						
Electric	Natural Gas	Telephone/Internet	Cable	Water	Sewer	Sanitation
MidAmerican Energy	MidAmerican Energy	Butler-Bremer Communications	Butler-Bremer Communications	City of Plainfield	City of Plainfield	Jendro Sanitation

HAZARDS & RISK ASSESSMENT

Section 3 identified and profiled the hazards for the entire planning area. However, each community analyzed their own vulnerability to those hazards applicable to their jurisdiction. Using the methodology outlined in Section 3 (Vulnerability Assessment), the City of Plainfield evaluated the risk associated with a specific hazard, defined by probability and frequency of occurrence, magnitude, severity, exposures, and consequences. Plainfield's vulnerability assessment provides in-depth knowledge of the hazards and vulnerabilities that affect the community. This analysis provides an all-hazard approach when evaluating the hazards of that affect the city, and the associated risks and impacts each hazard presents.

As mentioned previously in Section 3, the vulnerability assessment requires a five-year review with periodic updates, as needed. Potential future hazards and impacts may result from changing technology, new critical facilities, infrastructures, and development patterns, as well as demographic and socioeconomic changes that occur within or outside the area.

Disaster frequency and its effects or severity are important as a basis for planning emergency response and mitigation. Natural hazards tend to reoccur on a predictable seasonal basis, whereas manmade or technological events tend to change over time with advancement in technology and methods of operation. Five criteria were used by the Committee to assure a systematic and comprehensive approach to hazard analysis for their individual jurisdictions including: Historical Occurrence, Probability, Magnitude or Severity, Warning Time, and Duration.

The Committee assessed the defined hazards relevant to potential impact on the city. Using the scoring criteria previously defined (Tables 19-22) the city assessed each of the identified hazards based on probability, magnitude/severity, warning time, and duration. The scores for each of the factors were weighted using the formula below to develop the final hazard assessment score.

$$\begin{aligned} &(\text{Probability} \times .45) + (\text{Magnitude/Severity} \times .30) + (\text{Warning Time} \times .15) + (\text{Duration} \times .10) \\ &= \text{Final Hazard Assessment Score} \end{aligned}$$

Table C3 is the analysis scores for the City of Plainfield. As shown in the table, the five hazards for the city are Thunderstorm/Lightning/Hail, Severe Winter Storm, River Flooding, Transportation Incident, and Tornado/Windstorm.

TABLE C3: CITY OF PLAINFIELD HAZARD RISK ASSESSMENT						
Hazard Rank	Hazard	Probability	Magnitude/ Severity	Warning Time	Duration	Hazard Score
1	Thunderstorm/Lightning/Hail	4	2	3	1	2.95
2	Severe Winter Storm	4	1	1	3	2.55
3	River Flooding	3	2	1	4	2.50
4	Transportation Incident	3	1	4	1	2.35
5	Tornado/Windstorm	1	3	4	1	2.05
6	Infrastructure Failure	2	1	4	2	2.00
7	Flash Flood	2	1	3	3	1.95
8	Terrorism	1	2	4	2	1.85
9	Human Disease	2	1	2	3	1.80
10	Drought	2	1	1	4	1.75
10	Extreme Heat	2	1	1	4	1.75
12	Radiological Incident	1	3	1	2	1.70
13	HAZMAT Incident	1	1	4	2	1.55
14	Dam / Levee Failure	1	1	3	3	1.50
15	Earthquake	1	1	4	1	1.45
15	Grass/Wild Fire	1	1	4	1	1.45
15	Sinkholes	1	1	4	1	1.45
15	Animal/Plant/Crop Disease	2	1	1	1	1.45
19	Expansive Soils	1	1	1	4	1.30
19	Landslide	1	1	1	4	1.30

Once the Planning Committee had identified and scored the hazards, they examined each hazard in relation to the risk that hazard presented to the community. Hazards were given priority based on the ranking completed in the Hazard Analysis section of the plan. High Risk Hazards scored in the top one third of all hazards, Medium Risk Hazards scored in the middle two thirds, and Low Risk scored in the lower three thirds. Table D2 lists the hazards based on their risk for the City of Plainfield.

Vulnerability – Identifying Assets (Critical Facilities)

This section will describe the vulnerability for existing and future buildings, infrastructure, and critical facilities in those areas that can be impacted by the prioritized hazards. Since the majority of the hazards have an undefined hazard area (i.e., affecting an entire community or larger area) the following vulnerability assessment will only address those hazards that affect a specified area – flooding (river and flash). However, due to the historical occurrences of tornadoes, this hazard was added to the assessment.

Identifying the location of critical facilities and designated shelters (City Hall is the only designated shelter) in Plainfield is important in order to assess their vulnerability to hazards. These critical facilities are important to the operation of a community, quality of life, and the key components of the economic sector. For instance, high-density residential or commercial development, schools, police stations, government buildings, hospitals and care facilities, airports, gas stations, hardware stores, grocery stores, and water supply systems. It is important to know the threats each hazard poses to these facilities. *Attachment 6E* illustrates the location of identified critical facilities throughout Plainfield.

According to available data, Plainfield is projected to see a decrease in population over the next thirty years. This population decrease most likely result in a lesser need for additional critical facilities such as schools, daycare centers, or healthcare centers. However, the need for more critical facilities should be closely monitored these next 5-years and readdressed when this HMP is updated.

Flooding

A facility vulnerable to flooding is normally low, since these structures are not often constructed within the 100-year floodplain. According to the information provided, bridges and roadways was be impacted by flooding. This disruption in the transportation infrastructure would create a longer time period to receive and provide services and supplies to an area if a bridge was washed away due to flooding.

According to the data provided by INRCOG and Bremer County (see Table D4), there are 8 structures with a total assessed value of \$ 151,860 located within the

TABLE D3: CRITICAL FACILITIES IN PLAINFIELD

Nashua-Plainfield Community School (shelter)	Plainfield Methodist Church (shelter)
First Baptist Church (shelter)	Fire Station (shelter)
Farmer's Co-op	Wastewater Treatment Plant
Public Library	Public Works Building
<i>Source: Community</i>	

**TABLE D4: CITY OF PLAINFIELD
100-YEAR FLOODPLAIN PROPERTIES**

Number of Structures	8
Building Value	\$ 151,860
Dwelling Value	\$ 108,270
Total Value	\$ 260,130
<i>Source: INRCOG & Bremer County Assessor (2011 \$)</i>	

100-year floodplain. See *Attachment 5E: Flood Scenario Map of the City*.

Tornadoes

As stated on the FEMA website²⁵, mobile homes are highly vulnerable to tornadoes. Even mobile homes that are tied down, offer little protection from tornadoes.

According to Census information, there are 8 mobile homes (also referred to as manufactured homes) located in the Plainfield. According to 2010 US Census, the average household size in the city was 2.36 persons. Using this information, it is estimated that 19 persons live General observation would suggest a recent increase in the number of manufactured homes in the area. This increased popularity has the potential to increase the potential risk of damage to people and property in the community. Currently, no FEMA certified tornado safe shelters are known to exist in the community.

The primary reason for the increased popularity of mobile and manufactured homes is affordability. Although HUD regulations and local building codes have increased the safety components of these types of houses significantly in recent history, this affordability has often been accompanied with a reduced level of safety. Based on national data on circumstance of tornado fatalities between 1985 and 1997, it was found that 38% of fatalities were occupants of mobile or manufactured homes, 27% were in permanent homes, 11% in vehicles, 9% outdoors (open), 4% in businesses, 4% in structures with long-span roofs, and 2% in schools. These data highlight the high exposure of occupants of mobile and manufactured homes (*AR State Hazard Mitigation Plan, 1999*).

Vulnerability – Social Assets (Populations)

The social vulnerability assessment identified how the hazards affect the population of Plainfield and it is assumed that the identified populations are more likely to require assistance during times of disaster; therefore, are considered, generally speaking, more “at-risk” than the remaining population. The “at-risk” population must be identified and targeted in successful mitigation efforts.

According to Table D5, 15% of residents are 65 years and older. There are no persons living in group quarters.

Persons under the age of 18 are also at higher risk during some disasters. This is mostly due to the fact that young persons often are not aware of the proper actions to take in the event of a disaster. In addition, very young children would be more susceptible to a disaster such as a disease epidemic simply

TABLE D5: CITY OF PLAINFIELD “AT-RISK” POPULATION

	2010
Total City Population (2010)	436
Elderly (65 yrs and older)	67
Youth (under 18 yrs old)	118
Householder Living Alone	52
Non-English Speaking Population (speaks English less than ‘very well’)	0.5%
Population Living in Poverty	4.1%
Population in Mobile Homes	19
Group Quarters Population	0

Source: U.S. Census, 2010, 2010-2014 ACS and Iowa Data Center

²⁵ Federal Emergency Management Agency (FEMA), <http://www.fema.gov/areyouready/tornadoes.shtm>

due to their age. In 2010, there was 27% of the city's total population under the age of 18.

In addition, persons living in mobile homes, also known as manufactured housing may also be at risk from tornadoes or high winds. It is estimated that there are 14 mobile homes in the city. Based on the average household size (2.36) it is estimated that there are approximately 33 persons living in mobile homes.

Flooding

Portions of Bremer County are highly vulnerable to floods, especially along the Cedar River in Plainfield. Flooding puts the entire population at some level of risk, whether through the flooding of their homes, businesses, or places of employment, or the road, sewer, and water infrastructure that serve them daily. High floodwaters can devastate homeowners with property damage, property loss, and extensive, time-consuming cleanup. Secondary effects caused by flooding can add to the property damage. Power loss can leave citizens without heat or air conditioning for extended periods of time. The transportation infrastructure of the community can be impacted by flooding events, which can endanger citizens attempting to travel or evacuate the area, as well as leave those remaining without goods and services.

As shown on the city's Flood Plain Map (Map 3I) only the far eastern edge of the city is within a floodplain. However, in recent years the city has experienced increased flooding in the western and central parts of the community. Plainfield is situated between Highway 218 (west of the city) and the Cedar River (east of the city).

During high rain and flood events, the city takes on water via runoff from approximately 1,700 acres west/northwest of the city, which drains to the Cedar River. This is particularly problematic when the water table is high due to flooding. When this occurs, water cannot properly drain from west to east (through the city) to the Cedar River.

In late September of 2016 the city experienced significant flooding due to heavy rain, on top of already high water levels in the Cedar River, throughout the western and central portions of the city due to this drainage issue. Several residences and buildings experienced water in their basements. Nashua-Plainfield Middle School sustained an estimated \$80,000 in damage due to flooding. Two months after the rain event, water was still being pumped out of basements as it would not drain due to the high water table.

Flooding on the western/central part of the city is further compounded by limited capacity of the city's storm water drains. Runoff from the five culverts that drain from Highway 218 must pass through/around the city on its way to the Cedar River. The city began to notice an increase in runoff when Highway 218 was redone in the early 2000s. The city's existing storm water system does not have the capacity to handle this increased runoff.

Vulnerability – Estimating Potential Property Losses

Valuations are an important component of hazard mitigation planning inasmuch as it provides measurable data that can be used to form some type of estimate as to the potential losses a community could face in the event of a catastrophic disaster.

The valuations for the City of Plainfield are available from the County Assessors and Auditors offices. City of Plainfield’s property valuations are in Table D6.

Future Development

Future development within identified hazard areas can change the threat level of an area by placing critical facilities, businesses, transportation networks, utilities, and populations within vulnerable areas. While it can be difficult to curb development in the planning area, it is the jurisdiction’s advantage to be aware of development trends in order to successfully mitigation future hazards as risks increase. However, continued conformity with the State Building Codes and local land use ordinances and regulations (zoning, subdivision, floodplain management, etc.) will help to mitigate the effects hazards have on new and future development.

National Flood Insurance Program/Repetitive Loss Properties

The city of Plainfield participates in the National Flood Insurance Program (NFIP) and has a flood ordinance in place. As Table D7 shows, there are currently four NFIP policies in place within the city.

FEMA defines a repetitive loss property as an insurable building that has experienced two losses in a 10-year period in which each loss is \$1,000 or more. There is one repetitive loss property in the city. River flooding is the most common cause of repetitive loss in Bremer County. Table D7 illustrates the number of repetitive loss properties for the city. Currently (as of 11/30/2014) there is one active repetitive loss building in the city.

TABLE D6: CITY OF PLAINFIELD’S VALUATION

	Total Valuation	Average Valuation per Unit or Parcel
Residential Property	\$ 15,203,960	\$85,898/parcel
Commercial Property	\$ 1,552,050	\$ 77,603/unit
Industrial Property	\$ 122,210	\$ 122,210/unit
Agricultural Buildings	\$ 75,870	\$ 75,870/unit
Agricultural Land	\$ 45,920	\$ 975/acre
Utilities, G & E	\$ 379,926	N/A
Railroads	\$ 51,387	N/A
Exemptions (military)	\$ 59,264	N/A
Gross Valuation	\$ 17,431,323	N/A
Total Valuation	\$ 17,372,059	N/A

Source: Bremer County Assessor, as of 1/1/2010

TABLE D7: NFIP AND REPETITIVE LOSS DATA FOR PLAINFIELD							
CID #	# of NFIP Policies	NFIP Insurance in Force (\$)	Total # of RLB	RLB Insured	# of Active RLB	Total RLB Losses (\$)	RLB Losses Insured (\$)
190327	4	\$370,800	1	0	1	\$22,512	\$0
<i>Source: Federal Emergency Management Agency (FEMA); Note: RLB = Repetitive Loss Building; NFIP data current as of 9/30/2016; Repetitive loss data current as of 11/30/2014</i>							

This HMP attempts to reduce loss by identifying potential natural and manmade hazards. As a result of many natural and manmade hazards, repairs and reconstruction area often completed in a way that returns the structure to pre-disaster condition yet does little to prevent a reoccurrence of damage. Replication of the pre-disaster conditions allows for the repetitive cycle of property damage, reconstruction, and re-damage. Hazard mitigation is needed to ensure that such cycles are broken, that post-disaster repairs and reconstruction are analyzed, and sound, less vulnerable conditions are produced. Additionally, other mitigation strategies may be considered, such as voluntary property buy-outs.

River flooding is the most common cause of repetitive loss in Bremer County. The City of Plainfield participates in the NFIP has one repetitive loss property.

MITIGATION STRATEGY

Hazard Mitigation Plan Goals

The hazard mitigation plan goals were reviewed by the Hazard Mitigation Planning Committee at their second committee meeting. The committee set as a priority the development of broad-based goals that would address a multitude of hazards and encompass a variety of mitigation activities. The hazard mitigation plan goals identified are as follows:

1. Reduce the chance of and impact of flooding in the community.
2. Take measures to minimize the occurrence of injuries and loss of life due to hazards.
3. Take measures to minimize or eliminate damages that may occur as a result of hazards.
4. Increase the city's ability to respond to natural disasters and man-made hazards.
5. Return to the community to similar or improved pre-event conditions as quickly as possible following a disaster event.
6. Incorporate the City Plan into the proposed Multi-Jurisdictional Plan.
7. Continually re-assess and re-evaluate the plan and mitigation activities.

Current Mitigation Actions

Prevention Mitigation Actions

Table D7 summarizes Plainfield's preventive mitigation actions.

TABLE D7: CURRENT PLANNING AND REGULATORY DOCUMENTS FOR PLAINFIELD								
Previous HMP	Comprehensive Plan	Building Code	Zoning Ordinance	Subdivision Regulations	Floodplain Management Ordinance	Tree-Trimming Ordinance	Storm Water Ordinance	Snow Removal Ordinance
Yes	No	No	No	No	Yes	Yes	Yes	Yes

Source: Local Communities, Note: RR=Restricted Residential

Property Protection Mitigation Actions

While the City has explored a number of property protection alternatives in this plan, the primary protection efforts historically, in regard to flooding, have been to the wastewater treatment facility. In 2001, the city raised the facility by 2' so that floodwaters would not as easily impact the structure. Furthermore, they have installed independent power generation at the facility so that it can continue to operate in the event of a power failure.

Public Education and Awareness Mitigation Actions

The outdoor early warning siren system consists of a single siren located in the southern half of Plainfield. The siren is located between old 218 and Railroad Street, just north of Jefferson Street.

NOAA Weather Radio broadcasts are also available in the community. NOAA Radio's provide up to the minute weather related alerts. Other locations that warnings and watches can be found are television, Internet, and radio (KWAY broadcasts out of Waverly).

Emergency Services Mitigation Actions

Plainfield works with the Bremer County Emergency Management Coordinator, based out of the City of Waverly, on various safety and emergency events. The Emergency Management Coordinator works in conjunction with local fire, rescue, police, and government officials to draft and implement workable emergency action plans in the community. The current Emergency Management Coordinator is Kip Ladage and current contact information is as follows: Bremer County Emergency Management Agency, 111 4th St. NE, Bremer-Waverly LEC, Waverly, Iowa 50677, (319) 352-0133, email: kladage@co.bremer.ia.us

Law Enforcement

The Bremer County Sheriff's Department and the Iowa State Patrol provide police protection in the City of Plainfield. The Bremer County Sheriff's Department is located in Waverly, the county seat. **Fire Protection** Fire protection is provided for Plainfield with a force of 24 volunteer firemen. Fire equipment used by the city includes a total of five vehicles. The fire station is located in the northeastern part of the city on the corner of East Street and County Road 188. Plainfield's rating for insurance is Class 7 within city limits.

TABLE D8: FIRE & FLOOD INFORMATION FOR PLAINFIELD		
Fire Insurance Rating	National Flood Insurance Program (NFIP) (Y or N & Year Joined)	NFIP CID #
7	Yes, Current Map 3/4/08; Joined 3/1/86	190327
Source: Communities and FEMA		

Equipment used by the Plainfield Fire Department includes the following:

- ◆ 1996 Chevy Kodiak pumper
- ◆ 2000 Chevy C8500 tanker
- ◆ 2006 Chevy Kodiak rescue van
- ◆ 2008 Ford 1 ton grass unit
- ◆ 2008 International pumper

Ambulance

Plainfield does not have an ambulance service. Services are provided by the hospital in Waverly.

Medical Facilities

Plainfield does not have any medical facilities.

HAZMAT

Plainfield contracts with Northeast Iowa Response Group for response to hazardous material spills. The Northeast Iowa Response Group is a division of Waterloo Fire Rescue as is the Hazardous Materials Regional Training Center. The Training Center provides training to fire departments and companies from around the state and country. Not only is this a training center it also serves as a hazardous materials quick response unit to Black Hawk County, surrounding counties, and many municipalities in a ten county region. The Unit provides local fire departments with hazard materials emergency procedures thus reducing additional contamination. An evacuation plan is also in place in conjunction with the activities with the local department. Contact information for the facility is as follows: Hazardous Materials Regional Training Center, 1925 Newell Street, Waterloo, Iowa 50707, Phone: (319) 291-4275, Toll Free: (800) 291-4682, Fax: (319) 291-4285

The jurisdiction also partners the Northeast Iowa Response Group for assistance in responding to any methamphetamine labs located in the city limits. The Response Group assists the Police Departments in containment of the site and disposal of the hazardous chemicals.

Natural Resource Protection Mitigation Actions

Plainfield does not have nor done any natural resource protection mitigation actions.

Structural Projects Mitigation Actions

Plainfield does not have nor done any structural projects mitigation actions.

Future Mitigation Actions

While the existing mitigation activities discussed above detail the City's efforts to mitigate hazards when possible and to respond to hazards in a timely and efficient manner, the Committee also recognizes that there are many more mitigation activities and projects that would benefit county residents. Thus, the Committee developed a list of future hazard mitigation activities that, if accomplished, would serve to further reduce the risk of hazards to the community. The list may include a combination of projects the Committee feels the community should try to accomplish and mitigation efforts that are ongoing that the Committee view as vital to the continued well-being of the public.

The Committee analyzed the potential mitigation activities. This analysis included a discussion of the potential benefits of implementing the activity, some hurdles that the community may face in implementing the action step, and the drawbacks of implementation. The analysis utilized the STAPLEE feasibility criteria. The STAPLEE technique is a FEMA suggested method of evaluation. The STAPLEE approach assesses both positive and negative impacts on the following aspects of a county: Social, Technical, Addministrative, Political, Legal, Economic, and Environmental. Based on this analysis, each activity was ranked as High (H), Medium (M) or Low (L). However, not all identified activities are applicable to all jurisdictions and is marked as such in Table D9.

Funding

Although in the long-term hazard mitigation actions will save money by avoiding the loss of lives or property damages, in the short-term each action will have an associated cost. The City will rely heavily on local funding sources to fulfill most of the plan obligations; however, they will also seek funds from State and Federal agencies for both pre- and post-disaster mitigation activities.

The estimated cost(s) for each mitigation action, program, or project is either: Minimal, Low, Moderate, or High depending upon various factors.

- Minimal: Cost estimate is \$10,000 or less based on using current staff, time commitment, continuous of current duties, proposed action/program/project, and funding sources.
- Low: Cost estimate for project range from \$10,001 - \$99,999 based on existing proposed treatment, time commitment, any further study that is needed, and level of engineering, and project components (permits, acquisition, coordination, etc.).
- Moderate : Cost estimate for project range from \$100,000 - \$299,999 based on existing conditions, time commitment, proposed action/program/project, any further study that is needed, and level of engineering, and project components (permits, acquisition, coordination, etc.), and funding sources.
- High : Cost estimate for project range is \$300,000 or higher based on existing conditions, time commitment, proposed action/ program/project, any further study that is needed, and level of engineering, project components (permits, acquisition, coordination, etc.), and funding sources.

Implementation Strategy

Once the Committee identified and ranked the future hazard mitigation activities, the activities were then analyzed. In addition, the Committee identified a time line for each activity, identified the responsible party (ies) for each activity and finally related each activity to at least one of the five Hazard Mitigation Plan Goals listed above. Table D9 below is the City of Plainfield's Implementation Strategy.

TABLE D9: CITY OF PLAINFIELD'S IMPLEMENTATION STRATEGY

Priority	Mitigation Action/Program/Project	Associated Hazard	Primary Agency Responsible for Implementation	Date for Completion	Estimated Cost (s)	Funding Source
Education/Public Awareness						
H	Continue training and education for fire departments, law enforcement agencies and ambulance crew personnel	All	City Council	On-Going	Moderate	Local
H	Encourage use of Iowa One call before digging	Communications Failure, Explosion	City Council, Staff	On-Going	Minimal	Local
H	Keep the county updated on personnel changes	Communications Failure	City Staff	On-Going	Minimal	Local
H	Maintain and improve signals/signage along roadways and at railroad crossings	Transportation	City Council	On-Going	Minimal	Local
H	Cooperate with any countywide mass vaccination plan	Disease	City Council, Fire Department	On-Going	Low	Local
H	Educate city personnel to identify risk areas	Expansive Soils	Staff	On-Going	Minimal to Low	Local
H	Inform the public of reputable and ill reputable contractors following disasters	Emergency Management	City Council, Staff	On-Going	Minimal	Local
H	Encourage all communities to participate in their Local Emergency Planning Commission (LEPC)	Emergency Management	City Council, Public Works	On-Going	Minimal	Local
M	Educate the public	All	City Council, Staff	On-Going	Minimal	Local
M	Encourage utility providers and developers to place all utilities underground	Severe Winter Storm, Communications Failure, Thunderstorm/Lightning	City Council	On-Going	Moderate	Local
M	Notify the media on shelter locations	Severe Winter Storm, Extreme Heat, Tornado	City Council	On-Going	Minimal	Local
M	Encourage lead based paint and asbestos removal	HAZMAT	City Council	On-Going	Minimal	Local
M	Encourage and maintain enrollment in emergency notification system	Thunderstorm/Lightning, Windstorm, Tornado, Communication Failure	City Council, Fire Department	On-going	Minimal	Local
M	Encourage home owners to keep emergency kits	Windstorm, Tornado	Bremer County EMA	On-Going	Minimal	Local
M	Encourage residents to keep smoke detectors, sprinkler systems and fire extinguishers maintained in their homes	Fire	City Council	On-Going	Minimal	Local
M	Educate the public on maintaining their sump pumps	Flash Flood	Fire Department, Public Works	On-Going	Minimal	Local
M	Encourage the public to receive vaccinations	Disease	City Council	On-Going	Minimal	Local
M	Educate city personnel to handle a sinkhole situation	Sinkholes	City Council	On-Going	Minimal	Local
Emergency Services						
H	Maintain and acquire materials and equipment for fire departments, law enforcement agencies and ambulance crew personnel	All	City Council	On-Going	Minimal	Local
H	Provide emergency shelters for evacuees	All	Bremer County EMA	On-Going	Minimal	Local
H	Maintain storm spotter training for local fire departments/deputies and EMS crews	Thunderstorm/Lightning, Windstorm, Tornado,	Bremer County EMA, City Council	On-Going	Minimal	Local

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		Hailstorm				
H	Enhance Standard Operating Procedures for dissemination of information/press releases in the event of a disaster	Communications Failure	City Council, EMA	On-Going	Minimal	Local
H	Continue training and promotion of the Incident Command System	Communications Failure	City Council	On-Going	Minimal	Local
H	Maintain list of county emergency contacts	Communications Failure	All City Departments	On-Going	Minimal to Low	Local
H	Provide fans and/or cooling shelter	Extreme Heat	City Council	On-Going	Minimal	Local
H	Develop and maintain staging area for dumping during cleanup	River Flood	City Council, Fire Department	On-Going	Minimal	Local
H	Set a designated number of people to be trained in post-disaster record keeping/damage assessments	Emergency Management	City Council, Staff	On-Going	Minimal	Local
H	Maintain lists of personnel and equipment available to use with response plans	Emergency Management	City Council, Fire Department	On-Going	Minimal	Local
M	Make available a cleanup crew for after a storm	Thunderstorm/Lightning	City Council, EMA	On-Going	Minimal to Low	Local
M	Maintain automatic TTY TDD machines for emergency personnel and city/county employees	Communications Failure	City Council, EMA	On-Going	Minimal	Local
M	Complete continuity of government plan	Communications Failure	City Council	On-Going	Minimal	Local
M	Keep supply of backup radios and cellphones	Communications Failure	City Council	On-Going	Minimal	Local
L	Maintain list of potential translators to be called upon in case of an emergency	Communications Failure	Bremer County EMA, City Council	On-Going	Minimal	Local
L	Maintain or install GPS units in all emergency service and city/county vehicles	Communications Failure	City Council	On-Going	Minimal	Local
Prevention						
H	Maintain mutual aid agreements	All	City Council	On-Going	Minimal	Local
H	Purchase and maintain backup generators	Severe Winter Storm, Thunderstorm/Lightning, Tornado, Emergency Management	City Council	On-Going	Minimal	Local
H	Maintain public works equipment	Severe Winter Storm	City Council	On-Going	Minimal	Local
H	Backup all digital data	Thunderstorm/Lightning	Bremer County EMA, City Council	On-Going	Minimal	Local, State
H	Maintain mutual aid agreements with the Northeast Iowa response Group	HAZMAT	City Council	On-Going	Minimal	Local
H	Keep HAZMAT manuals/information current and easily accessible	HAZMAT	All City personnel	On-Going	Minimal	Local
H	Maintain, test, and replace warning sirens	Windstorm, Tornado, Hailstorm, Thunderstorm/Lightning, Communications Failure	EMA	On-Going	Minimal to Low	Local
H	Identify areas throughout the county that would substantially benefit from outdoor warning sirens	Windstorm, Tornado	City Council	On-Going	Moderate	Local, State
H	Regularly review and amend fire and medical HAZMAT response standard operating procedures	Communications Failure	City Staff	On-Going	Minimal	Local
H	Improve standard operating procedures for schools	Communications Failure	City Council, Staff	On-Going	Minimal	Local
H	Seek to improve communications with other agencies	Communications Failure,	Bremer County EMA, City	On-Going	Minimal	Local

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		Terrorism				
H	Continue cooperation between county roads department and local fire departments during snow emergencies	Severe Winter Storm	City Council, Staff	On-Going	Minimal to Low	Local
H	Continue fire prevention program	Fire	City Council, Staff	On-Going	Minimal	Local
H	Maintain membership in the NFIP	Flash Flood, River Flood	City Staff	On-Going	Minimal	Local
H	Maintain and keep storm drains clear of debris	Flash Flood	City Council	On-Going	Minimal	Local
H	Stockpile sand and sandbags	Flash Flood, River Flood	Fire Department	On-Going	Minimal to Low	Local
H	Purchase additional trash pumps	Flash Flood, River Flood	City Council	On-Going	Minimal	Local
H	Initiate and enforce burn ban in times of drought or as needed	Grass/Wildfire, Drought	Fire Department	On-Going	Minimal	Local
H	Establish alternative transportation routes should a road need to be closed	Transportation	City Council	On-Going	Moderate	Local
H	Identify fallout shelter locations	Radiological/Nuclear Event	City Council, Staff	On-Going	Minimal	Local
H	Maintain and update anti-virus software	Terrorism	City Council, Fire Department	On-Going	Minimal	Local
H	Secure vulnerable targets, as identified by the LEPC and County EMA with alarms, security cameras and fences	Terrorism	City Council, Public Works	On-Going	Low	Local
H	Review and update fire codes as necessary	Fire, Explosion	City Council, Police	On-Going	Moderate	Local
H	Continue to cooperate with pipeline owners and operators to ensure locations are marked	Fire, Explosion	Public Works	On-Going	Minimal	Local
H	Maintain air conditioner(s) in community buildings	Extreme Heat	Public Works	On-Going	Minimal to Low	Local
H	Keep a supply of drinking water to distribute	Extreme Heat	City Council	On-Going	Minimal	Local
H	Monitor disease outbreak news from the CDC and Iowa Department of Public Health	Disease	Fire Department	On-Going	Minimal	Local
H	Initiate and enforce burn ban in times of drought or as needed	Drought	City Council, Fire Department	On-Going	Low to Moderate	Local
H	Secure the area (around a sinkhole)	Sinkholes	City Council, Fire Department	On-Going	Minimal	Local
H	Inspect any utility lines that are near a sinkhole	Sinkholes	City Council, Public Works	On-Going	Minimal	Local
H	Update flood maps/flood studies for areas throughout the county	River Flood	All City Departments	On-Going	Minimal	Local
H	Establish transportation evacuation routes and protocols	River Flood	City Council, Fire Department	On-Going	Minimal	Local
H	Continue cooperation with county in developing flood mitigation efforts	Flash Flood, River Flood	City Council, Staff	On-Going	Minimal	Local
H	Continue working with the Bremer County Recovery Coalition	Flash Flood, River Flood	City Council	On-Going	Minimal	Local
H	Maintain and update emergency response plans	Emergency Management	City Council	On-Going	Minimal	Local
H	Maintain communication with county contacts	Emergency Management	City Council	On-Going	Minimal	Local
H	Maintain NIMS compliance	Emergency Management	City Council	On-Going	Minimal	Local
M	Determine locations for potential heating shelters and volunteer organization	Severe Winter Storm	Bremer County EMA, City Council	On-Going	Minimal	Local
M	Enforce sidewalk clearance ordinance	Severe Winter Storm	City Council	On-Going	Minimal	Local
M	Maintain law enforcement monitoring of large storage supplies	HAZMAT	City Council, Fire Department	On-Going	Minimal	Local

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M	Acquire necessary response and detection equipment for city/county employees	HAZMAT	City Staff	On-Going	Minimal	Local
M	Provide a local hazardous waste dropoff site	HAZMAT	City Council, Fire Department	On-Going	Minimal to Low	Local, State
M	Upgrade radio communications equipment as needed	Communications Failure	City Staff	On-Going	Minimal	Local
M	Enforce no parking designations at special events	Transportation	City Council, Sheriff	On-Going	Minimal	Local
M	Develop rationing procedures	Drought	City Council	On-Going	Minimal	Local
M	Enforce a curfew	Riot/Violent Demonstration	Sheriff	On-Going	Minimal	Local
M	Identify and inventory potential sinkhole sites	Sinkholes	City Council, Staff	On-Going	Minimal	Local
M	Enforce the local zoning ordinances	Landslides/Mudflows	City Council, Staff	On-Going	Minimal	Local
L	Purchase NOAA weather radios	Thunderstorm/Lightning, Windstorm, Tornado, Radiological/Nuclear Event	City Council, Zoning Administrator	On-Going	Minimal	Local
L	Place alarms on storage facilities containing hazardous materials	Hazardous Materials (HAZMAT)	City Council	On-Going	Minimal	Local
Property Protection						
H	Continue enforcement of city sump pump discharge ordinance	Thunderstorm/Lightning	City Council	On-Going	Minimal	Local
H	Maintain, enforce and update floodplain ordinance	Flash Flood, River Flood	City Staff	On-Going	Minimal	Local
H	Develop sandbagging procedures for the community	River Flood	City Council, Fire Department	On-Going	Minimal	Local
H	Maintain pump station	River Flood	City Council, Staff	On-Going	Minimal	Local
M	Use surge protectors to prevent electrical damage to critical and sensitive equipment	Thunderstorm/Lightning	City Council	On-Going	Minimal	Local
M	Enforce and update building codes, as needed	Thunderstorm/Lightning, Windstorm, Tornado, Hailstorm, Expansive Soils, Earthquake	Bremer County EMA	On-Going	Minimal	Local
M	Identify, purchase and remove structures from flood hazard areas	Flash Flood, River Flood	City Council, Staff	On-Going	Moderate	Local, Federal
L	Install a snow fence around the wastewater treatment facility	Severe Winter Storm	City Council	On-Going	Minimal	Local
L	Maintain use of snow fences in the city/county	Severe Winter Storm	County Staff	On-Going	Minimal	Local
L	Placement of lighting arrestors on power lines	Thunderstorm/Lightning	City Council	On-Going	Minimal	Local
Structural Projects						
H	Construct or designate a safe room or storm shelter	Windstorm, Tornado, Hailstorm	City Staff	On-Going	High	Local, State, Federal
H	Encourage backup power generation for local telephone systems and cellular operations	Communications Failure	Bremer County EMA	On-Going	Minimal	Local
H	Pursue partnership with rural water as the system expands	Fire, Explosion	City Council, Fire Department	On-Going	Minimal	Local
H	Improve water system to enhance firefighting capacity/ability	Fire	City Staff	On-Going	Minimal	Local
H	Acquire more water pumps	Flash Flood, River Flood, Dam Failure, Levee Failure	City Council	On-Going	Minimal	Local

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H	Continue with improvement to the storm water system	Flash Flood	City Council, Staff	On-Going	Low to Moderate	Local, State
H	Prevent inflow and infiltration into the sanitary sewer	Flash Flood, River Flood	City Council, Fire Department	On-Going	Minimal	Local
H	Purchase emergency signs to be used in case of an incident	Transportation	City Council	On-Going	Minimal	Local
H	Encourage floodproofing/elevating structures in the floodplain	River Flood	City Council, Staff	On-Going	Minimal	Local
H	Encourage construction of dikes, levees, dams, and retention ponds	River Flood	City Council, Police	On-Going	Minimal	Local
H	Identify bridges and culverts than can cost effectively be reengineered to reduce future flooding	River Flood	City Council, Staff	On-Going	Minimal	Local
H	Dig drainage ditch to west side of town, to river	River Flood	City Council	On-Going	Minimal	Local
H	Regularly inspect dams	Dam Failure	City Council	On-Going	Minimal	Local
H	Regularly inspect levees	Levee Failure	City Council	On-Going	Minimal	Local
H	Establish backup plan in case levees fail	Levee Failure	City Council	On-Going	Minimal	Local
M	Maintain a list of potential storm sewer projects	Thunderstorm/Lightning	City Council, Staff	On-Going	Minimal	Local
M	Continue an annual inspection program for commercial and industrial properties	Fire	City Council	On-Going	Low to Moderate	Local, State
M	Encourage the use of proper materials and construction techniques	Expansive Soils	City Council, Staff	On-Going	Minimal to Low	Local
M	Install tiling to help water move away from structures	Expansive Soils	Public Works	On-Going	Minimal to Low	Local
L	Install rip rap around wastewater treatment facility	Flash Flood	Fire Department	On-Going	Minimal	Local
Natural Resource Protection						
H	Maintain and/or develop a wellhead protection program	Groundwater Contamination	City Council, Staff	On-Going	Low	Local
H	Monitor wells in areas of identified contamination	Groundwater Contamination	City Council	On-Going	Low	Local
H	Monitor the drinking water supply	Groundwater Contamination, Disease	City Council, Public Works	On-Going	Low	Local
H	Identify and map areas of past contamination	Groundwater Contamination	City Council, City Staff	On-Going	Minimal	Local
H	Maintain and/or develop storm water management program	Groundwater Contamination, Flash Flood	City Council, Staff	On-Going	Low	Local
H	Eliminate and cap private and abandoned wells in the city	Groundwater Contamination	City Council, Public Works	On-Going	Low	Local
H	Eliminate the use of septic tank systems in the city limits	Groundwater Contamination	City Council	On-Going	Low	Local
H	Follow monitoring requirements set forth by the Iowa DNR	Groundwater Contamination	City Council	On-Going	Low	Local
H	Carry out conservation measures such as erosion control and work with the following organizations: Extension, NRCS, Farm Bureau, EPA, DNR, and Soil and water Conservation District	Groundwater Contamination	City Council	On-Going	Low	Local, State, Federal
H	Restrict water usage should it be necessary	Drought	City Council	On-Going	Minimal	Local, State
H	Purchase additional parkland in order to increase greens space and reducing surface flow	River Flood	City Council	On-Going	Moderate	Local
M	Maintain tree trimming program	Severe Winter Storm,	City Council	On-Going	Low	Local

		Windstorm, Hailstorm				
M	Encourage community to plant shade trees	Extreme Heat	City Council	On-Going	Minimal	Local
M	Plant trees along water bodies and slopes	Landslides/Mudflows	City Council	On-Going	Minimal to Low	Local, State
M	Clear ditches, streams, and waterways on a regular basis	River Flood	City Council	On-Going	Minimal to Low	Local, State

APPENDIX E: CITY OF READLYN

COMMUNITY PROFILE

Geography

Readlyn is located in southeast Bremer County, in the northeastern quadrant of Iowa, at latitude 42.70 N x longitude 92.23 W. Elevations in Readlyn range from between 1,020 and 1,040 feet above sea level. The Wapsipinicon River runs to the east of the city, which is served by two major highways, State Highway 3 and County Highway V49.

The terrain, on which Readlyn is built, is generally the undulating topography that characterizes the agricultural areas of northeast Iowa. Most of the community is actually very similar, with very few areas of natural slope. The highest point in the community lies at approximately 1,040 feet above sea level and is located in the northern half of town.

History

The earliest non-American Indians to settle in the Readlyn area arrived in the early 1900's. Around this time, the Ohlendorf family emigrated from Germany, and settled on the prairie in the Maxfield Township.

It wasn't long before the rail would impact the young settlement. In 1903 a representative of Great Western Railroad inquired about buying land to build a station on the rail line between Waverly and Oelwein. In the following year Readlyn experienced several significant developments. In March of 1904 the first lots in the community were sold. In this same year, Readlyn was incorporated, and saw the construction of a creamery, meat market, and post office.

TABLE E1: CITY OF READLYN DEMOGRAPHICS

<i>Government Framework</i>	Mayor – City Council
<i>General Population, 2010 Census</i>	
Total Population	808
Median Age	37.8
At-Risk Population, <18 Years	227
At-Risk Population, >64 Years	135
Total Males	388
Total Females	420
One Race-White	792
Black or African American	4
American Indian and Alaskan Native	1
Asian	4
Two or More Races	2
<i>Housing Characteristics, 2010 Census</i>	
Total Households	338
Households with children <18 Yrs.	115
Households with persons >65 Yrs.	102
Average Household Size	2.39
Average Family Size	3.01
Total Housing Units	346
Occupied Housing Units	338
Vacant Housing Units	8
Owner-Occupied Housing Units	292
Renter-Occupied Housing Units	46
Persons Living in Group Quarters	0

By 1910 the City of Readlyn had reached a population of 100. Shortly thereafter, in 1912, fire destroyed a large part of the business district. The following year the city elected twelve citizens to be volunteer firemen, and voted to establish city water works.

During the 1930's and 1940's Readlyn again experienced significant developments within the community. In 1932 water mains were extended throughout various parts of the town. A new high school was built in 1935 to house both grade school and high school students. And in 1947 a new well was drilled to supply water to the residents of Readlyn. By the early 1950's the community's roads were blacktopped and the Readlyn Community Building was completed.

Readlyn's modern history consists of several additions to the community. The first addition came in 1959 with the Meier addition, and the most recent in 1981 with the Fekkether addition.

Demographics

Population

Readlyn's demographic data is outlined in Tables E1 and E2. In the recent 2010 U.S. Census, Readlyn's population grew to 808, an increase of 2.8% percent over ten years. The previous U.S. Census, taken in 2000, recorded a population figure of 786 for Readlyn.

Community Services

The City of Readlyn has a municipal water supply with an elevated storage capacity of 150,000 gallons with an average daily water consumption of 95,000 gallons per day (gpd). The rated capacity of the overall system is 300,000 gpd. The peak demand is 196,000 gpd.

A primary sewer treatment plant serves Readlyn. Average load is 85,000 (gpd) with a peak load of 263,000 (gpd). The rated capacity of the sewer treatment plant is 172,000 gpd and is likely in need of expansion. The DNR noted that the city has had problems with wastewater bypassing the treatment facility because of the lack of capacity. The problems are especially apparent during heavy rainfall events, where storm water infiltrates into the sanitary sewer system. The city is working with their engineers and the DNR on the wastewater permit process and finding feasible solutions to address the problem.

TABLE E2: CITY OF READLYN DEMOGRAPHICS	
<i>Economics Characteristics, 2010-2014 ACS</i>	
Population 16 years and over	662
Population In Labor Force (16 years and over)	475
Persons Employed	468
Persons Unemployed	7
Persons Employed in Management, Business, Science, and Arts Occupations	110
Persons Employed in Service Occupations	47
Persons Employed in Sales and Office Occupations	142
Persons Employed in Natural Resources, Construction, and Maintenance Occupations	83
Persons Employed in Production, Transportation, and Material Moving Occupations	86
Median Household Income	\$57,438
Mean Household Income	\$64,770
Percent of Persons < 18 yrs. Below Poverty Level	3.6%
Percent of Persons 18-64 Yrs. Below Poverty Level	1.6%
Percent of Persons >65 Yrs. Below Poverty Level	14.2%
<i>Social Characteristics, 2010-2014 ACS</i>	
School Enrollment (3 yrs and over)	230
Nursery School, Preschool	24
Kindergarten and Elementary School (grades 1-8)	88
High School (grades 9-12)	45
College or Graduate School	43
Education Attainment: Population 25 Years and Over	557
Less than High School Graduate	6.4%
High School Graduate (includes equivalency)	37.9%
Some College, Associate's Degree	50.0%
Bachelor's Degree or Higher	17.8%

Table E3 shows the primary utility providers for the City of Waverly.

TABLE E3: READLYN UTILITY PROVIDERS						
Electric	Natural Gas	Telephone/Internet	Cable	Water	Sewer	Sanitation
City of Readlyn	Black Hills Energy	Readlyn Telephone Co.	Readlyn Telephone Co.	City of Readlyn	City of Readlyn	Tripoli-Readlyn Sanitation

HAZARDS & RISK ASSESSMENT

Section 3 identified and profiled the hazards for the entire planning area. However, each community analyzed their own vulnerability to those hazards applicable to their jurisdiction. Using the methodology outlined in Section 3 (Vulnerability Assessment), the City of Readlyn evaluated the risk associated with a specific hazard, defined by probability and frequency of occurrence, magnitude, severity, exposures, and consequences. Readlyn's vulnerability assessment provides in-depth knowledge of the hazards and vulnerabilities that affect the community. This analysis provides an all-hazard approach when evaluating the hazards of that affect the city, and the associated risks and impacts each hazard presents.

As mentioned previously in Section 3, the vulnerability assessment requires a five-year review with periodic updates, as needed. Potential future hazards and impacts may result from changing technology, new critical facilities, infrastructures, and development patterns, as well as demographic and socioeconomic changes that occur within or outside the area.

Disaster frequency and its effects or severity are important as a basis for planning emergency response and mitigation. Natural hazards tend to reoccur on a predictable seasonal basis, whereas manmade or technological events tend to change over time with advancement in technology and methods of operation. Five criteria were used by the Committee to assure a systematic and comprehensive approach to hazard analysis for their individual jurisdictions including: Historical Occurrence, Probability, Magnitude or Severity, Warning Time, and Duration.

The Committee assessed the defined hazards relevant to potential impact on the city. Using the scoring criteria previously defined (Tables 19-22) the city assessed each of the identified hazards based on probability, magnitude/severity, warning time, and duration. The scores for each of the factors were weighted using the formula below to develop the final hazard assessment score.

$$\begin{aligned} &(\text{Probability} \times .45) + (\text{Magnitude/Severity} \times .30) + (\text{Warning Time} \times .15) + (\text{Duration} \times .10) \\ &= \text{Final Hazard Assessment Score} \end{aligned}$$

Table E4 is the analysis scores for the City of Readlyn. As shown, the top hazards for Readlyn are: Flash Flood, Severe Winter Storm, Tornado/Windstorm, and Drought.

TABLE E4: CITY OF READLYN HAZARD RISK ASSESSMENT						
Hazard Rank	Hazard	Probability	Magnitude/ Severity	Warning Time	Duration	Hazard Score
1	Flash Flood	4	2	4	2	3.20
2	Severe Winter Storm	4	2	2	3	3.00
3	Tornado/Windstorm	3	3	4	1	2.95
4	Drought	3	3	1	4	2.80
5	Thunderstorm/Lightning/Hail	3	2	3	2	2.60
6	Extreme Heat	3	2	1	3	2.40
6	Infrastructure Failure	2	2	4	3	2.40
8	Animal/Plant/Crop Disease	3	1	1	4	2.20
9	Transportation Incident	1	1	4	7	2.05
10	River Flooding	2	2	1	3	1.95
11	HAZMAT Incident	1	2	4	1	1.75
11	Terrorism	1	1	4	4	1.75
13	Earthquake	1	1	4	1	1.45
13	Grass/Wild Land Fire	1	1	4	1	1.45
13	Landslide	1	1	4	1	1.45
13	Sinkholes	1	1	4	1	1.45
17	Expansive Soils	1	1	1	4	1.30
17	Human Disease	1	1	1	4	1.30
19	Radiological Incident	1	1	1	1	1.00
19	Dam / Levee Failure	1	1	1	1	1.00

Vulnerability – Identifying Critical Facility Assets

This section will describe the vulnerability for existing and future buildings, infrastructure, and critical facilities in those areas that can be impacted by the prioritized hazards. Since the majority of the hazards have an undefined hazard area (i.e., affecting an entire community or larger area) the following vulnerability assessment will only address those hazards that affect a specified area – flooding (river and flash). However, due to the community’s historical occurrences of tornadoes this hazard was added to the assessment. The following discussion only considers the assets in the community of Readlyn.

According to available data, Readlyn is projected to see an increase in population over the next thirty years. This population increase most likely result in a greater need for additional critical facilities such as schools, daycare centers, or healthcare centers. However, the need for more critical facilities should be closely monitored these next 5-years and readdressed when this HMP is updated.

Critical Facilities

Identifying the location of critical facilities and designated shelters (see TableE5) in Readlyn is important in order to assess their vulnerability to hazards. These critical facilities are important to the community’s operations, quality of life, and the key components of the economic sector. For instance, high-density residential or commercial development, schools, police stations, government buildings, hospitals and care facilities, airports, gas stations, hardware stores, grocery stores, and water supply systems. It is important to know the threats each hazard poses to these facilities. *Attachment 6F* illustrates the location of identified critical facilities throughout the community.

Homes In Hazardous Areas

Homes and facilities vulnerable to flooding is normally low, since these structures are not often constructed within the 100-year floodplain. According to the information provided, bridges and roadways would be impacted by flooding. This disruption in the transportation infrastructure would create a longer time period to receive and provide services and supplies to an area if a bridge was washed away due to flooding. According to the data provided by INRCOG and Bremer County there are three structures in the 100-year floodplain. See *Attachment 5F: Flood Scenario Map of the City*.

As stated on the FEMA website²⁶, mobile homes are highly vulnerable to tornadoes. Even mobile homes that are tied down, offer little protection from tornadoes. According to Census information, there are no mobile homes located in the community.

TABLE E5: CRITICAL FACILITIES IN READLYN	
Readlyn Elementary School (shelter)	Public Library
St. Paul Lutheran Church (shelter)	Zion Lutheran Church (shelter)
Wastewater Treatment Plant	Fire Station
Water Plant and Tower	
Source: Community	

TABLE E4: CITY OF READLYN 100-YEAR FLOODPLAIN PROPERTIES	
Number of Structures	3
Building Value	\$ 292,740
Dwelling Value	\$ 168,900
Total Value	\$ 461,640
Source: INRCOG & Bremer County Assessor (2011 \$)	

²⁶ Federal Emergency Management Agency (FEMA), <http://www.fema.gov/areyouready/tornadoes.shtml>

Nursing homes or skilled living centers are also highly vulnerable to tornadoes. These facilities are designed for caring for the elderly population, majority of which use wheelchairs or other assistance devices, limiting mobility. There are no nursing homes in the City of Readlyn.

Vulnerability – Identifying Social Asset Populations

The social vulnerability assessment identified how the hazards affect the population of Readlyn and it is assumed that the identified populations are more likely to require assistance during times of disaster; therefore, are considered, generally speaking, more “at-risk” than the remaining population. The “at-risk” population must be identified and targeted in successful mitigation efforts. Table E5 presents an overview of the at-risk population in Readlyn according to information retrieved from the 2000 U.S. Census and Iowa Data Center.

According to Table E5, 17 percent (135 persons) of Readlyn residents are 65 years and older.

Children are also at higher risk during some disasters. This is mostly due to the fact that young persons often are not aware of the proper actions to take in the event of a disaster. In addition, very young children would be more susceptible to a disaster such as a disease epidemic simply due to their age. In 2010, 23 percent (188 persons) of the city’s population was under the age of 15.

Only a small portion of the city of Readlyn is within the 100-year floodplain. Therefore, very few of the community’s residents are vulnerable to river flooding. However, the town has experienced flash flooding. Using the 2010 Census figure (2.39) for average household size for Readlyn, approximately seven persons are living within the floodplain.

Vulnerability – Estimating Potential Property Losses

Valuations are an important component of hazard mitigation planning insomuch as it provides measurable data that can be used to form some type of estimate as to the potential losses a community could face in the event of a catastrophic disaster.

The valuations for the City of Readlyn are available from the County Assessors and Auditors offices. City of Readlyn’s property valuations are in Table E6. This

TABLE E5: CITY OF READLYN “AT-RISK” POPULATION

Total City Population (2010)	808
Elderly (65 yrs and older)	135
Youth (under 18 yrs old)	227
Householder Living Alone	109
Non-English Speaking Population (speaks English less than ‘very well’)	0%
Population Living in Poverty	4%
Population in Mobile Homes	0
Group Quarters Population	0

Source: 2010 US Census, 2014 ACS

TABLE E6: CITY OF READLYN’S VALUATION

	Total Valuation	Average Valuation per Unit or Parcel
Residential Property	\$ 35,644,960	\$ 114,247/parcel
Commercial Property	\$ 5,515,340	\$ 172,354/unit
Industrial Property	\$ 152,440	\$ 76,220/unit
Agricultural Buildings	\$ 0	N/A
Agricultural Land	\$ 7,740	\$ 1,395/acre
Utilities	\$ 259,308	N/A
Railroads	\$ 0	N/A
Exemptions (military)	\$ 96,304	N/A
Gross Valuation	\$ 41,579,788	N/A
Total Valuation	\$ 41,483,484	N/A

Source: Bremer County Assessor (2011 \$)

information was made available from the Butler County Assessor's office. It should be noted however that these dollar amounts do not include gas and electric utility valuations nor do the evaluations include exempt properties, including government buildings, infrastructure, and religious/nonprofit properties. These results should be considered preliminary, as a full accounting of assets has not been completed.

Future Development

Future development within identified hazard areas can change the threat level of an area by placing critical facilities, businesses, transportation networks, utilities, and populations within vulnerable areas. While it can be difficult to curb development in the planning area, it is the jurisdiction's advantage to be aware of development trends in order to successfully mitigation future hazards as risks increase. However, continued conformity with the State Building Codes and local land use ordinances and regulations (zoning, subdivision, floodplain management, etc.) will help to mitigate the effects hazards have on new and future development.

National Flood Insurance Program/Repetitive Loss Properties

The city participates in the National Flood Insurance Program (NFIP) and has a flood ordinance in place. However, as Table E7 shows, there are currently no NFIP policies in place within the city.

FEMA defines a repetitive loss property as an insurable building that has experienced two losses in a 10-year period in which each loss is \$1,000 or more. As of 11/30/2016, there are no repetitive loss properties in Readlyn.

River flooding is the most common cause of repetitive loss in Bremer County. According to Table E7, Readlyn participates in the NFIP, but has no active policies in force. Readlyn has no repetitive loss properties.

TABLE E7: NFIP AND REPETITIVE LOSS DATA FOR READLYN							
CID #	# of NFIP Policies	NFIP Insurance in Force	Total # of RLB	RLB Insured	# of Active RLB	Total RLB Losses	RLB Losses Insured
190645	0	\$0	0	0	0	\$0	\$0

Source: Federal Emergency Management Agency (FEMA); Note: RLB = Repetitive Loss Building; NFIP data current as of 9/30/2016; Repetitive loss data current as of 11/30/2014

This HMP attempts to reduce loss by identifying potential natural and manmade hazards. As a result of many natural and manmade hazards, repairs and reconstruction area often completed in a way that returns the structure to pre-disaster condition yet does little to prevent a reoccurrence of damage. Replication of the pre-disaster conditions allows for the repetitive cycle of property damage, reconstruction, and re-damage. Hazard mitigation is needed to ensure that such cycles are broken, that post-disaster repairs and reconstruction are analyzed, and sound, less vulnerable conditions are produced. Additionally, other mitigation strategies may be considered, such as voluntary property buy-outs.

MITIGATION STRATEGY

Hazard Mitigation Plan Goals

The hazard mitigation plan goals were reviewed by the Hazard Mitigation Planning Committee at their second committee meeting. The committee set as a priority the development of broad-based goals that would address a multitude of hazards and encompass a variety of mitigation activities. The hazard mitigation plan goals identified are as follows:

1. Reduce the chance of and impact of flooding in the community.
2. Take measures to minimize the occurrence of injuries and loss of life due to hazards.
3. Take measures to minimize or eliminate damages that may occur as a result of hazards.
4. Increase the city's ability to respond to natural disasters and man-made hazards.
5. Return to the community to similar or improved pre-event conditions as quickly as possible following a disaster event.
6. Incorporate the City Plan into the proposed Multi-Jurisdictional Plan.
7. Continually re-assess and re-evaluate the plan and mitigation activities.

Current Mitigation Actions

Prevention Mitigation Actions

The city of Readlyn, in cooperation with FEMA, updated the existing firm map for the city. This process resulted in substantial area being removed from the identified flood hazard area. The effective date of the updated flood insurance rate map was March 4, 2008.

TABLE E8: CURRENT PLANNING AND REGULATORY DOCUMENTS FOR READLYN								
Previous HMP	Comprehensive Plan	Building Code	Zoning Ordinance	Subdivision Regulations	Floodplain Management Ordinance	Tree-Trimming Ordinance	Storm Water Ordinance	Snow Removal Ordinance
Yes	Yes	Yes	Yes – RR	Yes	Yes	Yes	Yes	Yes
<i>Source: Community, Note: RR=Restricted Residential</i>								

Property Protection Mitigation Actions

Due to the fact that Readlyn has only a small area located within the 100-year floodplain, the city has not historically experienced flooding events, and therefore the city has not participated in a Housing Buy Out program funded through FEMA, IDED, and the Iowa Emergency Management Division (IEMD).

According to statistics obtained from the FEMA NFIP Loss Statistics Report for the State of Iowa, the City of Readlyn has had no losses dating back to 1978.

Public Education and Awareness Mitigation Actions

The existing early warning siren is approximately ten years old. The siren has a battery back-up system, along with voice capability. The system is activated by the Bremer County Emergency Management Coordinator. The Police Department's squad car cannot be used as a mobile warning system, but the city is looking into this capability.

NOAA Weather Radio broadcasts are also available in the community. NOAA Radio's provide up to the minute weather related alerts. Other locations that warnings and watches can be found are television, Internet, and radio (KWAY and KOEL).

Emergency Services Mitigation Actions

Readlyn works with the Bremer County Emergency Management Coordinator, based out of the City of Waverly, on various safety and emergency events. The Emergency Management Coordinator works in conjunction with local fire, rescue, police, and government officials to draft and implement workable emergency action plans in the community. The current Emergency Management Coordinator is Kip Ladage and current contact information is as follows: Bremer County Emergency Management Agency, 111 4th St. NE, Bremer-Waverly LEC, Waverly, Iowa 50677, (319) 352-0133, email: kladage@co.bremer.ia.us

Law Enforcement

Police protection is provided by the Readlyn Police Department, Bremer County Law Enforcement, and the Iowa State Patrol. Currently, there is one full-time officer serving the Police Department. The Department uses one squad car, which is replaced every five years.

Fire Protection

Fire protection is provided for Readlyn with a force of 22 volunteer firemen. Fire equipment includes two firefighting pumper trucks, one tanker truck, one grass wildfire truck and one rescue unit. The fire station is located in the south-central area of the city. Readlyn's rating for insurance is Class 7 within city limits.

Equipment used by the Readlyn Fire Department includes the following: 2004 Ford F-350 4x4 Pickup; 1996 Pierce/Frieghtliner Pumper (1,250 gpm pump); 1989 Chevy C-60 Tanker (1,500 gallon); 1974 Ford F-700 Rescue van w/ Command Center; 1964 Dodge Pumper (750 gpm pump); 13 SCBA units; 1 Hurst Jaw w/ cutter and spreader; and 4 Generators.

TABLE E9: FIRE & FLOOD INFORMATION FOR READLYN		
Fire Insurance Rating	National Flood Insurance Program (NFIP) (Y or N & Year Joined)	NFIP CID #
7	Yes, Joined 8/12/08; Current Map 3/4/08	190645

Source: Community and FEMA

Ambulance

The city has and maintains an ambulance service. It is staffed with volunteer certified EMTs and paramedics. The EMS crew utilizes a 2009 Chevrolet G-4500 ambulance.

Medical Facilities

There is a part-time chiropractor in the community, but no medical facilities.

HAZMAT

Readlyn contracts with Northeast Iowa Response Group for response to hazardous material spills. The Northeast Iowa Response Group is a division of Waterloo Fire Rescue as is the Hazardous Materials Regional Training Center. The Training Center provides training to fire departments and companies from around the state and country. Not only is this a training center it also serves as a hazardous materials quick response unit to Black Hawk County, surrounding counties, and many municipalities in a ten county region. The Unit provides local fire departments with hazard materials emergency procedures thus reducing additional contamination. An evacuation plan is also in place in conjunction with the activities with the local department. Contact information for the facility is as follows: Hazardous Materials Regional Training Center, 1925 Newell Street, Waterloo, Iowa 50707, Phone: (319) 291-4275, Toll Free: (800) 291-4682, Fax: (319) 291-4285

The jurisdiction also partners the Northeast Iowa Response Group for assistance in responding to any methamphetamine labs located in the city limits. The Response Group assists the Police Departments in containment of the site and disposal of the hazardous chemicals.

Natural Resource Protection Mitigation Actions

None.

Structural Projects Mitigation Actions

None.

Future Mitigation Actions

While the existing mitigation activities discussed above detail the City's efforts to mitigate hazards when possible and to respond to hazards in a timely and efficient manner, the Committee also recognizes that there are many more mitigation activities and projects that would benefit county residents. Thus, the Committee developed a list of future hazard mitigation activities that, if accomplished, would serve to further reduce the risk of hazards to the community. The list may include a combination of projects the Committee feels the community should try to accomplish and mitigation efforts that are ongoing that the Committee view as vital to the continued well-being of the public.

The Committee analyzed the potential mitigation activities. This analysis included a discussion of the potential benefits of implementing the activity, some hurdles that the community may face in implementing the action step, and the drawbacks of implementation. The analysis utilized the STAPLEE feasibility criteria. The STAPLEE technique is a FEMA suggested method of evaluation. The STAPLEE approach assesses both positive and negative impacts on the following aspects of a county: Social, Technical, Aministrative, Political, Legal, Economic, and Environmental. Based on this analysis, each activity was ranked as High (H), Medium (M) or Low (L). However, not all identified activities are applicable to all jurisdictions and is marked as such in Table E10.

Funding

Although in the long-term hazard mitigation actions will save money by avoiding the loss of lives or property damages, in the short-term each action will have an associated cost. The City will rely heavily on local funding sources to fulfill most of the plan obligations; however, they will also seek funds from State and Federal agencies for both pre- and post-disaster mitigation activities.

The estimated cost(s) for each mitigation action, program, or project is either: Minimal, Low, Moderate, or High depending upon various factors.

- Minimal: Cost estimate is \$10,000 or less based on using current staff, time commitment, continuous of current duties, proposed action/program/project, and funding sources.
- Low: Cost estimate for project range from \$10,001 - \$99,999 based on existing proposed treatment, time commitment, any further study that is needed, and level of engineering, and project components (permits, acquisition, coordination, etc.).
- Moderate : Cost estimate for project range from \$100,000 - \$299,999 based on existing conditions, time commitment, proposed action/program/project, any further study that is needed, and level of engineering, and project components (permits, acquisition, coordination, etc.), and funding sources.
- High : Cost estimate for project range is \$300,000 or higher based on existing conditions, time commitment, proposed action/ program/project, any further study that is needed, and level of engineering, project components (permits, acquisition, coordination, etc.), and funding sources.

Implementation Strategy

Once the Committee identified and ranked the future hazard mitigation activities, the activities were then analyzed. In addition, the Committee identified a time line for each activity, identified the responsible party (ies) for each activity and finally related each activity to at least one of the five Hazard Mitigation Plan Goals listed above. Table E10 is the City of Readlyn's Implementation Strategy.

TABLE E10: CITY OF READLYN'S IMPLEMENTATION STRATEGY

Priority	Mitigation Action/Program/Project	Associated Hazard	Primary Agency Responsible for Implementation	Date for Completion	Estimated Cost (s)	Funding Source
Emergency Services						
H	Continue training and education for fire departments, law enforcement agencies and ambulance crew personnel	All	City Council	On-Going	Moderate	Local
H	Maintain and acquire materials and equipment for fire departments, law enforcement agencies and ambulance crew personnel	All	City Council	On-Going	Minimal	Local
H	Provide emergency shelters for evacuees	All	Bremer County EMA, Council	On-Going	Minimal	Local
H	Maintain mutual aid agreements	All	City Council	On-Going	Minimal	Local
H	Maintain storm spotter training for local fire departments/deputies and EMS crews	Thunderstorm/Lightning, Windstorm, Tornado, Hailstorm	Bremer County EMA, Fire Dept.	On-Going	Minimal	Local
H	Maintain law enforcement monitoring of large storage supplies	HAZMAT	City Council, Sheriff	On-Going	Minimal	Local
H	Maintain mutual aid agreements with the Northeast Iowa response Group	HAZMAT	City Council	On-Going	Minimal	Local
H	Keep HAZMAT manuals/information current and easily accessible	HAZMAT	All City personnel	On-Going	Minimal	Local
H	Maintain or install GPS units in all emergency service and city/county vehicles	Communications Failure	City Council	On-Going	Minimal	Local
H	Continue training and promotion of the Incident Command System	Communications Failure	City Council, EMA	On-Going	Minimal	Local
H	Complete continuity of government plan	Communications Failure	City Council	On-Going	Minimal	Local
H	Upgrade radio communications equipment as needed	Communications Failure	City Staff	On-Going	Minimal	Local
H	Regularly review and amend fire and medical HAZMAT response standard operating procedures	Communications Failure	City Staff	On-Going	Minimal	Local
H	Improve standard operating procedures for schools	Communications Failure	City Council, Schools	On-Going	Minimal	Local
H	Keep supply of backup radios and cellphones	Communications Failure	City Council, Staff	On-Going	Minimal	Local

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H	Maintain list of county emergency contacts	Communications Failure	All City Departments	On-Going	Minimal	Local
H	Improve water system to enhance firefighting capacity/ability	Fire	City Council	On-Going	Minimal	Local
H	Purchase emergency signs to be used in case of an incident	Transportation	City Council, Fire Dept.	On-Going	Low	Local
H	Set a designated number of people to be trained in post-disaster record keeping/damage assessments	Emergency Management	City Council, Staff	On-Going	Minimal	Local
H	Maintain and update emergency response plans	Emergency Management	City Council, Staff	On-Going	Minimal	Local
H	Maintain lists of personnel and equipment available to use with response plans	Emergency Management	City Council, Staff	On-Going	Minimal	Local
H	Maintain communication with county contacts	Emergency Management	City Council, Staff	On-Going	Minimal	Local
H	Maintain NIMS compliance	Emergency Management	City Council, Staff	On-Going	Minimal	Local
M	Make available a cleanup crew for after a storm	Thunderstorm/Lightning	City Council, EMA	On-Going	Minimal to Low	Local
M	Maintain automatic TTY TDD machines for emergency personnel and city/county employees	Communications Failure	City Council, EMA	On-Going	Minimal	Local
M	Enhance Standard Operating Procedures for dissemination of information/press releases in the event of a disaster	Communications Failure	City Council, EMA	On-Going	Minimal	Local
M	Stockpile sand and sandbags	Flash Flood, River Flood	City Council	On-Going	Minimal	Local
M	Develop sandbagging procedures for the community	River Flood	City Council, Fire Department	On-Going	Minimal	Local
M	Develop and maintain staging area for dumping during cleanup	River Flood	City Council, Fire Department	On-Going	Moderate	Local
L	Maintain list of potential translators to be called upon in case of an emergency	Communications Failure	Bremer County EMA, City Council	On-Going	Minimal	Local
Natural Resource Protection						
H	Continue with improvement to the storm water system	Flash Flood	City Staff, Council	On-Going	Low to Moderate	Local, State
H	Prevent inflow and infiltration into the sanitary sewer	Flash Flood, River Flood	City Council, Staff	On-Going	Minimal	Local
H	Maintain and keep storm drains clear of debris	Flash Flood	Public Works	On-Going	Minimal	Local

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H	Maintain and/or develop a wellhead protection program	Groundwater Contamination	City Council	On-Going	Low	Local
H	Monitor wells in areas of identified contamination	Groundwater Contamination	City Council	On-Going	Low	Local
H	Monitor the drinking water supply	Groundwater Contamination, Disease	City Council, Public Works	On-Going	Low	Local
H	Identify and map areas of past contamination	Groundwater Contamination	City Council, City Staff	On-Going	Minimal	Local
H	Maintain and/or develop storm water management program	Groundwater Contamination, Flash Flood	City Council, Public Works	On-Going	Low	Local
H	Eliminate and cap private and abandoned wells in the city	Groundwater Contamination	City Council, Public Works	On-Going	Low	Local
H	Eliminate the use of septic tank systems in the city limits	Groundwater Contamination	City Council	On-Going	Moderate	Local
H	Follow monitoring requirements set forth by the Iowa DNR	Groundwater Contamination	City Council	On-Going	Low	Local
H	Carry out conservation measures such as erosion control and work with the following organizations: Extension, NRCS, Farm Bureau, EPA, DNR, and Soil and water Conservation District	Groundwater Contamination	City Council	On-Going	Minimal	Local, State, Federal
M	Develop rationing procedures	Drought	City Council	On-Going	Minimal	Local
M	Restrict water usage should it be necessary	Drought	City Council	On-Going	Minimal to Low	Local
Prevention						
H	Maintain tree trimming program	Severe Winter Storm, Windstorm, Hailstorm	City Council	On-Going	Low	Local
H	Determine locations for potential heating shelters and volunteer organization	Severe Winter Storm	Bremer County EMA, City Council	On-Going	Minimal	Local
H	Purchase and maintain backup generators for lift station, water tower, fire station, and other sites as determined	All	City Council	Medium-Term	Moderate	Local
H	Maintain public works equipment	Severe Winter Storm	City Council	On-Going	Minimal	Local
H	Backup all digital data	Thunderstorm/Lightning	Staff	On-Going	Minimal	Local
H	Enforce and update building codes, as needed	Thunderstorm/Lightning, Windstorm, Tornado, Hailstorm, Expansive Soils, Earthquake	City Council	On-Going	Minimal	Local
H	Continue enforcement of city sump pump	Thunderstorm/Lightning	City Council	On-Going	Minimal	Local

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	discharge ordinance					
H	Place alarms on storage facilities containing hazardous materials	Hazardous Materials (HAZMAT)	City Council	On-Going	Minimal	Local
H	Acquire necessary response and detection equipment for city/county employees	HAZMAT	City Staff	On-Going	Minimal	Local
H	Maintain, test, and replace warning sirens	Windstorm, Tornado, Hailstorm, Thunderstorm/Lightning, Communications Failure	EMA, Council	On-Going	Minimal to Low	Local
H	Seek to improve communications with other agencies	Communications Failure, Terrorism	City Council, Staff	On-Going	Minimal	Local
H	Continue cooperation between county roads department and local fire departments during snow emergencies	Severe Winter Storm	City Council, Staff	On-Going	Minimal to Low	Local
H	Establish snow ordinance requiring vehicles to be remove from streets for clearing	Severe Winter Storm	City Council	Short-Term	Minimal	Local
H	Continue fire prevention program	Fire	City Council, Fire Dept.	On-Going	Low	Local, State
H	Maintain membership in the NFIP	Flash Flood, River Flood	City Staff	On-Going	Minimal	Local
H	Maintain, enforce and update floodplain ordinance	Flash Flood, River Flood	City Staff	On-Going	Minimal	Local
H	Identify, purchase and remove structures from flood hazard areas	Flash Flood, River Flood	City Council, Staff	On-Going	Moderate	Local, Federal
H	Initiate and enforce burn ban in times of drought or as needed	Grass/Wildfire, Drought	City Council	On-Going	Minimal	Local
H	Enforce no parking designations at special events	Transportation	City Council	On-Going	Minimal	Local
H	Keep communication lines open with Nuclear Plant in Palo, IA	Radiological/Nuclear Event	City Council	On-Going	Minimal	Local
H	Maintain and update anti-virus software	Terrorism	Staff	On-Going	Minimal	Local
H	Review and update fire codes as necessary	Fire, Explosion	City Council, Fire Dept.	On-Going	Minimal	Local
H	Purchase a new tanker and/or pumper	Fire, Explosion	City Council, Fire Dept.	On-Going	Low to Moderate	Local
H	Provide fans and/or cooling shelter	Extreme Heat	City Council	On-Going	Minimal	Local
H	Maintain air conditioner(s) in community	Extreme Heat	Public Works	On-Going	Minimal	Local

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	buildings					
H	Keep a supply of drinking water to distribute	Extreme Heat	City Council, Fire Department	On-Going	Minimal	Local
H	Initiate and enforce burn ban in times of drought or as needed	Drought	City Council	On-Going	Minimal	Local
H	Encourage the use of proper materials and construction techniques	Expansive Soils	Public Works	On-Going	Minimal to Low	Local
H	Enforce a curfew	Riot/Violent Demonstration	Sheriff	On-Going	Minimal	Local
H	Identify and inventory potential sinkhole sites	Sinkholes	City Council	On-Going	Minimal	Local
H	Secure the area (around a sinkhole)	Sinkholes	Fire Dept.	On-Going	Minimal	Local
H	Enforce the local zoning ordinances	Landslides/Mudflows	City Council, Staff	On-Going	Minimal	Local
H	Develop water conservation policy to take effect in event of water rationing	All	City Council	Shot-Term	Minimal	Local
H	Clear ditches, streams, and waterways on a regular basis	River Flood	City Council	On-Going	Minimal	Local
H	Update flood maps/flood studies for areas throughout the county	River Flood	Staff	On-Going	Minimal	Local
H	Continue cooperation with county in developing flood mitigation efforts	Flash Flood, River Flood	City Council, Staff	On-Going	Minimal	Local
H	Continue working with the Bremer County Recovery Coalition	Flash Flood, River Flood	City Council	On-Going	Minimal	Local
M	Enforce sidewalk clearance ordinance	Severe Winter Storm	City Council	On-Going	Minimal	Local
M	Maintain use of snow fences in the city/county	Severe Winter Storm	City Council	On-Going	Minimal	Local
L	Install a snow fence around the wastewater treatment facility	Severe Winter Storm	City Council	On-Going	Minimal	Local
L	Provide a local hazardous waste dropoff site	HAZMAT	City Council	On-Going	Minimal to Low	Local, State
L	Identify areas throughout the county that would substantially benefit from outdoor warning sirens	Windstorm, Tornado	City Council	On-Going	Minimal	Local
Public Education/Awareness						
H	Educate the public	All	City Council, Staff	On-Going	Minimal	Local

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H	Notify the media on shelter locations	Severe Winter Storm, Extreme Heat, Tornado	City Council	On-Going	Minimal	Local
H	Encourage and maintain enrollment in emergency notification system	Thunderstorm/Lightning, Windstorm, Tornado, Communication Failure	City Council, EMA	On-going	Minimal	Local
H	Encourage home owners to keep emergency kits	Windstorm, Tornado	Bremer County EMA	On-Going	Minimal	Local
H	Encourage use of Iowa One call before digging	Communications Failure, Explosion	City Council, Staff	On-Going	Minimal	Local
H	Keep the county updated on personnel changes	Communications Failure	City Staff	On-Going	Minimal	Local
H	Encourage residents to keep smoke detectors, sprinkler systems and fire extinguishers maintained in their homes	Fire	City Council, Fire Dept.	On-Going	Minimal	Local
H	Educate the public on maintaining their sump pumps	Flash Flood	City Council, Staff	On-Going	Minimal	Local
H	Maintain and improve signals/signage along roadways and at railroad crossings	Transportation	City Council	On-Going	Minimal	Local
H	Establish alternative transportation routes should a road need to be closed	Transportation	Fire Department, Council	On-Going	Minimal	Local
H	Continue to cooperate with pipeline owners and operators to ensure locations are marked	Fire, Explosion	Public Works, Council	On-Going	Minimal	Local
H	Encourage community to plant shade trees	Extreme Heat	City Council, Public Works	On-Going	Minimal	Local
H	Encourage the public to receive vaccinations	Disease	City Council	On-Going	Minimal	Local
H	Cooperate with any countywide mass vaccination plan	Disease	City Council	On-Going	Minimal	Local
H	Monitor disease outbreak news from the CDC and Iowa Department of Public Health	Disease	City Staff	On-Going	Minimal	Local
H	Educate city personnel to identify risk areas	Expansive Soils	Staff	On-Going	Minimal	Local
H	Educate city personnel to handle a sinkhole situation	Sinkholes	City Council	On-Going	Minimal	Local
H	Establish transportation evacuation routes and protocols	River Flood	City Council, Fire Department	On-Going	Minimal	Local
H	Inform the public of reputable and ill	Emergency Management	City Council, Staff	On-Going	Minimal	Local

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	reputable contractors following disasters					
H	Encourage all communities to participate in their Local Emergency Planning Commission (LEPC)	Emergency Management	City Council, Staff	On-Going	Minimal	Local
M	Purchase NOAA weather radios	Thunderstorm/Lightning, Windstorm, Tornado, Radiological/Nuclear Event	City Council	On-Going	Minimal	Local
M	Encourage lead based paint and asbestos removal	HAZMAT	City Council, Fire Dept.	On-Going	Minimal	Local
M	Identify fallout shelter locations	Radiological/Nuclear Event	City Council	On-Going	Minimal	Local
Structural Projects						
H	Implement storm water user fee/ordinance to generate funds for future improvements	Flash Flood, River Flood, Infrastructure Failure	City Council	Short-Term	Low	Local
H	Increase capacity of storm water drainage system	Flash Flood, River Flood, Infrastructure Failure	City Council	Medium-Term	Moderate	Local
H	Develop redundancies/plan in event the city's one well becomes compromised	Infrastructure Failure	City Council	Short-Term	Moderate	Local
H	Encourage utility providers and developers to place all utilities underground	Severe Winter Storm, Communications Failure, Thunderstorm/Lightning	City Council	On-Going	Moderate	Local
H	Use surge protectors to prevent electrical damage to critical and sensitive equipment	Thunderstorm/Lightning	City Council	On-Going	Minimal	Local
H	Placement of lighting arrestors on power lines	Thunderstorm/Lightning	City Council	On-Going	Minimal	Local
H	Construct or designate a safe room or storm shelter	Windstorm, Tornado, Hailstorm	City Council, Schools	On-Going	Moderate to High	Local, State, Federal
H	Encourage backup power generation for local telephone systems and cellular operations	Communications Failure	Bremer County EMA, Council	On-Going	Minimal	Local
H	Inspect any utility lines that are near a sinkhole	Sinkholes	Public Works	On-Going	Minimal	Local
H	Maintain pump station	River Flood	City Council, Public Works	On-Going	Minimal	Local
M	Maintain a list of potential storm sewer projects	Thunderstorm/Lightning	City Council, Staff	On-Going	Minimal	Local
M	Acquire more water pumps	Flash Flood, River Flood, Dam Failure, Levee Failure	City Staff	On-Going	Minimal	Local

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M	Purchase additional trash pumps	Flash Flood, River Flood	City Council	On-Going	Minimal to Low	Local
L	Pursue partnership with rural water as the system expands	Fire, Explosion	City Council	On-Going	Minimal	Local
L	Encourage floodproofing/elevating structures in the floodplain	River Flood	City Council	On-Going	Minimal to Low	Local, State
L	Encourage construction of dikes, levees, dams, and retention ponds	River Flood	City Council, Staff	On-Going	Minimal	Local
L	Identify bridges and culverts than can cost effectively be reengineered to reduce future flooding	River Flood	City Council, Staff	On-Going	Minimal	Local

APPENDIX F – CITY OF SUMNER

COMMUNITY PROFILE

Location

Sumner is located in northeast Bremer County (a small portion of the city lies within Fayette County), in the northeastern quadrant of Iowa,

Geography

At latitude 42.85 N x longitude 92.10 W. the majority of Sumner lies at an elevation of between 1,050 and 1,100 feet (*see Attachment 1: Sumner Topographic Map of the City*). The Little Wapsipinicon River runs to the east of the community, then curves to the west running immediately south of the community. Two highways, State Highway 93 and County Road V62, serve the City of Sumner.

The terrain on which Sumner is built is relatively flat topography. There are very few areas of steeper than normal slope with these being dispersed throughout the community. The highest points of the community lie at approximately 1,100 feet above sea level, and are located in the northern and eastern areas of the city.

History

The earliest non-American Indians to settle in the Sumner area arrived in 1852, establishing homes in Wilson Grove. In 1865 Stephen F. Cass establishes another nearby settlement called Cassville. In 1869 Chauncy Carpenter purchased land in what is now the City of Sumner. It was in 1872 that Carpenter would decide to establish a town. This was decided after the Iowa and Pacific Railroad suggested that their line run through Carpenter's Land.

In 1875 residents of Wilson Grove and Cassville moved into Sumner after receiving news of the possibility of a railroad coming through the town. Many developments would come

TABLE F1: CITY OF SUMNER DEMOGRAPHICS	
Government Framework	Mayor – City Council
General Population, 2010 Census	
Total Population	2,038
Median Age	45.3
At-Risk Population, <18 Years	456
At-Risk Population, >64 Years	516
Total Males	929
Total Females	1,099
One Race-White	1,997
Black of African American	0
American Indian and Alaskan Native	1
Asian	16
Two or More Races	12
Housing Characteristics, 2010 Census	
Total Households	869
Households with children <18 Yrs.	235
Households with persons >65 Yrs.	320
Average Household Size	2.24
Average Family Size	2.83
Total Housing Units	944
Occupied Housing Units	869
Vacant Housing Units	75
Owner-Occupied Housing Units	699
Renter-Occupied Housing Units	170
Persons Living in Group Quarters	78

soon thereafter. In 1875 the first church was established. The first schoolhouse was built in 1876. Mr. Cass himself would build the first bank in 1879. A significant development occurred in 1882, when telephone lines connected Sumner with the City of Waverly.

The City of Sumner was incorporated in 1894. Other noteworthy improvements were also made that same year. These included the establishment of the Sumner Fire Department, and the construction of City Hall. In 1901 a new brick school building was erected. The Sumner Public Library opened its doors for the first time in 1938.

Some more recent historically significant developments took place in the 1950's. In 1950 the Sumner Community Memorial Hospital opened its doors. Later that decade, in 1959, Sumner established its first police force, which initially consisted of three men.

Demographics

Population

Sumner's demographic data is outlined in Tables F1 and F2. In the recent 2010 U.S. Census, Sumner's population declined to 2,028, a decrease of 3.7% percent over ten years. The previous U.S. Census, taken in 2000, recorded a population figure of 2,106 for Sumner. Much of the data included in the tables are from the 2000 U.S. Census, since detailed data from the 2010 Census is not yet available.

Community Services

The City of Sumner has a municipal water supply with an elevated storage capacity of 500,000 gallons with an average consumption of 180,000 gallons per day (gpd). The rated capacity of the overall system is 500,000 gpd. The peak demand is 240,000 gpd.

A primary sewer treatment plant serves Sumner. Average load is 180,000 (gpd) with a peak load of 240,000 (gpd). The rated capacity of the sewer treatment plant is 1,400,000 gpd and is more than sufficient to handle Sumner's current level of development as well as future development.

In 2016 the city completed approximately \$1,000,000 of improvements to the city's wastewater treatment facility. The project included: installation of a backup generator; new Ultraviolet light treatment process to treat e. coli; and installation of clarifier covers to prevent lagoons from freezing during the winter.

Table F3 shows the primary utility providers for the City of Sumner.

TABLE F2: CITY OF SUMNER DEMOGRAPHICS	
<i>Economics Characteristics, 2010-2014 ACS</i>	
Population 16 years and over	1,659
Population In Labor Force (16 years and over)	1,106
Persons Employed	1,023
Persons Unemployed	83
Persons Employed in Management, Business, Science, and Arts Occupations	1,023
Persons Employed in Service Occupations	267
Persons Employed in Sales and Office Occupations	223
Persons Employed in Natural Resources, Construction, and Maintenance Occupations	217
Persons Employed in Production, Transportation, and Material Moving Occupations	101
Median Household Income	\$48,641
Mean Household Income	\$53,851
Percent of Persons < 18 yrs. Below Poverty Level	17.7%
Percent of Persons 18-64 Yrs. Below Poverty Level	10.9%
Percent of Persons >65 Yrs. Below Poverty Level	11.8%
<i>Social Characteristics, 2010-2014 ACS</i>	
School Enrollment (3 yrs and over)	519
Nursery School, Preschool	59
Kindergarten and Elementary School (grades 1-8)	242
High School (grades 9-12)	119
College or Graduate School	89
Education Attainment: Population 25 Years and Over	1,434
Less than High School Graduate	2.4%
High School Graduate (includes equivalency)	44.5%
Some College, Associate's Degree	35.0%
Bachelor's degree or Higher	18.0%

TABLE F3: SUMNER UTILITY PROVIDERS						
Electric	Natural Gas	Telephone/Internet	Cable	Water	Sewer	Sanitation
Sumner Municipal Light Plant	Black Hills Energy	Windstream/Mediacom	Mediacom	City of Sumner	City of Sumner	City of Sumner/Bremer County

The city has recycling containers located at 300 Pleasant Street which are open 24 hours per day, 7 days per week. Residents are able to drop off milk jugs, plastics, office paper, newspaper, magazines, tin cans, chipboard, and cardboard.

HAZARDS & RISK ASSESSMENT

Section 3 identified and profiled the hazards for the entire planning area. However, each community analyzed their own vulnerability to those hazards applicable to their jurisdiction. Using the methodology outlined in Section 3 (Vulnerability Assessment), the City of Sumner evaluated the risk associated with a specific hazard, defined by probability and frequency of occurrence, magnitude, severity, exposures, and consequences. Sumner's vulnerability assessment provides in-depth knowledge of the hazards and vulnerabilities that affect the community. This analysis provides an all-hazard approach when evaluating the hazards of that affect the city, and the associated risks and impacts each hazard presents.

As mentioned previously in Section 3, the vulnerability assessment requires a five-year review with periodic updates, as needed. Potential future hazards and impacts may result from changing technology, new critical facilities, infrastructures, and development patterns, as well as demographic and socioeconomic changes that occur within or outside the area.

Disaster frequency and its effects or severity are important as a basis for planning emergency response and mitigation. Natural hazards tend to reoccur on a predictable seasonal basis, whereas manmade or technological events tend to change over time with advancement in technology and methods of operation. Five criteria were used by the Committee to assure a systematic and comprehensive approach to hazard analysis for their individual jurisdictions including: Historical Occurrence, Probability, Magnitude or Severity, Warning Time, and Duration.

The Committee assessed the defined hazards relevant to potential impact on the city. Using the scoring criteria previously defined (Tables 19-22) the city assessed each of the identified hazards based on probability, magnitude/severity, warning time, and duration. The scores for each of the factors were weighted using the formula below to develop the final hazard assessment score.

$$(\text{Probability} \times .45) + (\text{Magnitude/Severity} \times .30) + (\text{Warning Time} \times .15) + (\text{Duration} \times .10) \\ = \text{Final Hazard Assessment Score}$$

Table F4 is the analysis scores for the City of Sumner. As shown, the top hazards for Sumner are: River Flooding, Tornado/Windstorm, and Severe Winter Storm.

TABLE F4: CITY OF SUMNER HAZARD RISK ASSESSMENT						
Hazard Rank	Hazard	Probability	Magnitude/ Severity	Warning Time	Duration	Hazard Score
1	River Flooding	3	2	1	3	2.4
2	Tornado/Windstorm	2	2	3	2	2.15
3	Severe Winter Storm	2	2	1	2	1.85
4	Thunderstorm/Lightning/Hail	2	1	2	2	1.7
5	Grass/Wild Land Fire	1	1	4	2	1.55
6	HAZMAT Incident	1	2	1	3	1.5
7	Human Disease	1	1	2	4	1.45
8	Extreme Heat	1	2	1	2	1.4
8	Infrastructure Failure	1	2	1	2	1.4
10	Transportation Incident	1	1	3	1	1.3
11	Flash Flood	1	1	1	3	1.2
12	Dam / Levee Failure	1	1	2	1	1.15
13	Animal/Plant/Crop Disease	1	1	1	2	1.1
14	Drought	1	1	1	1	1
14	Earthquake	1	1	1	1	1
14	Expansive Soils	1	1	1	1	1
14	Landslide	1	1	1	1	1
14	Sinkholes	1	1	1	1	1
14	Radiological Incident	1	1	1	1	1
14	Terrorism	1	1	1	1	1

Vulnerability – Identifying

This section will describe the vulnerability for existing and future buildings, infrastructure, and critical facilities in those areas that can be impacted by the prioritized hazards. Since the majority of the hazards have an undefined hazard area (i.e., affecting an entire community or larger area) the following vulnerability assessment will only address those hazards that affect a specified area – flooding (river and flash). However, due to the community’s historical occurrences of tornadoes this hazard was added to the assessment. The following discussion only considers the assets in the community of Sumner.

According to available data, Sumner is projected to see a decrease in population over the next thirty years. This population decrease most likely result in a lesser need for additional critical facilities such as schools, daycare centers, or healthcare centers. However, the need for more critical facilities should be closely monitored these next 5-years and readdressed when this HMP is updated.

Critical Facilities

Identifying the location of critical facilities and designated shelters (see Table F5) in Sumner is important in order to assess their vulnerability to hazards. These critical facilities are important to the operation of a community, the quality of life, and the key components of the economic sector. For instance, high-density residential or commercial development, schools, police stations, government buildings, hospitals and care facilities, airports, gas stations, hardware stores, grocery stores, and water supply systems. *Attachment 6G* illustrates the location of identified critical facilities in Sumner.

Nursing homes or skilled living centers are also highly vulnerable to tornadoes/windstorms. These facilities are designed for caring for the elderly population, majority of which use wheelchairs or other assistance devices, limiting mobility. Also, the majority of nursing homes are constructed as a single-level building with or without basements. Therefore, additional attention needs to be taken to ensure the safety of the residents and employees before, during, and after a tornado event. Hillcrest Nursing Home is the only nursing home in the community. The facility houses 86 beds. According to 2014 ACS, there were 78 persons living in group quarters within the city. In addition, Sumner Housing Corporation has 28 apartments available for rent to the elderly population (62 or older) or disabled persons of any age.

Homes In Hazardous Areas

A facility vulnerable to flooding is normally low, since these structures are not often constructed within the 100-year floodplain. According to the information provided, bridges and roadways will be impacted by flooding. This disruption in the transportation infrastructure would create a longer time period to receive and provide services and supplies to an area if a bridge was washed away due to flooding.

TABLE F5: CRITICAL FACILITIES IN SUMNER

Sumner High School (shelter)	Sumner Jr. High School (shelter)
Sumner Community Hospital (shelter)	St. John’s Lutheran Church (shelter)
Sumner City Hall	Sumner Public Library
United Methodist Church (shelter)	Wastewater Treatment Plant
Fire Station	Public Works Building
Light Plant	

Source: Community

**TABLE F6: CITY OF SUMNER
100-YEAR FLOODPLAIN PROPERTIES**

Number of Structures	229
Building Value	\$ 2,557,820
Dwelling Value	\$ 5,824,740
Total Value	\$ 8,382,560

Source: INRCOG & Bremer County Assessor (2011)

.An INRCOG count of structures in the floodplain showed 90 dwellings located within the floodplain. Using the 2010 Census figure (2.24) for average household size, and assuming all of the households are occupied, there are approximately there are approximately 201 persons living in the floodplain in Sumner.

Table F6 lists the number properties that are located within the 100-year floodplain in Sumner. According to the data provided by INRCOG and Bremer County, there are 229 structures with a total value of \$ 8,382,560 located within the 100-year floodplain. Of those structures, 90 are residential dwellings and 139 are buildings. See *Attachment 5G: Flood Scenario Map of the City*.

As stated on the FEMA website²⁷, mobile homes are highly vulnerable to tornadoes. Even mobile homes that are tied down, offer little protection from tornadoes.

According to Census information, there are 22 mobile homes in Sumner. Based on the city's average household size of 2.24 persons, it estimated that approximately 50 persons live in mobile homes. General observation would suggest a recent increase in the number of manufactured homes in the area. This increased popularity has the potential to increase the potential risk of damage to people and property in the community. Currently, no FEMA certified tornado safe shelters are known to exist in the community.

The primary reason for the increased popularity of mobile and manufactured homes is affordability. Although HUD regulations and local building codes have increased the safety components of these types of houses significantly in recent history, this affordability has often been accompanied with a reduced level of safety. Based on national data on circumstance of tornado fatalities between 1985 and 1997, it was found that 38% of fatalities were occupants of mobile or manufactured homes, 27% were in permanent homes, 11% in vehicles, 9% outdoors (open), 4% in businesses, 4% in structures with long-span roofs, and 2% in schools. These data highlight the high exposure of occupants of mobile and manufactured homes (*AR State Hazard Mitigation Plan, 1999*).

TABLE F7: CITY OF SUMNER "AT-RISK" POPULATION

	2010
Total City Population (2010)	2,028
Elderly (65 yrs and older)	516
Youth (under 18 yrs old)	456
Householder Living Alone	287
Non-English Speaking Population (speaks English less than 'very well')	0.3%
Population Living in Poverty	12.8%
Population in Mobile Homes	50
Group Quarters Population	78

Source: U.S. Census, 2010 and Iowa Data Center

²⁷ Federal Emergency Management Agency (FEMA), <http://www.fema.gov/areyouready/tornadoes.shtm>

Vulnerability – Identifying Social Asset Populations

The social vulnerability assessment also identified how the hazards affect the population of Sumner and it is assumed that the identified populations are more likely to require assistance during times of disaster and are therefore, generally speaking, more at-risk than the remaining population. The at-risk population must be identified and targeted in successful mitigation efforts. Table F5 identifies the population of various segments of the population that may consider “at-risk” in the event of a hazard.

According to Table F7, 25 percent (561) of the city’s residents are 65 years and older. There are 77 persons living in group quarters.

Children are also at higher risk during some disasters. This is mostly due to the fact that young persons often are not aware of the proper actions to take in the event of a disaster. In addition, very young children would be more susceptible to a disaster such as a disease epidemic simply due to their age. In 2010, 24 percent (456 persons) were under the age of 18.

Portions of Bremer County are highly vulnerable to floods, especially along the Little Wapsipinicon River in Sumner. Flooding puts the entire population at some level of risk, whether through the flooding of their homes, businesses, or places of employment, or the road, sewer, and water infrastructure that serve them daily. High floodwaters can devastate homeowners with property damage, property loss, and extensive, time-consuming cleanup. Secondary effects caused by flooding can add to the property damage. Power loss can leave citizens without heat or air conditioning for extended periods of time. The transportation infrastructure of the community can be impacted by flooding events, which can endanger citizens attempting to travel or evacuate the area, as well as leave those remaining without goods and services.

Populations living in the 100-year floodplain are also at risk of sustaining personal injury or property damage. According to INRCOG data, there are approximately 201 persons living within the 100-year floodplain.

Vulnerability – Estimating Potential Property Losses

Valuations are an important component of hazard mitigation planning inasmuch as it provides measurable data that can be used to form some type of estimate as to the potential losses a community could face in the event of a catastrophic disaster.

The valuations for the City of Sumner are available from the County Assessors and Auditors offices. It should be noted however that these dollar amounts do not include gas and electric utility valuations nor do the evaluations include exempt properties, including government buildings, infrastructure, and religious/nonprofit properties. These results should be considered preliminary, as a full accounting of assets has not been completed.

City of Sumner's property valuations are in TableF8.

Future Development

Future development within identified hazard areas can change the threat level of an area by placing critical facilities, businesses, transportation networks, utilities, and populations within vulnerable areas. While it can be difficult to curb development in the planning area, it is the jurisdiction's advantage to be aware of development trends in order to successfully mitigate future hazards as risks increase. However, continued conformity with the State Building Codes and local land use ordinances and regulations (zoning, subdivision, floodplain management, etc.) will help to mitigate the effects hazards have on new and future development.

Repetitive Loss Properties

FEMA defines a repetitive loss property as an insurable building that has experienced two losses in a 10-year period in which each loss is \$1,000 or more. There are two repetitive loss properties in Sumner.

This HMP attempts to reduce loss by identifying potential natural and manmade hazards. As a result of many natural and manmade hazards, repairs and reconstruction area often completed in a way that returns the structure to pre-disaster condition yet does little to prevent a reoccurrence of damage. Replication of the pre-disaster conditions allows for the repetitive cycle of property damage, reconstruction, and re-damage. Hazard mitigation is needed to ensure that such cycles are broken, that post-disaster repairs and reconstruction are analyzed, and sound, less vulnerable conditions are produced. Additionally, other mitigation strategies may be considered, such as voluntary property buy-outs.

River flooding is the most common cause of repetitive loss in Bremer County. Table F9 illustrates the number of repetitive loss properties for Sumner.

TABLE F8: COMMUNITY VALUATION AS FOR SUMNER		
	Total Valuation	Average Valuation per Unit or Parcel
Residential Property	\$ 75,920,060	\$ 92,136/parcel
Commercial Property	\$ 10,078,790	\$ 89,193/unit
Industrial Property	\$ 5,096,000	\$ 566,222/unit
Agricultural Buildings	\$ 305,030	\$ 76,258/unit
Agricultural Land	\$ 657,900	\$1,198/acre
Utilities	\$ 679,309	N/A
Railroads	0	N/A
Exemptions (military)	\$ 314,840	N/A
Gross Valuation	\$ 92,737,089	N/A
Total Net Valuation	\$ 92,422,249	
<i>Source: City of Sumner & County Assessor (1/1/2011)</i>		

TABLE F9: REPETITIVE LOSS PROPERTIES FOR SUMNER,							
CID #	# of NFIP Policies	NFIP Insurance in Force (\$)	Total Paid Losses	Total Payments Made (\$)	# of Repetitive Loss Properties	Repetitive Loss Payment (\$)	Target Rep. Loss Buildings
190029	18	\$ 1,622,800	7	\$ 59,473	2	\$ 43,111	0
<i>Source: Federal Emergency Management Agency (FEMA); Repetitive Loss data as of 11/30/2014; NFIP data as of 9/30/2016</i>							

MITIGATION STRATEGY

Hazard Mitigation Plan Goals

The hazard mitigation plan goals were reviewed by the Hazard Mitigation Planning Committee at their second committee meeting. The committee set as a priority the development of broad-based goals that would address a multitude of hazards and encompass a variety of mitigation activities. The hazard mitigation plan goals identified are as follows:

1. Reduce the chance of and impact of flooding in the community.
2. Take measures to minimize the occurrence of injuries and loss of life due to hazards.
3. Take measures to minimize or eliminate damages that may occur as a result of hazards.
4. Increase the city's ability to respond to natural disasters and man-made hazards.
5. Return to the community to similar or improved pre-event conditions as quickly as possible following a disaster event.
6. Incorporate the City Plan into the proposed Multi-Jurisdictional Plan.
7. Continually re-assess and re-evaluate the plan and mitigation activities.

Current Mitigation Actions

Sumner's current mitigation actions are listed below for the following categories: prevention, property protection, public education and awareness,

Prevention Mitigation Actions

On July 16, 1990 the City of Sumner became an active member in the National Flood Insurance Program (NFIP) by adopting its initial floodplain ordinance. The Federal Insurance Administration manages the insurance component of the NFIP, and works closely with FEMA's Mitigation Directorate, which oversees the floodplain management aspect of the program.

The City updated the Floodplain Ordinance most recently in July of 1990. In accordance with NFIP guidelines, the ordinance does not allow for new construction within the floodplain. In addition, it requires those structures within the 100-year flood to: (i) "be adequately anchored to prevent flotation, collapse or lateral movement of the structure"; (ii) "be constructed with materials and utility equipment resistant to flood damage" and; (iii) "be constructed by methods and practices that minimize flood damage."

FEMA revised the Flood Insurance Rate Maps for Sumner and several other communities in Bremer County on March 4, 2008.

TABLE F8: CURRENT PLANNING AND REGULATORY DOCUMENTS FOR SUMNER

Previous HMP	Comprehensive Plan	Building Code	Zoning Ordinance	Subdivision Regulations	Floodplain Management Ordinance	Tree-Trimming Ordinance	Storm water Ordinance	Snow Removal Ordinance
Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes

Source: City of Sumner

Property Protection Mitigation Actions

The City of Sumner has contained in their Code of Ordinances a Flood Plain Regulations chapter. According to city officials, the City of Sumner has never participated in any housing buyout programs, or other flood protection programs.

Public Education & Awareness Mitigation Actions

The outdoor early warning siren system consists of two sirens, which are approximately ten years old. Both sirens have battery backup and are remotely operated.

NOAA Weather Radio broadcasts are also available in the community. NOAA Radio's provide up to the minute weather related alerts. Other locations that warnings and watches can be found are television, Internet, and radio.

Natural Resource Protection Mitigation Actions

None.

Emergency Services Mitigation Actions

Sumner works with the Bremer County Emergency Management Coordinator, based out of the City of Waverly, on various safety and emergency events. The Emergency Management Coordinator works in conjunction with local fire, rescue, police, and government officials to draft and implement workable emergency action plans in the community. The current Emergency Management Coordinator is Kip Ladage and current contact information is as follows: Bremer County Emergency Management Agency, 111 4th St. NE, Bremer-Waverly LEC, Waverly, Iowa 50677, (319) 352-0133, email: kladage@co.bremer.ia.us

Law Enforcement

The Sumner Police Department, Bremer County Sheriff's Department, and the Iowa State Patrol provide police protection in the City of Sumner. The Sumner Police Department currently employs 3 officers.

Fire Protection

Fire protection is provided for Sumner with a force of 30 volunteer firemen. Service provided by the department includes fire protection, rescue, storm watch, search, and sand bagging. Equipment used by the Sumner Fire Department includes the following: 1996 Ford Pumper; 1972 Chevy Pumper; 1981 Ford Tanker; 1976 Chevy Tanker; 1968 Chevy Tanker; 1995 International Rescue Vehicle; 1979 Van; and a 1967 Jeep.

Ambulance

The City of Sumner is also served by a local ambulance service of 25 volunteers and 2 ambulances.

Medical Facilities

The City of Sumner has a small hospital (Sumner Medical Clinic) and three doctor's offices.

HAZMAT

Sumner contracts with Northeast Iowa Response Group for response to hazardous material spills. The Northeast Iowa Response Group is a division of Waterloo Fire Rescue as is the Hazardous Materials Regional Training Center. The Training Center provides training to fire departments and companies from around the state and country. Not only is this a training center it also serves as a hazardous materials quick response unit to Black Hawk County, surrounding counties, and many municipalities in a ten county region. The Unit provides local fire departments with hazard materials emergency procedures thus reducing additional contamination. An evacuation plan is also in place in conjunction with the activities with the local department. Contact information for the facility is as follows: Hazardous Materials Regional Training Center, 1925 Newell Street, Waterloo, Iowa 50707, Phone: (319) 291-4275, Toll Free: (800) 291-4682, Fax: (319) 291-4285

The jurisdictions also partners the Northeast Iowa Response Group for assistance in responding to any methamphetamine labs located in the city limits. The Response Group assists the Police Departments in containment of the site and disposal of the hazardous chemicals.

Public Works / Street Department

The City of Sumner also views proper snow and ice removal from roadways to be essential in mitigating negative effects of severe winter storms. Snow removal and ice prevention techniques are practiced by City, County and State employees on the corresponding roadways within the city limits. The City of Sumner employs one full time and one part time workers in their public works department. Equipment used includes two dump trucks with snow blades, dump truck, grade, skid loader and Case tractor.

Structural Projects Mitigation Actions

None.

TABLE F9: FIRE & FLOOD INFORMATION FOR SUMNER

Fire Insurance Rating	National Flood Insurance Program (NFIP) (Y or N & Year Joined)	NFIP CID #
6	Yes, Joined 7/16/90, Current Map 3/4/08	190029

Source: Community and FEMA

Future Mitigation Actions

While the existing mitigation activities discussed above detail the City's efforts to mitigate hazards when possible and to respond to hazards in a timely and efficient manner, the Committee also recognizes that there are many more mitigation activities and projects that would benefit county residents. Thus, the Committee developed a list of future hazard mitigation activities that, if accomplished, would serve to further reduce the risk of hazards to the community. The list may include a combination of projects the Committee feels the community should try to accomplish and mitigation efforts that are ongoing that the Committee view as vital to the continued well-being of the public.

The Committee analyzed the potential mitigation activities. This analysis included a discussion of the potential benefits of implementing the activity, some hurdles that the community may face in implementing the action step, and the drawbacks of implementation. The analysis utilized the STAPLEE feasibility criteria. The STAPLEE technique is a FEMA suggested method of evaluation. The STAPLEE approach assesses both positive and negative impacts on the following aspects of a county: Social, Technical, Addministrative, Political, Legal, Economic, and Environmental. Based on this analysis, each activity was ranked as High (H), Medium (M) or Low (L). However, not all identified activities are applicable to all jurisdictions and is marked as such in Table F10.

Funding

Although in the long-term hazard mitigation actions will save money by avoiding the loss of lives or property damages, in the short-term each action will have an associated cost. The City will rely heavily on local funding sources to fulfill most of the plan obligations; however, they will also seek funds from State and Federal agencies for both pre- and post-disaster mitigation activities.

The estimated cost(s) for each mitigation action, program, or project is either: Minimal, Low, Moderate, or High depending upon various factors.

- Minimal: Cost estimate is \$10,000 or less based on using current staff, time commitment, continuous of current duties, proposed action/program/project, and funding sources.
- Low: Cost estimate for project range from \$10,001 - \$99,999 based on existing proposed treatment, time commitment, any further study that is needed, and level of engineering, and project components (permits, acquisition, coordination, etc.).
- Moderate : Cost estimate for project range from \$100,000 - \$299,999 based on existing conditions, time commitment, proposed action/program/project, any further study that is needed, and level of engineering, and project components (permits, acquisition, coordination, etc.), and funding sources.
- High : Cost estimate for project range is \$300,000 or higher based on existing conditions, time commitment, proposed action/ program/project, any further study that is needed, and level of engineering, project components (permits, acquisition, coordination, etc.), and funding sources.

Implementation Strategy

Once the Committee identified and ranked the future hazard mitigation activities, the activities were then analyzed. In addition, the Committee identified a time line for each activity, identified the responsible party (ies) for each activity and finally related each activity to at least one of the five Hazard Mitigation Plan Goals listed above. Table F10 below is the City of Sumner's Implementation Strategy.

TABLE F10: CITY OF SUMNER'S IMPLEMENTATION STRATEGY						
Priority	Mitigation Action/Program/Project	Associated Hazard	Primary Agency Responsible for Implementation	Date for Completion	Estimated Cost (s)	Funding Source
Emergency Services						
H	Continue training and education for fire departments, law enforcement agencies and ambulance crew personnel	All	City Council	On-Going	Low to Moderate	Local
H	Maintain and acquire materials and equipment for fire departments, law enforcement agencies and ambulance crew personnel	All	City Council	On-Going	Low to Moderate	Local
H	Maintain mutual aid agreements	All	City Council	On-Going	Minimal	Local
H	Maintain storm spotter training for local fire departments/deputies and EMS crews	Thunderstorm/Lightning, Windstorm, Tornado, Hailstorm	City Council, EMA	On-Going	Minimal	Local
H	Make available a cleanup crew for after a storm	Thunderstorm/Lightning	City Council, Staff	On-Going	Minimal	Local
H	Maintain mutual aid agreements with the Northeast Iowa response Group	HAZMAT	City Council	On-Going	Minimal	Local
H	Keep HAZMAT manuals/information current and easily accessible	HAZMAT	All City personnel	On-Going	Minimal	Local
H	Maintain or install GPS units in all emergency service and city/county vehicles	Communications Failure	City Council	On-Going	Minimal	Local
H	Maintain automatic TTY TDD machines for emergency personnel and city/county employees	Communications Failure	City Council, EMA	On-Going	Minimal	Local
H	Continue training and promotion of the Incident Command System	Communications Failure	City Council	On-Going	Minimal	Local
H	Upgrade radio communications equipment as needed	Communications Failure	City Staff	On-Going	Minimal	Local
H	Maintain list of county emergency contacts	Communications Failure	City Staff	On-Going	Minimal	Local
H	Continue cooperation between county roads department and local fire departments during snow emergencies	Severe Winter Storm	City Council, Public Works	On-Going	Minimal	Local
H	Improve water system to enhance firefighting capacity/ability	Fire	City Council, Fire Dept.	On-Going	Minimal	Local
H	Maintain and keep storm drains clear of debris	Flash Flood	Public Works	On-Going	Minimal to Low	Local
H	Initiate and enforce burn ban in times of drought or as needed	Grass/Wildfire, Drought	Fire Department, Council	On-Going	Minimal	Local
H	Enforce no parking designations at special events	Transportation	City Council, Police	On-Going	Minimal	Local

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H	Maintain air conditioner(s) in community buildings	Extreme Heat	City Council	On-Going	Minimal	Local
H	Initiate and enforce burn ban in times of drought or as needed	Drought	City Council, Fire Dept.	On-Going	Minimal	Local
H	Develop sandbagging procedures for the community	River Flood	City Council	On-Going	Minimal	Local
H	Develop and maintain staging area for dumping during cleanup	River Flood	City Council, Public Works	On-Going	Minimal	Local
H	Maintain and update emergency response plans	Emergency Management	City Council, Fire Department	On-Going	Minimal	Local
H	Maintain lists of personnel and equipment available to use with response plans	Emergency Management	City Council, Fire Department	On-Going	Minimal	Local
H	Maintain NIMS compliance	Emergency Management	City Council	On-Going	Minimal	Local
M	Provide emergency shelters for evacuees	All	Bremer County EMA	On-Going	Minimal	Local
M	Acquire necessary response and detection equipment for city/county employees	HAZMAT	City Council	On-Going	Minimal	Local
M	Enhance Standard Operating Procedures for dissemination of information/press releases in the event of a disaster	Communications Failure	City Council	On-Going	Minimal	Local
M	Complete continuity of government plan	Communications Failure	City Council, Staff	On-Going	Minimal	Local
M	Regularly review and amend fire and medical HAZMAT response standard operating procedures	Communications Failure	City Council, Staff	On-Going	Minimal	Local
M	Set a designated number of people to be trained in post-disaster record keeping/damage assessments	Emergency Management	City Council, Fire Department	On-Going	Minimal	Local
L	Maintain list of potential translators to be called upon in case of an emergency	Communications Failure	Bremer County EMA, City Council	On-Going	Minimal	Local
L	Stockpile sand and sandbags	Flash Flood, River Flood	City Council, Fire Department	On-Going	Minimal to Low	Local
L	Purchase additional trash pumps	Flash Flood, River Flood	City Council	On-Going	Minimal	Local
L	Purchase emergency signs to be used in case of an incident	Transportation	City Council, Police	On-Going	Minimal	Local
L	Purchase a new tanker and/or pumper	Fire, Explosion	City Council, Fire Department	On-Going	Low	Local
L	Provide fans and/or cooling shelter	Extreme Heat	City Council	On-Going	Minimal	Local
Natural Resource Protection						
H	Maintain and/or develop a wellhead protection program	Groundwater Contamination	City Council	On-Going	Minimal	Local
H	Monitor wells in areas of identified contamination	Groundwater Contamination	City Council, Public Works	On-Going	Minimal	Local
H	Monitor the drinking water supply	Groundwater Contamination, Disease	City Council, Public Works	On-Going	Low	Local
H	Maintain and/or develop storm water management program	Groundwater Contamination, Flash Flood	City Council, Public Works	On-Going	Low	Local, State
H	Follow monitoring requirements set forth by the Iowa DNR	Groundwater Contamination	City Council	On-Going	Low	Local
H	Carry out conservation measures such as erosion control and work with the following organizations: Extension, NRCS, Farm Bureau, EPA, DNR, and Soil and water Conservation District	Groundwater Contamination	City Council	On-Going	Minimal to Low	Local, State, Federal
H	Secure the area (around a sinkhole)	Sinkholes	Public Works, Fire Department	On-Going	Minimal	Local

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M	Identify and map areas of past contamination	Groundwater Contamination	City Council, Public Works	On-Going	Low	Local
M	Restrict water usage should it be necessary	Drought	Public Works, Council	On-Going	Minimal	Local
M	Clear ditches, streams, and waterways on a regular basis	River Flood	Public Works	On-Going	Minimal	Local
L	Eliminate and cap private and abandoned wells in the city	Groundwater Contamination	City Council	On-Going	Low	Local
L	Eliminate the use of septic tank systems in the city limits	Groundwater Contamination	City Council	On-Going	Minimal to Low	Local, State
L	Encourage community to plant shade trees	Extreme Heat	City Council	On-Going	Minimal	Local
L	Keep a supply of drinking water to distribute	Extreme Heat	City Council	On-Going	Minimal	Local
L	Develop rationing procedures	Drought	City Council	On-Going	Minimal	Local
L	Plant trees along water bodies and slopes	Landslides/Mudflows	City Council, Public Works	On-Going	Minimal	Local
L	Purchase additional parkland in order to increase greens space and reducing surface flow	River Flood	City Council	On-Going	Minimal to Low	Local
Prevention						
H	Maintain public works equipment	Severe Winter Storm	City Council	On-Going	Minimal to Low	Local
H	Continue fire prevention program	Fire	City Council, Fire Dept.	On-Going	Minimal	Local
H	Maintain membership in the NFIP	Flash Flood, River Flood	City Staff	On-Going	Minimal	Local
H	Enforce a curfew	Riot/Violent Demonstration	City Council, Police	On-Going	Minimal	Local
H	Identify and inventory potential sinkhole sites	Sinkholes	Public Works	On-Going	Minimal	Local
H	Enforce the local zoning ordinances	Landslides/Mudflows	City Council, Zoning Admin.	On-Going	Minimal	Local
H	Maintain public works equipment	Severe Winter Storm	City Council	On-Going	Minimal to Low	Local
H	Continue working with the Bremer County Recovery Coalition	Flash Flood, River Flood	City Council	On-Going	Minimal	Local
M	Maintain tree trimming program	Severe Winter Storm, Windstorm, Hailstorm	City Council	On-Going	Low	Local
M	Enforce sidewalk clearance ordinance	Severe Winter Storm	City Council	On-Going	Minimal	Local
M	Enforce and update building codes, as needed	Thunderstorm/Lightning, Windstorm, Tornado, Hailstorm, Expansive Soils, Earthquake	City Council, Zoning Administrator	On-Going	Minimal	Local
M	Continue enforcement of city sump pump discharge ordinance	Thunderstorm/Lightning	City Council, Staff	On-Going	Minimal	Local
M	Maintain a list of potential storm sewer projects	Thunderstorm/Lightning	City Council	On-Going	Minimal	Local
M	Continue an annual inspection program for commercial and industrial properties	Fire	City Council, Fire Dept.	On-Going	Minimal	Local
M	Maintain, enforce and update floodplain ordinance	Flash Flood, River Flood	City Staff	On-Going	Minimal	Local
M	Encourage the use of proper materials and construction techniques	Expansive Soils	City Council, Zoning Admin.	On-Going	Minimal	Local
M	Update flood maps/flood studies for areas throughout the county	River Flood	City Council	On-Going	Minimal to Low	Local, Federal
L	Determine locations for potential heating shelters and volunteer organization	Severe Winter Storm	Bremer County EMA, City Council	On-Going	Minimal	Local

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L	Purchase and maintain backup generators	Severe Winter Storm, Thunderstorm/Lightning, Tornado, Emergency Management	City Council	On-Going	Minimal to Low	Local
L	Maintain use of snow fences in the city/county	Severe Winter Storm	City Council	On-Going	Minimal	Local
L	Backup all digital data	Thunderstorm/Lightning	Staff	On-Going	Minimal	Local
L	Maintain law enforcement monitoring of large storage supplies	HAZMAT	Police	On-Going	Minimal	Local
L	Encourage backup power generation for local telephone systems and cellular operations	Communications Failure	Bremer County EMA, City Council	On-Going	Minimal	Local
L	Keep supply of backup radios and cellphones	Communications Failure	All City Departments	On-Going	Minimal	Local
L	Maintain and update anti-virus software	Terrorism	Staff	On-Going	Minimal	Local
L	Secure vulnerable targets, as identified by the LEPC and County EMA with alarms, security cameras and fences	Terrorism	Police	On-Going	Minimal	Local
L	Review and update fire codes as necessary	Fire, Explosion	City Council, Fire Dept.	On-Going	Minimal	Local
Public Awareness/Education						
H	Educate the public	All	City Council, Staff	On-Going	Minimal	Local
H	Maintain, test, and replace warning sirens	Windstorm, Tornado, Hailstorm, Thunderstorm/Lightning, Communications Failure	City Council	On-Going	Minimal to Low	Local
H	Identify areas throughout the city that would substantially benefit from outdoor warning sirens	Windstorm, Tornado	City Council, Fire Department, EMA	On-going	Minimal	Local
H	Encourage and maintain enrollment in emergency notification system	Thunderstorm/Lightning, Windstorm, Tornado, Communication Failure	City Council, EMA	On-Going	Minimal	Local
H	Encourage use of Iowa One call before digging	Communications Failure, Explosion	City Staff	On-Going	Minimal	Local
H	Improve standard operating procedures for schools	Communications Failure	City Council, School Board	On-Going	Minimal	Local
H	Seek to improve communications with other agencies	Communications Failure, Terrorism	City Council	On-Going	Minimal	Local
H	Keep the county updated on personnel changes	Communications Failure	City Council, Staff	On-Going	Minimal	Local
H	Encourage residents to keep smoke detectors, sprinkler systems and fire extinguishers maintained in their homes	Fire	City Council, Fire Dept.	On-Going	Minimal	Local
H	Keep communication lines open with Nuclear Plant in Palo, IA	Radiological/Nuclear Event	City Council	On-Going	Minimal	Local
H	Cooperate with any countywide mass vaccination plan	Disease	City Council	On-Going	Minimal	Local
H	Monitor disease outbreak news from the CDC and Iowa Department of Public Health	Disease	City Council	On-Going	Minimal	Local
H	Educate city personnel to handle a sinkhole situation	Sinkholes	City Council, Staff	On-Going	Minimal	Local
H	Continue cooperation with county in developing flood mitigation efforts	Flash Flood, River Flood	City Council, Staff	On-Going	Minimal	Local

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H	Encourage all communities to participate in their Local Emergency Planning Commission (LEPC)	Emergency Management	City Council	On-Going	Minimal	Local
H	Maintain communication with county contacts	Emergency Management	City Council	On-Going	Minimal	Local
M	Purchase NOAA weather radios	Thunderstorm/Lightning, Windstorm, Tornado, Radiological/Nuclear Event	Bremer County EMA, City Council	On-Going	Minimal	Local
M	Encourage lead based paint and asbestos removal	HAZMAT	City Council, Fire Department	On-Going	Minimal	Local
M	Encourage home owners to keep emergency kits	Windstorm, Tornado	Bremer County EMA	On-Going	Minimal	Local
M	Establish alternative transportation routes should a road need to be closed	Transportation	City Council, Police	On-Going	Minimal	Local
M	Identify fallout shelter locations	Radiological/Nuclear Event	City Council, Zoning Administrator	On-Going	Minimal	Local
M	Encourage the public to receive vaccinations	Disease	City Council, Fire Department, EMS	On-Going	Minimal	Local
M	Educate city personnel to identify risk areas	Expansive Soils	City Council	On-Going	Minimal	Local
M	Establish detour routes	Bridge Failure, Flash Flood, River Flood	City Council, Police	On-Going	Minimal	Local
M	Establish transportation evacuation routes and protocols	River Flood	City Council, Police	On-Going	Minimal	Local
M	Inform the public of reputable and ill reputable contractors following disasters	Emergency Management	City Council, Staff	On-Going	Minimal	Local
L	Notify the media on shelter locations	Severe Winter Storm, Extreme Heat, Tornado	City Council	On-Going	Minimal	Local
L	Educate the public on maintaining their sump pumps	Flash Flood	City Staff	On-Going	Minimal	Local
Structural Projects						
H	Relocate Sumner Municipal Light Plant	Infrastructure Failure, River Flooding, Flash Flooding	Light Plant Board	Medium-Term	High	Local
H	Replace/make improvements (widen or raise) at 3 rd and 5 th Street bridges to increase river flow capacity	Infrastructure Failure, River Flooding, Flash Flooding	City Council, DOT	Long-Term	High	Local, State, Federal
H	Relocate Public Works Building	Infrastructure Failure, River Flooding, Flash Flooding	City Council	Medium-Term	Moderate	Local
H	Use surge protectors to prevent electrical damage to critical and sensitive equipment	Thunderstorm/Lightning	Staff	On-Going	Minimal	Local, State
H	Placement of lighting arrestors on power lines	Thunderstorm/Lightning	City Council	On-Going	Minimal	Local
H	Pursue partnership with rural water as the system expands	Fire, Explosion	City Council	On-Going	Minimal	Local
H	Continue with improvement to the storm water system	Flash Flood	City Council	On-Going	Low to Moderate	Local, State
H	Prevent inflow and infiltration into the sanitary sewer	Flash Flood, River Flood	City Staff	On-Going	Minimal to Low	Local
H	Continue to cooperate with pipeline owners and operators to ensure locations are marked	Fire, Explosion	City Council, Public Works	On-Going	Minimal	Local
H	Continue regular bridge inspections	Bridge Failure	City Council, Staff	On-Going	Minimal to Low	Local
H	Place barricades to close dangerous bridges	Bridge Failure	City Council, Police	On-Going	Minimal	Local
H	Maintain embargos/weight limits as necessary	Bridge Failure	City Council, Police	On-Going	Minimal	Local
H	Inspect any utility lines that are near a sinkhole	Sinkholes	Public Works	On-Going	Minimal	Local

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H	Encourage construction of dikes, levees, dams, and retention ponds	River Flood	City Council	On-Going	Minimal	Local
H	Maintain pump station	River Flood	City Council, Staff	On-Going	Minimal	Local
M	Encourage utility providers and developers to place all utilities underground	Severe Winter Storm, Communications Failure, Thunderstorm/Lightning	City Council	On-Going	Minimal	Local
M	Construct or designate a safe room or storm shelter	Windstorm, Tornado, Hailstorm	City Council, EMA, School Board	On-Going	High	Local, State, Federal
M	Identify, purchase and remove structures from flood hazard areas	Flash Flood, River Flood	City Council	On-Going	Low to Moderate	Local, Federal
M	Install tiling to help water move away from structures	Expansive Soils	City Council, Zoning Admin.	On-Going	Minimal to Low	Local
M	Encourage floodproofing/elevating structures in the floodplain	River Flood	City Council	On-Going	Minimal	Local
M	Identify bridges and culverts than can cost effectively be reengineered to reduce future flooding	River Flood	City Council, Staff	On-Going	Minimal	Local
M	Protect wastewater treatment facility from flooding	Infrastructure Failure, River Flooding, Flash Flood	City Council	On-Going	Minimal to Low	Local
L	Place alarms on storage facilities containing hazardous materials	Hazardous Materials (HAZMAT)	City Council, Fire Department	On-Going	Minimal	Local
L	Acquire more water pumps	Flash Flood, River Flood, Dam Failure, Levee Failure	City Council, Fire Department	On-Going	Minimal to Low	Local
L	Receive education/training from DOT on the subject of embargo/weight limits	Bridge Failure	City Council, Staff	On-Going	Minimal	Local

APPENDIX G: CITY OF TRIPOLI

COMMUNITY PROFILE

Location

The City of Tripoli is located in the northeast quadrant of the county along Highway 93.

Natural Environment

Tripoli is located in north-north central Bremer County, in the northeastern quadrant of Iowa, at latitude 42.81 N x longitude 92.26 W and elevations ranging from 950 to 1,020. The City is bordered on all sides by farmland and the Wapsipinicon River runs east of the city. The land within the City is gently sloping but is generally flat. Two highways serve the City of Tripoli; State Highway 93, which leads to Sumner and Highway 63, and County Road V43, which leads to Highway 3. The major water system affecting the City of Tripoli is the Wapsipinicon River. The peak elevation in Tripoli is approximately 1,310 feet and is located in the northern part of the city.

History

Tripoli was incorporated as a village in 1895, with a fire department and municipal drinking water system established two years later. Like many other communities in Iowa, the land was settled by families from Ohio, Indiana and Illinois. The land where Tripoli sits today was first discovered by eastern settlers in 1853. Having determined the land was a good place to take root, the settlers brought more of their families to Tripoli from the east. Once a mill was up and running, this attracted more population and commerce to the village.

Today, Tripoli is home to several businesses and an excellent school system. The city serves as a bedroom community for the Waterloo-Cedar Falls metro area, as many of the city's residents work outside of the city.

TABLE G1: CITY OF TRIPOLI DEMOGRAPHICS

<i>Government Framework</i>	Mayor – City Council
<i>General Population, 2010 Census</i>	
Total Population	1,313
Median Age	40.5
At-Risk Population, <18 Years	342
At-Risk Population, >64 Years	254
Total Males	517
Total Females	696
One Race-White	1,290
Black or African American	2
American Indian and Alaskan Native	0
Asian	4
Two or More Races	10
<i>Housing Characteristics, 2010 Census</i>	
Total Households	540
Households with children <18 Yrs.	180
Households with persons >65 Yrs.	162
Average Household Size	2.37
Average Family Size	2.95
Total Housing Units	568
Occupied Housing Units	540
Vacant Housing Units	28
Owner-Occupied Housing Units	447
Renter-Occupied Housing Units	93
Persons Living in Group Quarters	32

Demographics

Population

Tripoli's demographic data is outlined in Tables G1 and G2. In the recent 2010 U.S. Census, Tripoli's population grew to 1,313, an increase of 0.23 percent over ten years. The previous U.S. Census, taken in 2000, recorded a population figure of 1,310 for Tripoli.

Community Services

The City of Tripoli has a municipal water supply with an elevated storage capacity of 265,000 gallons with an average consumption of 91,000 gallons per day (gpd). The rated capacity of the overall system is 300,000 gpd. The peak demand is 150,000 gpd.

A primary sewer treatment plant serves Tripoli. Average load is 236,000 (gpd) with a peak load of 1,212,000 (gpd). The rated capacity of the sewer treatment plant is 2,278,000 gpd and is more than sufficient to handle Tripoli's current level of development as well as future development.

Table G3 shows the primary utility providers for the City of Tripoli.

TABLE G2: CITY OF TRIPOLI DEMOGRAPHICS	
<i>Economics Characteristics, 2010-2014 ACS</i>	
Population 16 years and over	1,166
Population In Labor Force (16 years and over)	714
Persons Employed	674
Persons Unemployed	40
Persons Employed in Management, Business, Science, and Arts Occupations	162
Persons Employed in Service Occupations	142
Persons Employed in Sales and Office Occupations	147
Persons Employed in Natural Resources, Construction, and Maintenance Occupations	82
Persons Employed in Production, Transportation, and Material Moving Occupations	141
Median Household Income	\$47,125
Mean Household Income	\$54,736
Percent of Persons < 18 yrs. Below Poverty Level	29.7%
Percent of Persons 18-64 Yrs. Below Poverty Level	15.1%
Percent of Persons >65 Yrs. Below Poverty Level	8.0%
<i>Social Characteristics, 2010-2014 ACS</i>	
School Enrollment (3 yrs. and over)	487
Nursery School, Preschool	28
Kindergarten and Elementary School (grades 1-8)	178
High School (grades 9-12)	169
College or Graduate School	122
Education Attainment: Population 25 Years and Over	932
Less than High School Graduate	13.0%
High School Graduate (includes equivalency)	42.1%
Some College, Associate's Degree	20.7%
Bachelor's degree or Higher	2.1%

TABLE G3: TRIPOLI UTILITY PROVIDERS						
Electric	Natural Gas	Telephone/Internet	Cable	Water	Sewer	Sanitation
Alliant Energy	Black Hills Energy	Butler-Bremer Communications	Butler-Bremer Communications	City of Tripoli	City of Tripoli	Tripoli-Readlyn Sanitation

HAZARDS & RISK ASSESSMENT

Section 3 identified and profiled the hazards for the entire planning area. However, each community analyzed their own vulnerability to those hazards applicable to their jurisdiction. Using the methodology outlined in Section 3 (Vulnerability Assessment), the City of Tripoli evaluated the risk associated with a specific hazard, defined by probability and frequency of occurrence, magnitude, severity, exposures, and consequences. Tripoli's vulnerability assessment provides in-depth knowledge of the hazards and vulnerabilities that affect the community. This analysis provides an all-hazard approach when evaluating the hazards of that affect the city, and the associated risks and impacts each hazard presents.

As mentioned previously in Section 3, the vulnerability assessment requires a five-year review with periodic updates, as needed. Potential future hazards and impacts may result from changing technology, new critical facilities, infrastructures, and development patterns, as well as demographic and socioeconomic changes that occur within or outside the area.

Disaster frequency and its effects or severity are important as a basis for planning emergency response and mitigation. Natural hazards tend to reoccur on a predictable seasonal basis, whereas manmade or technological events tend to change over time with advancement in technology and methods of operation. Five criteria were used by the Committee to assure a systematic and comprehensive approach to hazard analysis for their individual jurisdictions including: Historical Occurrence, Probability, Magnitude or Severity, Warning Time, and Duration.

The Committee assessed the defined hazards relevant to potential impact on the city. Using the scoring criteria previously defined (Tables 19-22) the city assessed each of the identified hazards based on probability, magnitude/severity, warning time, and duration. The scores for each of the factors were weighted using the formula below to develop the final hazard assessment score.

$$\begin{aligned} &(\text{Probability} \times .45) + (\text{Magnitude/Severity} \times .30) + (\text{Warning Time} \times .15) + (\text{Duration} \times .10) \\ &= \text{Final Hazard Assessment Score} \end{aligned}$$

Table G4 is the analysis scores for the City of Tripoli. As shown, the top five hazards for Tripoli are: Transportation Incident, Human Disease, Grass/Wild Fire, Tornado/Windstorm, and River Flooding.

TABLE G4: CITY OF TRIPOLI HAZARD RISK ASSESSMENT						
Hazard Rank	Hazard	Probability	Magnitude/ Severity	Warning Time	Duration	Hazard Score
1	Transportation Incident	3	3	4	3	3.15
2	Human Disease	3	2	3	3	2.7
2	Grass/Wild Fire	2	3	4	3	2.7
4	Tornado/Windstorm	2	3	3	4	2.65
4	River Flooding	3	2	2	4	2.65
6	Severe Winter Storm	3	2	1	3	2.4
7	Thunderstorm/Lightning/Hail	3	2	2	1	2.35
8	Flash Flood	2	2	3	2	2.15
9	Terrorism	1	2	4	4	2.05
10	Drought	2	2	2	2	2
11	Infrastructure Failure	1	2	3	3	1.8
12	Earthquake	1	2	4	1	1.75
12	Extreme Heat	1	2	2	4	1.75
12	HAZMAT Incident	1	2	2	4	1.75
15	Expansive Soils	1	2	2	3	1.65
16	Animal/Plant/Crop Disease	1	1	1	1	1
16	Landslide	1	1	1	1	1
16	Levee/Dam Failure	1	1	1	1	1
16	Radiological Incident	1	1	1	1	1
16	Sinkholes	1	1	1	1	1

Vulnerability – Critical Facilities

This section will describe the vulnerability for existing and future buildings, infrastructure, and critical facilities in those areas that can be impacted by the prioritized hazards. Since the majority of the hazards have an undefined hazard area (i.e., affecting an entire community or larger area) the following vulnerability assessment will only address those hazards that affect a specified area – flooding (river and flash). The following discussion only considers the assets in the community of Tripoli.

Critical Facilities

Identifying the location of critical facilities and designated shelters (see TableG5) in Tripoli is important in order to assess their vulnerability to hazards. These critical facilities are important to the operation of a community and the key installations of the economic sector. For instance, high-density residential or commercial development, schools, police stations, government buildings, hospitals and care facilities, airports, gas stations, hardware stores, grocery stores, and water supply systems. It is important to know the threats each hazard poses to these facilities. *Attachment 6H* illustrates the location of identified critical facilities throughout the community.

Nursing homes or skilled living centers are also highly vulnerable to tornadoes. These facilities are designed for caring for the elderly population, majority of which use wheelchairs or other assistance devices, limiting mobility. Also, the majority of nursing homes are constructed as a single-level building with or without basements. Therefore, additional attention needs to be taken to ensure the safety of the residents and employees before, during, and after a tornado event. Tripoli Nursing Home, located in the east portion of town, is the only group quarters facility in the community. The non-profit has 28 bed licenses setting certified by Medicare and Medicaid.

According to Section 2, Tripoli is projected to see an increase in population over the next thirty years. This population increase most likely result in a greater need for additional critical facilities such as schools, daycare centers, or healthcare centers. However, the need for more critical facilities should be closely monitored these next 5-years and readdressed when this HMP is updated.

Homes in Hazardous Areas

The City of Tripoli is potentially affected by flooding from the Wapsipinicon River. The west/east traveling river bisects the community into a northern and southern portion of the city. The waterway has 100-year floodplains, and according to City records there remain a number of houses located within those floodplains. According to INRCOG and GIS Data, there are currently 5 residential structures and 24 buildings located within the 100-year floodplain.

As Table G6 shows, there are 29 structures within the 100-year floodplain with a total value of \$1,190,030. See

TABLE G5: CRITICAL FACILITIES IN TRIPOLI

Faith United Church (Shelter)	Tripoli Community High School (Shelter)
Grace Lutheran Church (Shelter)	City Hall (Shelter)
Tripoli Public Library (Shelter)	Tripoli Elementary School (Shelter)
Wastewater Treatment Plant	Tripoli Co-op
Power Lines/Utilities	
<i>Source: Community</i>	

**TABLE G6: CITY OF TRIPOLI
100-YEAR FLOODPLAIN PROPERTIES**

Number of Structures	29
Building Value	\$ 933,420
Dwelling Value	\$ 256,610
Total Value	\$ 1,190,030
<i>Source: INRCOG & Bremer County Assessor (2011\$)</i>	

Attachment 1 for a flood Scenario Map of the City.

As stated on the FEMA website²⁸, mobile homes are highly vulnerable to tornadoes. Even mobile homes that are tied down, offer little protection from tornadoes.

According to American Community Survey 5-year average, there 20 mobile homes located in the city. Based on the city's average household size of 2.37 persons, it can be estimated that approximately 47 persons live in mobile home. General observation would suggest a recent increase in the number of manufactured homes in the area. This increased popularity has the potential to increase the potential risk of damage to people and property in the community. Currently, no FEMA certified tornado safe shelters are known to exist in the community.

The primary reason for the increased popularity of mobile and manufactured homes is affordability. Although HUD regulations and local building codes have increased the safety components of these types of houses significantly in recent history, this affordability has often been accompanied with a reduced level of safety. Based on national data on circumstance of tornado fatalities between 1985 and 1997, it was found that 38% of fatalities were occupants of mobile or manufactured homes, 27% were in permanent homes, 11% in vehicles, 9% outdoors (open), 4% in businesses, 4% in structures with long-span roofs, and 2% in schools. These data highlight the high exposure of occupants of mobile and manufactured homes (*AR State Hazard Mitigation Plan, 1999*).

Finally, persons living in some multi-family housing units may also be at risk, due to the lack of a proper emergency shelter. According to 2014 ACS data, there 10, 2-unit; 31 3-4 unit; and 5, 5-9 unit structures in the city. Based on the average household size of 2.37 persons, it is estimated that approximately. In 2000 there were 48 multi-family housing units housing from 2 to 9 apartments. According to this, approximately 85 persons were living in multi-family housing units with three or more units.

Vulnerability – Social Assets (Populations)

The social vulnerability assessment identified how the hazards affect the population of Tripoli and it is assumed that the identified populations are more likely to require assistance during times of disaster; therefore, are considered, generally speaking, more “at-risk” than the remaining population.

The “at-risk” population must be identified and targeted in successful mitigation efforts. Table G5 presents an overview of the at-risk population in Tripoli according to information retrieved from the 2000 U.S. Census and Iowa Data Center.

According to, 19.3 percent (254 persons) of residents are 65 years or older. As indicated by ACS there are 32 persons living in group quarters, indicating the

TABLE G7: CITY OF TRIPOLI “AT-RISK” POPULATION	
Total City Population (2010)	1,313
Elderly (65 yrs and older)	254
Youth (under 15 yrs old)	260
Householder Living Alone	169
Non-English Speaking Population (speaks English less than ‘very well’)	1%
Population in Mobile Homes	47
Group Quarters Population	32
<i>Source: 2010 U.S. Census, 2010-2014 ACS 5-year Averages</i>	

²⁸ Federal Emergency Management Agency (FEMA), <http://www.fema.gov/areyouready/tornadoes.shtm>

remaining elderly populations live throughout the community.

Children are also at higher risk during some disasters. This is mostly due to the fact that young persons often are not aware of the proper actions to take in the event of a disaster. In addition, very young children would be more susceptible to a disaster such as a disease epidemic simply due to their age. According to ACS, 19.8 percent (260 persons) of the community's population is under the age of 15.

Portions of Bremer County are highly vulnerable to floods, especially along the Cedar and Wapsipinicon Rivers. The City of Tripoli is no exception, with the Wapsipinicon River causing flooding. Flooding puts the entire population at some level of risk, whether through the flooding of their homes, businesses, or places of employment, or the road, sewer, and water infrastructure that serve them daily. High floodwaters can devastate homeowners with property damage, property loss, and extensive, time-consuming cleanup. Secondary effects caused by flooding can add to the property damage. Power loss can leave citizens without heat or air conditioning for extended periods of time. The transportation infrastructure of the community can be impacted by flooding events, which can endanger citizens attempting to travel or evacuate the area, as well as leave those remaining without goods and services.

Populations living in the 100-year floodplain are also at risk of sustaining personal injury or property damage. As mentioned earlier, there are currently 5 residential structures and 24 buildings located within the 100-year floodplain. Using the average persons per household figure from the 2010 Census of 2.37, there are approximately 12 persons living in the 100-year floodplain.

Vulnerability – Estimating Potential Property Losses

Valuations are an important component of hazard mitigation planning insomuch as it provides measurable data that can be used to form some type of estimate as to the potential losses a community could face in the event of a catastrophic disaster.

The valuations for the City of Tripoli are available from the County Assessors and Auditors offices. City of Tripoli's property valuations are in Table G8. It should be noted however that these dollar amounts do not include gas and electric utility valuations nor do the evaluations include exempt properties, including government buildings, infrastructure, and religious/nonprofit properties. These results should be considered preliminary, as a full accounting of assets has not been completed.

Future Development

Future development within identified hazard areas can change the threat level of an area by placing critical facilities, businesses, transportation networks, utilities, and populations within vulnerable areas. While it can be difficult to curb development in the planning area, it

TABLE G8: CITY OF TRIPOLI'S VALUATIONS

	Total Valuation	Average Valuation per Unit or Parcel
Residential Valuation	\$ 40,212,720	\$ 79,003/parcel
Commercial Valuation	\$ 5,273,460	\$99,499 /unit
Industrial Valuation	\$ 188,870	\$ 94,435/unit
Agricultural Buildings	\$ 311,460	\$ 103,820/unit
Agricultural Land	\$ 557,860	\$ 1,272/acre
Utilities	\$ 1,508,460	N/A
Railroads	0	N/A
Exemptions (military)	\$ 174,088	N/A
Gross Valuation	\$ 48,052,830	N/A
Total Net Valuation	\$47,878,742	N/A

Source: City of Tripoli & Bremer County Assessor (1/1/2010)

is the jurisdiction's advantage to be aware of development trends in order to successfully mitigation future hazards as risks increase. However, continued conformity with the State Building Codes and local land use ordinances and regulations (zoning, subdivision, floodplain management, etc.) will help to mitigate the effects hazards have on new and future development.

National Flood Insurance Program/Repetitive Loss Properties

The city participates in the National Flood Insurance Program (NFIP) and has a flood ordinance in place. As Table G9 shows, there are currently two NFIP policies in place within the city.

FEMA defines a repetitive loss property as an insurable building that has experienced two losses in a 10-year period in which each loss is \$1,000 or more. There is one repetitive loss property in Tripoli.

River flooding is the most common cause of repetitive loss in Bremer County. Table G7 illustrates the number of repetitive loss properties for Tripoli. According to FEMA's data, Tripoli has 5 NFIP policies issued and only one repetitive loss property. According to information, City of Tripoli did not have any repetitive loss properties until after May 22, 2004. However, according to FEMA loss statistics, the City had 4 losses claimed between January 1, 1978 and December 31, 2010. These losses resulted in total payments of \$46,785. Currently (as of 11/30/2014) there is one active repetitive loss building in the city.

Table G9 shows relevant NFIP and Repetitive Loss statistics for the city.

TABLE G9: NFIP AND REPETITIVE LOSS DATA FOR TRIPOLI							
CID #	# of NFIP Policies	NFIP Insurance in Force (\$)	Total # of RLB	RLB Insured	# of Active RLB	Total RLB Losses (\$)	RLB Losses Insured (\$)
190669	2	\$220,000	1	0	1	\$40,927	\$0

Source: Federal Emergency Management Agency (FEMA); Note: RLB = Repetitive Loss Building; NFIP data current as of 9/30/2016; Repetitive loss data current as of 11/30/2014

This HMP attempts to reduce loss by identifying potential natural and manmade hazards. As a result of many natural and manmade hazards, repairs and reconstruction area often completed in a way that returns the structure to pre-disaster condition yet does little to prevent a reoccurrence of damage. Replication of the pre-disaster conditions allows for the repetitive cycle of property damage, reconstruction, and re-damage. Hazard mitigation is needed to ensure that such cycles are broken, that post-disaster repairs and reconstruction are analyzed, and sound, less vulnerable conditions are produced. Additionally, other mitigation strategies may be considered, such as voluntary property buy-outs.

MITIGATION STRATEGY

Hazard Mitigation Plan Goals

The hazard mitigation plan goals were reviewed by the Hazard Mitigation Planning Committee at their second committee meeting. The committee set as a priority the development of broad-based goals that would address a multitude of hazards and encompass a variety of mitigation activities. The hazard mitigation plan goals identified are as follows:

1. Reduce the chance of and impact of flooding in the community.
2. Take measures to minimize the occurrence of injuries and loss of life due to hazards.
3. Take measures to minimize or eliminate damages that may occur as a result of hazards.
4. Increase the city's ability to respond to natural disasters and man-made hazards.
5. Return to the community to similar or improved pre-event conditions as quickly as possible following a disaster event.
6. Incorporate the City Plan into the proposed Multi-Jurisdictional Plan.
7. Continually re-assess and re-evaluate the plan and mitigation activities.

Current Mitigation Actions

Prevention Mitigation Actions

The primary flood research document prepared for the City of Tripoli was the July 1979 Flood Insurance Study. This document was prepared under the auspices of the United States Department of Housing and Urban Development, who, at the time was charged with the oversight of the Federal Insurance Administration. This responsibility has since been transferred to the Federal Emergency Management Agency.

The City has not had any recent flood studies completed, but their FEMA Flood Insurance Rate Map was updated on March 4, 2008.

Tripoli adopted their first Hazard Mitigation Plan on June 4, 2007. Tripoli currently has and enforces a Zoning Ordinance. The Tripoli City Council is unofficially charged with enforcing the Zoning Ordinance.

TABLE G10: CURRENT PLANNING AND REGULATORY DOCUMENTS FOR TRIPOLI								
Previous HMP	Comprehensive Plan	Building Code	Zoning Ordinance	Subdivision Regulations	Floodplain Management Ordinance	Tree-Trimming Ordinance	Storm Water Ordinance	Snow Removal Ordinance
Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Source: Local Communities								

Property Protection Mitigation Actions

The City of Tripoli has implemented a number of tools that are useful in protecting property in the community. In addition, there have also been some protection measures that have occurred as a result of private development. These measures include the adoption of a floodplain ordinance, the implementation of the zoning ordinance, and the elevation of the city's sanitary sewer treatment facility.

Public Education and Awareness Mitigation Actions

Information regarding how to protect oneself in the event of a tornado is largely publicized in the form of flyers, radio, newspaper, and television announcements. The City provides basic safety information for various hazard events (i.e., tornados) and what to do before, during, and after an event.

Emergency Services Mitigation Actions

There are two early warning sirens in the community. One is sits atop City Hall and the other is located on South Park. The siren can be activated locally at the Tripoli Fire Department station, while the Consolidated Dispatch Center or the Bremer County Emergency Management office can activate it remotely. Tripoli works with the Bremer County Emergency Management Coordinator, based out of the City of Waverly, on various safety and emergency events. The Emergency Management Coordinator works in conjunction with local fire, rescue, police, and government officials to draft and implement workable emergency action plans in the community. The current Emergency Management Coordinator is Kip Ladage and current contact information is as follows: Bremer County Emergency Management Agency, 111 4th St. NE, Bremer-Waverly LEC, Waverly, Iowa 50677, (319) 352-0133, email: kladage@co.bremer.ia.us

Law Enforcement

The Tripoli Police Department, Bremer County Sheriff's Department, and the Iowa State Patrol provide police protection in the City of Tripoli. The Tripoli Police Department currently employs one full time officer.

Fire Protection

The Tripoli fire department includes 25 volunteers from the community and takes pride in having a well-equipped station. The department owns the following vehicles. Equipment used by the Sumner Fire Department includes the following: Pumper Truck; Rescue Van; Tanker (2); Grass Rigger; and an ATV.

Ambulance

There are two ambulances owned and operated by the Tripoli Ambulance Service. Both ambulances are certified as advanced care units and the department is a Certified Provisional Paramedic Service. The service is staffed with 28 volunteers from the community.

Medical Facilities

The town is home to one walk-in medical clinic. The closest hospitals are in Sumner and Waverly. Additionally, residents could access the hospitals in New Hampton or Waterloo, but these are a further distance from Tripoli.

HAZMAT

Tripoli contracts with Northeast Iowa Response Group for response to hazardous material spills. The Northeast Iowa Response Group is a division of Waterloo Fire Rescue as is the Hazardous Materials Regional Training Center. The Training Center provides training to fire departments and companies from around the state and country. Not only is this a training center it also serves as a hazardous materials quick response unit to Black Hawk County, surrounding counties, and many municipalities in a ten county region. The Unit provides local fire departments with hazard materials emergency procedures thus reducing additional contamination. An evacuation plan is also in place in conjunction with the activities with the local department. Contact information for the facility is as follows: Hazardous Materials Regional Training Center, 1925 Newell Street, Waterloo, Iowa 50707, Phone: (319) 291-4275, Toll Free: (800) 291-4682, Fax: (319) 291-4285

The jurisdiction also partners the Northeast Iowa Response Group for assistance in responding to any methamphetamine labs located in the city limits. The Response Group assists the Police Departments in containment of the site and disposal of the hazardous chemicals.

Streets and Public Works Department

Tripoli views proper snow and ice removal from roadways to be essential in mitigating negative effects of these events. Snow removal and ice prevention techniques are practiced by City, County, and State employees on the corresponding roadways within the city limits. The City currently employs one full time and one part time worker in the Streets Department. Equipment used for snow and ice removal includes 2 Dump Trucks, 2 snow plows, backhoe, lawn mower, pickup truck and a trailer. Finally, the City also has a snow ordinance that is in effect during snow season. This ordinance serves to assist the City in its efforts to clear the city streets after a snow event.

Natural Resource Protection Mitigation Actions

Tripoli has not done any natural resource protection mitigation actions.

Structural Projects Mitigation Actions

None.

Future Mitigation Actions

While the existing mitigation activities discussed above detail the City's efforts to mitigate hazards when possible and to respond to hazards in a timely and efficient manner, the Committee also recognizes that there are many more mitigation activities and projects that would benefit county residents. Thus, the Committee developed a list of future hazard mitigation activities that, if accomplished, would serve to further reduce the risk of hazards to the community. The list may include a combination of projects the Committee feels the community should try to accomplish and mitigation efforts that are ongoing that the Committee view as vital to the continued well-being of the public.

The Committee analyzed the potential mitigation activities. This analysis included a discussion of the potential benefits of implementing the activity, some hurdles that the community may face in implementing the action step, and the drawbacks of implementation. The analysis utilized the STAPLEE feasibility

criteria. The STAPLEE technique is a FEMA suggested method of evaluation. The STAPLEE approach assesses both positive and negative impacts on the following aspects of a county: Social, Technical, Addministrative, Political, Legal, Economic, and Environmental. Based on this analysis, each activity was ranked as High (H), Medium (M) or Low (L). However, not all identified activities are applicable to all jurisdictions and is marked as such in Table G10.

Funding

Although in the long-term hazard mitigation actions will save money by avoiding the loss of lives or property damages, in the short-term each action will have an associated cost. The City will rely heavily on local funding sources to fulfill most of the plan obligations; however, they will also seek funds from State and Federal agencies for both pre- and post-disaster mitigation activities.

The estimated cost(s) for each mitigation action, program, or project is either: Minimal, Low, Moderate, or High depending upon various factors.

- Minimal: Cost estimate is \$10,000 or less based on using current staff, time commitment, continuous of current duties, proposed action/program/project, and funding sources.
- Low: Cost estimate for project range from \$10,001 - \$99,999 based on existing proposed treatment, time commitment, any further study that is needed, and level of engineering, and project components (permits, acquisition, coordination, etc.).
- Moderate : Cost estimate for project range from \$100,000 - \$299,999 based on existing conditions, time commitment, proposed action/program/project, any further study that is needed, and level of engineering, and project components (permits, acquisition, coordination, etc.), and funding sources.
- High : Cost estimate for project range is \$300,000 or higher based on existing conditions, time commitment, proposed action/ program/project, any further study that is needed, and level of engineering, project components (permits, acquisition, coordination, etc.), and funding sources.

Implementation Strategy

Once the Committee identified and ranked the future hazard mitigation activities, the activities were then analyzed. In addition, the Committee identified a time line for each activity, identified the responsible party (ies) for each activity and finally related each activity to at least one of the five Hazard Mitigation Plan Goals listed above. Table G11 below is the City of Tripoli's Implementation Strategy.

TABLE G11: CITY OF TRIPOLI'S IMPLEMENTATION STRATEGY						
Priority	Mitigation Action/Program/Project	Associated Hazard	Primary Agency Responsible for Implementation	Date for Completion	Estimated Cost (s)	Funding Source
Emergency Services						
H	Continue training and education for fire departments, law enforcement agencies and ambulance crew personnel	All	City Council	On-Going	Low to Moderate	Local
H	Maintain and acquire materials and equipment for fire departments, law enforcement agencies and ambulance crew personnel	All	City Council	On-Going	Low to Moderate	Local
H	Provide emergency shelters for evacuees	All	Bremer County EMA, Council	On-Going	Minimal	Local
H	Maintain storm spotter training for local fire departments/deputies and EMS crews	Thunderstorm/Lightning, Windstorm, Tornado, Hailstorm	Bremer County EMA, City Council	On-Going	Minimal	Local
H	Maintain automatic TTY TDD machines for emergency personnel and city/county employees	Communications Failure	City Council, EMA	On-Going	Minimal	Local
H	Continue training and promotion of the Incident Command System	Communications Failure	City Council, EMA	On-Going	Minimal	Local
H	Complete continuity of government plan	Communications Failure	City Council	On-Going	Minimal	Local
H	Upgrade radio communications equipment as needed	Communications Failure	City Staff, Fire Dept.	On-Going	Minimal to Low	Local
H	Regularly review and amend fire and medical HAZMAT response standard operating procedures	Communications Failure	City Council, Staff	On-Going	Minimal	Local
H	Keep supply of backup radios and cellphones	Communications Failure	City Council, Staff	On-Going	Minimal	Local
H	Maintain list of county emergency contacts	Communications Failure	All City Departments	On-Going	Minimal	Local
H	Develop and maintain staging area for dumping during cleanup	River Flood	City Council, Staff	On-Going	Minimal	Local
M	Conduct a fire and ambulance mass disaster training	All	City Council	Short-Term	Low	Local
M	Maintain mutual aid agreements	All	City Council	On-Going	Minimal	Local
M	Make available a cleanup crew for after a storm	Thunderstorm/Lightning	City Council, EMA	On-Going	Minimal to Low	Local
M	Improve water system to enhance firefighting capacity/ability	Fire	City Council	On-Going	Low to Moderate	Local, State
M	Stockpile sand and sandbags	Flash Flood, River Flood	Fire Department	On-Going	Minimal to Low	Local
M	Purchase additional trash pumps	Flash Flood, River Flood	City Council	On-Going	Minimal	Local
M	Purchase a new tanker and/or pumper	Fire, Explosion	City Council, Fire Dept.	On-Going	Minimal to Low	Local
M	Develop sandbagging procedures for the community	River Flood	City Council, Fire Department	On-Going	Minimal	Local
L	Acquire necessary response and detection equipment for city/county employees	HAZMAT	City Council	On-Going	Minimal	Local
L	Maintain list of potential translators to be called upon	Communications Failure	Bremer County EMA, City Council	On-Going	Minimal	Local

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	in case of an emergency					
L	Maintain or install GPS units in all emergency service and city/county vehicles	Communications Failure	City Staff	On-Going	Low	Local
L	Keep the county updated on personnel changes	Communications Failure	City Staff	On-Going	Minimal	Local
Natural Resource Protection						
H	Continue enforcement of city sump pump discharge ordinance	Thunderstorm/Lightning	City Council	On-Going	Minimal	Local
H	Maintain and/or develop storm water management program	Groundwater Contamination, Flash Flood	City Council, Public Works	On-Going	Low	Local, State
H	Restrict water usage should it be necessary	Drought	Public Works, Council	On-Going	Minimal	Local
M	Provide a local hazardous waste dropoff site	HAZMAT	City Council	On-Going	Minimal to Low	Local, State
M	Plant trees along water bodies and slopes	Landslides/Mudflows	City Council, Public Works	On-Going	Minimal	Local
M	Clear ditches, streams, and waterways on a regular basis	River Flood	City Council, Public Works	On-Going	Low	Local
L	Develop rationing procedures	Drought	City Council	On-Going	Minimal	Local
L	Purchase additional parkland in order to increase greens space and reducing surface flow	River Flood	City Council	On-Going	Minimal to Low	Local
Prevention						
H	Maintain tree trimming program	Severe Winter Storm, Windstorm, Hailstorm	City Council	On-Going	Low	Local
H	Maintain and enforce building codes	All	City Council	Active	Minimal	Local
H	Determine locations for potential heating shelters and volunteer organization	Severe Winter Storm	Bremer County EMA, City Council	On-Going	Minimal	Local
H	Purchase and maintain backup generators	Severe Winter Storm, Thunderstorm/Lightning, Tornado, Emergency Management	City Council	On-Going	Minimal to Low	Local
H	Place alarms on storage facilities containing hazardous materials	Hazardous Materials (HAZMAT)	City Council	On-Going	Minimal	Local
H	Maintain law enforcement monitoring of large storage supplies	HAZMAT	City Council, Police	On-Going	Minimal	Local
H	Maintain mutual aid agreements with the Northeast Iowa response Group	HAZMAT	City Council	On-Going	Minimal	Local
H	Encourage backup power generation for local telephone systems and cellular operations	Communications Failure	City Council	On-Going	Minimal	Local
H	Seek to improve communications with other agencies	Communications Failure, Terrorism	City Council	On-Going	Minimal	Local
H	Maintain and keep storm drains clear of debris	Flash Flood	City Council, Public Works	On-Going	Minimal	Local
H	Follow monitoring requirements set forth by the Iowa DNR	Groundwater Contamination	City Council	On-Going	Low	Local
H	Maintain air conditioner(s) in community buildings	Extreme Heat	City Council, Public Works	On-Going	Minimal	Local
H	Secure the area (around a sinkhole)	Sinkholes	Public Works, Fire Dept.	On-Going	Minimal	Local
H	Establish transportation evacuation routes and protocols	River Flood	City Council, Fire Department	On-Going	Minimal	Local

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H	Maintain lists of personnel and equipment available to use with response plans	Emergency Management	City Council, Staff	On-Going	Minimal	Local
M	Install a snow fence around the wastewater treatment facility	Severe Winter Storm	City Council	On-Going	Minimal	Local
M	Enforce sidewalk clearance ordinance	Severe Winter Storm	City Council	On-Going	Minimal	Local
M	Maintain use of snow fences in the city/county	Severe Winter Storm	City Staff	On-Going	Minimal	Local
M	Enforce and update building codes, as needed	Thunderstorm/Lightning, Windstorm, Tornado, Hailstorm, Expansive Soils, Earthquake	City Council, Zoning Admin.	On-Going	Minimal	Local
M	Encourage lead based paint and asbestos removal	HAZMAT	City Council	On-Going	Minimal	Local
M	Maintain, test, and replace warning sirens	Windstorm, Tornado, Hailstorm, Thunderstorm/Lightning, Communications Failure	City Council	On-Going	Minimal to Low	Local
M	Continue cooperation between county roads department and local fire departments during snow emergencies	Severe Winter Storm	City Council, Staff	On-Going	Minimal to Low	Local
M	Continue an annual inspection program for commercial and industrial properties	Fire	City Council, Fire Dept.	On-Going	Low to Moderate	Local
M	Continue fire prevention program	Fire	City Council, Fire Dept.	On-Going	Minimal	Local
M	Maintain membership in the NFIP	Flash Flood, River Flood	City Council	On-Going	Minimal	Local
M	Maintain, enforce and update floodplain ordinance	Flash Flood, River Flood	City Staff	On-Going	Minimal	Local
M	Identify, purchase and remove structures from flood hazard areas	Flash Flood, River Flood	City Council	On-Going	Low to Moderate	Local, Federal
M	Keep communication lines open with Nuclear Plant in Palo, IA	Radiological/Nuclear Event	City Council	On-Going	Low	Local
M	Maintain and/or develop a wellhead protection program	Groundwater Contamination	City Council	On-Going	Low	Local
M	Monitor the drinking water supply	Groundwater Contamination, Disease	City Council, Public Works	On-Going	Low	Local
M	Eliminate and cap private and abandoned wells in the city	Groundwater Contamination	City Council	On-Going	Moderate	Local
M	Eliminate the use of septic tank systems in the city limits	Groundwater Contamination	City Council	On-Going	Low	Local
M	Carry out conservation measures such as erosion control and work with the following organizations: Extension, NRCS, Farm Bureau, EPA, DNR, and Soil and water Conservation District	Groundwater Contamination	City Council	On-Going	Low	Local, State, Federal
M	Maintain and update anti-virus software	Terrorism	City Staff	On-Going	Minimal	Local
M	Review and update fire codes as necessary	Fire, Explosion	City Council, Fire Dept.	On-Going	Minimal	Local
M	Provide fans and/or cooling shelter	Extreme Heat	City Council, Public Works	On-Going	Minimal	Local
M	Encourage community to plant shade trees	Extreme Heat	Public Works	On-Going	Minimal	Local
M	Identify and inventory potential sinkhole sites	Sinkholes	City Council, Public Works	On-Going	Minimal	Local
M	Educate city personnel to handle a sinkhole situation	Sinkholes	City Council	On-Going	Minimal	Local
M	Enforce the local zoning ordinances	Landslides/Mudflows	City Council, Zoning Admin.	On-Going	Minimal	Local
M	Update flood maps/flood studies for areas throughout the county	River Flood	City Council	On-Going	Minimal to Low	Local, Federal

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M	Continue cooperation with county in developing flood mitigation efforts	Flash Flood, River Flood	City Council, Staff	On-Going	Minimal	Local
M	Continue working with the Bremer County Recovery Coalition	Flash Flood, River Flood	City Council	On-Going	Minimal	Local
M	Maintain and update emergency response plans	Emergency Management	City Council, Staff	On-Going	Minimal	Local
M	Maintain NIMS compliance	Emergency Management	City Council	On-Going	Minimal	Local
M	Conduct Mosquito Spraying	Human Disease, Animal Disease	City Council	Active – seasonal	Low	Local
L	Inspect and ensure vacant structures do not have rodents or infestations	Human Disease, Animal/Plant/Crop Disease	City Council	Active	Minimal	Local
L	Backup all digital data	Thunderstorm/Lightning	City Staff	On-Going	Minimal	Local
L	Identify areas throughout the county that would substantially benefit from outdoor warning sirens	Windstorm, Tornado	City Council	On-Going	Minimal	Local
L	Enforce no parking designations at special events	Transportation	City Council, Sheriff	On-Going	Minimal	Local
L	Monitor wells in areas of identified contamination	Groundwater Contamination	City Council	On-Going	Low	Local
L	Identify and map areas of past contamination	Groundwater Contamination	City Council, Public Works	On-Going	Low	Local
L	Secure vulnerable targets, as identified by the LEPC and County EMA with alarms, security cameras and fences	Terrorism	City Council, Sheriff	On-Going	Moderate	Local
L	Keep a supply of drinking water to distribute	Extreme Heat	Fire Department	On-Going	Minimal	Local
L	Monitor disease outbreak news from the CDC and Iowa Department of Public Health	Disease	City Council	On-Going	Minimal	Local
L	Educate city personnel to identify risk areas	Expansive Soils	Public Works	On-Going	Minimal	Local
L	Enforce a curfew	Riot/Violent Demonstration	City Council, Sheriff	On-Going	Minimal	Local
L	Encourage flood proofing/elevating structures in the floodplain	River Flood	City Council	On-Going	Low to Moderate	Local, Federal
Public Awareness/Education						
H	Educate the public	All	City Council, Staff	On-Going	Minimal	Local
H	Purchase NOAA weather radios	Thunderstorm/Lightning, Windstorm, Tornado, Radiological/Nuclear Event	City Council, EMA	On-Going	Minimal	Local
H	Keep HAZMAT manuals/information current and easily accessible	HAZMAT	All City personnel	On-Going	Minimal	Local
H	Enhance Standard Operating Procedures for dissemination of information/press releases in the event of a disaster	Communications Failure	City Council, EMA	On-Going	Minimal	Local
H	Encourage use of Iowa One call before digging	Communications Failure, Explosion	City Council, Staff	On-Going	Minimal	Local
H	Improve standard operating procedures for schools	Communications Failure	City Council, Staff, School Board	On-Going	Minimal	Local
H	Educate the public on maintaining their sump pumps	Flash Flood	City Council, Public Works	On-Going	Minimal	Local
H	Initiate and enforce burn ban in times of drought or as needed	Grass/Wildfire, Drought	Fire Department, Council	On-Going	Minimal	Local
H	Maintain and improve signals/signage along roadways and at railroad crossings	Transportation	City Council	On-Going	Minimal	Local
H	Establish alternative transportation routes should a road need to be closed	Transportation	City Council, Fire Dept.	On-Going	Minimal	Local

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H	Encourage the public to receive vaccinations	Disease	City Council	On-Going	Minimal	Local
H	Cooperate with any countywide mass vaccination plan	Disease	City Council	On-Going	Minimal	Local
H	Initiate and enforce burn ban in times of drought or as needed	Drought	City Council, Fire Dept.	On-Going	Minimal	Local
H	Maintain communication with county contacts	Emergency Management	City Council, Staff	On-Going	Minimal	Local
M	Notify the media on shelter locations	Severe Winter Storm, Extreme Heat, Tornado	City Council	On-Going	Minimal	Local
M	Encourage and maintain enrollment in emergency notification system (ALERT IOWA)	Thunderstorm/Lightning, Windstorm, Tornado, Communication Failure	City Council, EMA	On-going	Minimal	Local
M	Encourage home owners to keep emergency kits	Windstorm, Tornado	Bremer County EMA, Council	On-Going	Minimal	Local
M	Encourage residents to keep smoke detectors, sprinkler systems and fire extinguishers maintained in their homes	Fire	City Council, Fire Dept.	On-Going	Minimal	Local
M	Purchase emergency signs to be used in case of an incident	Transportation	City Council	On-Going	Minimal	Local
M	Set a designated number of people to be trained in post-disaster record keeping/damage assessments	Emergency Management	City Council, EMA	On-Going	Minimal	Local
M	Inform the public of reputable and ill reputable contractors following disasters	Emergency Management	City Council, Staff	On-Going	Minimal	Local
M	Routinely test/maintain sirens and educate public on what to do when sirens activated	Tornado/Windstorm; Thunderstorm/Lightning/Hail	City Council	Active	Low	Local
L	Spread public awareness on importance of immunizations	Human Disease	City Council, Public Health, EMA, School Districts	Active	Minimal	Local
L	Identify fallout shelter locations	Radiological/Nuclear Event	City Council, EMA	On-Going	Minimal	Local
L	Encourage the use of proper materials and construction techniques	Expansive Soils	City Council, Zoning Admin.	On-Going	Minimal	Local
L	Encourage all communities to participate in their Local Emergency Planning Commission (LEPC)	Emergency Management	City Council	On-Going	Minimal	Local
Structural Projects						
H	Install new or retrofit existing facilities to have a storm shelter/safe room	Thunderstorm/Lightning/Hail, Tornado/Windstorm	City Council	Medium-Term	Moderate	Local, State, Federal
H	Encourage utility providers and developers to place all utilities underground	Severe Winter Storm, Communications Failure, Thunderstorm/Lightning	City Council	On-Going	Minimal	Local
H	Maintain public works equipment	Severe Winter Storm	City Council	On-Going	Minimal to Low	Local
H	Use surge protectors to prevent electrical damage to critical and sensitive equipment	Thunderstorm/Lightning	City Staff	On-Going	Minimal	Local
H	Maintain a list of potential storm sewer projects	Thunderstorm/Lightning	City Council, Staff	On-Going	Minimal	Local
H	Construct or designate a safe room or storm shelter	Windstorm, Tornado, Hailstorm	Bremer County EMA, City Council, School Board	On-Going	High	Local, State, Federal
H	Acquire more water pumps	Flash Flood, River Flood, Dam	City Council	On-Going	Minimal to Low	Local

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		Failure, Levee Failure				
H	Continue with improvement to the storm water system	Flash Flood	City Council	On-Going	Low to Moderate	Local, State
H	Prevent inflow and infiltration into the sanitary sewer	Flash Flood, River Flood	City Council, Staff	On-Going	Minimal	Local
H	Make upgrades to prevent sanitary sewer/storm sewer cross contamination	Flash Flood, River Flood, Infrastructure Failure	Public Works, Engineer	Active	Low	Local
H	Install rip rap around wastewater treatment facility	Flash Flood	City Council	On-Going	Minimal	Local
H	Maintain pump station	River Flood	City Council, Public Works	On-Going	Minimal	Local
M	Placement of lighting arrestors on power lines	Thunderstorm/Lightning	City Council	On-Going	Minimal	Local
M	Pursue partnership with rural water as the system expands	Fire, Explosion	City Council, Fire Department	On-Going	Minimal	Local
M	Continue to cooperate with pipeline owners and operators to ensure locations are marked	Fire, Explosion	City Council, Public Works	On-Going	Minimal	Local
M	Inspect any utility lines that are near a sinkhole	Sinkholes	Public Works	On-Going	Minimal	Local
M	Encourage construction of dikes, levees, dams, and retention ponds	River Flood	City Council, Staff	On-Going	Minimal	Local
M	Maintain and enforce policy that manufactured homes must be anchored	Tornado/Windstorm, Severe Winter Storm, Thunderstorm/Lightning/Hail	City Council	Active	Minimal	Local
M	Identify bridges and culverts than can cost effectively be reengineered to reduce future flooding	River Flood	City Council	On-Going	Minimal	Local
L	Install tiling to help water move away from structures	Expansive Soils	City Council	On-Going	Minimal	Local

APPENDIX H: CITY OF WAVERLY

COMMUNITY PROFILE

Location

The City of Waverly is located in the central portion of Buchanan County and has the largest population among the county's cities. Waverly is home to the Bremer County Courthouse and county departments, including County Emergency Management and Sheriff's Office.

Natural Environment

The City of Waverly is located in southwest Bremer County in the northeast quadrant of Iowa at latitude 42.7° N x longitude 92.5° W. Elevations in Waverly peak at 1,050 feet above sea level, with an average elevation of 886 feet. The Cedar River divides the community, which is served by two major highways, U.S. Highway 218 (State Highway 27) and State Highway 3.

The terrain on which Waverly is built is generally the undulating topography that characterizes the agricultural areas of northeast Iowa. There are a few areas of steeper than normal slope with these being dispersed throughout the community adjacent to watercourses. The highest point in the community lies at approximately 1,050 feet above sea level and is located near the water tower on the east side of town.

The city is bisected by the Cedar River, which caused significant flood damage in 2008.

History

The Waverly area was originally given to the Winnebago Indians by a treaty that lasted from 1833 to 1850. In 1859, the Winnebago traded their lands in Iowa for lands further to the northwest.

The earliest non-American Indians to settle in the Waverly area arrived in 1852. Frederick Cretzmeyer, his brother Wendelin, and their families were the first to arrive. Soon

TABLE H1: CITY OF WAVERLY DEMOGRAPHICS

<i>Government Framework</i>	Mayor – City Council
<i>General Population, 2010 Census</i>	
Total Population	9,874
Total Males	4,685
Total Females	5,189
Median Age	33.1
At-Risk Population, <18 Yrs	2,013
At-Risk Population, >64 Yrs	1,656
One Race-White	9,409
One Race-Black or African American	165
One Race-Asian	122
Two or More Races	138
Hispanic or Latino (of any race)	132
Total Household Population	8,297
Total Population in Group Quarters	1,577
Persons in Group Quarters – Correctional Institutions	N/A
Persons in Group Quarters – Nursing Homes	N/A
Persons in Group Quarters – Other Noninstitutions	N/A
<i>Housing Characteristics, 2010 Census</i>	
Total Housing Units	3,717
Total Owner-Occupied Housing Units	2,665
Total Renter-Occupied Housing Units	779
Total Vacant Housing Units	273
Total 1-Unit Detached and Attached Structures	2,765
Total 2, 3, and 4-Unit Structures	377
Total 5 to 19-Unit Structures	226
Total Mobile Homes	139
Year Majority of Housing Units were Built	1969 or earlier (50.3%)
Average Household Size	2.34
Average Family Size	2.86
Specified Renter-Occupied Units	N/A
Median Gross Rent	\$599
Specified Owner-Occupied Units	N/A
Median Housing Value, Owner-Occupied	\$142,800
Method of Heating Household	Utility Gas (85.7%)
Households with No Telephone Service	90

thereafter, William P. Harmon arrived and promptly purchased ten acres of land from the Cretzmeyers. Mr. Harmon constructed a sawmill with the goal of building a town around it. His dream was soon realized and many of the first homes in the Waverly area were built using wood from the Harmon sawmill and bricks from a manufacturing plant (Waverly's first industry) started by Wendelin Cretzmeyer.

Since Waverly's early existence, education has been a priority. The first schoolhouse, which was also used for public meetings, was built in 1855. Construction of the area's first high school began in 1872. Seven years later, German Lutheran College was founded in Waverly. In 1935, what was originally German Lutheran College became what is today Wartburg College. The college has remained an important contributor to the economic, social, and cultural structure of the community. Wartburg College is now a fully accredited, four-year liberal arts college with an estimated enrollment of approximately 1,800 students. The college is named after the Wartburg Castle in Eisenach, Germany.

(Source: Bremer County Independent, Historical Issue)

Demographics

Population

The City of Waverly experienced growth in every decade of the 20th century. The Farm Crisis that affected the majority of communities in the region also slowed the population growth in Waverly. Waverly, unlike some neighboring communities, was able to maintain positive population growth, although somewhat decelerated, throughout the turbulent 1980s. This is a trend that eluded Bremer County as a whole during the same period. According to the 2000 Census information, Waverly maintained positive population growth during the 1990s by posting a five percent increase. From 2000 to 2010, the population increased over ten percent to 9,874 persons. Tables H1 and H2 provide an overview of the city's population characteristics.

Community Services

The City of Waverly has a municipal water supply with an elevated storage capacity of 1,750,000 gallons. The capacity of the water plant is approximately 6,000,000 gallons. Average daily consumption is roughly 1,000,000 gallons. Peak recorded consumption is 1.8 million gallons.

TABLE H2: CITY OF WAVERLY DEMOGRAPHICS

<i>Economics Characteristics, 2010 Census</i>	
Population 16 years and over	8,050
Population In Labor Force (16 yrs+)	5,402
Persons in Civilian Labor Force	5,388
Persons Employed	4,985
Persons Unemployed	403
Persons in Armed Forces	14
Mean Travel Time to Work in Minutes (16 yrs & over)	13.8
Persons Employed in Management, Professional, or Related Occupations	1,970
Persons Employed in Service Occupations	1,009
Persons Employed in Sales and Office Occupations	1,197
Persons Employed in Farming, Fishing, or Forestry Occupations	11
Persons Employed in Construction, Extraction, or Maintenance Occupations	303
Persons Employed in Production, Transportation, or Material Moving Occupations	495
Median Household Income	\$61,308
Median Family Income	\$76,875
Per Capita Personal Income	\$26,007
Families below Poverty Level	3.7%
Individuals below Poverty Level	10.4%
Unemployment Rate,	5.0%
<i>Social Characteristics, 2010 Census</i>	
School Enrollment (3 yrs and over)	3,518
Nursery School, Preschool	162
Kindergarten and Elementary School (grades 1-8)	1,001
High School (grades 9-12)	515
College or Graduate School	1,840
Education Attainment: Population 25 Years and Over	5,810
Persons with Less than 9 th Grade	168
Persons with 9 th to 12 th Grade, No Diploma	180
Persons with High School Degree or Equivalency	1,679
Persons with Some College, No Degree	1,150
Persons with Associate Degree	564
Persons with Bachelor's Degree	1,400
Persons with Graduate or Higher Degree	674
Persons with a Disability Status (5 yrs+)	896
Persons that Speak a Language other than English at Home (5yrs+)	300

The current Waste Water Treatment Facility consists of waste management treatment tanks located in the southeast corner of the city near the intersection of 8th Street SE and 17th Avenue SE. The wastewater is transported to the facility with the assistance of nine (9) wastewater lift stations. The city currently has what is commonly referred to as a tertiary sewage treatment system. Over 95 percent of the city is served by the municipal sewer system. The average load in gallons per day is approximately 1,240,000 gallons. The system has a peak load of 2,951,000 gallons per day. The current design capacity is 2,330,000 gallons per day.

Table H3 shows the primary utility providers for the City of Waverly.

TABLE H3: WAVERLY UTILITY PROVIDERS						
Electric	Natural Gas	Telephone/Internet	Cable	Water	Sewer	Sanitation
Waverly Utilities	MidAmerican Energy	Waverly Utilities; Mediacom; Century Link	Waverly Utilities; Mediacom	City of Waverly	City of Waverly	City of Waverly

HAZARDS & RISK ASSESSMENT

Section 3 identified and profiled the hazards for the entire planning area. However, each community analyzed their own vulnerability to those hazards applicable to their jurisdiction. Using the methodology outlined in Section 3 (Vulnerability Assessment), the City of Waverly evaluated the risk associated with a specific hazard, defined by probability and frequency of occurrence, magnitude, severity, exposures, and consequences. Waverly's vulnerability assessment provides in-depth knowledge of the hazards and vulnerabilities that affect the community. This analysis provides an all-hazard approach when evaluating the hazards of that affect the city, and the associated risks and impacts each hazard presents.

As mentioned previously in Section 3, the vulnerability assessment requires a five-year review with periodic updates, as needed. Potential future hazards and impacts may result from changing technology, new critical facilities, infrastructures, and development patterns, as well as demographic and socioeconomic changes that occur within or outside the area.

Disaster frequency and its effects or severity are important as a basis for planning emergency response and mitigation. Natural hazards tend to reoccur on a predictable seasonal basis, whereas manmade or technological events tend to change over time with advancement in technology and methods of operation. Five criteria were used by the Committee to assure a systematic and comprehensive approach to hazard analysis for their individual jurisdictions including: Historical Occurrence, Probability, Magnitude or Severity, Warning Time, and Duration.

The Committee assessed the defined hazards relevant to potential impact on the city. Using the scoring criteria previously defined (Tables 19-22) the city

assessed each of the identified hazards based on probability, magnitude/severity, warning time, and duration. The scores for each of the factors were weighted using the formula below to develop the final hazard assessment score.

$$(\text{Probability} \times .45) + (\text{Magnitude/Severity} \times .30) + (\text{Warning Time} \times .15) + (\text{Duration} \times .10) = \text{Final Hazard Assessment Score}$$

Table G3 is the analysis scores for the City of Waverly. As shown in Table H3, the five hazards for Waverly are: Severe Winter Storm, Thunderstorm/Lightning/Hail, Tornado/Windstorm, River Flooding, and Infrastructure Failure.

TABLE H3: CITY OF WAVERLY HAZARD RISK ASSESSMENT						
Hazard Rank	Hazard	Probability	Magnitude/ Severity	Warning Time	Duration	Hazard Score
1	Severe Winter Storm	4	2	1	3	2.85
2	Thunderstorm/Lightning/Hail	4	1	3	2	2.75
3	Tornado/Windstorm	1	4	4	2	2.45
4	River Flooding	2	2	1	4	2.05
4	Infrastructure Failure	1	2	4	4	2.05
6	Flash Flood	2	1	4	1	1.90
7	Sinkholes	1	1	4	4	1.75
7	Radiological Incident	1	1	4	4	1.75
9	HAZMAT Incident	1	1	4	2	1.55
9	Transportation Incident	1	1	4	2	1.55
9	Terrorism	1	1	4	2	1.55
12	Earthquake	1	1	4	1	1.45
12	Grass/Wild Land Fire	1	1	4	1	1.45
12	Landslide	1	1	4	1	1.45
15	Animal/Plant/Crop Disease	1	1	1	4	1.30
15	Drought	1	1	1	4	1.30
16	Extreme Heat	1	1	1	4	1.30
16	Human Disease	1	1	1	4	1.30
16	Dam / Levee Failure	1	1	1	1	1.00
16	Expansive Soils	1	1	1	1	1.00

Vulnerability – Identifying Assets (Critical Facilities)

This section will describe the vulnerability for existing and future buildings, infrastructure, and critical facilities in those areas that can be impacted by the prioritized hazards. Since the majority of the hazards have an undefined hazard area (i.e., affecting an entire community or larger area) the following vulnerability assessment will only address those hazards that affect a localized area – specifically flooding and tornadoes.

Identifying the location of critical facilities and designated shelters (see Table H4) in Waverly is important in order to assess their vulnerability to hazards. These critical facilities are important to the operation of a community and the key installations of the economic sector. For instance, high-density residential or commercial development, schools, police stations, government buildings, hospitals and care facilities, airports, gas stations, hardware stores, grocery stores, and water supply systems. It is important to know the threats each hazard poses to these facilities. *Attachment 6L* illustrates the location of identified critical facilities throughout the community.

As of June 2001 there were 126 nursing home beds, 30 assisted-living units and 38 independent-living units in Waverly.

The county’s only airport, Waverly Municipal Airport (C25), is located two miles northwest of Waverly’s central business district and is accessible from US 218 via 210th St.

According to available data sources, Waverly is projected to see an increase in population over the next thirty years. This population increase most likely will result in a greater need for additional critical facilities such as schools, daycare centers, or healthcare centers. However, the need for more critical facilities should be closely monitored these next 5 years and readdressed when this HMP is updated.

Flooding

The City of Waverly is potentially affected by flooding from the Cedar River, Dry Run Creek, and Unnamed Creek. The waterways have 100-year floodplains and there remain a number of houses located within those floodplains. Throughout previous years the city has participated in buy-out programs in efforts to remove houses from the floodplain. This will continue to be a priority for the city as opportunities for purchasing homes in the floodplain come forward in the future.

According to information obtained from the County Assessor’s office, there are approximately 636 residential structures (including some detached structures) and 61 commercial and industrial structures in the 100-year

TABLE H4: CRITICAL FACILITIES IN WAVERLY	
Wartburg College	Waverly City Hall
Bremer County Courthouse	Waverly Municipal Hospital
Waverly-Shell Rock High School	Waverly-Shell Rock Middle School
Southeast Elementary School	Margaretta Carey Elementary School
West Cedar Elementary School	Bremwood Residential Treatment Center
Waverly Light & Power	Waverly Municipal Airport
Waverly Fire Station	Waverly Police Dept. Headquarters
Waverly Public Library	Bartels Assisted Living Apartments
Source: Community	

TABLE H5: CITY OF WAVERLY 100-YEAR FLOODPLAIN PROPERTIES (2014)	
Number of Structures	697
Building Value	\$15,313,730
Dwelling Value	\$59,945,430
Total Value	\$75,259,160
Source: Bremer County Assessor	

floodplain including the floodway.

After the 2008 floods, the Waverly-Shell Rock School District passed a referendum and received FEMA public assistance funds to construct a new elementary/middle school out of the floodplain. In doing so, the School District has eliminated the threat of river flooding from all but one public school facility. Southeast Elementary School (public) remains vulnerable to river flooding and dam failure upriver, as it is situated within the floodplain. St Paul's Lutheran School (parochial/private) is also situated within the floodplain and, while not part of the School District, remains a concern to the community. The Waverly-Shell Rock School District is a member of the Butler County 2015 Multi-Jurisdictional Hazard Mitigation Plan Update. A copy of the plan can be located online at www.inrcog.org/pub under the "Hazard Mitigation Planning" subheading.

Tornadoes

As stated on the FEMA website²⁹, mobile homes are highly vulnerable to tornadoes. Even mobile homes that are tied down, offer little protection from tornadoes. According to the 2008-2012 American Community Survey 5-Year Estimates, there were an estimated 139 manufactured housing units in Waverly. Using the average persons per household, there are approximately 370 persons living in manufactured housing units in Waverly. Since the 2000 Census, there has been a significant increase in the number of manufactured housing units in Waverly, from an estimated 84 units to 139 units. This increased popularity has the potential to increase the potential risk of damage to people and property in the community.

The primary reason for the increased popularity of mobile and manufactured homes is affordability. Although HUD regulations and local building codes have increased the safety components of these types of houses significantly in recent history, this affordability has often been accompanied with a reduced level of safety. Based on national data on circumstance of tornado fatalities between 1985 and 1997, it was found that 38 percent of fatalities were occupants of mobile or manufactured homes, 27 percent were in permanent homes, 11 percent in vehicles, 9 percent outdoors (open), 4 percent in businesses, 4 percent in structures with long-span roofs, and 2 percent in schools. These data highlight the high exposure of occupants of mobile and manufactured homes (*AR State Hazard Mitigation Plan, 1999*).

In addition, persons living in some multi-family housing units may also be at risk due to the lack of a proper tornado shelter. In 2010 there were 813 multi-family housing units in apartment buildings housing from 2 to 20 or more apartments. According to this, approximately 2,163 persons were living in multi-family housing units. Nursing homes or skilled living centers are also highly vulnerable to tornadoes. These facilities are designed for caring for the elderly population, majority of which use wheelchairs or other assistance devices, limiting mobility. Also, the majority of nursing homes are constructed as a single-level building with or without basements. Therefore, additional attention needs to be taken to ensure the safety of the residents and employees before, during, and after a tornado event. And as

TABLE H6: CITY OF WAVERLY "AT-RISK" POPULATION	
	2010
Total City Population	9,874
Elderly (65 yrs and older)	1,656
Youth (under 18 yrs old)	2,013
Householder Living Alone	1,005
Non-English Speaking Population (speaks English less than 'very well', 5yrs+)	79
Population Living in Poverty	881
Population in Mobile Homes	370
Group Quarters Population	1,577
Persons with Disabilities (age 5+)	896
Persons w/Hearing Difficulty	289
Persons w/Vision Difficulty	91
Persons w/Cognitive Difficulty	196
Persons w/Ambulatory Difficulty	451
Persons w/Self-Care Difficulty	153
Persons w/Independent Living Difficulty	184
Source: U.S. Census, 2010 and Iowa Data Center	

²⁹ Federal Emergency Management Agency (FEMA), <http://www.fema.gov/areyouready/tornadoes.shtm>

mentioned earlier, Waverly has 126 nursing home beds, 30 assisted-living units and 38 independent-living units.

There are two safe rooms completed or near-completion in the Waverly-Shell Rock School District. The first was built in 2011 in the Middle School auditorium and has a capacity of approximately 850 persons. The second is currently in the process of being completed and will have a capacity of approximately 1,000 persons. There still remains a need for safe rooms at the School District's elementary school facilities.

Under the auspices of the County Emergency Management office, Bremer County has compiled a list of shelters within each community. The list includes such information such as location, heating source, water source, overall capacity, sleeping capacity, and feeding capacity. The details of the list can be found in full in the *"Contingency Plan for Bremer County."* The list of shelters within Waverly included the following:

- St. John Lutheran Church – 311 4th Ave SW
- Trinity United Methodist Church – 1400 W Bremer Ave
- Bartels Home – 1922 5th Ave NW
- Waverly Municipal Hospital – 312 9th St SW
- Bremer County Courthouse – 415 E Bremer Ave
- Waverly-Shell Rock Middle School – 215 3rd St NW
- Waverly-Shell Rock High School – 1415 4th Ave SW
- Wartburg College
 - Becker Science Hall – 111 10th St. NW
 - Field House – 1015 2nd Ave NW
 - Knights Gym – 231 10th St. NW
 - Luther Hall – 200 9th St NW
 - The W – 100 Wartburg Blvd

It should be noted that there are several other structures that could serve as suitable shelters in certain events. The above list consists of those structures that meet the specific requirements of a fallout shelter as defined by the State of Iowa. The Emergency Management Coordinator is responsible for reviewing the fallout shelter compliance of the above named structures during the regular plan reviews.

Vulnerability – Social Assets (Populations)

The social vulnerability assessment identified how the hazards affect the population of Waverly and it is assumed that the identified populations are more likely to require assistance during times of disaster; therefore, are considered, generally speaking, more "at-risk" than the remaining population.

The “at-risk” population must be identified and targeted in successful mitigation efforts. Table H6 presents an overview of the at-risk population in Waverly according to information retrieved from the 2010 U.S. Census and Iowa Data Center.

Tornadoes

As mentioned previously, persons living in mobile homes, also known as manufactured housing are also at risk from tornadoes. At the time of the 2010 Census, there were 139 mobile homes in Waverly. Again using the average persons per household, there are approximately 370 persons living in these housing units.

According to Table H6, 16.8 percent of residents are 65 years or older. There are 1,577 persons living in group quarters, indicating the remaining elderly populations live throughout the community. According to the Iowa Department of Elder Affairs, the City of Waverly has 126 nursing home beds and 30 assisted living facility units.

Persons under the age of 18 are also at higher risk during some disasters. This is mostly due to the fact that young persons often are not aware of the proper actions to take in the event of a disaster. In addition, very young children would be more susceptible to a disaster such as a disease epidemic simply due to their age. In 2010, there was 20.4 percent of the community’s total population under the age of 18. Fortunately, as a result of the Waverly-Shell Rock School District’s efforts to construct two safe rooms, many school-age children will have a safe destination in the event of a tornado during school hours.

Finally, persons living in some multi-family housing units may also be at risk, due to the lack of a proper emergency shelter. In 2010, there were 813 multi-family housing units housing from 2 to 20 or more apartments. According to this, approximately 2,163 persons were living in multi-family housing units.

Flooding

Portions of Bremer County are highly vulnerable to floods, especially along the Cedar River. The City of Waverly is no exception. Flooding puts the entire population at some level of risk, whether through the flooding of their homes, businesses, or places of employment, or the road, sewer, and water infrastructure that serve them daily. High floodwaters can devastate homeowners with property damage, property loss, and extensive, time-consuming cleanup. Secondary effects caused by flooding can add to the property damage. Power loss can leave citizens without heat or air conditioning for extended periods of time. The transportation infrastructure of the community can be impacted by flooding events, which can endanger citizens attempting to travel or evacuate the area, as well as leave those remaining without goods and services.

Populations living in the 100-year floodplain are also at risk of sustaining personal injury or property damage. As mentioned earlier, there are currently 636 houses and 61 commercial/industrial/public structures located within the 100-year floodplain. Using the average persons per household figure from the 2010 Census of 2.66, there are approximately 1,692 persons living in the 100-year floodplain. Since the relocation of the Waverly-Shell Rock Elementary/Middle School after the flood of 2008, the only remaining public school facility in the floodplain is the Southeast Elementary School. St Paul’s Lutheran School (parochial/private) is also situated within the floodplain, but is not administered by the Waverly-Shell Rock School District.

Vulnerability – Estimating Potential Property Losses

Valuations are an important component of hazard mitigation planning insomuch as it provides measurable data that can be used to form some type of estimate as to the potential losses a community could face in the event of a catastrophic disaster.

The valuations for the City of Waverly are available from the County Assessors and Auditors offices. City of Waverly's property valuations are in Table H7.

Future Development

Future development within identified hazard areas can change the threat level of an area by placing critical facilities, businesses, transportation networks, utilities, and populations within vulnerable areas. While it can be difficult to curb development in the vulnerable areas, it is the jurisdiction's advantage to be aware of development trends in order to successfully mitigate future hazards as risks increase. However, continued conformity with the State Building Codes and local land use ordinances and regulations (zoning, subdivision, floodplain management, etc.) will help to mitigate the effects hazards have on new and future development.

National Flood Insurance/Repetitive Loss Properties

The city participates in the National Flood Insurance Program (NFIP) and has a flood ordinance in place. As Table H8 shows, there are over 250 NFIP policies in place within the city.

FEMA defines a repetitive loss property as an insurable building that has experienced two losses in a 10-year period in which each loss is \$1,000 or more. There are 59 repetitive loss properties in the City of Waverly. River flooding is the most common cause of repetitive loss in Bremer County. Table H8 illustrates the number of repetitive loss properties for Waverly.

TABLE H7: CITY OF WAVERLY'S VALUATIONS		
	Total Valuation	Average Valuation per Unit or Parcel
Residential Valuation	\$ 457,372,680	\$ 155,147/parcel
Commercial Valuation	\$ 104,576,140	\$ 226,355/unit
Industrial Valuation	\$ 28,004,960	\$ 500,089/unit
Agricultural Buildings	N/A	N/A
Agricultural Land	\$ 2,224,500	\$ 778/acre
Utilities	\$ 6,198,511	N/A
Railroads	N/A	N/A
Exemptions (military)	N/A	N/A
Gross Valuation	N/A	N/A
Total Net Valuation	\$ 598,376,791	N/A
<i>Source: Bremer County Assessor and Auditors Office (1/1/2009)</i>		

TABLE H8: NFIP AND REPETITIVE LOSS DATA FOR WAVERLY							
CID #	# of NFIP Policies	NFIP Insurance in Force (\$)	Total # of RLB	RLB Insured	# of RL	Total RLB Losses (\$)	RLB Losses Insured (\$)
190030	265	\$39,693,900	59	39	120	\$2,500,017	\$1,513,150
<i>Source: Federal Emergency Management Agency (FEMA); Note: RLB = Repetitive Loss Building; NFIP data current as of 9/30/2016; Repetitive loss data current as of 11/30/2014</i>							

This HMP attempts to reduce loss by identifying potential natural and manmade hazards. As a result of many natural and manmade hazards, repairs and reconstruction area often completed in a way that returns the structure to pre-disaster condition, yet does little to prevent a reoccurrence of damage. Replication of the pre-disaster conditions allows for the repetitive cycle of property damage, reconstruction, and re-damage. Hazard mitigation is needed to ensure that such cycles are broken, that post-disaster repairs and reconstruction are analyzed, and sound, less vulnerable conditions are produced. Additionally, other mitigation strategies may be considered, such as voluntary property buy-outs.

MITIGATION STRATEGY

Hazard Mitigation Plan Goals

The hazard mitigation plan goals were reviewed by the Hazard Mitigation Planning Committee. The committee set as a priority the development of broad-based goals that would address a multitude of hazards and encompass a variety of mitigation activities. The hazard mitigation plan goals identified are in no particular order; they are as follows:

1. Reduce the chance of and impact of flooding in the community.
2. Take measures to minimize the occurrence of injuries and loss of life due to hazards.
3. Take measures to minimize or eliminate damages that may occur as a result of hazards.
4. Increase the city's ability to respond to natural disasters and man-made hazards.
5. Return to the community to similar or improved pre-event conditions as quickly as possible following a disaster event.
6. Maintain participation in the Bremer County Multi-Jurisdictional Plan.
7. Continually re-assess and re-evaluate the plan and mitigation activities.

Current Mitigation Actions

Prevention Mitigation Actions

In 1980 the Federal Emergency Management Agency conducted a standard Flood Insurance Study for the City of Waverly. The study looked at flooding from three primary sources: the Cedar River, Unnamed Creek, and Dry Run Creek. The study reflects 100 and 500-year flood levels for rivers and streams located in the unincorporated portions of Waverly. It is this study and the corresponding Flood Insurance Rate Maps that are used to enforce the county's flood plain ordinance. These maps were updated in 1989 as part of a Flood Insurance Study for all of Bremer County.

In January of 1980 the Dry Run Creek Drainage and Flood Control Study was prepared for the City of Waverly by Brice, Petrides & Associates, Inc. of Waterloo, IA. This study looked at the flooding characteristics of Dry Run Creek in Waverly. It then delineated the flood plain and identified flood problem areas. The plan

then presented, in detail, solutions to the identified problems.

On September 2nd, 1980 the City of Waverly became active members in the National Flood Insurance Program (NFIP) by adopting its initial floodplain ordinance. The Federal Insurance Administration manages the insurance component of the NFIP, and works closely with FEMA's Mitigation Directorate, which oversees the floodplain management aspect of the program.

The city updated the Floodplain Ordinance most recently in 1996. In accordance with NFIP guidelines, the ordinance does not allow for new construction within the floodplain. In addition, it requires those structures within the 100-year flood to: (a.) "be adequately anchored to prevent flotation, collapse or lateral movement of the structure"; (b.) "be constructed with materials and utility equipment resistant to flood damage" and; (c) "be constructed by methods and practices that minimize flood damage."

In the wake of the 1999 Cedar River flooding in Waverly, a report was conducted in order to identify projects that would mitigate the effects that future events would have on the city. The report was simply titled Waverly Flood Study. It was prepared for the City of Waverly by Stanley Consultants, Inc. This plan identified several projects and discussed impact and funding of the projects. The solutions derived from this study were incorporated into the alternatives section of the previous plan. Stanley Consultants updated the Waverly Flood Study in the winter of 2008, following record event flooding in the prior summer. Stanley Consultants focused much research on the city's intentions to construct an inflatable dam and address flash flooding concerns in the Dry Run Creek.

Floodplain management efforts have been made with the construction of several detention ponds in Waverly. These detention ponds are thought to have a tremendous impact on the Dry Run Creek flooding situation. Dry Run Creek is a creek that historically has flooded due to heavy localized rains. The result is flash floods, much different than the floods of the Cedar River, which usually are accompanied with substantial warning time. The detention ponds are expected to help control the water in the Dry Run Creek area.

In May 2011, AECOM released the Southeast Waverly Flood Protection Feasibility Study Summary Report prepared for the City of Waverly. The project consisted of completing a feasibility study for protecting the southeast portion of Waverly from flooding associated with the Cedar River. The City of Waverly requested AECOM to study the possibility of a proposed levee system to protect this area of the community from flooding. The study consisted of reviewing the existing FEMA Flood Insurance Study (FIS) Cedar River Flood Profiles and associated floodplain and floodway mapping for the City. In addition, aerial photography and LiDAR contours were used to develop preliminary alignments for the proposed Levee Protection System. Three levee alternatives were developed for the flood study area:

- Option 1 – 100-year flood protection with four feet of freeboard (provides two feet above 500-year protection, construction approximately \$9,542,000)
- Option 2 – 100-year flood protection with two feet of freeboard (provides zero feet above 500-year protection, construction approximately \$7,113,000)
- Option 3 – 100-year flood protection with zero feet of freeboard (construction approximately \$4,818,000)

Option 1 would be designed to FEMA Standards and would protect 173 properties with freeboard in the 100-year and 500-year floodplains. Option 2 would only

protect the 83 properties with freeboard in the 100-year floodplain, but not the remaining 90 properties in the 500-year floodplain. Option 3 does not include freeboard. The Study included two public participation meetings. The first was held on November 16, 2010, and the second was held on February 22, 2011. Comments received were reviewed and filed for the project.

The Waverly-Shell Rock Community School District is active in its efforts to add tornado safe rooms to its facilities. The Waverly-Shell Rock Middle School currently has a 750-seat auditorium which was built and designated as a safe room. The Middle School was built in 2011 in response to flood damage sustained by the Washington Irving Elementary School (grades 5-6) and the Waverly-Shell Rock Jr. High School (grades 7-8) in 2008. The safe room is designated and constructed to meet the criteria established in the FEMA 361 publication.

In addition, the School District has completed a safe room in the Waverly-Shell Rock High School. The safe room is an addition to the existing school which will also serve the school's science department. Construction of the addition is completed. As with the Middle School safe room, the High School safe room is designed and constructed to meet the guidance criteria established in the FEMA 361 publication. The safe room is also compliant with the City of Waverly's Planning and Building requirements as well as the State Fire Marshal's office.

Table H9 outlines the current planning and regulatory documents for Waverly.

TABLE H9: CURRENT PLANNING AND REGULATORY DOCUMENTS FOR WAVERLY								
Previous HMP	Comprehensive Plan	Building Code	Zoning Ordinance	Subdivision Regulations	Floodplain Management Ordinance	Tree-Trimming Ordinance	Storm Water Ordinance	Snow Removal Ordinance
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Source: City								

Property Protection Mitigation Actions

As a result of the 1999 Flood and a Federal Disaster Declaration, the City participated in a Structural Acquisition program funded through FEMA, IDED, and the Iowa Emergency Management Division (IEMD). There were three phases of housing buyouts. The first two required matching funds to the IEMD funds. The City developed a list of structures that would be candidates for buyout. This list was then forwarded to FEMA where a cost/benefit analysis was performed. In all, the funds were used to purchase 10 homes in the city along the Cedar River. A total of \$444,847 was spent in the purchase of the homes. An additional \$11,150 was spent for the relocation of tenants living in two homes that were rental properties. The intent of buying out houses in the flood plain is to remove people from harm's way.

As a result of the 2008 Flood the City has participated in in a Structural Acquisition program funded through FEMA and Iowa Homeland Security Emergency Management. Some residential property owners opted to participate in the Hazard Mitigation Grant Program (HMGP) and the State of Iowa Community Development Block Grant (CDBG) program. These properties, as a condition of receiving grant monies, are obligated to remain as permanent green space

forever as a condition of the City receiving said funds. As a result of these programs, 69 flood-damaged single-family properties were removed using HMGP, and 20 flood-damaged single-family properties were removed using CDBG, totaling 89 properties altogether. Of these 89 properties, 28 were rental properties.

Additionally, after the 2008 Flood, the Waverly-Shell Rock School District moved the Elementary/Middle school out of the floodplain using FEMA public assistance funds.

Public Education and Awareness Mitigation Actions

Information regarding how to protect oneself in the event of a tornado is largely publicized in the form of flyers, radio, newspaper, and television announcements. The City provides basic safety information for various hazard events (i.e., tornados) and what to do before, during, and after an event. The Waverly-Shell Rock School District maintains its own procedures for conducting safety drills during school hours.

Emergency Services Mitigation Actions

The City of Waverly has relatively new sirens in place that cover the entire populated area of the City as well as the School District within the City limits. Each one of these sirens is equipped with a battery back up to ensure operation in the event of a power failure. In the event of a tornado, the spotter contacts the dispatcher at Law Center who then activates the tornado sirens. The first test of the current system took place in 2001. In addition to this system, some facilities in the City of Waverly still maintain and use the Plectron Warning System.

There are also a wide variety of early warning messages provided through local radio and television stations as well as the cable Weather Channel. Furthermore, the National Oceanic and Atmospheric Administration (NOAA) Weather Radio broadcasts are also available in the community. NOAA Weather Radio is a nationwide network of radio stations broadcasting continuous weather information direct from a nearby National Weather Service office. NOAA Weather Radio broadcasts National Weather Service warnings, watches, forecasts and other hazard information 24 hours a day. Other locations that warnings and watches can be found are television, Internet, and radio (KWAY and KWAR are local broadcasts). In addition, the City of Waverly currently has in place E911 Emergency Assistance. The E911 System is administered through the City of Waverly-Bremer County Law Office.

The Waverly-Shell Rock School District maintains NOAA radios in each of its safe rooms.

Communication of upstream river depths has been important in being able to predict river levels. With a river gage in Charles City (upstream on the Cedar River from Waverly) and another near the Horton Road bridge forecasting river crests has become a very accurate endeavor. The advancement of real-time data has been very influential in these efforts. During past hazards such as the 1999 and 2008 Floods, emergency services were coordinated from the public works department, which also serves as the emergency response center. This facility is old and not an ideal venue for coordinating disaster services. The committee identified the need for a new or alternative site from which to coordinate these activities.

On June 19th, 2000 an official Flood Communication Protocol was officially adopted by the City Council of the City of Waverly. This document was prepared in order to develop a consistent method for notice to citizens regarding high water and flood conditions on the Cedar River.

Also on the City's website is a link to the Code Red Service, which is available to all citizens including the Waverly-Shell Rock School District. The Code Red Service acts as a reverse 911 system. In the event of an emergency/hazard, the system would activate, essentially contacting each citizen residing within harm's way with an automated message, warning them of potential danger. All citizens listed in the City's phone directory are automatically entered into the system. Citizens also have the ability to enter a cell phone, work phone, and other additional alternative phone numbers into the system. Bremer County Emergency Management is responsible for contacting Code Red with the appropriate warning. County Sheriff's Department, City Police, and Fire will coordinate with Emergency Management to communicate accurate information in a timely manner.

Bremer County's Emergency Management Coordinator is based out of the City of Waverly, the county seat. The Emergency Management Coordinator works in conjunction with local fire, rescue, police, and government officials to draft and implement workable emergency action plans in the county. Although the Emergency Management Coordinator is accountable to the entire county, the location of the office in the Bremer County Sheriff's Office is beneficial to the City of Waverly. The current Emergency Management Coordinator is Kip Ladage and the current contact information is as follows:

Bremer County Emergency Management
111 4th St NE
Waverly, Iowa 50677
319-352-0133
Email address: kladage@co.bremer.ia.us

TABLE H10: FIRE & FLOOD INFORMATION FOR WAVERLY		
Fire Insurance Rating	National Flood Insurance Program (NFIP) (Y or N & Year Joined)	NFIP CID #
5	Yes, Joined in 3/2/84, Current Map 3/4/08	190030
Source: Community and FEMA		

Law Enforcement

Police protection is provided by the Waverly Police Department, Bremer County Sheriff Department, and the Iowa State Patrol. Currently, there are a total of 15 sworn officers and 1 full-time secretary serving the Police Department. The Police department shares a building with the Bremer County Sheriff's Department. Richard Pursell is the current Police Chief. Contact information is as follows:

Waverly Police Department
111 4th Street NE
Waverly, IA 50677
(319) 352-5400

Fire Protection

Fire protection is provided for Waverly with an authorized force of 30-40 volunteer firemen. Fire equipment includes three fire-fighting trucks, two tanker trucks, and one rescue unit. The fire station is located in the central part of the city, on the west side of the Cedar River. Waverly's rating for insurance is Class 5 within city limits. Equipment used by the Waverly Fire Department includes three pumper trucks, two tankers, driving equipment, rescue van, 100' aerial, 4 x 4 grass rig, boat, and an all-terrain rescue/ small fire vehicle. Mutual Aid agreements have been signed with every fire department in Bremer County and the Waverly Fire Department (Bremer County). Dennis Happel is the current Fire Chief. Contact information for the Waverly fire department is as follows:

Waverly Fire Department
121 1st Street SW
Waverly, IA 50677
(319) 352-5521

Medical Facilities

Waverly is served by one local hospital:

Waverly Health Center
312 9th Street NW
Waverly, IA 50677
(319) 352-4121

There are six other hospitals available in a 25-mile radius of the City of Waverly. Within Waverly, Covenant Medical Center of Waterloo owns and operates a clinic. Furthermore, there are clinics within Waverly Health Center, and Integra Health has an office in Waverly. These facilities are in addition to the many small doctor's offices and small clinics in the community.

Ambulance

Emergency rescue and ambulance service is provided throughout and beyond the city limits by the Waverly Health Center. The hospital also has a landing area for Life Flight helicopters. Helicopters arrive generally from one of three hospitals; Mayo Clinic of Rochester, MN; Covenant Medical Center of Waterloo, IA; and University of Iowa Hospitals and Clinics of Iowa City, IA.

HAZMAT

The City of Waverly contracts with Northeast Iowa Response Group for response to hazardous material spills. The Northeast Iowa Response Group is a division of Waterloo Fire Rescue as is the Hazardous Materials Regional Training Center. The Training Center provides training to fire departments and companies from around the state and country. Not only is this a training center, it also serves as a hazardous materials quick response unit to Bremer County, surrounding counties, and many municipalities in a ten county region.

The Unit provides local fire departments with hazard materials emergency procedures thus reducing additional contamination. An evacuation plan is also in place in conjunction with the activities with the local department. Contact information for the facility is as follows:

Hazardous Materials Regional Training Center
1925 Newell Street
Waterloo, Iowa 50707
Phone: (319) 291-4275

Toll Free: (800) 291-4682

Fax: (319) 291-4285

The City is also a partner in the Tri-County Drug Task Force. This group works with the city in the event of the discovery of a methamphetamine lab within city limits. The Task Force exists to assist the city Police Department in containment of the site and disposal of the hazardous chemicals.

Streets and Public Works Department

The City of Waverly relies on forecasting efforts to predict the onset of a winter storm. Current technology usually allows for several days' notice before the arrival of a major winter storm.

The NOAA estimates that approximately 70 percent of all deaths attributed to winter storms occur in an automobile. Therefore, the City of Waverly views proper snow and ice removal from roadways to be essential in mitigating negative effects of these events. Snow removal and ice prevention techniques are practiced by city and state employees on the corresponding local and state roadways within the city limits. The following is equipment currently available to the Waverly Public Works department that can be used for snow and ice removal:

- Two Graders
- Two End Loaders
- Seven Plow Trucks
- Two Small Plows for One Ton Truck
- Rotary Blower that can be mounted on an End Loader

The City also has a snow ordinance that is in effect during snow season. This ordinance serves to assist the City in its efforts to clear the city streets after a snow event. In an ideal winter storm scenario, it is estimated that all of the city roads can be adequately cleared within six hours or less barring continued moisture or high winds. In this scenario, travel would be reasonable after two hours.

Natural Resource Protection Mitigation Actions

Neither the City of Waverly nor the Waverly-Shell Rock School District has done any natural resource protection mitigation actions.

Structural Projects Mitigation Actions

Neither the City of Waverly nor the Waverly-Shell Rock School District has done any structural project mitigation actions.

Future Mitigation Actions

While the activities discussed above detail the City's efforts to mitigate hazards when possible and to respond to hazards in a timely and efficient manner, the Committee also recognizes that there are many more mitigation activities and projects that would benefit county residents. Thus, the Committee developed a list of future hazard mitigation activities that, if accomplished, would serve to further reduce the risk of hazards to the community. The list may include a combination of projects the Committee feels the community should attempt to accomplish as well as ongoing mitigation efforts that the Committee view as vital to the continued well-being of the public.

The Committee analyzed the potential mitigation activities. This analysis included a discussion of the potential benefits of implementing the activity, some hurdles that the community may face in implementing the action step, and the drawbacks of implementation. The analysis started by utilizing the STAPLEE feasibility criteria. The STAPLEE technique is a FEMA-suggested method of evaluation. The STAPLEE approach assesses both positive and negative impacts on the following aspects of a county: Social, Technical, Addministrative, Political, Legal, Economic, and Environmental. Based on this analysis, each activity was ranked as a High (H), Medium (M) or Low (L) need. However, not all identified activities may be applicable and are marked as such in Table H11.

Funding

Although in the long-term hazard mitigation actions will save money by avoiding the loss of lives or property damages, in the short-term each action will have an associated cost. The City will rely heavily on local funding sources to fulfill most of the plan obligations; however, they will also seek funds from State and Federal agencies for both pre- and post-disaster mitigation activities.

The estimated cost(s) for each mitigation action, program, or project is either: Minimal, Low, Moderate, or High depending upon various factors.

- Minimal: Cost estimate is \$10,000 or less based on using current staff, time commitment, continuous of current duties, proposed action/program/project, and funding sources.
- Low: Cost estimate for project range from \$10,001 - \$99,999 based on existing proposed treatment, time commitment, any further study that is needed, and level of engineering, and project components (permits, acquisition, coordination, etc.).
- Moderate : Cost estimate for project range from \$100,000 - \$299,999 based on existing conditions, time commitment, proposed action/program/project, any further study that is needed, and level of engineering, and project components (permits, acquisition, coordination, etc.), and funding sources.
- High : Cost estimate for project range is \$300,000 or higher based on existing conditions, time commitment, proposed action/ program/project, any further study that is needed, and level of engineering, project components (permits, acquisition, coordination, etc.), and funding sources.

Implementation Strategy

Once the Committee identified and ranked the future hazard mitigation activities, they were then analyzed. In addition, the Committee established a timeline for each activity, identified the responsible party (ies) for each activity and finally related each activity to at least one of the five Hazard Mitigation Plan Goals listed above. Table H11 below is the City of Waverly and Waverly-Shell Rock School District's Implementation Strategy.

TABLE H11: CITY OF WAVERLY'S IMPLEMENTATION STRATEGY						
Priority	Mitigation Action/Program/Project	Associated Hazard	Primary Agency Responsible for Implementation	Date for Completion	Estimated Cost (s)	Funding Source
Emergency Services						
H	Train and educate emergency service personnel	Disease, Emergency Management, Explosion, Fire, Grass/Wildfire, HAZMAT, Riot/Violent Demonstration, Terrorism, Transportation	City Council	Ongoing	Moderate	Local, State
H	Maintain and acquire materials and equipment for emergency service personnel	Emergency Management, Fire, Grass/Wildfire, Riot/Violent Demonstration	City Council	Ongoing	Minimal	Local, State
H	Maintain mutual aid agreements	Emergency Management, Explosion, Fire, Grass/Wildfire, HAZMAT, Transportation	City Council	Ongoing	Minimal	Local
H	Continue to recruit volunteer first responders and promote these opportunities	Thunderstorm/Lightning	City Council	Ongoing	Minimal	Local
H	Continue working relationship with Tri-County Drug Task Force	Hazardous Materials (HAZMAT)	City Council, Sheriff	Ongoing	Minimal	Local
H	Regularly review and amend fire, medical, and HAZMAT response standard operating procedures	Communications Failure, Emergency Management	City Council, Fire Dept., Ambulance, EMA, Police	Ongoing	Minimal	Local
H	Review and update Incident Command procedures	Emergency Management, Nuclear Event	City Council, EMA	Ongoing	Low	Local
H	Update Emergency Response Plan	Emergency Management	City Council, EMA	Ongoing	Minimal to Low	Local
H	Develop a Continuity of Operations Plan	Emergency Management	City Council	Ongoing	Minimal	Local
M	Upgrade radio communications equipment as needed	Communications Failure, Explosion, Fire	Public Works, Fire Dept.	Ongoing	Minimal	Local
M	Improve water system to enhance firefighting capacity/ability	Fire	City Council	Ongoing	Low to Moderate	Local
M	Develop a comprehensive list of alternative routes for different fire scenarios	Fire	City Council	Ongoing	Minimal	Local
M	Maintain a flood response protocol for response, sand bagging, and evacuation procedures	Flood	City Council, EMA	Ongoing	Minimal	Local
M	Maintain inter-governmental cooperation, e.g. cost sharing	Grass/Wildfire	City Council	Ongoing	Minimal	Local
M	Evaluate equipment and personnel capacity	Disease	City Council	Ongoing	Minimal	Local
M	Install Automatic Vehicle Locators (AVL) in all emergency vehicles	Emergency Management	Fire Dept., Ambulances, Police, EMA	Ongoing	Minimal to Low	Local

2017 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

L	Determine possible sheltering locations to be used in the event of a nuclear emergency	Radiological/Nuclear Event	City Council, EMA	Ongoing	Minimal	Local
L	Monitor the transportation of radioactive chemicals to the best of the city's ability	Radiological/Nuclear Event	City Council	Ongoing	Minimal	Local
Natural Resource Protection						
H	Continue further development of and update Storm Water Management Program	Flood, Groundwater Contamination	City Council	Ongoing	Low	Local
H	Create a regional plan to address flooding concerns including wetland areas and detention ponds	Flood	City Council, Planning & Zoning, Engineering	Ongoing	Low to Moderate	Local
H	Monitor and enforce drainage regulations on residential, commercial, and industrial developments	River Flooding; Flash Flooding	City Council, Public Works	Ongoing	Minimal	Local
M	Follow monitoring requirements set forth by the Iowa DNR	Human Disease; HAZMAT	City Council	Ongoing	Low to Moderate	Local
M	Acquire and maintain equipment for debris removal of drainage areas and post disaster	River Flooding; Flash Flood	City Council	As needed	Low To Moderate	Local
M	Reduce groundwater nitrate contamination	Human Disease; River Flooding; Flash Flood	City Council; Watershed Management Authority; Private Landowners	Long-Term	Moderate	Local, State
L	Consider dredging the river	River Flooding	City Council	Ongoing	High	Local, State, Federal
L	Identify alternative water sources such as dry hydrants and ponds	Grass/Wildfire	Fire Dept	Ongoing	Minimal	Local
L	Continue Wastewater Facility Storm Water Program	Groundwater Contamination	City Council, Public Works	Ongoing	Minimal	Local
L	Discourage the clearing of trees and shrubbery from cliffs and steep sloping hills.	Landslides/Mudflows	City Council, Zoning Admin.	Ongoing	Minimal	Local
Prevention						
H	Maintain tree trimming program	Severe Winter Storm, Thunderstorm/Lightning, Tornado/Windstorm	City Council	Ongoing	Low	Local
H	Systematically review, make necessary updates to, and enforce building code requirements	Earthquake, Fire, Thunderstorm/Lightning, Tornado/Windstorm	City Council, Zoning Admin.	Ongoing	Minimal	Local
H	Continue enforcement of snow ordinance	Severe Winter Storm	City Council, Sheriff	Ongoing	Minimal	Local
H	Acquire and maintain staff and equipment for snow removal	Severe Winter Storm	Public Works & Leisure Services	Active	Low to Moderate	Local
M	Continue an annual inspection program for commercial and industrial properties	Fire	City Council, Fire Dept.	Ongoing	Minimal	Local
M	Enforce existing laws	Transportation	City Council, Sheriff	Ongoing	Minimal	Local
L	Enforce City guidelines for burning	Fire	City Council, Fire Dept.	Ongoing	Minimal	Local
L	Continue annual fire inspection program	Fire	City Council	Ongoing	Minimal	Local
L	Research railway concerns	Transportation	City Council	Ongoing	Low	Local
L	Evaluate current terrorism mitigation efforts	Terrorism	City Council, School Board*	Ongoing	Minimal	Local

2017 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

L	Establish local "cooling sites" for at risk populations such as the elderly and/or the disabled	Extreme Heat	City Council	Ongoing	Minimal	Local
L	Adhere to the Quarantine Plan	Disease	City Council	Ongoing	Minimal to Low	Local
L	Adhere to the current FAD (foreign animal disease) Plan	Disease	City Council	Ongoing	Minimal	Local
L	Continue to enforce City and County guidelines for burning	Drought	Fire Department, Council	Ongoing	Minimal	Local
L	Create a zoning ordinance restricting building near the top and bottom of steep sloping cliffs and hills	Landslides/Mudflows	City Council, Zoning Admin.	Ongoing	Minimal	Local
Public Awareness/Education						
H	Educate the public	Disease, Expansive Soils, Grass/Wildfire, HAZMAT, Landslides/Mudflows, Levee Failure, Tornado/Windstorm, Transportation	City Council, Engineering, Public Works, Fire Department	Ongoing	Minimal	Local
H	Distribute emergency alerts and information through local media	All	EMA, TV/Radio stations	As needed	Minimal	Local
H	Test and maintain outdoor warning system	Tornado/Windstorm; Thunderstorm/Lightning/Hail	Public Works	Active	Minimal	Local
M	Develop and distribute annual hazard mitigation newsletter	All	City Council, EMA	Annually	Minimal	Local
M	Continue to promote NOAA Weather Radio awareness program	Thunderstorm/Lightning, Tornado/Windstorm	City Council, EMA	Ongoing	Minimal	Local, State
M	Continue to utilize ALERT IOWA notification system	Thunderstorm/Lightning	City Council, EMA	Ongoing	Low	Local
M	Expand weather spotter training	Tornado/Windstorm	Bremer County EMA, City Council	Ongoing	Minimal	Local
M	Maintain Crisis Communication Plan	Communications Failure	City Council	Ongoing	Low	Local
M	Enhance coordination of disaster plans in the community	Communications Failure	City Council	Ongoing	Minimal	Local
M	Enhance communication amongst the private sector, public sector, media outlets and citizens	Fire	City Council	Ongoing	Minimal	Local
M	Ensure proper training and certification of Floodplain Manager(s)	Flood	City Council	Ongoing	Minimal	Local
M	Review and improve education plans and file with the Community Emergency Response Team (CERT)	Emergency Management	City Council, Public Works, Engineering	Ongoing	Minimal to Low	Local
L	Develop a "Tornado Safe Room" awareness program	Tornado/Windstorm	City Council, School Board*	Ongoing	Minimal	Local
L	Provide information on proper ditch and open burning, when permitted, who to contact in case of an emergency, how to recognize the presence of explosive gasses, how to contain and manage an approved open fire and/or ditch burning, and how to react in the event of a fire	Grass/Wildfire	City Council, Fire Dept.	Ongoing	Minimal to Low	Local
L	Develop the proper steps to be taken in the event of an earthquake and communicate these procedures to the public	Earthquake	City Council	Ongoing	Minimal	Local

2017 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

Structural Projects						
H	Continue participation in the NFIP	Flood	City Council	Ongoing	Minimal	Local
H	Maintain, enforce and update floodplain ordinances as needed	Flood	City Council, Floodplain Administrator	Ongoing	Minimal	Local
H	Develop the Cedar River Parkway/Bridge	Fire, Transportation, Bridge Failure	City Council	Ongoing	High	Local, State, Federal
H	Encourage the inclusion of tornado safe rooms in newly constructed public facilities	Tornado/Windstorm	City Council, School Board*	Ongoing	Minimal	Local
H	Complete the Dry Run Creek obstruction and flash flooding analysis and consider other mitigation activities such as removal of the 3 rd St Bridge and Cedar River Trail Bridge	Flood	City Council	Ongoing	High	Local, State, Federal
H	Encourage local utilities to upgrade equipment used to locate and identify underground utility lines	Explosion	City Council, Public Works	Ongoing	Minimal to High	Local, Waverly Light & Power
H	Continue bridge inspection program	Bridge Failure	City Council, Public Works	Ongoing	Minimal to Low	Local
H	Explore replacement alternative for bridges	Bridge Failure	City Council, Public Works	Ongoing	High	Local, State, Federal
H	Continue to make necessary inspections and repairs to existing dam	Dam Failure	City Council, Public Works	Ongoing	Minimal to Low	Local
H	Inspect, and make upgrade as needed, to maintain safe operations of sanitary sewer collection system and treatment facility	Infrastructure Failure; River Flooding; Flash Flooding	Engineer	Active	Moderate	Local
M	Inspect/repair/replace water mains	Infrastructure Failure	Public Works	As Needed	Low	Local
M	Work with local utility companies to encourage burying of utility lines	Thunderstorm/Lightning, Tornado/Windstorm	City Council, Waverly Light & Power	Ongoing	Moderate	Local
M	Continue to install and update surge protectors on major electric lines	Fire, Thunderstorm/Lightning	Waverly Light and Power	Ongoing	Minimal	Local
M	Research and secure grant dollars for shelter and safe room construction	Tornado/Windstorm	City Council, School Board*	Ongoing	Minimal	Local
M	Construct additional storm shelters and tornado safe rooms	Tornado/Windstorm	City Council, School Board*	Ongoing	High	Local, State, Federal
M	Flood proof of structures in the floodplain	Flood	City Council	Ongoing	Minimal to High	Local, Federal
M	Replace or increase capacity of 3 rd Street bridge	Flood	City Council, Public Works	Ongoing	High	Local, State, Federal
M	Implement projects identified for the Cedar Lane Bike Path	Flood	City Council	Ongoing	High	Local, State, Federal
M	Enhance and maintain storm sewer capacity	Flood	City Council, Public Works	Ongoing	High	Local, State, Federal
M	Increase measures taken to protect and secure the city's critical infrastructure	Terrorism	City Council, Sheriff	Ongoing	Minimal to High	Local, State, Federal
M	Maintain a list of structures and sites to be used as gathering sites in the event of an emergency situation	Emergency Management	City Council	Ongoing	Minimal	Local
L	Retrofit current facilities to include tornado safe rooms	Tornado/Windstorm	City Council, School Board*	Ongoing	High	Local, State, Federal

2017 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

L	Continue acquisition and removal of homes from the floodplain	Flood	City Council	Ongoing	Minimal to High	Local, Federal
L	Construct a dike and levee system in SE Waverly, near SE 7 th Avenue	Flood	City Council, Public Works	Ongoing	High	Local, State, Federal

ATTACHMENT I: MAPS

1: Location Maps

1 Bremer County

2: Geography Maps

a Topography

b Sinkholes

3: Flood Plain and Flood Scenario Maps

a/b Bremer County

c/d Denver

e/f Frederika

g/h Janesville

i/j Plainfield

k/l Readlyn

m/n Sumner

o/p Tripoli

q/r Waverly

4: Historic Tornado and Scenario Maps

a Bremer County - Historic

b/c Denver

d/e Frederika

f/g Janesville

h/i Plainfield

j/k Readlyn

l/m Sumner

n/o Tripoli

p/q Waverly

5: Critical Site Maps

a Bremer County

b Denver

c Frederika

d Janesville

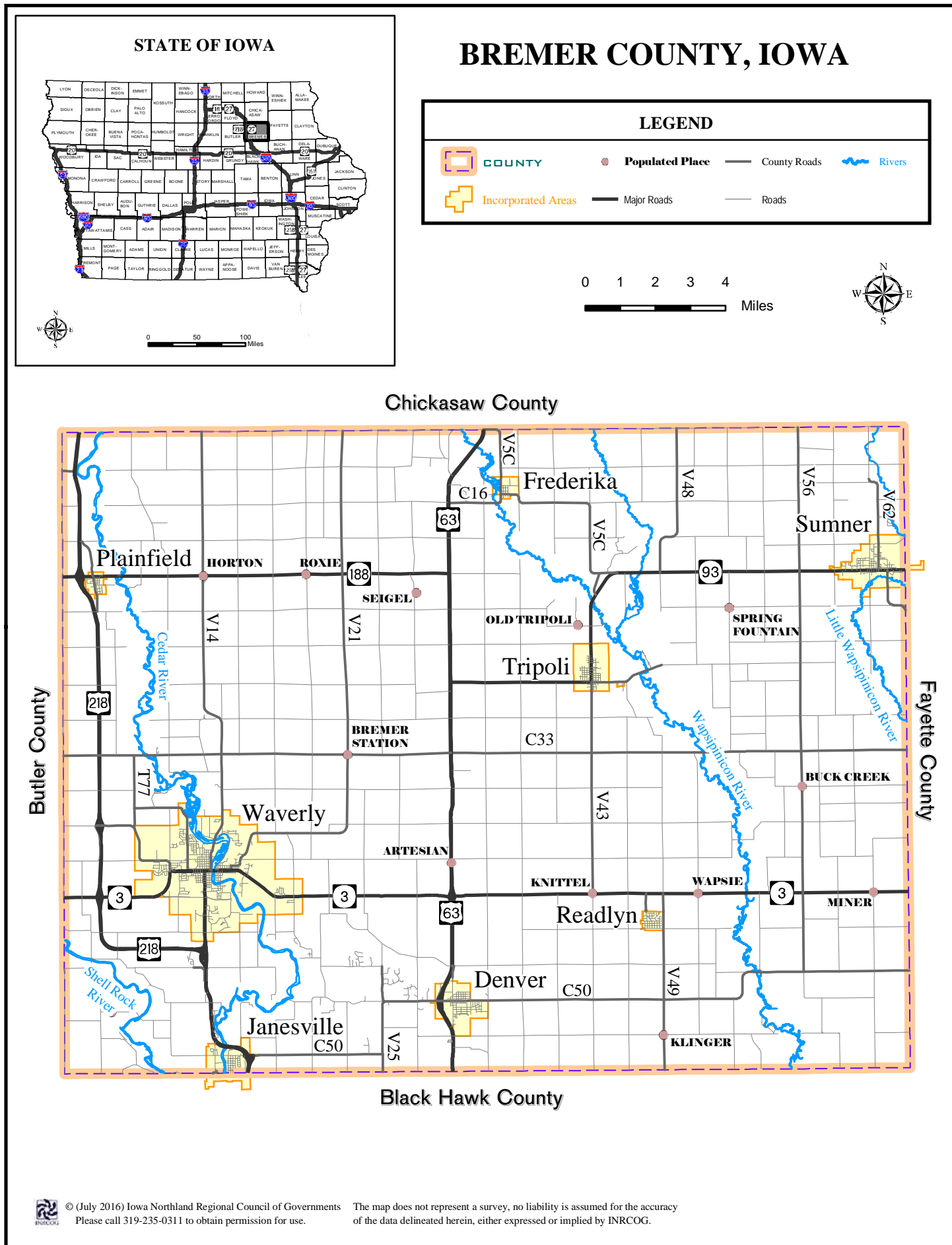
e Plainfield

f Readlyn

g Sumner

h Tripoli

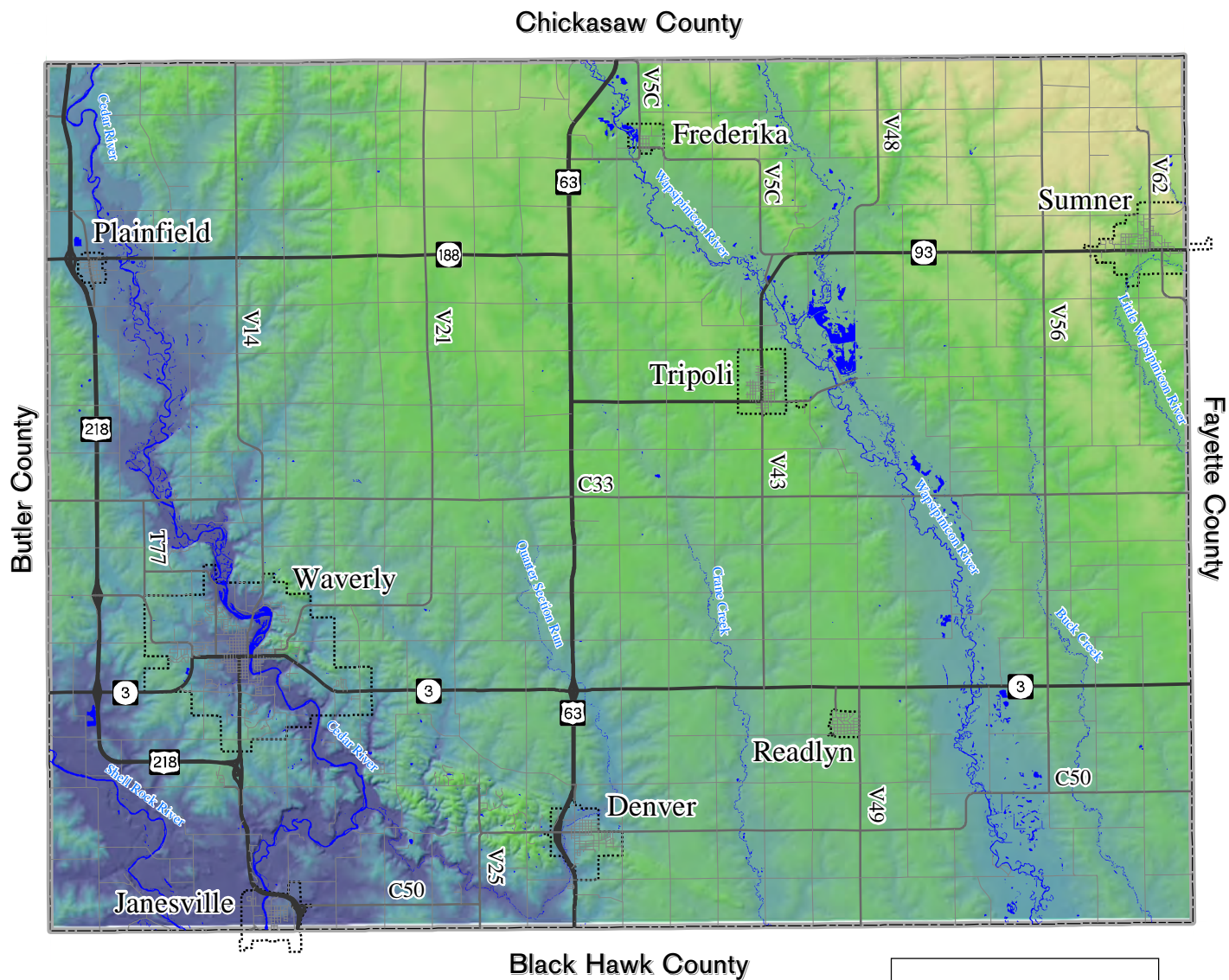
i Waverly



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Bremer County, Iowa Topographic Map



LEGEND

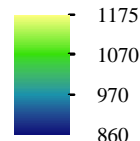


Water



Incorporated Areas

Elevation Feet

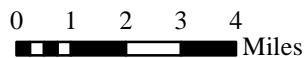


1175

1070

970




860



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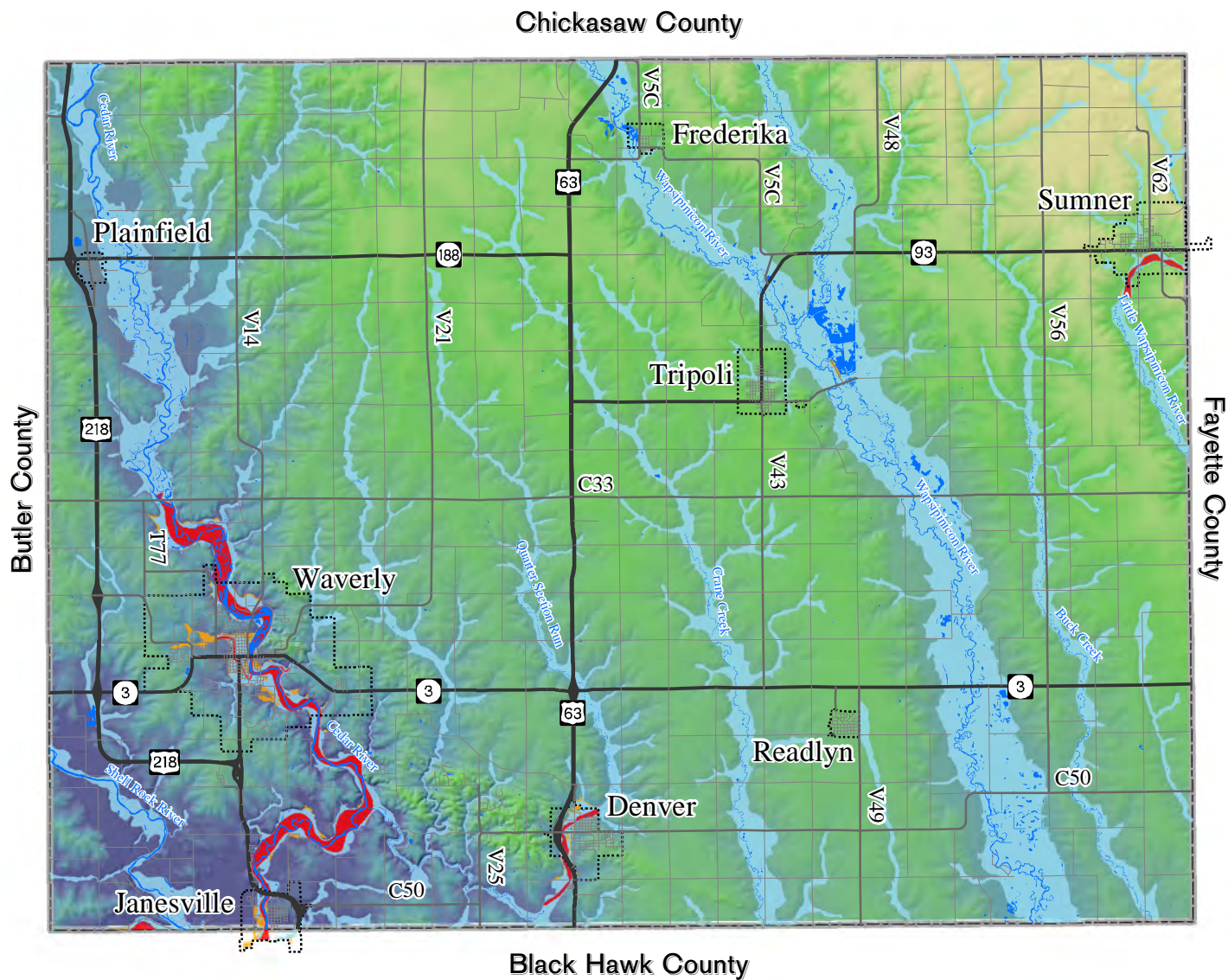
 Sinkhole
 Water
 Incorporated Areas

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Bremer County, Iowa Flood Plain Map



DISCLAIMER

This flood overlay shows the current floodplain designations in the County. The digital flood layer was obtained from the Federal Emergency Management Agency (FEMA). This digital data is FEMA's current Digital Flood Insurance Rate map for Bremer County Effective 3/04/2008.

For actual determination if a location is within the floodplain please contact your local floodplain administrator.



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Water



Incorporated Areas

Flood Zone



Floodway and 1.0% Annual Chance of Flooding

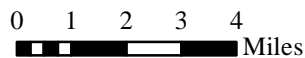
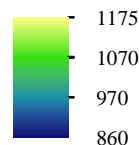


1.0% Annual Chance of Flooding



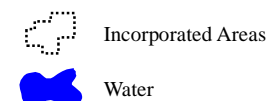
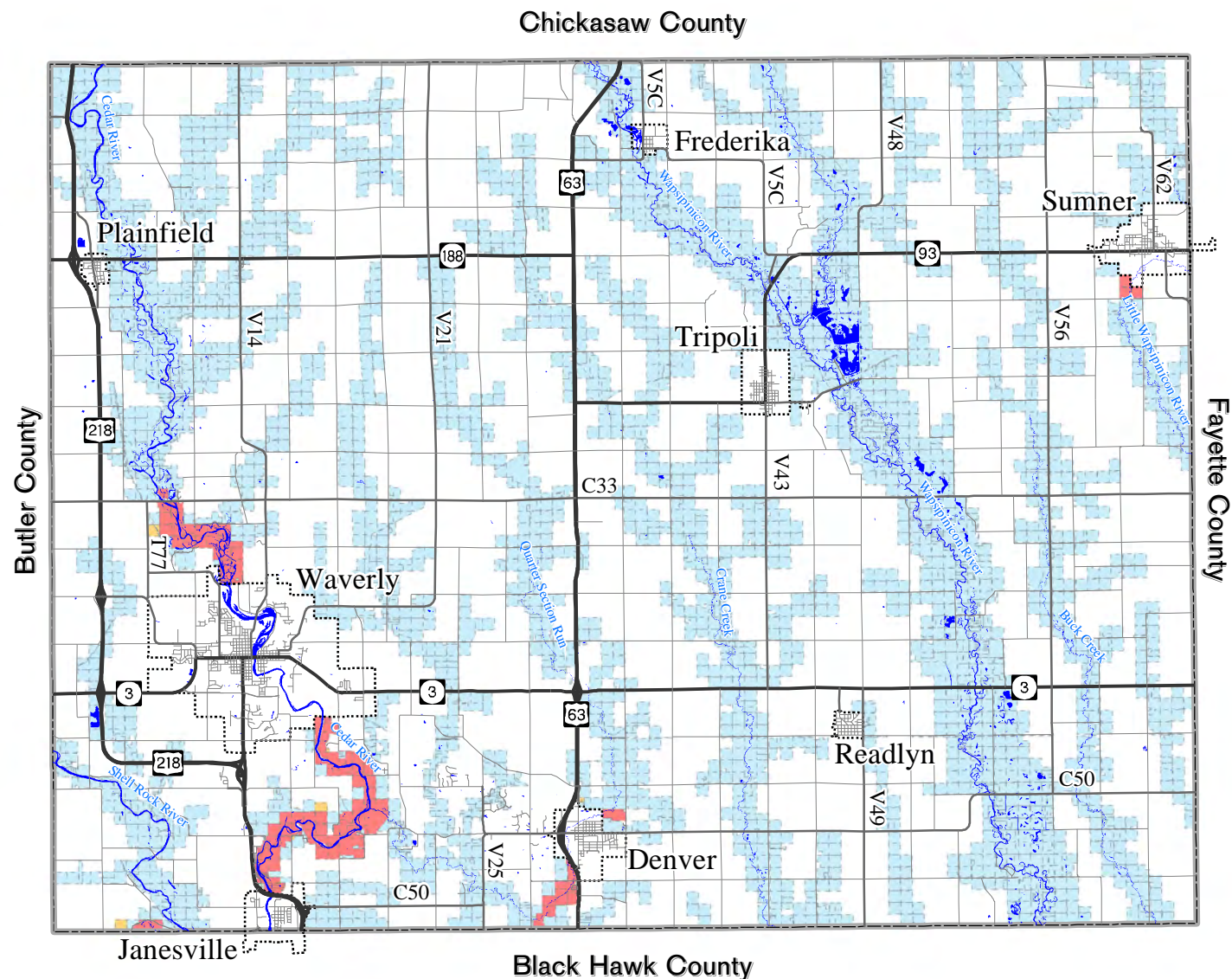
0.2% Annual Chance of Flooding

Elevation Feet



Bremer County, Iowa

Flood Scenario Map (Unincorporated Areas Only)



Flood Scenario

- Parcels Affected by the Floodway and 1.0% Annual Chance of Flooding
- Parcels Affected by 1.0% Annual Chance of Flooding
- Parcels Affected by 0.2% Annual Chance of Flooding

Damage Estimates

Number of Parcels Impacted in the Floodway and 1.0% Annual Chance of Flood Plain -	182
Number of Parcels Impacted in the 1.0% Annual Chance of Flood Plain -	3,791
Number of Parcels Impacted in the 0.2% Annual Chance of Flooding -	11
Number of Parcels Not Affected by Flood Scenario -	7,054

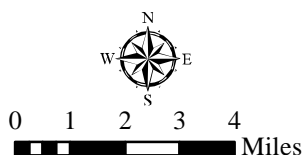
DISCLAIMER

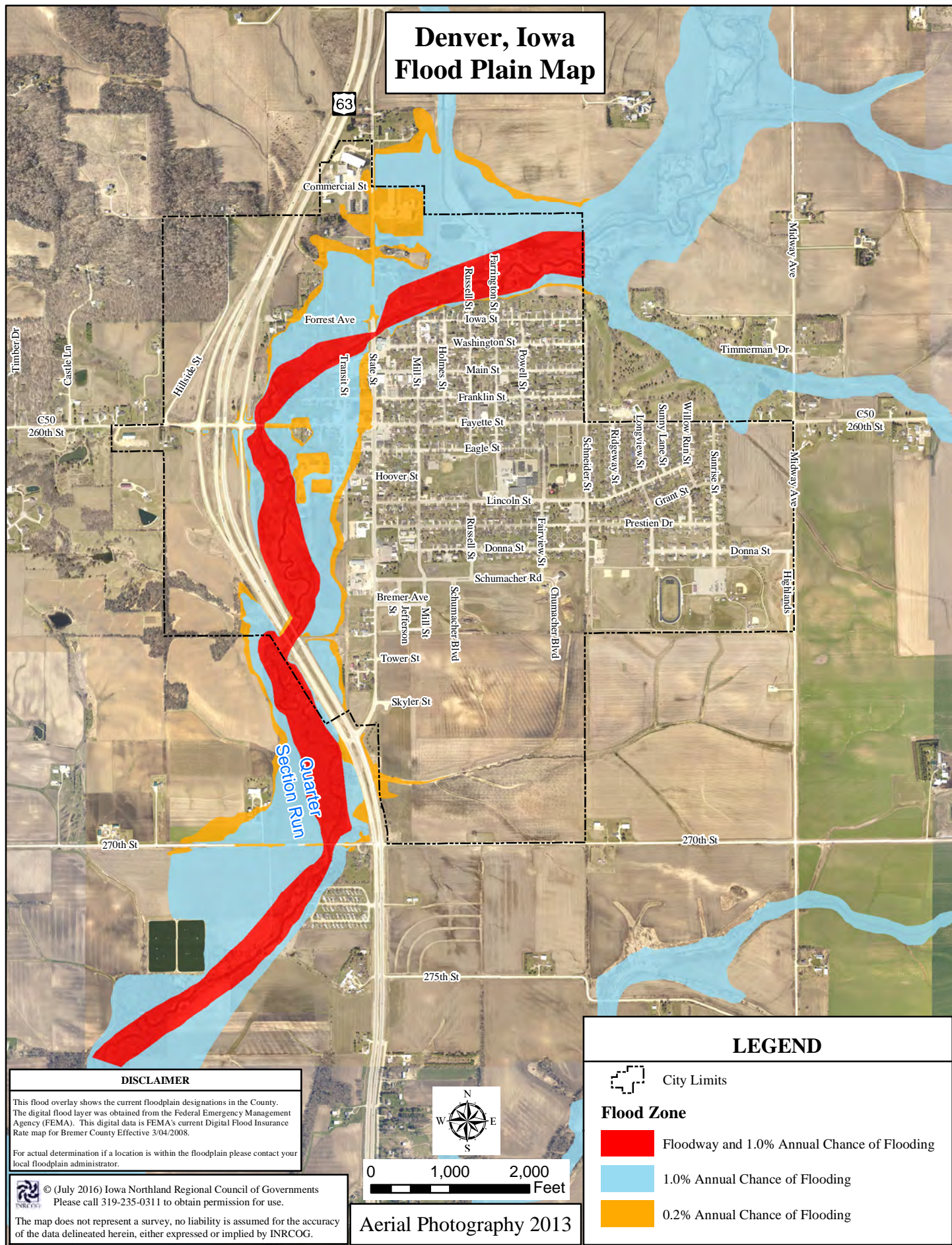
This flood overlay shows the current floodplain designations in the County. The digital flood layer was obtained from the Federal Emergency Management Agency (FEMA). This digital data is FEMA's current Digital Flood Insurance Rate map for Bremer County Effective 3/04/2008.

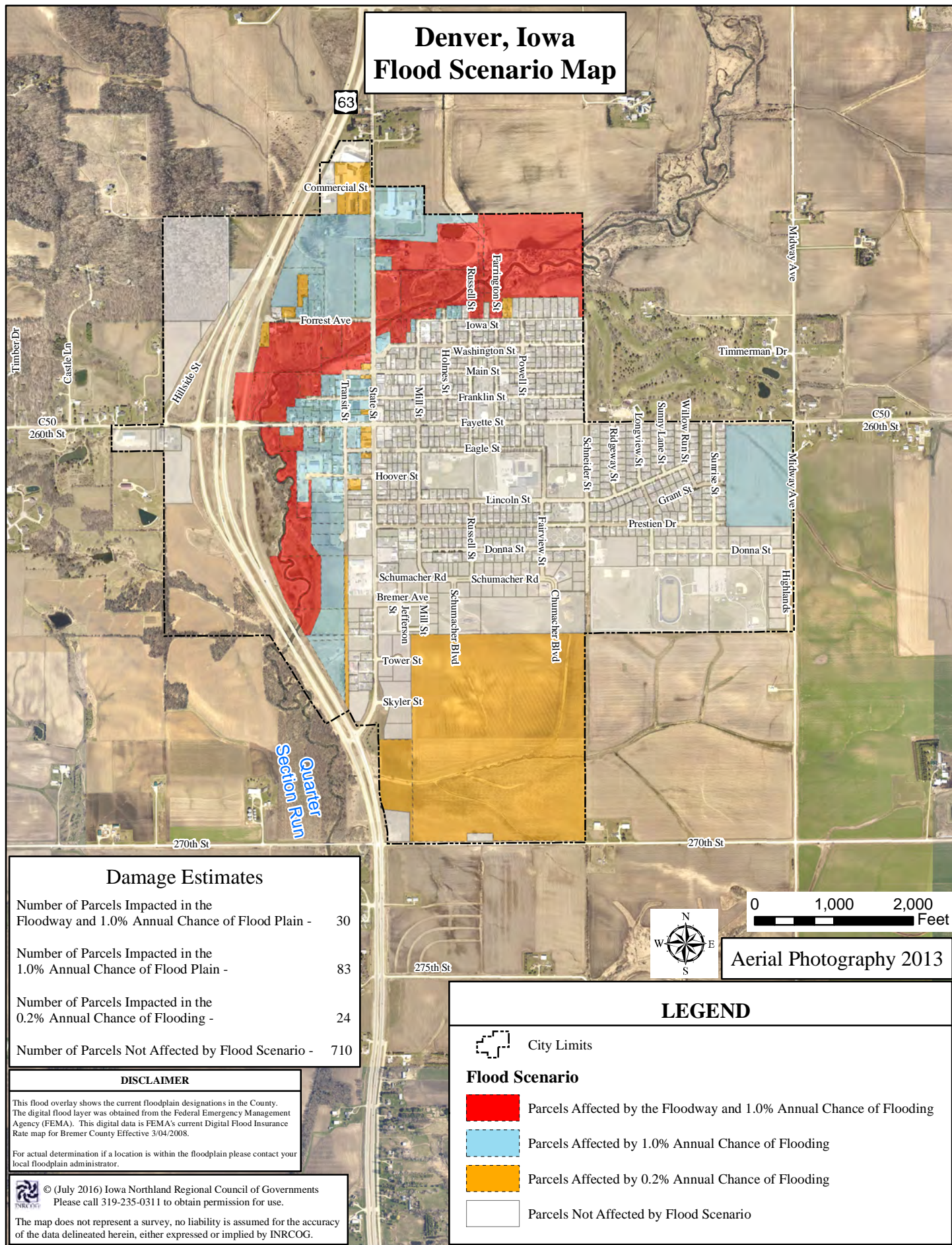
For actual determination if a location is within the floodplain please contact your local floodplain administrator.

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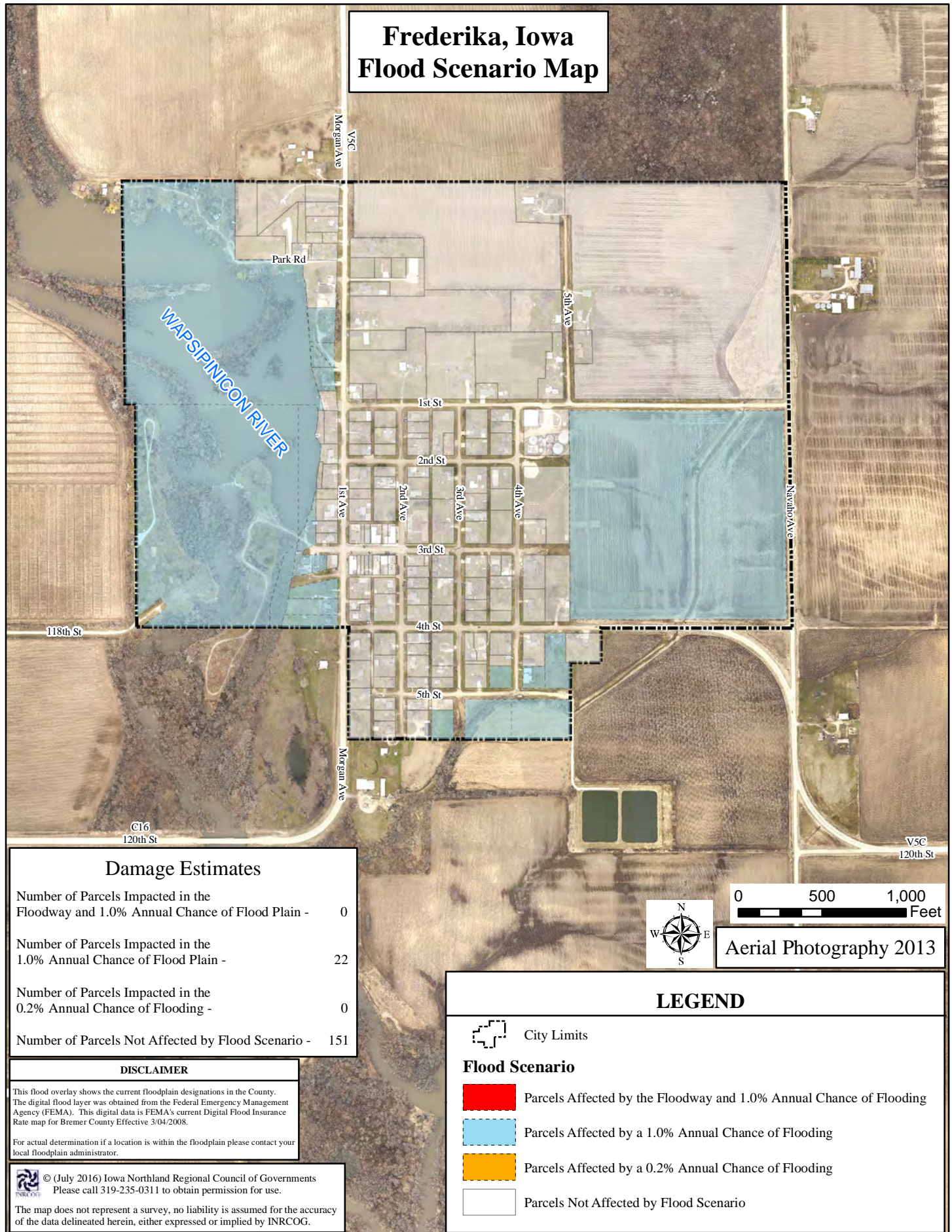
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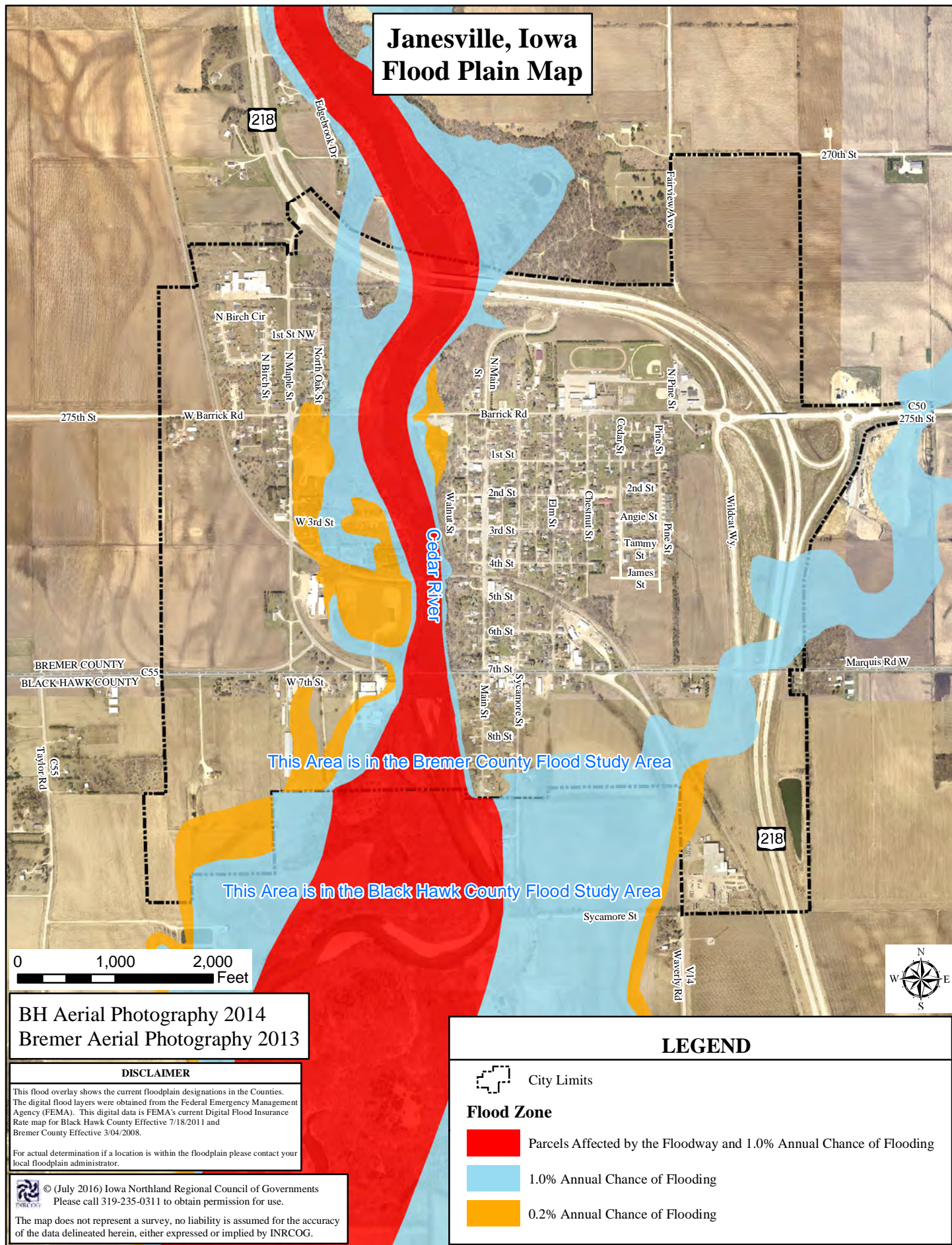


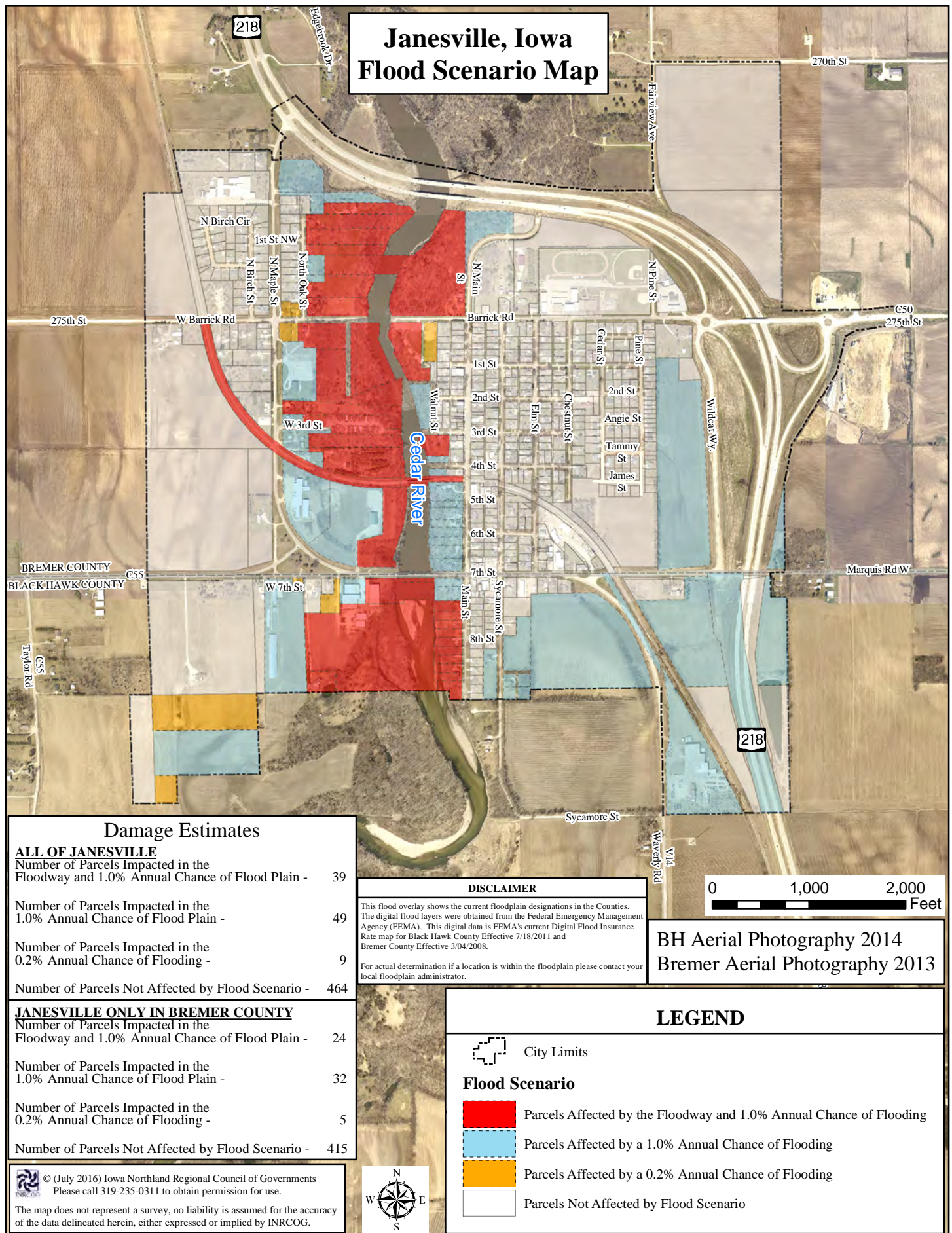




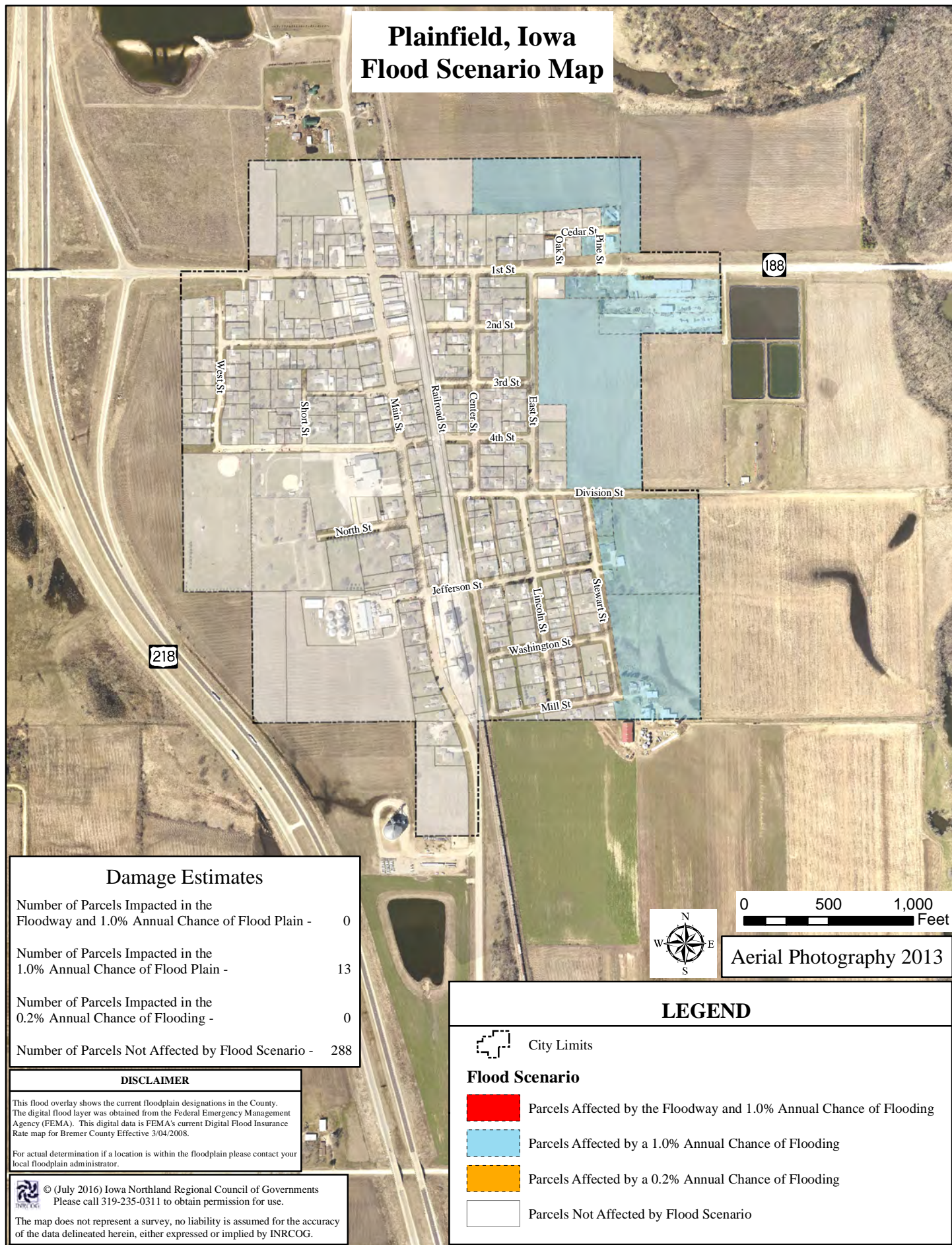


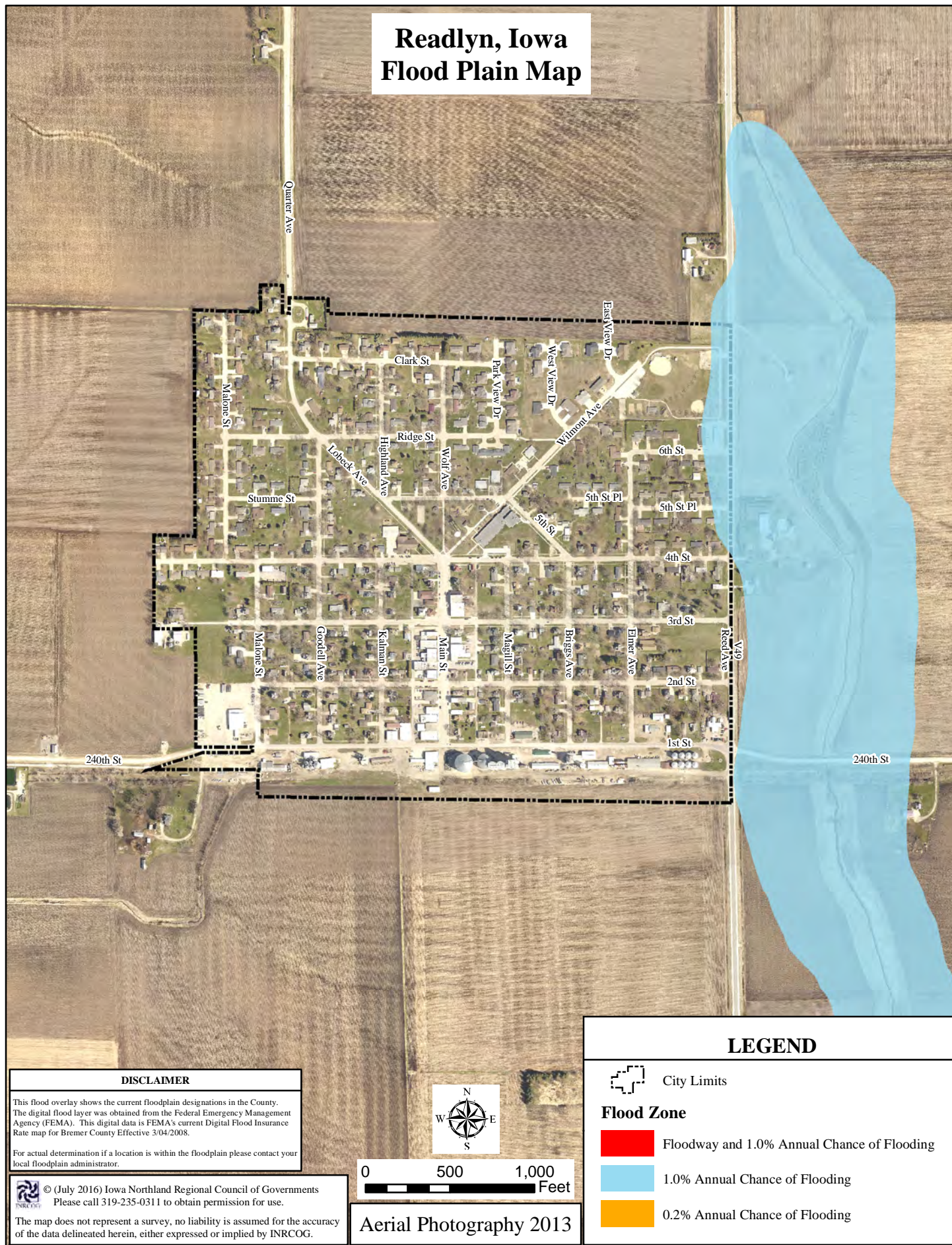




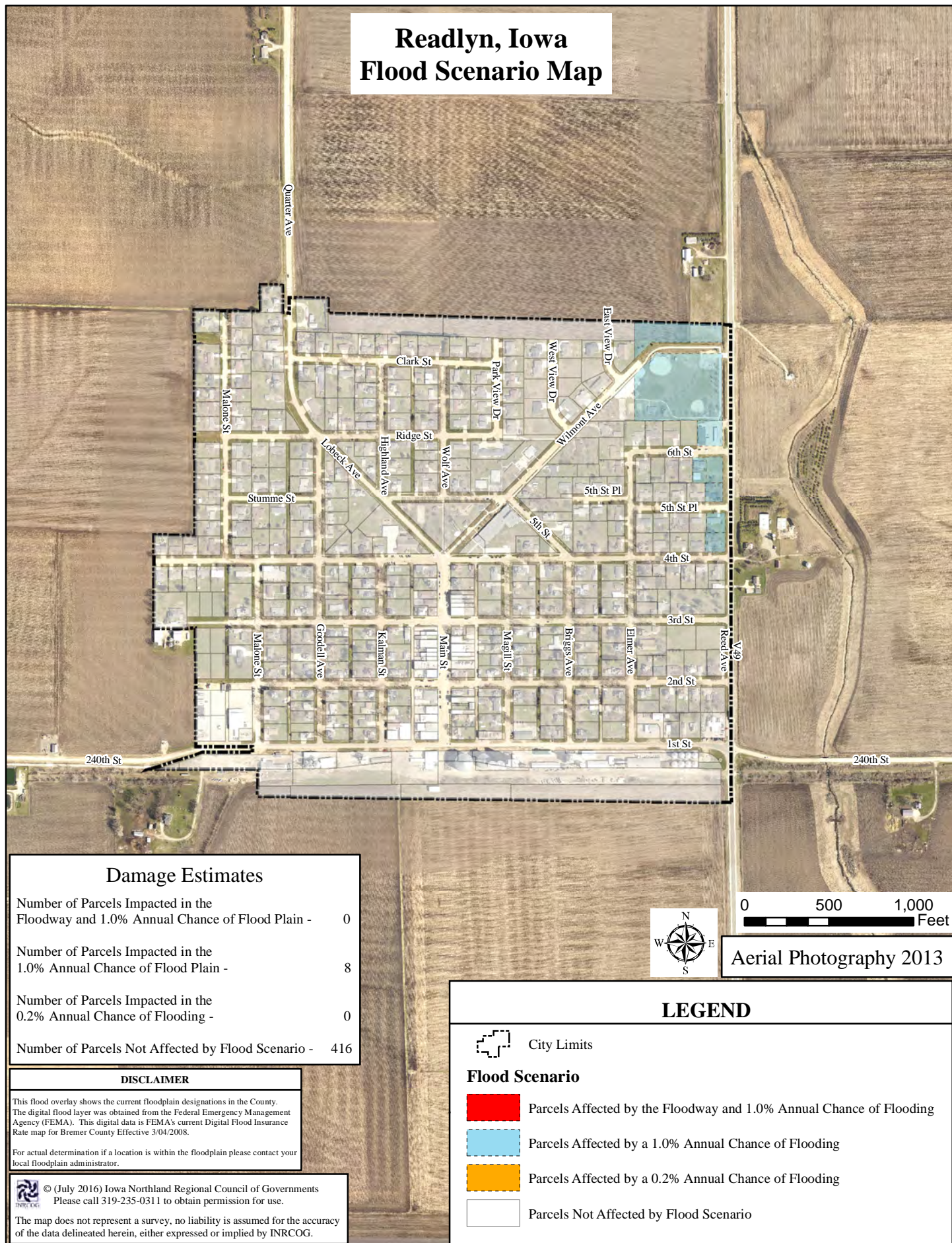


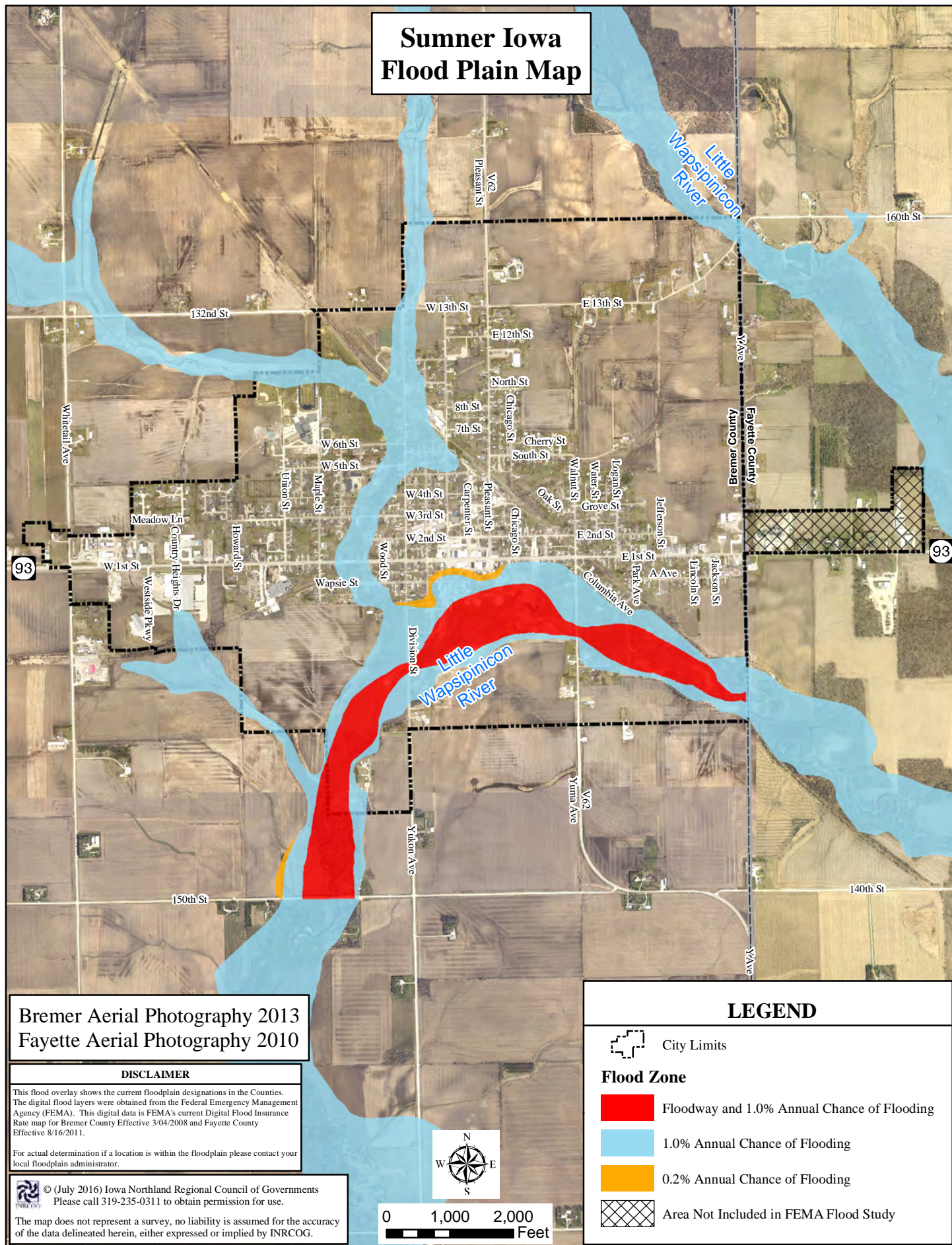


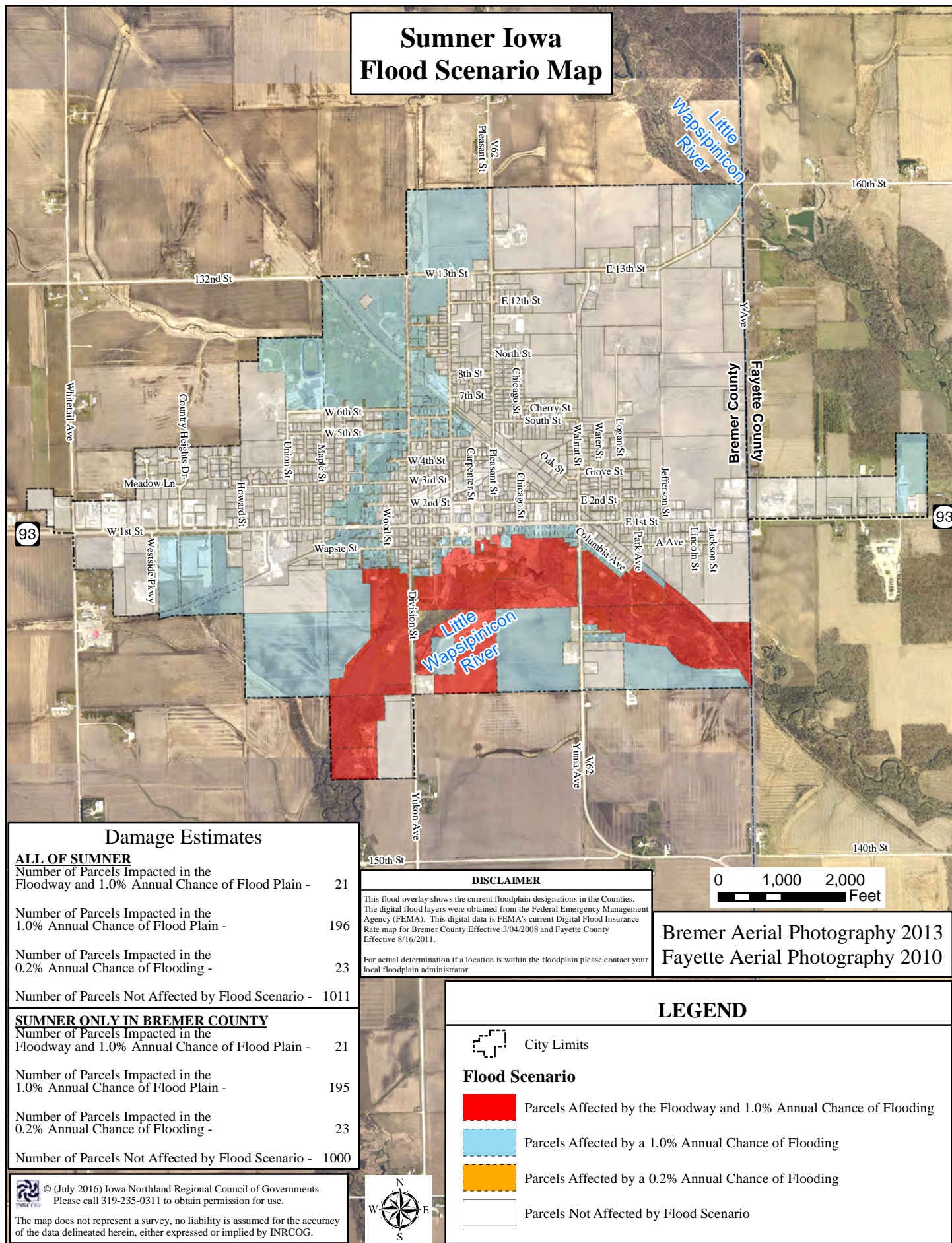


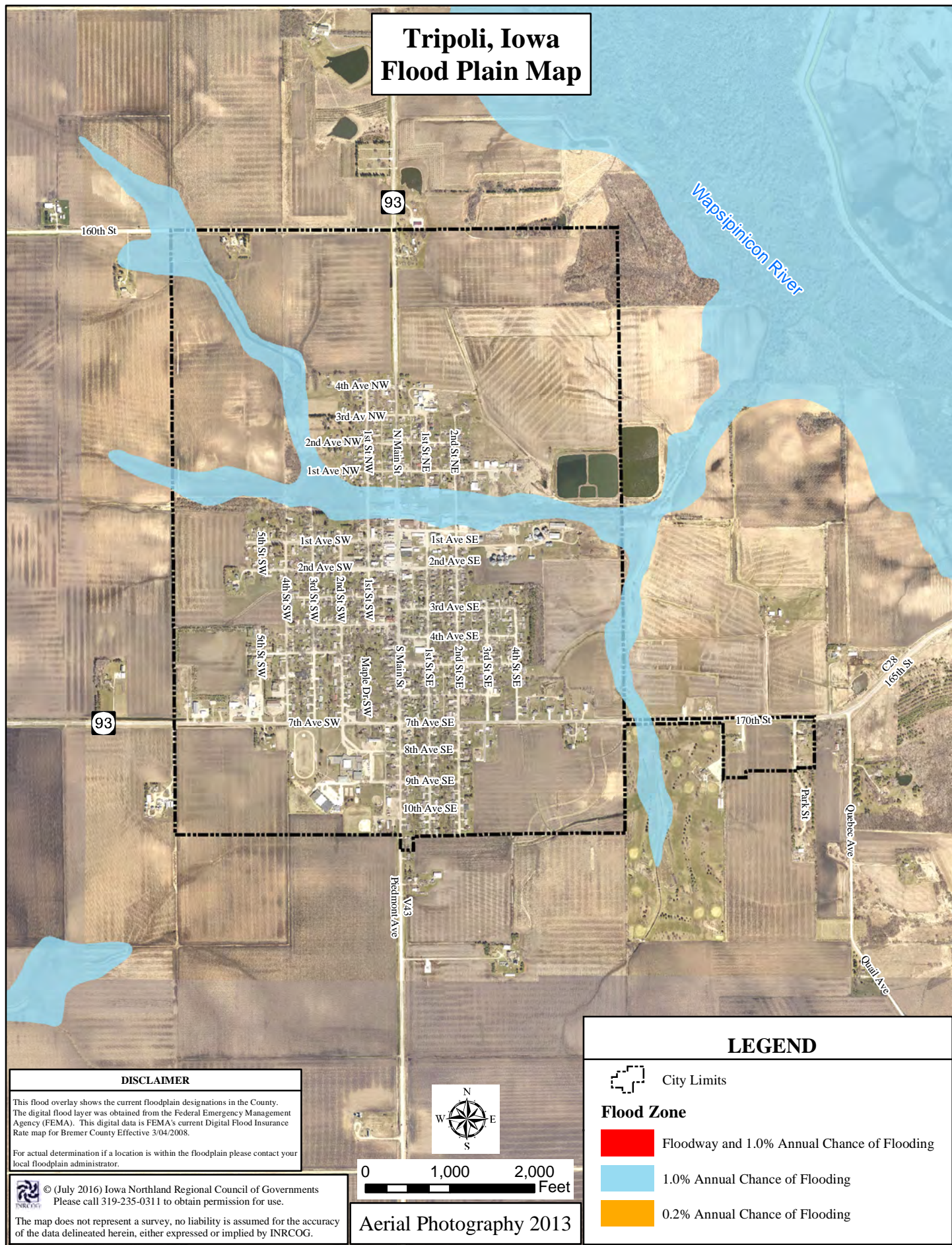


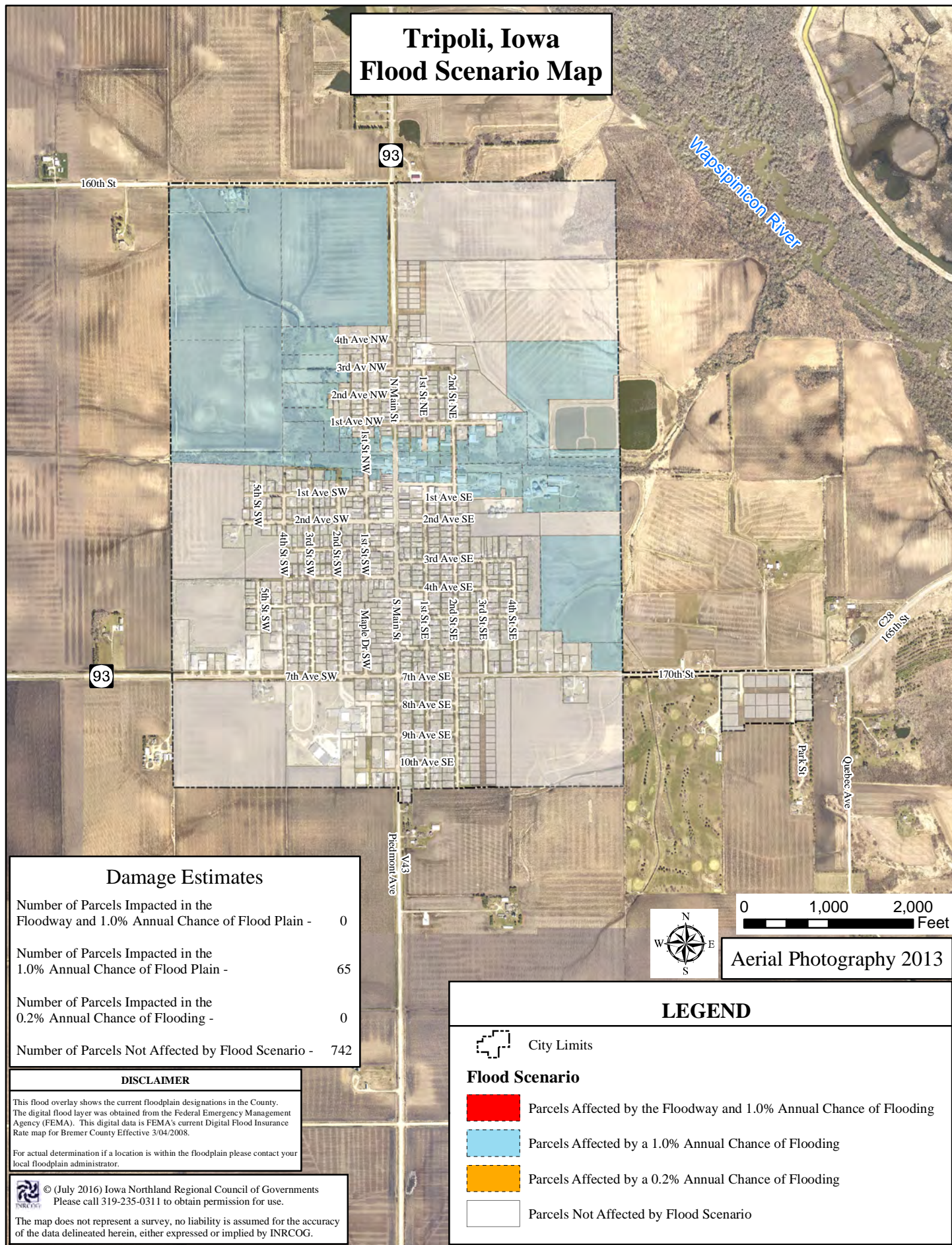
Readlyn, Iowa Flood Scenario Map

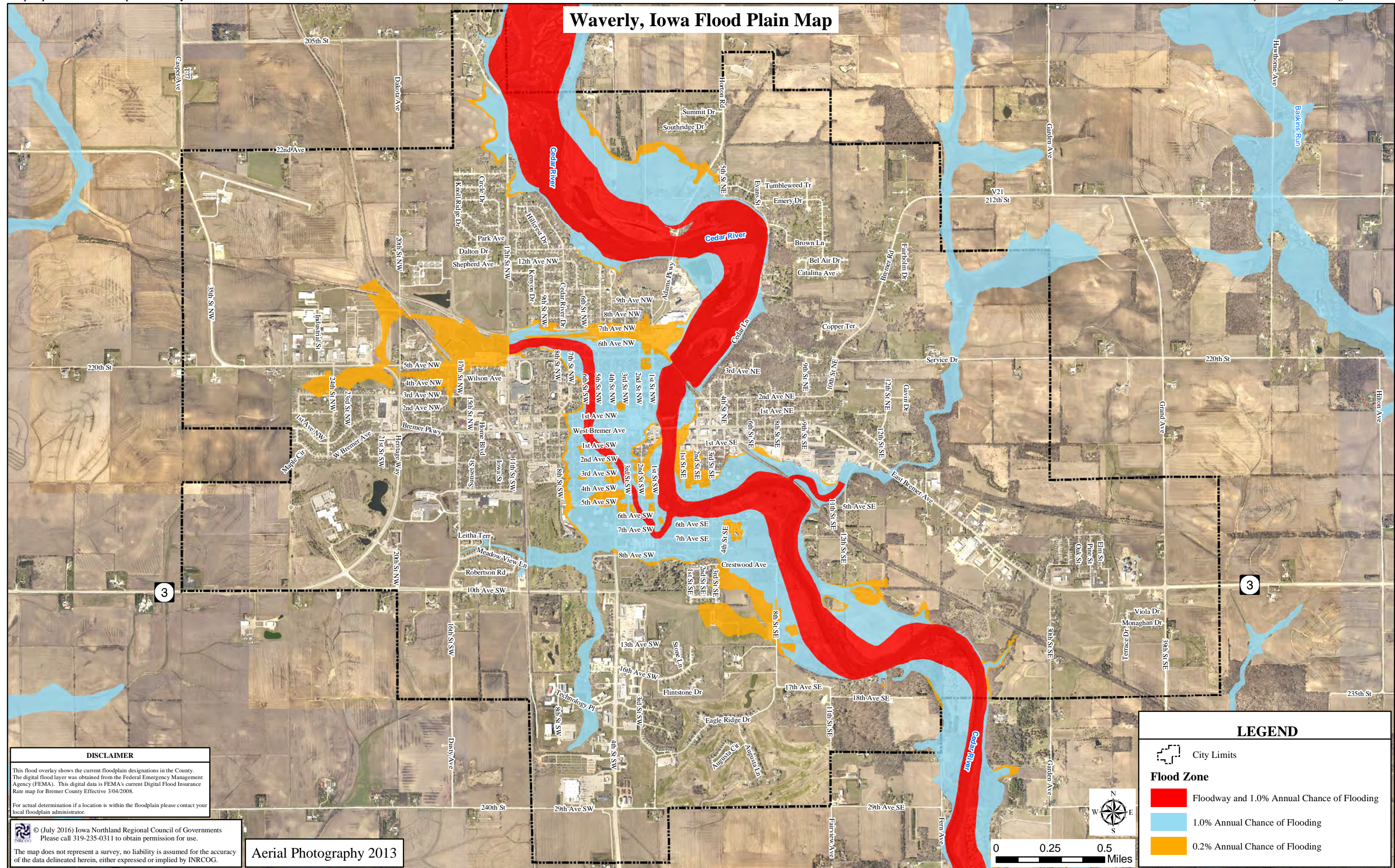


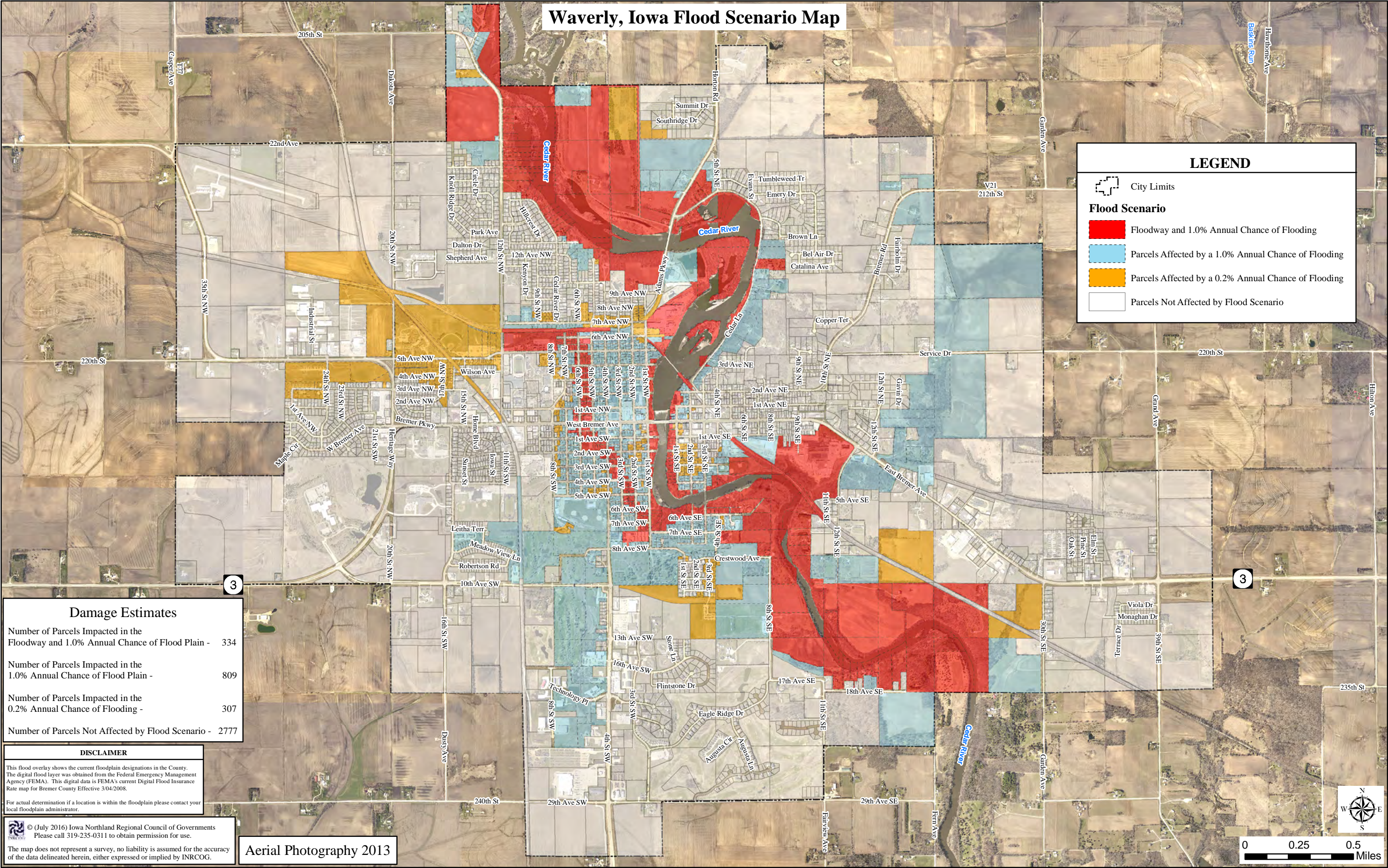
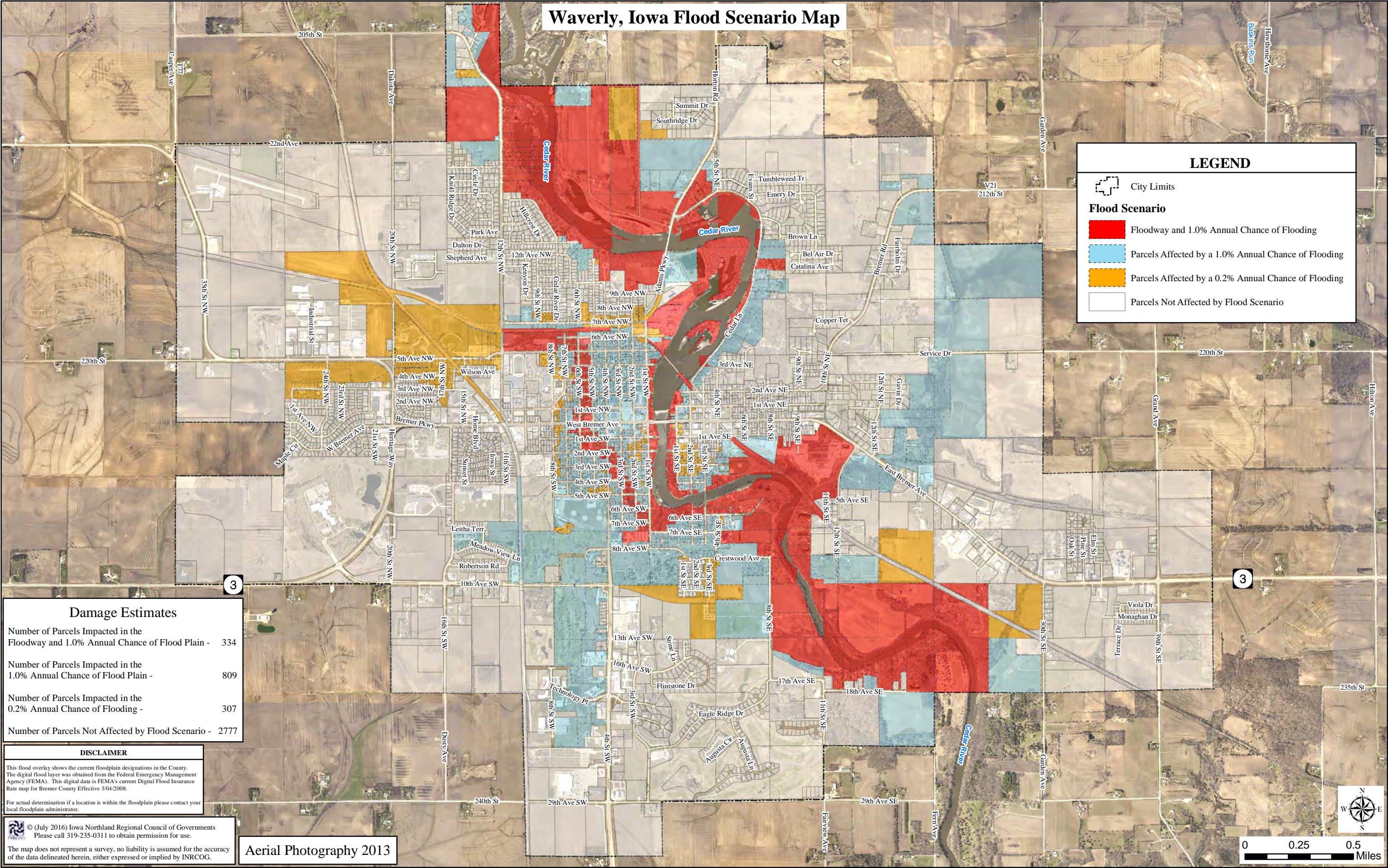












Bremer County, Iowa Historic Tornado Map

This map illustrates the historical impact of tornadoes in Bremer County, Iowa, spanning from 1961 to 2011. It details the Enhanced Fujita Scale magnitude of each event and the resulting property damage. Major highways and neighboring counties (Chickasaw, Butler, Fayette, Black Hawk) are shown for context.

Tornado Events:

- 9/1/1961:** EF4, near Plainfield.
- 9/8/1970:** EF2, near Plainfield.
- 5/29/1962:** EF2, near Sumner.
- 6/7/1977:** EF2, near Sumner.
- 5/14/1981:** EF2, near Sumner.
- 4/10/1981:** EF2, near Sumner.
- 7/12/1971:** EF2, near Sumner.
- 11/9/1975:** EF2, near Sumner.
- 6/4/1973:** EF1, near Waverly.
- 11/15/1983:** EF1, near Waverly.
- 6/27/1998:** EF2, near Waverly.
- 7/2/1973:** EF2, near Waverly.
- 6/1/2001:** EF2, near Waverly.
- 6/14/1991:** EF1, near Tripoli.
- 6/23/2010:** EF1, near Tripoli.
- 6/16/2014:** EF1, near Tripoli.
- 5/22/2011:** EF1, near Tripoli.
- 7/3/1985:** EF1, near Readlyn.
- 6/20/1984:** EF1, near Readlyn.
- 5/3/1988:** EF1, near Readlyn.
- 6/1/2001:** EF1, near Denver.
- 4/19/1961:** EF2, near Sumner.
- 11/9/1975:** EF2, near Sumner.
- 5/3/1988:** EF1, near Readlyn.

LEGEND

Enhanced Fujita Scale Magnitude		Property Damage	
EF0	•	\$0-\$1,000	
EF1	○	\$1,001-\$3,000	
EF2	○	\$3,001-\$30,000	
EF3	○	\$30,001-\$100,000	
EF4	○	\$100,001-\$2,500,000	
EF5	○	Over \$2,500,000	

Scale: 0 to 4 Miles

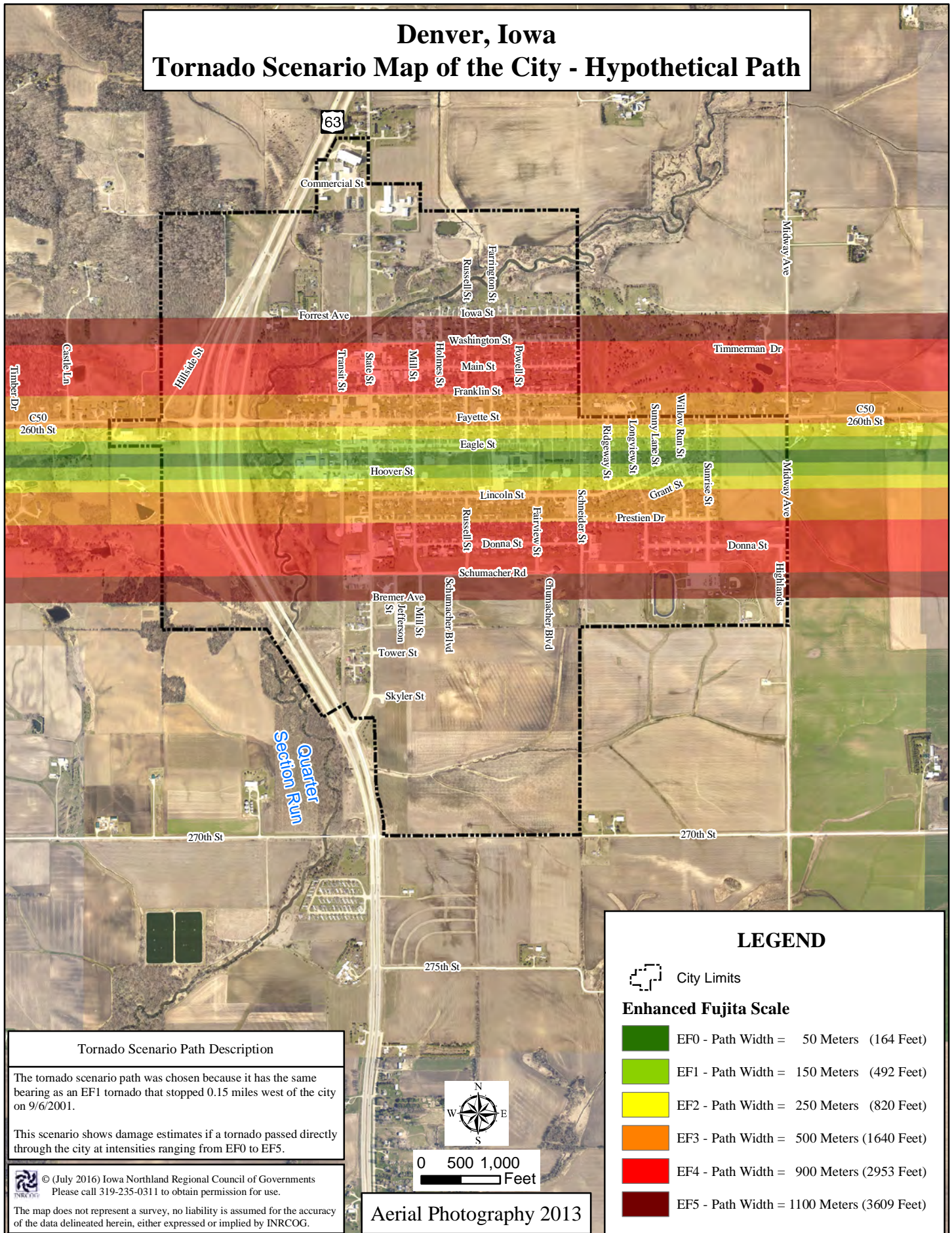
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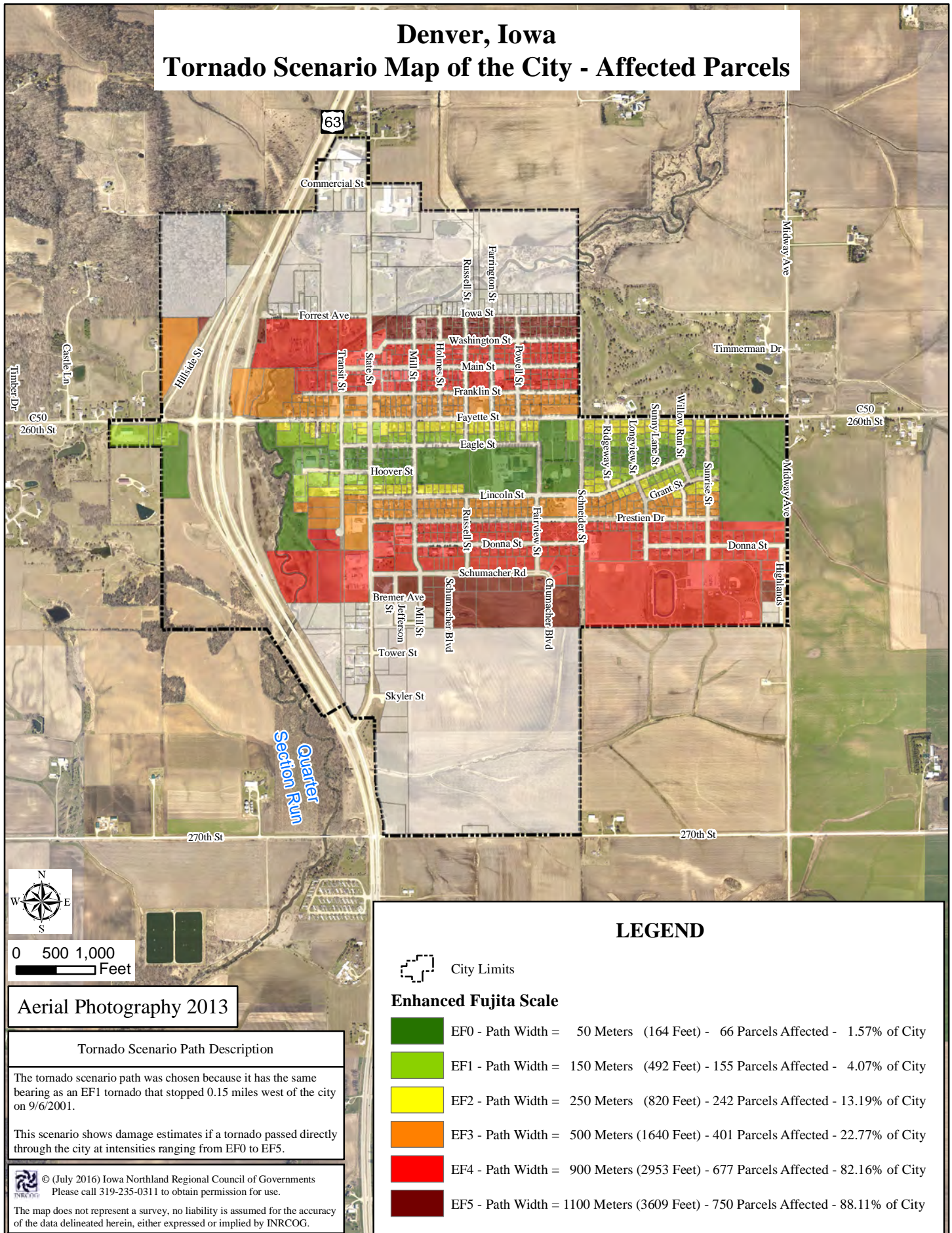
A scale bar with markings at 0, 1, 2, 3, and 4 miles. The bar is black with white segments. The number 3 is underlined.

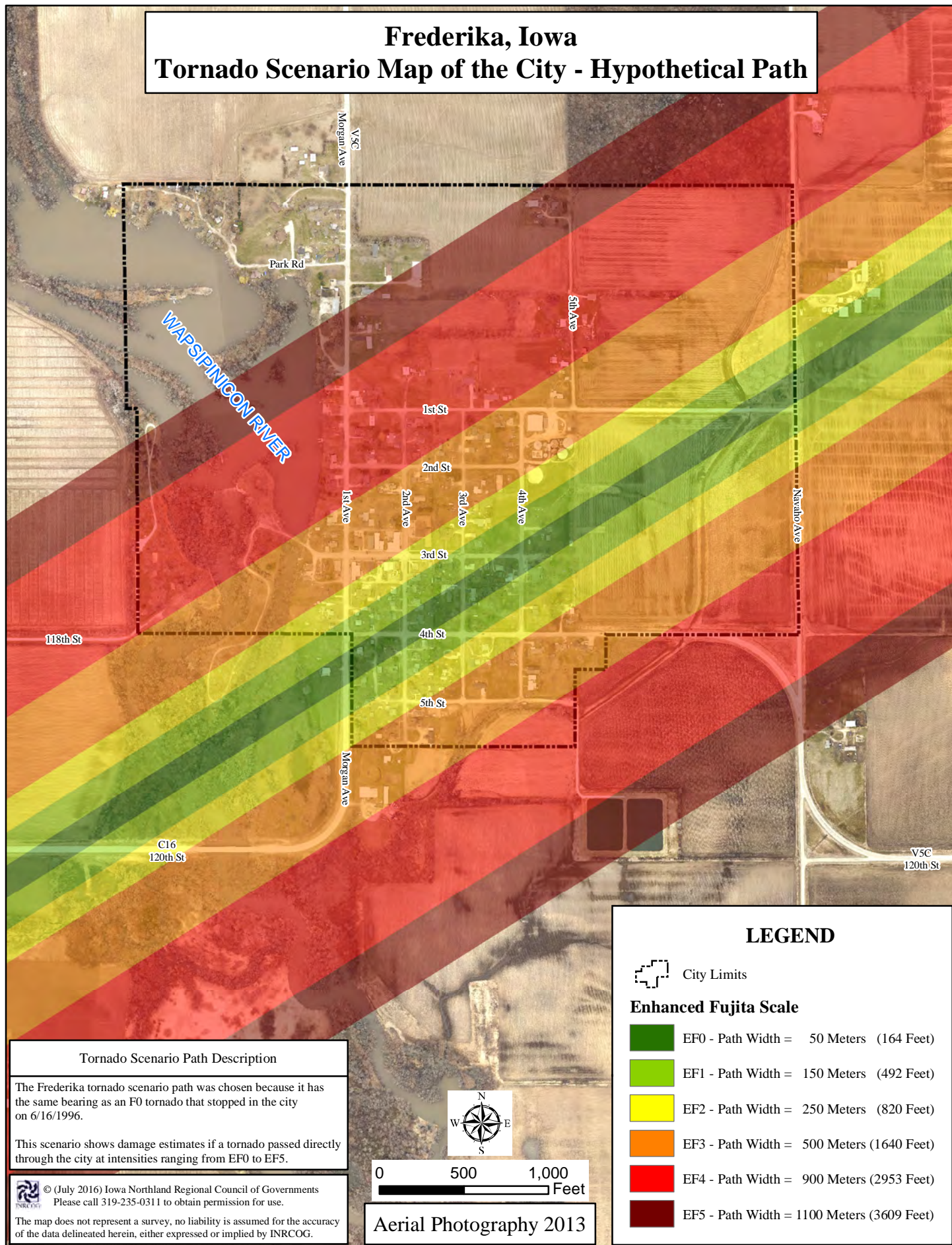


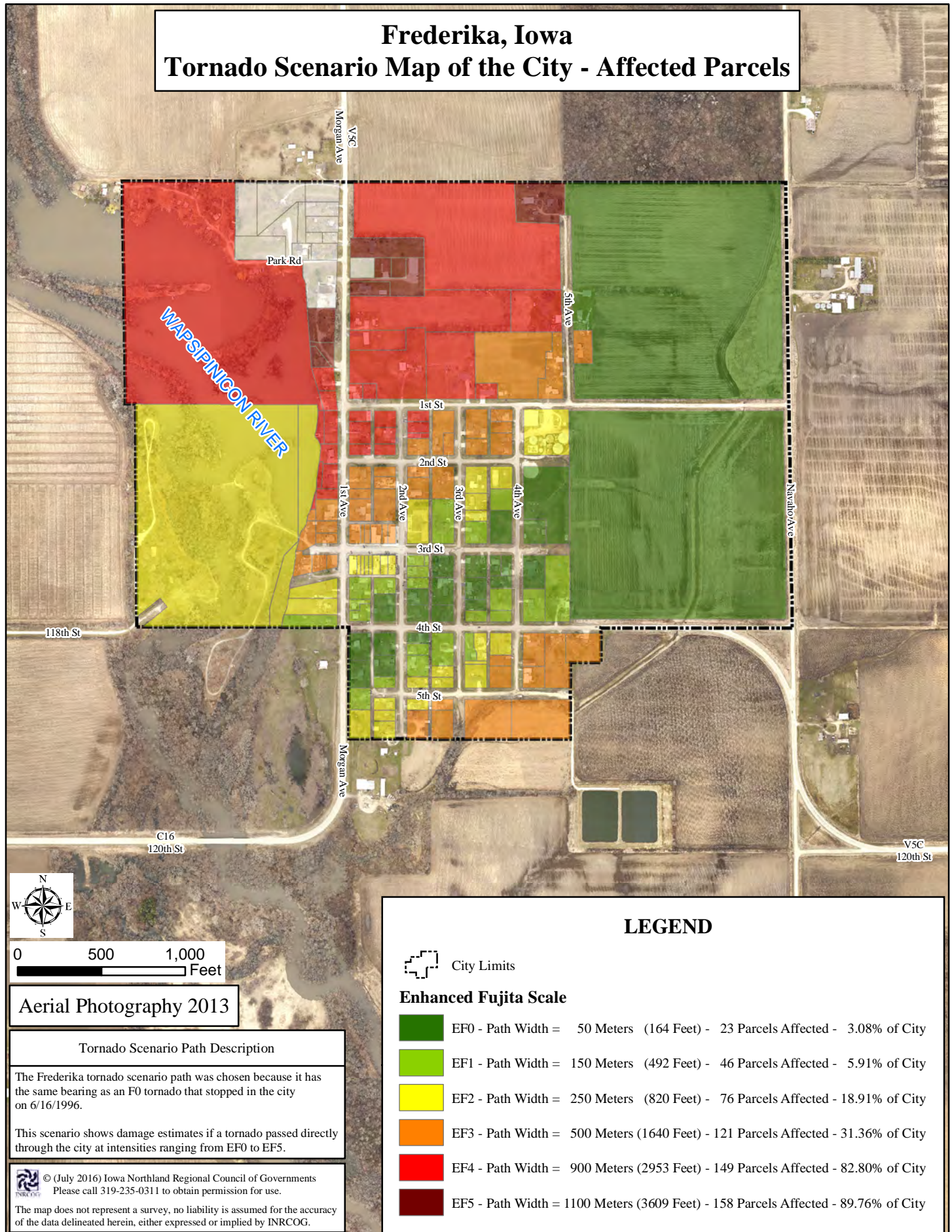
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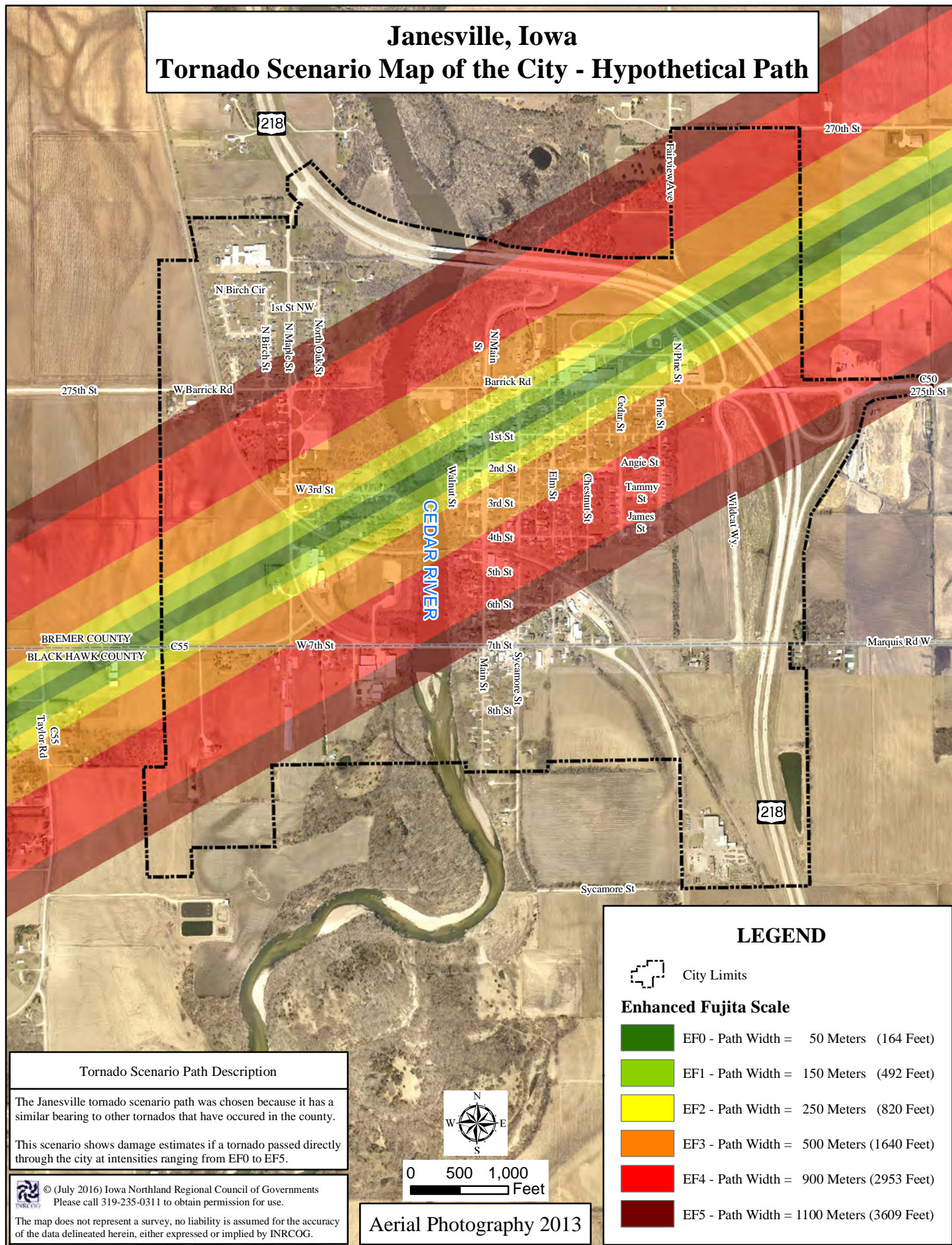
The map does not represent a survey, no liability is assumed for the accuracy of the data delineated herein, either expressed or implied by INRCOG.

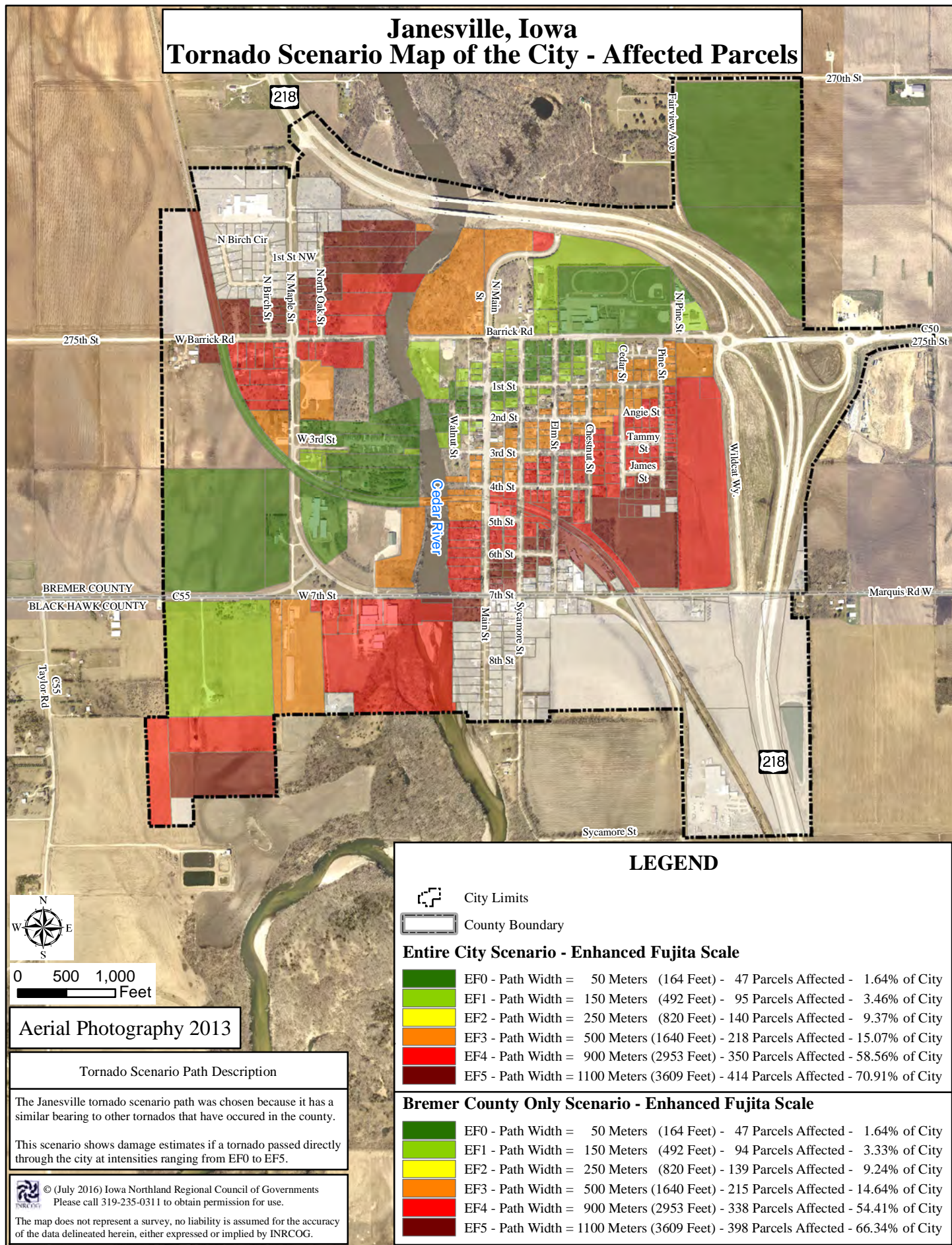


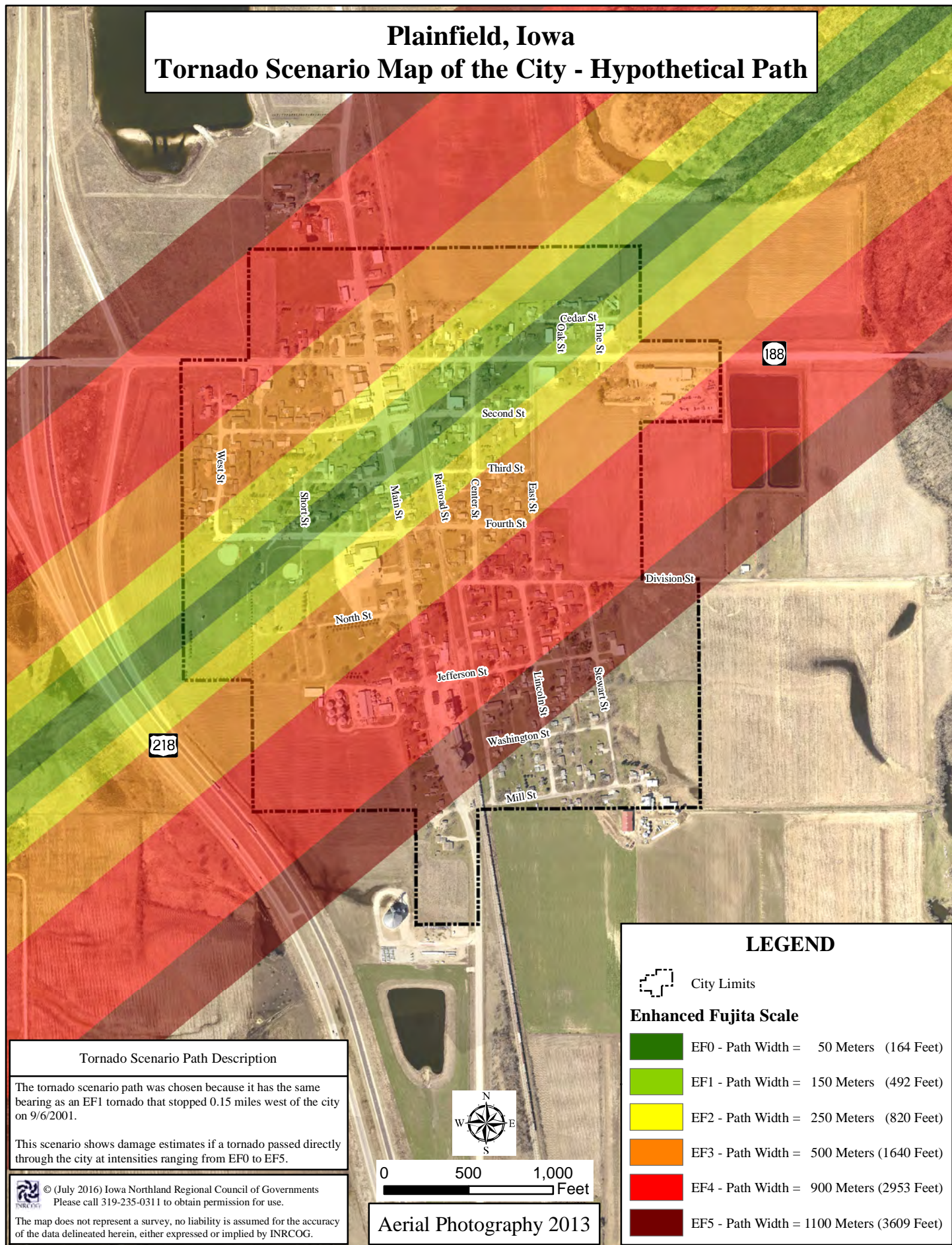


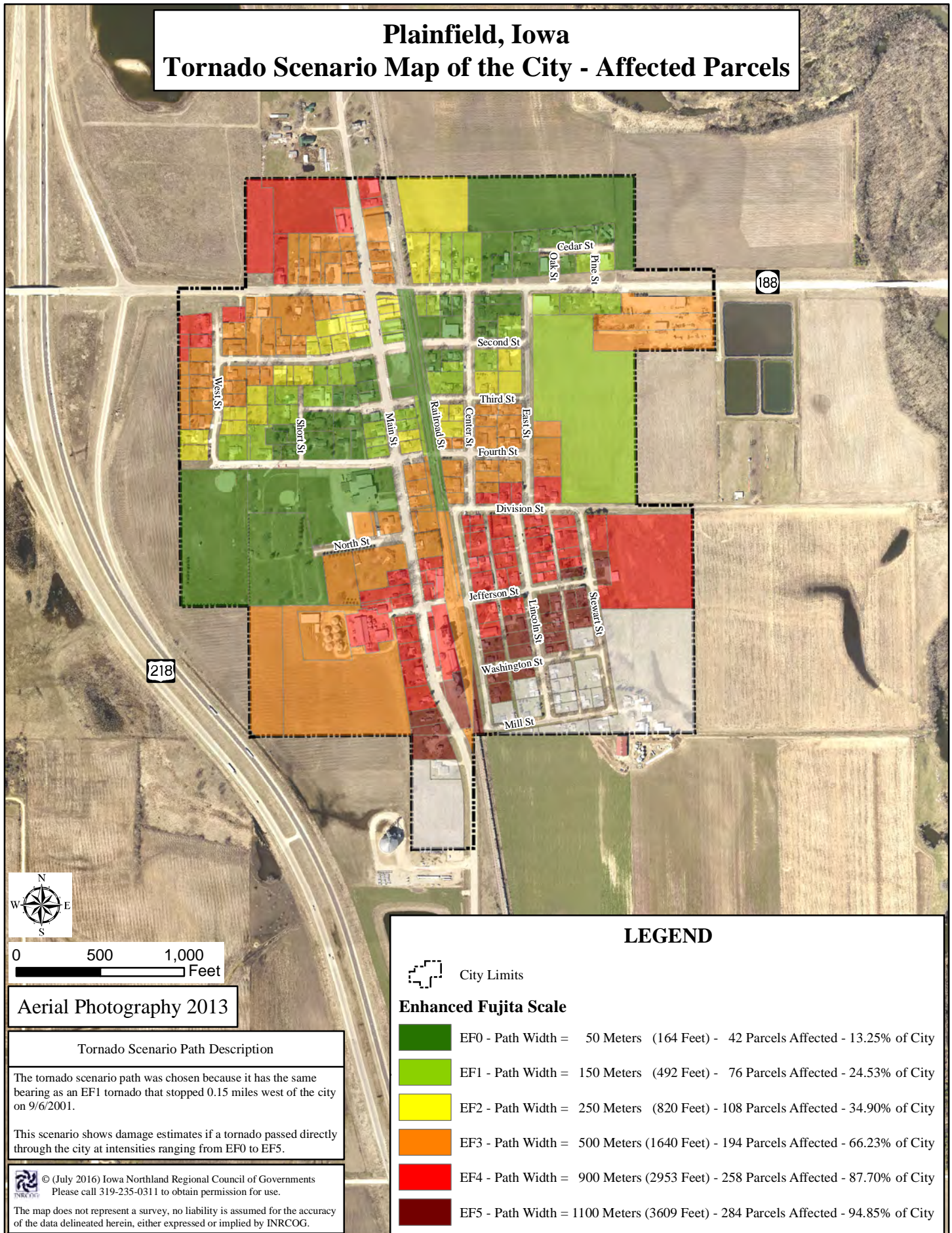


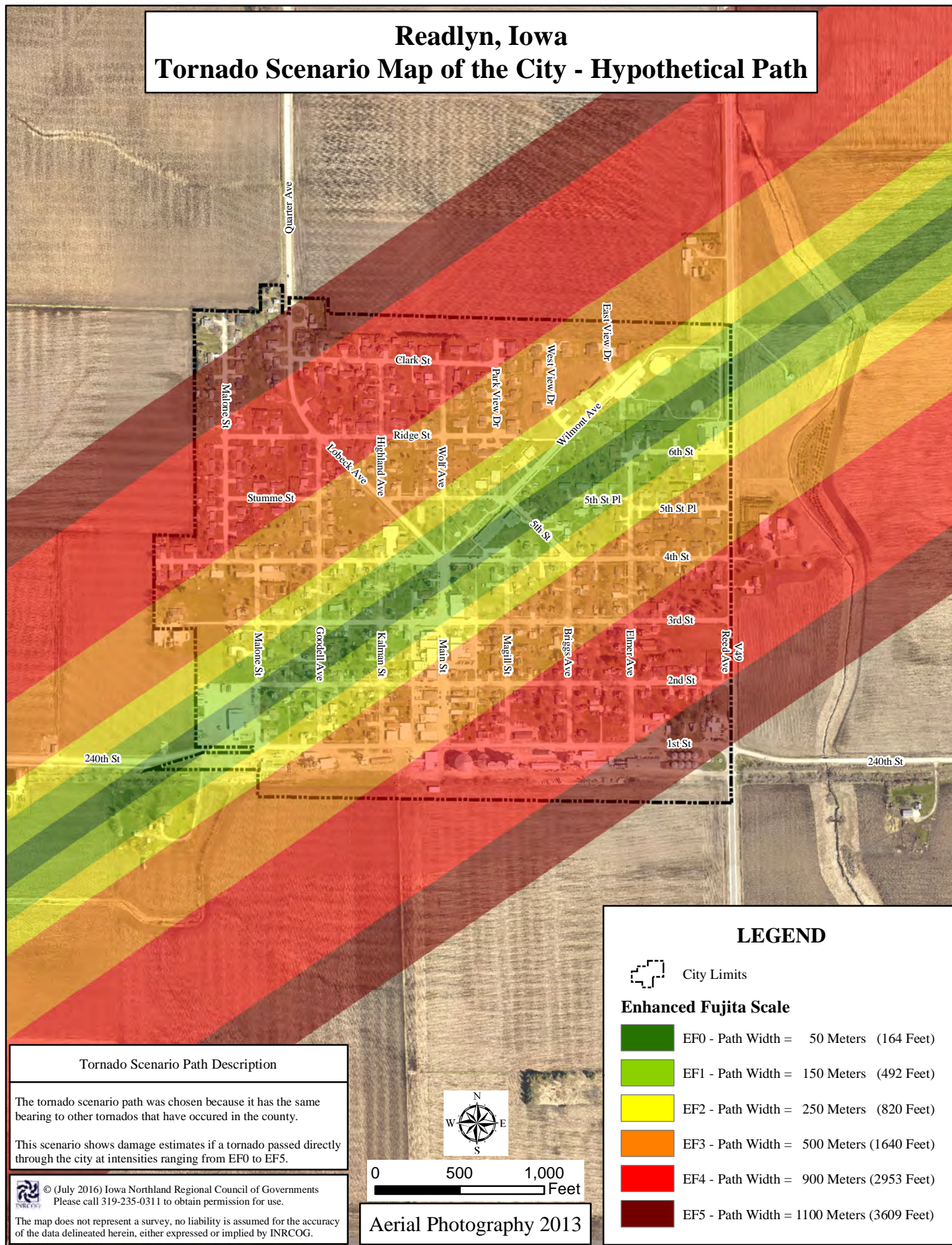


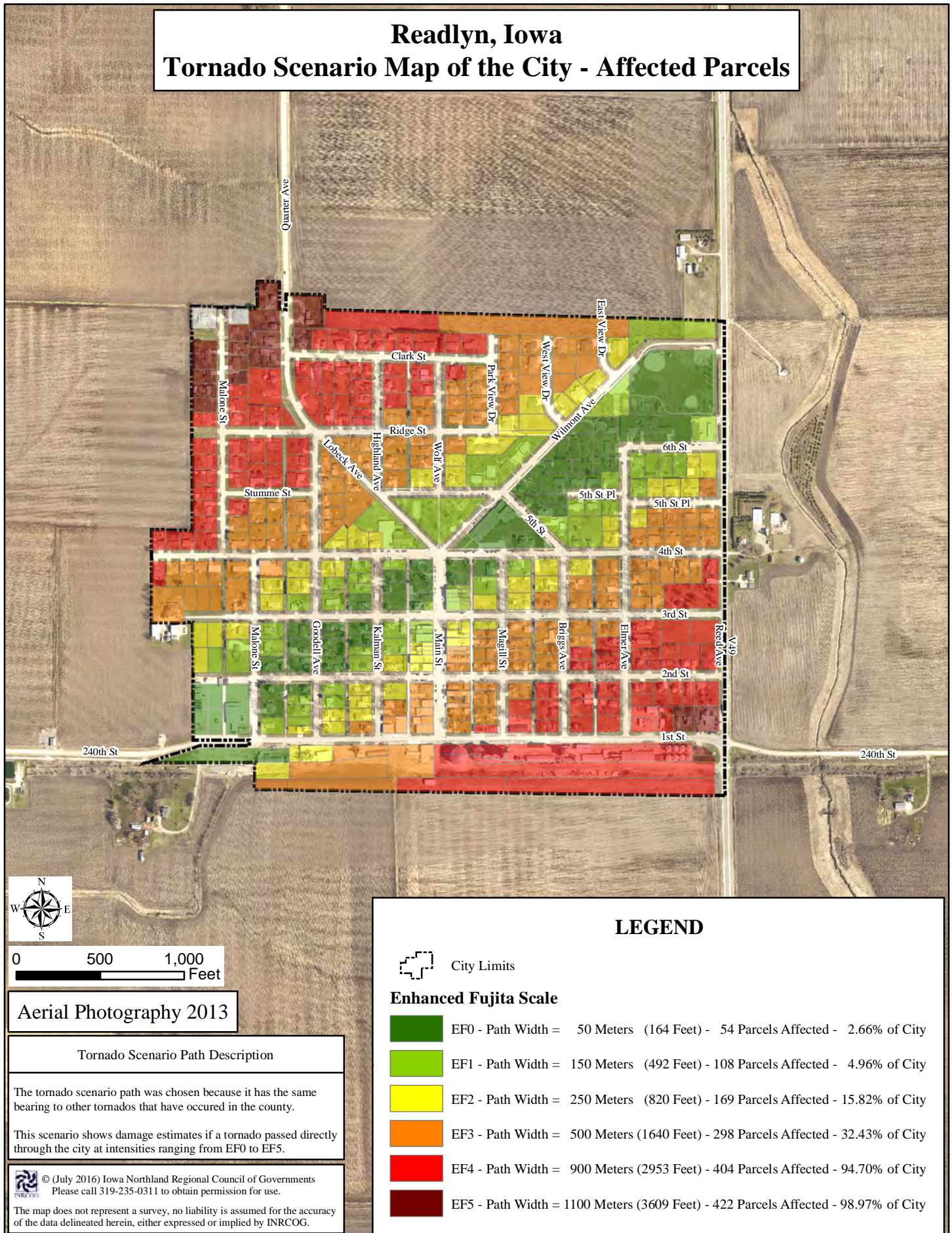


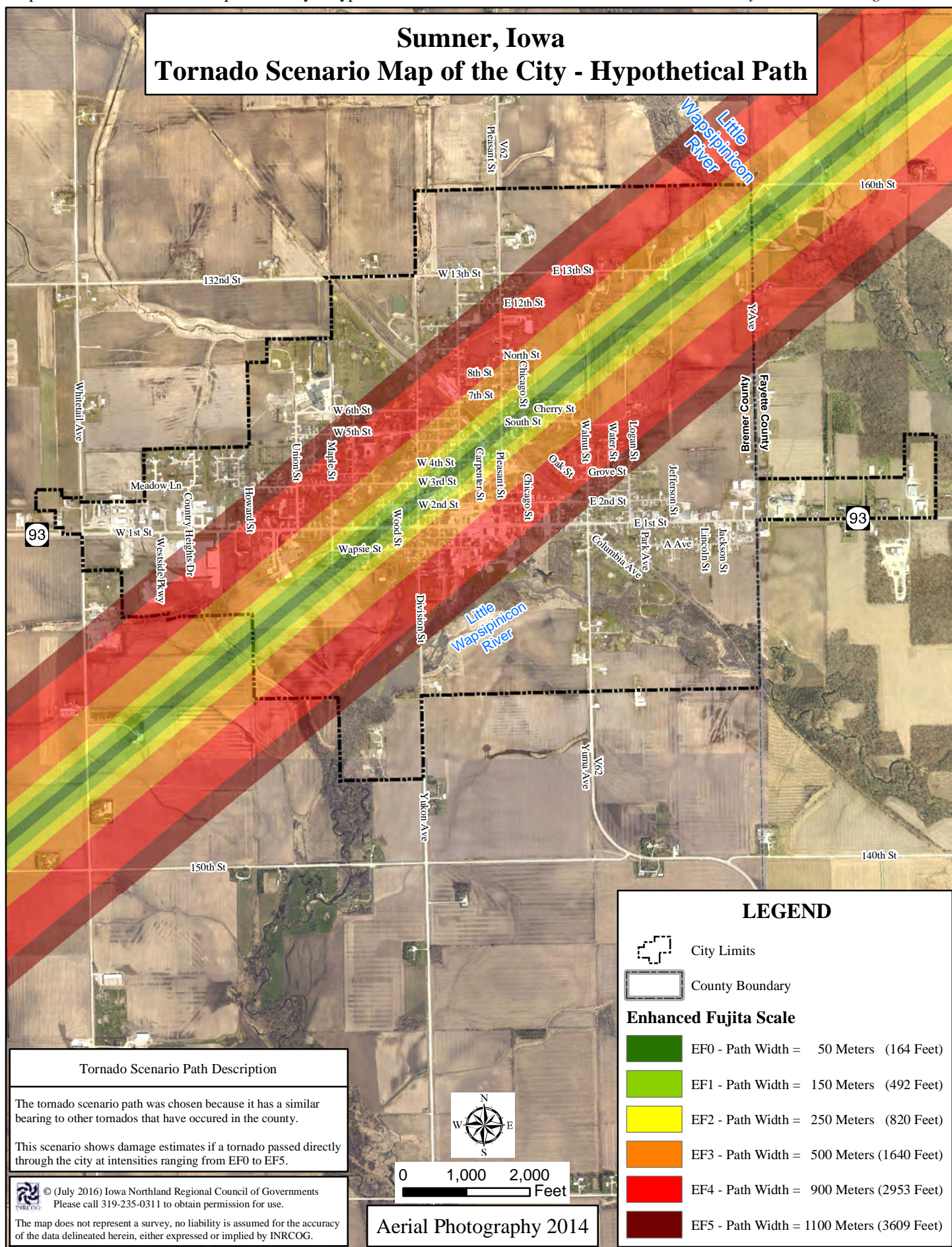


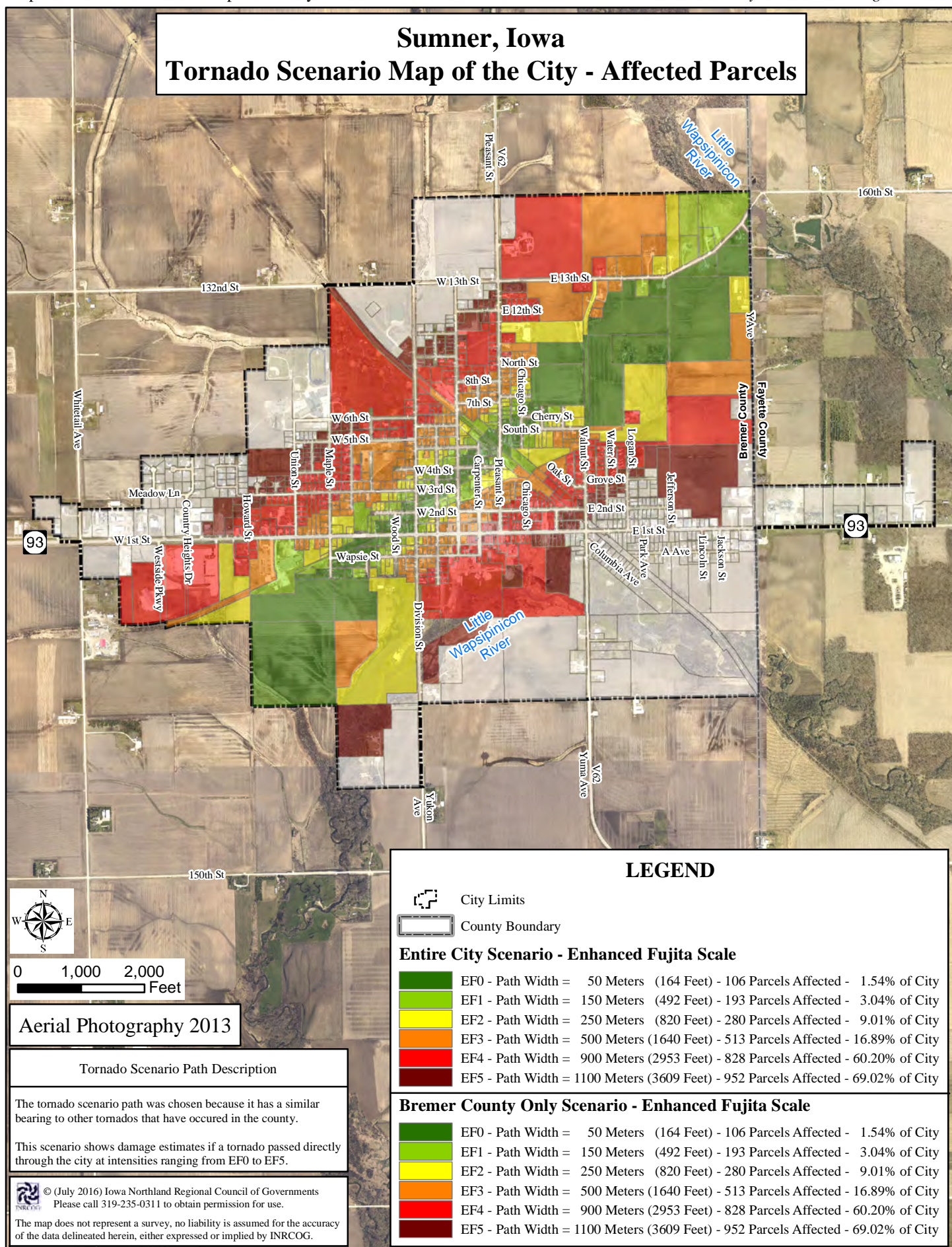


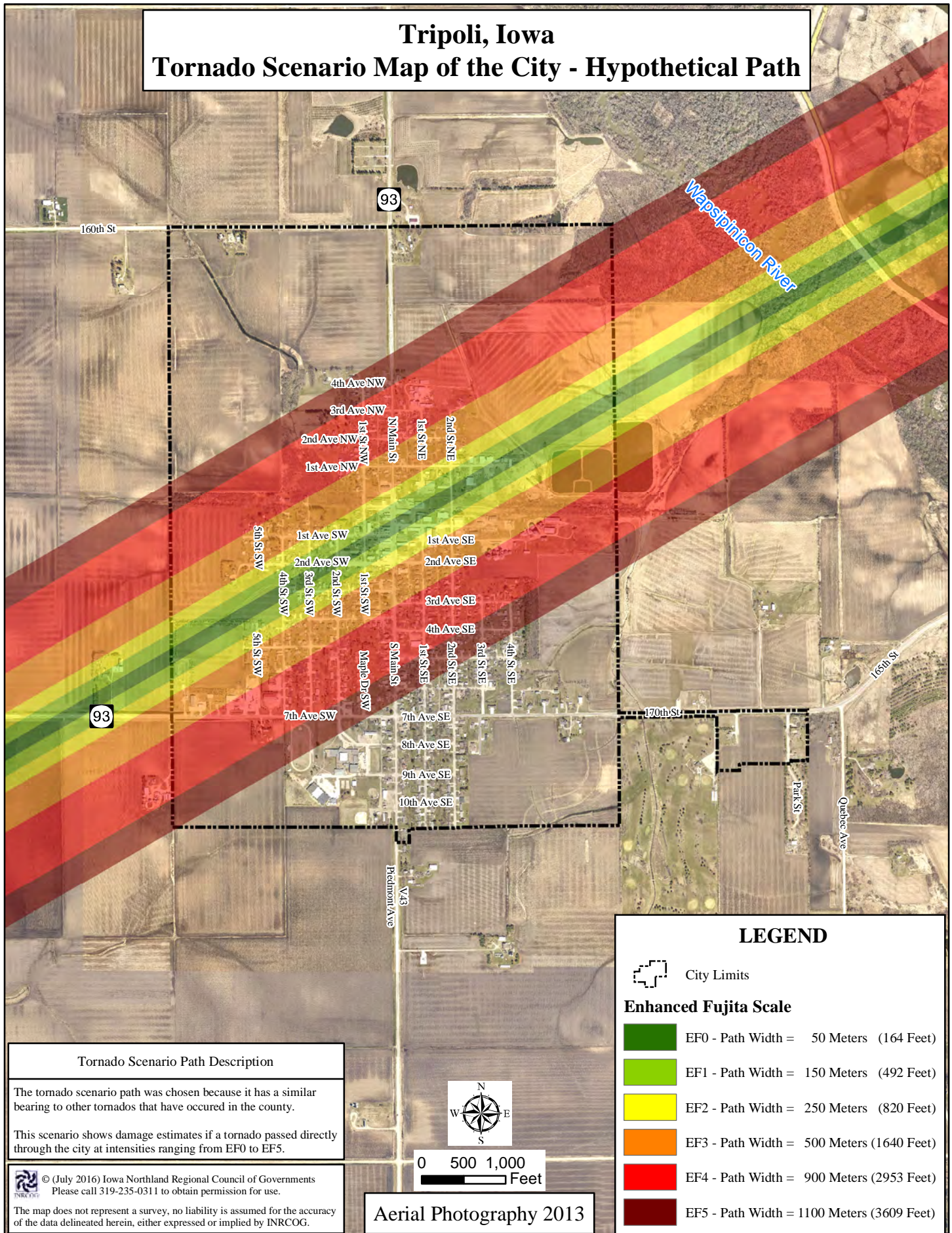


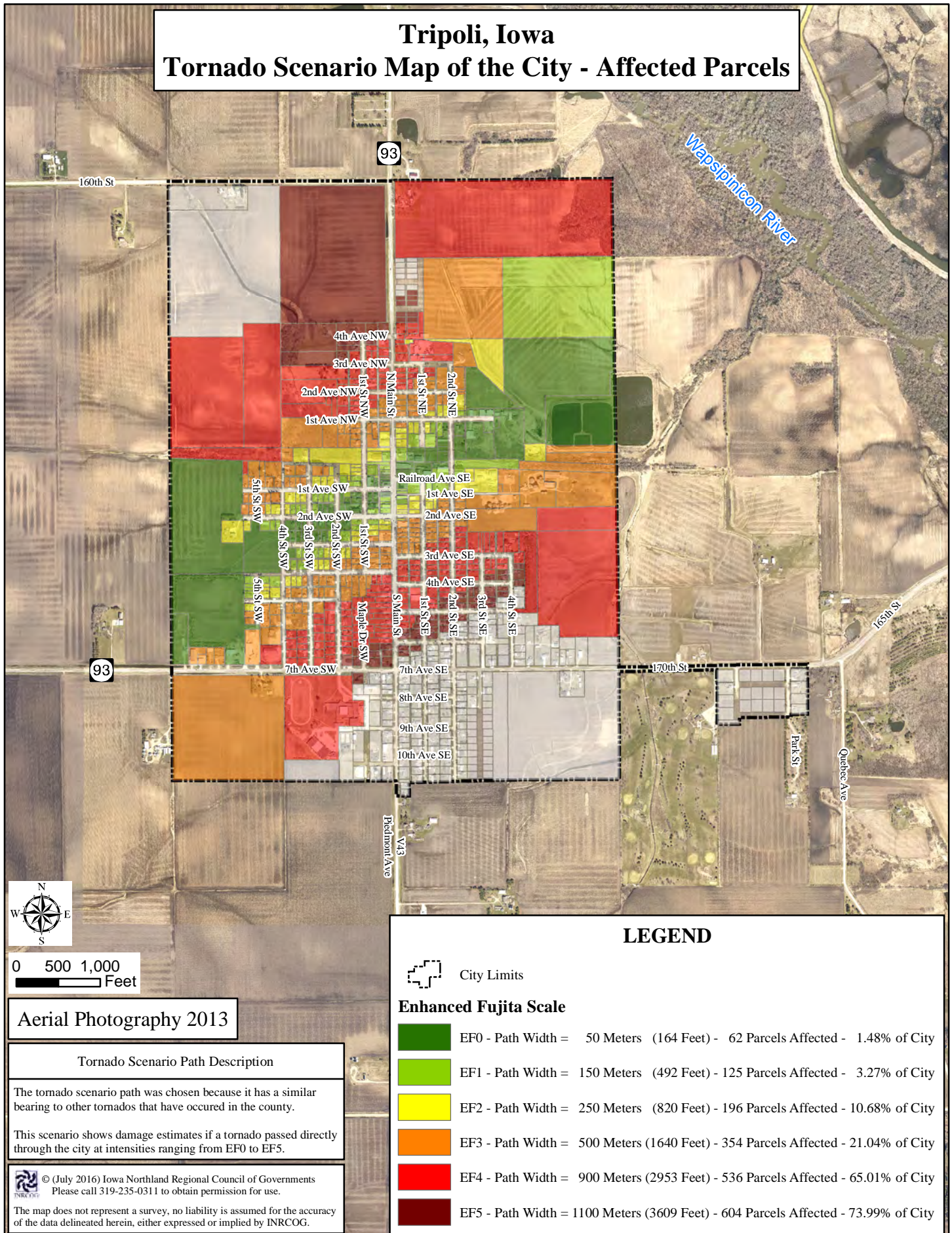


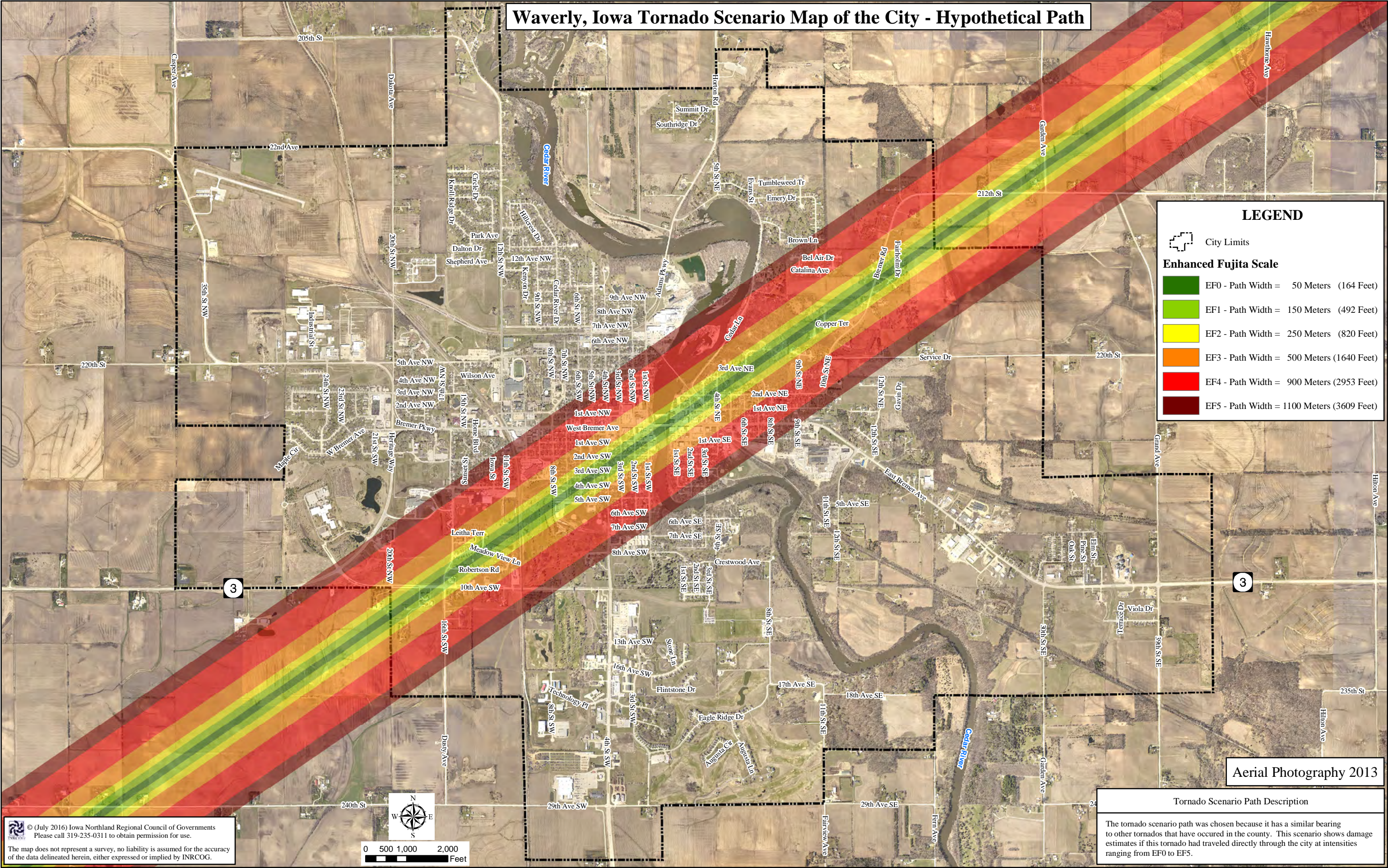


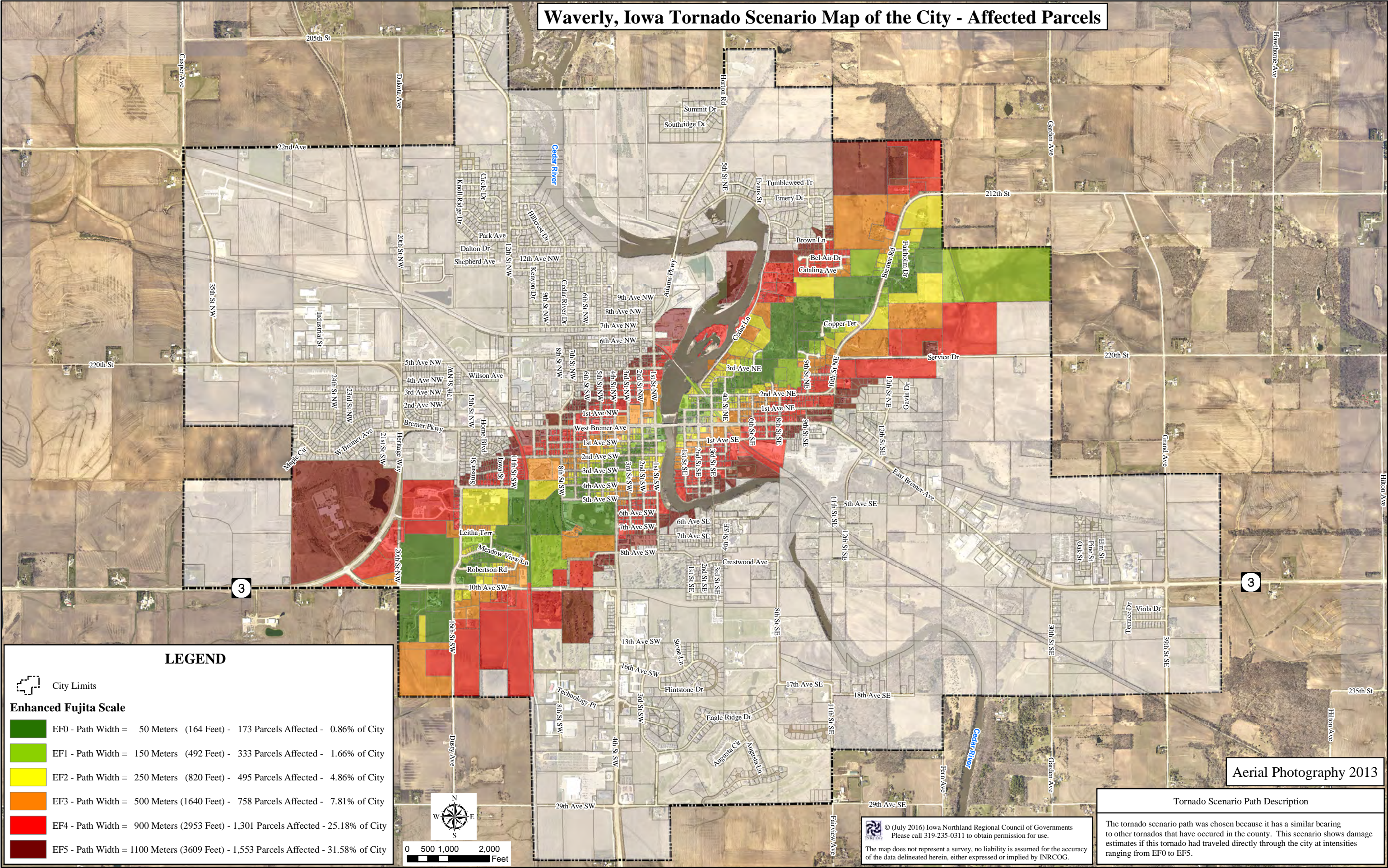




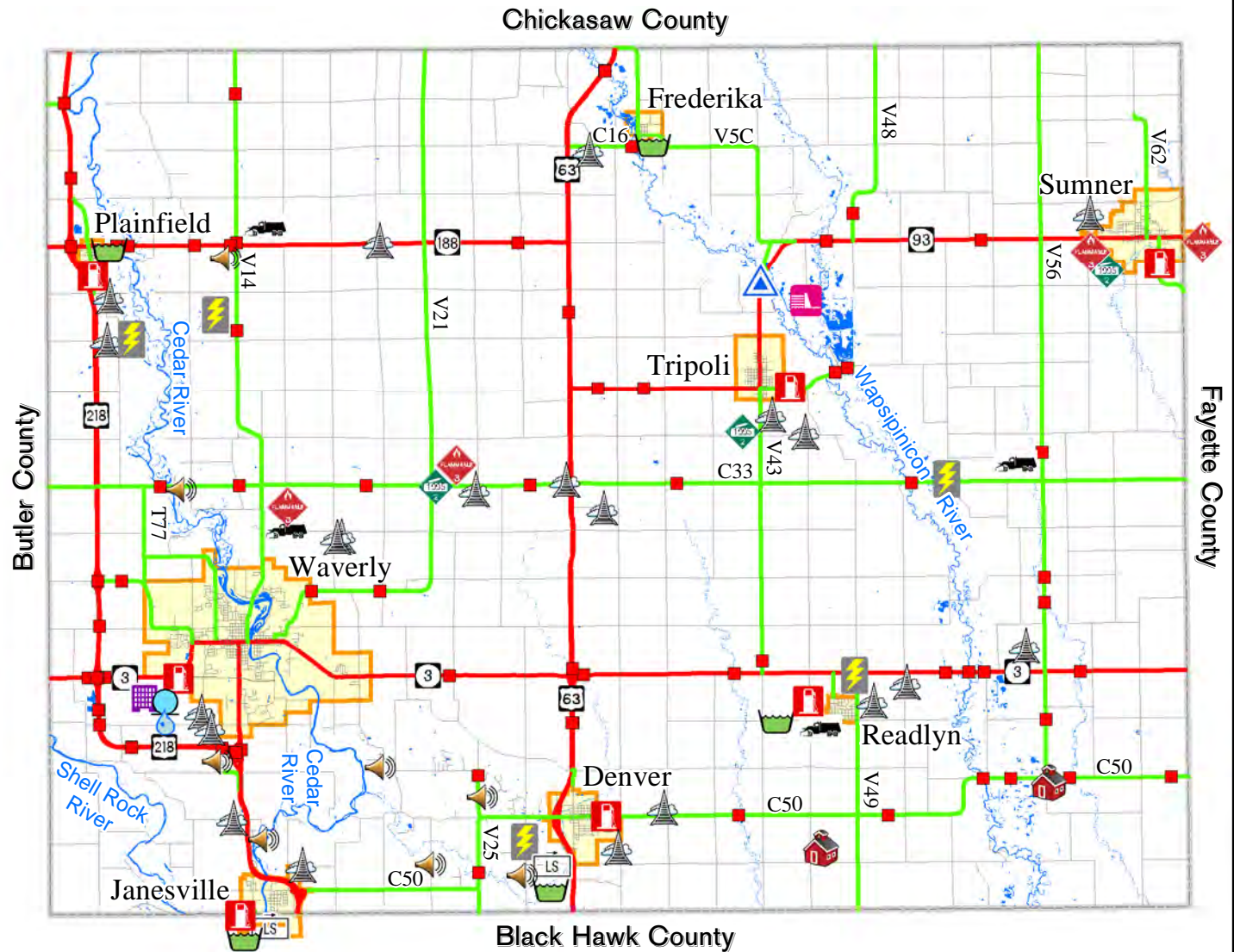








Bremer County, Iowa Critical Sites Map of Unincorporated Areas



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Miles

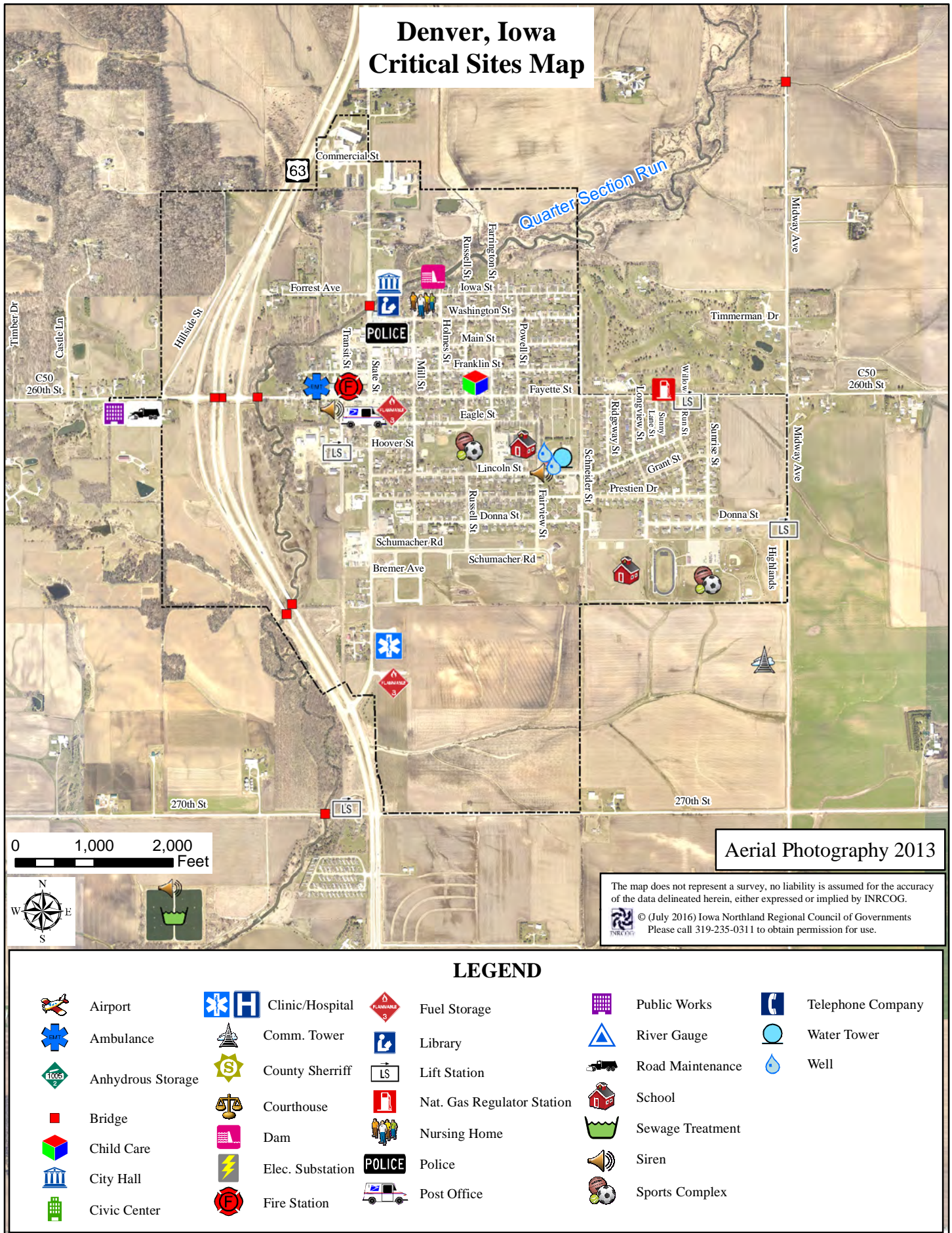
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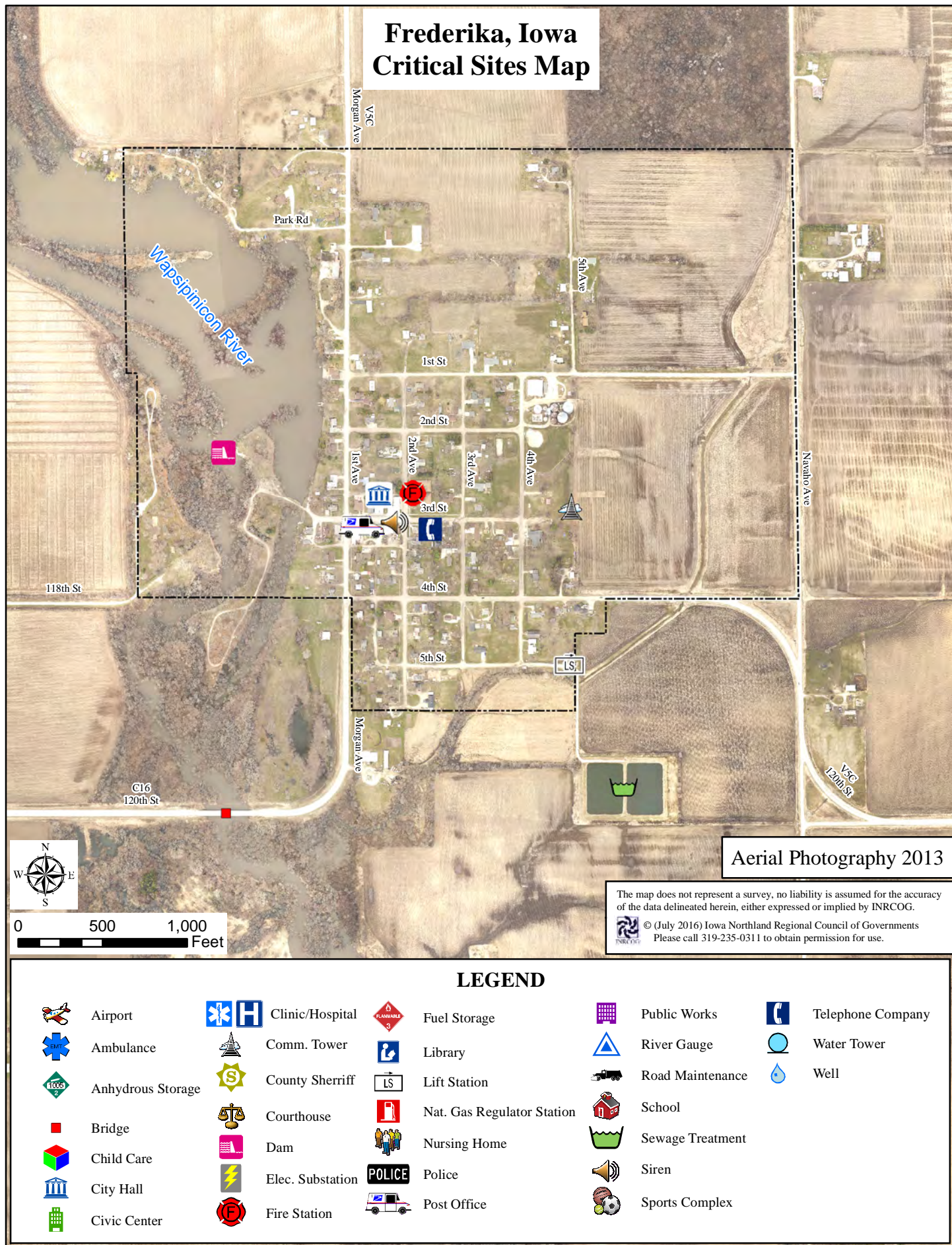


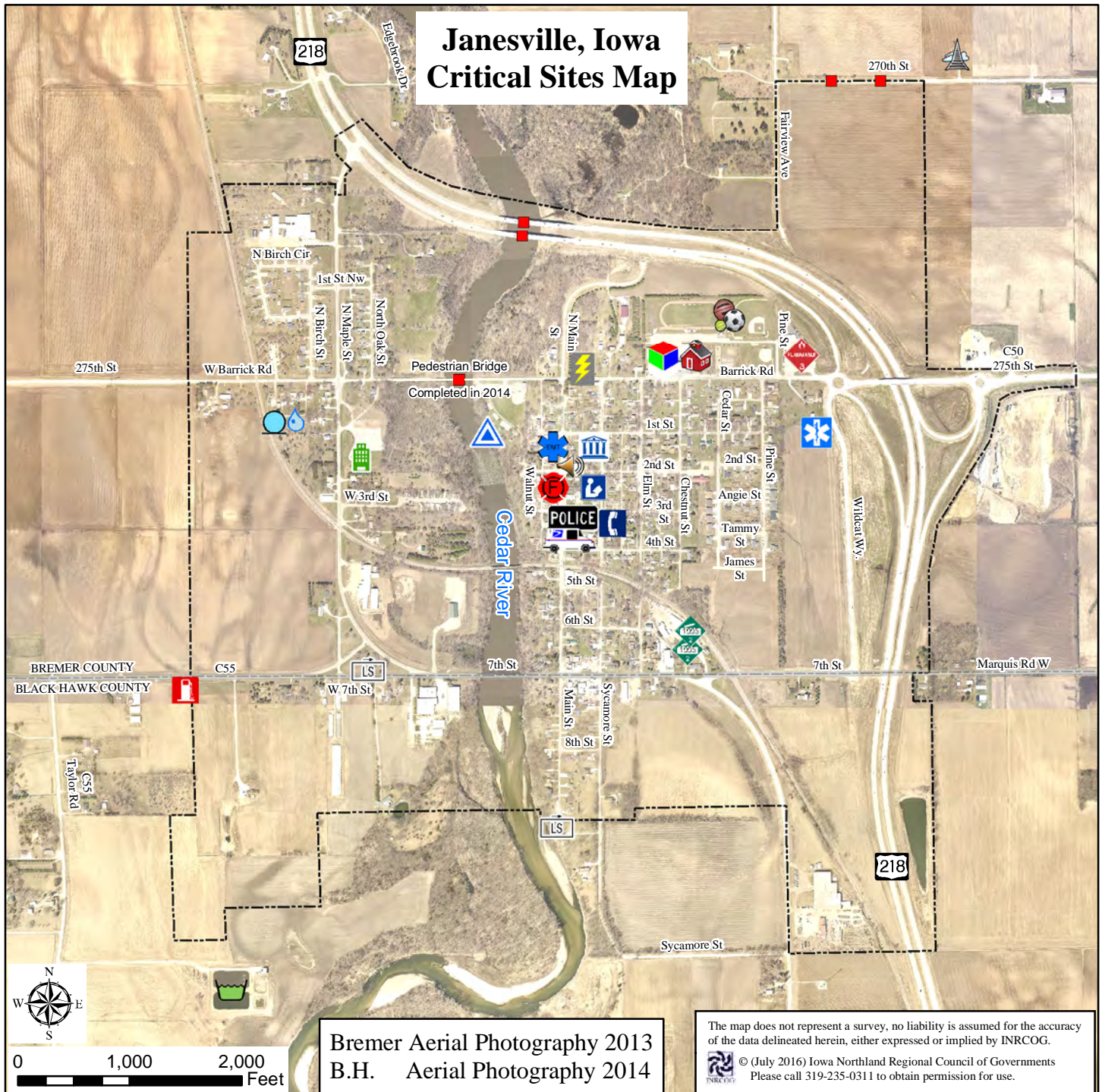
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LEGEND

Airport	Clinic/Hospital	Fuel Storage	Public Works	Telephone Company
Ambulance	Comm. Tower	Library	River Gauge	Water Tower
Anhydrous Storage	County Sheriff	Lift Station	Road Maintenance	Well
Bridges-Hard Surface	Courthouse	Nat. Gas Regulator Station	School	
Child Care	Dam	Nursing Home	Sewage Treatment	
City Hall	Elec. Substation	Police	Siren	
Civic Center	Fire Station	Post Office	Sports Complex	

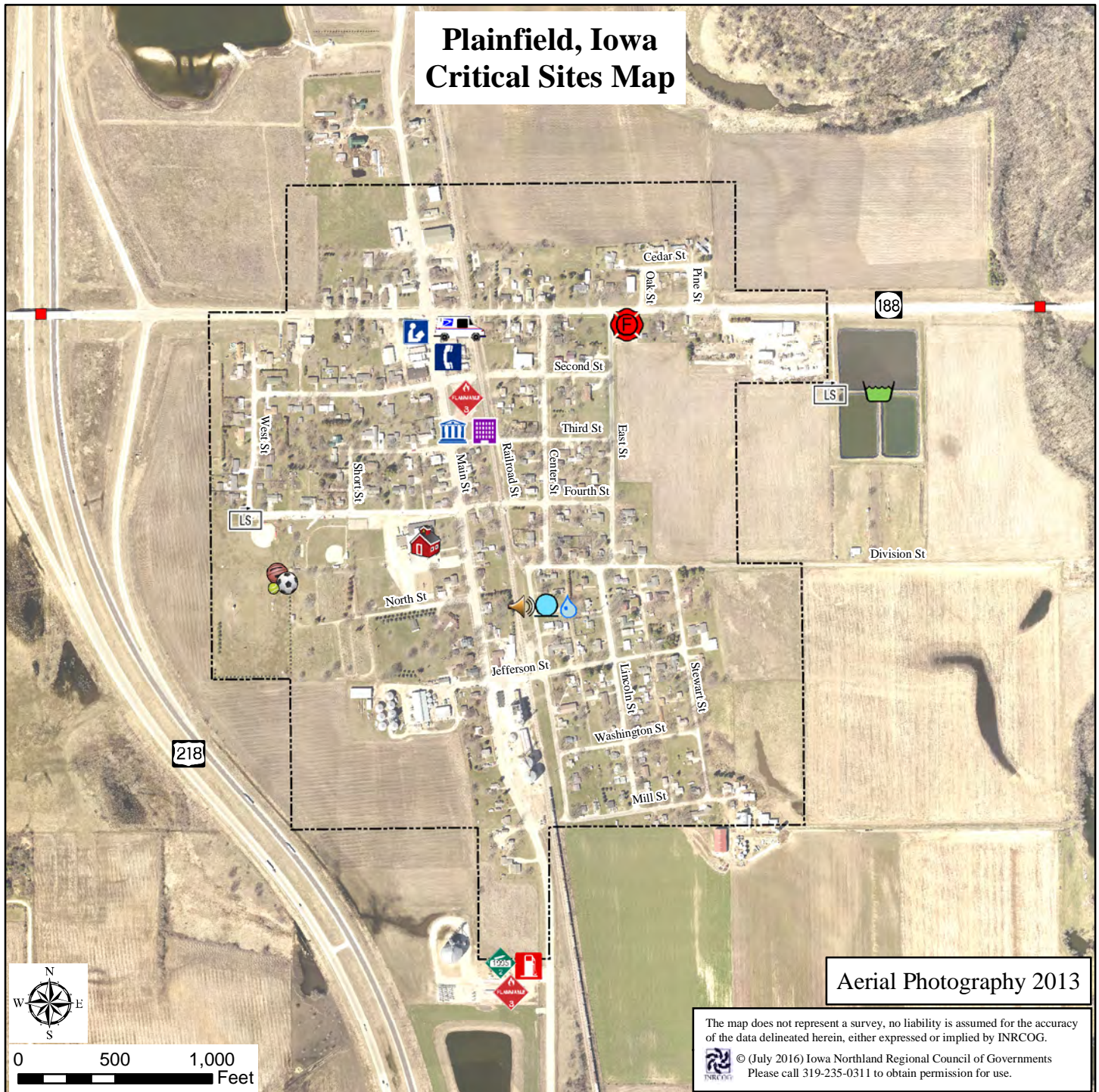






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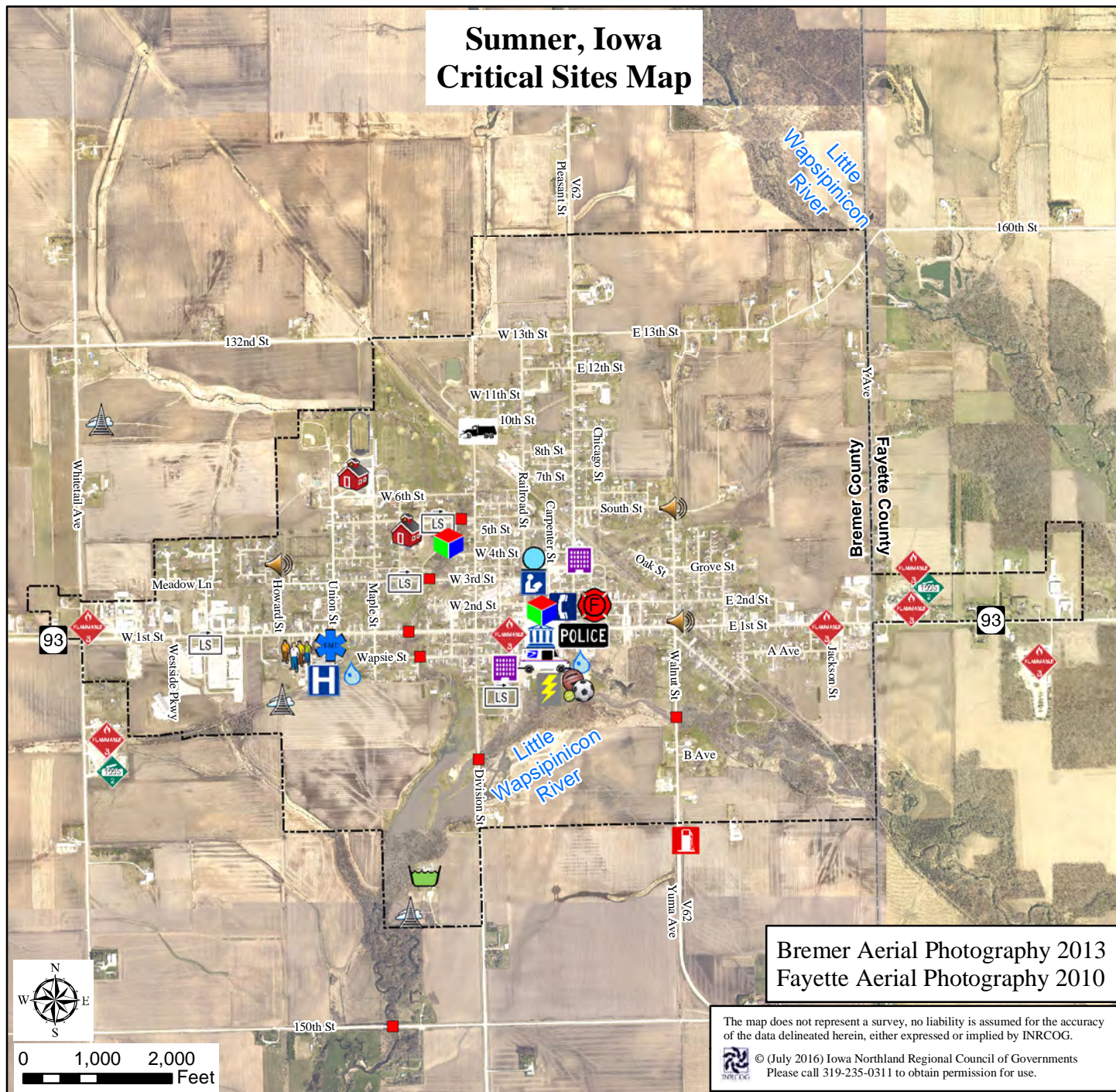
	Airport		Clinic/Hospital		Fuel Storage		Public Works		Telephone Company
	Ambulance		Comm. Tower		Library		River Gauge		Water Tower
	Anhydrous Storage		County Sherriff		Lift Station		Road Maintenance		Well
	Bridge		Courthouse		Nat. Gas Regulator Station		School		
	Child Care		Dam		Nursing Home		Sewage Treatment		
	City Hall		Elec. Substation		Police		Siren		
	Civic Center		Fire Station		Post Office		Sports Complex		



LEGEND

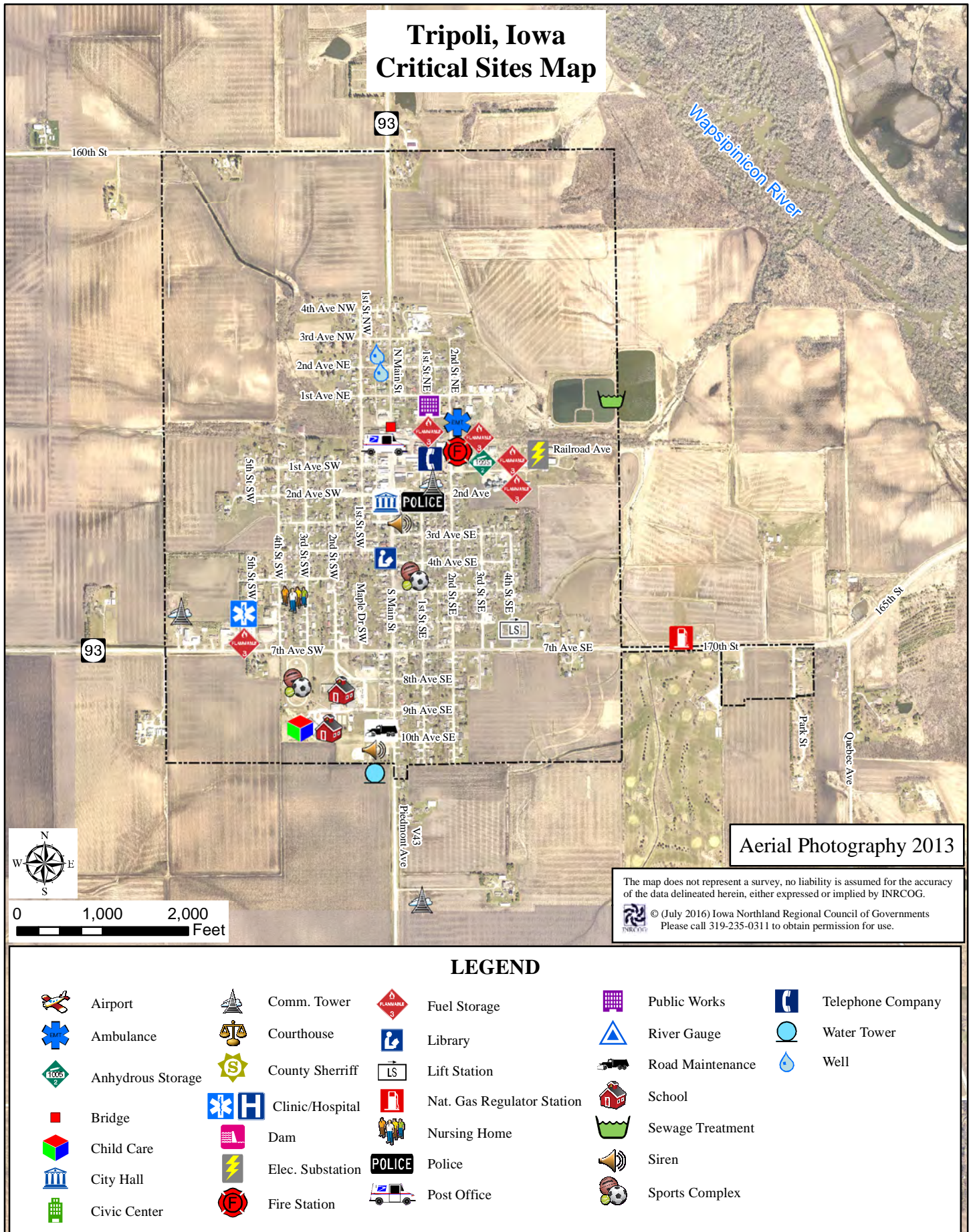
	Airport		Clinic/Hospital		Fuel Storage		Public Works		Telephone Company
	Ambulance		Comm. Tower		Library		River Gauge		Water Tower
	Anhydrous Storage		County Sherriff		Lift Station		Road Maintenance		Well
	Bridge		Courthouse		Nat. Gas Regulator Station		School		
	Child Care		Dam		Nursing Home		Sewage Treatment		
	City Hall		Elec. Substation		Police		Siren		
	Civic Center		Fire Station		Post Office		Sports Complex		

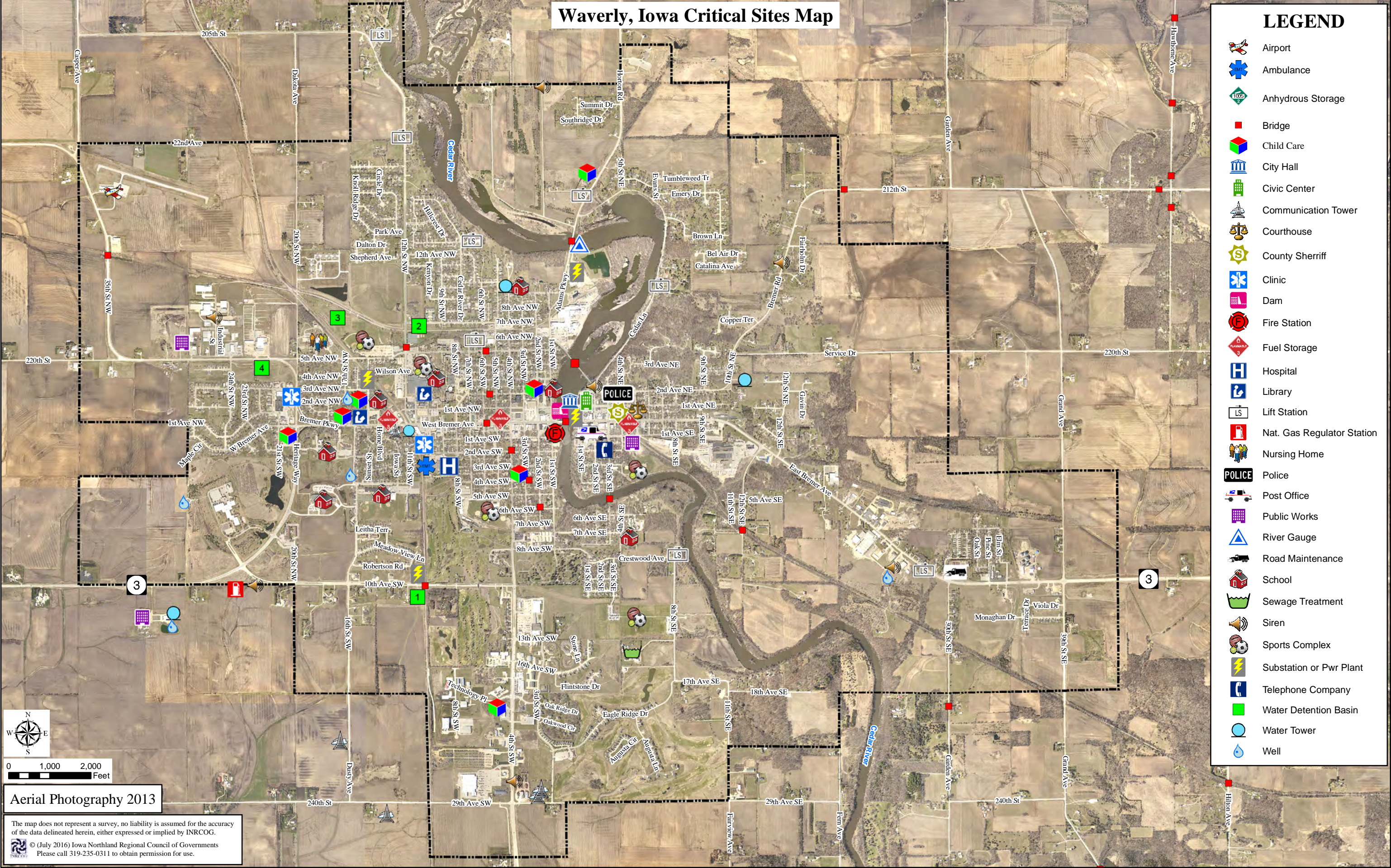




LEGEND

	Airport		Comm. Tower		Fuel Storage		Public Works		Telephone Company
	Ambulance		Courthouse		Library		River Gauge		Water Tower
	Anhydrous Storage		County Sherriff		Lift Station		Road Maintenance		Well
	Bridge		Clinic/Hospital		Nat. Gas Regulator Station		School		Sewage Treatment
	Child Care		Dam		Nursing Home		Siren		Sports Complex
	City Hall		Elec. Substation		Police				
	Civic Center		Fire Station		Post Office				





ATTACHMENT 2: PLAN ADOPTION RESOLUTIONS

<u>JURISDICTION</u>	<u>DATE OF PLAN ADOPTION</u>
Bremer County	January 30, 2017
City of Denver	June 19, 2017
City of Frederika	February 15, 2017
City of Janesville	March 13, 2017
City of Plainfield	March 13, 2017
City of Readlyn	March 13, 2017
City of Sumner	March 20, 2017
City of Tripoli	February 20, 2017
City of Waverly	March 6, 2017

Bremer County

RESOLUTION 17-17.

A RESOLUTION OF THE BOARD OF SUPERVISORS, OF BREMER COUNTY, IOWA, ADOPTING A MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY.

WHEREAS, the Board of Supervisors of Bremer County, Iowa has authorized the development of a Multi-Jurisdictional Hazard Mitigation Plan for Bremer County; and

WHEREAS, Bremer County, Iowa has received funding through the Hazard Mitigation Grant Program; and

WHEREAS, the Multi-Jurisdictional Hazard Mitigation Planning Committee of the Bremer County has participated in the formulation of said Plan; and has recommended the adoption of said Multi-Jurisdictional Hazard Mitigation Plan; and

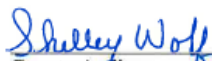

WHEREAS, a Public Hearing has been held in the County Courthouse for the purpose of obtaining citizen input on the Multi-Jurisdictional Hazard Mitigation Plan; and

NOW THEREFORE BE IT RESOLVED THAT the Board of Supervisors of Bremer County, Iowa herewith adopts the Bremer County Multi-Jurisdictional Hazard Mitigation Plan, incorporating into the Plan citizen comment and future FEMA and IHSEMD recommendations.

Passed and adopted this 30th day of January 2017.


Chair

ATTEST:


County Auditor
By: , Clerk

City of Denver

RESOLUTION NO. 37-2017

A RESOLUTION OF THE CITY COUNCIL OF DENVER, IOWA, ADOPTING A MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY.

WHEREAS, the City Council of the City of Denver, Iowa has agreed to participate in the development of a Multi-Jurisdictional Hazard Mitigation Plan ("Plan") for Bremer County; and,

WHEREAS, Bremer County, Iowa has received funding through the Hazard Mitigation Grant Program for the development of said Plan; and,

WHEREAS, the Bremer County Multi-Jurisdictional Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and,

WHEREAS, the City of Denver, participated in the formulation of said Plan through community representation on the Hazard Mitigation Planning Committee ("Committee"); and said Committee has recommended the adoption of said Bremer County Multi-Jurisdictional Hazard Mitigation Plan; and,

WHEREAS, a Public Hearing has been held in the City Hall on June 19, 2017 at 7:00 p.m. for the purpose of obtaining citizen input on said Plan; and,

NOW THEREFORE BE IT RESOLVED THAT the City Council of the City of Denver, Iowa herewith adopts the Bremer County Multi-Jurisdictional Hazard Mitigation Plan, incorporating into the Plan citizen comments and future FEMA and IHSEMD recommendations.

Passed and adopted this 19th day of June, 2017.

	<u>AYES</u>	<u>NAYS</u>	<u>ABSTAIN</u>	<u>ABSENT</u>
Gustafson	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Peterson	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Richmann	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Scharnhorst	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wikner	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>


Rod Diercks, Mayor

ATTEST:


Larry Farley, City Clerk/Admin

City of Frederika

RESOLUTION # 2017-2

A RESOLUTION OF THE CITY COUNCIL OF Frederika, IOWA,
ADOPTING A MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN
FOR BREMER COUNTY.

WHEREAS, the City Council of the City of Frederika, Iowa has agreed to participate in the development of a Multi-Jurisdictional Hazard Mitigation Plan ("Plan") for Bremer County; and,

WHEREAS, Bremer County, Iowa has received funding through the Hazard Mitigation Grant Program for the development of said Plan; and,

WHEREAS, the Bremer County Multi-Jurisdictional Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and,

WHEREAS, the City of Frederika, participated in the formulation of said Plan through community representation on the Hazard Mitigation Planning Committee ("Committee"); and said Committee has recommended the adoption of said Bremer County Multi-Jurisdictional Hazard Mitigation Plan; and,

WHEREAS, a Public Hearing has been held in the City Hall for the purpose of obtaining citizen input on said Plan; and,

NOW THEREFORE BE IT RESOLVED THAT the City Council of the City of Frederika, Iowa herewith adopts the Bremer County Multi-Jurisdictional Hazard Mitigation Plan, incorporating into the Plan citizen comments and future FEMA and IHSEMD recommendations.

Passed and adopted this 15th day of February 2017.


Mayor

ATTEST:


City Clerk

City of Janesville

RESOLUTION #1567

A RESOLUTION OF THE CITY COUNCIL OF JANESVILLE, IOWA,
ADOPTING A MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN
FOR BREMER COUNTY.

WHEREAS, the City Council of the City of Janesville, Iowa has agreed to participate in the development of a Multi-Jurisdictional Hazard Mitigation Plan ("Plan") for Bremer County; and,

WHEREAS, Bremer County, Iowa has received funding through the Hazard Mitigation Grant Program for the development of said Plan; and,

WHEREAS, the Bremer County Multi-Jurisdictional Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and,

WHEREAS, the City of Janesville, participated in the formulation of said Plan through community representation on the Hazard Mitigation Planning Committee ("Committee"); and said Committee has recommended the adoption of said Bremer County Multi-Jurisdictional Hazard Mitigation Plan; and,


WHEREAS, a Public Hearing has been held in the City Hall for the purpose of obtaining citizen input on said Plan; and,

NOW THEREFORE BE IT RESOLVED THAT the City Council of the City of Janesville, Iowa herewith adopts the Bremer County Multi-Jurisdictional Hazard Mitigation Plan, incorporating into the Plan citizen comments and future FEMA and IHSEMD recommendations.

Passed and adopted this 13th day of March 2017.


Sandi Carroll - Mayor

ATTEST:


Christine A. Murley - City Clerk

City of Plainfield

RESOLUTION NO. 2017-02

A RESOLUTION OF THE CITY COUNCIL OF PLAINFIELD, IOWA, ADOPTING A MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY

WHEREAS, the City Council of the City of Plainfield, Iowa has agreed to participate in the development of a Multi-Jurisdictional Hazard Mitigation Plan ("Plan") for Bremer County; and,

WHEREAS, Bremer County, Iowa has received funding through the Hazard Mitigation Grant Program for the development of said Plan; and,

WHEREAS, the Bremer County Multi-Jurisdictional Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and,

WHEREAS, the City of Plainfield, participated in the formulation of said Plan through community representation on the Hazard Mitigation Planning Committee ("Committee"); and said Committee has recommended the adoption of said Bremer County Multi-Jurisdictional Hazard Mitigation Plan; and,

WHEREAS, a Public Hearing has been held in the City Hall for the purpose of obtaining citizen input on said Plan; and,

NOW THEREFORE BE IT RESOLVED THAT the City Council of the City of Plainfield, Iowa herewith adopts the Bremer County Multi-Jurisdictional Hazard Mitigation Plan, incorporating into the Plan citizen comments and future FEMA and IHSEMD recommendations.

Passed and adopted this 13th day of March 2017.

ATTEST:

Brittney Lentz
Brittney Lentz, City Clerk/Treasurer

"I hereby certify that the foregoing constitutes a true and complete copy of a resolution duly adopted by the City Council of the City of Plainfield, at a regular meeting held on March 13, 2017, at which all council members were present.

I further certify that Balvanz moved for adoption of said resolution and that Douning seconded said motion."

Brittney Lentz
Brittney Lentz, City Clerk/Treasurer

City of Readlyn

RESOLUTION 785

A RESOLUTION SETTING A DATE FOR A PUBLIC HEARING ON THE ADOPTION OF THE MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA.

WHEREAS, the Board of Supervisors of Bremer County, Iowa has authorized the Iowa Northland Regional Council of Governments to develop a Multi-Jurisdictional Hazard Mitigation Plan in cooperation with the Multi-Jurisdictional Hazard Mitigation Planning Committee for the County; and,

WHEREAS, the Board of Supervisors, Iowa has received Hazard Mitigation Grant Planning funds to prepare said Plan; and

WHEREAS, the City of Readlyn participated in both the grant writing and award process, as well as the plan preparation; and

WHEREAS, the City Council of Readlyn, Iowa desires citizen input on the establishment and adoption of a Multi-Jurisdictional Hazard Mitigation Plan, and,

NOW THEREFORE BE IT RESOLVED THAT, a public hearing be held on the adoption of a Multi-Jurisdictional Hazard Mitigation Plan for Bremer County, Iowa. Said Public Hearing to be held on the 13th day of March, 2017 at 7:00 P.M. at the Readlyn City Hall, Readlyn, Iowa.

Passed and adopted this 13th day of February 2017.

ATTEST:

Steph J. Bulew
City Clerk

Paul Bulew
Mayor

City of Sumner

RESOLUTION #486

**A RESOLUTION OF THE CITY COUNCIL OF SUMNER, IOWA, ADOPTING
A MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER
COUNTY.**

WHEREAS, the City Council of the City of Sumner, Iowa has agreed to participate in the development of a Multi-Jurisdictional Hazard Mitigation Plan ("Plan") for Bremer County; and,

WHEREAS, Bremer County, Iowa has received funding through the Hazard Mitigation Grant Program for the development of said Plan; and,

WHEREAS, the Bremer County Multi-Jurisdictional Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and,

WHEREAS, the City of Sumner, participated in the formulation of said Plan through community representation on the Hazard Mitigation Planning Committee ("Committee"); and said Committee has recommended the adoption of said Bremer County Multi-Jurisdictional Hazard Mitigation Plan; and,

WHEREAS, a Public Hearing has been held in the City Hall for the purpose of obtaining citizen input on said Plan; and,

NOW THEREFORE BE IT RESOLVED THAT the City Council of the City of Sumner, Iowa herewith adopts the Bremer County Multi-Jurisdictional Hazard Mitigation Plan, incorporating into the Plan citizen comments and future FEMA and IHSEMD recommendations.

Passed and adopted this 20th day of March 2017.


David Waskow
Mayor

ATTEST:


Lisa Oberbroeckling
City Clerk

City of Tripoli

RESOLUTION 2017-4

**A RESOLUTION OF THE CITY COUNCIL OF TRIPOLI, IOWA, ADOPTING
A MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER
COUNTY.**

WHEREAS, the City Council of the City of Tripoli, Iowa has agreed to participate in the development of a Multi-Jurisdictional Hazard Mitigation Plan ("Plan") for Bremer County; and,

WHEREAS, Bremer County, Iowa has received funding through the Hazard Mitigation Grant Program for the development of said Plan; and,

WHEREAS, the Bremer County Multi-Jurisdictional Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and,

WHEREAS, the City of Tripoli, participated in the formulation of said Plan through community representation on the Hazard Mitigation Planning Committee ("Committee"); and said Committee has recommended the adoption of said Bremer County Multi-Jurisdictional Hazard Mitigation Plan; and,

WHEREAS, a Public Hearing has been held in the City Hall for the purpose of obtaining citizen input on said Plan; and,

NOW THEREFORE BE IT RESOLVED THAT the City Council of the City of Tripoli, Iowa herewith adopts the Bremer County Multi-Jurisdictional Hazard Mitigation Plan, incorporating into the Plan citizen comments and future FEMA and IHSEMD recommendations.

Passed and adopted this 20th day of February, 2017.


Mayor

ATTEST:


City Clerk

City of Waverly

Resolution 17-24

A Resolution of the City Council of Waverly, Iowa, Adopting a Multi-Jurisdictional Hazard Mitigation Plan for Bremer County.

WHEREAS, the City Council of the City of Waverly, Iowa has agreed to participate in the development of a Multi-Jurisdictional Hazard Mitigation Plan ("Plan") for Bremer County; and,

WHEREAS, Bremer County, Iowa has received funding through the Hazard Mitigation Grant Program for the development of said Plan; and,

WHEREAS, the Bremer County Multi-Jurisdictional Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and,

WHEREAS, the City of Waverly, participated in the formulation of said Plan through community representation on the Hazard Mitigation Planning Committee ("Committee"); and said Committee has recommended the adoption of said Bremer County Multi-Jurisdictional Hazard Mitigation Plan; and,

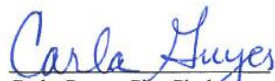
WHEREAS, a Public Hearing has been held in the City Hall for the purpose of obtaining citizen input on said Plan; and,

NOW, THEREFORE BE IT RESOLVED THAT, the City Council of the City of Waverly, Iowa herewith adopts the Bremer County Multi-Jurisdictional Mitigation Plan, incorporating into the Plan citizen comments and future FEMA and IHSEMD recommendations.

PASSED AND ADOPTED this 6th day of March, 2017.


Charles D. Infelt, Mayor

ATTEST:


Carla Guyer, City Clerk

ATTACHMENT 3: STATUS OF 2012 HAZARD MITIGATION PLAN

OVERALL HMP UPDATE CHANGES

All of the jurisdiction's that participated in the 2017 plan update were also part of the county's first multi-jurisdictional hazard mitigation plan developed in 2012. The first step in the planning process was for each participating jurisdiction reviewed the County's 2012 MJ-HMP. Needed updates were identified by each jurisdiction, including: development, status of mitigation actions, and assessment of hazards. Relevant county and city data was also researched and updated regarding population and infrastructure totals and vulnerabilities. The table below displays a summary of updates by section.

Overall MJ-HMP Updates		
Section	MJ-HMP	Comments
Section 1 - Introduction	Yes	<ul style="list-style-type: none"> Updated planning process, participants and schedule Updated identified hazards and assessment to reflect hazards and assessment criteria of State of Iowa's 2013 HMP
Section 2 – Composite Community Profile	Yes	<ul style="list-style-type: none"> Updated Infrastructure information, including transportation and utilities Updated Census and American Community Survey data Updated housing, income, and economy data Updated local jurisdictional information Updated all tables and local information
Section 3 – Risk Assessment (includes Vulnerability Assessment)	Yes	<ul style="list-style-type: none"> Identified new list of hazards (2013 State HMP hazards) Identified new list of hazards Scored new hazard list with new scoring criteria for each jurisdiction Updated composite assessment scores for Bremer County and all jurisdictions Updated disaster historical occurrences Updated average assessment scores for Bremer County and all jurisdictions Redefined subcategories describing individual hazards Updated and completed vulnerability assessments (identifying critical facilities and social assets) affected by flooding (river and flash) and tornados. Updated the estimating potential property losses and repetitive loss properties with available data Updated NFIP status Updated vulnerability assessment, including shelters, values in floodplains, and “at-risk” population data

Section 4 – Mitigation Strategy	Yes	<ul style="list-style-type: none"> Reviewed and confirmed existing mitigation goals for the planning area Removed completed or no longer applicable projects/actions/activities, if any Changed format from listing mitigation activities repeatedly under each hazard to once under the FEMA’s six categories for mitigation activities – prevention, property protection, natural resource protection, emergency management, structural, and public education and awareness Updated planning and regulatory documents Updated public education and awareness mitigation actions Updated emergency services mitigation actions Updated to include new warning system in place Reviewed, added and deleted mitigation activities analysis from the previous menu of potential strategies. Identified agencies responsible for implementation of mitigation activities Reorganized Mitigation Action Steps into subgroups
Section 5 – Plan Maintenance	Yes	<ul style="list-style-type: none"> Updated how the MJ-HMP should be updated, evaluated and reviewed, incorporated into other planning mechanisms, and continued public participation should be met
Appendices / Attachments	Yes	<ul style="list-style-type: none"> Reorganized maps/city profiles into appendixes and attachments Updated all city appendixes from 2012 plan <ul style="list-style-type: none"> Community Profiles, transportation, developments, and utility providers Demographic data New list of hazards and analysis criteria Vulnerability analysis of critical facilities, populations, and estimated property loss NFIP status and repetitive loss status, where applicable Current mitigation activities Reviewed, added and deleted mitigation activities analysis from the previous menu of potential strategies Added tornado scenario maps Updated historic tornado map Updated city flood scenario and county floodplain maps Added city floodplain maps Updated city critical site maps Updated county-wide critical site maps and divided into individual maps for each critical site Added status update of previous hazard mitigation activities

2017 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

In addition to the general plan updates described above, each jurisdiction documented the status of their community's action steps identified in the 2012 plan. The following tables state the status of the actions in the 2012 plan.

BREMER COUNTY – STATUS OF 2012 HAZARD MITIGATION ACTIVITIES	
Mitigation Action	Committee Determination/Comments
Educate the public	Active; personnel appearances at events, social media, and press
Continue training and education for fire departments, law enforcement agencies and ambulance crew personnel	Active; through individual agencies and associates
Maintain and acquire materials and equipment for fire departments, law enforcement agencies and ambulance crew personnel	Active; as needed
Provide emergency shelters for evacuees	As needed; implemented in past
Maintain mutual aid agreements	Active; fire and EMS service agreed to via 28E
Maintain county roads department	Active; as needed
Maintain tree trimming program	Active; added roadside management position
Determine locations for potential heating shelters and volunteer organization	Active; through Bremer County CERT
Encourage utility providers and developers to place all utilities underground	Active; as practical during permitting process
Purchase and maintain backup generators	Active
Maintain public works equipment	Active
Notify the media on shelter locations	As needed; via PIO functions
Maintain use of snow fences in the city/county	Active; done as practical via secondary Roads
Use surge protectors to prevent electrical damage to critical and sensitive equipment	Active; through MIS
Backup all digital data	Active; through MIS
Purchase NOAA weather radios	As available; previously purchased when grant funds available
Enforce and update building codes, as needed	Active; updated as needed
Maintain storm spotter training for local fire departments/deputies and EMS crews	Completed, active; done in partnership with Butler County
Make available a cleanup crew for after a storm	Requested as needed

2017 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

Place alarms on storage facilities containing hazardous materials	Not completed; privately owned (Drop in 2017 plan)
Maintain law enforcement monitoring of large storage supplies	Active; routine patrols
Acquire necessary response and detection equipment for city/county employees	Active, necessary equipment in place; update as needed
Encourage lead based paint and asbestos removal	Active; available at landfill
Provide a local hazardous waste dropoff site	Active; through EMA
Maintain mutual aid agreements with the Northeast Iowa response Group	Active; through EMA
Keep HAZMAT manuals/information current and easily accessible	Active; updated as needed
Maintain, test, and replace warning sirens	Completed, active; tested monthly
Identify areas throughout the county that would substantially benefit from outdoor warning sirens	Active; as identified and funding available
Encourage and maintain enrollment in emergency notification system	Active; county participates in and promotes Alert Iowa program
Construct or designate a safe room or storm shelter	Active; assist as requested
Encourage home owners to keep emergency kits	Active; via various media sources
Encourage backup power generation for local telephone systems and cellular operations	<i>Not completed; privately owned (Drop in 2017 plan)</i>
Maintain list of potential translators to be called upon in case of an emergency	Active; done through Wartburg College in Waverly
Maintain or install GPS units in all emergency service and city/county vehicles	Partially completed; in emergency vehicles only as of now
Maintain automatic TTY TDD machines for emergency personnel and city/county employees	Active; done at dispatch
Enhance Standard Operating Procedures for dissemination of information/press releases in the event of a disaster	Active; through Bremer County PIO network
Continue training and promotion of the Incident Command System	Active; through EMA facilitation
Complete continuity of government plan	Not yet completed
Encourage use of Iowa One call before digging	Active
Upgrade radio communications equipment as needed	As needed/funds available
Regularly review and amend fire and medical HAZMAT response standard operating procedures	Active; as needed
Improve standard operating procedures for schools	Active; partnerships maintained with active county schools
Seek to improve communications with other agencies	<i>Drop in 2017 plan</i>
Keep supply of backup radios and cellphones	Active; EMA maintains inventory of backup radios

2017 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

Maintain list of county emergency contacts	Completed, active; done through county and EMA
Keep the county updated on personnel changes	As needed; done through EMA
Continue cooperation between county roads department and local fire departments during snow emergencies	Completed as needed
Pursue partnership with rural water as the system expands	Completed, active; Rural water
Encourage residents to keep smoke detectors, sprinkler systems and fire extinguishers maintained in their homes	Active; completed via local fire departments, EMA, and CERT
Continue fire prevention program	Active; completed through fire departments and EMA
Maintain membership in the NFIP	Active completed; membership maintained
Maintain, enforce and update floodplain ordinance	Active, implemented by Building and Zoning
Acquire more water pumps	Not completed
Educate the public on maintaining their sump pumps	<i>Drop in 2017 plan</i>
Maintain and keep storm drains clear of debris	Active; as needed via EMA (<i>drop in 2017 plan</i>)
Stockpile sand and sandbags	As needed; responsibility of local jurisdiction, not county
Identify, purchase and remove structures from flood hazard areas	As needed; when state and federal funding available
Purchase additional trash pumps	Completed as needed
Initiate and enforce burn ban in times of drought or as needed	Implemented as needed
Maintain and improve signals/signage along roadways and at railroad crossings	Active; improvements made as necessary
Establish alternative transportation routes should a road need to be closed	As needed
Ensure that all county road maintenance personnel are trained in the proper procedures for road preparation and repair	Active
Purchase emergency signs to be used in case of an incident	Drop in 2017 plan
Enforce no parking designations at special events	Active, as needed
Identify fallout shelter locations	In place
Keep communication lines open with Nuclear Plant in Palo, IA	Active; maintained
Maintain and/or develop a wellhead protection program	Active; through Environmental Health
Monitor wells in areas of identified contamination	Active

2017 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

Monitor the drinking water supply	Responsibility of local jurisdictions; assist in communicating any needed alerts
Identify and map areas of past contamination	Active; database maintained by DNR
Follow monitoring requirements set forth by the Iowa DNR	Active; responsibility of Environmental Health
Carry out conservation measures such as erosion control and work with the following organizations: Extension, NRCS, Farm Bureau, EPA, DNR, and Soil and water Conservation District	Active, as funding available
Maintain and update anti-virus software	Active; MIS
Secure vulnerable targets, as identified by the LEPC and County EMA with alarms, security cameras and fences	Not completed; facilities either privately owned or owned by cities
Review and update fire codes as necessary	Active, as needed
Continue to cooperate with pipeline owners and operators to ensure locations are marked	Active; regular meetings
Provide fans and/or cooling shelter	Active; have identified
Maintain air conditioner(s) in community buildings	Responsibility of local jurisdictions (drop in 2017 plan)
Keep a supply of drinking water to distribute	Not completed, (drop in 2017 plan)
Continue contract with county public health nursing agency	Active; partnership with Public Health department
Encourage the public to receive vaccinations	As needed
Cooperate with any countywide mass vaccination plan	As needed
Monitor disease outbreak news from the CDC and Iowa Department of Public Health	Active, as needed
Develop rationing procedures	Not completed (drop in 2017 plan)
Initiate and enforce burn ban in times of drought or as needed	Implemented as needed
Restrict water usage should it be necessary	As needed; not implemented
Encourage the use of proper materials and construction techniques	Active, via building code requirements
Install tiling to help water move away from structures	Not completed; encouraged via Code
Enforce a curfew	Per state law – drop for 2017 plan
Continue regular bridge inspections	Active, routine
Place barricades to close dangerous bridges	Active, as needed
Maintain embargos/weight limits as necessary	Active, as needed

2017 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

Receive education/training from DOT on the subject	(drop in 2017 plan)
Establish detour routes	Active; Secondary Roads
Identify and inventory potential sinkhole sites	Active; EMA
Secure the area (around a sinkhole)	As needed; work with landowners
Inspect any utility lines that are near a sinkhole	Utility responsibility (drop in 2017 plan)
Enforce the local zoning ordinances	Active; zoning ordinances in place and enforced
Plant trees along water bodies and slopes	Yes, implemented as needed
Clear ditches, streams, and waterways on a regular basis	Active, as needed; via local governments and county vegetation management
Encourage floodproofing/elevating structures in the floodplain	Active; via Building and Zoning permits
Encourage construction of dikes, levees, dams, and retention ponds	Active, WMA
Update flood maps/flood studies for areas throughout the county	As needed; responsibility of FEMA and NFIP. County maps updated in 2008
Identify bridges and culverts than can cost effectively be reengineered to reduce future flooding	Active; as identified
Establish transportation evacuation routes and protocols	As needed, EMA/ESFIO
Develop sandbagging procedures for the community	As needed; assist cities
Develop and maintain staging area for dumping during cleanup	As needed, work with WMA
Continue cooperation with county in developing flood mitigation efforts	Active, continued to work with elected officials of cities and Board of Supervisors
Continue working with the Bremer County Recovery Coalition	Active, as needed
Purchase additional parkland in order to increase greens space and reducing surface flow	Active; implemented by Buchanan County Conservation Board
Regularly inspect dams	Active; implemented by Buchanan County Conservation Board
Regularly inspect levees	No levees in county (drop in 2017 plan)
Establish backup plan in case levees fail	No levees in county (drop in 2017 plan)
Set a designated number of people to be trained in post-disaster record keeping/damage assessments	Active
Inform the public of reputable and ill reputable contractors following disasters	Active, as needed
Maintain the county website as a source of public information	Active, implemented as needed

2017 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

Encourage all communities to participate in their Local Emergency Planning Commission (LEPC)	Communities can participate in regional
Maintain and update emergency response plans	Active, maintained
Maintain lists of personnel and equipment available to use with response plans	Active, maintained
Maintain communication with county contacts	Active, maintained
Maintain NIMS compliance	Active, compliance maintained

CITY OF DENVER— STATUS OF 2012 HAZARD MITIGATION ACTIVITIES	
Mitigation Action	Committee Determination/Comments
Educate the public	Active, Denver utilizes its webpage www.cityofdenveriowa.com , Facebook, Newspaper and Quarterly Newsletter to its citizens.
Continue training and education for fire departments, law enforcement agencies and ambulance crew personnel	Very Active all three departments receive annual training and the City Council budgets for training every year
Maintain and acquire materials and equipment for fire departments, law enforcement agencies and ambulance crew personnel	Very Active purchasing new equipment for all departments, in May a new Ambulance was delivered, a new Police Car was ordered, Police Officers have Body Cameras and Fire Department is getting new SCBA Air System and air packs and new Fire Gear.
Provide emergency shelters for evacuees	Active the Denver Community Room is designated as a shelter by the Red Cross
Maintain mutual aid agreements	Active and updated for Police, Fire, ambulance and Public Works
Maintain tree trimming program	Active the Electric Department trims trees every year
Determine locations for potential heating shelters and volunteer organization	Active and completed the Denver Community Room is an active shelter
Encourage utility providers and developers to place all utilities underground	Active all new subdivisions are required to install all utilities underground
Purchase and maintain backup generators	Active all City Building have backup generators and are tested monthly
Maintain public works equipment	Active and ongoing Public Works Employees are responsible for maintaining equipment
Notify the media on shelter locations	Active when needed media is notified
Install a snow fence around the wastewater treatment facility	Completed the new Waste Water Treatment Plant has a chain link fence around it
Enforce sidewalk clearance ordinance	Active and completed the City of Denver inspects and notifies property owners affected with corrective action notices

Maintain use of snow fences in the city/county	Active the Denver Public Works installs a snow fence at Direcks Park to limit drifting snow on Lincoln Street
Use surge protectors to prevent electrical damage to critical and sensitive equipment	Active we use surge protectors as needed
Backup all digital data	Active and completed all of City of Denver utility billing and financial data is backed up every night off-site
Purchase NOAA weather radios	Not Completed
Enforce and update building codes, as needed	Active and the city of Denver contracts with Bremer County Building & Zoning to enforce the Denver Zoning Ordinance
Maintain storm spotter training for local fire departments/deputies and EMS crews	Active this is completed by the Denver Fire Department
Continue enforcement of city sump pump discharge ordinance	Active, sump pumps connected is prohibited by City Ordinance and inspections are made by Bremer County Building Inspectors on all new homes constructed
Maintain a list of potential storm sewer projects	Completed in our Capital Improvement Plan
Make available a cleanup crew for after a storm	Active and yes our Public Works Department does this after storms if needed
Placement of lighting arrestors on power lines	Active and completed by the Electric Department
Place alarms on storage facilities containing hazardous materials	Not Completed
Maintain law enforcement monitoring of large storage supplies	Not Completed
Acquire necessary response and detection equipment for city/county employees	Active and completed Police/Fire/Ambulance are On-Call and Public Works Employees
Encourage lead based paint and asbestos removal	Active through the Bremer County Health Department
Provide a local hazardous waste dropoff site	Not Completed but necessary; residents currently can utilize county landfill
Maintain mutual aid agreements with the Northeast Iowa response Group	Not Completed
Keep HAZMAT manuals/information current and easily accessible	Completed
Maintain, test, and replace warning sirens	Active and Completed and the sirens are activated the 1 st Tuesday of each month
Identify areas throughout the county that would substantially benefit from outdoor warning sirens	Completed by Bremer County Emergency Management
Encourage and maintain enrollment in emergency notification system	Completed and Active we also have Code Red available to our residents
Construct or designate a safe room or storm shelter	Not Completed
Encourage home owners to keep emergency kits	Not Completed
Encourage backup power generation for local telephone systems and cellular operations	Not Completed, U.S. Cellular has a backup generator on its cell phone tower

2017 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

Maintain list of potential translators to be called upon in case of an emergency	Active we call the Denver Community School Foreign Language Teacher
Maintain or install GPS units in all emergency service and city/county vehicles	Not Completed
Maintain automatic TTY TDD machines for emergency personnel and city/county employees	Not Completed
Enhance Standard Operating Procedures for dissemination of information/press releases in the event of a disaster	Not Completed
Continue training and promotion of the Incident Command System	Active and Completed with assistance from Denver Fire Department and Denver Ambulance
Complete continuity of government plan	Not completed
Encourage use of Iowa One call before digging	Active and Ongoing we inform the public to call before they dig
Upgrade radio communications equipment as needed	Active and ongoing the New Ambulance will be installing a new radio and the Police Department has new radios
Regularly review and amend fire and medical HAZMAT response standard operating procedures	Active and regularly review annually
Improve standard operating procedures for schools	Not sure what is done at the Denver Community School District
Seek to improve communications with other agencies	Ongoing
Keep supply of backup radios and cellphones	Not Completed
Maintain list of county emergency contacts	Completed
Keep the county updated on personnel changes	Completed; ongoing
Continue cooperation between county roads department and local fire departments during snow emergencies	Completed
Pursue partnership with rural water as the system expands	Not Completed
Encourage residents to keep smoke detectors, sprinkler systems and fire extinguishers maintained in their homes	Active and Completed the Denver Fire Department sends out its mailing every year and reminds everyone to change the battery in their smoke detector during Fire Safety Week
Continue an annual inspection program for commercial and industrial properties	Active and completed by Bremer County Building & Zoning
Continue fire prevention program	Completed annually each fall by the Denver Fire Department
Improve water system to enhance firefighting capacity/ability	Active as water mains are replaced larger diameter pipe of at least 8" is installed
Maintain membership in the NFIP	Active and Completed we keep all information requested updated; membership maintained
Maintain, enforce and update floodplain ordinance	Active and updated and is enforced by the Bremer County Building & Zoning

2017 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

Acquire more water pumps	Not completed
Continue with improvement to the storm water system	Active and Ongoing
Prevent inflow and infiltration into the sanitary sewer	Active and Ongoing the City of Denver completed a major project of sewer pipe lining in 2012 an 2013
Educate the public on maintaining their sump pumps	Active through our Quarterly Newsletter
Maintain and keep storm drains clear of debris	Active and Ongoing and is completed by the Denver Public Works Department
Stockpile sand and sandbags	Completed we have sand bags available at the Denver Public Works Building
Identify, purchase and remove structures from flood hazard areas	As Needed
Purchase additional trash pumps	Completed the City of Denver has a 6" trash pump and numerous 2" and 3" trash pumps
Install rip rap around wastewater treatment facility	Completed with new Waste Water Treatment Facility
Initiate and enforce burn ban in times of drought or as needed	Active and enforced and completed by Bremer County Emergency Management and the Denver Fire Department
Maintain and improve signals/signage along roadways and at railroad crossings	Completed and Active as needed and approved by the Denver City Council. Denver does not have a railroad going through town
Establish alternative transportation routes should a road need to be closed	As needed
Purchase emergency signs to be used in case of an incident	Completed the signs are located at the Denver Public Works Building
Enforce no parking designations at special events	Active and completed by the Denver Police department
Identify fallout shelter locations	Active and completed in the basement of City Hall
Keep communication lines open with Nuclear Plant in Palo, IA	As Needed
Maintain and/or develop a wellhead protection program	Active Denver has a Wellhead Protection Program and signs are posted at the entrances of Denver
Monitor wells in areas of identified contamination	Active Bremer County Department of Health and Bremer County Building & Zoning handle this for the City of Denver
Monitor the drinking water supply	Active, the Denver Water Supply is tested daily for chlorine levels and two monthly bacteria samples are sent to be tested.
Identify and map areas of past contamination	Completed map is hanging in City Council Chambers
Maintain and/or develop storm water management program	Active we replace storm sewer intakes annually and install new storm sewer pipes on streets are re-constructed
Eliminate and cap private and abandoned wells in the city	Active as needed and is handled by Bremer County Health Department
Eliminate the use of septic tank systems in the city limits	Active and Implemented all new services must be connected to the City Sanitary Sewer System

2017 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

Follow monitoring requirements set forth by the Iowa DNR	Active and Ongoing monthly compliance with IDNR Rules
Carry out conservation measures such as erosion control and work with the following organizations: Extension, NRCS, Farm Bureau, EPA, DNR, and Soil and water Conservation District	Not Completed
Maintain and update anti-virus software	Active and Completed the City of Denver contracts ACES to keep our anti-virus software updated
Secure vulnerable targets, as identified by the LEPC and County EMA with alarms, security cameras and fences	Not Completed
Review and update fire codes as necessary	Active and completed in all City Buildings
Continue to cooperate with pipeline owners and operators to ensure locations are marked	Active completed when we receive notice from Iowa One-Call and the Denver Public Works Department calls in locates when we dig.
Purchase a new tanker and/or pumper	Active, City council approves purchase of Fire Trucks and has an updated felt of Fire Trucks
Provide fans and/or cooling shelter	Active the Cooling Shelter is the Denver Community Room and is also a Red Cross emergency location
Encourage community to plant shade trees	Active, implemented by the Denver Tree Board
Maintain air conditioner(s) in community buildings	Active all HVAC equipment is maintained in working order
Keep a supply of drinking water to distribute	Active drinking water is purchased as needed
Encourage the public to receive vaccinations	Not completed
Cooperate with any countywide mass vaccination plan	Active the Visiting Nurses utilize the Denver Community Room for Flu Shots each fall
Monitor disease outbreak news from the CDC and Iowa Department of Public Health	Not completed
Develop rationing procedures	Not completed
Initiate and enforce burn ban in times of drought or as needed	Active and we follow recommendations from Bremer County Emergency management and the Denver Fire Department
Restrict water usage should it be necessary	Active City Council has this authority by City Ordinance
Encourage the use of proper materials and construction techniques	Active the City uses SUDAS Specifications for constructing public projects
Educate city personnel to identify risk areas	Active, this is an ongoing discussion with City Employees as needed
Install tiling to help water move away from structures	Not Completed
Enforce a curfew	Active, By Ordinance and enforced by the Denver Police Department
Continue regular bridge inspections	Active Completed in 2016 and completed every two years as required by the IDOT

2017 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

Place barricades to close dangerous bridges	Active as needed completed by Denver Public Works Department
Maintain embargos/weight limits as necessary	Active but not used
Receive education/training from DOT on the subject	Not Completed
Establish detour routes	Active and As Needed depending on construction schedule and streets affected by construction and the public is informed
Identify and inventory potential sinkhole sites	Not completed
Educate city personnel to handle a sinkhole situation	Not Completed
Secure the area (around a sinkhole)	Not Completed
Inspect any utility lines that are near a sinkhole	Not Completed
Enforce the local zoning ordinances	Active, Bremer County Building & Zoning is contracted by the City of Denver to administer Denver's Zoning Ordinances
Plant trees along water bodies and slopes	Not Completed
Clear ditches, streams, and waterways on a regular basis	Active as needed the City hires Denver Underground & Grading to perform this work.
Encourage floodproofing/elevating structures in the floodplain	Not completed, Not Active
Encourage construction of dikes, levees, dams, and retention ponds	Not Completed
Update flood maps/flood studies for areas throughout the county	Active City used Bremer County Building & Zoning and our City Engineer at AECOM
Identify bridges and culverts than can cost effectively be reengineered to reduce future flooding	Active and completed
Establish transportation evacuation routes and protocols	Completed
Develop sandbagging procedures for the community	Active as needed
Develop and maintain staging area for dumping during cleanup	Active we use our Brush Dump and that is communicated to our residents
Maintain pump station	Completed all four lift stations are checked daily and cleaned and vacuumed annually by Municipal Pipe & Tool
Continue cooperation with county in developing flood mitigation efforts	Completed the City has a contract with Bremer County Building & Zoning to handle Flood Plain Administration
Continue working with the Bremer County Recovery Coalition	Active, through Bremer County Building & Zoning
Purchase additional parkland in order to increase greens space and reducing surface flow	Not Completed
Regularly inspect dams	Not Completed

2017 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

Regularly inspect levees	N/A; no levees in city
Establish backup plan in case levees fail	N/A; no levees in city
Set a designated number of people to be trained in post-disaster record keeping/damage assessments	Not Completed
Inform the public of reputable and ill reputable contractors following disasters	Active, through our educate the public efforts mentioned above.
Encourage all communities to participate in their Local Emergency Planning Commission (LEPC)	Active Larry Farley and Councilman Wikner attend INRCOG Meetings
Maintain and update emergency response plans	Active as needed
Maintain lists of personnel and equipment available to use with response plans	Completed and Active this is an ongoing activity.
Maintain communication with county contacts	Active Denver communicates with the Bremer County Board of Supervisors and Emergency Management Director. The City Council had ALICE Training by Bremer County Emergency Management
Maintain NIMS compliance	Active and Completed by Employees and Elected Officials
Encourage all communities to participate in their Local Emergency Planning Commission (LEPC)	Active Larry Farley and Councilman Wikner attend INRCOG Meetings

CITY OF FREDERIKA – STATUS OF 2012 HAZARD MITIGATION ACTIVITIES	
Mitigation Action	Committee Determination/Comments
Educate the public	Active; FEMA training for key city personnel ; fire safety/hazard mitigation training for residents; Red Cross First Aid/CPR/AED training available for key personnel/emergency personnel and other interested residents
Continue training and education for fire departments, law enforcement agencies and ambulance crew personnel	Active; no ambulance; first responders/EMT volunteers for emergency medical responses
Maintain and acquire materials and equipment for fire departments, law enforcement agencies and ambulance crew personnel	No ambulance; first responders/EMT; primary agency is city council and fire chief
Provide emergency shelters for evacuees	Active
Maintain mutual aid agreements	Active – ongoing
Maintain tree trimming program	Active; Alliant Energy
Determine locations for potential heating shelters and volunteer organization	Active

Encourage utility providers and developers to place all utilities underground	Active; communication lines currently being buried with fiber optic cable; county water system for city to be buried
Purchase and maintain backup generators	Active; generator in place for sewage system
Maintain public works equipment	Active
Notify the media on shelter locations	Active; coordination through American Red Cross and Bremer County EMA Director
Install a snow fence around the wastewater treatment facility	Active; protection via tree lines
Enforce sidewalk clearance ordinance	Active
Maintain use of snow fences in the city/county	Active
Use surge protectors to prevent electrical damage to critical and sensitive equipment	Active; surge protectors active at sewage plant
Backup all digital data	Active
Purchase NOAA weather radios	Active; none purchased at this time
Maintain storm spotter training for local fire departments/deputies and EMS crews	Active
Continue enforcement of city sump pump discharge ordinance	Active
Maintain a list of potential storm sewer projects	Active; replacing storm drainage culverts
Make available a cleanup crew for after a storm	Active
Placement of lighting arrestors on power lines	Active; Alliant Energy
Place alarms on storage facilities containing hazardous materials	Active
Maintain law enforcement monitoring of large storage supplies	Active; contract with Bremer County Sheriff
Acquire necessary response and detection equipment for city/county employees	Active
Encourage lead based paint and asbestos removal	Active
Provide a local hazardous waste dropoff site	Active
Maintain mutual aid agreements with the Northeast Iowa response Group	Active
Keep HAZMAT manuals/information current and easily accessible	Active
Maintain, test, and replace warning sirens	Active; tested monthly
Identify areas throughout the county that would substantially benefit from outdoor warning sirens	Active; EMA Director

Encourage and maintain enrollment in emergency notification system	Active
Construct or designate a safe room or storm shelter	Active; most private residents have basement; community center is designated emergency shelter; no multi person below ground safe room available
Encourage home owners to keep emergency kits	Active
Encourage backup power generation for local telephone systems and cellular operations	Active; Butler-Bremer Communications
Maintain list of potential translators to be called upon in case of an emergency	Active
Maintain or install GPS units in all emergency service and city/county vehicles	Active; fire department/first responders currently utilizing cell phone GPS systems
Maintain automatic TTY TDD machines for emergency personnel and city/county employees	Active; currently in discussion
Enhance Standard Operating Procedures for dissemination of information/press releases in the event of a disaster	Active; currently would use Bremer E-911, TV stations and radio stations; all EMS personnel connected to E-911 via cell phone and radio pager
Continue training and promotion of the Incident Command System	Active; FEMA training ongoing; being coordinated/given by EMA Director
Complete continuity of government plan	Active; in progress
Encourage use of Iowa One call before digging	Active; all residents/employees are actively and continuously encouraged to use One Call prior to any digging
Upgrade radio communications equipment as needed	Active
Regularly review and amend fire and medical HAZMAT response standard operating procedures	Active
Improve standard operating procedures for schools	Active
Seek to improve communications with other agencies	Active
Keep supply of backup radios and cellphones	Active
Maintain list of county emergency contacts	Active
Keep the county updated on personnel changes	Active
Continue cooperation between county roads department and local fire departments during snow emergencies	Active
Pursue partnership with rural water as the system expands	Active; rural water has been approved by voters; installation scheduled for summer to fall 2016; pipe installed as far as west side of town
Encourage residents to keep smoke detectors, sprinkler systems and fire extinguishers maintained in their homes	Active

2017 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

Continue an annual inspection program for commercial and industrial properties	Active
Continue fire prevention program	Active
Improve water system to enhance firefighting capacity/ability	Active; have looked into viability of fire hydrants with rural water
Maintain membership in the NFIP	Active
Maintain, enforce and update floodplain ordinance	Active
Acquire more water pumps	Active
Continue with improvement to the storm water system	Active; reviewing drainage system procedures
Prevent inflow and infiltration into the sanitary sewer	Active
Educate the public on maintaining their sump pumps	Active
Maintain and keep storm drains clear of debris	Active
Stockpile sand and sandbags	Active
Identify, purchase and remove structures from flood hazard areas	Active
Purchase additional trash pumps	Active
Initiate and enforce burn ban in times of drought or as needed	Active; follow county bans
Maintain and improve signals/signage along roadways and at railroad crossings	Active; no railroad crossings in city
Establish alternative transportation routes should a road need to be closed	Active; alternate routes identified
Purchase emergency signs to be used in case of an incident	Active
Enforce no parking designations at special events	Active
Identify fallout shelter locations	Active
Keep communication lines open with Nuclear Plant in Palo, IA	Active
Maintain and/or develop a wellhead protection program	Active
Monitor wells in areas of identified contamination	Active
Monitor the drinking water supply	Active; rural water has been approved by voters
Identify and map areas of past contamination	Active
Maintain and/or develop storm water management program	Active; working with county/state entities

2017 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

Eliminate and cap private and abandoned wells in the city	Active
Eliminate the use of septic tank systems in the city limits	Active; most residents are now on city sewer
Follow monitoring requirements set forth by the Iowa DNR	Active; requirements followed by city sewage system
Carry out conservation measures such as erosion control and work with the following organizations: Extension, NRCS, Farm Bureau, EPA, DNR, and Soil and water Conservation District	Active
Maintain and update anti-virus software	Active
Secure vulnerable targets, as identified by the LEPC and County EMA with alarms, security cameras and fences	Active
Review and update fire codes as necessary	Active; maintained by fire chief
Continue to cooperate with pipeline owners and operators to ensure locations are marked	Active
Purchase a new tanker and/or pumper	Active
Provide fans and/or cooling shelter	Active
Encourage community to plant shade trees	Active
Maintain air conditioner(s) in community buildings	Active; central air system in community building
Keep a supply of drinking water to distribute	Active
Encourage the public to receive vaccinations	Active
Cooperate with any countywide mass vaccination plan	Active
Monitor disease outbreak news from the CDC and Iowa Department of Public Health	Active
Develop rationing procedures	Active
Initiate and enforce burn ban in times of drought or as needed	Active; follow county ban restrictions
Restrict water usage should it be necessary	Active
Encourage the use of proper materials and construction techniques	Active; new building code procedures enacted by city council
Educate city personnel to identify risk areas	Active
Install tiling to help water move away from structures	Active
Enforce a curfew	Active

Continue regular bridge inspections	Active; no bridges within city limits
Place barricades to close dangerous bridges	Active; no bridges within city limits
Maintain embargos/weight limits as necessary	Active
Receive education/training from DOT on the subject	Active
Establish detour routes	Active
Identify and inventory potential sinkhole sites	Active
Educate city personnel to handle a sinkhole situation	Active
Secure the area (around a sinkhole)	Active
Inspect any utility lines that are near a sinkhole	Active
Enforce the local zoning ordinances	Active
Plant trees along water bodies and slopes	Active
Clear ditches, streams, and waterways on a regular basis	Active
Encourage floodproofing/elevating structures in the floodplain	Active
Encourage construction of dikes, levees, dams, and retention ponds	Active
Update flood maps/flood studies for areas throughout the county	Active
Identify bridges and culverts than can cost effectively be reengineered to reduce future flooding	Active
Establish transportation evacuation routes and protocols	Active
Develop sandbagging procedures for the community	Active
Develop and maintain staging area for dumping during cleanup	Active
Maintain pump station	Active; city sewer system maintained
Continue cooperation with county in developing flood mitigation efforts	Active
Continue working with the Bremer County Recovery Coalition	Active
Purchase additional parkland in order to increase greens space and reducing surface flow	Active
Regularly inspect dams	Active

Set a designated number of people to be trained in post-disaster record keeping/damage assessments	Active
Inform the public of reputable and ill reputable contractors following disasters	Active
Encourage all communities to participate in their Local Emergency Planning Commission (LEPC)	Active
Maintain and update emergency response plans	Active
Maintain lists of personnel and equipment available to use with response plans	Active
Maintain communication with county contacts	Active; coordinated by county
Maintain NIMS compliance	Completed, active;

CITY OF JANESVILLE— STATUS OF 2012 HAZARD MITIGATION ACTIVITIES	
Mitigation Action	Committee Determination/Comments
Educate the public	Active; to be implemented as needed – notices sent via email to community distribution list, placed on city website, and various city and community Facebook pages
Continue training and education for fire departments, law enforcement agencies and ambulance crew personnel	Active; monthly, bi-monthly and annual training is provided to our emergency services personnel and others as may be necessary to maintain current certifications
Maintain and acquire materials and equipment for fire departments, law enforcement agencies and ambulance crew personnel	Active; as needed – ordered new police car (2017 Dodge Charger w/expected delivery by 6/30/17) and recently purchased new tasers, jaws of life and grain bin rescue equipment
Provide emergency shelters for evacuees	Active, as needed – emergency shelter is maintained at the Janesville Riviera-Roose Community Center
Maintain mutual aid agreements	Active; mutual aid agreements with neighboring jurisdictions and/or townships are in place
Determine locations for potential heating shelters and volunteer organization	Completed; Janesville Riviera-Roose Community Center is maintained as an emergency shelter for water, heat, and cooling and volunteer organization. The Janesville School, City Hall/Fire Station, Messiah Lutheran Church, and United Methodist Church are also options
Encourage utility providers and developers to place all utilities underground	Active; all utility providers and developers are encouraged to place all utilities underground when possible

Purchase and maintain backup generators	Completed and Active; backup generators are routinely tested and available at City Hall/Fire Station and Lift Stations
Maintain public works equipment	Active; equipment is routinely maintained and/or replaced when necessary
Notify the media on shelter locations	To be implemented when necessary
Install a snow fence around the wastewater treatment facility	Completed; the city maintains a ten foot high fence around the wastewater treatment plant
Enforce sidewalk clearance ordinance	Active; if an property owner fails to clean snow, ice, and accumulation within a reasonable time, our Public Works Director may have the natural accumulation of snow or ice removed without notice to the property owner with the costs assessed to the property owner
Maintain use of snow fences in the city/county	Active; repetitive – public works personnel install snow fence every fall and remove the fence each spring
Use surge protectors to prevent electrical damage to critical and sensitive equipment	Completed; surge protectors were purchased and are used for office computers
Backup all digital data	Active; repetitive – city clerk’s office computers are backed up daily for on-site and off-site storage
Purchase NOAA weather radios	Not completed; lack of funding
Maintain storm spotter training for local fire departments/deputies and EMS crews	Active; emergency personnel routinely received spotter training
Continue enforcement of city sump pump discharge ordinance	Active; implemented and enforced as necessary
Maintain a list of potential storm sewer projects	Not completed; no action taken
Make available a cleanup crew for after a storm	Active; city personnel are readily available and a contact list is maintained of local tree trimming companies
Placement of lighting arrestors on power lines	Not completed; no action taken by the city to contact Mid American Energy, our power supplier
Place alarms on storage facilities containing hazardous materials	Not completed; no action taken
Maintain law enforcement monitoring of large storage supplies	Active; police personnel monitor city property and large storage supplies routinely during their shift schedules
Acquire necessary response and detection equipment for city/county employees	As needed; none acquired
Encourage lead based paint and asbestos removal	Not completed; no action taken
Provide a local hazardous waste drop off site	Active via Bremer Count Landfill; Residents can also utilize Black Hawk County landfill
Maintain mutual aid agreements with the Northeast Iowa response Group	Active, maintained

Keep HAZMAT manuals/information current and easily accessible	Active; via posting at relevant facilities
Maintain, test, and replace warning sirens	Active; repetitive – warning sirens are tested monthly during April – November of each year and maintained as necessary
Identify areas throughout the county that would substantially benefit from outdoor warning sirens	Active; the city has identified areas within our corporate limits that would benefit from outdoor warning sirens
Encourage and maintain enrollment in emergency notification system	Completed and Active; notices have been sent via email to our customer distribution list, placed on city utility bills, website, and Facebook page
Construct or designate a safe room or storm shelter	Not completed; lack of funding
Encourage home owners to keep emergency kits	No action
Encourage backup power generation for local telephone systems and cellular operations	No action
Maintain list of potential translators to be called upon in case of an emergency	Active; responsibility of county dispatch
Maintain or install GPS units in all emergency service and city/county vehicles	Not completed; the fire department recently acquired an I-Pad (service through Verizon Wireless) which is placed in a fire vehicle when responding to emergency calls
Maintain automatic TTY TDD machines for emergency personnel and city/county employees	Active; responsibility of county dispatch
Enhance Standard Operating Procedures for dissemination of information/press releases in the event of a disaster	As needed; coordinated with County EMA
Continue training and promotion of the Incident Command System	Completed and Active; emergency and city personnel have received Incident Command Training as required and as available
Complete continuity of government plan	Not completed
Encourage use of Iowa One call before digging	Completed and Active; messages have periodically been placed on utility bills, city website and Facebook page
Upgrade radio communications equipment as needed	Active; radio equipment is maintained and upgraded as needed and/or required
Regularly review and amend fire and medical HAZMAT response standard operating procedures	Procedures in place
Improve standard operating procedures for schools	Active; public safety services and school leaders coordinate
Seek to improve communications with other agencies	Active via current operations
Keep supply of backup radios and cellphones	Not completed
Maintain list of county emergency contacts	Active; a list of emergency contacts is maintained and routinely reviewed and revised
Keep the county updated on personnel changes	Active; regular information sharing with counterparts

Continue cooperation between county roads department and local fire departments during snow emergencies	Active
Pursue partnership with rural water as the system expands	Completed and Active; the city signed a 20-year Municipal Water Purchase Agreement with Central Iowa Water Association in May 2016 to furnish the city its water supply demands up to a peak day of 200,000 gallons per day
Encourage residents to keep smoke detectors, sprinkler systems and fire extinguishers maintained in their homes	Completed and Active; announcements routinely made on Janesville Fire Recue Facebook page
Continue an annual inspection program for commercial and industrial properties	Not completed – no action taken
Continue fire prevention program	Active; Janesville Fire Rescue sponsoring training and educational materials to Janesville pre-school and elementary students annually during Fire Prevention Week as well as placing announcements on their Facebook page
Improve water system to enhance firefighting capacity/ability	Active; a large new water line will be installed along Barrick Road (expected completion date of 10/31/17) that will improve fire protection and volume
Maintain membership in the NFIP	Active; membership maintained
Maintain, enforce and update floodplain ordinance	Active; the city maintains, enforces, and has updated their floodplain ordinance with assistance through the Bremer County Building and Zoning Administrator
Acquire more water pumps	As needed; not completed
Continue with improvement to the storm water system	As possible with existing infrastructure maintenance and new construction
Prevent inflow and infiltration into the sanitary sewer	Active; the sanitary sewer system is monitored by public works personnel on a daily basis
Educate the public on maintaining their sump pumps	Not completed; no action taken
Maintain and keep storm drains clear of debris	Active; public works personnel maintain and keep storm drains clear of debris
Stockpile sand and sandbags	Active; the city has an ample supply of sandbags and sand is readily available from the sand volleyball courts
Identify, purchase and remove structures from flood hazard areas	The city is unaware of any structures that need removal from flood hazard areas
Purchase additional trash pumps	Completed and Active; the city currently has three 4" trash pumps read to go as needed
Install rip rap around wastewater treatment facility	Active;
Initiate and enforce burn ban in times of drought or as needed	Active;
Maintain and improve signals/signage along roadways and at railroad crossings	Active;
Establish alternative transportation routes should a road need to be closed	Active;
Purchase emergency signs to be used in case of an incident	Active;

Enforce no parking designations at special events	Active; parking is enforced by police personnel as needed
Identify fallout shelter locations	To our knowledge, there are no ideal fallout shelters with Janesville's corporate limits
Keep communication lines open with Nuclear Plant in Palo, IA	Not completed; no action taken
Maintain and/or develop a wellhead protection program	Active; city ordinance has been adopted to prevent contamination and to preserve the water quality available to citizens of the city
Monitor wells in areas of identified contamination	Active; the city's wells are not in operation at this time as water is currently supplied and purchased through Central Iowa Water Association
Monitor the drinking water supply	Active; the drinking water is monitored on a daily basis and/or as required
Identify and map areas of past contamination	Active; city personnel have compiled a "Flood Bible" that includes various maps, written notes and past action taken
Maintain and/or develop storm water management program	Not completed; no action taken
Eliminate and cap private and abandoned wells in the city	Completed and Active; all known abandoned wells have been either eliminated and/or capped. This process will be continued as abandoned wells are identified and when new connections are made to the city's water system
Eliminate the use of septic tank systems in the city limits	Active; it is mandatory to connect to the city's public sewer system if the public sewer is located within one hundred (100) feet of the property line and is of such design as to receive and convey by gravity such sewage as may be conveyed to it
Follow monitoring requirements set forth by the Iowa DNR	Active; public works personnel have implemented and continue to monitor as necessary and/or required
Carry out conservation measures such as erosion control and work with the following organizations: Extension, NRCS, Farm Bureau, EPA, DNR, and Soil and water Conservation District	Not completed; no action taken
Maintain and update anti-virus software	Completed and Active; anti-virus software is maintained and updated as necessary
Secure vulnerable targets, as identified by the LEPC and County EMA with alarms, security cameras and fences	Active; Led by EMA
Review and update fire codes as necessary	As needed; no updates made
Continue to cooperate with pipeline owners and operators to ensure locations are marked	As needed
Purchase a new tanker and/or pumper	Completed; a new tanker and pumper was purchased by our fire department in 2012
Provide fans and/or cooling shelter	Active; the following facilities are available for cooling shelters: City Hall/Fire Station, Janesville Riviera-Roose Community Center, Messiah Lutheran Church, and United Methodist Church
Encourage community to plant shade trees	Not completed; no action taken

Maintain air conditioner(s) in community buildings	Active; air conditioners are routinely maintained and serviced at City Hall/Library/Fire Station and a generator is readily available
Keep a supply of drinking water to distribute	Active; a supply of drinking water is readily available to the community when needed
Encourage the public to receive vaccinations	Active; a flu shot clinic at City Hall is scheduled and held annually through the Waterloo Visiting Nurses Association
Cooperate with any countywide mass vaccination plan	To be implemented as needed; recently met with Bremer County Health Nurse and reviewed high water health concerns
Monitor disease outbreak news from the CDC and Iowa Department of Public Health	Active; maintain contact with Bremer County EMS Director and Health Nurse
Develop rationing procedures	Not completed; no action taken
Initiate and enforce burn ban in times of drought or as needed	Active; as needed, announcements will be made electronically through our community distribution list, and placed on city website and Facebook page and Janesville Fire Rescue Facebook page
Restrict water usage should it be necessary	Active and to be implemented as needed; notices are prepared and sent electronically through our community distribution list, and placed on city website and Facebook page and Janesville Fire Rescue Facebook page
Encourage the use of proper materials and construction techniques	Active; the city contracts with Bremer County and their Building & Zoning Administrator for the enforcement and issuance of various codes and permits
Educate city personnel to identify risk areas	Active; Annual safety training
Install tiling to help water move away from structures	Not completed; gutters were installed on park building
Enforce a curfew	Active; curfew is set by city code and enforced as necessary
Continue regular bridge inspections	Active; biannual bridge inspection are performed and completed by certified engineers as required
Place barricades to close dangerous bridges	Active; barricades are readily available and placed as necessary
Maintain embargos/weight limits as necessary	Active; city ordinance was approved and adopted that restricts the weight limit on our 7 th Street bridge to ten (10) ton and a designated truck routes for motor vehicles weighing five (5) tons or more when loaded or empty
Receive education/training from DOT on the subject	Not completed
Establish detour routes	Active; detour routes are established as necessary with notifications electronically sent to our community distribution list and placed on city website and Facebook page
Identify and inventory potential sinkhole sites	Not completed; no action taken – no experience with sink holes within corporate limits of city
Educate city personnel to handle a sinkhole situation	Not completed; no action taken
Secure the area (around a sinkhole)	Not completed; the city has not experienced a sinkhole within its corporate

	limits
Inspect any utility lines that are near a sinkhole	Not completed; the city has not experienced sinkhole within its corporate limits
Enforce the local zoning ordinances	Active; the city has contracted with the Bremer County Building and Zoning Administrator for over 25+ years to enforce the city's zoning ordinances
Plant trees along water bodies and slopes	Not completed; no action taken - lack of funding and/or resources
Clear ditches, streams, and waterways on a regular basis	Not completed; no action taken – lack of funding and/or resources
Encourage flood proofing/elevating structures in the floodplain	Not completed; no action taken
Encourage construction of dikes, levees, dams, and retention ponds	Not completed; retention ponds are addressed in the city's development ordinance
Update flood maps/flood studies for areas throughout the county	Active; no action taken; maps current FIRM maps effective as of 03/04/2008
Identify bridges and culverts than can cost effectively be reengineered to reduce future flooding	Not completed; no action taken
Establish transportation evacuation routes and protocols	Active; the city has maps that identify high water areas and ensuing road closures and evacuation routes
Develop sandbagging procedures for the community	Active; city employees are compiling notes from past high water procedures and experiences in to a response plan
Develop and maintain staging area for dumping during cleanup	Active; city employees are compiling notes from past high water procedures and experiences in to a response plan – including contact information for dumpster rentals
Maintain pump station	Active; the pump stations are checked on a daily basis
Continue cooperation with county in developing flood mitigation efforts	Active; the city works closely with INRCOG representatives and the Bremer County EMS Director in developing flood mitigation efforts
Continue working with the Bremer County Recovery Coalition	As needed; when recovery coalition meetings called
Purchase additional parkland in order to increase greens space and reducing surface flow	Not completed; no action taken – lack of funding
Regularly inspect dams	There are no dams within the corporate limits of the city
Set a designated number of people to be trained in post-disaster record keeping/damage assessments	Not completed
Inform the public of reputable and ill reputable contractors following disasters	Not completed; no need
Encourage all communities to participate in their Local Emergency Planning Commission (LEPC)	Undetermined
Maintain and update emergency response plans	Active; city employees are currently compiling information for an emergency response plan

Maintain lists of personnel and equipment available to use with response plans	Active; the city has maintained a current list of personnel (volunteers) and equipment available along with the appropriate contact information
Maintain communication with county contacts	Active; the Bremer County/Waverly Law Center is the center of our communications network for emergency services (law enforcement, fire, and first responders)
Maintain NIMS compliance	Active; new volunteers, personnel and mayor and council members are generally trained, as soon as possible, upon of their acceptance, election, and/or hiring with the city

CITY OF PLAINFIELD – STATUS OF 2012 HAZARD MITIGATION ACTIVITIES	
Mitigation Action	Committee Determination/Comments
Educate the public	Active – incorporated Facebook page, website, use of mailings and media, etc.
Continue training and education for fire departments, law enforcement agencies and ambulance crew personnel	Active and as needed – Keeping up with required emergency training
Maintain and acquire materials and equipment for fire departments, law enforcement agencies and ambulance personnel	Active and as needed – Car crash stabilizer system and grain bin system purchased, Future CAFS, New fire retardant system.
Provide emergency shelters for evacuees.	Active – Currently the City Hall, Fire Department, and Library, as well as two churches.
Maintain mutual aid agreements	Active, Repetitive, Renewed annually or as needed.
Maintain tree trimming program	Active – City ordinance in place and enforced.
Determine locations for potential heating shelters and volunteer organization	Active – Currently the City Hall, Fire Department, and Library, as well as two churches.
Encourage utility providers and developers to place all utilities underground	Active – Example, new fiber optics installed in 2015
Purchase and maintain backup generators	Completed – Generators have been placed at all key facilities, Fire Station, City Hall, Lift Station, Waste Water Treatment plant, Water tower “pump station”, All generators test run weekly, and are recorded.
Maintain public works equipment	Active and ongoing – Purchased new trash pumps, portable generators, and replaced city pickup.

Notify the media on shelter locations	As needed – depending on the emergency the shelters may vary.
Install a snow fence around the wastewater treatment facility	Done – there is a chain link fence surrounding the facility that is gated and maintained.
Enforce sidewalk clearance ordinance	Active and ongoing – Ordinance in place and enforced.
Maintain use of snow fences in the city / county	Not completed; not needed
Use surge protectors to prevent electrical damage to critical and sensitive equipment	Active and ongoing – need to evaluate the need, the computers are protected.
Backup all digital data.	Active and ongoing – backup system in use.
Purchase NOAA weather radios.	Not completed – Lack of funding.
Enforce and update building codes as needed.	Active and ongoing – Continually review and update codes.
Maintain storm spotter training for local fire departments / deputies and EMS crews.	Active- select firemen are certified spotters.
Continue enforcement of city sump pump discharge ordinance.	Active and ongoing – Corrected when identified.
Maintain a list of potential storm sewer projects.	Active and ongoing - Lack of funding prevents new projects.
Make available a cleanup crew for after a storm.	Active and ongoing - mostly driven by volunteers.
Placement of lighting arrestors on power lines	Active and ongoing - and will investigate with MidAmerican Energy.
Place alarms on storage facilities containing hazardous materials.	Not completed – due to lack of funding.
Maintain law enforcement monitoring of large storage supplies.	Active and ongoing – Bremer county sheriff contract in place.
Acquire necessary response and detection equipment for city / county employees.	Active and ongoing – Fire department and First responders are continually identifying new opportunities.
Encourage lead based paint and asbestos removal.	Not completed – need being assessed.
Provide a local hazardous waste drop off site.	Not completed- we rely on county drop off sites.
Maintain mutual aid agreements with the Northeast Iowa response Group.	Active and ongoing – Will continue to keep relationships and agreements current.
Keep HAZMAT manuals / information current and easily accessible.	Active and ongoing – Fire station and city hall keeps them current.
Maintain test, and replace warning sirens.	Active and ongoing – In collaboration with Bremer County. Service agreement with White Electric.
Identify areas throughout the county that would substantially benefit from outdoor warning sirens.	Active – rely on the county for input.
Encourage and maintain enrollment in emergency notification system.	Active – now promoting new ALERT IOWA program (replaced Code Red)

Construct or designate a safe room or storm shelter.	Not completed – Lack of funding.
Encourage home owners to keep emergency kits.	Active, county holds local campaign annually
Encourage backup power generation for local telephone systems and cellular operations.	Active and ongoing – Possibly complete as Butler-Bremer Communication's main hub is located in Plainfield.
Maintain list of potential translators to be called upon in case of an emergency.	Not completed – will use County list if needed.
Maintain or install GPS units in all emergency service and city / county vehicles.	Not completed – Lack of funding.
Maintain automatic TTY TDD machines for emergency personnel and city / county employees.	Dispatch only.
Enhance Standard Operating Procedures for dissemination of information / press releases in the event of a disaster.	Active and ongoing – Implementing of Facebook for the City. City Clerk is the admin, Maintenance Supervisor has access to post.
Continue training and promotion of the Incident Command System.	Active and ongoing – Fire Dept. has training.
Complete continuity of government plan.	Active- in Code of Ordinances.
Encourage use of Iowa One Call before digging.	Active and ongoing – Part of city ordinance and building permit application.
Upgrade radio communications equipment as needed.	Active and ongoing- Completed as required as per Bremer County.
Regularly review and amend fire and medical HAZMAT response standard operating procedures.	Active and ongoing – Annually reviewed and updated as needed.
Improve standard operating procedures for schools.	Active and ongoing – School coordinates these activities.
Seek to improve communications with other agencies.	Active and ongoing
Keep supply of backup radios and cellphones.	Active- extra radios available at Fire Station, extra cell phone at City Hall.
Maintain list of county emergency contacts.	Active and ongoing.
Keep the county updated on personnel changes.	Active and ongoing – Contact information remains consistent with employee position.
Continue cooperation between county roads department and local fire departments during snow emergencies.	Active and ongoing – The Fire department directs as needed.
Pursue partnership with rural water as the system expands.	Not Completed – Rural water does not supply our area.
Encourage residents to keep smoke detectors, sprinkler systems and fire extinguishers maintained in their homes.	Active and ongoing – headed by the fire department.
Encourage use of Iowa One Call before digging.	Active and ongoing – Part of city ordinance and building permit application.
Continue an annual inspection program for commercial and industrial properties.	Active and ongoing – Performed by the fire department.

Continue fire prevention program.	Active and ongoing – Performed by the fire department.
Improve water system to enhance firefighting capacity / ability.	Active and ongoing – The city has contracted with MSA engineering to identify problems and to develop improvements to the water system.
Maintain membership in the NFIP	Active; membership maintained
Maintain, enforce and update floodplain ordinance.	Active; ordinance in place
Acquire more water pumps	Completed.; trash and water pumps acquired last 3-5 years
Continue with improvement to storm water system.	Active – exploring increasing capacity of east/west running stormwater from Highway to river and drainage away from downtown area
Prevent inflow and infiltration into the sanitary sewer.	Active and ongoing – The city has contracted with MSA Professional Services to identify problems and to develop improvements/plan for the waste water system.
Educate the public on maintaining their sump pumps.	To be implemented as needed.
Maintain and keep storm drains clear of debris.	Active and ongoing – The city regularly cleans gutters and catch basins with the use of its end loader, street sweeper, and labor.
Stockpile sand and sandbags.	Active and ongoing – The city maintains a supply of sand bags and sand.
Identify, purchase and remove structures from flood hazard areas.	Not completed- lack of funding.
Purchase additional trash pumps.	Completed; trash pumps purchased in last 3-5 years
Install rip rap around wastewater treatment facility.	Completed – Wastewater treatment facility is lined with a plastic liner.
Initiate and enforce burn ban in times of drought or as needed.	Completed – The City of Plainfield falls under Bremer County burn bans, and ordinance addresses seasonal burning.
Maintain and improve signals / signage along roadways and at railway crossings.	Active and ongoing – traffic signs are up to standards and maintained and inspected. Railroad crossings are all cross arm protected.
Establish alternative transportation routes should a road be closed.	To be implemented as needed.
Purchase emergency signs to be used in case of an incident.	Completed – The city has signs for this purpose, and has funds budgeted for the purchase of more.
Enforce no parking designations at special events.	Active – The city has portable signs for this purpose.
Identify fallout shelter locations.	There are no fallout shelters in the City.
Maintain and / or develop wellhead protection program.	Active and ongoing- Wellhead Protection plan is in place.

2017 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

Monitor wells in areas of identified contamination.	NA – there are no known identified contamination sites.
Monitor the drinking water supply.	Active and ongoing – The drinking water is monitored to comply with DNR standards.
Identify and map areas of past contamination.	Completed; responsibility of DNR
Maintain and / or develop storm water management program.	Not completed – lack of funding.
Eliminate and cap private and abandoned wells in the city.	Done.
Eliminate the use of septic tank systems in the city limits.	Done.
Follow monitoring requirements set forth by the Iowa DNR.	Active; regular reporting on city's water and wastewater systems
Cary out conservation measures such as erosion control and work with the following organizations: Extension, NRCS, Farm Bureau, EPA, DNR, and Soil and Water Conservation District.	Active and ongoing – Source Water Protection team has identified well capture area and is working with these agencies.
Maintain and update anti-virus software.	Active and ongoing – This is maintained by TJ Digital.
Secure vulnerable targets, as identified by the LEPC and County EMA with alarms, security cameras and fences.	Not completed – lack of funds.
Review and update fire codes as necessary.	Not Completed – this falls under Bremer County/State of Iowa.
Continue to cooperate with pipeline owners and operators to ensure locations are marked.	Active and ongoing.
Provide fans and / or cooling shelter.	Active and ongoing – Both the Library and City Hall can be used as cooling stations.
Encourage community to plant shade trees.	Active and ongoing – with MidAmerican Energy, and Trees Forever.
Maintain air conditioner(s) in community buildings,	Active and ongoing.
Keep supply of drinking water to distribute.	To be purchased as needed.
Encourage the public to receive vaccinations.	Active and ongoing- through Bremer County Health Department.
Cooperate with any countywide mass vaccination plan.	Active and ongoing.
Monitor disease outbreak news from the CDC and Iowa Department of Public Health.	Active and ongoing- through Bremer County Health Department.
Develop rationing procedures.	To be implemented as needed.
Initiate and enforce burn ban in times of drought or as needed.	Completed – The City of Plainfield falls under Bremer County burn bans, and ordinances address seasonal burning.

Restrict water usage should it be necessary.	To be implemented as needed.
Encourage the use of proper materials and construction techniques.	Active and ongoing – as directed by code.
Educate city personnel to identify risk areas.	Active and ongoing.
Install tiling to help water move away from structures.	To be implemented as needed.
Enforce a curfew.	Active – A curfew ordinance is in place.
Identify and inventory potential sinkhole sites.	There are no sink holes in Plainfield.
Educate city personnel to handle a sinkhole situation.	There are no sink holes in Plainfield.
Secure the area (around a sinkhole)	There are no sink holes in Plainfield.
Inspect and utility lines that are near a sinkhole.	There are no sink holes in Plainfield.
Enforce the local zoning ordinances.	Active and ongoing.
Plant trees along water bodies and slopes.	NA – there are no water bodies or slopes in town.
Clear ditches, streams, and waterways on a regular basis.	Active and ongoing- part of regular maintenance.
Encourage flood proofing / elevating structures in the floodplain.	Active and ongoing- encourage Citizens to apply for funding as needed.
Encourage construction of dikes, levees, dams, and retention ponds.	NA
Update flood maps / flood studies for areas throughout the county.	Active
Identify bridges and culverts that can cost effectively be reengineered to reduce future flooding.	Done
Establish transportation evacuation routes and protocols.	To be implemented as needed.
Develop sandbagging procedures for the community.	Done – The city provides bags and sand and coordinates volunteers.
Develop and maintain staging area for dumping during cleanup.	Active and ongoing – A yard waste facility is provided by the city.
Maintain pump station.	NA
Dig drainage ditch to west side of town, to river.	Not Completed – Lack of funding. This problem has been aided by a culvert to carry water from the west side of town to the east, reshaping drainage by highway, and the addition of a pond north of town.
Continue cooperation with county in developing flood mitigation efforts.	Active and ongoing – the City Of Plainfield is an active member of the Upper Cedar Valley water shed authority.
Continue working with the Bremer County Recovery Coalition.	Active and ongoing.

Purchase additional Parkland in order to increase greens space and reducing surface flow.	Not completed – lack of funding.
Regularly inspect dams.	NA – No dams (drop from 2017 plan)
Regularly inspect levees.	NA – No levees(drop from 2017 plan)
Establish backup plan in case levees fail.	NA 0 No levees (drop from 2017 plan)
Set a designated number of people to be trained in post-disaster record keeping / damage assessments.	Active and ongoing – Under the guidance of Bremer County CRCT team.
Inform the public of reputable and ill reputable contractors following disasters.	To be implemented as needed.
Encourage all communities to participate in their Local Emergency Planning Commission (LEPC)	
Maintain and update emergency response plans.	Active and ongoing – updated as needed.
Maintain lists of personnel and equipment available to use with response plans.	Active and ongoing – updated as needed.
Maintain communication with county contacts.	Active and ongoing.
Maintain NIMS compliance.	Active and ongoing.

CITY OF READLYN – STATUS OF 2012 HAZARD MITIGATION ACTIVITIES	
Mitigation Action	Committee Determination/Comments
Educate the public	Active, to be continued; alert residents with severe weather updates on public access channel as well as notices on city's electronic sign and social media; residents can also utilize the Alert Iowa program through the county
Continue training and education for fire departments, law enforcement agencies and ambulance crew personnel	Active; each city department is responsible for staying current on required training.
Maintain and acquire materials and equipment for fire departments, law enforcement agencies and ambulance crew personnel	As needed; recently updated EMS pagers and radios
Provide emergency shelters for evacuees	Not completed, lack of funding
Maintain mutual aid agreements	Active; agreements continued to be updated for EMS and Fire services
Maintain tree trimming program	Active; ordinance in place
Determine locations for potential heating shelters and volunteer organization	Completed, will be continued; locations identified include: fire station, elementary school, and churches in town

Encourage utility providers and developers to place all utilities underground	Ongoing; private utility companies are responsible for
Purchase and maintain backup generators	ongoing
Maintain public works equipment	Ongoing
Notify the media on shelter locations	Implemented as needed
Install a snow fence around the wastewater treatment facility	As needed
Enforce sidewalk clearance ordinance	Active; in place and enforced during winter months
Maintain use of snow fences in the city/county	Ongoing
Use surge protectors to prevent electrical damage to critical and sensitive equipment	Ongoing
Backup all digital data	Ongoing
Purchase NOAA weather radios	Ongoing
Enforce and update building codes, as needed	Ongoing
Maintain storm spotter training for local fire departments/deputies and EMS crews	Ongoing
Continue enforcement of city sump pump discharge ordinance	Ongoing
Maintain a list of potential storm sewer projects	Ongoing
Make available a cleanup crew for after a storm	As needed; city staff available
Placement of lighting arrestors on power lines	Ongoing; in place
Place alarms on storage facilities containing hazardous materials	Not completed
Maintain law enforcement monitoring of large storage supplies	Ongoing; Police/Sheriff
Acquire necessary response and detection equipment for city/county employees	Ongoing
Encourage lead based paint and asbestos removal	Ongoing
Provide a local hazardous waste dropoff site	In place; city residents are able to utilize the county landfill
Maintain mutual aid agreements with the Northeast Iowa response Group	Active; agreement is up to date
Keep HAZMAT manuals/information current and easily accessible	Active; information included with all EMS trucks and rigs
Maintain, test, and replace warning sirens	Active; monthly tests
Identify areas throughout the county that would substantially benefit from outdoor warning	Ongoing; will monitor

sirens	
Encourage and maintain enrollment in emergency notification system	Active; Alert Iowa program through the county
Construct or designate a safe room or storm shelter	Completed; new Wapsie Valley elementary school constructed with safe room
Encourage home owners to keep emergency kits	Active; Public service announcements encourage
Encourage backup power generation for local telephone systems and cellular operations	In place, will be continued
Maintain list of potential translators to be called upon in case of an emergency	Not completed; low priority due to lack of cultural diversity in the community at this time
Maintain or install GPS units in all emergency service and city/county vehicles	GPS in Ambulance; otherwise depend on cell phone GPS which has worked well for the city
Maintain automatic TTY TDD machines for emergency personnel and city/county employees	Not completed; ongoing effort
Enhance Standard Operating Procedures for dissemination of information/press releases in the event of a disaster	Active; repetitive via County EMA
Continue training and promotion of the Incident Command System	Active. repetitive
Complete continuity of government plan	Ongoing
Encourage use of Iowa One call before digging	Ongoing – City staff
Upgrade radio communications equipment as needed	Active, as needed; EMS upgraded radios in 2015 with Narrow banding
Regularly review and amend fire and medical HAZMAT response standard operating procedures	Ongoing; annually HAZMAT training for EMS and Fire
Improve standard operating procedures for schools	Active, annually; joint training held with schools and EMS/Fire
Seek to improve communications with other agencies	Active; as needed; continue to implement narrow banding for communications and replace equipment as needed
Keep supply of backup radios and cellphones	Active; as allowed by funding
Maintain list of county emergency contacts	Completed; actively maintained
Keep the county updated on personnel changes	Active; as needed
Continue cooperation between county roads department and local fire departments during snow emergencies	Ongoing with city staff and emergency responders
Pursue partnership with rural water as the system expands	City Council/ City Staff
Encourage residents to keep smoke detectors, sprinkler systems and fire extinguishers maintained in their homes	Active, ongoing; presentations at fundraisers

Continue fire prevention program	Active, repetitive
Improve water system to enhance firefighting capacity/ability	Ongoing
Maintain membership in the NFIP	Ongoing
Maintain, enforce and update floodplain ordinance	Completed, active; ordinance in place and enforced
Acquire more water pumps	Ongoing
Continue with improvement to the storm water system	Ongoing; as funding permits
Prevent inflow and infiltration into the sanitary sewer	Ongoing; city program requiring property owners not to discharge sump pumps into sanitary sewer
Educate the public on maintaining their sump pumps	City council, staff - ongoing
Maintain and keep storm drains clear of debris	Ongoing, routine; implemented by public works
Stockpile sand and sandbags	Implemented as needed
Identify, purchase and remove structures from flood hazard areas	As needed; currently no structures in the flood hazard area
Purchase additional trash pumps	Ongoing
Initiate and enforce burn ban in times of drought or as needed	Ongoing; city council/county
Maintain and improve signals/signage along roadways and at railroad crossings	Ongoing by city staff
Establish alternative transportation routes should a road need to be closed	Active; as needed
Purchase emergency signs to be used in case of an incident	Active, implemented as needed
Enforce no parking designations at special events	As needed; Law Enforcement
Identify fallout shelter locations	As needed
Keep communication lines open with Nuclear Plant in Palo, IA	Ongoing
Maintain and/or develop a wellhead protection program	Ongoing/ City council
Monitor wells in areas of identified contamination	Ongoing/ City council and staff
Monitor the drinking water supply	Ongoing / City Council and Public Works
Identify and map areas of past contamination	Ongoing
Maintain and/or develop storm water management program	Ongoing
Eliminate and cap private and abandoned wells in the city	Completed, continued as needed; all known private and

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	abandoned wells in the city have been capped
Eliminate the use of septic tank systems in the city limits	Completed, continued as needed; no private septic systems in use within city limits
Follow monitoring requirements set forth by the Iowa DNR	Active; public works
Carry out conservation measures such as erosion control and work with the following organizations: Extension, NRCS, Farm Bureau, EPA, DNR, and Soil and water Conservation District	Ongoing/ city council
Maintain and update anti-virus software	Active; routine maintenance
Review and update fire codes as necessary	As needed
Continue to cooperate with pipeline owners and operators to ensure locations are marked	Active; local trainings and annual information update event held annually
Purchase a new tanker and/or pumper	Completed, active; In 2012 purchased a 2001 Spartan 500 gallon Rescue/Pumper; In 2013, purchased 1986 GMC Tanker, 1,500 gallon
Provide fans and/or cooling shelter	Completed, implemented as needed; equipment provided by the Fire Department
Encourage community to plant shade trees	Ongoing City Council/ Staff
Maintain air conditioner(s) in community buildings	Completed, active
Keep a supply of drinking water to distribute	Active
Encourage the public to receive vaccinations	Active; routine public announcements
Cooperate with any countywide mass vaccination plan	As needed
Monitor disease outbreak news from the CDC and Iowa Department of Public Health	Monitored all year long and information distributed via public service announcements
Develop rationing procedures	Not completed
Initiate and enforce burn ban in times of drought or as needed	Active; burn ban implemented as needed
Restrict water usage should it be necessary	Active; not need to be implemented yet
Encourage the use of proper materials and construction techniques	Completed, active; per adopted building codes
Educate city personnel to identify risk areas	Active; public works staff
Enforce a curfew	Active; enforced by Sheriff and Police
Identify and inventory potential sinkhole sites	As needed

Educate city personnel to handle a sinkhole situation	As needed
Secure the area (around a sinkhole)	As needed
Inspect any utility lines that are near a sinkhole	Not completed – no need for in past five years
Enforce the local zoning ordinances	Active; Zoning enforced, work with Bremer Co Zoning Dept.
Clear ditches, streams, and waterways on a regular basis	Active, as needed; implemented by Public Works
Encourage floodproofing/elevating structures in the floodplain	Flood ordinance in place; currently no structures in flood plain
Encourage construction of dikes, levees, dams, and retention ponds	As needed; city council and staff
Update flood maps/flood studies for areas throughout the county	Responsibility of state and federal governments
Identify bridges and culverts than can cost effectively be reengineered to reduce future flooding	As needed; city council and staff
Establish transportation evacuation routes and protocols	As needed
Develop sandbagging procedures for the community	Active
Develop and maintain staging area for dumping during cleanup	As needed
Maintain pump station	Completed, active; pump stations maintained
Continue cooperation with county in developing flood mitigation efforts	Active; partnership continued
Continue working with the Bremer County Recovery Coalition	Active; partnership continued
Set a designated number of people to be trained in post-disaster record keeping/damage assessments	Not completed, need to do yet
Inform the public of reputable and ill reputable contractors following disasters	As needed
Encourage all communities to participate in their Local Emergency Planning Commission (LEPC)	Continued
Maintain and update emergency response plans	Active, maintained
Maintain lists of personnel and equipment available to use with response plans	Active; inventory maintained
Maintain communication with county contacts	Active; quarterly basis
Maintain NIMS compliance	Completed, active; NIMS maintained

CITY OF SUMNER– STATUS OF 2012 HAZARD MITIGATION ACTIVITIES	
Mitigation Action	Committee Determination/Comments
Educate the public	Distribute educational material in city utility bills
Continue training and education for fire departments, law enforcement agencies and ambulance crew personnel	Completed, ongoing classes and training reviewing procedures
Maintain and acquire materials and equipment for fire departments, law enforcement agencies and ambulance crew personnel	Completed, though city is still looking for a new police car and fire truck
Provide emergency shelters for evacuees	Utilize schools, churches, city hall, fire station, and hospital as shelters when needed
Maintain mutual aid agreements	Completed, maintained; mutual aid with Sumner Fire/Rural Fire, city police and county sheriff
Maintain tree trimming program	Trees are trimmed annually by Sumner Municipal Light Plant
Determine locations for potential heating shelters and volunteer organization	Utilize churches, legion hall and fire station
Encourage utility providers and developers to place all utilities underground	Continuous implementation, Sumner Municipal Light Plant has plan in place for placing utilities underground
Purchase and maintain backup generators	Sumner Municipal Light Plant maintains backup generators
Maintain public works equipment	Public Works Department has maintenance program and place and upgrade/purchase equipment as needed
Notify the media on shelter locations	Sumner Cable Channel, LED community sign, local newspaper, and local news channel
Enforce sidewalk clearance ordinance	In place; local police department and public works department
Maintain use of snow fences in the city/county	Maintained, snow fences are utilized in the county as needed
Use surge protectors to prevent electrical damage to critical and sensitive equipment	Systems have surge protectors and backup generators attached to them
Backup all digital data	Digital data is backed up daily
Purchase NOAA weather radios	We have normal weather scanners
Enforce and update building codes, as needed	Completed, ongoing; have City Code book that is updated and referred to for enforcing codes
Maintain storm spotter training for local fire departments/deputies and EMS crews	Spotter training classes are available for all emergency personnel

Continue enforcement of city sump pump discharge ordinance	Ordinance in place, no sump pump discharge allowed in city sewer system
Maintain a list of potential storm sewer projects	Completed, ongoing; addressing storm sewer project as needs are identified
Make available a cleanup crew for after a storm	Public works department personnel and fire department are available to help when needed
Placement of lighting arrestors on power lines	Sumner Municipal Light Plan is responsible for this project
Place alarms on storage facilities containing hazardous materials	Completed, alarm system in place
Maintain law enforcement monitoring of large storage supplies	Sumner Police Department is responsible for patrolling areas of the city
Acquire necessary response and detection equipment for city/county employees	Use county dispatch and cell phone to notify city/county employees of areas needing assistance
Encourage lead based paint and asbestos removal	Continually working on removal of asbestos etc
Maintain mutual aid agreements with the Northeast Iowa response Group	Work closely with Northeast Iowa Group to develop plans for response
Keep HAZMAT manuals/information current and easily accessible	HAZMAT materials are available in Public Works Department offices and fire station
Maintain, test, and replace warning sirens	Warning sirens are tested twice weekly
Identify areas throughout the city that would substantially benefit from outdoor warning sirens	City has two outdoor warning sirens covering both ends of Sumner
Encourage and maintain enrollment in emergency notification system	Membership with county, state and national emergency response systems
Construct or designate a safe room or storm shelter	Storm shelters available in city hall and hospital
Encourage home owners to keep emergency kits	Educate homeowners of the need to keep emergency kits available
Encourage backup power generation for local telephone systems and cellular operations	Work with local cell phone and telephone companies to have backup power available
Maintain list of potential translators to be called upon in case of an emergency	Very little need for this in Sumner but have several people available to help if needed
Maintain or install GPS units in all emergency service and city/county vehicles	Emergency vehicles are working on GPS systems
Maintain automatic TTY TDD machines for emergency personnel and city/county employees	Machines are checked annually to make sure operational
Enhance Standard Operating Procedures for dissemination of information/press releases in the event of a disaster	Notify newspaper and radio of details of disaster

Continue training and promotion of the Incident Command System	Yearly training meetings with County Emergency Management
Complete continuity of government plan	Work with city, county and state officials on clean up plan
Encourage use of Iowa One call before digging	Yes we encourage all to call before they dig
Upgrade radio communications equipment as needed	We have upgraded our radios
Regularly review and amend fire and medical HAZMAT response standard operating procedures	Emergency departments have yearly training on HAZMAT
Improve standard operating procedures for schools	Work closely with schools to have procedures in place for emergencies
Seek to improve communications with other agencies	Try to work closely with all agencies for procedures to respond to emergencies
Keep supply of backup radios and cellphones	Fire station and police station have backup radios available
Maintain list of county emergency contacts	List of emergency contacts in city hall and fire station
Keep the county updated on personnel changes	Contact the county when have personnel changes
Continue cooperation between county roads department and local fire departments during snow emergencies	Keep the lines of communication open with all departments city and county
Pursue partnership with rural water as the system expands	City water department works closely with rural water departments
Encourage residents to keep smoke detectors, sprinkler systems and fire extinguishers maintained in their homes	Yearly operation EDITH to encourage all homes to be fire ready
Continue an annual inspection program for commercial and industrial properties	Use of city codes for inspection of commercial and industrial properties
Continue fire prevention program	Fire department works closely with city to enforce fire prevention
Improve water system to enhance firefighting capacity/ability	Semi-annual check of all water hydrants to assure they are in working condition
Maintain membership in the NFIP	Yes
Maintain, enforce and update floodplain ordinance	Enforce all city codes to prevent flooding issues
Acquire more water pumps	Have an adequate amount of water pumps
Continue with improvement to the storm water system	Working on improving storm water system
Prevent inflow and infiltration into the sanitary sewer	System in place to check the inflow into the sanitary sewer system
Educate the public on maintaining their sump pumps	Sewer Department Head publicizes the need to maintain sump

	pumps
Maintain and keep storm drains clear of debris	Sweep the streets to remove debris from the storm drains
Stockpile sand and sandbags	Sand is available at city garage and fire department is available to help fill the sandbags
Identify, purchase and remove structures from flood hazard areas	All flood areas are identified
Purchase additional trash pumps	Have all necessary pumps available
Improve water system to enhance firefighting capacity/ability	Semi-annual check of all water hydrants to assure they are in working condition
Install rip rap around wastewater treatment facility	Waste water treatment plant is not in flood zone; current grading and plantings protect the plant;
Initiate and enforce burn ban in times of drought or as needed	Burn ban is initiated by county
Establish alternative transportation routes should a road need to be closed	Detours are set up for closed roads
Purchase emergency signs to be used in case of an incident	In the past couple years the city has purchased new signs
Enforce no parking designations at special events	Have a police force taking care of these events with the help of the public works department
Identify fallout shelter locations	City hall
Keep communication lines open with Nuclear Plant in Palo, IA	Communicate with Palo if necessary
Maintain and/or develop a wellhead protection program	Maintain all buildings
Monitor wells in areas of identified contamination	Wells are monitored every day
Monitor the drinking water supply	We daily test drinking water
Identify and map areas of past contamination	Record all testing information
Maintain and/or develop storm water management program	Working on necessary storm water management program
Eliminate and cap private and abandoned wells in the city	All private wells are addressed as necessary
Eliminate the use of septic tank systems in the city limits	Septic tank issues have been addressed
Follow monitoring requirements set forth by the Iowa DNR	In communication with the DNR to assure we are in compliance
Carry out conservation measures such as erosion control and work with the following organizations: Extension, NRCS, Farm Bureau, EPA, DNR, and Soil and water Conservation District	Conservation measures are followed to eliminate erosion problems

Maintain and update anti-virus software	Maintenance program in place to upgrade our software
Secure vulnerable targets, as identified by the LEPC and County EMA with alarms, security cameras and fences	Cameras and security systems are in place
Review and update fire codes as necessary	Work closely with local fire department to assure all buildings are up to code
Continue to cooperate with pipeline owners and operators to ensure locations are marked	Work with pipelines as necessary
Purchase a new tanker and/or pumper	Fire department has a rotation plan for replacement of equipment as necessary
Provide fans and/or cooling shelter	Fans and shelter are available through city and fire department
Encourage community to plant shade trees	County grants available for purchase of trees
Maintain air conditioner(s) in community buildings	Local plumbing and heating business is available for all repairs needed
Keep a supply of drinking water to distribute	Drinking water available through local grocery stores and convenience stores
Encourage the public to receive vaccinations	Vaccines available through hospital and local drug store
Cooperate with any countywide mass vaccination plan	County nurse available for any county wide vaccines needed
Monitor disease outbreak news from the CDC and Iowa Department of Public Health	County nurse notifies us of all disease outbreak information
Develop rationing procedures	Procedures in place
Initiate and enforce burn ban in times of drought or as needed	County initiates burn ban
Restrict water usage should it be necessary	Work with water departments to set up restrictions if needed
Encourage the use of proper materials and construction techniques	Inspections of building projects
Educate city personnel to identify risk areas	Risk assessment meetings to identify areas in need
Install tiling to help water move away from structures	Removal of water from city buildings is in place
Enforce a curfew	Local police department
Continue regular bridge inspections	County does bridge inspections
Place barricades to close dangerous bridges	Public works department
Maintain embargos/weight limits as necessary	County enforces embargos/weight limits
Receive education/training from DOT on the subject	Public works department

Establish detour routes	Police department and public works department
Identify and inventory potential sinkhole sites	Public works director surveys the streets to identify any problems
Educate city personnel to handle a sinkhole situation	Public works department
Secure the area (around a sinkhole)	Barricades set up around the area
Inspect any utility lines that are near a sinkhole	Sumner Municipal Utilities
Enforce the local zoning ordinances	Planning and Zoning committee
Plant trees along water bodies and slopes	Parks department
Clear ditches, streams, and waterways on a regular basis	Public works department and park department work together on this
Encourage floodproofing/elevating structures in the floodplain	Park and public works department
Encourage construction of dikes, levees, dams, and retention ponds	Public works department and park department work together on this
Update flood maps/flood studies for areas throughout the county	Flood maps available through FEMA
Identify bridges and culverts than can cost effectively be reengineered to reduce future flooding	County and City work together on this project
Establish transportation evacuation routes and protocols	Set up with school for buses and work with fire department for help when needed
Develop sandbagging procedures for the community	Sandbags are available through city and fire department. Fire department available to help deliver and set up
Develop and maintain staging area for dumping during cleanup	City recycling building
Maintain pump station	Waste Water Department head available for this
Continue cooperation with county in developing flood mitigation efforts	Work with County Engineer
Continue working with the Bremer County Recovery Coalition	Keep lines of communication open to work with county
Purchase additional parkland in order to increase greens space and reducing surface flow	No need for this
Set a designated number of people to be trained in post-disaster record keeping/damage assessments	We have a disaster assessment group in place
Inform the public of reputable and ill reputable contractors following disasters	Encourage citizens to make sure all contractors are reputable
Encourage all communities to participate in their Local Emergency Planning Commission (LEPC)	Work with other communities on their planning

Maintain and update emergency response plans	Emergency plans are in place in the office for city employees to refer to
Maintain lists of personnel and equipment available to use with response plans	List are available in the city hall
Maintain communication with county contacts	Working relationships between county and city employees
Maintain NIMS compliance	NIMS Compliant

CITY OF TRIPOLI – STATUS OF 2012 HAZARD MITIGATION ACTIVITIES	
Mitigation Action	Committee Determination/Comments
Educate the public	Active; email notifications, quarterly newsletters
Continue training and education for fire departments, law enforcement agencies and ambulance crew personnel	Active – ongoing all the time as required by law
Maintain and acquire materials and equipment for fire departments, law enforcement agencies and ambulance crew personnel	Active – ongoing
Provide emergency shelters for evacuees	Active – ongoing; emergency response plan in place
Maintain mutual aid agreements	Active – ongoing
Maintain tree trimming program	Active; done yearly
Determine locations for potential heating shelters and volunteer organization	Active; emergency response plan in place
Encourage utility providers and developers to place all utilities underground	Not done much on this
Purchase and maintain backup generators	Active – ongoing maintenance
Maintain public works equipment	Active – ongoing
Notify the media on shelter locations	Not done
Install a snow fence around the wastewater treatment facility	Not done
Enforce sidewalk clearance ordinance	Active – ongoing
Maintain use of snow fences in the city/county	Active – ongoing

Use surge protectors to prevent electrical damage to critical and sensitive equipment	?
Backup all digital data	Done
Purchase NOAA weather radios	Not done
Enforce and update building codes, as needed	Active – ongoing
Maintain storm spotter training for local fire departments/deputies and EMS crews	Active – ongoing
Continue enforcement of city sump pump discharge ordinance	Active – ongoing; more difficult to implement
Maintain a list of potential storm sewer projects	Active – ongoing
Make available a cleanup crew for after a storm	?
Placement of lighting arrestors on power lines	Not done
Place alarms on storage facilities containing hazardous materials	Not done
Maintain law enforcement monitoring of large storage supplies	?
Acquire necessary response and detection equipment for city/county employees	Active – ongoing; purchases done when funds are available
Encourage lead based paint and asbestos removal	Active – ongoing
Maintain mutual aid agreements with the Northeast Iowa response Group	?
Keep HAZMAT manuals/information current and easily accessible	Active; there are kept at fire station
Maintain, test, and replace warning sirens	Active – ongoing; tested monthly
Identify areas throughout the city that would substantially benefit from outdoor warning sirens	This is more a county issue
Encourage and maintain enrollment in emergency notification system	Active – ongoing; email notification system has been implemented
Construct or designate a safe room or storm shelter	Not done; not enough money; need a grant
Encourage home owners to keep emergency kits	Done on the county emergency management website and Facebook
Encourage backup power generation for local telephone systems and cellular operations	County level has discussed this issue; not sure where their plan
Maintain list of potential translators to be called upon in case of an emergency	Not done; not sure how to proceed
Maintain or install GPS units in all emergency service and city/county vehicles	As new vehicles are purchased this has become standard
Maintain automatic TTY TDD machines for emergency personnel and city/county employees	Not done

Enhance Standard Operating Procedures for dissemination of information/press releases in the event of a disaster	Active – ongoing; county emergency management coordinator does an excellent job
Continue training and promotion of the Incident Command System	Active – ongoing; as new officials are elected and people hired they do training
Complete continuity of government plan	Active – ongoing; not yet completed
Encourage use of Iowa One call before digging	Active – ongoing; continue to provide citizens flyers provided
Upgrade radio communications equipment as needed	Active - ongoing; currently working with county; 28E agreement signed
Regularly review and amend fire and medical HAZMAT response standard operating procedures	Active – ongoing; departments keep current
Improve standard operating procedures for schools	Not our control
Seek to improve communications with other agencies	Active – ongoing
Keep supply of backup radios and cellphones	Not done
Maintain list of county emergency contacts	Active – ongoing
Keep the county updated on personnel changes	Active – ongoing
Continue cooperation between county roads department and local fire departments during snow emergencies	Active – ongoing
Pursue partnership with rural water as the system expands	No longer an option; we discussed with them and chose to upgrade our system
Encourage residents to keep smoke detectors, sprinkler systems and fire extinguishers maintained in their homes	Active – ongoing
Continue an annual inspection program for commercial and industrial properties	Active – ongoing; Bremer County Building & Zoning does this for us
Continue fire prevention program	Active – ongoing; fire department does a program yearly at school
Improve water system to enhance firefighting capacity/ability	Active – ongoing; just installed larger water main sin six areas of town; replaced hydrants and valves
Maintain membership in the NFIP	Yes; fire department continues to be a member
Maintain, enforce and update floodplain ordinance	Active – ongoing; Bremer County Building & Zoning does this for us
Acquire more water pumps	Two new pumps were purchased this past summer
Continue with improvement to the storm water system	Every street project and curb and gutter project includes storm sewer
Prevent inflow and infiltration into the sanitary sewer	Active – ongoing; when houses sell a sump pump inspection is done; if connected to sewer it must be corrected

Educate the public on maintaining their sump pumps	Active – ongoing
Maintain and keep storm drains clear of debris	Active – ongoing; street department has made this a top priority
Stockpile sand and sandbags	Not done in city; county has these
Identify, purchase and remove structures from flood hazard areas	Ongoing; a home was purchased a few years ago and made into a park
Purchase additional trash pumps	Ongoing; two new pumps were purchased in the past year
Install rip rap around wastewater treatment facility	Active; every few years this is reviewed and more added as needed
Initiate and enforce burn ban in times of drought or as needed	County issues burn bans; we enforce
Maintain and improve signals/signage along roadways and at railroad crossings	Active – ongoing; new street signs were bought last month; new yield/stop signs will be installed
Establish alternative transportation routes should a road need to be closed	Active – ongoing; done as needed; work with IDOT
Purchase emergency signs to be used in case of an incident	New sign was purchased and installed downtown in front of welcome center
Enforce no parking designations at special events	Active – ongoing; portable signs put up as needed
Identify fallout shelter locations	Not done
Keep communication lines open with Nuclear Plant in Palo, IA	Not done on city level; maybe county
Maintain and/or develop a wellhead protection program	Done; on file
Monitor wells in areas of identified contamination	No well identified; only one home well was in city limits and now is hooked to city water
Monitor the drinking water supply	Active – ongoing; daily
Identify and map areas of past contamination	Done
Maintain and/or develop storm water management program	Active; still working on this
Eliminate and cap private and abandoned wells in the city	Done; see above
Eliminate the use of septic tank systems in the city limits	Done; only area one mile east of town is not on city sewer; not feasible
Follow monitoring requirements set forth by the Iowa DNR	Active – ongoing
Carry out conservation measures such as erosion control and work with the following organizations: Extension, NRCS, Farm Bureau, EPA, DNR, and Soil and water Conservation District	Active – ongoing; all new developments are monitored
Maintain and update anti-virus software	All computers have updated and have the anti-virus software

Secure vulnerable targets, as identified by the LEPC and County EMA with alarms, security cameras and fences	Done at water plant; not enough funds for sewer lagoon
Review and update fire codes as necessary	Done; fire department handles
Continue to cooperate with pipeline owners and operators to ensure locations are marked	Active - ongoing
Purchase a new tanker and/or pumper	Rural fire purchased a new pumper a few years ago
Provide fans and/or cooling shelter	Active – ongoing
Encourage community to plant shade trees	Active – ongoing; city paid membership to trees forever
Maintain air conditioner(s) in community buildings	Active; this is done
Keep a supply of drinking water to distribute	Not done; we buy as needed
Encourage the public to receive vaccinations	Active – ongoing; shot clinics are done yearly
Cooperate with any countywide mass vaccination plan	Active – ongoing
Monitor disease outbreak news from the CDC and Iowa Department of Public Health	Active – ongoing
Develop rationing procedures	Not done
Initiate and enforce burn ban in times of drought or as needed	Active – ongoing; county issues burn ban; we enforce
Restrict water usage should it be necessary	Ongoing; when needed
Encourage the use of proper materials and construction techniques	Active – ongoing
Educate city personnel to identify risk areas	Active – ongoing
Install tiling to help water move away from structures	Active – ongoing; storm sewers are built when street projects are done
Enforce a curfew	Police do this daily
Continue regular bridge inspections	Active; per DOT requirements
Place barricades to close dangerous bridges	Active; as needed; ; primarily during flood events or damage
Maintain embargos/weight limits as necessary	Active
Receive education/training from DOT on the subject	Active
Establish detour routes	As needed; road construction, etc.
Identify and inventory potential sinkhole sites	Not done

Educate city personnel to handle a sinkhole situation	Not done
Secure the area (around a sinkhole)	Not done
Inspect any utility lines that are near a sinkhole	Not done
Enforce the local zoning ordinances	City contracts with Bremer County Building & Zoning; enforced at all times
Plant trees along water bodies and slopes	Active – ongoing
Clear ditches, streams, and waterways on a regular basis	Active – ongoing; as needed
Encourage floodproofing/elevating structures in the floodplain	Active – ongoing
Encourage construction of dikes, levees, dams, and retention ponds	Active – ongoing
Update flood maps/flood studies for areas throughout the county	Completed; County is point on
Identify bridges and culverts than can cost effectively be reengineered to reduce future flooding	Done by the county or IDOT
Establish transportation evacuation routes and protocols	Active; emergency response plan in place
Develop sandbagging procedures for the community	Done with the county
Develop and maintain staging area for dumping during cleanup	Active; city purchased land three years ago and uses it weekly
Maintain pump station	Active – ongoing
Continue cooperation with county in developing flood mitigation efforts	Active – ongoing
Continue working with the Bremer County Recovery Coalition	As needed – when meetings are called or a need declared
Purchase additional parkland in order to increase greens space and reducing surface flow	Done; a new park was put in the floodplain
Set a designated number of people to be trained in post-disaster record keeping/damage assessments	Done; city clerk
Inform the public of reputable and ill reputable contractors following disasters	Have not had a disaster to do anything
Encourage all communities to participate in their Local Emergency Planning Commission (LEPC)	Active – ongoing
Maintain and update emergency response plans	Active – ongoing; reviewed yearly
Maintain lists of personnel and equipment available to use with response plans	Active – ongoing; part of the emergency response plan
Maintain communication with county contacts	Active – ongoing; daily
Maintain NIMS compliance	Active – ongoing; newly elected people and employees are required to pass

CITY OF WAVERLY – STATUS OF 2012 HAZARD MITIGATION ACTIVITIES	
Mitigation Action	Committee Determination/Comments
Educate the public	Public Services newsletter; social media information; website information
Train and educate emergency service personnel	Regular training for fire, police and EMS; Emergency management training for city staff
Maintain and acquire materials and equipment for emergency service personnel	City maintains adequate inventory of materials and equipment and uses a schedule for replacing equipment
Maintain mutual aid agreements	Mutual aid agreements for fire protection, police cooperation and operate ambulance service county-wide
Maintain tree trimming program	City Leisure Services and Street Department have an extensive and regular tree trimming operation, including Ash Tree program
Work with local utility companies to develop a program for the burying of existing lines	Coordinate with Waverly Utilities to bury newly installed lines and existing lines when possible
Purchase new generators to provide emergency power in times of need	City maintains portable generators for emergency operation; Waverly Utilities has power generation capacity
Continue to install and update surge protectors on major electric lines	Waverly Utilities has a program to install, maintain and update surge protectors
Develop a NOAA Weather Radio awareness program	City Public Services includes information about weather radios through the newsletter to utility customers
Systematically review, make necessary updates to, and enforce building code requirements	City and County maintain updated building codes
Develop the Cedar River Parkway/Bridge	City has moved forward with the engineering design of the East extension of the Parkway, including a new bridge
Continue enforcement of snow ordinance	City police and staff enforce snow shoveling ordinance
Continue to recruit volunteer first responders and promote these opportunities	City provides ongoing training opportunities for emergency medical responders
Continue to utilize and develop the Code Red System	City has implemented a warning system that is comparable to Code Red
Continue working relationship with Tri-County Drug Task Force	City police continue to participate in the Tri-County Drug Task Force
Expand weather spotter training	City Fire personnel and other volunteers are provided with periodic weather spotter training
Develop a “Tornado Safe Room” awareness program	A specific program has not been implemented but parents and students are made aware of new facilities at the schools
Research and secure grant dollars for shelter and safe room construction	WSR Schools have installed safe rooms in new school construction and school additions
Construct additional storm shelters and tornado safe rooms	WSR Schools have installed safe rooms in new school construction and school additions

Retrofit current facilities to include tornado safe rooms	The High School new addition included a new safe room.
Encourage the inclusion of tornado safe rooms in newly constructed public facilities	The new High School addition includes a safe room
Maintain Crisis Communication Plan	Ongoing planning with Bremer County Emergency management and other agencies
Enhance coordination of disaster plans in the community	Ongoing planning with Bremer County Emergency management and other agencies
Upgrade radio communications equipment as needed	Emergency services providers maintain operational communication equipment
Regularly review and amend fire, medical, and HAZMAT response standard operating procedures	City Fire Department maintains and reviews emergency SOP's
Continue an annual inspection program for commercial and industrial properties	Fire Department does periodic inspection of commercial and industrial properties
Improve water system to enhance firefighting capacity/ability	City has installed new looped water mains; Will install new water mains along Bremer Avenue in 2017-2018
Continue annual fire inspection program	The City will continue fire inspection programs.
Develop a comprehensive list of alternative routes for different fire scenarios	Fire Department trains regularly on fire response throughout the city
Enhance communication amongst the private sector, public sector, media outlets and citizens	The city uses a variety of communication methods, including radio, TV, newsletter and social media
Continue further development of and update of the Storm Water Management Program	City enforces storm water management practices during development projects
Continue participation in the NFIP	Completed, active; membership maintained
Maintain, enforce and update floodplain ordinances as needed	Completed, active; ordinance in place
Continue acquisition and removal of homes from the floodplain	Most at risk properties have been acquired and removed; will continue this for any further properties at risk
Ensure proper training and certification of Floodplain Manager(s)	The floodplain manager receives proper training and supervision using latest mapping resources
Flood proof of structures in the floodplain	City staff enforces rule against development in the special hazard zone
Replace or increase capacity of 3 rd Street bridge	City continues to discuss and debate proper repair or replacement of the 3 rd Street Bridge.
Implement projects identified for the Cedar Lane Bike Path	Engineering for rebuild of Cedar Lane is complete and awaiting construction
Construct a dike and levee system in SE Waverly, near SE 7 th Avenue	City staff has budgeted for planning of flood control measures in SE Waverly
Enhance and maintain storm sewer capacity	Completed 2 nd Street NW storm sewer upgrade project; ongoing as development occurs

Create a regional plan to address flooding concerns including wetland areas and detention ponds	City participates in the Upper Cedar River Watershed Protection Coalition
Monitor and enforce drainage regulations on residential, commercial, and industrial developments	Ongoing as the City develops stricter oversight of development;
Consider dredging the river	Not implemented; determined to be impractical
Complete the Dry Run Creek obstruction and flash flooding analysis and consider other mitigation activities such as removal of the 3 rd St Bridge and Cedar River Trail Bridge	Dry Run Creek project is complete; 3 rd Street Bridge remains the subject of planning; Dam improvements protect Trail Bridge
Maintain a flood response protocol for response, sand bagging, and evacuation procedures	Emergency service providers regularly coordinate emergency response procedures
Provide information on proper ditch and open burning, when permitted, who to contact in case of an emergency, how to recognize the presence of explosive gasses, how to contain and manage an approved open fire and/or ditch burning, and how to react in the event of a fire	Fire Safety programs for public are ongoing by the Fire Dept.; Community Development issues and monitors burning permits
Identify alternative water sources such as dry hydrants and ponds	Fire Department routinely identifies alternative water sources in those areas without hydrants
Maintain inter-governmental cooperation, e.g. cost sharing	Fire, EMS, Police and City Staff maintain cooperation and cost sharing with other agencies
Enforce existing laws	The Police and City Staff regularly enforce existing state laws and local ordinances
Research railway concerns	City has secured federal grant for enhanced crossing gates on 20 th Street NW; ongoing reviews
Determine possible sheltering locations to be used in the event of a nuclear emergency	Not implemented by City Staff; rely upon Bremer County Emergency Management staff for assistance
Monitor the transportation of radioactive chemicals to the best of the city's ability	Police monitor such vehicles as they are notified by IDOT
Continue Wastewater Facility Storm Water Program	City program to identify and mitigate inflow and infiltration of storm water into sanitary sewer system
Follow monitoring requirements set forth by the Iowa DNR	City follows DNR monitoring requirements as a priority
Evaluate current terrorism mitigation efforts	City supports State and National efforts
Increase measures taken to protect and secure the city's critical infrastructure	Increased use of video monitoring; regular inspection of infrastructure
Encourage local utilities to upgrade equipment used to locate and identify underground utility lines	City utility uses best equipment available for such locating
Establish local "cooling sites" for at risk populations such as the elderly and/or the disabled	City has programs and facilities for support of elderly and disabled
Adhere to the Quarantine Plan	City will adhere to any local, State and Federal plans and notifications
Adhere to the current FAD (foreign animal disease) Plan	City will adhere to any local, State and Federal plans and notifications

Evaluate equipment and personnel capacity	City at least annually and often more frequently evaluates equipment and personnel capacity
Continue to enforce City and County guidelines for burning	City police and Community Development enforce ordinances regarding open burning
Continue bridge inspection program	City has Engineering Company under contract for periodic inspection
Explore replacement alternative for bridges	City has development plans for new and replacement bridges for Cedar River Parkway and 3 rd Street SW
Create a zoning ordinance restricting building near the top and bottom of steep sloping cliffs and hills	Not implemented; staff provides awareness to developers of at risk property
Discourage the clearing of trees and shrubbery from cliffs and steep sloping hills.	Staff provides awareness to developers of at risk property
Develop the proper steps to be taken in the event of an earthquake and communicate these procedures to the public	Not implemented; will rely upon Bremer Emergency Management for direction
Continue to make necessary inspections and repairs to existing dam	City has regular program for periodic inspection and maintenance
Review and update Incident Command procedures	Police, Fire and other City Staff are afforded training opportunities for Incident command procedures
Update Emergency Response Plan	Emergency Response Plans are reviewed and updated periodically during training opportunities
Develop a Continuity of Operations Plan	Continuity plans are discussed during staff meetings and training at city and schools
Maintain a list of structures and sites to be used as gathering sites in the event of an emergency situation	City staff has identified structures and sites throughout the community to be used in emergency events
Review and improve education plans and file with the Community Emergency Response Team (CERT)	Working on implementation of this
Install Automatic Vehicle Locators (AVL) in all emergency vehicles	Not implemented

ATTACHMENT 4: PLANNING COMMITTEE & PUBLIC INVOLVEMENT MATERIALS

MEETING #1: NOVEMBER 4, 2015

TO: Waverly Newspapers

FROM: Jacob Tjaden, INRCOG
229 East Park Avenue
Waterloo, Iowa 50703
(319) 235-0311

(Note: Please publish this press release in the next edition of your newspaper. Invoice INRCOG at the above address. Also please provide one publisher's affidavit to INRCOG along with the invoice. Thank you.)

BREMER COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION KICK-OFF PLANNING SESSION MEETING

The Federal Emergency Management Agency (FEMA) recently awarded Bremer County a Hazard Mitigation Planning Grant. Funds will be used to update the county's multi-jurisdictional Hazard Mitigation Plan. The purpose of the plan is two-fold. The plan is a federal requisite to remain eligible for other mitigation grant programs offered by FEMA. FEMA mandates the plan be updated every five (5) years. Second, the plan is designed to create hazard mitigation strategies which can reduce negative impacts caused by natural, technological and human-caused hazards within the county and the incorporated jurisdictions.

This first meeting will review the purpose and benefits of a multi-jurisdictional hazard mitigation plan, project budget, planning process/scope of work, and updating the status of projects as well as the community profiles of participating jurisdictions from the previous plan. This public meeting will be held on Wednesday, November 4th, 2015 at 7:00 pm at the Tripoli City Hall, 303 S Main St., Tripoli, IA 50676.

For questions or comments, contact Jacob Tjaden at INRCOG, (319) 235-0311 or jtjaden@inrcog.org

- PUBLIC MEETING AGENDA-

Bremer County Multi-Jurisdictional
Hazard Mitigation Plan Meeting #1

Date: Wednesday, November 4th, 2015

Time: 7:00 PM

Place: Tripoli City Hall
303 S Main St.
Tripoli, IA 50676

1. Welcome and Introductions
2. Review Meeting Information and Timeline
3. Provide Updates for Existing Mitigation Action Steps
4. Review and Update Community Profiles
5. Set Future Meeting Dates
6. Adjourn

THIS IS A PUBLIC MEETING

MEMBERS OF THE COMMUNITY ARE INVITED TO ATTEND AND PARTICIPATE IN THIS MEETING

For Questions or Comments, contact:
Jacob Tjaden / INRCOG / (319) 235-0311 / jtjaden@inrcog.org

2017 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

Bremer County MJ-HMP Planning Meeting Minutes Planning Meeting #1 / November 4, 2015 / 7:00 PM Tripoli City Hall / Tripoli, Iowa

The Bremer County Multi-Jurisdictional Hazard Mitigation Plan kick-off Meeting was called to order by Jacob Tjaden of the Iowa Northland Regional Council of Governments (INRCOG) at 7:00 pm.

The following persons were in attendance: Randy McKenzie, Bremer County Building Department; Dewey Hildebrandt, Bremer County Board of Supervisors; Kip Ladage, Bremer County EMA; Sue Stapleton, Janesville City Council; Chris Robinson, Janesville City Council; Bryan Destival, Janesville Fire Chief; Sandi Carroll, Janesville Mayor; Traci Berry, Janesville First Responder Director; Doug Bettis, Janesville City Council; Randy Samec, Janesville Police Chief; Blake Franzen, Plainfield City Council; Tom Geise, Plainfield Mayor; Jordan Ladage, Tripoli City Council; DeAnn Lahmann, Tripoli City Clerk; Billy Lehmkuhl, Sumner City Council; David Lease, Sumner Public Works Director; Lois Buhr, Readlyn City Clerk; Dan Flaylock, Readlyn First Assistant Fire Chief; S. Sommerfelds, Readlyn EMS Director; and Jacob Tjaden, INRCOG.

The following jurisdictions were represented at the meeting: Bremer County; cities of Readlyn, Sumner, Tripoli, Plainfield, and Janesville. Jurisdictions invited, but not in attendance, included the cities of Waverly, Denver, and Frederika.

After calling the meeting to order Jacob Tjaden provided an overview of the agenda for the evening, how the planning process will work as well as the scope of the plan.

Tjaden also explained the definition of mitigation and how it relates to hazards in each city and the county. He commented the HMP's purpose is two-fold, which is to become and remain eligible for FEMA mitigation grant funding and more importantly to create and prioritize strategies and actions to reduce negative impacts of hazards at community and regional levels.

The committee divided into groups based on jurisdiction. Communities then reviewed and provided updates to their appendices from the 2012 plan as well as the critical sites inventory maps.

Next, Tjaden provided an overview and process for updating the action steps communities had identified in the previous plan. Communities then proceeded to update the status of their action steps.

All of the jurisdictions had questions regarding the status of their action steps they wished to discuss with elected officials and/or city staff. It was determined each jurisdiction would take the action step worksheet with them to gather additional input. A due date of November 20, 2015 was set for jurisdictions to return the worksheets to Mr. Tjaden.

Before dismissing the committee, a general discussion of the time, location, and day of the week of future meetings was held. It was determined that Wednesday evenings at 7:00 pm worked well with committee members. Tjaden stated the next meeting would likely be held in mid-February, 2016 and would send out a meeting invitation with the time, date, and location, at a later date. The meeting adjourned at 8:45 pm.

Respectfully Submitted,
Jacob Tjaden
Community Planner

Bremer County Multi-Jurisdictional Hazard Mitigation Plan Update Wednesday, November 4th, 2015 – Tripoli City Hall Meeting 1 - Attendance Sign-In Sheet

	Name (please print & sign)	Position/Title Agency/Department	Jurisdiction/ Organization	Email Address	Volunteer or Non-Volunteer
1	Randy McKenzie	Bremer Co. Bldg Dept	Bremer Co.	rmckenzie@co.bremer.iowa.us	volunteer
2	Dewey Hildebrandt	Bremer Co. B.O.S.	Bremer Co.	dhildebrandt@co.bremer.iowa.us	Volunteer
3	Kip Ladage	Bremer Co. EMA	Bremer Co.	kladage@co.bremer.iowa.us	And
4	Sue Stapleton	General Commissioner Janesville City Council	Janesville	S.L.Stapleton@hotmail.com	Volunteer
5	Chris Robinson	Janesville City Council	Janesville	christianrobinson72@gmail.com	Volunteer
6	Bryan Destival	Janesville Fire Chief	Janesville	bddestival@janesvillefire.net	Volunteer
7	Sandi Carroll	Janesville Mayor	Janesville	carroll.sandi@yahoo.com	volunteer
8	Traci Berry	Janesville 1st Responder Director	Janesville	firstresponders@janesville.iowa.gov traci@kaypark.com	volunteer
9	Doug Bettis	Janesville City Council	Janesville	Bettis.doug@janesville.iowa.gov	Volunteer
10	Randy Samec	Janesville Police Chief	Janesville	JanesvillePolice@yahoo.com	And
11	Blake Franzen	Plainfield City Council	Plainfield	FranzenBlake@johndere.com	Volunteer

2017 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

Bremer County Multi-Jurisdictional Hazard Mitigation Plan Update
Attendance Sign-In Sheet, Meeting 1

Name (please print & sign)	Position/Title Agency/Department	Jurisdiction/ Organization	Email Address	Volunteer or Non-Volunteer
Tom Geise <i>[Signature]</i>	Mayor	Plainfield	tedgeise@qgma.com	Volunteer
Jedyn Lodage <i>[Signature]</i>	City Council	Tripoli	jedman_2011@yahoo.com	Volunteer
DeAnn Lahmann <i>[Signature]</i>	Clerk	Tripoli	tripdi@butler-bremer.com	Volunteer
DeAnn Lahmann <i>[Signature]</i>	City Council	Sumner	BillyT@Yahoo.com	Volunteer
Billy T. Johnson <i>[Signature]</i>	PWD	Sumner	Shesee@qgsummer.com	
Lois Buhr <i>[Signature]</i>	City Clerk	Readyln	cityhallreadyln@netins.net	Volunteer
Ran Blaylock <i>[Signature]</i>	1st Asst. Fire Chief	Acadlynn	randblaylock1999@gmail.com	Vol
Sherry Sommerfeldt <i>[Signature]</i>	EMS Director	Readyln	Sherry.Sommerfeldt@qgma.com	Vol
Jacob Tjeden <i>[Signature]</i>	Planner	ARCOC	_____	Not Volunteer

STATE OF IOWA

ss:

Bremer County,

CERTIFICATION OF PUBLICATION

I, Carrie Fowler being duly sworn
depose and say that I am Office Manager of

THE WAVERLY NEWSPAPERS, a weekly newspaper published at
Waverly, Bremer County, Iowa, and I further state that the annexed and
subjoined notice was duly published in said paper, as often as once in
each week for 1 week(s), commencing on the 27th
day of October, 2015, and ending on the _____ day of

_____, 2015.
Carrie Fowler

Subscribed and sworn to before me this 27th
day of October, 2015.

Susan M Hosto
Notary Public in and for Bremer County, Iowa

Printer's Fee, \$ 18.01



*Charge for additional certificates

Public Notice BREMER COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION KICK-OFF PLANNING

The Federal Emergency Management Agency (FEMA) recently awarded Bremer County a Hazard Mitigation Planning Grant. Funds will be used to update the county's multi-jurisdictional Hazard Mitigation Plan. This is a critical first step in the process of updating the plan to remain eligible for other mitigation grant programs offered by FEMA. FEMA mandates that the plan be updated every five (5) years. Second, the plan is designed to create hazard mitigation strategies which can reduce negative impacts caused by natural, technological and human-caused hazards to the county and the incorporated jurisdictions.

This first meeting will review the purpose and benefits of a multi-jurisdictional hazard mitigation plan, project budget, planning process, and the status of the status of projects as well as the community profiles of participating jurisdictions from the previous plan. This public meeting will be held on Wednesday, November 4th, 2015, at 10:00 AM in the Trecoil Community Center, 303 S Main St., Tripoli, IA 50676.

For questions or comments, contact Jacob Tjeden at ARCOC, (815) 285-0311 or jtjeden@aqg.org

MEETING #2: DECEMBER 15, 2015

TO: Waverly Newspapers

FROM: Jacob Tjaden, INRCOG
229 East Park Avenue
Waterloo, Iowa 50703
(319) 235-0311

(Note: Please publish this press release once in the next editions of the Waverly Democrat and Bremer County Independent. Invoice INRCOG at the above address. Also please provide one publisher's affidavit to INRCOG along with the invoice. Thank you.)

BREMER COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLANNING MEETING

The Federal Emergency Management Agency (FEMA) recently awarded Bremer County a Hazard Mitigation Planning Grant. Funds will be used to update the county's multi-jurisdictional Hazard Mitigation Plan. The purpose of the plan is two-fold. The plan is a federal requisite to remain eligible for other mitigation grant programs offered by FEMA. FEMA mandates the plan be updated every five (5) years. Second, the plan is designed to create hazard mitigation strategies which can reduce negative impacts caused by natural, technological and human-caused hazards within the county and the incorporated jurisdictions.

This meeting will review the purpose and benefits of a multi-jurisdictional hazard mitigation plan, project budget, planning process/scope of work, and updating the status of projects as well as the community profiles of participating jurisdictions from the previous plan. This public meeting will be held on Tuesday, December 15, 2015 at 7:00 pm at Waverly City Hall, 200 1st Ave. NE Waverly, IA 50677.

For questions or comments, contact Jacob Tjaden at INRCOG, (319) 235-0311 or jtjaden@inrcog.org

- PUBLIC MEETING AGENDA -

Bremer County Multi-Jurisdictional Hazard Mitigation Plan Meeting

Date: December 15, 2015

Time: 7:00 PM

Place: Waverly City Hall
200 1st Ave. NE
Waverly, IA 50677

1. Welcome and Introductions
2. Review Meeting Information and Timeline
3. Provide Updates for Existing Mitigation Action Steps
4. Review and Update Community Profiles
5. Set Future Meeting Dates
6. Adjourn

THIS IS A PUBLIC MEETING

MEMBERS OF THE COMMUNITY ARE INVITED TO ATTEND AND PARTICIPATE IN THIS MEETING

For Questions or Comments, contact:
Jacob Tjaden / INRCOG / (319) 235-0311 / jtjaden@inrcog.org

2017 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

Bremer County MJ-HMP Planning Meeting Minutes Planning Meeting #2 / December 15, 2015 / 7:00 PM Waverly City Hall / Waverly, Iowa

The second Bremer County Multi-Jurisdictional Hazard Mitigation Plan kick-off meeting was called to order by Jacob Tjaden of the Iowa Northland Regional Council of Governments (INRCOG) at 7:00 pm.

There were three jurisdictions with representation at the meeting, these were the cities of: Denver, Frederika, and Waverly. This residual kick-off meeting was held as representatives from these three cities were unable to attend the first meeting on November 4, 2015.

The following persons were in attendance: Tab Ray, Waverly Leisure Services Director; Neil Whitney, Frederika Mayor; Sylvan Mutschler, Frederika resident; Joel Wikner, Denver City Council; Larry Farley, Denver City Administrator; Brock Farley, Denver resident; and Jacob Tjaden, INRCOG Planner.

After calling the meeting to order Jacob Tjaden provided an overview of the agenda for the evening, how the planning process will work as well as the scope of the plan.

Tjaden also explained the definition of mitigation and how it relates to hazards in each city and the county. He commented the HMP's purpose is two-fold, which is to become and remain eligible for FEMA mitigation grant funding and more importantly to create and prioritize strategies and actions to reduce negative impacts of hazards at community and regional levels.

The committee divided into groups based on jurisdiction. Communities then reviewed and provided updates to their appendices from the 2012 plan as well as the critical sites inventory maps.

Next, Tjaden provided an overview and process for updating the action steps communities had identified in the previous plan. Communities then proceeded to update the status of their action steps.

All of the jurisdictions had questions regarding the status of their action steps they wished to discuss with elected officials and/or city staff. It was determined each jurisdiction would take the action step worksheet with them to gather additional input. A due date of December 31, 2015 was set for jurisdictions to return the worksheets to Mr. Tjaden.

Tjaden stated the next meeting would likely be held in mid-late February, 2016 and would send out a meeting invitation with the time, date, and location, at a later date. The meeting adjourned at 8:05 pm.

Respectfully Submitted,
Jacob Tjaden
Community Planner

Bremer County Multi-Jurisdictional Hazard Mitigation Plan Update Tuesday, December 15, 2015 – Waverly City Hall Sign-In Sheet

Name (please print & sign)	Position/Title Agency/Department	Jurisdiction/ Organization	Email Address	Volunteer or Non-Volunteer
Tab Ray	Leisure Services Director	City of Waverly	t.tab@waverly.iowa.us	Non
Neil Whitney	Mayor	City of Frederika	Whitney@Butler-Bremer.com	Non
Sylvan Mutschler	city representative	City of Frederika	mutschler@aol.com	Vol
Joel Wikner	Council Member	City of Denver		Non
Larry Farley	City Administrator	City of Denver	larry.farley@cityofdenveria.org	Vol-Observer
Jacob Tjaden	Planner	INRCOG		Vol
Brock Farley		City of Denver		Vol

STATE OF IOWA

ss:

Bremer County,

CERTIFICATION OF PUBLICATION

I, Carrie Fowler being duly sworn
depose and say that I am Office Manager of

THE WAVERLY NEWSPAPERS, a weekly newspaper published at
Waverly, Bremer County, Iowa, and I further state that the annexed and
subjoined notice was duly published in said paper, as often as once in
each week for 2 week(s), commencing on the 18th

day of December, 2015, and ending on the 30th day of
December, 2015.

Carrie Fowler

Subscribed and sworn to before me this 3rd
day of December, 2015.

Susan M Hosto
Notary Public in and for Bremer County, Iowa

Printer's Fee, \$ 28.00*



*Charge for additional certificates

Public Notice

BREMER COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLANNING MEETING
The Federal Emergency Management Agency (FEMA) recently awarded Bremer County a Hazard Mitigation Planning Grant. Funds will be used to update the County's multi-jurisdictional Hazard Mitigation Plan. The purpose of the plan is to remain eligible for other mitigation grant programs offered by FEMA. FEMA mitigation grants are awarded every five (5) years. Second, the plan is designed to create hazard mitigation strategies which can reduce negative impacts caused by natural, technological and human-caused hazards within the county and the incorporated jurisdictions.
This meeting will review the purpose and benefits of a multi-jurisdictional hazard mitigation plan. Agenda topics include: process, scope of work, and updating the status of projects as well as the community profiles of participating jurisdictions from the previous plan. This public meeting is being held on Wednesday, December 15, 2015 at 7:00 pm at Waverly City Hall, 200 1st Ave. NE Waverly, IA 50677.
For questions or comments, contact Jacob Tjaden at INRCOG, (319) 235-0311 or jacob.tjaden@incog.org. The Bremer County Hazard Mitigation Plan is being published on December 1st, 2015 and the Waverly Democrat on December 3rd, 2015.

Public Notice

BREMER COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLANNING MEETING
The Federal Emergency Management Agency (FEMA) recently awarded Bremer County a Hazard Mitigation Planning Grant. Funds will be used to update the County's multi-jurisdictional Hazard Mitigation Plan. The purpose of the plan is to remain eligible for other mitigation grant programs offered by FEMA. FEMA mitigation grants are awarded every five (5) years. Second, the plan is designed to create hazard mitigation strategies which can reduce negative impacts caused by natural, technological and human-caused hazards within the county and the incorporated jurisdictions.
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For questions or comments, contact Jacob Tjaden at INRCOG, (319) 235-0311 or jacob.tjaden@incog.org. The Bremer County Hazard Mitigation Plan is being published on December 1st, 2015 and the Waverly Democrat on December 3rd, 2015.

MEETING #3: APRIL 20, 2016

TO: Waverly Newspapers

FROM: Jacob Tjaden, INRCOG
229 East Park Avenue
Waterloo, Iowa 50703
(319) 235-0311

(Note: Please publish this press release once in the next editions of the Waverly Democrat and Bremer County Independent. Invoice INRCOG at the above address. Also please provide one publisher's affidavit to INRCOG along with the invoice. Thank you.)

**BREMER COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION
PLANNING MEETING**

The Federal Emergency Management Agency (FEMA) recently awarded Bremer County a Hazard Mitigation Planning Grant. Funds will be used to update the county's multi-jurisdictional Hazard Mitigation Plan. The purpose of the plan is two-fold. The plan is a federal requisite to remain eligible for other mitigation grant programs offered by FEMA. FEMA mandates the plan be updated every five (5) years. Second, the plan is designed to create hazard mitigation strategies which can reduce negative impacts caused by natural, technological and human-caused hazards within the county and the incorporated jurisdictions.

This meeting will review the purpose, process, and benefits of a multi-jurisdictional hazard mitigation plan; updates to community profiles; and discuss potential impacts of hazards. This public meeting will be held on Wednesday, April 20 at 7:00 PM at the Tripoli City Hall, 303 S Main St. Tripoli, IA 50676

For questions or comments, contact Jacob Tjaden at INRCOG, (319) 235-0311 or jtjaden@inrcog.org

- PUBLIC MEETING AGENDA-

**Bremer County Multi-Jurisdictional
Hazard Mitigation Plan Meeting #2**

Date: Wednesday, April 20, 2016

Time: 7:00 PM

Place: Tripoli City Hall
303 S Main St.
Tripoli, IA 50676

1. Welcome and Introductions
2. Review Meeting Information and Timeline
3. Review and Update Community Profiles
4. Evaluate Hazards
5. Set Future Meeting Dates
6. Adjourn

THIS IS A PUBLIC MEETING

MEMBERS OF THE COMMUNITY ARE INVITED TO ATTEND AND PARTICIPATE IN THIS MEETING

For Questions or Comments, contact:
Jacob Tjaden / INRCOG / (319) 235-0311 / jtjaden@inrcog.org

2017 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

Bremer County MJ-HMP Planning Meeting Minutes Planning Meeting #2 / December 15, 2015 / 7:00 PM Waverly City Hall / Waverly, Iowa

The second Bremer County Multi-Jurisdictional Hazard Mitigation Plan kick-off meeting was called to order by Jacob Tjaden of the Iowa Northland Regional Council of Governments (INRCOG) at 7:00 pm.

There were three jurisdictions with representation at the meeting, these were the cities of: Denver, Frederika, and Waverly. This residual kick-off meeting was held as representatives from these three cities were unable to attend the first meeting on November 4, 2015.

The following persons were in attendance: Tab Ray, Waverly Leisure Services Director; Neil Whitney, Frederika Mayor; Sylvan Mutschler, Frederika resident; Joel Wikner, Denver City Council; Larry Farley, Denver City Administrator; Brock Farley, Denver resident; and Jacob Tjaden, INRCOG Planner.

After calling the meeting to order Jacob Tjaden provided an overview of the agenda for the evening, how the planning process will work as well as the scope of the plan.

Tjaden also explained the definition of mitigation and how it relates to hazards in each city and the county. He commented the HMP's purpose is two-fold, which is to become and remain eligible for FEMA mitigation grant funding and more importantly to create and prioritize strategies and actions to reduce negative impacts of hazards at community and regional levels.

The committee divided into groups based on jurisdiction. Communities then reviewed and provided updates to their appendixes from the 2012 plan as well as the critical sites inventory maps.

Next, Tjaden provided an overview and process for updating the action steps communities had identified in the previous plan. Communities then proceeded to update the status of their action steps.

All of the jurisdictions had questions regarding the status of their action steps they wished to discuss with elected officials and/or city staff. It was determined each jurisdiction would take the action step worksheet with them to gather additional input. A due date of December 31, 2015 was set for jurisdictions to return the worksheets to Mr. Tjaden.

Tjaden stated the next meeting would likely be held in mid-late February, 2016 and would send out a meeting invitation with the time, date, and location, at a later date. The meeting adjourned at 8:05 pm.

Respectfully Submitted,
Jacob Tjaden
Community Planner

Bremer County Multi-Jurisdictional Hazard Mitigation Plan Update Wednesday, April 20, 2016 - Tripoli City Hall Meeting 2 - Attendance Sign-In Sheet

Name (please print & sign)	Position/Title Agency/Department	Jurisdiction/ Organization	Email Address	Volunteer or Non-Volunteer
Bill Wergor <i>[Signature]</i>	City Attorney	Waverly	wdwerger@ci.waverly.iowa.us	NV
Bruce Furrer	City Council	Plainfield		V
Mike Fanger	City Council	Plainfield		V
David Lehman	Board of Supervisors	Bremer County		V
David Schwan	Board of Supervisors	Bremer Co.		V
Keri Kammerer	Board of Supervisors	Bremer Co.		V
Ken Kinn	Board of Supervisors	Bremer Co.		V
Tim Neil	Building Official	Bremer Co.		V
Tim Neil	Building Official	Bremer Co.		V
Randall McKenzie	Board of Supervisors	Bremer Co.		V
Dewey Hildebrandt	Interim-Bremer County FEMA	Bremer Co.	bertasab@uni.edu	V
Dewey L. Hildebrandt	Interim-Bremer County FEMA	Bremer Co.		V
Susan Burton	Bremer Co.	Bremer Co.		V
Susan Burton	Bremer Co.	Bremer Co.		V
Bob Janday	Bremer Co.	Bremer Co.		NV
Maddi Friedrich	SFD	Bremer Co.		NV
Coly Friesse	Sumner PD	Sumner		NV

2017 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

Bremer County Multi-Jurisdictional Hazard Mitigation Plan Update
Attendance Sign-In Sheet, Meeting #2, 4/20/2016

	Name (please print & sign)	Position/Title Agency/Department	Jurisdiction/ Organization	Email Address	Volunteer or Non-Volunteer
12	Dave Pense	Sumner PWD	Sumner City		No
13	Billy Schindler	Sumner City Council	Sumner Iowa		✓
14	Alan Junker	Sumner High Airt	Sumner IA		
15	Daniel Blaylock	Sumner High Airt	Sumner IA		Vol.
16	James Busbee	City Supt.	City of Redlyn		Vol.
17	Bing Fortsch	City Council	Redlyn		Vol
18	Sylvan Mutschler	Fire Dept City Rep. For Milgha	Fredericks		Vol
19	Lara Farley	City Administrator	Denver		Vol
20	Brock Falley	Citizen	Denver		Vol
21	Brendt Bernard	Tripoli Mayor	Tripoli	brendtbernard@gmail.com	
22	Jacob Tjaden	INRCOG	Planner		NV

Public Notice BREMER COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION

The Federal Emergency Management Agency (FEMA) recently awarded Bremer County a Hazard Mitigation Planning Grant. Funds from this grant will be used to update the county's multi-jurisdictional Hazard Mitigation Plan. The purpose of the plan is to remain eligible for other federal grants and programs offered by FEMA. FEMA mandates that the plan be updated every five (5) years. Second, the plan is designed to create hazard mitigation strategies which can reduce negative impacts caused by natural, technological and human-caused hazards within the county and the incorporated jurisdictions.

This meeting will review the purpose, process, and benefits of a multi-jurisdictional hazard mitigation plan; updates to community profiles; and discuss potential impacts of hazards. This public meeting will be held on Wednesday, April 20 at 7:00 PM in the Tripoli City Hall, 303 S Main St, Tripoli, IA 50676.

For questions or comments, contact Jacob Tjaden at (319) 235-0311 or jtjaden@inrcog.org.

Published in the Bremer County Recorder on April 12, 2016 and the Waverly Democrat on April 14, 2016.

Public Notice BREMER COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION

The Federal Emergency Management Agency (FEMA) recently awarded Bremer County a Hazard Mitigation Planning Grant. Funds from this grant will be used to update the county's multi-jurisdictional Hazard Mitigation Plan. The purpose of the plan is to remain eligible for other federal grants and programs offered by FEMA. FEMA mandates that the plan be updated every five (5) years. Second, the plan is designed to create hazard mitigation strategies which can reduce negative impacts caused by natural, technological and human-caused hazards within the county and the incorporated jurisdictions.

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For questions or comments, contact Jacob Tjaden at (319) 235-0311 or jtjaden@inrcog.org.

Published in the Bremer County Recorder on April 12, 2016 and the Waverly Democrat on April 14, 2016.

STATE OF IOWA
Bremer County,

ss:

CERTIFICATION OF PUBLICATION

I, Kim Franzen being duly sworn
do hereby certify that I am Office Manager of
THE WAVERLY NEWSPAPERS, a weekly newspaper published at
Waverly, Bremer County, Iowa, and I further state that the annexed and
subjoined notice was duly published in said paper, as often as once in
each week for 1 week(s), commencing on the 12th
day of April, 2016, and ending on the 14th day of
April, 2016.

Kim K Franzen
Subscribed and sworn to before me this 10th
day of May, 2016.

Carrie Fowler
Notary Public in and for Bremer County, Iowa

Printer's Fee, \$ 40.26 *

*Charge for additional certificates



MEETING #4: MAY 9, 2016

C

TO: Waverly Newspapers

FROM: Jacob Tjaden, INRCOG
229 East Park Avenue
Waterloo, Iowa 50703
(319) 235-0311

(Note: Please publish this press release once in the next editions of the Waverly Democrat and Bremer County Independent. Invoice INRCOG at the above address. Also please provide one publisher's affidavit to INRCOG along with the invoice. Thank you.)

**BREMER COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION
PLANNING MEETING**

The Federal Emergency Management Agency (FEMA) recently awarded Bremer County a Hazard Mitigation Planning Grant. Funds will be used to update the county's multi-jurisdictional Hazard Mitigation Plan. The purpose of the plan is two-fold. The plan is a federal requisite to remain eligible for other mitigation grant programs offered by FEMA. FEMA mandates the plan be updated every five (5) years. Second, the plan is designed to create hazard mitigation strategies which can reduce negative impacts caused by natural, technological and human-caused hazards within the county and the incorporated jurisdictions.

This meeting will review the purpose, process, and benefits of a multi-jurisdictional hazard mitigation plan; updates to community profiles; and discuss and evaluate potential impacts of hazards. This public meeting will be held on Thursday, May 19 at 7:00 PM at the Tripoli City Hall, 303 S Main St. Tripoli, IA 50676

For questions or comments, contact Jacob Tjaden at INRCOG, (319) 235-0311 or jtjaden@inrcog.org

- PUBLIC MEETING AGENDA-

**Bremer County Multi-Jurisdictional
Hazard Mitigation Plan Meeting #3**

Date: Thursday, May 19, 2016

Time: 7:00 PM

Place: Tripoli City Hall
303 S Main St.
Tripoli, IA 50676

1. Welcome and Introductions
2. Review Meeting Information and Timeline
3. Review and update Hazard Assessment Scores
4. Identify potential mitigation actions and areas of concern for top hazards
5. Review and update Community Profiles
6. Adjourn

THIS IS A PUBLIC MEETING

MEMBERS OF THE COMMUNITY ARE INVITED TO ATTEND AND PARTICIPATE IN THIS MEETING

For Questions or Comments Contact:
Jacob Tjaden / INRCOG / (319) 235-0311 / jtjaden@inrcog.org

Bremer County MJ-HMP Planning Meeting Minutes

Planning Meeting #3 / May 19, 2016 / 7:00 PM

Tripoli City Hall / Tripoli, Iowa

The Bremer County Multi-Jurisdictional Hazard Mitigation Plan kick-off Meeting was called to order by Jacob Tjaden of the Iowa Northland Regional Council of Governments (INRCOG) at 7:00 pm.

The following persons were in attendance: Randy McKenzie, Bremer County Building Official; Dewey Hildebrandt, Bremer County Supervisor; Kip Ladage, Bremer County EMA; Tim Neil, Bremer County Supervisor; Joel Wikner, Denver City Council; Larry Farley, Denver City Administrator; Sue Stapleton, Janesville City Council; Bryan Destival, Janesville Fire Chief; Sandi Carroll, Janesville Mayor; Dustin Mooty, Janesville Police; Andy Lunk, Plainfield; Tom Geise, Plainfield Mayor; David Lehman, Plainfield City Council; Loui Burh, Readlyn City Clerk; Dan Blaylock, Readlyn; Barry Fortsch, Readlyn City Council; Dave Waskow, Sumner Mayor; Tim Duhrkopf, Sumner Fire Chief; Cindy Asmus, Frederika City Clerk; Jordan Ladage, Tripoli City Council; DeAnn Lahmann, Tripoli City Clerk; Mike Cherry, Waverly Public Works Director; Jacob Tjaden, Community Planner INRCOG.

The following jurisdictions were represented at the meeting: Bremer County; cities of Denver, Frederika, Janesville, Plainfield, Readlyn, Tripoli, Sumner, and Waverly.

After calling the meeting to order Jacob Tjaden provided an overview of the agenda for the evening, how the planning process will work as well as the scope of the plan.

After the introduction, the committee members divided into their respective jurisdictions and began planning discussions. The hazard scores, completed at the previous meeting, were reviewed and amended as needed.

The next item focused on was identifying new or existing mitigation action steps communities are or are interested in pursuing. Each committee focused on their top five hazards, as identified from the hazard scoring formula.

Before dismissing the committee, Tjaden commented that the next group meeting would likely be towards the end of summer at the same time and location, but the date has yet been set. The meeting adjourned at 8:40 pm.

Respectfully Submitted,
Jacob Tjaden
Community Planner

Bremer County Multi-Jurisdictional Hazard Mitigation Plan Update
Thursday, May 19, 2016 - Tripoli City Hall
Meeting 3 - Attendance Sign-In Sheet

	Name (please print & sign)	Position/Title Agency/Department	Jurisdiction/ Organization	Email Address	Volunteer or Non-Volunteer
1	Dewey Hildebrandt	Bremer Co. Supervisor			Vol
2	Tim Neil	Bremer Co Supervisor			Vol
3	Randy McKenzie	Bremer Co. Bldg Off			Vol.
4	Kip Ladage	Bremer EMA			
5	Andy Lunk	City of Plainfield			Non
6	Tom Geise	Mayor of Plainfield Council Member			Vol
7	David Lehman	Plainfield City Council			Vol
8	Dave Waskow	Mayor of Sumner			Non
9	Tim Duhrkopf	Fire Chief	Sumner		Vol.
10	Barry Fortsch	City Council	Readlyn		
11	Dan Blaylock Sandi Carroll	Dist. Fire Chief	Readlyn		Vol.

2017 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

Bremer County Multi-Jurisdictional Hazard Mitigation Plan Update
Attendance Sign-In Sheet, Meeting #3, 5/19/2016

Name (please print & sign)	Position/Title Agency/Department	Jurisdiction/ Organization	Email Address	Volunteer or Non-Volunteer
12 Lois Buhr	City Clerk	City of Readlyn	cityhallreadlyn@netins.net	
13 Jordan Ladage	City Council	City of Tripoli	jordan_2011@yahoo.com	✓
14 DeAnn Lahmann	City Clerk	City of Tripoli	tripoli@butler- bremer.com	N-V
15 Cindy Asmus	City Clerk	City of Fredericks	cindy@butler-bremer. com	N-V
16 Larry Faltay	City Administrator	City of Denver	larry.faltay@cityofdenver.iowa.com	N-V
17 Joel Wilkner	City Council	City of Denver		✓
18 Mike Cherry	Public Works Dir.	City of Waverly	mike@ci.waverly.iowa.us	N-V
19 Dustin Muoty	Police Officer	City of Janesville	Janesville Police Dept dustinmuoty@janesville.org	N-V
20 Randy Sams	Police	City of Janesville		
21 Bryan Destini	J'sville Fire Chief	J'sville Fire	bryandestini@gmail.com	✓
22 Sue Stayer	City Council Janesville	Janesville	S. Stayer@cityofjanesville.org	

Bremer County Multi-Jurisdictional Hazard Mitigation Plan Update
Attendance Sign-In Sheet, Meeting #3, 5/19/2016

Name (please print & sign)	Position/Title Agency/Department	Jurisdiction/ Organization	Email Address	Volunteer or Non-Volunteer
23 Sandi Carroll	Mayor	Janesville	carroll.sandi@yahoo.com	
24 Jacob Faden	Planner	Janesville		N-V
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STATE OF IOWA

ss: Bremer County,

CERTIFICATION OF PUBLICATION

I, Kim Franzen being duly sworn
depose and say that I am Office Manager of
THE WAVERLY NEWSPAPERS, a weekly newspaper published at
Waverly, Bremer County, Iowa, and I further state that the annexed and
subjoined notice was duly published in said paper, as often as once in
each week for 1 week(s), commencing on the 10th
day of May, 2016, and ending on the 12th day of
May, 2016.

Kim K Franzen
Subscribed and sworn to before me this 12th
day of May, 2016.

Notary Public in and for Bremer County, Iowa

Printer's Fee, \$ 39.76 *



*Charge for additional certificates

**Public Notice
BREMER COUNTY MULTI-
JURISDICTIONAL HAZARD
MITIGATION
PLANNING MEETING**

The Federal Emergency Management Agency (FEMA) recently awarded Bremer County a Hazard Mitigation Planning Grant. Funds will be used to update the county's multi-jurisdictional Hazard Mitigation Plan. The purpose of this meeting is two-fold. The plan is a federal requisite to remain eligible for other mitigation grant programs offered by FEMA. FEMA mandates the plan be updated every five years. Second, the plan is designed to create hazard mitigation strategies which can reduce negative impacts caused by natural hazards within the county and the incorporated jurisdictions.

This meeting will review the purpose, process, and benefits of a multi-jurisdictional hazard mitigation plan; updates to community profiles; and discuss and evaluate potential impacts of hazards. This public meeting will be held on Thursday, May 19 at 7:00 PM at the Tripoli City Hall, 303 S Main St, Tripoli, IA 50676.

For questions or comments, contact Jacob Tiedel at INRCOG, (319) 235-0311 or jtiedel@inrcog.org.

Published in the Bremer County Independent on May 10, 2016.

**Public Notice
BREMER COUNTY MULTI-
JURISDICTIONAL HAZARD
MITIGATION
PLANNING MEETING**

The Federal Emergency Management Agency (FEMA) recently awarded Bremer County a Hazard Mitigation Planning Grant. Funds will be used to update the county's multi-jurisdictional Hazard Mitigation Plan. The purpose of this meeting is two-fold. The plan is a federal requisite to remain eligible for other mitigation grant programs offered by FEMA. FEMA mandates the plan be updated every five years. Second, the plan is designed to create hazard mitigation strategies which can reduce negative impacts caused by natural hazards within the county and the incorporated jurisdictions.

This meeting will review the purpose, process, and benefits of a multi-jurisdictional hazard mitigation plan; updates to community profiles; and discuss and evaluate potential impacts of hazards. This public meeting will be held on Thursday, May 19 at 7:00 PM at the Tripoli City Hall, 303 S Main St, Tripoli, IA 50676.

For questions or comments, contact Jacob Tiedel at INRCOG, (319) 235-0311 or jtiedel@inrcog.org.

Published in the Bremer County Independent on May 10, 2016.

MEETING #5: NOVEMBER 22, 2016

TO: Waverly Newspapers

FROM: Jacob Tjaden, INRCOG
229 East Park Avenue
Waterloo, Iowa 50703
(319) 235-0311

(Note: Please publish this press release once in the next editions of the Waverly Democrat and Bremer County Independent. Invoice INRCOG at the above address. Also please provide one publisher's affidavit to INRCOG along with the invoice. Thank you.)

**BREMER COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION
PLANNING MEETING**

The Federal Emergency Management Agency (FEMA) recently awarded Bremer County a Hazard Mitigation Planning Grant. Funds will be used to update the county's multi-jurisdictional Hazard Mitigation Plan. The purpose of the plan is two-fold. The plan is a federal requisite to remain eligible for other mitigation grant programs offered by FEMA. FEMA mandates the plan be updated every five (5) years. Second, the plan is designed to create hazard mitigation strategies which can reduce negative impacts caused by natural, technological and human-caused hazards within the county and the incorporated jurisdictions.

This meeting will review and make updates the current draft plan, including hazard scores, current mitigation strategies, and future mitigation actions. This public meeting will be held on Tuesday, November 22nd at 7:00 PM at the Tripoli City Hall, 303 S Main St. Tripoli, IA 50676

For questions or comments, contact Jacob Tjaden at INRCOG, (319) 235-0311 or jtjaden@inrcog.org

- PUBLIC MEETING AGENDA-

Bremer County Multi-Jurisdictional
Hazard Mitigation Plan Meeting #4

Date: Tuesday, November 22, 2016

Time: 7:00 PM

Place: Tripoli City Hall
303 S Main St.
Tripoli, IA 50676

1. Welcome and Introductions
2. Review Meeting Information and Timeline
3. Review Community Profiles
4. Finalize Hazard Assessment Scores
5. Finalize Mitigation Actions
6. Adjourn

THIS IS A PUBLIC MEETING

MEMBERS OF THE COMMUNITY ARE INVITED TO ATTEND AND PARTICIPATE IN THIS MEETING

For question, contact:
Jacob Tjaden / INRCOG / (319) 235-0311 / jtjaden@inrcog.org

Bremer County MJ-HMP Planning Meeting Minutes

Planning Meeting #4 / November 22, 2016 / 7:00 PM
Tripoli City Hall / Tripoli, Iowa

The Bremer County Multi-Jurisdictional Hazard Mitigation Plan kick-off Meeting was called to order by Jacob Tjaden of the Iowa Northland Regional Council of Governments (INRCOG) at 7:00 pm.

The following persons were in attendance: Randy McKenzie, Bremer County Building Official; Ken Kammeyer, Bremer County Supervisor;; Tim Neil, Bremer County Supervisor; Andy Lunk, Plainfield; Tom Geise, Plainfield Mayor; David Lehman, Plainfield City Council; DeAnn Lahmann, Tripoli City Clerk; Mike Cherry, Waverly Public Works Director; Sylvan M Ryan McKinley, Community Planner, INRCOG; Jacob Tjaden, Community Planner, INRCOG.

The following jurisdictions were represented at the meeting: Bremer County; cities of Plainfield, Waverly, Frederika, and Tripoli.

After calling the meeting to order, Tjaden provided an overview of the remaining HMP timeline, including when plan edits are due, intended date of county approval, and tentative submission date.

Then jurisdictions reviewed, made updates, and comments on city maps. Next, committee members reviewed and made updates to their draft appendices.

Following this, committee members reviewed/modified the status of their 2012 HMP action steps. Finally, each jurisdiction completed an "Capabilities Inventory" worksheet.

The meeting adjourned at 8:40 pm.

Respectfully Submitted,
Jacob Tjaden
Community Planner

Bremer County Multi-Jurisdictional Hazard Mitigation Plan Update
Tuesday, November 22, 2016 – Tripoli City Hall
Meeting 4 - Attendance Sign-In Sheet

	Name (please print & sign)	Position/Title Agency/Department	Jurisdiction/ Organization	Email Address (to receive relevant HMP plan updates)	Volunteer or Non-Volunteer
1	Tim Neil	Board of Supervisors			Non Volunteer
2	Ken Kammeyer	Board of Supervisors			Non
3	Randy McKenzie	Building Official			Non
4	Andy Lunk	Maintenance Supervisor City of Plainfield			Non
5	David Lehman	City Council City of Plainfield			Volunteer
6	Thomas Geise	Mayor City of Plainfield			Volunteer
7	Mike Cherry	Director of Public Works & City Engineer	City of Waverly		Non
8	Sylvan McKinley	City Representative	Frederika		Volunteer
9	DeAnn Lahmann	City Clerk	City of Tripoli	tripoli@butler- bremer.com	Non Volunteer
10	Jacob Tjaden	Planner	INRCOG		NV

Brenner County Multi-Jurisdictional Hazard Mitigation Plan Update Attendance Sign-In Sheet, Meeting #4, 11/22/2016				
Name (please print & sign)	Position/Title Agency/Department	Jurisdiction/ Organization	Email Address	Volunteer or Non-Volunteer
Ryan McKinley	Community Planner	INURCO	—	NV
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STATE OF IOWA

Bremer County,

CERTIFICATION OF PUBLICATION

I, Kim Franzen being duly sworn
depose and say that I am Office Assistant of

THE WAVERLY NEWSPAPERS, a weekly newspaper published at Waverly, Bremer County, Iowa, and I further state that the annexed and subjoined notice was duly published in said paper, as often as once in each week for 2 week(s), commencing on the 15th

day of November, 2016, and ending on the 17th day of
November, 2016.

Kim K Frazer

Subscribed and sworn to before me this 17th day of November, 2016.

Notary Public in and for Bremer County, Iowa

Printer's Fee, \$ 39.70 *

*Charge for additional certificates



U.S. Department of Homeland Security
FEMA Region VII
9221 Ward Parkway, Ste. 300
Kansas City, MO 64114-1323



FEMA

Mark Schouten, Director
Iowa Homeland Security & Emergency Management Division
7900 Hickman Road, Suite 500
Windsor Heights, IA 50324

Subject: Review of the Bremer County, Iowa Hazard Mitigation Plan

Dear Mr. Schouten:

The purpose of this letter is to provide the status of the above referenced Local Hazard Mitigation Plan, pursuant to the requirements of 44 CFR Part 201 - Mitigation Planning and the Local Multi-Hazard Mitigation Planning Guidance. The Local Hazard Mitigation Plan Review Tool documents the Region's review and the plan compliance with all required elements of 44 CFR Part 201.6. The Plan Review Tool also identifies the jurisdictions participating in the planning process. FEMA's approval will be for a period of five years effective starting with the approval date indicated below.

Prior to the expiration of the plan the community will be required to review and revise their plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval in order to continue to be eligible for mitigation project grant funding.

Plan Name	Date Submitted	Date Approved	Date of Plan Adoption	Date of Plan Expiration	Review Status
Breast Cancer	April 17, 2017	May 23, 2017	January 30, 2017	May 23, 2022	Approved

If you have any questions or concerns, please contact Joe Chandler, Planning Team Lead, at (816) 283-7071.

Sincerely,

KENNETH G SESA

**Kenneth Sessa, Acting Director
Mitigation Division**

Digitally signed by KENNETH G. SIESS
DN: c=US, o=U.S. Government, ou=Department of
Homeland Security, ou=HHS, ou=people, cn=KENNETH
G. SIESS, o=2342, 1.2.840.100.1.1=00044962771066
Date: 2017.05.23 04:54:25 -0500

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2017 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

HAZARD MITIGATION PLAN REVIEW TOOL Bremer COUNTY, IOWA

Approved

FEMA Region VII
1st Review

Jurisdiction: Bremer County; Cities of Denver, Frederika, Janesville, Plainfield, Readlyn, Sumner, Tripoli, & Waverly	Title of Plan: 2017 Updated Multi-Jurisdictional Hazard Mitigation Plan for Bremer County, Iowa	Date of Plan: February 2017
Local Point of Contact: Jacob Tjaden	Address: 229 E. Park Ave. Waterloo, IA 50703	
Title: Community Planner		
Agency: INRCOG		
Phone Number: 319-235-0311	E-Mail: jtjaden@inrcog.org	
Funding Source: FEMA, HLSEM, Local		
State Reviewer: Larry Gioffredi	Title:	Date: February 2017
FEMA Reviewer: Justin Sorg	Title: HM Community Planner	Date: May 3, 2017
Date Received in FEMA Region VII	April 17, 2017	
Plan Not Approved		
Plan Approvable Pending Adoption		
Plan Approved	May 23, 2017	

Jurisdiction:	NFIP Status*	
	Y	NP
1. Bremer County (<i>Adopted 1-30-17</i>)	Y	
2. Denver	Y	
3. Frederika	Y	
4. Janesville	Y	
5. Plainfield	Y	
6. Readlyn	Y	
7. Sumner	Y	
8. Tripoli	Y	
9. Waverly	Y	

* Notes: Y = Participating NP = Not Participating in NFIP S- Sanctioned R-Rescinded

HAZARD MITIGATION PLAN REVIEW TOOL Bremer COUNTY, IOWA

Approved

FEMA Region VII
1st Review

SECTION 1: REGULATION CHECKLIST

1. REGULATION CHECKLIST	Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)			
ELEMENT A. PLANNING PROCESS			
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))	Pages 1-7, Attachment 2	✓	
A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))	Page 4	✓	
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))	Pages 3-6, Attachment 4	✓	
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))	Page 6	✓	
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))	Pages 3-6, 99-101	✓	
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))	Pages 3-6, 99-101	✓	
ELEMENT A: REQUIRED REVISIONS			
None.			
Plan Strengths:			
<ul style="list-style-type: none"> Participation from a variety of elected and appointed officials in the planning process. 			
Opportunities for Improvement:			
<ul style="list-style-type: none"> On pg. 8 there appears to be some language leftover from the last plan that should be removed, "Since Waverly adopted their own Hazard Mitigation Plan in 2009, they are not included in this plan, but may be included in a future Multi-Jurisdictional Plan update." Similarly, pg. 87 states, under Property Protection Mitigation Actions, "Bremer County has not participated in any buyout program. The only community that has participated in a FEMA buy-out program is Waverly, and that jurisdiction is not part of this HMP." 			

2017 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

HAZARD MITIGATION PLAN REVIEW TOOL Bremer COUNTY, IOWA	Approved	FEMA Region VII 1 st Review
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1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT				
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))	Pages 22-84, Appendices A-H	✓		
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(ii))	Pages 22-84, Appendices A-H	✓		
B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(iii))	Pages 22-84, Appendices A-H	✓		
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))	Pages 87-88, Appendices A-H	✓		
ELEMENT B: REQUIRED REVISIONS				
None.				
Plan Strengths:				
<ul style="list-style-type: none"> Excellent use of charts and maps to display information. The critical sites maps are particularly useful to illustrate areas of greatest concern. Jurisdictional profiles are really well done and present a concise summary of each jurisdiction's capabilities and vulnerabilities. 				
Opportunities for Improvement:				
<ul style="list-style-type: none"> Hazard scoring methodology (pg. 25-26): There is some inherent conflict between the chosen scales of Magnitude/Severity and Duration as the Magnitude/Severity scale includes a measure of how long the hazard will impact the jurisdiction ("less than 24 hrs, more than a week, at least 2 weeks and more than 30 days"), which do not correspond to the Duration timeframes ("less than 6 hrs, less than 1 day, less than 1 week, more than 1 week"). Dam/Levee Failure <ul style="list-style-type: none"> The dam failure risk analysis could be improved by identifying the hazard classification categories of dams in the planning area, as well as the current condition of the dams. The Magnitude/Severity narrative for levee failure (pg. 34) appears to be for Butler County and contradicts the Historical Occurrence narrative on (pg. 33) which indicates there are no levees in the planning area. Drought: The Warning Time narrative states (pg.38), "Warning time is not a concern with a drought as the onset of drought can take weeks, months, and sometimes even years to feel the effects." This statement is contrary to current drought planning guidance, which suggests the criticality of drought early warning systems. As by the time a community or region realizes it is experiencing drought, it may already have foregone many good opportunities to mitigate the event. The planning team is highly encouraged to consult www.drought.gov for additional information. Extreme heat, pg. 38 states, "Those who have an elevated risk include the elderly, young children, chronic invalids, those on certain medication or drugs...Those individuals or families who cannot afford air conditioning or do not have access to air conditioning are also more susceptible to the effects of elevated temperatures. Unfortunately, it is unknown how many of Butler [Bremer] County's population would fall into this category." Demographic information is readily available on Census.gov and appears to be included on as part of the Thunderstorm Magnitude analysis on pg. 75. Pg. 20 of the plan reference economic status of the planning area and could be combined with demographic information to further analyzed and develop assumptions about potential population impacts due to extreme heat. The Janesville community profile lists NFIP policy statistics for Tripoli (pg. D8). 				
ELEMENT C. MITIGATION STRATEGY				

3

HAZARD MITIGATION PLAN REVIEW TOOL Bremer COUNTY, IOWA	Approved	FEMA Region VII 1 st Review
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1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))	Pages 86, Appendices A-H	✓		
C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))	Pages 87-88, Appendices A-H	✓		
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))	Page 93, Appendices A-H	✓		
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(iii))	Appendices A-H	✓		
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))	Pages 90-98, Appendices A-H	✓		
C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))	Pages 99-101, Appendices A-H	✓		

2017 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

HAZARD MITIGATION PLAN REVIEW TOOL Bremer COUNTY, IOWA		FEMA Region VII 1 st Review	
Approved			
1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met
Regulation (44 CFR 201.6 Local Mitigation Plans)			Not Met
ELEMENT C: REQUIRED REVISIONS			
None.			
Plan Strengths:			
<ul style="list-style-type: none"> Excellent explanation of how STAPLEE was used to evaluate the feasibility of mitigation actions and not relied upon to solely rank priority. 			
Opportunities for Improvement:			
<ul style="list-style-type: none"> FEMA's latest <i>Local Mitigation Planning Handbook</i> (March 2013) consolidated the 6 mitigation action categories in previous guidance (listed on page 85 in the Plan) into 4 categories: 1) local plans and regulations, 2) structure and infrastructure projects, 3) natural systems protection, and 4) education and awareness programs. Using the current categories would discourage including preparedness actions in the mitigation plan, and result in more substantive, actionable strategies. Mitigation actions are "specific actions, projects, activities or processes taken to reduce or eliminate long-term risk". In general, mitigation strategies should avoid beginning with "encourage", "ensure" or "continue/maintain" as these are not specific actions, nor can their progress be measured. Planning teams are encouraged to reformulate these statements into measurable actions. Additionally, jurisdictions should minimize the use of "on-going" mitigation activity timelines for the same reasons as above. Several mitigation strategies contain actions that are emergency response or operational preparedness in nature. While these are not required to be removed from the plan, they are not considered hazard mitigation actions and are not eligible for funding under the Hazard Mitigation Assistance program. In future updates, the planning team is encouraged to focus on developing actual mitigation actions. Several jurisdictions identified "Establish backup plan in case levees fail" and "Regularly inspect dams and levees" as mitigation actions. However, according to the risk assessment, there are no levees in in the planning area offering flood protection. Mitigation strategies could be strengthened by encouraging each individual jurisdiction to use the risk analysis and problem/issue statements relative to their own community to develop unique mitigation actions. While jurisdictions can certainly implement similar actions, developing a "laundry list" of mitigation strategies for jurisdictions to select and evaluate may lead to jurisdictions considering actions not relevant to their jurisdiction, capabilities or risks. Future updates could be improved by including greater detail as to how each individual community specifically intends to integrate the hazard mitigation plan into other planning mechanisms. This could be added to the Hazard Mitigation Activities table for each jurisdiction. For example, an action like "Develop and implement well-head protection plan, eliminate and cap private and abandoned wells" could be integrated into a Capital Improvement Plan, or Public Works Operations Budget, or similar mechanisms. 			

HAZARD MITIGATION PLAN REVIEW TOOL Bremer COUNTY, IOWA		FEMA Region VII 1 st Review	
Approved			
1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met
Regulation (44 CFR 201.6 Local Mitigation Plans)			Not Met
ELEMENT D: PLAN REVIEW, EVALUATION, AND IMPLEMENTATION (applicable to plan updates only)			
D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))	Pages 86-98 Appendices A-H; Attachment 3	✓	
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))	Attachment 3	*✓/	
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))	Page 85-98, Appendices A-H	✓	
ELEMENT D: REQUIRED REVISIONS			
*D2. a. The plan must describe the status of hazard mitigation actions in the previous plan by identifying those that have been completed or not completed. For actions that have not been completed, the plan must either describe whether the action is no longer relevant or be included as part of the updated action plan. This information appears to be missing for Denver. This jurisdiction should not be considered a planning participant until this requirement is met.			
ELEMENT E: PLAN ADOPTION			
E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))	Attachment 2	✓	
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))	Attachment 2	pending	
ELEMENT E: REQUIRED REVISIONS			
E2. Written proof that all jurisdictions' governing bodies have formally adopted the plan (usually a resolution) must be submitted to FEMA.			
Note: If the plan is not adopted by a participating jurisdiction, that jurisdiction would not be eligible for project grants under the following hazard mitigation assistance programs: HMGP, PDM and FMA.			

SECTION 2: PLAN ASSESSMENT

A. Overall Plan Strengths and Opportunities for Improvement

Overall Plan Strengths

- The plan is easy to read and provides a number of visuals and tables to support risk assessment.

Overall Opportunities for Improvement

- Throughout the plan there are a few references to outdated guidance documents. The *Local Mitigation Planning Handbook* (Handbook) is the official guide for local governments to develop, update and implement local mitigation plans to meet the requirements of the Stafford Act and Title 44 Code of Federal Regulations (CFR) §201.6, and is a much improved resource over the formerly developed *How-To Guides*.
- Throughout the plan there are numerous references to Butler County and tables/figures that are not found in the plan.

B. Resources for Implementing Your Approved Plan

A variety of mitigation resources are available to communities. The Iowa Homeland Security & Emergency Management website: http://www.iowahomelandsecurity.org/disasters/hazard_mitigation.html provides planning and project related information as well as details on how major FEMA mitigation programs are implemented in the State.

HSEMD's training website provides information on upcoming training opportunities within the State: <http://homelandsecurity.iowa.gov/training/>.

Review of the FEMA HMA guidance (FY15 is the most current) is also encouraged as guidance provides information about application and eligibility requirements. This guidance is available from <http://www.iowahomelandsecurity.org/grants/HMA.html> or through FEMA's grant applicant resources page at http://www.fema.gov/government/grant/hma/grant_resources.shtm.

The FEMA Hazard mitigation planning site <http://www.fema.gov/plan/mitplanning/index.shtm> contains the official guidance to meet the requirements of the Stafford Act, as well as other resources and procedures for the development of hazard mitigation plans.

Various funding programs are available from several state and federal agencies to assist local jurisdictions in accomplishing their mitigation activities and goals. A detailed listing of programs, information on each program, and contact information is also available from the 2013 State Hazard Mitigation Plan.