

# 2022 Updated Multi-Jurisdictional Hazard Mitigation Plan Bremer County, Iowa



## Adopted By:

Bremer County  
City of Denver  
City of Frederika  
City of Readlyn  
City of Janesville  
City of Plainfield  
City of Sumner  
City of Tripoli  
City of Waverly

Denver Community School District  
Janesville Consolidated School District  
Sumner-Fredericksburg Community School District  
Tripoli Community School District  
Wapsie Valley Community School District

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## Funded by:

Bremer County

## Prepared by:



**INRCOG**  
Iowa Northland Regional  
Council of Governments



### 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 some of people who participated in the hazard mitigation plan meetings:

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Supervisor Ken Kammeyer  
Supervisor Tim Neil  
Kip Ladage  
Jan Heidemann

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Larry Farley-clerk  
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Christa Kurtz-clerk  
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#### **City of Plainfield**

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#### **City of Readlyn**

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#### **City of Tripoli**

Mayor Brendt Bernard  
Ellen Kalkbrenner

#### **City of Waverly**

Mayor Dean Soash  
Isaac Pezley

Paige Yoder

#### **Denver Community School District**

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#### **Janesville Community School District**

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#### **Sumner-Fredericksburg Community School District**

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#### **Tripoli Community School District**

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#### **Wapsie Valley Community School District**

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# Section 1 – 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 2022 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, Waverly, unincorporated Bremer County, Denver Community School District, Janesville Consolidated School District, Sumner-Fredericksburg Community School District, Tripoli Community School District, and the Wapsie Valley Community School District. Waverly-Shell Rock School District deferred their official district plan to the Butler County (home county of Shell Rock) 2020 MJ-HMP which the school district participated in and adopted. Nashua-Plainfield School District deferred their official district plan to Chickasaw County (home county of Nashua) 2019 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](http://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.*

*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.*

### 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 Act 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.”

### 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

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 have developed a list of departments and positions they determined would best represent the knowledge base required to begin the planning process. The idea was 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.



Figure 1: Hazard Mitigation Planning Process

TABLE 1.1: BREMER COUNTY MJ-HMP PLANNING COMMITTEE MEMBERS

Name	Jurisdiction	Position	Name	Jurisdiction	Position
Dewey Hildebrandt	Bremer County	Supervisor	Blake Franzen	Plainfield	City Council
Kip Ladage	Bremer County	EMA Coordinator	Britney Lentz	Plainfield	City Clerk/Treasurer
Joel Wikner	Denver	City Council	Tom Geise	Plainfield	Mayor
Larry Farley	Denver	City Administrator	Louis Buhr	Readlyn	City Clerk
Duane Meihost	Frederika	Mayor	Steve Aiello	Readlyn/Wapsie Valley CSD	Police Chief/School Board
Christa Kurtz	Janesville	City Clerk	Fred Matlage	Sumner-Fred. CSD	Superintendent
Eric Ver Steegt	Janesville	Assist. to the City Clerk	Jay Marley	Tripoli CSD	Superintendent
Sue Stapleton	Janesville	City Council	Brad Laures	Denver CSD	Superintendent
Alicia Smith	Sumner	Emergency Medical Services	Ellen Kalkbrenner	Tripoli	City Clerk
Lisa Oberbroeckling	Sumner	City Clerk	Isaac Pezley	Waverly	Zoning Administrator
Tim Duhrkopf	Sumner	Fire Chief			

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. Once established, this assembly was considered the Hazard Mitigation Planning Committee.

Additionally, Brian Schoon and Nick Fratzke from INRCOG organized the meetings in conjunction with the County Emergency Management Coordinator and 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 the County's official newspapers of publication, 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

Four public planning meetings were held virtually 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 Board of Supervisors and City Council meetings, started at 4:30 pm.

TABLE 1.2: MEETINGS SUMMARY			
Location	Group	Date	Topic
Virtual	Participating jurisdictions from 2017 MJ-HMP	3/18/2021	Introductions, Purpose of HMP, Overview of the planning process and timeline, Community Profile review and update, Evaluation of existing Mitigation Action Steps
Virtual	Planning Committee	4/15/2021	Review Hazard Analysis/Risk Assessment, Establish Goals, Identify revisions to Mitigation Action/Activity Development
Virtual	Planning Committee	5/20/2021	Finish Mitigation Action/Activity Development
Virtual	Planning Committee	3/23/2022	Review Mitigation Action/Activities, Prioritize Action / Activities, Finalize mitigation actions, Review HMP Draft Document
Bremer County Courthouse	Board of Supervisors	5/2/2022	Public Hearing for Adoption of MJ-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
- 2017 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 community's 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 2017 plan. The committee elected to use the same set of hazards as identified in the State of Iowa's 2018 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 an 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 2017 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 24,988 residents (2020 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.

#### History<sup>1</sup>

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.

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

## 2022 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

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 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.

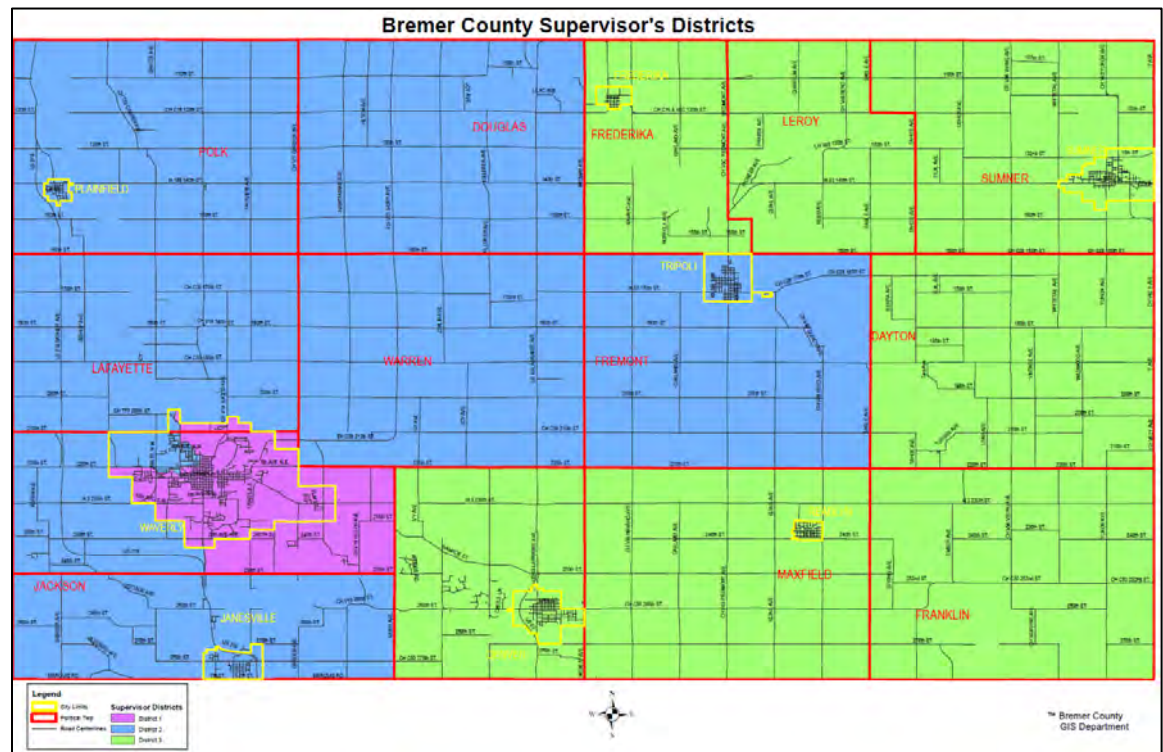


Figure 2.1: Bremer County Board of Supervisors District Map

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 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 1: 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 area<sup>2</sup>:

- **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.

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

## Climate

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: <a href="http://www.idcide.com">www.idcide.com</a> (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: <a href="http://www.idcide.com">www.idcide.com</a> (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 133.5 miles of paved roads, 579 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 (INRTC), now OnBoard Public Transit 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 OnBoard Public Transit 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 firefighting. It is estimated that the water line would need to be at least six inches in order to supply effective pressure for actual firefighting. 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 Bremer 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 found 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.

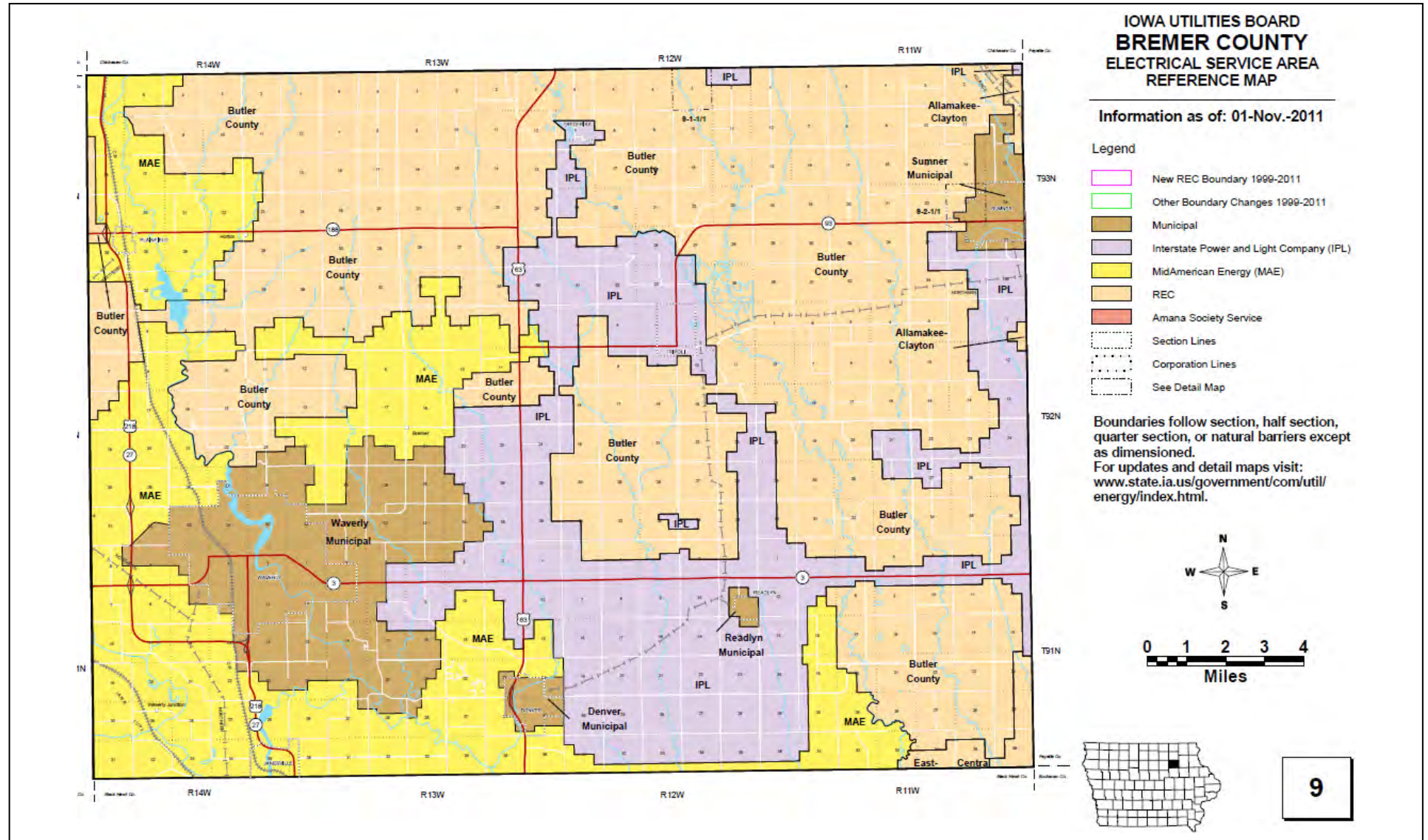
**TABLE 2.3: PRIMARY PROVIDERS FOR COMMUNITY UTILITIES WITHIN BREMER COUNTY**

Community	Electric	Natural Gas	Telephone/ Internet	Cable TV	Water	Sewer	Sanitation
<b>Bremer County (unincorporated)</b>	MidAmerican Energy, Alliant Energy, REC	MidAmerican Energy; Black Hills Energy;	Butler-Bremer Communications	Butler-Bremer Communications	Iowa Regional Utilities Association; Private Wells	Private Systems	Private Systems
<b>City of Denver</b>	City of Denver	MidAmerican Energy	Qwest	Mediacom	City of Denver	City of Denver	City of Denver
<b>City of Frederika</b>	Alliant Energy	NA (LP Only)	Butler-Bremer Communications	Butler-Bremer Communications	Iowa Regional Utilities Association (Individual Wells)	City of Frederika	Waste Management of Iowa
<b>City of Janesville</b>	MidAmerican Energy	Northern Natural Gas	Windstream, Iowa Telecom, Mediacom	Mediacom	City of Janesville	City of Janesville	Rite Environmental
<b>City of Plainfield</b>	MidAmerican Energy	MidAmerican Energy	Butler-Bremer Communications	Butler-Bremer Communications	City of Plainfield	City of Plainfield	City of Plainfield/Jendro Sanitation
<b>City of Readlyn</b>	Butler/Bremer REC	Black Hills Energy	Readlyn Telephone Co.	Readlyn Telephone Co.	City of Readlyn	City of Readlyn	Tripoli-Readlyn Sanitation
<b>City of Sumner</b>	Sumner Municipal Light & Power	Black Hills Energy	Windstream, Mediacom, Community Digital Wireless	Mediacom, Community Digital Wireless	City of Sumner	City of Sumner	City of Sumner/Black Hawk County Landfill
<b>City of Tripoli</b>	Alliant Energy	Black Hills Energy	Butler-Bremer Communications	Butler-Bremer Communications	City of Tripoli	City of Tripoli	Tripoli-Readlyn

			ns	ns			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							

## Other Utilities

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



### 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.bremercounty.iowa.gov>
- Denver: <http://www.cityofdenveriowa.com>
- Denver Community School District: <http://www.denver-cyclones.com>
- Frederika: <https://www.frederikabank.com/community.htm>
- Janesville: <http://www.janesvilleia.com/>
- Janesville Consolidated School District: <http://www.janesville.k12.ia.us>
- Plainfield: <https://www.plainfieldiowa.com/government>
- Nashua-Plainfield Community School District: <http://www.nashua-plainfield.k12.ia.us>
- Readlyn: <http://www.readlyn.com>
- Wapsie Valley Community School District: <http://www.wapsievalleyschools.com>
- Sumner <http://www.mysumneriowa.com>
- Sumner-Fredericksburg Community School District: <http://www.sfcougars.org>
- Tripoli: <http://www.tripoliowa.com>
- Tripoli Community School District: <http://www.tripoli.k12.ia.us>
- 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:

- Waverly Independent
- 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 increase in population since 1980, and 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 1960, 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	1990 Population	2000 Population	2010 Population	2020 Population	% Change 1990-2020
City of Denver, IA	1,600	1,627	1,780	1,919	19.9
City of Frederika, IA	188	199	183	204	8.5
City of Janesville, IA	822	829	930	1,034	25.8
City of Plainfield, IA	455	438	436	393	-13.6
City of Readlyn, IA	773	786	808	845	9.3
City of Sumner, IA	2,078	2,106	2,028	2,030	-2.3
City of Tripoli, IA	1,188	1,310	1,313	1,191	0.3
City of Waverly, IA	8,539	8,968	9,874	10,394	21.7
Bremer County (Unincorporated Area)	7,170	7,062	6,924	6,978	-2.7
Bremer County (total)	22,813	23,325	24,276	24,988	9.5
State of Iowa	2,776,755	2,926,324	3,046,355	3,190,369	14.9

*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)
1960	21,108	----	----
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
2020	24,988	712	3.2
Average (1960-2020)		3,880 / 6.0 = 646.7	18.3 / 6.0 = 3.05%

*Source: U.S. Census Bureau and Iowa Data Center*

## Housing and Development Trends

According to 2020 Census data, there are 10,484 total housing units in the County (Table 2.7). Of these housing units, approximately 8,000 are owner-occupied, 1,676 are renter-occupied, and 808 are vacant (occupancy rates are approximate). Mobile homes make up approximately 1.1 percent of the county's housing units. This is slightly less than the State's figure of 3.4 percent. Besides the unincorporated area, the communities of Denver, Janesville, Sumner, and Waverly have a large number of mobile homes within their jurisdiction (Table 2.8). Bremer County's total population is 24,988, with 1,470 living in group quarters. Average household size for Bremer County is 2.32 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 witnessed a dramatic decline in the number of houses being built with a slight rebound in the 1990's and more decline into present day. 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.

**TABLE 2.6: POPULATION PROJECTIONS FOR BREMER COUNTY, IA**

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*

**TABLE 2.8: TOTAL MOBILE HOMES IN SELECTED COMMUNITIES IN BREMER COUNTY, IA**

Community	2020
City of Denver, IA	0
City of Frederika, IA	0
City of Janesville, IA	20
City of Plainfield, IA	0
City of Readlyn, IA	3
City of Sumner, IA	19
City of Tripoli, IA	0
City of Waverly, IA	46
Unincorporated Area	32
Bremer County (total)	117

*Source: 2019 American Community Survey*

**TABLE 2.7: TOTAL HOUSING UNITS IN SELECTED COMMUNITIES IN BREMER COUNTY, IA**

Community	1990	2000	2010	2020
City of Denver, IA	622	672	731	*805
City of Frederika, IA	113	122	118	*140
City of Janesville, IA	343	359	409	455
City of Plainfield, IA	193	202	197	189
City of Readlyn, IA	317	326	346	351
City of Sumner, IA	900	930	944	938
City of Tripoli, IA	546	561	568	554
City of Waverly, IA	3,160	3,383	3,732	4,166
Unincorporated Area	2,653	2,771	2,870	2,886
Bremer County (Total)	8,847	9,337	9,915	10,484
State of Iowa	1,143,669	1,232,511	1,336,417	1,412,789

*Source: U.S. Census Bureau, \*2019 American Community Survey 5-Year Estimate*

**TABLE 2.9: AGE OF HOUSING UNITS IN BREMER COUNTY, IA**

Year Built	Bremer County		Iowa Percent (%)
	Number	Percent (%)	
2014 or later	245	2.4	2.5
2010-2013	284	2.7	2.7
2000-2009	989	9.5	14.0
1990-1999	1,013	9.7	13.9
1980-1989	623	6.0	13.4
1970-1979	1,608	15.4	15.2
1960-1969	1,011	9.7	10.6
1950-1959	810	7.8	10.3
1940-1949	521	5.0	4.9
1939 or earlier	3,310	32.0	12.6
Total	10,414	100.0	100.0

*Source: U.S. Census Bureau (2019: American Community Survey 5 Year Estimates)*

## Value of Housing

Housing value within Bremer County, as a whole, has dramatically increased since that of the previous decennial census, with exceptions in Frederika, Plainfield, and Tripoli. According to data available in lieu of 2020 Decennial Census data, the 2019 American Community Survey estimates that the median value for an owner-occupied unit in the county was \$165,700.00. While this value is higher than the State average, half of 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 \$147,800 in 2020, according to 2019 ACS data, as alluded to in 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 \$128 less than the State's. Of Bremer County's jurisdictions, Readlyn has the lowest median gross rent, at \$522.

TABLE 2.10: MEDIAN VALUE OF A SPECIFIED OWNER-OCCUPIED UNITS IN SELECTED COMMUNITIES				
Community	1990	2000	2010	2020
City of Denver, IA	\$ 53,900	\$ 92,000	\$ 147,500	*\$ 162,800
City of Frederika, IA	27,900	60,900	82,800	*81,300
City of Janesville, IA	38,000	77,600	120,800	*167,200
City of Plainfield, IA	28,600	66,100	90,700	*82,700
City of Readlyn, IA	39,000	78,200	110,400	*130,400
City of Sumner, IA	30,100	68,100	78,000	*88,000
City of Tripoli, IA	29,200	64,800	90,000	*91,200
City of Waverly, IA	53,100	95,800	142,800	*173,700
Bremer County (total)	45,900	88,000	139,300	*165,700
State of Iowa	45,500	82,500	123,000	*147,800
Source: U.S. Census Bureau and *2019 ACS 5-Year Estimate				

TABLE 2.11: HOUSING UNITS BY TYPE IN BREMER COUNTY		
Units in Structure	Number of Units	Percent
1-unit, detached	8,789	84.4%
1-unit, attached	309	3.0%
2 units	202	1.9%
3 or 4 units	266	2.6%
5 to 9 units	183	1.8%
10 to 19 units	187	1.8%
20 or more units	334	3.3%
Mobile Home	134	1.3%
<b>Total Housing Units</b>	<b>10,414</b>	<b>100.0%</b>
Source: 2019 American Community Survey 5-Year Estimate		

TABLE 2.12: MEDIAN GROSS RENT FOR SELECTED COMMUNITIES				
Community	1990	2000	2010	2020
City of Denver, IA	\$167	\$451	\$571	\$588
City of Frederika, IA	203	288	475	*767
City of Janesville, IA	262	358	518	*625
City of Plainfield, IA	309	450	650	*625
City of Readlyn, IA	256	360	525	*522
City of Sumner, IA	257	351	505	*644
City of Tripoli, IA	264	405	521	*555
City of Waverly, IA	298	418	599	*715
Bremer County (total)	288	400	577	*661
State of Iowa	336	470	655	*789
Source: U.S. Census Bureau and *2019 ACS 5-Year Estimate				

TABLE 2.13: PER CAPITA & MEDIAN HOUSEHOLD INCOME FOR SELECTED COMMUNITIES						
Community	Per Capita Income			Median Household Income		
	2000	2010	2020	2000	2010	2020
City of Denver, IA	\$20,791	\$26,978	*35,959	\$44,375	\$61,042	*67,288
City of Frederika, IA	20,224	34,968	*21,519	36,250	54,000	*45,417
City of Janesville, IA	18,878	26,549	*31,331	40,060	53,102	*63,750
City of Plainfield, IA	18,156	24,786	*27,250	39,688	52,969	*58,681
City of Readlyn, IA	17,721	27,907	*28,816	41,625	57,083	*69,750
City of Sumner, IA	18,029	25,419	*33,419	33,417	47,768	*64,018
City of Tripoli, IA	16,882	19,734	*29,895	34,444	45,724	*57,386
City of Waverly, IA	18,285	26,007	*28,846	39,587	61,308	*64,949
Bremer County(total)	19,199	28,276	*32,814	40,826	60,193	*70,395
State of Iowa	19,674	26,545	*33,107	39,469	51,129	*60,523
Source: U.S. Census Bureau and *2019 American Community Survey 5-Year Estimate						

## 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 2019 dollars of \$32,814. The median household income for the entire county, in 2019 dollars, is \$70,395. The City of Frederika has both the smallest per capita income, \$21,519, as well as the smallest median household income, \$45,417.

### 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 19.6% of the county. The table also shows the rural environment of the county, with 3.5% 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	
	#	%	#	%
<b>Agriculture, Forestry, Fishing &amp; Hunting, and Mining</b>	454	3.5%	60,645	3.7%
Construction	732	5.6	108,780	6.7
Manufacturing	2,582	19.6	244,944	15.1
Wholesale Trade	314	2.4	42,567	2.6
Retail Trade	1,415	10.8	179,895	11.1
Transportation & Warehousing, and Utilities	519	3.9	82,311	5.1
Information	144	1.1	23,949	1.5
Finance, Insurance, Real Estate, and Rental & Leasing	1,018	7.7	120,586	7.5
Professional, Scientific, Management, Administrative, and Waste Management Services	605	4.6	124,277	7.7
Education, Health and Social Services	3,849	29.3	397,983	24.6
Arts, Entertainment, Recreation, Accommodations and Food Services	683	5.2	117,053	7.2
Other Services (except public administration)	541	4.1	65,564	4.1
Public Administration	302	2.3	50,002	3.1
Source: U.S. Census Bureau (2019 American Community Survey 1-Year Estimates)				

Agriculture, crops and livestock are major components of the Bremer County economy. According to the 2017 Census of Agriculture<sup>3</sup>, Bremer County had 963 farms and over 262,000 acres of farm land. Farm land occupies more than 94 percent of the surface land in the county. In 2017 Bremer County farmers harvested 138,149 acres of corn and 80,177 acres of soybeans. All crop production in the county contributed \$136.6 million in economic output. The total crop and livestock economic output was estimated to be \$229.9 million in Bremer County in 2017.

### 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 2020 MJ-HMP), Denver Community School, Janesville Consolidated School (member of this MJ-HMP), Sumner-Fredericksburg Community School, Tripoli Community School, Wapsie Valley Community School,

There are industrial parks located in Waverly (95 acres), Sumner (15 acres), and Denver has some acreage available as well.

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<sup>3</sup> [https://www.nass.usda.gov/Publications/AqCensus/2017/Online\\_Resources/County\\_Profiles/Iowa/cp19017.pdf](https://www.nass.usda.gov/Publications/AqCensus/2017/Online_Resources/County_Profiles/Iowa/cp19017.pdf)

## 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 2017 Bremer County Multi-Jurisdictional Hazard Mitigation Plan, the 2018 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 2018 Iowa Hazard Mitigation Plan.

The Iowa 2018 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.

A large portion of a community's risks 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 2018 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.

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	

## 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.

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.

*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.*

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
October 31, 2016	Severe Storms and Flooding	DR-4289-IA
August 27, 2017	Severe Storms, Tornadoes, Straight-line Winds, and Flooding	DR-4334-IA
March 23, 2019	Severe Storms and Flooding	DR-4421-IA
March 13, 2020	Covid-19	EM-3480-IA
March 23, 2020	Covid-19 Pandemic	DR-4483-IA
Source: FEMA, as of 4/27/2021		

## 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.

### Probability

The probability score reflects the likelihood

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.

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 Bremer 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	Tornado/Windstorm	2.36	3.14	3.57	2.36	2.78
2	Thunderstorm/Lightning/Hail	3.36	1.86	2.93	2.00	2.71
3	Flash Flood	2.93	2.21	3.21	2.36	2.70
4	Severe Winter Storm	3.29	1.86	1.43	2.71	2.52
5	River Flooding	2.29	2.14	1.71	3.00	2.23
6	Human Disease	1.86	2.21	1.79	3.57	2.13
7	Extreme Heat	2.00	1.50	1.07	2.86	1.99
8	Infrastructure Failure	1.36	2.07	3.00	2.64	1.95
8	HAZMAT Incident	1.43	1.57	3.21	2.57	1.85
10	Animal/Plant/Crop Disease	2.14	1.36	1.00	3.14	1.84
11	Grass/Wild Fire	1.43	1.36	4.00	1.79	1.83
12	Transportation Incident	1.71	1.36	3.29	1.14	1.79
13	Terrorism	1.14	1.57	3.57	2.07	1.76
14	Drought	1.36	1.50	1.07	3.00	1.52
15	Radiological Incident	1.00	1.00	3.07	1.93	1.46
16	Earthquake	1.00	1.43	2.71	1.64	1.45
16	Sinkholes	1.14	1.14	2.79	1.71	1.45
17	Landslide	1.00	1.00	3.43	1.50	1.41
18	Levee/Dam Failure	1.00	1.14	2.29	2.14	1.35
19	Expansive Soils	1.14	1.00	1.5	1.86	1.23

TABLE 3.8: HAZARD ASSESSMENT SCORES FOR UNINCORPORATED BREMER COUNTY						
Hazard Rank	Hazard	Probability	Magnitude/Severity	Warning Time	Duration	Final Score
1	Transportation Incident	4	3	4	1	3.40
2	Thunderstorm/Lightning/Hail	4	2	4	1	3.10
3	River Flooding	4	2	2	3	3.00
4	Tornado/Windstorm	2	4	4	2	2.90
4	HAZMAT Incident	4	1	4	2	2.90
5	Grass/Wild Land Fire	4	1	4	1	2.80
6	Flash Flood	3	1	4	3	2.55
7	Animal/Plant/Crop Disease	3	2	1	4	2.50
8	Human Disease	1	4	1	4	2.20
9	Severe Winter Storm	3	1	1	3	2.10
10	Drought	1	3	1	4	1.90
11	Levee/Dam Failure	1	1	4	2	1.55
11	Sinkholes	1	1	4	2	1.55
11	Expansive Soils	1	1	4	2	1.55
11	Earthquake	1	1	4	2	1.55
11	Terrorism	1	1	4	2	1.55
11	Radiological Incident	1	1	4	2	1.55
13	Infrastructure Failure	1	1	4	1	1.45
14	Landslide	1	1	3	2	1.40
15	Extreme Heat	1	1	1	3	1.20

## 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 Rabit calicivirus disease. In recent years, Avain 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 it's 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. The Census of Agriculture determined that in 2017, agriculture attributed over \$229 million in economic output and provided 1,629 jobs throughout Bremer County.<sup>4</sup>

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.

## **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.

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<sup>4</sup> [https://www.nass.usda.gov/Publications/AgCensus/2017/Online\\_Resources/County\\_Profiles/Iowa/cp19017.pdf](https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/Iowa/cp19017.pdf)

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.

<b>TABLE 3.9: DAM HAZARD POTENTIAL CLASSIFICATION</b>	
<b>High Hazard Potential</b>	Dams assigned the high hazard potential classification are those where failure or mis-operation will probably cause loss of human life.
<b>Significant Hazard Potential</b>	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
<b>Low Hazard Potential</b>	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 hydrostatic 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 3.9. 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.

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.

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.<sup>5</sup>

TABLE 3.11: BREMER COUNTY DROUGHT EVENTS, 2001-2021				
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 4/27/2021 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 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

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

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 23<sup>rd</sup>. 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 13<sup>th</sup>. 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 23<sup>rd</sup>. In the four months of recorded drought, there was a total estimated \$96 million in crop damage.

Table 3.11 displays drought events in Butler County from 2001-2021 as recorded by the National Climatic Data Center.

### Probability

From 2001-2021 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.

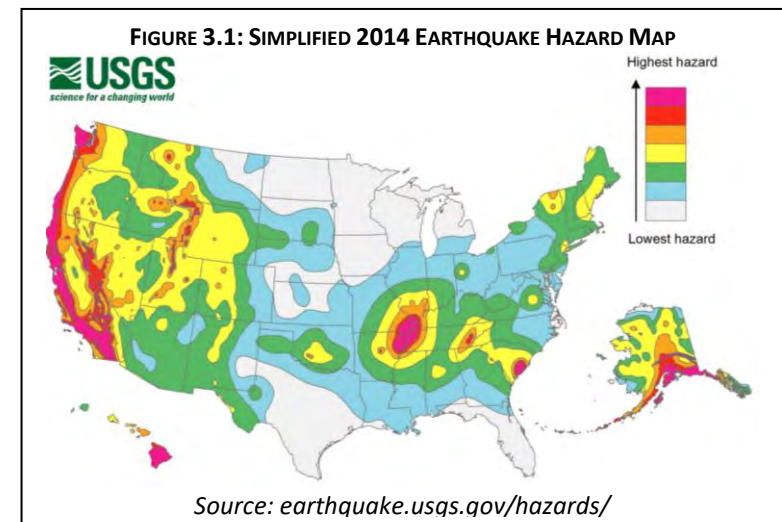
## Earthquake

### 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

As a whole, Iowa 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 effects 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

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).

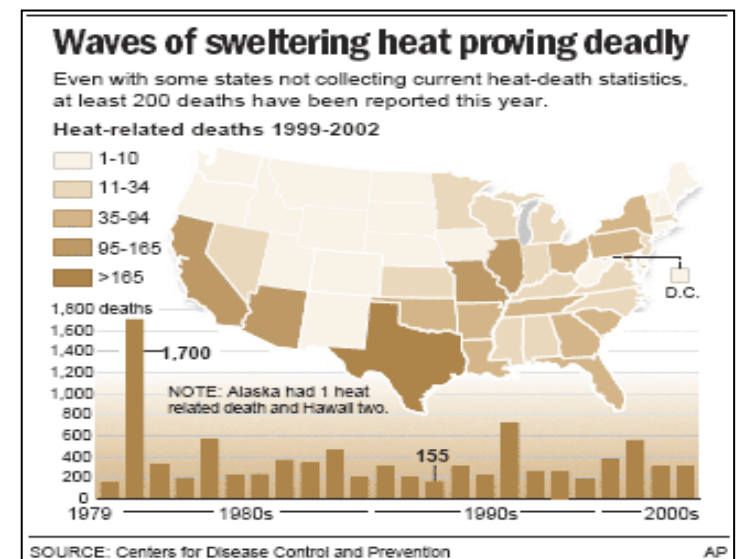


Figure 3.2: Heat Related Deaths, 1999-2002

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 two 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, and again, beginning July 18, 2019 and ending July 20, 2019. No injuries or deaths as a result, but there was an estimated \$135,000 worth of property damage across several Iowa counties during the 2011 event. 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 17 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 are 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 measures 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 2020. These floods caused an estimated \$2.78 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.

TABLE 3.12: HISTORICAL OCCURRENCES OF FLASH FLOODING IN BREMER COUNTY, 1996-2020					
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
Unincorporated Area	9/23/2016	03:45	0	\$10,000	\$0
Denver	9/23/2016	03:45	0	\$0	\$0
Schwerin Fld. Arpt.	7/21/2017	09:40	0	\$0	\$0
Buck Creek	7/21/2017	11:00	0	\$0	\$0
Countywide	7/22/2017	00:35	0	\$200,000	\$0
Sumner	5/28/2020	10:00	0	\$0	\$0
Frederika	5/28/2020	10:35	0	\$0	\$0
Total			0	\$2,780,000	\$270,000
Source: National Climatic Data Center; retrieved 4/27/2021					

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.

### 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 2018 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 2020, there were 126 wild land fires affecting 2,168 acres in Iowa in 2020.

### 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

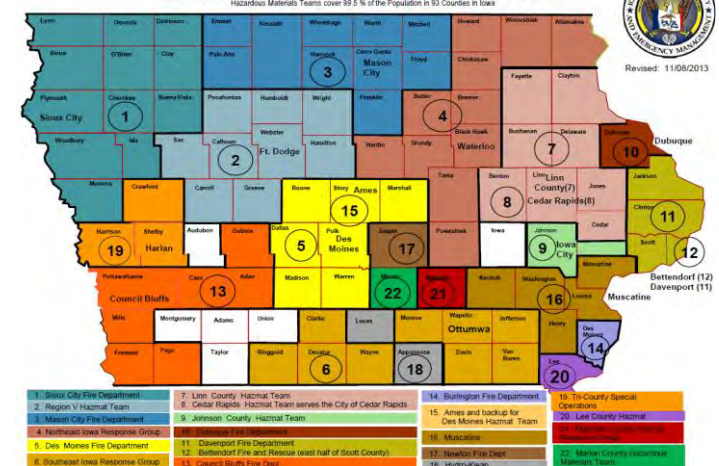
The area immediately impacted by a grass or wildland fire will be impacted during the duration of the fire. Based on previous experience of fires, likely hours, but depending on size could be days.

## 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

**FIGURE 3.3: IOWA HAZARDOUS MATERIALS TEAMS**  
Courtesy of Iowa Homeland Security<sup>6</sup>  
IOWA HAZARDOUS MATERIALS TEAMS



<sup>6</sup> [http://homelandsecurity.iowa.gov/documents/maps/MAP\\_HazMatTeams.pdf](http://homelandsecurity.iowa.gov/documents/maps/MAP_HazMatTeams.pdf)

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.

Table 3.13: HAZARD SPILLS BY MODE January 1, 2017 – January 1, 2021	
Mode of Spill	Quantity
Handling and Storage	6
Transportation	5
Transformer	0
Manure	1
Pipeline	0
Vandalism	0
Other	1
<b>Total</b>	<b>13</b>
<i>Source: Iowa DNR Hazardous Material Release Database</i>	

### Historical Occurrence

According to data from the Iowa Department of Natural Resources Hazardous Material Release Database<sup>7</sup>, there have been 13 hazardous material spills or incidents in Bremer County from January 1, 2017 through January 1, 2021. Table 3.14 shows hazardous spill by type. The most frequent types of spills were petroleum and fertilizer/pesticides. Table 3.13 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 nearly 3 hazardous spill incidents per year from 2017 through 2021.

Hazardous materials are transported over 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 2019 National Analysis dataset, there are 486 TRI facilities in Iowa and 21,458 TRI sites across the United States. However, Bremer County does not have any TRI facilities.<sup>8</sup>

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 to 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.

**Table 3.14 HAZARD SPILLS BY TYPE**  
January 1, 2017 – January 1, 2021

Type of Spill	Quantity
Petroleum	8
Fertilizer/Pesticide	4
Transformer oil/PCB	0
Inorganic Chemical	0
Manure	1
Acids/Bases	0
Organic Chemical	0
Propane/LPG/Natural Gas	0
<b>Total</b>	<b>13</b>
<i>Source: Iowa DNR Hazardous Material Release Database</i>	

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

<sup>8</sup> [http://iaspub.epa.gov/triexplorer/tri\\_factsheet.factsheet?pDataSet=TRIQ1&pyear=2013&pstate=IA&pcounty=Bremer%20County](http://iaspub.epa.gov/triexplorer/tri_factsheet.factsheet?pDataSet=TRIQ1&pyear=2013&pstate=IA&pcounty=Bremer%20County)

### 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 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 twelve “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, Poliomyelitis, Rabies (human), Severe acute respiratory syndrome (SARS), Viral hemorrhagic fever (VHF) (e.g., Lassa, Marburg, Ebola, Crimean-Congo), 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 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 several years, Ebola and the Zika Virus have both become concerning public health threats.

The global respiratory illness (COVID-19) was discovered in late 2019 which causes very severe illness and death in some, and very minor symptoms in others. There is still a great deal to learn about this disease. Nationwide reporting and tracking were implemented in an effort to irradiate the spread of the pandemic. To date (10/06/2021) 43,773,573 total cases of COVID-19 have been reported in the United States, resulting in 702,360 deaths.<sup>10</sup>

### 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 other than what can be reasonably expected, prior to the COVID-19 pandemic.

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.<sup>9</sup>

### Probability

It is highly likely human disease as defined will affect Bremer County residents on an annual basis. Although the COVID-19 pandemic has shown us that human diseases can and do spread on a global level, there is a far less likely probability, historically, 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 mitigate the occurrence of a human disease epidemic, and from the current global crisis, more safeguards will likely transpire. Numerous hospitals and clinics in Bremer 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. Bremer 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 Bremer 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.

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

<sup>10</sup> <https://covid.cdc.gov/covid-data-tracker/#datatracker-home>

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), ninety six percent of civilian fire deaths occurred in the home (one-or two-family dwellings, apartments or manufactured housing) from 2015 thru 2019.

Most fire casualties occur as a result of five causes (cooking, heating equipment, electrical distribution and lighting equipment, intentional fire setting, and smoking materials. According to statistics obtained from the NFPA Iowa ranked 31<sup>st</sup> out of the 50 states in the number of deaths per million between 2011 and 2015, showing a 13% decrease in the number of deaths from 2006 to 2010.

Cooking was 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. Though there is 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

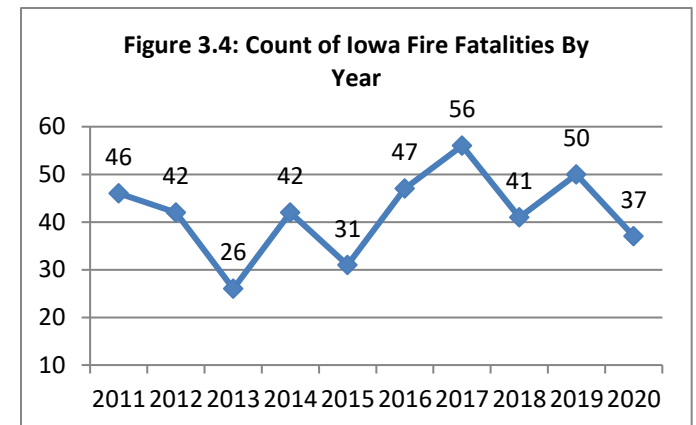
Although much effort has been put into fire prevention in the community, based on historical occurrence, it is highly likely that numerous fires will occur in the county and its jurisdictions in the next year. The average probability score of all fourteen jurisdictions determined the likelihood of infrastructure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

### Magnitude / Severity

The magnitude and severity of an infrastructure failure ranges from trivial to catastrophic. Regarding events that are most likely to take place, such as a brief 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.



Source: Iowa Department of Public Safety, State Fire Marshal Division

### 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 over steepened 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

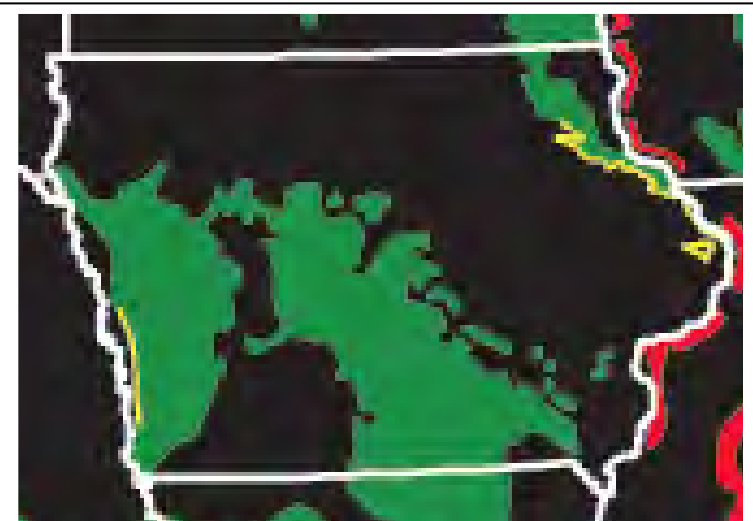
Slope material that becomes saturated with water may develop a debris flow or mud flow. The resulting slurry of rock and mud may pick up trees, houses, and cars, thus blocking bridges and tributaries causing flooding along its path (USGS). Landslides commonly occur in connection with other major natural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



**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](http://www.usgs.gov)*

### 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 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 disrupt electricity, water service, communications, and transportation routes in some areas along riverbanks or in areas where impaired 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 Survey<sup>10</sup> landslides:

- Cause damage in all 50 states
- Cost between \$2-\$4 billion per year 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 country most susceptible to a landslide include the Appalachian Mountains, Rocky Mountains, and the west coast. The Midwest, with a relative flat terrain, experiences very few 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.

## **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

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

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”<sup>11</sup>

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**

<b>Unusual Event</b>	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,
<b>Alert</b>	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)
<b>Site Area Emergency</b>	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.
<b>General Emergency</b>	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.
<i>Source: US Nuclear Regulatory Commission, “Emergency Classification”</i>	

<sup>11</sup> <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.

Transportation of radiological materials is licensed and regulated by the federal government. According to the state's 2018 Hazard Mitigation Plan, there have been no occurrences of transportation radiological incidents in Iowa.

On August 10<sup>th</sup>, 2020, operations ceased at the Duane Arnold Nuclear Plant as a result of damage sustained to the cooling towers by a derecho (land-based hurricane). With decommissioning scheduled for October of the same year, this storm expedited the process. Decommissioning is slated to take place over a 60 year period, with all spent fuel ultimately being moved to a secure government storage facility and demolition of the site by 2080.

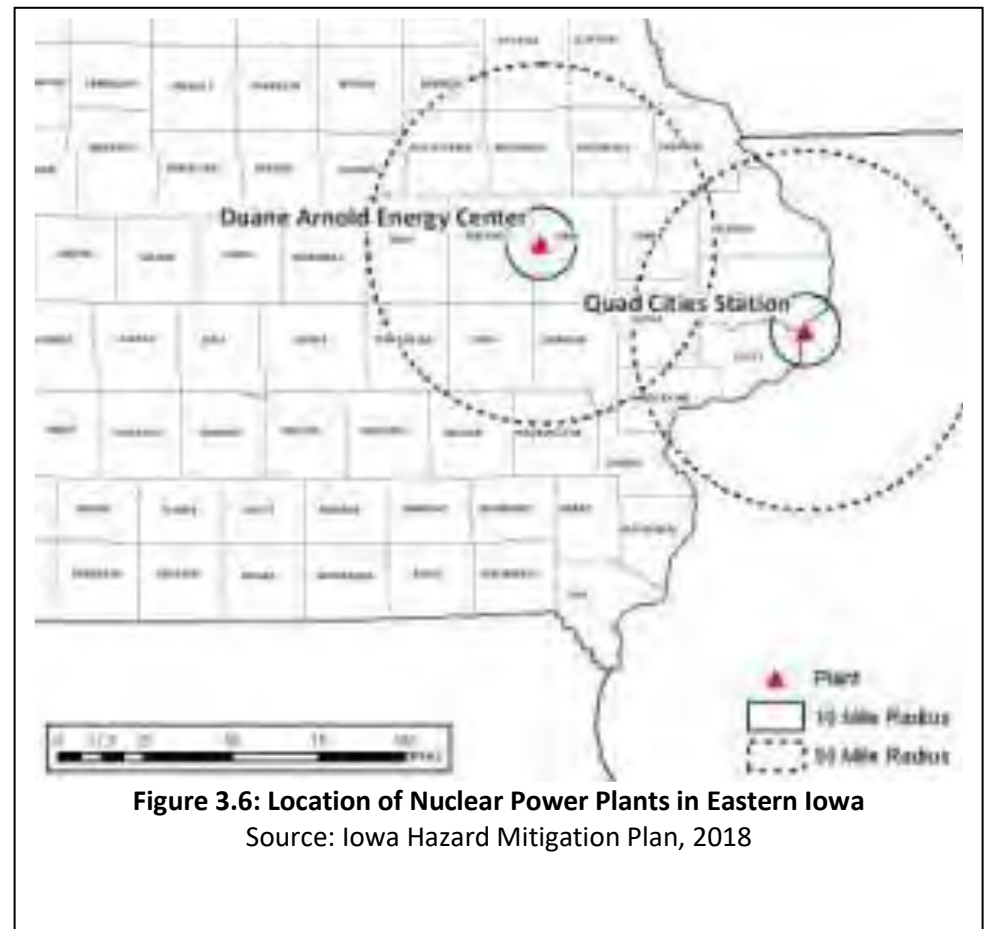
### Probability

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 boarder. 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



**Figure 3.6: Location of Nuclear Power Plants in Eastern Iowa**

Source: Iowa Hazard Mitigation Plan, 2018

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”<sup>12</sup>

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 Denver, and Readlyn, and their surrounding areas, 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.<sup>13</sup>

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.

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

<sup>13</sup> <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 30 recorded flood events within Bremer County from 1996 through 2020. Table 3.16 displays the date, general location, and impact of these floods. Since 1998, floods have caused nearly \$25 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 twenty-year span, from January 1, 2000 through December 31, 2020.

#### 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.

**TABLE 3.16: RIVER FLOODING EVENTS IN BREMER COUNTY, 2000-2020**

Location	Date	Time	Death or Injuries	Property Damage (\$)	Crop Damage (\$)
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	210.00K	0.00K
WAVERLY	4/24/2008	21:30	0	100.00K	0.00K
DENVER	4/25/2008	5:00	0	100.00K	0.00K
WAVERLY	6/07/2008	21:15	0	10.00K	0.00K
PLAINFIELD	6/08/2008	10:20	0	250.00K	500.00K
WAVELY	6/08/2008	1:26	0	10.00K	0.00K
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
FREDERIKA	6/13/2018	11:11	0	50.00K	100.00K
PLAINFIELD	7/01/2018	00:40	0	100.00K	500.00K
JANESVILLE	9/02/2018	18:32	0	50.00K	150.00K
FINCHFORD	3/14/2019	10:00	0	200.00K	0.00K
<b>Total</b>			<b>0</b>	<b>2.136M</b>	<b>21.823M</b>

Source: National Climatic Data Center, retrieved 3/25/2022

As part of three watersheds (Shell Rock River, Upper Cedar River, and Upper Wapsipinicon), areas adjacent to the rivers and 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 the county. The parcel information is current as of 05/10/2021. The FEMA Digital FIRM data for Bremer County was completed on 01/29/2021. The incorporated boundaries are current as of 05/10/2021. 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	1,000	\$21,591,290	\$28,436,027	\$50,915,553	\$100,942,870
0.2% Annual Chance Floodplain Values	1,334	\$29,166,280	\$37,084,044	\$84,942,876	\$151,193,200
Total Incorporated Floodplain Value	2,334	\$50,757,570	\$65,520,071	\$135,858,429	\$252,136,070
Total Incorporated Value	8,719	\$221,944,380	\$174,147,417	\$826,682,693	\$1,222,774,490
<i>Figures calculated using data from Bremer County GIS Department; Parcel data current as of 05/10/2021</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	3,602	\$110,424,020	\$4,839,750	\$106,767,180	\$222,030,950
0.2% Annual Chance Floodplain Values	2,498	\$96,768,550	\$4,551,210	\$90,190,000	\$191,509,760
Total Unincorporated Floodplain Value	6,100	\$207,192,570	\$9,390,960	\$196,957,180	\$413,540,710
Total Unincorporated Value	11,097	\$456,050,500	\$28,429,718	\$493,115,072	\$977,595,290
<i>Figures calculated using data from Bremer County GIS Department; Parcel data current as of 05/10/2021</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
<b>Blizzard</b>	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
<b>Cold/wind Chill</b>	A period of low temperatures or wind chill temperatures reaching or exceeding locally/regionally defined advisory (typically value is -18°F or colder).
<b>Heavy Snow</b>	Snow accumulation meeting or exceeding the locally/regionally defined 12 and 24 hours warning criteria
<b>Ice Storm</b>	Ice accretion meeting or exceeding locally/regionally defined warning criteria (typical value is ¼ or ½ inch or more)
<b>Winter Storm</b>	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 2000 through 2021 there were 63 winter storm events, including: Blizzard (14), Cold/Wind Chill (4), Heavy Snow (12), Ice Storm (6), and Winter Storm (25). According to this data, there have been no fatalities or injuries resulting in from these hazard events. However, it is estimated that these 63 winter storm events have caused nearly \$1.072 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, 2000, through October 11, 2021.

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**TABLE 3.20 WINTER STORM EVENTS IN BREMER COUNTY, 2000-2021**

*Source: National Climatic Data Center; Damage estimates include areas outside of Bremer County*

Date	Type	Property Damage (\$)	Crop Damage (\$)	Date	Type	Property Damage (\$)	Crop Damage (\$)
1/19/2000	Winter Storm	1.00K	0.00K	1/20/2012	Heavy Snow	0.00K	0.00K
2/17/2000	Winter Storm	10.00K	0.00K	12/19/2012	Winter Storm	25.00K	0.00K
12/10/2000	Winter Storm	24.90K	0.00K	12/20/2012	Blizzard	100.00K	0.00K
12/18/2000	Blizzard	25.00K	0.00K	1/27/2013	Ice Storm	50.00K	0.00K
12/21/2000	Blizzard	20.00K	0.00K	1/30/2013	Winter Storm	25.00K	0.00K
12/28/2000	Heavy Snow	5.00K	0.00K	2/21/2013	Heavy Snow	0.00K	0.00K
2/8/2001	Ice Storm	75.00K	0.00K	1/26/2014	Blizzard	10.00K	0.00K
2/8/2001	Winter Storm	50.00K	0.00K	2/20/2014	Blizzard	25.00K	0.00K
3/1/2002	Heavy Snow	5.00K	0.00K	1/8/2015	Blizzard	0.00K	0.00K
3/4/2003	Heavy Snow	1.00K	0.00K	2/1/2015	Winter Storm	50.00K	0.00K
4/4/2003	Ice Storm	5.00K	0.00K	2/25/2015	Heavy Snow	0.00K	0.00K
4/6/2003	Winter Storm	5.00K	0.00K	11/20/2015	Winter Storm	0.00K	0.00K
1/1/2005	Ice Storm	5.00K	0.00K	12/28/2015	Winter Storm	0.00K	0.00K
1/4/2005	Heavy Snow	10.00K	0.00K	02/02/2016	Winter Storm	0.00K	0.00K
1/22/2005	Blizzard	5.00K	0.00K	12/18/2016	Extreme Cold	0.00K	0.00K
1/20/2007	Heavy Snow	0.00K	0.00K	01/15/2017	Ice Storm	0.00K	0.00K
2/24/2007	Winter Storm	250.00K	0.00K	01/24/2017	Winter Storm	0.00K	0.00K
12/1/2007	Winter Storm	10.00K	0.00K	03/12/2017	Winter Storm	0.00K	0.00K
2/10/2008	Cold/wind Chill	0.00K	0.00K	12/30/2017	Extreme Cold	0.00K	0.00K
12/8/2008	Winter Storm	10.00K	0.00K	01/01/2018	Extreme Cold	0.00K	0.00K
12/18/2008	Winter Storm	5.00K	0.00K	02/08/2018	Winter Storm	0.00K	0.00K
12/20/2008	Blizzard	0.00K	0.00K	03/23/2018	Winter Storm	0.00K	0.00K
12/27/2008	Ice Storm	5.00K	0.00K	01/27/2019	Winter Storm	0.00K	0.00K
1/13/2009	Heavy Snow	0.00K	0.00K	01/29/2019	Extreme Cold	0.00K	0.00K
4/5/2009	Winter Storm	0.00K	0.00K	02/11/2019	Winter Storm	0.00K	0.00K
12/8/2009	Heavy Snow	10.00K	0.00K	02/19/2019	Winter Storm	0.00K	0.00K
12/9/2009	Blizzard	50.00K	0.00K	02/23/2019	Blizzard	0.00K	0.00K
1/6/2010	Winter Storm	25.00K	0.00K	01/25/2021	Heavy Snow	0.00K	0.00K
1/25/2010	Blizzard	75.00K	0.00K	02/04/2021	Blizzard	0.00K	0.00K
12/11/2010	Blizzard	75.00K	0.00K	02/14/2021	Cold/Wind Chill	0.00K	0.00K
12/23/2010	Heavy Snow	0.00K	0.00K	03/15/2021	Winter Storm	0.00K	0.00K
2/1/2011	Blizzard	25.00K	0.00K		<b>Total</b>	<b>1,071,900</b>	<b>0.00K</b>

### Probability

From 1996 through 2021 there have been 75 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 24 years Bremer County has averaged three winter storm events per year.

TABLE 3.21: Annual Average of Winter Storm Events in Bremer County, 1996-2021		
Storm Event	Total Events	Events Per Year
Blizzard	17	0.7
Cold/wind Chill	7	0.3
Heavy Snow	16	0.7
Ice Storm	11	0.5
Winter Storm	24	1
<b>Total</b>	<b>75</b>	<b>3.1</b>
<i>Source: National Climatic Data Center, retrieved on 5/3/2021</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 were 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.

## Sinkholes

### Definition and Description

A sinkhole is the loss of surface elevation due to the removal of subsurface support. Sinkholes range from broad, regional lowering of the land surface to abrupt localized collapse. The primary causes of most subsidence are human activities such as underground mining of coal, groundwater/petroleum withdraw, or drainage of organic soils. Sinkholes can aggravate flooding potential, collapse of an abandoned mine may destroy buildings, roads, and utilities.

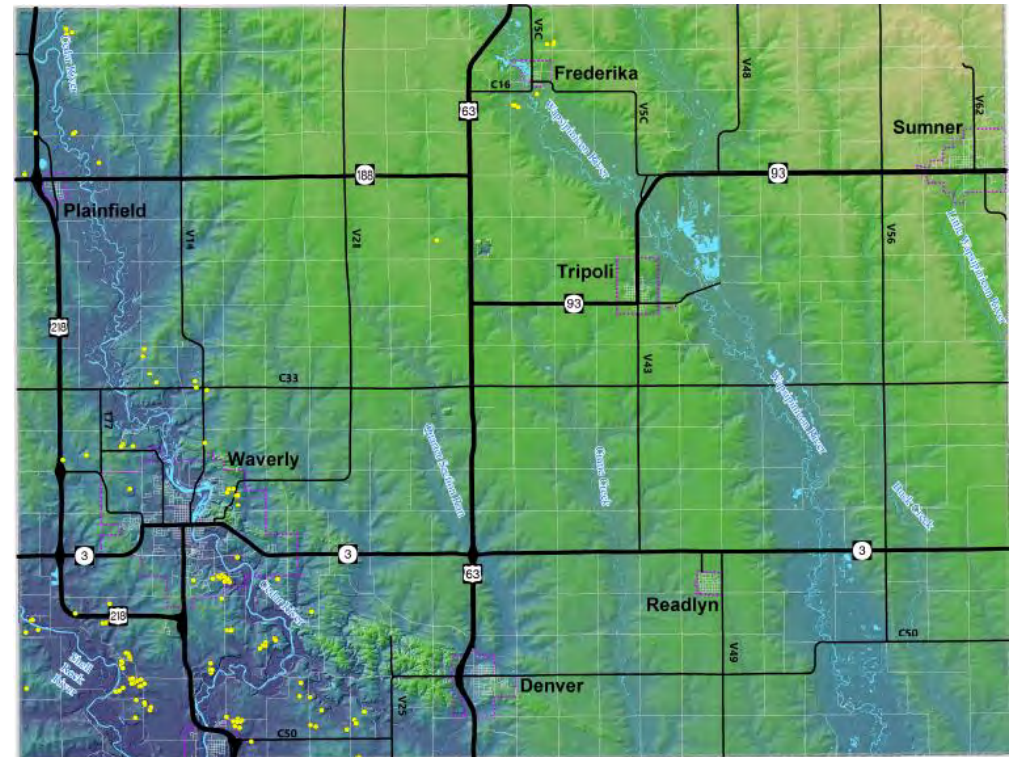
Sinkholes are common where the rock below the land surface is limestone, carbonate rock, salt beds, or rocks that can naturally be dissolved by ground water circulating through them. As the rock dissolves, spaces and caverns develop underground. Sinkholes are dramatic because the land usually stays intact for a while until the underground spaces just get too big. If there is not enough support for the land above the spaces, then a sudden collapse of the land surface can occur. New sinkholes have been correlated to land-use practices, especially from groundwater pumping and from construction and development practices. Sinkholes can also form when natural water-drainage patterns are changed, and new water-diversion systems are developed. Some sinkholes form when the land surface is changed, such as when industrial and runoff-storage ponds are created. The substantial weight of the new material can trigger an underground collapse of supporting material, thus causing a sinkhole.

### Historical Occurrence

Most of Iowa's sinkholes occur in rural areas where their main impact is rendering some land unsuitable for row-crop agriculture. Sinkholes have also resulted in the failure of farm and other types of ponds, roads, and one sewage-treatment lagoon. As sinkholes sometimes allow surface runoff to directly enter bedrock aquifers, their presence has implications for groundwater quality.<sup>14</sup>

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

Figure 3.7: Locations of Sinkhole Depressions in Bremer County



Source: Iowa Department of Natural Resources's Natural Resources Geographic Information Systems Library & INRCOG

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 Map<sup>15</sup> 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 or 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.

### Duration

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

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

### 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.

**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

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		

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 1/1/2010 – 12/31/2020. 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 lightning being observed or detected), with speeds of at least 50 knots (58 mph) or winds of any speed producing a fatality, injury, or damage...”<sup>16</sup> NOAA reports, from 2010-2020, Bremer County experienced 41 Thunderstorm Wind events over 19 days.

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

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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. 2010-2020**

Location	Date	Wind Speed (knots)	Property Damage	Crop Damage	Location	Date	Wind Speed (knots)	Property Damage	Crop Damage
TRIPOLI	6/23/2010	83 kts. EG	50.00K	0.00K	WAVERLY AIRPORT	4/19/2017	56 kts. EG	5.00K	0.00K
BREMER	6/23/2010	83 kts. EG	350.00K	0.00K	BREMER	4/19/2017	52 kts. EG	2.00K	0.00K
TRIPOLI	6/23/2010	87 kts. EG	50.00K	0.00K	PLAINFIELD	5/15/2017	51 kts. MG	0.00K	0.00K
SUMNER	6/23/2010	74 kts. EG	50.00K	0.00K	PLAINFIELD	5/15/2017	56 kts. EG	0.00K	0.00K
SUMNER	6/23/2010	65 kts. EG	20.00K	0.00K	PLAINFIELD	5/15/2017	59 kts. MG	0.00K	0.00K
PLAINFIELD	8/8/2010	56 kts. MG	0.00K	0.00K	TRIPOLI	5/15/2017	61 kts. EG	1.00K	0.00K
TRIPOLI	8/8/2010	52 kts. EG	2.00K	0.00K	TRIPOLI	5/15/2017	61 kts. EG	1.00K	0.00K
SUMNER	5/24/2012	57 kts. EG	15.00K	0.00K	TRIPOLI	5/15/2017	56 kts. EG	10.00K	0.00K
WAVERLY AIRPORT	6/20/2012	52 kts. EG	5.00K	0.00K	TRIPOLI	5/17/2017	50 kts. EG	0.00K	0.00K
PLAINFIELD	5/19/2013	52 kts. EG	2.00K	0.00K	SCHWERIN FLD ARPT	5/17/2017	56 kts. MG	0.00K	0.00K
WAVERLY	5/19/2013	52 kts. EG	2.00K	0.00K	PLAINFIELD	5/17/2017	56 kts. MG	0.00K	0.00K
PLAINFIELD	8/22/2013	51 kts. MG	0.00K	0.00K	SUMNER	7/19/2017	56 kts. EG	5.00K	0.00K
PLAINFIELD	8/22/2013	61 kts. EG	25.00K	0.00K	WAVERLY	7/25/2018	50 kts. EG	0.00K	0.00K
HORTON	8/22/2013	56 kts. EG	25.00K	5.00K	HORTON	6/30/2019	65 kts. EG	5.00K	0.00K
BUCK CREEK	6/16/2014	83 kts. EG	200.00K	0.00K	WAVERLY	7/20/2019	60 kts. EG	20.00K	0.00K
PLAINFIELD	8/29/2014	56 kts. MG	10.00K	0.00K	WAVERLY	7/20/2019	50 kts. EG	0.00K	0.00K
JANESVILLE	6/22/2016	65 kts. MG	50.00K	0.00K	FREDERIKA	7/20/2019	60 kts. EG	25.00K	0.00K
DENVER	6/30/2016	56 kts. EG	5.00K	0.00K	SUMNER	7/20/2019	60 kts. EG	2.00K	0.00K
BREMER	6/30/2016	56 kts. EG	10.00K	0.00K	PLAINFIELD	6/21/2020	50 kts. EG	0.00K	0.00K
PLAINFIELD	7/11/2016	56 kts. EG	50.00K	0.00K	PLAINFIELD	6/21/2020	52 kts. EG	0.00K	0.00K
WAVERLY AIRPORT	4/19/2017	52 kts. EG	30.00K	0.00K	<b>Total</b>			<b>1.027M</b>	<b>5.00K</b>

Source: National Climatic Data Center, retrieved 5/3/2021

Since January 1993, the National Climatic Data Center reports that there have been four lighting strikes recorded in Bremer County thru 2020. In 1997, lighting struck and blew up the chimney of a home in Waverly. Other lighting strikes have included antennas, trees, and homes.

Data from NOAA, compiled using National Lightning Detection Network, found that the state of Iowa averaged 645,685 cloud-to-ground lighting flashes between 1997 and 2011; equating to an average of 11.4 flashes per square mile<sup>17</sup>. 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 2010-2020. 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 it 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.

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<sup>17</sup> [http://www.lightningsafety.noaa.gov/stats/Table-Flashes\\_by\\_State\\_1997-2011.pdf](http://www.lightningsafety.noaa.gov/stats/Table-Flashes_by_State_1997-2011.pdf)

## 2022 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

**TABLE 3.24: HISTORIC HAILSTORMS IN BREMER COUNTY, 2010-2020**

City/Township	Date	Magnitude (inches)	Property Damage	Crop Damage	City/Township	Date	Magnitude (inches)	Property Damage	Crop Damage
DENVER	4/6/2010	0.88 in.	1.00K	0.00K	TRIPOLI	6/12/2013	0.88 in.	0.00K	5.00K
READLYN	4/6/2010	1.00 in.	0.00K	0.00K	BUCK CREEK	6/12/2013	1.75 in.	10.00K	10.00K
TRIPOLI	5/22/2011	1.00 in.	1.00K	0.00K	BUCK CREEK	6/12/2013	1.75 in.	10.00K	15.00K
TRIPOLI	5/22/2011	1.00 in.	3.00K	5.00K	READLYN	6/12/2013	2.75 in.	25.00K	15.00K
SUMNER	5/22/2011	2.00 in.	3.00K	3.00K	READLYN	6/12/2013	2.00 in.	15.00K	10.00K
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	READLYN	6/12/2013	1.50 in.	5.00K	15.00K
PLAINFIELD	5/19/2013	1.00 in.	1.00K	0.00K	TRIPOLI	6/12/2013	0.88 in.	0.00K	5.00K
JANESVILLE	6/12/2013	1.00 in.	1.00K	0.00K	BUCK CREEK	6/12/2013	1.00 in.	2.00K	10.00K
PLAINFIELD	6/12/2013	1.75 in.	1.00K	5.00K	SUMNER	4/12/2014	1.25 in.	3.00K	0.00K
PLAINFIELD	6/12/2013	1.50 in.	5.00K	10.00K	PLAINFIELD	4/12/2014	1.00 in.	0.00K	0.00K
BREMER	6/12/2013	1.50 in.	5.00K	0.00K	WAVERLY	4/12/2014	0.88 in.	0.00K	0.00K
BREMER	6/12/2013	1.00 in.	5.00K	10.00K	WAVERLY	4/12/2014	1.00 in.	2.00K	0.00K
BREMER	6/12/2013	1.00 in.	0.00K	5.00K	WAVERLY	4/12/2014	0.88 in.	0.00K	0.00K
TRIPOLI	6/12/2013	1.00 in.	0.00K	5.00K	DENVER	4/12/2014	1.25 in.	3.00K	0.00K
FREDERIKA	6/12/2013	0.75 in.	0.00K	5.00K	DENVER	4/12/2014	2.00 in.	30.00K	0.00K
ARTESIAN	6/12/2013	1.75 in.	0.00K	5.00K	READLYN	4/12/2014	1.75 in.	15.00K	0.00K
ARTESIAN	6/12/2013	1.75 in.	5.00K	10.00K	READLYN	4/12/2014	1.75 in.	10.00K	0.00K
KNITTEL	6/12/2013	1.75 in.	5.00K	10.00K	WAVERLY	4/12/2014	1.25 in.	2.00K	0.00K
ARTESIAN	6/12/2013	1.75 in.	10.00K	10.00K	WAVERLY	4/12/2014	1.75 in.	15.00K	0.00K
KNITTEL	6/12/2013	1.75 in.	5.00K	10.00K	DENVER	6/30/2016	0.75 in.	0.00K	0.00K
BREMER	6/12/2013	0.75 in.	5.00K	10.00K	PLAINFIELD	6/15/2017	1.75 in.	0.00K	0.00K
TRIPOLI	6/12/2013	1.75 in.	0.00K	5.00K	JANESVILLE	6/15/2017	1.50 in.	0.00K	0.00K
TRIPOLI	6/12/2013	1.00 in.	0.00K	5.00K	JANESVILLE	6/15/2017	1.25 in.	0.00K	0.00K
TRIPOLI	6/12/2013	1.25 in.	3.00K	10.00K	WAVERLY	5/29/2019	1.00 in.	0.00K	0.00K
KNITTEL	6/12/2013	1.75 in.	10.00K	10.00K	READLYN	9/5/2020	1.75 in.	0.00K	0.00K
READLYN	6/12/2013	1.00 in.	3.00K	10.00K					
KNITTEL	6/12/2013	2.00 in.	15.00K	10.00K					
READLYN	6/12/2013	1.75 in.	10.00K	10.00K	<b>Total</b>			<b>312.00K</b>	<b>306.00K</b>
BUCK CREEK	6/12/2013	1.75 in.	10.00K	15.00K	<i>Source: National Climatic Data Center, retrieved 5/3/2021</i>				

### 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 measurable 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 2010-2020, 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 56 hail events in the past 10 years have occurred over the course of 10 days. From 1985-2020, 35 years, there were 39 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 24,864 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 3.25

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.

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.

#### Historical Occurrence

Since 1960 there have been 24 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 \$33,000. The recorded tornado events for the entire planning area can be referenced for detail in Table 3.26. 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 snowstorms or tornados.

<b>Touch Down Location</b>	<b>Date</b>	<b>Deaths / Injuries</b>	<b>Property Damage (\$)</b>	<b>Crop Damage (\$)</b>	<b>Fujita Scale</b>
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
JANESVILLE	10/9/2018	0	0.00K	0.00K	EF0
<b>Totals</b>	<b>-</b>	<b>0</b>	<b>6.524M</b>	<b>33.00K</b>	<b>-</b>

Source: Tornado Project and National Climatic Data Center, retrieved 5/6/2020

According to the National Climatic Data Center, the county experienced 93 Thunderstorm wind events between 1/1/2002 and 1/31/2021. Winds resulted in

estimated \$1.844 million in property damage and \$360,000 in crop damage.

Table 3.23 in the Thunderstorm / Lighting / Hail hazard section includes a table of historical Thunderstorm Wind events from 2006 through 2021.

#### Probability

There have been 24 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, 2006-2021, Bremer County has experienced four 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 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.

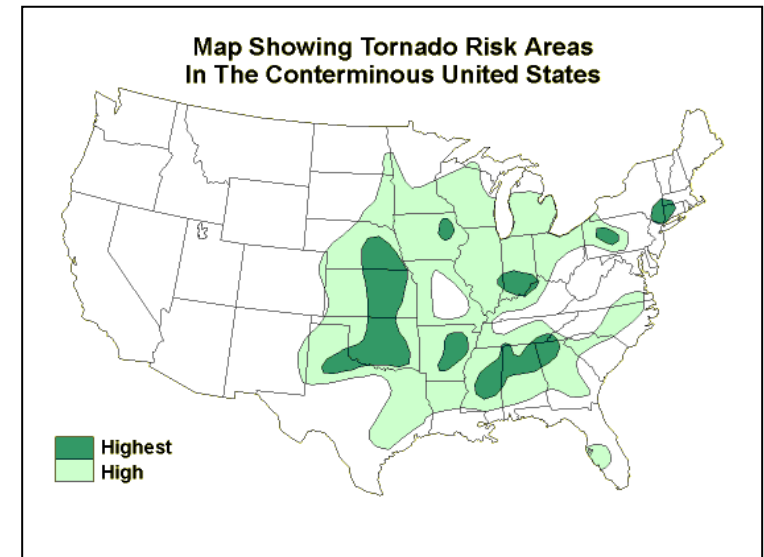
#### Magnitude / Severity

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

**FIGURE 3.8: TORNADO RISK**



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.

As Figure 3.8 shows, northeast Iowa is considered one of the highest risk locations for tornadoes in the nation. According to 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."<sup>18</sup>

Using available data, a tornado scenario was developed for each city. These scenarios estimate the potential damage of an EF0 through EF5 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 have 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 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.

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<sup>18</sup> <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.

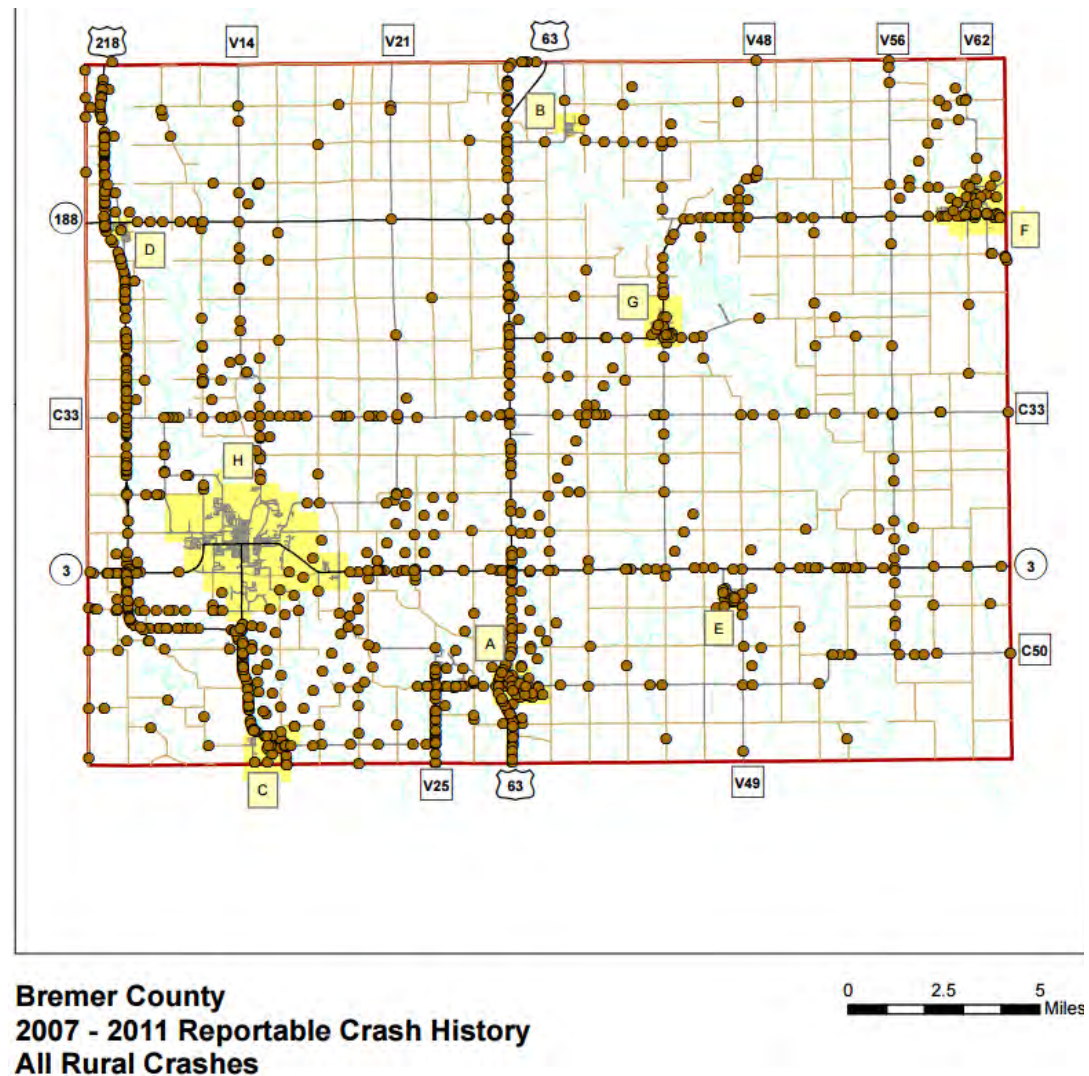
TABLE 3.27: AUTOMOBILE CRASHES IN BREMER COUNTY, 2016-2020			
Year	Number of Crashes	Total Fatalities	Total Injuries
2016	382	1	53
2017	344	0	46
2018	355	3	45
2019	403	4	39
2020	289	2	46
<b>5-year Total</b>	<b>1,773</b>	<b>10</b>	<b>229</b>
<b>Annual Average</b>	<b>354.6</b>	<b>2</b>	<b>45.8</b>
Source: Iowa Department of Transportation, retrieved 5/10/2021			

### 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 260<sup>th</sup> 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 was complete by 2016. While funding has not been identified for the interchange at 260<sup>th</sup> Street, it is anticipated that this project will be

FIGURE 3.9: Map of Crash Locations



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

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 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 Transportation<sup>19</sup>, rural Bremer County reported 2,440 vehicular crashes from 2015 to 2021.

As shown in Table 3.28, from 2000-2013 there were ten train-vehicles accidents in the planning area, resulting in an average of 0.71 train crashes per year. From 2013 to 2021, there were an additional 6 train involved

FIGURE 3.10: RAIL ROUTES THROUGH BREMER COUNTY



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

<sup>19</sup> Iowa Department of Transportation, Iowa Crash Data for Bremer County, <https://icat.iowadot.gov/>, Retrieved October 21, 2021.

accidents reported, resulting in an average of .75 train involved crashes annually. 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 Wapsipinicon River.<sup>20</sup> One other incident was reported in 2019 in which a boat struck an individual on an innertube on the Cedar River.<sup>21</sup>

#### Probability

Based on historic crash data shown in Table 3.25 and Figure 3.9, the County should expect multiple crashes each year, likely more than 300. Probability of a railway, waterway, and 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 increased 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 hazard to crop duster airplanes 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.

TABLE 3.28: 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				

<sup>20</sup> <http://db.desmoinesregister.com/iowa-boating-accidents> [https://wcfcourier.com/news/local/crime-and-courts/waverly-woman-injured-in-tubing-boat-crash-boat-driver-investigated/article\\_c4954e3d-4ab2-56c1-8ef3-4f3cce907aff.html](https://wcfcourier.com/news/local/crime-and-courts/waverly-woman-injured-in-tubing-boat-crash-boat-driver-investigated/article_c4954e3d-4ab2-56c1-8ef3-4f3cce907aff.html)

#### 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 crossing could impact the immediate area for a few days.

## 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. Bremer County has adopted the January 29, 2021 Flood Insurance Rate Maps (FIRM) by resolution as part of their Floodplain Management Ordinance. 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, with a recent contract to update by the end of 2023 and is administrated by the County Zoning Administrator, Lindsey Lambert.



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

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	Yes	No	No	Yes-RR	No	Yes	Yes	No	No
City of Janesville, IA	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City of Plainfield, IA	Yes	No	Yes	Yes	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	No	Yes	Yes	Yes	Yes
City of Tripoli, IA	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	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 cities of Waverly and Sumner have both participated in a FEMA buyout program (see Appendix F and H for additional information).

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 4.2 NFIP STATISTICS IN BREMER COUNTY				
Community	Participates in NFIP?	CID #	# of NFIP Policies	NFIP Insurance in Force (\$)
Denver	Yes	190026	10	\$1,348,700
Frederika	Yes	190027	2	\$245,000
Janesville	Yes	190023	0	\$0
Plainfield	Yes	190327	3	\$575,200
Readlyn	Yes	190645	0	\$0
Sumner	Yes	190029	12	\$1,445,400
Tripoli	Yes	190669	1	\$100,000
Waverly	Yes	190030	118	\$23,545,100
Bremer County	Yes	190847	37	\$6,342,400
<b>Total</b>	-	-	<b>183</b>	<b>\$33,601,800</b>
<i>Source: Federal Emergency Management Agency (FEMA); NFIP Statistics as of 10/26/2021</i>				

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 86 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	0	5	0	\$29,886.75	\$0
Plainfield	2	0	3	0	\$41,911.91	\$0
Readlyn	-	-	-	-	-	-
Sumner	5	0	9	0	\$149,764.50	\$0
Tripoli	1	0	2	0	\$40,926.91	\$0
Waverly	166	9	204	15	\$5,137,319.51	\$414,562.13
Bremer County	13	2	19	2	\$540,541.18	\$119,465.18
<b>TOTAL</b>	<b>190</b>	<b>12</b>	<b>244</b>	<b>19</b>	<b>\$5,958,066.42</b>	<b>\$551,742.97</b>
<i>Source: Iowa Department of Natural Resources; Data does not include properties that have been mitigate; RL = Repetitive Loss; Data as of 10/26/2021</i>						

## 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, and social media. 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.<sup>21</sup>

<sup>21</sup> <https://homelandsecurity.iowa.gov/alert-iowa/>

### 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](mailto:kladage@co.bremer.ia.us)

#### Law Enforcement

The Bremer County Sheriff's Office contracts 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, with Shell Rock and Oran Fire Departments providing service from outside of the county.

#### Ambulance & Emergency Management Services

Much like the Fire Departments, the entire county is divided into Ambulance Districts. The entire county is covered just like with fire districts. Emergency Service providers for Bremer County are: Non-transport EMS: Janesville First Responders, Frederika First Responders, Readlyn First Responders, Plainfield First Responders; Transport Services: Denver Ambulance, Tripoli Ambulance, Sumner EMS, Waverly Health Center EMS. The County also receives Mutual Aid from Paramedic/Ambulance/EMS from: Covenant Medical Center Ambulance Service, Sartori Ambulance Service, AMR Ambulance Service in Charles City, and Mason City Fire Department, Shell Rock First Responders, Oran First Responders.

#### Medical Facilities

Bremer County has two hospitals within its boundaries – Waverly Health Center in Waverly and Community Memorial Hospital in Sumner; otherwise, residents go to neighboring counties for medical attention.

#### HAZMAT

Bremer County (covering each community in the county) contracts 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 material's quick response unit to Black Hawk County, surrounding counties, and many municipalities in an eleven-county region. The Unit provides local fire departments with hazardous 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 Landon Moore, County Engineer, who is also in charge of the Secondary Roads Department. The shop equipment supervisor is Andy Tiedt. Bremer County has the following assets in the Engineer/Secondary Roads Department: 12 motor graders, 15 dump trucks, 2 end loaders, 1 dozers, 2 semi-tractor/lowboy, 10 pickup trucks, and 2 rubber tire excavators, and one track excavator.

## **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: Social, Technical, Aministrative, Political, Legal, Economic, and Environmental. 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 whole 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, 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 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 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 (s)	Funding Source
<b>Education/Public Awareness</b>						
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 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	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

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L	Notify the media on shelter locations	Severe Winter Storm, Extreme Heat, Tornado	Sheriff, EMA	On-Going	Minimal	Local
H	Promote awareness of the Iowa Disaster Behavioral Health Response Team (DBHRT) as a resource in the event of a disaster	ALL	Mental Health/Disability Services of the East Central Region, County EMA	On-going	Minimal to Low	State, County, Local
<b>Emergency Services</b>						
M	Continue training and education for fire departments, law enforcement agencies and ambulance crew personnel	All	Bremer County EMA and EMS Departments	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 EMA and EMS Departments	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 city/county employees	HAZMAT	Bremer County EMA	On-Going	Minimal	Local, 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

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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
M	Purchase P25 compliant, multi-band radios to allow communications interoperability between traditional VHF radio system (analog and digital (P25) format) and the SARA and ISICS systems used in neighboring communities	Emergency Management	Board of Supervisors, EMA	On-Going	Low to Moderate	County/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
H	Promote awareness of the Iowa Disaster Behavioral Health Response Team (DBHRT)	ALL	Mental Health/Disability Services of the East Central Region, County EMA	On-going	Minimal to Low	State, County, Local
<b>Natural Resource Protection</b>						
M	Participate in Watershed	Flash Flooding, River	Engineer, EMA	Active	Minimal	County

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	Management Authorities	Flooding				
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	Building, Zoning, & Sanitation	On-Going	Low	Local, State
M	Monitor wells in areas of identified contamination	Groundwater Contamination	Building, Zoning, & Sanitation	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, EMA, and Soil and water Conservation District	Terrorism	Board of Supervisors, County Engineer, EMA	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 space and reducing surface flow	River Flood	Board of Supervisors	On-Going	Minimal	Local
L	Restrict water usage should it be necessary	Drought	Board of Supervisors	On-Going	Minimal to Low	Local

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L	Plant trees along water bodies and slopes	Landslides/Mudflows	Board of Supervisors, Public Works	On-Going	Minimal	Local
<b>Prevention</b>						
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	Encourage purchases and maintenance of 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	Encourage 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 drop-off site	HAZMAT	Board of Supervisors	On-Going	Minimal to Low	Local
M	Maintain, test, and replace warning sirens	Windstorm, Tornado, Hailstorm, Thunderstorm/Lightning,	Bremer County EMA	On-Going	Minimal to Low	Local, State

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		Communications Failure				
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	Assist with emergency planning 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	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
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	Transportation	Bremer County EMA, Sheriff	On-Going	Minimal	Local

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	closed					
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	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 department	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	Communities, EMA	On-Going	Minimal	Local
M	Continue cooperation with county	Flash Flood, River Flood	Board of Supervisors, EMA	On-Going	Minimal	Local

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	in developing flood mitigation efforts					
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	Develop rationing procedures	Drought	Board of Supervisors	On-Going	Minimal	Local
<b>Property Protection</b>						
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	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

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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	Inspect any utility lines that are near a sinkhole	Sinkholes	Public Works	On-Going	Minimal	Local
<b>Structural Projects</b>						
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	Expansive Soils	County Building	On-Going	Minimal	Local

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	away from structures		Department		to Low	
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/Conservation	On-Going	Minimal to Low	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.

*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.*

#### 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).

Each of the jurisdictions with previous HMPs have incorporated their plans into their comprehensive land use plans (excluding Frederika and Plainfield). 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, Councils of Government, 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.

Attachment 3 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, 2020 Decennial Census and *2019 American Community Survey</i>	
Total Population	1,919
Total Males	*803
Total Females	*923
Median Age	*37.7
At-Risk Population, <18 Yrs	*463
At-Risk Population, >64 Yrs	*331
One Race-White	1,861
Black or African American	0
American Indian and Alaskan Native	1
Asian	6
Other Race	9
Two or More Races	58
Hispanic or Latino	25
Total Household Population	1,860
Total Population in Group Quarters	47
Persons in Group Quarters – Institutionalized	47
Persons in Group Quarters – Noninstitutionalized	0
<i>Housing Characteristics, 2020 Decennial Census and *2019 American Community Survey</i>	
Total Housing Units	805
Total Owner-Occupied Housing Units	*556
Total Renter-Occupied Housing Units	*163
Total Vacant Housing Units	54
Total 1-Unit Detached and Attached Structures	*588
Total 2, 3, and 4-Unit Structures	*62
Total 5 and above-Unit Structures	*61
Total Mobile Homes	0
Year Majority of Housing Units were Built	*1939 or earlier (19.2%)
Average Household Size	*2.36
Average Family Size	*2.99

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.

<b>TABLE A1.1: CITY OF DENVER DEMOGRAPHICS</b>	
<b><i>Economics Characteristics, 2019 ACS 5-Year Estimates Data Profiles</i></b>	
Population 16 years and over	1,325
Population In Labor Force (16 yrs and over)	919
Persons Employed	889
Persons Unemployed	27
Persons Employed in Management, Business, Science, and Arts Occupations	344
Persons Employed in Service Occupations	120
Persons Employed in Sales and Office Occupations	215
Persons Employed in Natural Resources, Construction, and Maintenance Occupations	57
Persons Employed in Production, Transportation, and Material Moving Occupations	153
Median Household Income	\$67,228
Median Family Income	\$91,333
Percent of Persons < 18 yrs. Below Poverty Level	0.7%
Percent of Persons 18-64 Yrs. Below Poverty Level	6.4%
Percent of Persons >65 Yrs. Below Poverty Level	8.3%
<b><i>Social Characteristics, 2019 ACS 5-Year Estimates Data Profiles</i></b>	
School Enrollment (3 yrs and over)	441
Nursery School, Preschool	46
Kindergarten and Elementary School (grades 1-8)	210
High School (grades 9-12)	107
College or Graduate School	78
Education Attainment: Population 25 Years and Over	1,182
Less than High School Graduate	6.0%
High School Graduate (includes equivalency)	27.6%
Some College, Associate's Degree	34.8%
Bachelor's Degree or Higher	31.5%

Demographics

Population

Denver’s demographic data is outlined in Tables A1 and A1.1. In the recent 2020 U.S. Census, Denver’s population grew to 1,919, an increase of 7.8 percent over ten years. The previous U.S. Census, taken in 2010, recorded a population figure of 1,780 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

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. Attachment 1: 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 275 acres of land within the 100-year floodplain. As shown on *Attachment 1: Map 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 to the *Flood Scenario Map*, there are 50 dwellings and 72 buildings located within the identified floodplain. The total value of these structures is given in Table A4. Using the average

**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	122
Building Value	\$6,926,419
Dwelling Value	\$5,989,971
Total Value	\$12,525,390

*Source: INRCOG & Bremer County Assessor (2021 Values)*

household size figure (2.36) from the 2019 ACS 5-Year Estimates for Denver, approximately 118 people are living in dwellings within the floodplain.

### Tornadoes

As stated on the FEMA website<sup>22</sup>, 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 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, while Willow Winds Assisted Living has a capacity of 28 residents.

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<sup>22</sup> 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 2020 U.S. Census and 2019 American Community Survey 5-Year Estimates.

According to Table A5, 331 residents are 65 years and older. There are also 47 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, and Willow Winds Assisted Living to the south, are the only group care facilities 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.

Persons under the age of 18 are also at higher risk during some disasters. This is mostly due to the fact that young person’s 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 the 2019 American Community Survey 5-Year Estimates, there were 463 residents 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 community officials, there are zero mobile homes in the community.

The planning committee identified the Denver Sunset Home, Willow Winds Assisted Living, 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).

## 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.

**TABLE A5: CITY OF DENVER’S “AT-RISK” POPULATION**

Total Community Population (2010)	1,919
Elderly (65 yrs and older)	*331
Youth (under 18 yrs old)	*463
Householder Living Alone	*28.5%
Non-English Speaking Population (speaks English less than ‘very well’)	*0%
Population Living in Poverty	*5.3%
Population in Mobile Homes	0
Group Quarters Population	*47
<i>Source: U.S. Census, 2020, Iowa Data Center, and *2019 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	\$135,385,740	\$181,726 / parcel
Commercial Property	\$40,637,150	\$301,016 / parcel
Industrial Property	\$5,401,340	\$771,620 / parcel
Agricultural Buildings	NA	NA
Agricultural Land	\$383,010	\$1,232 / acre
Exemptions (military)	\$166,680	
Gross Valuation	\$147,239,277	

*Source: City of Denver and Bremer County Auditor, as of 1/3/2022*

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 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 A7 shows, there are currently there ten (10) 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 10/26/2021) 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	10	\$1,348,700	2	1	1	\$17,725	\$17,725
<i>Source: Federal Emergency Management Agency (FEMA); Note: RLB = Repetitive Loss Building; NFIP data current as of 10/26/2021; Repetitive loss data current as of 10/26/2021</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 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 through coordinated efforts with Bremer County.
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 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.
8. Take measured to create a unified communication system for all emergency entities in the County as the current system does not have such

capabilities.

### 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 two outdoor warning sirens within city limits and one additional siren just beyond the incorporated area. The sirens are 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 as 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](mailto: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, one full-time paramedic, 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 15-to-30-minute drive from Denver. Rochester's Mayo Clinic is 90 miles.

### ***HAZMAT***

Denver is included in the Bremer County 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 jurisdiction also partners with 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
<i>Education/Public Awareness</i>						
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	Emergency Management	Building and Zoning	On-Going	Minimal	Local

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	disasters					
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
H	Promote awareness of the Iowa Disaster Behavioral Health Response Team (DBHRT) as a resource in the event of a disaster	ALL	Mental Health/Disability Services of the East Central Region, County EMA	On-going	Minimal to Low	State, County, Local
<b>Emergency Services</b>						
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	Severe Winter Storm	City Council	On-Going	Minimal	Local

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	organization					
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	Maintain lists of personnel and equipment available to use with response plans	Emergency Management	City Council, Staff	On-Going	Minimal	Local
M	Purchase P25 compliant, multi-band radios to allow communications interoperability between traditional VHF radio system (analog and digital (P25) format) and the SARA and ISICS systems used in neighboring communities	Emergency Management	City Council, Police Department, Fire Department, EMA	On-Going	Low to Moderate	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
H	Promote awareness of the Iowa Disaster Behavioral Health Response Team (DBHRT)	ALL	Mental Health/Disability Services of the East Central Region, County	On-going	Minimal to Low	State, County, Local

			EMA			
<b>Natural Resource Protection</b>						
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	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	Maintain and/or develop a wellhead protection program	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
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	Landslides/Mudflows	City Council, Staff	On-Going	Minimal	Local

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	slopes					
L	Purchase additional parkland in order to increase greens space and reducing surface flow	River Flood	City Council	On-Going	Minimal	Local
<b>Prevention</b>						
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

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H	Maintain and keep storm drains clear of debris	Flash Flood	City Council	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
H	Establish alternative transportation routes should a road need to be closed	Transportation	City Council	On-Going	Minimal	Local
H	Maintain and update anti-virus software	Terrorism	City Council, Staff	On-Going	Low	Local
H	Maintain air conditioner(s) in community buildings	Extreme Heat	City Council, Public Works	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	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,	County EMA	On-Going	Minimal to Low	Local

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		Communications Failure				
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	Maintain law enforcement monitoring of large storage supplies	HAZMAT	City Council, Police	On-Going	Minimal	Local
L	Improve standard operating procedures for schools	Communications Failure	City Council, 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	Terrorism	City staff, Police	On-Going	Moderate	Local

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	by the LEPC and County EMA with alarms, security cameras and fences					
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
<b>Property Protection</b>						
H	Use surge protectors to prevent electrical damage to critical and sensitive equipment	Thunderstorm/Lightning	Staff	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	Maintain pump station	River Flood	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	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
<b>Structural Projects</b>						
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
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
M	Enforce and update building codes, as needed	Thunderstorm/Lightning, Windstorm, Tornado, Hailstorm, Expansive Soils, Earthquake	City Council, 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 borders Bremer County Alcock Park. The Wapsipinicon River runs along its western border and through Bremer County Alcock Park where a 210-foot concrete low-head dam crosses the Wapsipinicon River. The land within the city is gently sloping with a few areas of steeper grade near the river, but is generally flat. Two county highways serve the City of Frederika; County Road C16, which leads to Highway 63, and County Road V5C, which enters the city from the north and goes east to Highway 93.

#### History

The area around present-day Frederika was settled by two families in 1852. They built a sawmill 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. The town was named for Frederika Bremer, the Swedish author, for whom the surrounding county was also named. Various settlers over the years had established a variety of businesses, such as hardware, grocery restaurants, bars, and a Farmers Coop with grain storage bins serving nearby farmers. Before refrigeration, a successful ice mill operated on the Wapsipinicon River. A K-12 public school was erected in 1924, closing in 1966 with all students transferred to Tripoli Community School. A City Park was

TABLE B1: CITY OF FREDERIKA DEMOGRAPHICS	
<i>Government Framework</i>	Mayor – City Council
<i>General Population, 2020 Decennial Census and *2019 ACS 5-Year Estimates</i>	
Total Population	204
Median Age	*30.5
At-Risk Population, <18 Years	*108
At-Risk Population, >64 Years	*42
Total Males	*180
Total Females	*166
One Race-White	197
Black or African American	0
American Indian and Alaskan Native	0
Asian	0
Two or More Races	7
<i>Housing Characteristics, 2020 Decennial Census and *2019 ACS 5-Year Estimates</i>	
Total Households	113
Households with children <18 Yrs.	*52
Households with persons >65 Yrs.	*13
Average Household Size	*2.47
Average Family Size	*3.23
Total Housing Units	*140
Occupied Housing Units	98
Vacant Housing Units	15
Owner-Occupied Housing Units	*119
Renter-Occupied Housing Units	*21
Persons Living in Group Quarters	0

established on the school grounds with a Frederika Fort, park shelter, and ball diamond exists. A softball league started in the 1960's continues to play during the summer months for the town and surrounding area to enjoy.

Bremer County Alcock Park is located on the west side of Frederika with park property lying on both sides of the Wapsipinicon River. Initial land for the park (10 acres) was purchased in 1959. The current 42-acre park was completed in 1982 when the city of Frederika donated 17.2 acres on the east shore where a low-head dam crosses. The park offers a wide variety of recreational activities including, but not limited to, camping, fishing, boating, canoeing, and walking along the Wapsipinicon River.

Today, Frederika remains as a rural, farming community with stable population and few businesses consisting of: Farmers Savings Bank, Frederika Locker, Frederika Tap, Kenny's Maintenance, and a Riverside Bait (food/beverage and sport shop). The city serves as a bedroom community for residents who want the benefits of a secluded, small river-town atmosphere. Many residents find work in the Waterloo-Cedar Falls metro or in cities such as Waverly and New Hampton.

## Demographics

### Population

Frederika's demographic data is outlined in Tables B1 and B1.1. In the recent 2020 U.S. Decennial Census, Frederika's population climbed to 204, an increase of 11 percent over ten years. The previous U.S. Census, taken in 2010, recorded a population figure of 183 for Frederika. Much of the data included in the tables are from the 2019 American Community Survey Estimates, as detailed data from the 2020 Census is not yet available.

## Community Services

Iowa Regional Utilities Association (IRUA) from Newton, IA brought pressurized water lines from their Waverly well to Frederika. In 2018, IRUA installed various fire hydrants, however, the fire hydrants cannot be used directly by fire truck pumps at this time due to available supply and size of water pipes installed throughout portions of the city. IRUA bored water lines into multiple residential, multi-residential and businesses to supply treated and softened public water. The remaining residential and businesses are served by private water wells. The city identified and recorded an area for an eventual water tower and awaiting IRUA to obtain funding to have the tower erected. With water being pumped from Waverly, IRUA is to be notified when fire pumper or tanker truck and sewer

TABLE B1.1: CITY OF FREDERIKA DEMOGRAPHICS	
<i>Economics Characteristics, 2019 ACS 5-Year Estimates Data Profiles</i>	
Population 16 years and over	262
Population In Labor Force (16 yrs and over)	185
Persons Employed	183
Persons Unemployed	2
Persons Employed in Management, Business, Science, and Arts Occupations	69
Persons Employed in Service Occupations	15
Persons Employed in Sales and Office Occupations	24
Persons Employed in Natural Resources, Construction, and Maintenance Occupations	22
Persons Employed in Production, Transportation, and Material Moving Occupations	53
Median Household Income	\$45,417
Median Family Income	\$65,625
Percent of Persons < 18 yrs. Below Poverty Level	25%
Percent of Persons 18-64 Yrs. Below Poverty Level	16.6%
Percent of Persons >65 Yrs. Below Poverty Level	0.0%
<i>Social Characteristics, 2019 ACS 5-Year Estimates Data Profiles</i>	
School Enrollment (3 yrs and over)	104
Nursery School, Preschool	12
Kindergarten and Elementary School (grades 1-8)	40
High School (grades 9-12)	27
College or Graduate School	25
Education Attainment: Population 25 Years and Over	202
Less than High School Graduate	9
High School Graduate (includes equivalency)	56

cleaning truck fill up so an additional pump can be started to maintain water pressure.

A two-cell controlled discharge sewer treatment plant currently serves Frederika. The controlled discharges occur in the spring and fall of each year into the Wapsipinicon River. In 2019, the IDNR issued a conditional 5-year NPDES permit to address the ammonia and E-coli discharge limits. Based on Discharge Monitoring Reports over the past 3 years, it was determined that the average dry weather flow was 17,000 gpd, the average wet weather flow was 51,700 gpd, the maximum wet weather flow was 439,000 gpd occurred on July 22, 2017, and the peak hourly wet weather flow was 492,720 gpd. With this information, engineering determined an additional 6 million gallons primary lagoon needs to be constructed to hold the amount of water for the complete discharge periods and treat the water without any treatment mechanisms to be installed. The new lagoon must be operational by June 2024. During heavy rain events, the lift station pumps may not be able to keep up with sewer water flowing through the lines. In 2018, an OmniSite warning system was installed on the two lift pumps to send alerts whenever high water is detected within the pump pit. The alert allowed for mitigation action of adding a trash pump and bypassing water to nearby drainage ditch that flows to the Wapsipinicon River. This mitigation prevented sewer water backup into residential basements.

The City contracts with Waste Management of Iowa for the collection of garbage weekly. The City also contracts with Waste Management for a recycling container that residents deposit recyclables into and is replaced monthly. Waste Management hauls the garbage to the sanitary landfill facilities operated by Black Hawk County Solid Waste Management Commission.

TABLE B2: FREDERIKA UTILITY PROVIDERS						
Electric	Natural Gas	Telephone/Internet	Cable	Water	Sewer	Sanitation
Alliant Energy	NA (LP Only)	Butler-Bremer Communications	Butler-Bremer Communications	Iowa Regional Utilities Association	City of Frederika	Waste Management of Iowa

Frederika has 2 standby generators with LP being the alternative fuel. If there is a power outage, source of LP will become important to Frederika.

## 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. 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.

**(Probability x .45) + (Magnitude/Severity x. 30) + (Warning Time x .15) + (Duration x .10) = Final Hazard Assessment Score**

Table B3 is the analysis scores for the City of Frederika. As shown in the table, the top four hazards for the city are: Animal/Plant/Crop Disease, Severe Winter Storm, Flash Floods, River Flooding.

TABLE B3: CITY OF FREDERIKA'S HAZARD RISK ASSESSMENT						
Hazard Rank	Hazard	Probability	Magnitude/ Severity	Warning Time	Duration	Hazard Score
1	Animal/Plant/Crop Disease	4	3	1	4	3.25
2	Severe Winter Storm	4	2	2	3	3
3	Flash Flood	3	2	3	3	2.7
3	River Flooding	3	2	3	3	2.7
4	Thunderstorm/Lighting/Hail	3	2	2	3	2.55
5	Tornado/Windstorm	2	3	2	3	2.4
6	Grass/Wild land Fire	2	2	4	2	2.3
7	Human Disease	2	2	2	4	2.2
7	Expansive Soils	3	1	1	4	2.2
8	Extreme Heat	2	2	1	3	1.95
8	Terrorism	1	2	4	3	1.95
9	Infrastructure Failure	2	1	2	4	1.9
10	Levee/Dam Failure	1	2	1	4	1.6
11	HAZMAT Incident	1	2	2	2	1.55
12	Radiological Incident	1	1	3	3	1.5
13	Transportation Incident	1	1	4	1	1.45
13	Landslide	1	1	4	1	1.45
14	Drought	1	1	1	4	1.3
14	Earthquake	1	1	1	4	1.3
15	Sinkholes	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

## 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 B4) 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 1: Map 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 the Community Building with a standby generator could also be used in an emergency.

According to available data, Frederika is projected to see a decrease in population over the next thirty years. This population decrease will 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 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 B4: CRITICAL FACILITIES IN FREDERIKA**

St. John’s Lutheran Church (Shelter)	Frederika Methodist Church (Shelter)
Frederika Community Building (Shelter w/Standby Generator)	Fire Station
Wastewater Treatment Plant	Butler-Bremer Communication Substation
Butler-Bremer Communication Cellular Tower	E-911 Tower
<i>Source: Community</i>	

**TABLE B5: CITY OF FREDERIKA  
100-YEAR FLOODPLAIN PROPERTIES**

Number of Structures	29
Structure Value	\$ 1,374,930
Total Value	\$ 1,374,930
<i>Source: INRCOG &amp; Bremer County Assessor</i>	

Approximately 82 acres of land within the corporate limits of Frederika are located within the 100-year floodplain. Table B4 provides a breakdown for those acres. As shown on *Attachment 1: Map 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 93 acres of land within the 500-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 damage 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 to data acquired from the Bremer County Assessor and GIS, there are 29 buildings located within the identified floodplain. The total value of these structures is given in Table B5. Using the average household size figure (2.47) from the 2019 American Community Survey 5-Year Estimate Data for Frederika, approximately 2 people are living in dwellings within the floodplain.

### Tornadoes

As stated on the FEMA website<sup>23</sup>, 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*).

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<sup>23</sup> 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 B6 presents an overview of the at-risk population in Frederika according to information retrieved from the 2020 U.S. Decennial Census and 2019 American Community Survey 5-Year Estimates.

TABLE B6: CITY OF FREDERIKA “AT-RISK” POPULATION	
	2020
Total Community Population (2020)	204
Elderly (65 yrs and older)	*42
Youth (under 18 yrs old)	*108
Householder Living Alone	*13
Non-English Speaking Population (speaks English less than ‘very well’)	0
Population Living in Poverty	*60
Population in Mobile Homes	0
Group Quarters Population	0
Source: U.S. Decennial Census, 2020 and *2019 ACS 5-Year Estimates	

According to Table B6, 42 Frederika 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 2020, best estimates from current data show that 108 of Frederika’s residents were 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 2020 Census, there were no permanent residency mobile homes in the city, while one was identified by the community as being a vacation home. It is also noted that there are several motorized recreational vehicles used as secondary residencies within the community.

As mentioned earlier, approximately 82 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, 2.47, 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 B7.

TABLE B7: CITY OF FREDERIKA’S VALUATION AS OF JANUARY 1, 2021		
	Total Valuation	Average Valuation per Unit or Parcel
Residential Property	\$ 7,945,740	\$ 57,578 per unit
Commercial Property	\$ 795,350	\$ 31,814 per unit
Industrial Property	NA	NA
Agricultural Buildings	\$ 56,100	\$ 56,100 per unit
Agricultural Land	\$ 71,950	\$ 1,368 per acre
Utilities	NA	NA
Railroads	NA	NA
Exemptions (military)	\$166,680	NA
Gross Valuation	\$ 8,869,140	NA
<b>Total Net Valuation</b>	<b>\$ 8,869,140</b>	<b>NA</b>

Source: 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 B8 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 B8: 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	\$245,000	0	0	0	\$0	\$0

Source: Federal Emergency Management Agency (FEMA); Note: RLB = Repetitive Loss Building; NFIP data current as of 10/26/2021; There is no repetitive loss data to report for Frederika as of 10/26/2021

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 through coordinated efforts with Bremer County.
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 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.
8. Take measures to create a unified communication system for all emergency entities in the County as the current system does not have such capabilities.

### Current Mitigation Actions

#### *Prevention Mitigation Actions*

The City of Frederika has several planning and regulatory ordinances to assist with prevention mitigation. Table B9 summarizes these documents.

**TABLE B9: 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
Yes	No	No	Yes-RR	No	Yes	No	No	Yes

*Source: Community \*RR is Restricted Residence District*

***Property Protection Mitigation Actions***

Frederika has undergone replacement of culverts and reshaping of drainage ditches to minimize flooding and basement/groundwater inundation due to sump pump failure. Continued action will be taken as problems are identified, solutions determined, and funding is made available.

***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. The Fire Department performs storm watches whenever severe weather warnings are issued. The Fire Department posts trainings, awareness, and educational information on social media. Local television news, radio, cellular apps, and text alerts provide awareness. Bremer County Emergency Management maintains an email and/or alert notification system.

***Natural Resource Protection Mitigation Actions***

The City of Frederika became a stakeholder member of the Upper Wapsipinicon River Water Management Authority (UWRWMA) since the completion of the last Hazard Mitigation Plan. The purpose of the UWRWMA is to reduce the risk of flooding, to improve water quality, and conduct planning on a watershed level. The UWRWMA consists of various government entities from Northern Mitchell County to Buchanan County committed to fostering a multi-jurisdictional partnership and cooperation, leverage resources such as funding and technical expertise, and to facilitate stakeholder involvement in watershed management.

***Warning Systems & Communication***

An early warning siren has been installed in the center of town with in (date known by Kip Ladage) and is tested monthly by Bremer County EMA. New E911 communication tower was erected in 2019 and a communications repeater installed in the northeast corner of Frederika. This allowed emergency communications to the rural firefighters in the northern portion of Bremer County.

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***

Fire Department currently has 18 volunteers from residents City of Frederika and from the townships of Frederika, Leroy and Douglas. Funding is shared between the Fire Department through fund raisers, the City of Frederika and the Rural Board, consisting of representative from each township. Mutual aid 28E fire response agreements are in place with fire departments from surrounding communities. Current Equipment consists of:

- Kenworth Pumper-1,000 Gallon Tank
- Freightliner Tanker-3,000 Gallon Tank
- Chevrolet Tanker-1,500 Gallon Tank
- Ford F-350 Grass Unit-300 Gallon Tank
- Bunker Gear
- Radio and Pagers
- SCBA and Air Pumps
- Jaws and Rescue Equipment
- 2-Trash Pumps
- 1000 CC CAM-AM UTV-85 Gallon Tank

### ***Law Enforcement Department***

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

### ***HAZMAT***

Frederika is included in the Bremer County contract 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 contracts with local business to perform streets, drainage, lawn mowing, snow plowing and sewer maintenance. The City has a Sanitary Sewer Superintendent to oversee sewer operations and maintenance.

### ***Ambulance and First Responders***

The City has 5 EMS volunteers with 28E EMS agreements with Tripoli, Sumner and Denver EMS and ambulance services.

### ***Medical Facilities***

There are currently no medical facilities within the community. Nearest hospitals and medical clinics are in Sumner, Waverly, and New Hampton. Additional medical clinics are in Tripoli and Denver.

### ***Structural Projects Mitigation Actions***

Bremer County Conservation Board manages Alcock Park located in the western portion of Frederika. Within Alcock Park there are a few structural improvements are: 1) replacing a walking bridge between the east and west portions of Alcock Park that was destroyed in the 2008 flood; 2) the replacement of a water flume installed at the east entrance into Alcock Park; and 3) perform erosion control along the east bank of the cement dam located within Alcock Park. The dam and flume are critical to City of Frederika's cabin area located Indian Pond in the northwest portion of the city limits. Alcock Park is enjoyed by the residents of Frederika and a fishing, camping, and boating attraction that is needed to attract a restaurant or other community development.

## **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 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 B10 below is the City of Frederika's Implementation Strategy.

TABLE B10: 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
<b>Education/Public Awareness</b>						
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,	On-Going	Minimal	Local
H	Encourage residents to keep smoke detectors, sprinkler	Fire	City Council, Fire Department	On-Going	Minimal	Local

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	systems and fire extinguishers maintained in their homes					
H	Educate the public on maintaining their sump pumps	Flash Flood	City Council, Sanitary Sewer Superintendent	On-Going	Minimal to <del>low</del>	Local
H	Encourage the public to receive vaccinations	Disease	County-Public Health	On-Going	Minimal	-County
H	Set a designated number of people to be trained in post-disaster record keeping/damage assessments	Emergency Management	City Council, County EMA	On-Going	Minimal	Local, County
H	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, Fire Department	On-Going	Minimal	Local
L	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,	On-Going	Minimal	Local
M	Educate city personnel to handle a sinkhole situation	Sinkholes	County EMA	On-Going	Minimal to Low	County
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, Northeast Iowa Response Group	On-Going	Minimal	Local, State
H	Promote awareness of the Iowa Disaster Behavioral Health Response Team (DBHRT) as a resource in the event of a disaster	ALL	Mental Health/Disability Services of the East Central Region, County EMA	On-going	Minimal to Low	State, County, Local
<b>Emergency Services</b>						
H	Continue training and education for fire departments,	All	City Council, Fire Department	On-Going	Moderate	Local, County

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	law enforcement agencies and ambulance crew personnel					
H	Purchase emergency signs to be used in case of an incident	Transportation	City Fire Department, Police Department	On-Going	Minimal	Local, County
H	Maintain and update emergency response plans	Emergency Management	City Council, Fire Department, Police Department	On-Going	Minimal to Low	Local, County
H	Maintain lists of personnel and equipment available to use with response plans	Emergency Management	City Council	On-Going	Minimal	Local
M	Purchase P25 compliant, multi-band radios to allow communications interoperability between traditional VHF radio system (analog and digital (P25) format) and the SARA and ISICS systems used in neighboring communities	Emergency Management	City Council, Police Department, Fire Department, EMA	On-Going	Low to Moderate	Local
M	Maintain and acquire materials and equipment for fire departments, law enforcement agencies and ambulance crew personnel	All	City Council, Fire Department, Police Department	On-Going	Moderate	Local, Frederika Rural Board, County
M	Provide emergency shelters for evacuees	All	City Council	On-Going	Low	Local, County, State
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	, Police, Fire Department	On-Going	Minimal	Local
M	Make available a cleanup crew	Thunderstorm/Lightning	City Council,	On-Going	Low	Local, County, State

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	for after a storm					
M	Acquire necessary response and detection equipment for city/county employees	HAZMAT, Fire	City Council, Police, Fire Department	On-Going	Minimal	Local
M	Maintain or install GPS units in all emergency service and city/county vehicles	Communications Failure	City Council, Police, Fire Department	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, Bremer County EMA	On-Going	Minimal	Local, County
M	Continue training and promotion of the Incident Command System	Communications Failure	City Council, School Board	On-Going	Minimal	Local, County
L	Complete continuity of government plan	Communications Failure	City Council	On-Going	Minimal	Local
M	Maintain list of county emergency contacts	Communications Failure	Bremer County EMA	On-Going	Minimal	County
M	Develop and maintain staging area for dumping during cleanup	River Flood, Flash Flood, Tornado/Wind Strms	City Council	On-Going	Minimal	Local
M	Adopt and maintain snow ordinance	Severe Winter Storm	City Council	On-Going	Minimal	Local
H	Promote awareness of the Iowa Disaster Behavioral Health Response Team (DBHRT)	ALL	Mental Health/Disability Services of the East Central Region, County EMA	On-going	Minimal to Low	State, County, Local
<b>Natural Resource Protection</b>						
H	Monitor wells in areas of identified contamination	Groundwater Contamination	Public Health	On-Going	Minimal	County
H	Monitor the drinking water supply	Groundwater Contamination, Disease	Public Health, IRUA	On-Going	Minimal	County, State
H	Continue participation with the	River Flood, Flash Flood,	City Council	On-Ging	Minimal	Local

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	Upper Wapsipinicon River Water Management Authority	Groundwater Contamination				
H	Follow monitoring requirements set forth by the Iowa DNR	Groundwater Contamination	Sanitary Sewer Superintendent	On-Going	Minimum	Local, IDNR
M	Maintain and/or develop a wellhead protection program	Groundwater Contamination	Public Health	On-Going	Minimal	County
L	Identify and map areas of past contamination	Groundwater Contamination	City Council	On-Going	Low	Local
H	Adopt and maintain storm water ordinance	Groundwater Contamination, Flash Flood	City Council	On-Going	Minimal	Local
M	Maintain and/or develop storm water management program	Groundwater Contamination, Flash Flood	City Council,	On-Going	Moderate	Local,State
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
L	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,	On-Going	Minimal	Local
M	Clear ditches, streams, and waterways on a regular basis	River Flood	City Council,	On-Going	Minimal	Local,County,State
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	Low	Local, State
L	Purchase additional parkland in order to increase greens space	River Flood	City Council	On-Going	Moderate	Local,State

	and reducing surface flow					
<b>Prevention</b>						
H	Maintain mutual aid agreements	All	City Council	On-Going	Minimal	Local
H	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, Fire Department	On-Going	Minimal to Low	Local, State
H	Keep HAZMAT manuals/information current and easily accessible	HAZMAT	City Council, Fire Department	On-Going	Minimal	Local
H	Maintain, test, and replace warning sirens	Windstorm, Tornado, Hailstorm, Thunderstorm/Lightning, Communications Failure	City	On-Going	Minimal	Local, County
M	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	Fire Department, Police	On-Going	Minimal	Local
H	Regularly review and amend fire and medical HAZMAT response standard operating procedures	Communications Failure	FireDepartment	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	Fire Department	On-Going	Minimal	Local

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M	Establish alternative transportation routes should a road need to be closed	Transportation	City Council	On-Going	Minimal	Local,County
M	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
M	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	On-Going	Minimal	Local
H	Keep a supply of drinking water to distribute	Extreme Heat	City CouncilBremer County, EMA	On-Going	Minimal to Low	Local, County
H	Cooperate with any countywide mass vaccination plan	Disease	City Council, Bremer County Public Health	On-Going	Minimal	Local,County
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, Fire Department	On-Going	Minimal to Low	Local, County
M	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	Moderate	Local, County,State,Federal
H	Maintain communication with county contacts	Emergency Management	Police, Fire Department	On-Going	Minimal	Local
H	Maintain NIMS compliance	Emergency Management	City Council,Police, Fire Department	On-Going	Minimal	Local
L	Purchase NOAA weather radios	Thunderstorm/Lightning, Windstorm, Tornado,	City Council, Fire Department	On-Going	Minimal	Local

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		Radiological/Nuclear Event				
M	Identify areas throughout the county that would substantially benefit from outdoor warning sirens	Windstorm, Tornado	County EMA	On-Going	Minimal to Low	Local, County, State
H	Seek to improve communications with other agencies	Communications Failure, Terrorism	City Council, Police, Fire Department	On-Going	Low to Moderate	Local, County, State
M	Keep supply of backup radios and cellphones	Communications Failure	Police, Fire Department	On-Going	Low	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, State
M	Enforce no parking designations at special events	Transportation	City Council	On-Going	Minimal	Local
L	Develop rationing procedures	Drought	City Council, County EMA	On-Going	Minimal	Local, County
M	Develop sandbagging procedures for the community	River Flood	City Council,	On-Going	Minimal	Local
L	Enforce sidewalk clearance ordinance	Severe Winter Storm	City Council	On-Going	Minimal	Local
H	Backup all digital data	Thunderstorm/Lightning	City Clerk	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
H	Maintain and update anti-virus software	Terrorism	City Clerk, Fire Department	On-Going	Minimal	Local
M	Secure vulnerable targets, as identified by the LEPC and	Terrorism	City Council	On-Going	Minimal	Local, State, Federal

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	County EMA with alarms, security cameras and fences					
M	Purchase a new tanker and/or pumper	Fire, Explosion	Frederika Rural Board	On-Going	Minimal	Local, Township
M	Update flood maps/flood studies for areas throughout the county	River Flood	City Council	On-Going	Minimal	Local
M	Continue working with the Bremer County Recovery Coalition	Flash Flood, River Flood	City Council, County	On-Going	Minimal	Local, County
M	Encourage all communities to participate in their Local Emergency Planning Commission (LEPC)	Emergency Management	City Council, Fire Department	On-Going	Minimal	Local, County
<b>Property Protection</b>						
H	Continue enforcement of city sump pump discharge ordinance	Thunderstorm/Lightning	Sanitary Sewer Superintendent	On-Going	Minimal	Local
H	Continue fire prevention program	Fire	City Council, Fire Department	On-Going	Low to Moderate	Local,
H	Maintain membership in the NFIP	Flash Flood, River Flood	City Council, Building Official	On-Going	Minimal	Local
H	Maintain, enforce and update floodplain ordinance	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	Police, County EMA	On-Going	Minimal	Local, County
M	Place barricades to close dangerous bridges	Bridge Failure	County Engineer	On-Going	Minimal to Low	County
M	Secure the area (around a sinkhole)	Sinkholes	County EMA	On-Going	Minimal to Low	County
L	Inspect any utility lines that are near a sinkhole	Sinkholes	County EMA	On-Going	Minimal to Low	County
M	Maintain tree trimming program	Severe Winter Storm, Windstorm, Hailstorm	City Council	On-Going	Minimal	Local

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L	Continue an annual inspection program for commercial and industrial properties	Fire	Fire Department	On-Going	Minimal	Local
M	Review and update fire codes as necessary	Fire, Explosion	City Council, Fire Department	On-Going	Low	Local
L	Identify and inventory potential sinkhole sites	Sinkholes	Police, Fire Department	On-Going	Minimal	Local
M	Adopt and maintain subdivision ordinance	Infrastructure Failure	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	Maintain use of snow fences in the city/county	Severe Winter Storm	City Staff	On-Going	Minimal	Local
H	Use surge protectors to prevent electrical damage to critical and sensitive equipment	Thunderstorm/Lightning	City Clerk, Fire Department	On-Going	Minimal	Local
L	Identify, purchase and remove structures from flood hazard areas	Flash Flood, River Flood	City Council	On-Going	Moderate	Local, Federal
L	Purchase additional trash pumps	Flash Flood, River Flood	City Council Fire Department, Sanitary Sewer Superintendent	On-Going	Minimal	Local
L	Continue to cooperate with pipeline owners and operators to ensure locations are marked	Fire, Explosion	City staff	On-Going	Minimal	Local
H	Encourage floodproofing/elevating structures in the floodplain	River Flood	City Council, Building Official	On-Going	Minimal	Local
<b>Structural Projects</b>						
H	Maintain a list of potential storm sewer projects	Thunderstorm/Lightning	City Council	On-Going	Minimal	Local
M	Acquire more water pumps	Flash Flood, River Flood, Dam Failure,	City Council, Fire Department	On-Going	Minimal	Local

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H	Continue with improvement to the storm water system	Flash Flood, Thunderstorm	City Council	On-Going	Minimal to Low	Local
H	Maintain and keep storm drains clear of debris	Flash Flood, Thunderstorm	Fire Department,	On-Going	Minimal	Local
H	Maintain pump station	River Flood, Thunderstorm	City Council, Sanitary Sewer Superintendent	On-Going	Minimal to Low	Local
M	Construct or designate a safe room or storm shelter	Windstorm, Tornado, Hailstorm	City Council, Fire Department	On-going	Minimal	Local
M	Improve water system to enhance firefighting capacity/ability	Fire	City Council,	On-Going	Minimal	Local,State,Federal
L	Install tiling to help water move away from structures	Expansive Soils	City Council,	On-Going	Minimal to Low	Local
M	Continue regular bridge inspections	Bridge Failure	County Engineer	On-Going	Minimal	County
M	Maintain embargos/weight limits as necessary	Bridge Failure, Expansive Soils, Street Infrastructure	City Council, County Engineer	On-Going	Minimal to Low	Local, State
M	Encourage construction of dikes, levees, dams, and retention ponds	River Flood, Flash Flood	City Council, Upper Wapsipicon River WMA	On-Going	Minimal	Local, State,Federal
M	Regularly inspect dams	Dam Failure	Bremer County Conservation Board	On-Going	Minimal	County
M	Prevent inflow and infiltration into the sanitary sewer	Flash Flood, River Flood, Sewer Infrastructure	City Council	On-Going	Minimal	Local, State
M	Identify bridges and culverts than can cost effectively be reengineered to reduce future flooding	River Flood, Flash Flood, Thunderstorm	City Council	On-Going	Minimal to Low	Local, State

## 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	
<b>Government Framework</b>	Mayor – City Council
<b>General Population, 2020 Census and *2019 ACS 5-Year Estimates</b>	
Total Population	1,034
Median Age	*37.7
At-Risk Population, <18 Yrs	*268
At-Risk Population, >64 Yrs	*201
Total Males	*500
Total Females	*481
Hispanic or Latino	12
One Race-White	1,008
Black of African American	0
American Indian and Alaskan Native	0
Asian	5
Two or More Races	26
<b>Housing Characteristics, 2020 Census and *2019 ACS 5-Year Estimates</b>	
Total Households	*418
Households with children <18 Yrs.	*127
Households with persons >65 Yrs.	*20.8%
Average Household Size	*2.35
Average Family Size	*3.03
Total Housing Units	455
Occupied Housing Units	419
Vacant Housing Units	36
Owner-Occupied Housing Units	*358
Renter-Occupied Housing Units	*60
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 2020 U.S. Census, Janesville’s population grew to 1,034, an increase of 11 percent over ten years. The previous U.S. Census, taken in 2010, recorded a population figure of 930 for Janesville. Much of the data included in the tables are from the 2019 American Community Survey 5-Year Estimates, since detailed data from the 2020 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.

TABLE C1.1: CITY OF JANESVILLE DEMOGRAPHICS	
<i>Economics Characteristics, 2019 ACS 5-Year Estimate Data Profiles</i>	
Population 16 years and over	740
Population In Labor Force (16 yrs and over)	531
Persons Employed	517
Persons Unemployed	14
Persons Employed in Management, Business, Science, and Arts Occupations	158
Persons Employed in Service Occupations	42
Persons Employed in Sales and Office Occupations	115
Persons Employed in Natural Resources, Construction, and Maintenance Occupations	73
Persons Employed in Production, Transportation, and Material Moving Occupations	129
Median Household Income	\$63,750
Median Family Income	\$95,000
Percent of Persons < 18 yrs. Below Poverty Level	2.7%
Percent of Persons 18-64 Yrs. Below Poverty Level	3.1%
Percent of Persons >65 Yrs. Below Poverty Level	9%
<i>Social Characteristics, 2019 ACS 5-Year Estimate Data Profiles</i>	
School Enrollment (3 yrs and over)	256
Nursery School, Preschool	22
Kindergarten and Elementary School (grades 1-8)	154
High School (grades 9-12)	36
College or Graduate School	44
Education Attainment: Population 25 Years and Over	685
Less than High School Graduate	32
High School Graduate (includes equivalency)	279
Some College, Associate’s Degree	217
Bachelor’s Degree or Higher	157

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 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	MidAmerican Energy	Windstream, Iowa Telecom, Mediacom	Mediacom, Butler Bremer Communications	City of Janesville, Iowa Regional Utility Association	City of Janesville	Black Hawk Waste Disposal

## 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: River Flooding, Flash Flooding, Tornado/Windstorm, Severe Winter Storm.

TABLE C3: CITY OF JANESVILLE HAZARD RISK ASSESSMENT						
Hazard Rank	Hazard	Probability	Magnitude / Severity	Warning Time	Duration	Hazard Score
1	River Flooding	3	2	1	3	2.4
1	Flash Flood	2	3	2	3	2.4
2	Tornado/Windstorm	2	2	3	2	2.15
3	Severe Winter Storm	2	2	1	2	1.85
4	Human Disease	1	2	2	4	1.75
5	Thunderstorm/Lightning/Hail	2	1	2	2	1.7
6	Extreme Heat	2	1	1	2	1.55
6	Grass/Wild land Fire	1	1	4	2	1.55
7	HAZMAT Incident	1	2	1	3	1.5
8	Infrastructure Failure	1	2	1	2	1.4
9	Transportation Incident	1	1	3	1	1.3
10	Levee/Dam Failure	1	1	2	1	1.15
11	Animal/Plant/Crop Disease	1	1	1	2	1.1
12	Drought	1	1	1	1	1
12	Earthquake	1	1	1	1	1
12	Expansive Soil	1	1	1	1	1
12	Landslide	1	1	1	1	1
12	Sinkholes	1	1	1	1	1
12	Radiological Incident	1	1	1	1	1
12	Terrorism	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 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 Table C4) 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 1: Map 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 2020 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 C4: 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)
Riviera Roose Event Center (shelter)	
<i>Source: Community</i>	

TABLE C5: CITY OF JANESVILLE 100-YEAR FLOODPLAIN PROPERTIES	
Number of Structures	55
Building Value	\$ 2,407,200
Dwelling Value	\$ 3,779,700
Total Value	\$ 6,186,900
<i>Source: INRCOG &amp; Bremer County Assessor (2021 \$)</i>	

## Tornadoes

As stated on the FEMA website<sup>24</sup>, 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 4 mobile homes located in Janesville. General observation would suggest a recent decrease in the number of manufactured homes in the area. This decreased popularity has the potential to decrease 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 assumed that the identified populations are more likely to require assistance during times of disaster; therefore, are considered more “at-risk” than the remaining population. The “at-risk” population must be identified and targeted in successful mitigation efforts. Table C6 presents an overview of the at-risk population in Janesville according to information retrieved from the 2020 U.S. Census and 2019 American Community Survey Estimates.

According to Table C6, approximately 201 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 2020, there were approximately 268 Janesville residents under the age of 18, according to the 2019 American Community Survey Estimates.

TABLE C6: CITY OF JANESVILLE “AT-RISK” POPULATION	
	2020
Total City Population (2020)	1,034
Elderly (65 yrs and older)	*201
Youth (under 18 yrs old)	*268
Householder Living Alone	*144
Non-English Speaking Population (speaks English less than ‘very well’)	*0
Population Living in Poverty	*41
Population in Mobile Homes	20
Group Quarters Population	0
Persons with Disabilities (age 5+)	*100
Source: U.S. Census, 2020 and *2019 ACS 5-Year Estimates	

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<sup>24</sup> 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 2020 Census and according to city officials, there were approximately 20 mobile homes in the city. Using the 2019 American Community Survey sampling data, there are approximately 47 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 Bremer County Assessor GIS Data, Janesville has approximately -- structures 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, 2.35, approximately 76 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 Janesville are available from the County Assessors and Auditors offices. City of Janesville's property valuations are in Table C7.

### 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 C7: CITY OF JANESVILLE'S VALUATION		
	Total Valuation	Average Valuation per Unit or Parcel
Residential Property	\$ 57,686,400	\$ 140,699/parcel
Commercial Property	\$ 11,199,820	\$ 193,100/unit
Industrial Property	\$ 3,211,850	\$ 1,070,616/unit
Agricultural Buildings	\$ 22,480	\$ 22,480/unit
Agricultural Land	\$ 119,190	\$ 1,027.50/acre
Utilities, G & E	N/A	N/A
Railroads	\$ 65,960	N/A
Exemptions (military)	N/A	N/A
Gross Valuation	N/A	N/A
<b>Total Valuation</b>	<b>\$ 72,305,700</b>	

*Source: Bremer County Assessor, as of 12/1/2021*

### National Flood Insurance Program/Repetitive Loss Properties

The city participates in the National Flood Insurance Program (NFIP) and has a flood ordinance in place. According to the Federal Emergency Management Agency, there are 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. 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 10/26/2021 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 through coordinated efforts with Bremer County.
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 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.
8. Take measures to create a unified communication system for all emergency entities in the County, as the current system does not have such capabilities.

## 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 C8 summarizes Janesville’s preventive mitigation actions.

TABLE C8: 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	Yes	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 personal 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, social media, 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](mailto: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
- 2019 Midwest Mini-Pumper
- 2011 Tanker (2000 Gallon Capacity)
- 2012 Ford F-350 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 1<sup>st</sup> Responders service, with approximately 12 volunteers serving the city.

### ***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 is included in the Bremer County 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.

### ***Public Works / Street Department***

The Town Council oversees all snow removal and ice prevention. The city does employ 2 full-time and 1 part time employee in the public works department for routine maintenance of city property.

### ***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, 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 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 (\$)	Funding Source
<b>Education/Public Awareness</b>						
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
H	Promote awareness of the Iowa	ALL	Mental Health/Disability	On-going	Minimal to	State,

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	Disaster Behavioral Health Response Team (DBHRT) as a resource in the event of a disaster		Services of the East Central Region, County EMA		Low	County, Local
<b>Emergency Services</b>						
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
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	Purchase P25 compliant, multi-band radios to allow communications interoperability between traditional	Emergency Management	City Council, Police Department, Fire Department, EMA	On-Going	Low to Moderate	Local

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	VHF radio system (analog and digital (P25) format) and the SARA and ISICS systems used in neighboring communities					
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
H	Promote awareness of the Iowa Disaster Behavioral Health Response Team (DBHRT)	ALL	Mental Health/Disability Services of the East Central Region, County EMA	On-going	Minimal to Low	State, County, Local
<b>Natural Resource Protection</b>						
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

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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	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	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
<b>Prevention</b>						

**2022 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA**

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	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	Severe Winter Storm	City Staff, Council	On-Going	Minimal	Local

**2022 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA**

	emergencies					
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 protocols	River Flood	City Council, Police	On-Going	Minimal	Local
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

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M	Provide a local hazardous waste drop-off 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	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

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L	Purchase a new tanker and/or pumper	Fire, Explosion	Council, Fire Dept.	On-Going	Moderate	Local
<b>Property Protection</b>						
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 capacity/ability	Fire	City Council, Fire Department	On-Going	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 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

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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
<b>Structural Projects</b>						
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	River Flood	City Council, Staff	On-Going	Minimal	Local

**2022 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA**

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	to reduce future flooding					
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
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.

TABLE D1: CITY OF PLAINFIELD DEMOGRAPHICS

<b>Government Framework</b>	Mayor – City Council
<b>General Population, 2020 Decennial Census and *2019 ACS 5-Year Estimates</b>	
Total Population	393
Median Age	*33.7
At-Risk Population, <18 Yrs	*103
At-Risk Population, >64 Yrs	*70
Total Males	*255
Total Females	*262
One Race-White	378
Black or African American	2
American Indian and Alaskan Native	1
Asian	0
Two or More Races	12
<b>Housing Characteristics, 2020 Decennial Census and *2019 ACS 5-Year Estimates</b>	
Total Households	*211
Households with children <18 Yrs.	*62
Households with persons >65 Yrs.	*25
Average Household Size	*2.45
Average Family Size	*2.93
Total Housing Units	189
Occupied Housing Units	163
Vacant Housing Units	26
Owner-Occupied Housing Units	178/84.4%
Renter-Occupied Housing Units	33/15.6%
Persons Living in Group Quarters	0

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:

- 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 structures.
- 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.
- 2007: Ice storm knocks out power to entire town for 5 days
- 2008: East side of town flooded from Cedar River
- 2016: West side of town flooded from extensive rains and highway issues

## Demographics

### Population

Plainfield's demographic data is outlined in Tables D1 and D1.1. In the recent 2020 U.S. Census, Plainfield's population declined to 393, a decrease of nearly 10 percent over ten years. The previous U.S. Census, taken in 2010, recorded a population figure of 436 for Plainfield. Much of the data included in the tables are from the 2019 American Community Survey 5-Year Estimates, since detailed data from the 2020 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.

<b>TABLE D1.1: CITY OF PLAINFIELD DEMOGRAPHICS</b>	
<b><i>Economics Characteristics, 2019 ACS 5-Year Estimate</i></b>	
Population 16 years and over	426
Population In Labor Force (16 yrs and over)	318
Persons Employed	308
Persons Unemployed	10
Persons Employed in Management, Business, Science, and Arts Occupations	48
Persons Employed in Service Occupations	35
Persons Employed in Sales and Office Occupations	89
Persons Employed in Natural Resources, Construction, and Maintenance Occupations	44
Persons Employed in Production, Transportation, and Material Moving Occupations	92
Median Family Income	\$68,958
Median Household Income	\$58,681
Percent of Persons < 18 yrs. Below Poverty Level	2.9%
Percent of Persons 18-64 Yrs. Below Poverty Level	2.0%
Percent of Persons >65 Yrs. Below Poverty Level	2.9%
School Enrollment (3 yrs and over)	93
Nursery School, Preschool	10
Kindergarten and Elementary School (grades 1-8)	33
High School (grades 9-12)	22
College or Graduate School	28
Education Attainment: Population 25 Years and Over	346
Less than High School Graduate	10
High School Graduate (includes equivalency)	141
Some College, Associate's Degree	155
Bachelor's Degree or Higher	40

Table D2 shows the primary utility providers for the city.

TABLE D2: 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 D3 is the analysis scores for the City of Plainfield. As shown in the table, the five hazards for the city are Thunderstorm/Lightning/Hail, Flash Flooding, Tornado/Windstorm, River Flooding, and Severe Winter Storms.

<b>TABLE D3: CITY OF PLAINFIELD HAZARD RISK ASSESSMENT</b>						
<b>Hazard Rank</b>	<b>Hazard</b>	<b>Probability</b>	<b>Magnitude / Severity</b>	<b>Warning Time</b>	<b>Duration</b>	<b>Hazard Score</b>
<b>1</b>	Thunderstorm/Lightning/Hail	4	3	4	4	<b>3.7</b>
<b>2</b>	Flash Flood	3	3	4	4	<b>3.25</b>
<b>2</b>	Tornado/Windstorm	3	3	4	4	<b>3.25</b>
<b>3</b>	River Flooding	3	3	3	4	<b>3.1</b>
<b>4</b>	Sever Winter Storm	3	3	2	3	<b>2.85</b>
<b>5</b>	Infrastructure Failure	2	3	4	4	<b>2.8</b>
<b>6</b>	Transportation Incident	2	2	4	2	<b>2.3</b>
<b>7</b>	Extreme Heat	2	2	2	4	<b>2.2</b>
<b>8</b>	Drought	2	2	1	4	<b>2.05</b>
<b>8</b>	Human Disease	2	2	1	4	<b>2.05</b>
<b>9</b>	Levee/Dam Failure	1	2	3	4	<b>1.9</b>
<b>10</b>	Grass/Wild land Fire	1	1	4	4	<b>1.75</b>
<b>10</b>	Radiological Incident	1	1	4	4	<b>1.75</b>
<b>10</b>	Terrorism	1	1	4	4	<b>1.75</b>
<b>11</b>	Sinkholes	1	1	4	3	<b>1.65</b>
<b>11</b>	HAZMAT Incident	1	1	4	3	<b>1.65</b>
<b>12</b>	Landslide	1	1	3	3	<b>1.5</b>
<b>13</b>	Animal/Plant/Crop Disease	2	1	1	1	<b>1.45</b>
<b>14</b>	Earthquake	1	1	1	4	<b>1.3</b>
<b>15</b>	Expansive Soils	1	1	1	3	<b>1.2</b>

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 D3 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 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 1: Map 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 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 (see Table D5), there are 10 structures with a total assessed value of \$ 1,074,174 located within the 100-year floodplain. See *Attachment 5E: Flood Scenario Map of the City*.

**TABLE D4: CRITICAL FACILITIES IN PLAINFIELD**

	Plainfield Methodist Church (shelter)
First Baptist Church (shelter)	Fire Station (shelter)
Landus Co-op	Wastewater Treatment Plant/Lift Station
Public Library (Shelter)	Public Works Building
Plainfield City Hall/Public Works (Shelter)	Water Tower

*Source: Community*

**TABLE D5: CITY OF PLAINFIELD  
100-YEAR FLOODPLAIN PROPERTIES**

Number of Structures	10
Building Value	\$ 609,704
Dwelling Value	\$ 464,470
Total Value	\$ 1,074,174

*Source: INRCOG & Bremer County Assessor (2021 \$)*

## Tornadoes

As stated on the FEMA website<sup>25</sup>, 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 Estimates information, there are no mobile homes (also referred to as manufactured homes) located in the Plainfield. 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 D6, 70 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 due to their age. In 2020, there were 103 residents 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 no mobile homes in the city.

**TABLE D6: CITY OF PLAINFIELD “AT-RISK” POPULATION**

	<b>2020</b>
Total City Population (2020)	393
Elderly (65 yrs and older)	*70
Youth (under 18 yrs old)	*103
Householder Living Alone	*59
Non-English Speaking Population (speaks English less than ‘very well’)	*0
Population Living in Poverty	*12
Population in Mobile Homes	*0
Group Quarters Population	*0
<i>Source: U.S. Census, 2020 *2019 ACS 5-Year Estimates</i>	

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<sup>25</sup> Federal Emergency Management Agency (FEMA), <http://www.fema.gov/areyouready/tornadoes.shtm>

### 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 D7.

TABLE D7: CITY OF PLAINFIELD'S VALUATION		
	Total Valuation	Average Valuation per Unit or Parcel
Residential Property	\$ 17,671,470	\$78,890/parcel
Commercial Property	\$ 3,810,090	\$ 64,578/unit
Industrial Property	N/A	N/A
Agricultural Buildings	\$ 66,240	\$ 33,120/unit
Agricultural Land	\$ 44,200	\$ 1,078/acre
Utilities, G & E	\$ 106,432	N/A
Railroads	\$ 17,960	N/A
Exemptions (military)	N/A	N/A
Gross Valuation	N/A	N/A
<b>Total Valuation</b>	<b>\$ 21,716,392</b>	<b>N/A</b>

*Source: Bremer County Assessor, as of 12/1/2021*

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 D8 shows, there are currently 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. Table D8 illustrates the number of repetitive loss properties for the city. Currently (as of 10/26/2021) there is one active repetitive loss building in the city.

TABLE D8: 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	3	\$575,200	1	0	0	\$41,911	\$0

*Source: Federal Emergency Management Agency (FEMA); Note: RLB = Repetitive Loss Building; NFIP data current as of 10/26/2021; Repetitive loss data current as of 10/26/2021*

TABLE D9: FIRE & FLOOD INFORMATION FOR PLAINFIELD		
Fire Insurance Rating	National Flood Insurance Program (NFIP) (Y or N & Year Joined)	NFIP CID #
7	Yes, Current Map 1/29/21; Joined 3/1/86	190327

*Source: Communities and FEMA*

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 through coordinated efforts with Bremer County.
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 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.
8. Take measures to create a unified communication system for all emergency entities in the County as the current system does not have such capabilities.

### Current Mitigation Actions

#### *Prevention Mitigation Actions*

Table D10 summarizes Plainfield's preventive mitigation actions.

TABLE D10: 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	Yes	Yes	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 Main Street 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, social media, 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 25 volunteer firefighters. 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 First Street. Plainfield's rating for insurance is Class 7 within city limits.

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 with foam sprayer
- ◆ 2008 International pumper
- ◆ 2020 Can-Am UTV

### ***Ambulance***

Plainfield has 6 volunteer First Responders but does not have an ambulance service. Ambulance services are provided by Waverly Health Center.

### ***Medical Facilities***

Plainfield does not have any medical facilities.

### ***HAZMAT***

Plainfield is included in the Bremer County 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 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, Administrative, 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 D11.

### 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 D11: CITY OF PLAINFIELD'S IMPLEMENTATION STRATEGY						
Priority	Mitigation Action/Program/Project	Associated Hazard	Primary Agency Responsible for Implementation	Date for Completion	Estimated Cost (\$)	Funding Source
<i>Education/Public Awareness</i>						
H	Continue training and education for fire departments, law enforcement agencies and ambulance crew personnel	All	City Council, Department Heads	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

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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
H	Promote awareness of the Iowa Disaster Behavioral Health Response Team (DBHRT) as a resource in the event of a disaster	ALL	Mental Health/Disability Services of the East Central Region, County EMA	On-going	Minimal to Low	State, County, Local
<b>Emergency Services</b>						
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, Hailstorm	Bremer County EMA, City Council	On-Going	Minimal	Local
H	Enhance Standard Operating Procedures for dissemination of	Communications Failure	City Council, EMA	On-Going	Minimal	Local

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	information/press releases in the event of a disaster					
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	Purchase P25 compliant, multi-band radios to allow communications interoperability between traditional VHF radio system (analog and digital (P25) format) and the SARA and ISICS systems used in neighboring communities	Emergency Management	City Council, Police Department, Fire Department, EMA	On-Going	Low to Moderate	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	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	Communications Failure	City Council	On-Going	Minimal	Local

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	emergency service and city/county vehicles					
H	Promote awareness of the Iowa Disaster Behavioral Health Response Team (DBHRT)	ALL	Mental Health/Disability Services of the East Central Region, County EMA	On-going	Minimal to Low	State, County, Local
<b>Prevention</b>						
H	Maintain mutual aid agreements	All	City Council	On-Going	Minimal	Local
H	Purchase and maintain backup generator for Library	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	Seek to improve communications with other agencies	Communications Failure, Terrorism	Bremer County EMA, City	On-Going	Minimal	Local
H	Continue cooperation between county roads department and local fire departments during snow	Severe Winter Storm	City Council, Staff	On-Going	Minimal to Low	Local

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	emergencies					
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	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

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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	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
M	Acquire necessary response and detection equipment for city/county employees	HAZMAT	City Staff	On-Going	Minimal	Local
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,	City Council, Zoning	On-Going	Minimal	Local

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		Windstorm, Tornado, Radiological/Nuclear Event	Administrator			
L	Place alarms on storage facilities containing hazardous materials	Hazardous Materials (HAZMAT)	City Council	On-Going	Minimal	Local
<b>Property Protection</b>						
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
<b>Structural Projects</b>						
H	Construct or designate a safe room or storm shelter	Windstorm, Tornado, Hailstorm	City Staff	On-Going	High	Local, State, Federal
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
M	Maintain a list of potential storm sewer projects	Thunderstorm/Lightning	City Council, Staff	On-Going	Minimal	Local
M	Encourage the use of proper materials and construction techniques	Expansive Soils	City Council, Staff	On-Going	Minimal to Low	Local
<b>Natural Resource Protection</b>						
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	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:	Groundwater Contamination	City Council	On-Going	Low	Local, State, Federal

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	Extension, NRCS, Farm Bureau, EPA, DNR, and Soil and water Conservation District					
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	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	Maintain tree trimming program	Severe Winter Storm, Windstorm, Hailstorm	City Council	On-Going	Low	Local
M	Encourage community to plant shade trees	Extreme Heat	City Council	On-Going	Minimal	Local



# 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**

<b>Government Framework</b>	Mayor – City Council
<b>General Population, 2020 Decennial Census and *2019 ACS 5-Year Estimates</b>	
Total Population	845
Median Age	*40.3
At-Risk Population, <18 Years	*206
At-Risk Population, >64 Years	*174
Total Males	*381
Total Females	*399
One Race-White	821
Black of African American	0
American Indian and Alaskan Native	0
Asian	0
Two or More Races	20
<b>Housing Characteristics, 2020 Decennial Census and *2019 ACS 5-Year Estimates</b>	
Total Households	*299
Households with children <18 Yrs.	*101
Households with persons >65 Yrs.	*69
Average Household Size	*2.61
Average Family Size	*3.01
Total Housing Units	351
Occupied Housing Units	331
Vacant Housing Units	20
Owner-Occupied Housing Units	*272
Renter-Occupied Housing Units	*27
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 Fettkether addition.

## Demographics

### Population

Readlyn's demographic data is outlined in Tables E1 and E2. In the recent 2020 U.S. Census, Readlyn's population grew to 845, an increase of 4.4% percent over ten years. The previous U.S. Census, taken in 2010, recorded a population figure of 808 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.

The primary sewer treatment facility serving the city has undergone significant upgrades since the 2017 plan cycle. Current average load is 85,000 (gpd) with a peak load of 263,000 (gpd). The rated maximum wet weather capacity for the upgraded sewer treatment facility is 1.1 million gallons and was designed to accommodate future development and expansion of the community.

TABLE E2: CITY OF READLYN DEMOGRAPHICS	
<i>Economics Characteristics, 2019 ACS 5-Year Estimates</i>	
Population 16 years and over	598
Population In Labor Force (16 years and over)	390
Persons Employed	386
Persons Unemployed	4
Persons Employed in Management, Business, Science, and Arts Occupations	99
Persons Employed in Service Occupations	51
Persons Employed in Sales and Office Occupations	92
Persons Employed in Natural Resources, Construction, and Maintenance Occupations	55
Persons Employed in Production, Transportation, and Material Moving Occupations	89
Median Household Income	\$69,750
Mean Household Income	\$75,409
Percent of Persons < 18 yrs. Below Poverty Level	12.6%
Percent of Persons 18-64 Yrs. Below Poverty Level	10.8%
Percent of Persons >65 Yrs. Below Poverty Level	4.0%
<i>Social Characteristics, 2019 ACS 5-Year Estimates</i>	
School Enrollment (3 yrs and over)	219
Nursery School, Preschool	18
Kindergarten and Elementary School (grades 1-8)	119
High School (grades 9-12)	47
College or Graduate School	35
Education Attainment: Population 25 Years and Over	524
Less than High School Graduate	29
High School Graduate (includes equivalency)	202
Some College, Associate's Degree	178
Bachelor's Degree or Higher	115

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 (City purchases power from Butler/Bremer REC)	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: Thunderstorm/Lightning/Hail, Animal/Plant/Crop Disease, Flash Flooding, Tornado/Windstorm.

<b>TABLE E4: CITY OF READLYN HAZARD RISK ASSESSMENT</b>						
<b>Hazard Rank</b>	<b>Hazard</b>	<b>Probability</b>	<b>Magnitude / Severity</b>	<b>Warning Time</b>	<b>Duration</b>	<b>Hazard Score</b>
<b>1</b>	Thunderstorm/Lightning/Hail	4	2	4	1	<b>3.10</b>
<b>2</b>	Animal/Plant/Crop Disease	4	2	1	4	<b>2.95</b>
<b>3</b>	Flash Flood	4	1	4	1	<b>2.80</b>
<b>3</b>	Tornado/Windstorm	2	4	4	1	<b>2.80</b>
<b>4</b>	Severe Winter Storm	4	1	1	3	<b>2.55</b>
<b>4</b>	Human Disease	3	2	2	3	<b>2.55</b>
<b>5</b>	Drought	3	2	1	4	<b>2.50</b>
<b>6</b>	Extreme Heat	3	1	1	3	<b>2.10</b>
<b>7</b>	Grass/Wild land Fire	1	2	4	2	<b>1.85</b>
<b>8</b>	River Flooding	1	2	2	4	<b>1.75</b>
<b>8</b>	Earthquake	1	2	4	1	<b>1.75</b>
<b>9</b>	Radiological Incident	1	1	4	3	<b>1.65</b>
<b>10</b>	HAZMAT Incident	1	1	4	2	<b>1.55</b>
<b>11</b>	Expansive Soils	1	1	2	4	<b>1.45</b>
<b>11</b>	Landslide	1	1	4	1	<b>1.45</b>
<b>11</b>	Transportation Incident	1	1	4	1	<b>1.45</b>
<b>11</b>	Terrorism	1	1	4	1	<b>1.45</b>
<b>12</b>	Infrastructure Failure	1	1	1	4	<b>1.30</b>
<b>13</b>	Sinkholes	1	1	2	1	<b>1.15</b>
<b>14</b>	Levee/Dam Failure	1	1	1	1	<b>1.00</b>

## 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.

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 (Shelter)
Water Plant and Tower	
Source: Community	

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 1: Map 5F* 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 1: Map 3L: Flood Scenario Map of the City*.

TABLE E6: 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 \$)	

As stated on the FEMA website<sup>26</sup>, 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.

<sup>26</sup> 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. 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, more “at-risk” than the remaining population. The “at-risk” population must be identified and targeted in successful mitigation efforts. Table E7 presents an overview of the at-risk population in Readlyn according to information retrieved from the 2020 U.S. Census and 2019 American Community Survey 5-Year Estimates.

According to Table E7, 174 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 2020, 206 of Readlyn residents were under the age of 18.

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 2020 Census figure (2.61) 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 E8. This 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.

**TABLE E7: CITY OF READLYN “AT-RISK” POPULATION**

Total City Population (2020)	845
Elderly (65 yrs and older)	*174
Youth (under 18 yrs old)	*206
Householder Living Alone	*22.7%
Non-English Speaking Population (speaks English less than ‘very well’)	*6
Population Living in Poverty	*27.4%
Population in Mobile Homes	*8
Group Quarters Population	*0

Source: 2020 US Census, \*2019 ACS 5-Year Estimates

**TABLE E8: CITY OF READLYN’S VALUATION**

	Total Valuation	Average Valuation per Unit or Parcel
Residential Property	\$ 46,149,020	\$ 134,154/parcel
Commercial Property	\$ 9,865,590	\$131,541/unit
Industrial Property	\$ 12,820	\$ 12,820/unit
Agricultural Buildings	\$ 42,840	14,280
Agricultural Land	\$ 16,400	\$ 2,050/acre
Utilities	\$ 79,560	\$39,780
Railroads	\$ 2,380	N/A
Exemptions (military)	N/A	N/A
Gross Valuation	N/A	N/A
<b>Total Valuation</b>	<b>\$ 56,168,610</b>	<b>N/A</b>

Source: Bremer County Assessor (2021 \$)

### 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. However, as Table E9 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 1/27/2021, there are no repetitive loss properties in Readlyn.

River flooding is the most common cause of repetitive loss in Bremer County. According to Table E9, Readlyn participates in the NFIP, but has no active policies in force. Readlyn has no repetitive loss properties.

TABLE E9: 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
<i>Source: Federal Emergency Management Agency (FEMA); Note: RLB = Repetitive Loss Building; NFIP data current as of 10/27/2021; Repetitive loss data current as of 10/27/2021</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 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 through coordinated efforts with Bremer County.
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 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.
8. Take measures to create a unified communication system for all emergency entities in the County as the current system does not have such capabilities.

### 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 E10: 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

*Source: Community, Note: RR=Restricted Residential*

***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, social media, 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 E11: FIRE & FLOOD INFORMATION FOR  
READLYN**

<b>Fire Insurance Rating</b>	<b>National Flood Insurance Program (NFIP) (Y or N &amp; Year Joined)</b>	<b>NFIP CID #</b>
7	Yes, Joined 1/29/21; 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. 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 is included in the Bremer County 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 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, 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 E12.

### 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 E12 is the City of Readlyn's Implementation Strategy.

TABLE E12: 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
<b>Emergency Services</b>						
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

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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	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	Purchase P25 compliant, multi-band radios to allow communications interoperability between traditional VHF radio system (analog and digital (P25) format) and the SARA and ISICS systems used in neighboring communities	Emergency Management	City Council, Police Department, Fire Department, EMA	On-Going	Low to Moderate	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

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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	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
H	Promote awareness of the Iowa Disaster Behavioral Health Response Team (DBHRT)	ALL	Mental Health/Disability Services of the East Central Region, County EMA	On-going	Minimal to Low	State, County, Local
<b>Natural Resource Protection</b>						
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
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	Groundwater	City Council	On-Going	Moderate	Local

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	systems in the city limits	Contamination				
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	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	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
<b>Prevention</b>						
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	Thunderstorm/Lightning	City Council	On-Going	Minimal	Local

**2022 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA**

	pump 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	Maintain and update anti-virus software	Terrorism	Staff	On-Going	Minimal	Local

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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 buildings	Extreme Heat	Public Works	On-Going	Minimal	Local
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

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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
<b>Public Education/Awareness</b>						
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 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	Transportation	Fire Department, Council	On-Going	Minimal	Local

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	closed					
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 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, 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
H	Promote awareness of the Iowa	ALL	Mental Health/Disability	On-going	Minimal to	State,

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	Disaster Behavioral Health Response Team (DBHRT) as a resource in the event of a disaster		Services of the East Central Region, County EMA		Low	County, Local
<b>Structural Projects</b>						
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	City Staff	On-Going	Minimal	Local

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		Failure				
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 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.

TABLE F1: CITY OF SUMNER DEMOGRAPHICS

<b>Government Framework</b>	Mayor – City Council
<b>General Population, 2020 Decennial Census and *2019 ACS 5-Year Estimates</b>	
Total Population	2,030
Median Age	*42.5
At-Risk Population, <18 Years	*516
At-Risk Population, >64 Years	*481
Total Males	*1,018
Total Females	*1,157
One Race-White	1,922
Black or African American	2
American Indian and Alaskan Native	8
Asian	6
Two or More Races	69
<b>Housing Characteristics, 2020 Decennial Census and * 2019 American Community Survey 5-Year Estimates</b>	
Total Households	*903
Households with children <18 Yrs.	*232
Households with persons >65 Yrs.	*278
Average Household Size	*2.34
Average Family Size	*2.96
Total Housing Units	938
Occupied Housing Units	853
Vacant Housing Units	85
Owner-Occupied Housing Units	*695
Renter-Occupied Housing Units	*208
Persons Living in Group Quarters	*57

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 2020 U.S. Census, Sumner's population increased to 2,030, an increase of 2 over ten years. The previous U.S. Census, taken in 2010, recorded a population figure of 2,028 for Sumner. Much of the data included in the tables are from the 2020 U.S. Census, as well as the 2019 American Community Survey 5 -Year Estimates, since detailed data from the 2020 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.

In 2020 the city began work on approximately 2.7 million dollar stormwater improvements. Detention Basins were built around North Walnut Street between South Street and 13<sup>th</sup> Street. Planning continues and will include new stormwaters that will run from the detention basins south, run under Highway 93 and

<b>TABLE F2: CITY OF SUMNER DEMOGRAPHICS</b>	
<b><i>Economics Characteristics, 2019 ACS 5-Year Estimates</i></b>	
Population 16 years and over	1,741
Population In Labor Force (16 years and over)	1,240
Persons Employed	1,187
Persons Unemployed	40
Persons Employed in Management, Business, Science, and Arts Occupations	343
Persons Employed in Service Occupations	299
Persons Employed in Sales and Office Occupations	211
Persons Employed in Natural Resources, Construction, and Maintenance Occupations	162
Persons Employed in Production, Transportation, and Material Moving Occupations	172
Median Household Income	\$64,018
Mean Household Income	\$77,857
Percent of Persons < 18 yrs. Below Poverty Level	0.6%
Percent of Persons 18-64 Yrs. Below Poverty Level	1.6%
Percent of Persons >65 Yrs. Below Poverty Level	4.7%
<b><i>Social Characteristics, 2019 ACS 5-Year Estimates</i></b>	
School Enrollment (3 yrs and over)	504
Nursery School, Preschool	67
Kindergarten and Elementary School (grades 1-8)	214
High School (grades 9-12)	130
College or Graduate School	93
Education Attainment: Population 25 Years and Over	1,521
Less than High School Graduate	76
High School Graduate (includes equivalency)	615
Some College, Associate's Degree	487
Bachelor's degree or Higher	343

Columbia street to the Wapsie bridge on South Walnut street.

Also in 2020 in an effort to move out of the flood plan, the Sumner Municipal Light Plant built a new plant and substation on Pleasant Street. The plant was built to house 3 generators and has been designed for future growth. SMLP also brought a second transmission line into the new substation. SMLP continues to work on converting the City to all underground service and has approximately 25% of the work completed.

Table F3 shows the primary utility providers for the City of Sumner.

TABLE F3: SUMNER UTILITY PROVIDERS						
Electric	Natural Gas	Telephone/Internet	Cable	Water	Sewer	Sanitation
Sumner Municipal Light Plant	Black Hills Energy	Windstream/ Mediacom/Community Digital Wireless	Mediacom/ Community Digital Wireless	City of Sumner	City of Sumner	City of Sumner/ Black Hawk County Sanitary Landfill

The city has self-service 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.

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

Table F4 is the analysis scores for the City of Sumner. As shown, the top hazards for Sumner are: Extreme Heat, Flash Flooding, River Flooding.

TABLE F4: CITY OF SUMNER HAZARD RISK ASSESSMENT						
Hazard Rank	Hazard	Probability	Magnitude/ Severity	Warning Time	Duration	Hazard Score
1	Extreme Heat	2	1	1	2	2.90
2	Flash Flood	2	3	2	3	2.40
2	River Flooding	3	2	1	3	2.40
3	Tornado/Windstorm	2	2	3	2	2.15
4	HAZMAT Incident	1	2	4	3	1.95
5	Severe Winter storm	2	2	1	2	1.85
5	Infrastructure Failure	1	2	4	2	1.85
6	Human Disease	1	2	2	4	1.75
7	Thunderstorm/Lightning/Hail	2	1	2	2	1.70
8	Grass/Wild land Fire	1	1	4	2	1.55
9	Earthquake	1	1	4	1	1.45
9	Landslide	1	1	4	1	1.45
9	Sinkholes	1	1	4	1	1.45
9	Radiological Incident	1	1	4	1	1.45
9	Terrorism	1	1	4	1	1.45
10	Transportation Incident	1	1	3	1	1.30
11	Levee/Dam Failure	1	1	2	1	1.15
12	Animal/Plant/Crop Disease	1	1	1	2	1.10
13	Drought	1	1	1	1	1.00
13	Expansive Soils	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 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 and Cobblestone Assisted Living serve the aging population in the community. The Hillcrest Nursing Home facility houses 86 beds. According to 2019 ACS 5 Year Estimates, there were 57 persons living in group quarters within the city, an estimate that likely falls short of the actual figure. 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)	Cobblestone Assisted Living
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	Hillcrest Nursing Home

*Source: Community*

**TABLE F6: CITY OF SUMNER  
100-YEAR FLOODPLAIN PROPERTIES**

Number of Structures	116
Building Value	\$ 10,909,100
Dwelling Value	\$ 6,249,790
Total Value	\$ 17,158,890

*Source: INRCOG & Bremer County Assessor (2021)*

An INRCOG count of structures in the floodplain showed 91 dwellings located within the floodplain. Using the 2020 Census figure (2.34) for average household size, and assuming all of the households are occupied, there are approximately 214 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 to INRCOG by the Bremer County Assessor, there are 116 structures with a total value of \$17,158,890 located within the 100-year floodplain. Of those structures, 91 are residential dwellings and 25 are other types of buildings. See *Attachment G: Flood Scenario Map of the City*.

As stated on the FEMA website<sup>27</sup>, 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 fewer than 10 mobile homes in Sumner, based on more accurate data from city administrators. Based on the city's average household size of 2.24 persons, it estimated that approximately 22 persons live in mobile homes. General observation would suggest a recent decrease in the number of manufactured homes in the area. This 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**

	2020
Total City Population (2010)	2,030
Elderly (65 yrs and older)	*481
Youth (under 18 yrs old)	*516
Householder Living Alone	*292
Non-English Speaking Population (speaks English less than 'very well')	*0.2%
Population Living in Poverty	*2.0%
Population in Mobile Homes	22
Group Quarters Population	*57

*Source: U.S. Census, 2020 and \*2019 ACS 5-Year Estimates, City Staff*

<sup>27</sup> 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 F7 identifies the population of various segments of the population that may consider “at-risk” in the event of a hazard.

According to Table F7, 481 of the city’s residents are 65 years and older. There are 57 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 2020, 516 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 214 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 Table F8.

#### 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 four 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	\$ 96,339,870	\$ 95,481/parcel
Commercial Property	\$ 42,464,640	\$ 224,680/unit
Industrial Property	\$ 4,036,850	\$ 576,693/unit
Agricultural Buildings	\$ 46,480	\$ 9,296/unit
Agricultural Land	\$ 640,340	\$1,299/acre
Utilities	\$ 966,270	\$120,784
Railroads	0	N/A
Exemptions (military)	N/A	N/A
Gross Valuation	\$ 144,494,450	N/A
<b>Total Net Valuation</b>	<b>N/A</b>	

Source: City of Sumner & County Assessor (12/1/2021)

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	12	\$ 1,445,400	20	\$ 360,609	4	\$ 149,764	0

Source: Federal Emergency Management Agency (FEMA); Repetitive Loss data as of 10/27/2021; NFIP data as of 10/27/2021

## 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 through coordinated efforts with Bremer County.
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 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.
8. Take measures to create a unified communication system for all emergency entities in the County as the current system does not have such capabilities.

### 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 January of 2020. 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 January 29, 2021.

TABLE F10: 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 recently participated in FEMA 403 & 404 Housing Buyout Programs. As a result, 12 structures were removed from the floodplain.

#### ***Public Education & Awareness Mitigation Actions***

The outdoor early warning siren system consists of two sirens, which were updated in 2018. 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 full-time and 1 part-time 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:

2007 Sterling Pumper #1  
 1996 Ford Pumper #2  
 2004 Peterbuilt Tanker #3  
 2004 Peterbuilt Tanker #4  
 2013 Ford F350 #5  
 2006 Chevrolet #6  
 1981 Ford Tanker #7  
 2005 Kenworth #8  
 Grass/Rescue Ranger

### Ambulance

The City of Sumner is also served by a local ambulance service of 10 volunteers and 2 ambulances.

### Medical Facilities

The City of Sumner has a hospital (Community Memorial Hospital), built in 2013, and house a medical clinic with two doctor's and two Advanced Registered Nurse Practitioners.

### Outdoor Early Warning Siren

The City of Sumner outdoor early warning siren system consists of 2 sirens which were updated in 2018.

### HAZMAT

Sumner is included in the Bremer County 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

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 1/29/2021	190029
Source: Community and FEMA		

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 a John Deere skid steer, 1 ton Ford with snow blade, 2 dump trucks with blades, and a road grader.

### ***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 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
<b>Emergency Services</b>						
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	High	Local
H	Maintain storm spotter training for	Thunderstorm/Lightning,	City Council, EMA	On-Going	Minimal	Local

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	local fire departments/deputies and EMS crews	Windstorm, Tornado, Hailstorm				
H	Make available a cleanup crew for after a storm	Thunderstorm/Lightning	City Council, Public Works, Parks 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	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
H	Maintain air conditioner(s) in community buildings	Extreme Heat	City Council	On-Going	Minimal	Local
H	Develop sandbagging procedures for the community	River Flood	City Council	On-Going	Minimal	Local

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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	Purchase P25 compliant, multi-band radios to allow communications interoperability between traditional VHF radio system (analog and digital (P25) format) and the SARA and ISICS systems used in neighboring communities	Emergency Management	City Council, Police Department, Fire Department, EMA	On-Going	Low to Moderate	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	Communications Failure	Bremer County EMA, City Council	On-Going	Minimal	Local

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	emergency					
L	Stockpile sand and sandbags	Flash Flood, River Flood	City Council, Fire Department	On-Going	Minimal to Low	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	Moderate	Local
L	Provide fans and/or cooling shelter	Extreme Heat	City Council	On-Going	Minimal	Local
H	Promote awareness of the Iowa Disaster Behavioral Health Response Team (DBHRT)	ALL	Mental Health/Disability Services of the East Central Region, County EMA	On-going	Minimal to Low	State, County, Local
<b>Natural Resource Protection</b>						
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
M	Participate in and cooperate with other jurisdictions in improving	Flash Flooding, River Flooding	EMA, Individual cities	Active	Minimal	County, State,

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	watersheds, including Watershed Management Authorities and Drainage Districts					Federal
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, Public Works	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
<b>Prevention</b>						
H	Maintain public works equipment	Severe Winter Storm	Public Works	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	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	Public Works	On-Going	Low	Local

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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	Public Works	On-Going	Low	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
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	Public Works	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

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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
<b>Public Awareness/Education</b>						
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	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	Disease	City Council	On-Going	Minimal	Local

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	vaccination plan					
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
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

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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
H	Promote awareness of the Iowa Disaster Behavioral Health Response Team (DBHRT) as a resource in the event of a disaster	ALL	Mental Health/Disability Services of the East Central Region, County EMA	On-going	Minimal to Low	State, County, Local
<b>Structural Projects</b>						
H	Replace/make improvements (widen or raise) at 3 <sup>rd</sup> and 5 <sup>th</sup> 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

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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	Work with DOT to replace South Division Street Bridge	Bridge Failure	City Council, Public Works	On-going	High	Local, State
H	Inspect any utility lines that are near a sinkhole	Sinkholes	Public Works	On-Going	Minimal	Local
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	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
<b><i>General Population, 2020 Census and *2019 ACS 5-YEAR Estimates</i></b>	
Total Population	1,191
Median Age	*40.4
At-Risk Population, <18 Years	*331
At-Risk Population, >64 Years	*243
Total Males	*675
Total Females	*627
One Race-White	1,136
Black of African American	0
American Indian and Alaskan Native	1
Asian	0
Two or More Races	43
<b><i>Housing Characteristics, 2020 Census and *2019 ACS 5-Year Estimates</i></b>	
Total Households	*569
Households with children <18 Yrs.	*167
Households with persons >65 Yrs.	*169
Average Household Size	*2.26
Average Family Size	*2.86
Total Housing Units	554
Occupied Housing Units	508
Vacant Housing Units	46
Owner-Occupied Housing Units	*441
Renter-Occupied Housing Units	*128
Persons Living in Group Quarters	19

## Demographics

### Population

Tripoli's demographic data is outlined in Tables G1 and G2. In the recent 2020 U.S. Census, Tripoli's population declined to 1,191, an decrease of 9.3 percent over ten years. The previous U.S. Census, taken in 2010, recorded a population figure of 1,313 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, 2019 ACS 5-Year Estimates</i>	
Population 16 years and over	1,009
Population In Labor Force (16 years and over)	661
Persons Employed	651
Persons Unemployed	10
Persons Employed in Management, Business, Science, and Arts Occupations	167
Persons Employed in Service Occupations	94
Persons Employed in Sales and Office Occupations	154
Persons Employed in Natural Resources, Construction, and Maintenance Occupations	68
Persons Employed in Production, Transportation, and Material Moving Occupations	168
Median Household Income	\$57,386
Mean Household Income	\$68,561
Percent of Persons < 18 yrs. Below Poverty Level	0.6%
Percent of Persons 18-64 Yrs. Below Poverty Level	5.5%
Percent of Persons >65 Yrs. Below Poverty Level	14.2%
<i>Social Characteristics, 2019 ACS 5-Year Estimate</i>	
School Enrollment (3 yrs. and over)	294
Nursery School, Preschool	42
Kindergarten and Elementary School (grades 1-8)	142
High School (grades 9-12)	68
College or Graduate School	42
Education Attainment: Population 25 Years and Over	921
Less than High School Graduate	69
High School Graduate (includes equivalency)	320
Some College, Associate's Degree	335
Bachelor's degree or Higher	197

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.

$$\begin{aligned} & \text{(Probability x .45) + (Magnitude/Severity x .30) + (Warning Time x .15) + (Duration x .10)} \\ & \quad = \text{Final Hazard Assessment Score} \end{aligned}$$

Table G4 is the analysis scores for the City of Tripoli. As shown, the top five hazards for Tripoli are: Tornado/Windstorm, Thunderstorm/Lightning/Hail, Flash Floods, Human Disease.

TABLE G4: CITY OF TRIPOLI HAZARD RISK ASSESSMENT						
Hazard Rank	Hazard	Probability	Magnitude / Severity	Warning Time	Duration	Hazard Score
1	Tornado/Windstorm	4	3	4	1	3.40
2	Thunderstorm/Lightning/Hail	4	2	3	2	3.05
3	Flash Flood	4	1	4	2	2.90
4	Human Disease	3	3	1	4	2.80
5	Infrastructure Failure	2	3	4	3	2.70
5	Terrorism	2	3	4	3	2.70
6	Severe Winter Storm	4	1	1	3	2.55
7	Earthquake	1	3	4	2	2.15
8	HAZMAT Incident	2	1	4	2	2.00
9	Extreme Heat	2	2	1	3	1.95
10	Transportation Incident	2	1	4	1	1.90
11	Levee/Dam Failure	1	1	4	3	1.65
11	Drought	2	1	1	3	1.65
12	Grass/Wild land Fire	1	1	4	1	1.45
12	Landslide	1	1	4	1	1.45
12	Sinkholes	1	1	4	1	1.45
12	Radiological Incident	1	1	4	1	1.45
13	Animal/Plant/Crop Disease	1	1	1	3	1.20
14	Expansive Soils	1	1	2	1	1.15
15	River Flooding	1	1	1	2	1.10

## 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 acquired from the Bremer County Assessor, there are currently 5 residential structures and 37 buildings located within the 100-year floodplain.

**TABLE G5: CRITICAL FACILITIES IN TRIPOLI**

Faith United Church (Shelter)	Tripoli Community High School (Shelter)
Grace Lutheran Church (Shelter)	City Hall
Tripoli Public Library	Tripoli Elementary School
Wastewater Treatment Plant	Faith UCC School (Shelter)
Power Lines/Utilities	Tripoli Fire and Ambulance Garage (Shelter)
Tripoli Fire/EMS Building	Water Plant/Water Tower

*Source: Community*

**TABLE G6: CITY OF TRIPOLI  
100-YEAR FLOODPLAIN PROPERTIES**

Number of Properties	37
Building Value	\$ 1,277,653
Dwelling Value	\$ 1,063,787
Total Value	\$ 2,341,440

*Source: INRCOG & Bremer County Assessor (2021)*

As Table G6 shows, there are 32 structures within the 100-year floodplain with a total value of \$2,341,440. See Attachment 1 for a flood Scenario Map of the City.

As stated on the FEMA website<sup>28</sup>, 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 are no mobile homes located in the city. Based on the city's average household size of 2.37 persons, it can be estimated that approximately zero persons live in mobile home. General observation would suggest a recent decrease in the number of manufactured homes in the area. This decreased popularity has the potential to decrease 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 2019 ACS 5-Year Estimates, there are 21, 2-unit; 42 3-4 unit; and 17, 5-9 unit structures in the city. In 2019 it is estimated there were 80 multi-family housing units housing from 2 to 9 apartments. Based on average household size of 2.26 persons, approximately 180 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 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 2020 U.S. Census and 2019 American Community Survey 5-Year Estimates.

TABLE G7: CITY OF TRIPOLI “AT-RISK” POPULATION	
Total City Population (2020)	1,191
Elderly (65 yrs and older)	*169
Youth (under 18 yrs old)	*167
Householder Living Alone	*190
Non-English Speaking Population (speaks English less than ‘very well’)	*1%
Population in Mobile Homes	*0
Group Quarters Population	*19
Source: 2020 U.S. Census, *2019 ACS 5-year Averages	

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<sup>28</sup> Federal Emergency Management Agency (FEMA), <http://www.fema.gov/areyouready/tornadoes.shtml>

According to ACS data, 169 residents are 65 years or older. Also, as indicated by ACS there are 19 persons living in group quarters, indicating the 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, 167 of the community's residents is under the age of 18.

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 32 buildings located within the 100-year floodplain. Using the average persons per household figure from the 2020 Census of 2.26, 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.

<b>TABLE G8: CITY OF TRIPOLI'S VALUATIONS</b>		
	<b>Total Valuation</b>	<b>Average Valuation per Unit or Parcel</b>
Residential Valuation	\$ 51,251,170	\$ 84,853/parcel
Commercial Valuation	\$ 15,570,170	\$131,951 /unit
Industrial Valuation	0	N/A
Agricultural Buildings	\$ 17,250	\$ 8,625/unit
Agricultural Land	\$ 550,110	\$ 1,590/acre
Utilities	N/A	N/A
Railroads	0	N/A
Exemptions (military)	N/A	N/A
Gross Valuation	\$ 67,388,700	N/A
<b>Total Net Valuation</b>	<b>\$47,878,742</b>	<b>N/A</b>
<i>Source: City of Tripoli &amp; Bremer County Assessor (12/1/2021)</i>		

## **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 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 G9 illustrates the number of repetitive loss properties for Tripoli. According to FEMA's data, Tripoli has 1 NFIP policy 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 10/26/2021) 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	1	\$100,000	1	0	1	\$40,927	\$0

*Source: Federal Emergency Management Agency (FEMA); Note: RLB = Repetitive Loss Building; NFIP data current as of 10/26/2021; Repetitive loss data current as of 10/26/2021*

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 through coordinated efforts with Bremer County.
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 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.
8. Take measures to create a unified communication system for all emergency entities in the County as the current system does not have such capabilities.

### 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 January 29, 2021.

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	Yes	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 Tripoli Fire Department and Tripoli Rural Fire owns the following equipment: Pumper Truck (2); Rescue Van; Tanker (2); Grass Rigger. Tripoli Fire will be equipped with an ATV in 2022.

### ***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 is included in the Bremer County 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 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
<b>Emergency Services</b>						
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	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

**2022 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA**

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	Purchase P25 compliant, multi-band radios to allow communications interoperability between traditional VHF radio system (analog and digital (P25) format) and the SARA and ISICS systems used in neighboring communities	Emergency Management	City Council, Police Department, Fire Department, EMA	On-Going	Low to Moderate	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

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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 Staff	On-Going	Low	Local
L	Keep the county updated on personnel changes	Communications Failure	City Staff	On-Going	Minimal	Local
H	Promote awareness of the Iowa Disaster Behavioral Health Response Team (DBHRT)	ALL	Mental Health/Disability Services of the East Central Region, County EMA	On-going	Minimal to Low	State, County, Local
<b>Natural Resource Protection</b>						
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	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	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
<b>Prevention</b>						
H	Maintain tree trimming program	Severe Winter Storm,	City Council	On-Going	Low	Local

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		Windstorm, Hailstorm				
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
H	Maintain lists of personnel and	Emergency Management	City Council, Staff	On-Going	Minimal	Local

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	equipment available to use with response plans					
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	Maintain and/or develop a wellhead protection program	Groundwater Contamination	City Council	On-Going	Low	Local
M	Monitor the drinking water supply	Groundwater Contamination,	City Council, Public	On-Going	Low	Local

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		Disease	Works			
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
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

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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	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
<b>Public Awareness/Education</b>						
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

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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
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

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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	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
H	Promote awareness of the Iowa Disaster Behavioral Health Response Team (DBHRT) as a resource in the event of a disaster	ALL	Mental Health/Disability Services of the East Central Region, County EMA	On-going	Minimal to Low	State, County, Local
<b>Structural Projects</b>						
H	Install new or retrofit existing	Thunderstorm/Lightning/Hail,	City Council	Medium-	Moderate	Local,

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	facilities to have a storm shelter/safe room	Tornado/Windstorm		Term		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 Failure, Levee Failure	City Council	On-Going	Minimal to Low	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 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	Fire, Explosion	City Council, Public Works	On-Going	Minimal	Local

	ensure locations are marked					
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 Bremer 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.

TABLE H1: CITY OF WAVERLY DEMOGRAPHICS

<b>Government Framework</b>	Mayor – City Council
<b>General Population, 2020 Census and *2019 ACS 5-Year Estimate</b>	
Total Population	10,394
Total Males	*4,905
Total Females	*5,189
Median Age	*36.9
At-Risk Population, <18 Yrs	*2,407
At-Risk Population, >64 Yrs	*1,994
One Race-White	9,539
One Race-Black or African American	227
One Race-Asian	161
Two or More Races	358
Hispanic or Latino (of any race)	285
Total Household Population	*8,711
Total Population in Group Quarters	1,404
Persons in Group Quarters – Correctional Institutions	101
Persons in Group Quarters – Nursing Homes	99
Persons in Group Quarters – Other Noninstitutions	1,204
<b>Housing Characteristics, 2020 Census and *2019 ACS 5-Year Estimate</b>	
Total Housing Units	4,166
Total Owner-Occupied Housing Units	*2,845
Total Renter-Occupied Housing Units	*815
Total Vacant Housing Units	343
Total 1-Unit Detached and Attached Structures	*3,112
Total 2, 3, and 4-Unit Structures	*181
Total 5 to 19-Unit Structures	*264
Total Mobile Homes	*46
Year Majority of Housing Units were Built	*1979 or earlier (57%)
Average Household Size	*2.38
Average Family Size	*2.81
Specified Renter-Occupied Units	*22.3%
Median Gross Rent	*\$715
Specified Owner-Occupied Units	*77.7%
Median Housing Value, Owner-Occupied	*\$173,700
Method of Heating Household	Utility Gas *2,933
Households with No Telephone Service	*65

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 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 20<sup>th</sup> 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 2010 to 2020, the population increased over five percent to 10,394 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

TABLE H2: CITY OF WAVERLY DEMOGRAPHICS	
<i>Economics Characteristics, 2020 Census and *2019 ACS 5-Year Estimate</i>	
Population 16 years and over	*8,372
Population In Labor Force (16 yrs+)	*5,448
Persons in Civilian Labor Force	*5,448
Persons Employed	*5,295
Persons Unemployed	*153
Persons in Armed Forces	*0
Mean Travel Time to Work in Minutes (16 yrs & over)	*16.0
Persons Employed in Management, Business, Science, and Arts Occupations	*1,973
Persons Employed in Service Occupations	*1,079
Persons Employed in Sales and Office Occupations	*1,029
Persons Employed in Agriculture, Fishing, Forestry, Hunting, and Mining Occupations	*58
Persons Employed in Natural Resources, Construction, or Maintenance Occupations	*374
Persons Employed in Production, Transportation, or Material Moving Occupations	*840
Median Household Income	*\$64,949
Median Family Income	*\$82,100
Per Capita Personal Income	*\$28,846
Families below Poverty Level	*3.6%
Individuals below Poverty Level	*9.1%
Unemployment Rate,	*2.8%
<i>Social Characteristics, 2020 Census and *2019 ACS 5-Year Estimate</i>	
School Enrollment (3 yrs and over)	*3,561
Nursery School, Preschool	*236
Kindergarten and Elementary School (grades 1-8)	*959
High School (grades 9-12)	*497
College or Graduate School	*1,869
Education Attainment: Population 25 Years and Over	*6,042
Persons with Less than 9 <sup>th</sup> Grade	*80
Persons with 9 <sup>th</sup> to 12 <sup>th</sup> Grade, No Diploma	*101
Persons with High School Degree or Equivalency	*1,688
Persons with Some College, No Degree	*1,215
Persons with Associate Degree	*566
Persons with Bachelor's Degree	*1,403
Persons with Graduate or Higher Degree	*989
Persons with a Disability Status (5 yrs+)	*998
Persons that Speak a Language other than English at Home (5yrs+)	*1.8%

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.

The current Waste Water Treatment Facility consists of waste management treatment tanks located in the southeast corner of the city near the intersection of 8<sup>th</sup> Street SE and 17<sup>th</sup> 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 tornados.

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 November 2021, there were 120 nursing home beds, 50 assisted-living units and 128 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 210<sup>th</sup> 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.

**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
St. John's Lutheran Church (Shelter)	Bartels Lutheran Retirement Home (Shelter)
Bremer County Courthouse (Shelter)	Waverly-Shell Rock High School (Shelter)
Field House (Shelter)	Knight's Gym (Shelter)
Waverly Municipal Hospital (Shelter)	Trinity United Methodist Church (Shelter)
Wartburg College Becker Science Hall (Shelter)	Luther Hall (Shelter)
	The W (Shelter)

*Source: Community*

### 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 529 structures (including residential, commercial, industrial, and public use structures).

TABLE H5: CITY OF WAVERLY 100-YEAR FLOODPLAIN PROPERTIES (2021)	
Number of Structures	529
Building Value	\$33,932,315
Dwelling Value	\$35,750,955
Total Value	\$69,683,270
Source: Bremer County Assessor	

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 2020 Multi-Jurisdictional Hazard Mitigation Plan Update. A copy of the plan can be located online at [www.inrcog.org/pub](http://www.inrcog.org/pub) under the "Hazard Mitigation Planning" subheading.

### Tornadoes

As stated on the FEMA website<sup>29</sup>, mobile homes are highly vulnerable to tornadoes. Even mobile homes that are tied down, offer little protection from tornadoes. According to the 2014-2019 American Community Survey 5-Year Estimates, there were an estimated 46 manufactured housing units in Waverly. Using the average persons per household, there are approximately 110 persons living in manufactured housing units in Waverly. Since the 2010 Census, there has been a significant decrease in the number of manufactured housing units in Waverly, from an estimated 139 units to 46 units. This decreased popularity has the potential to decrease 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

TABLE H6: CITY OF WAVERLY "AT-RISK" POPULATION	
	2020
Total City Population	10,394
Elderly (65 yrs and older)	*1,994
Youth (under 18 yrs old)	*2,407
Householder Living Alone	*26.7%
Non-English Speaking Population (speaks English less than 'very well', 5yrs+)	*1.8%
Population Living in Poverty	*9.1%
Population in Mobile Homes	*110
Group Quarters Population	1,404
Persons with Disabilities (age 5+)	*988
Persons w/Hearing Difficulty	*349
Persons w/Vision Difficulty	*132
Persons w/Cognitive Difficulty	*393
Persons w/Ambulatory Difficulty	*408
Persons w/Self-Care Difficulty	*165
Persons w/Independent Living Difficulty	*321
Source: U.S. Census, 2020 and *2019 ACS 5-Year Estimate	

<sup>29</sup> Federal Emergency Management Agency (FEMA), <http://www.fema.gov/areyouready/tornadoes.shtml>

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 2020 there were estimated to be 445 multi-family housing units in apartment buildings housing from 2 to 20 or more apartments. According to this, approximately 1,059 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 mentioned earlier, Waverly has 120 nursing home beds, 50 assisted-living units and 128 independent-living units.

There are two safe rooms completed 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 has 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 4<sup>th</sup> Ave SW
- Trinity United Methodist Church – 1400 W Bremer Ave
- Bartels Home – 1922 5<sup>th</sup> Ave NW
- Waverly Municipal Hospital – 312 9<sup>th</sup> St SW
- Bremer County Courthouse – 415 E Bremer Ave
- Waverly-Shell Rock Middle School – 215 3<sup>rd</sup> St NW
- Waverly-Shell Rock High School – 1415 4<sup>th</sup> Ave SW
- Wartburg College
  - Becker Science Hall – 111 10<sup>th</sup> St. NW
  - Field House – 1015 2<sup>nd</sup> Ave NW
  - Knights Gym – 231 10<sup>th</sup> St. NW
  - Luther Hall – 200 9<sup>th</sup> 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 2020 U.S. Census and 2019 American Community Survey 5-Year Estimates.

#### 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 2020 Census, there were estimated to be 46 mobile homes in Waverly. Again, using the average persons per household, there are approximately 110 persons living in these housing units.

According to Table H6, 1,994 residents are 65 years or older. There are 1,404 persons living in group quarters, indicating the remaining elderly populations live throughout the community. According to Bartels Lutheran Retirement Community staff, the City of Waverly has 120 nursing home beds and 50 assisted living facility units, and 150 independent 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 2020, approximately 2,407 of the community’s total population was 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 2020, there were estimated to be 445 multi-family housing units housing from 2 to 20 or more apartments. According to this, approximately 1,059 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 334 houses and 195 commercial/industrial/public structures located within the 100-year floodplain. Using the average persons per household figure from the 2020 Census of 2.38, there are approximately 795 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 118 NFIP policies in place within the city, a significant decrease from the 2017 number of policies at 250. Much of this drop in the number of NFIP policies within the community is due to significant mitigation efforts in past years.

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 179 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

**TABLE H7: CITY OF WAVERLY'S VALUATIONS**

	<b>Total Valuation</b>	<b>Average Valuation per Unit or Parcel</b>
Residential Valuation	\$ 686,562,170	\$ 250,845/parcel
Commercial Valuation	\$ 344,963,120	\$ 516,763/unit
Industrial Valuation	\$ 34,223,630	\$ 900,622/unit
Agricultural Buildings	N/A	N/A
Agricultural Land	\$ 2,680,300	\$ 1,176/acre
Utilities	N/A	N/A
Railroads	N/A	N/A
Exemptions (military)	N/A	N/A
Gross Valuation	\$1,068,429,220	N/A
<b>Total Net Valuation</b>	<b>N/A</b>	<b>N/A</b>

*Source: Bremer County Assessor and Auditors Office (12/1/2021)*

number of repetitive loss properties for Waverly.

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 through coordinated efforts with Bremer County.
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 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.
8. Take measures to create a unified communication system for all emergency entities in the County as the current system does not have such capabilities.

**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	118	\$23,545,100	179	19	179	\$5,137,319	\$414,562

*Source: Federal Emergency Management Agency (FEMA); Note: RLB = Repetitive Loss Building; NFIP data current as of 10/25/2021; Repetitive loss data current as of 10/25/2021*

**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 1/29/2021	190030

*Source: Community and FEMA*

### 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 2<sup>nd</sup>, 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 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 October of 2010, construction of the new gated spillway began, replacing the existing mass-concrete ogee-shaped dam. The new dam maintains a set water elevation established by the city and approved by the Iowa Department of Natural Resources. The water level is now continuously monitored by pressure

transducers which feed information to a programmable logic controller. This computer senses when water levels are deviating from a desired level, which then triggers a supply of compressed air into a bladder which raises and lowers the gate, controlling discharge and pool level. The dam now protects hundreds of homes and businesses from the 100-year floodplain, preserves power generation at the hydroelectric facility, and creates more consistent recreational opportunities in the river upstream.

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
<i>Source: City</i>								

#### 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., tornadoes) 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 19<sup>th</sup>, 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 Alert Iowa Service, which is available to all citizens including the Waverly-Shell Rock School District. The Alert Iowa 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 Alert Iowa 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 4<sup>th</sup> St NE  
Waverly, Iowa 50677  
319-352-0133  
Email address: [kladage@co.bremer.ia.us](mailto:kladage@co.bremer.ia.us)

### ***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 4<sup>th</sup> 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 1<sup>st</sup> Street SW  
Waverly, IA 50677  
(319) 352-5521

### ***Medical Facilities***

Waverly is served by one local hospital:  
Waverly Health Center  
312 9<sup>th</sup> 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 is included in the Bremer County 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 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/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
<b>Emergency Services</b>						
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	Purchase P25 compliant, multi-band radios to allow communications interoperability between traditional VHF radio system (analog and digital (P25)	Emergency Management	City Council, Police Department, Fire Department, EMA	On-Going	Low to Moderate	Local

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	format) and the SARA and ISICS systems used in neighboring communities					
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
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
H	Promote awareness of the Iowa Disaster Behavioral Health Response Team (DBHRT)	ALL	Mental Health/Disability Services of the East Central Region, County EMA	On-going	Minimal to Low	State, County, Local
<b>Natural Resource Protection</b>						
H	Continue further development of and update Storm Water Management	Flood, Groundwater Contamination	City Council	Ongoing	Low	Local

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	Program					
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	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	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
<b>Prevention</b>						
H	Maintain tree trimming program	Severe Winter Storm,	City Council	Ongoing	Low	Local

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		Thunderstorm/Lightning, Tornado/Windstorm				
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
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
<b>Public Awareness/Education</b>						
H	Educate the public	Disease, Expansive Soils, Grass/Wildfire, HAZMAT,	City Council, Engineering, Public	Ongoing	Minimal	Local

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		Landslides/Mudflows, Levee Failure, Tornado/Windstorm, Transportation	Works, Fire Department			
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	Grass/Wildfire	City Council, Fire Dept.	Ongoing	Minimal to Low	Local

	approved open fire and/or ditch burning, and how to react in the event of a fire					
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
H	Promote awareness of the Iowa Disaster Behavioral Health Response Team (DBHRT) as a resource in the event of a disaster	ALL	Mental Health/Disability Services of the East Central Region, County EMA	On-going	Minimal to Low	State, County, Local
<b>Structural Projects</b>						
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 <sup>rd</sup> 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	Ongoing	Minimal to	Local

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			Works		Low	
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 <sup>rd</sup> 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	Terrorism	City Council, Sheriff	Ongoing	Minimal to	Local,

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	secure the city's critical infrastructure				High	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
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 <sup>th</sup> Avenue	Flood	City Council, Public Works	Ongoing	High	Local, State, Federal

# Appendix I: Denver Community School District

## District Profile

Denver Community School District (DCSD), located in the City of Denver, provides Pre-kindergarten through 12<sup>th</sup> grade education to nearly 850 students. The District serves the City of Denver as well as surrounding unincorporated areas, which includes parts of both Bremer and Black Hawk counties. Figure I.1 is a map of the school district's area as of the 2019-20 school year.

The school's campus is located centrally the city of Denver at 540 Lincoln Street, northeast from Highway 63. In addition to the school buildings themselves, the campus includes a bus barn, playground, football field and track, as well as a softball diamond and baseball diamonds. Situated just a few blocks southeast of the campus are the Denver Athletic Complex and Denver Cyclone Center. Construction of the new High School and Middle School began in 2021 with completion scheduled for August 2022.

## 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 area of town.

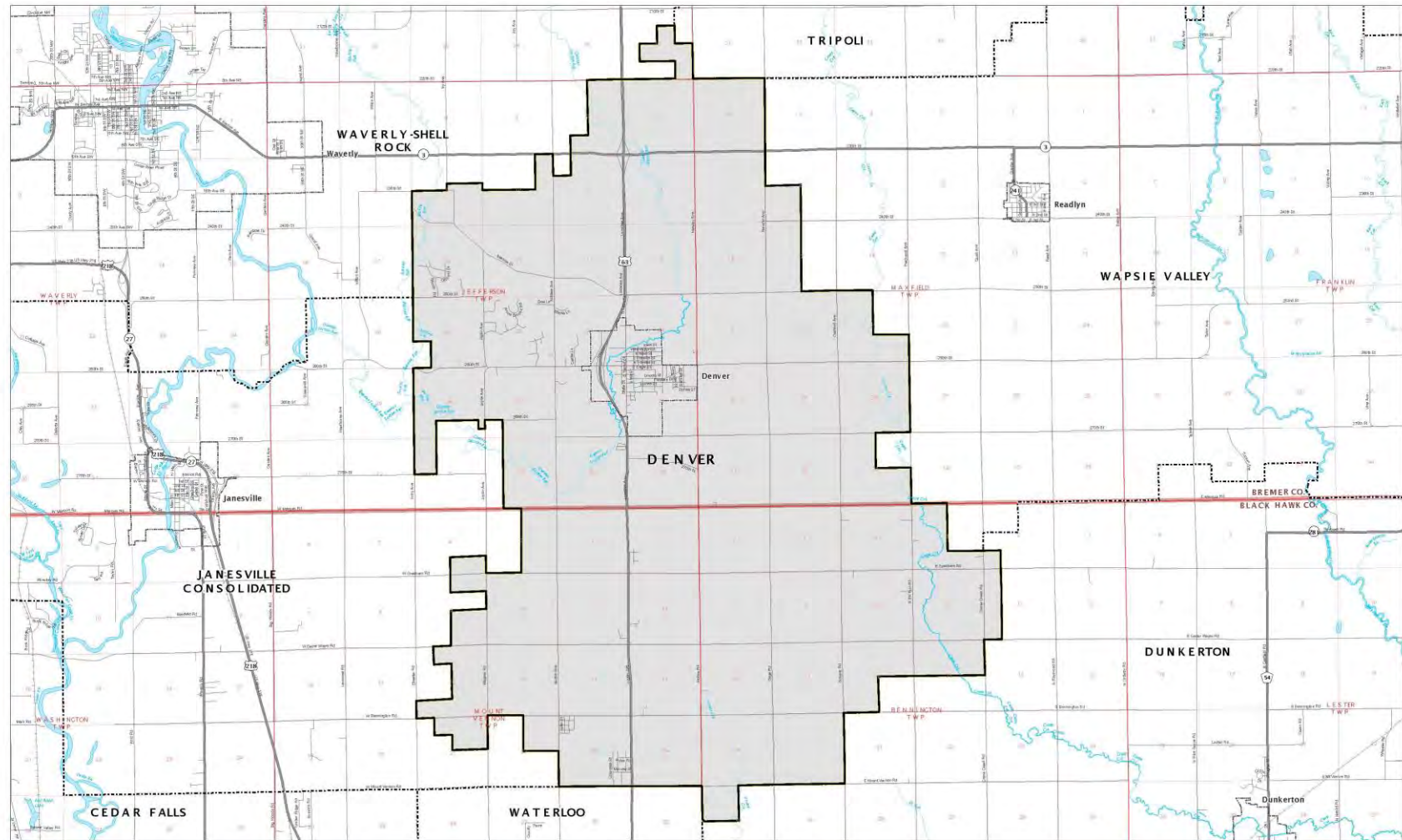
**TABLE I1: HISTORIC CERTIFIED ENROLLMENT**

School Year	Certified Enrollment
2012-13	717
2013-14	699
2014-15	695
2015-16	718
2016-17	716
2017-18	750
2018-19	778
2019-20	821
2020-21	846

*Source: Iowa Department of Education*

**Figure I.1: Map of Denver Community School District Area**

*Courtesy of: Iowa Department of Education, [www.educateiowa.gov](http://www.educateiowa.gov)*



Iowa Department of Education School District Boundary Verification 2019 - 2020

**DENVER**

DENVER  
 Other School District Boundary  
 City

Township  
 Section  
 County



The school district boundaries represented on this map were developed by the Iowa Department of Education and are current as of the 2019-2020 school year. The Iowa Department of Education is not responsible for any errors or omissions on this map. The Iowa Department of Education is not responsible for any errors or omissions on this map. The Iowa Department of Education is not responsible for any errors or omissions on this map.

## Community Services

Table I2 shows the primary utility providers for the City of Janesville.

TABLE I2: DENVER CSD 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

## Hazard 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 committee evaluated the risk associated with a specific hazard, defined by probability and frequency of occurrence, magnitude, severity, exposures, and consequences. The school district's vulnerability assessment provides in-depth knowledge of the hazards and vulnerabilities that affect the school district. This analysis provides an all-hazard approach when evaluating the hazards that affect the school district 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, infrastructure, 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 human caused or technological events tend to change over time with advancement in technology and methods of operation.

The Committee assessed the defined hazards relevant to potential impact on the school district. Using the scoring criteria previously defined (Tables 19-22) the school district 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 I3 displays the school district's hazard scores. The top three hazards for the Denver CSD are Tornado/Windstorm, Severe Winter Storm, and Thunderstorm/Lightning/Hail.

TABLE I3: DENVER COMMUNITY SCHOOL DISTRICT 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
10	Human Disease	2	2	3	2	2.15
11	Sinkholes	2	2	2	2	2
12	Terrorism	1	2	4	3	1.95
13	Landslide	1	1	4	3	1.65
14	Drought	1	2	1	4	1.6
15	Dam / Levee Failure	1	1	3	3	1.5
16	Earthquake	1	1	1	1	1
16	Expansive Soils	1	1	1	1	1
16	Radiological Incident	1	1	1	1	1

## **Vulnerability – Identifying Assets**

### **Critical Facilities**

All the school's buildings and campus areas are all considered critical facilities because of their student population. In the event of a hazard that requires seeking shelter, the school facilities themselves are utilized for sheltering in place. In the instance of hazard that requires sheltering, students and staff seek shelter "in place" within the respective school buildings. Although no certified tornado shelter currently exists in any of the buildings in the district, construction of the new facility does include plans for a tornado safe room.

### **Social Asset Populations**

The nature of a school's student population congregates large populations of "at-risk" individuals. Younger residents are often not aware of the proper actions to take in the event of a disaster. In addition, very young children can be more susceptible to disasters simply due to their age. As mentioned in District Profile, there are approximately 850 students and 130 staff in the district. The district actively takes steps to reduce the threat to their student population, as described below in the "Current Activities" section.

When school is in session, hundreds of people are in the various school buildings daily. This includes people from other communities attending various events throughout the year.

### **Estimating Property Loss**

Valuations are an important component of hazard mitigation planning in so much 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 disaster.

Denver Community school buildings and their contents are fully insured. The buildings themselves, currently in use, are valued at \$24,600,000. As mentioned earlier in the Plan, construction of a new High School and Middle School began in early 2021 and the current insured value of that project is \$16,200,000.

## Mitigation Strategy

### Hazard Mitigation Plan Goals

The district established the following hazard mitigation plan goals. These represent broad-based goals that would address a multitude of hazards and encompass a variety of mitigation activities. The hazard mitigation plan goals are identified as follows.

- 1) Maintain emergency services during hazard events, or if this is not possible, return to pre-disaster service levels as soon as possible.
- 2) Protect the health and welfare of students and staff by utilizing pre-disaster planning and constructing mitigation projects.
- 3) Mitigate or minimize the impact of natural, technological, and/or manmade disasters.
- 4) Minimize the occurrence of injuries and loss of life due to hazards.
- 5) Take steps to mitigate the potential of terrorism within our buildings.
- 6) Return to similar or improved pre-event conditions as quickly as possible following a disaster event.

### Current Mitigation Activities

This section includes an overview of the emergency response services and mitigation actions which are currently in place. Each school building in the district is equipped with a storm shelter, however, the new High School/Middle School will be equipped with a tornado safe room.

Located in the City limits, schools are within the services areas of the respective city's early warning siren system.

Denver CSD strives to create a friendly and safe learning environment for our students. Student safety measures have been in place for years, are reviewed and updated yearly and efforts are made to explore new options to further the environment and safety of our school. This plan includes communication and staff and student training.

A current focus area involves student safety with respect to outside intruders. Denver CSD Staff has created a detailed policy to follow in the event of intruders, bomb threats or other concerns within the community. The policy was developed and is practiced yearly with the support of local law enforcement and emergency service providers. This includes lockdown procedures and how staff and students should react to various intruders within our buildings.

It is also worth noting that Bremer County is very helpful in providing information through trainings and even weather alerts.

#### ***Bremer County Emergency Management Agency***

The Bremer County Emergency Management Coordinator, based out of the City of Waverly, works with cities and school districts throughout the county 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 three full time officers serving the Denver Police Department. The department currently operates 2 squad cars. Gary Everding is the current police chief of the department.

### ***Fire Protection***

Fire protection is provided for Denver by a force of 29 volunteer firefighters. All of these firefighters 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", chainsaws, 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.

### ***Medical Services and 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.

### ***Ambulance, EMS Services, and 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.

### ***Warning Systems***

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

## Future Activities & Implementation Strategy / Action Plan

### Priority

School representatives 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: Social, Technical, Addministrative, Political, Legal, Economic, and Environmental.

The Committee was asked to discuss the STAPLEE elements (Table I4) and determine each element's ranking (High -H, Medium -M, Low-L) for each

identified future mitigation activity. Afterwards, the average priority for each migration activity was recorded as the overall priority ranking for that particular future mitigation activity.

### Timeline

The Committee identified the time period each of the proposed mitigation activities will occur. Activities that occur regularly (either daily, weekly, monthly, or annually) were identified as Active. If the action is to occur within the next 1-5 years it was identified as Short-Term, if the activity would take 5-10 years it was labeled as Mid-Term, and any activities that would take 10 or more years were identified as Long-Term.

TABLE I4: STAPLEE ELEMENTS

<b>S – Social</b>	<ul style="list-style-type: none"> <li>Mitigation actions are acceptable to the community if they do not adversely affect a particular segment of the populations,</li> <li>Actions do not cause relocation of lower income people,</li> <li>Actions are compatible with the community's social and cultural values.</li> </ul>
<b>T- Technical</b>	<ul style="list-style-type: none"> <li>Mitigation actions are technically most effective if they provide long-term reduction of losses and have minimal secondary adverse impacts.</li> </ul>
<b>A – Administrative</b>	<ul style="list-style-type: none"> <li>Mitigation actions are easier to implement if the jurisdiction has the necessary staffing and funding.</li> </ul>
<b>P – Political</b>	<ul style="list-style-type: none"> <li>Mitigation actions can truly be successful if all stakeholders have been offered an opportunity to participate in the planning process and if there is public support for the action.</li> </ul>
<b>L – Legal</b>	<ul style="list-style-type: none"> <li>It is critical that the jurisdiction or implementing agency have the legal authority to implement and enforce a mitigation action.</li> </ul>
<b>E – Economic</b>	<ul style="list-style-type: none"> <li>Budget constraints can significantly deter the implementation of mitigation actions. Hence, it is important to evaluate whether an action is cost-effective, as determined by a cost benefit review, and possible to fund.</li> </ul>
<b>E - Environmental</b>	<ul style="list-style-type: none"> <li>Sustainable mitigation actions that do not have an adverse effect on the environment, that comply with Federal, State, and local environmental regulations,</li> <li>Are consistent with the community's environmental goals, have mitigation benefits while being environmentally sound.</li> </ul>

### ***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 School District 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.

Denver Community School District Future Mitigation Activities and Implementation Strategy are in Table I5.

## Implementation Strategy

The Committee generated a list of action steps to be implemented to mitigate the hazards discussed. In addition, the Committee identified a time line for each activity, associated hazards, estimated cost, priority, identified the responsible party or parties for each activity, and finally related each activity to at least one of the Hazard Mitigation Plan Goals listed above. Table I5, below, the school district's Implementation Strategy.

**TABLE I5: FUTURE MITIGATION ACTIVITIES-DENVER COMMUNITY SCHOOL DISTRICT**

Priority	Mitigation Action/Program/Project	Associated Hazard(s)	Primary Agency Responsible for Implementation	Associated Goal(s)	Timeline	Estimated Cost (\$)
High	Educate the Student Population/Public through: continued cooperation with local service organizations (American Red Cross, County EMA, etc.) to educate residents on how to prepare for and respond to various hazards.	ALL	School Board, Local Fire/Police	ALL	Active/Routine	Minimal
High	Identify locations (all school facilities, shelter locations) where it would be beneficial to have backup power generation or maintain backup power generation.	Tornadoes/Windstorms, Sever Winter Storms, Thunderstorm/Lightning/Hail	School Board and City	2	Short-Term	Minimal

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High	Maintain and update as needed, 28E Agreements with surrounding entities.	ALL	School Board and associated jurisdictions	2	Active	Minimal
High	Systematically review and update, as needed, Hazard Response Policies and Procedures	ALL	School Board and Staff	1	Active	Minimal
High	Continue to cooperate with local medical facilities and Health Department to increase likelihood of detection and proper response to outbreaks.	Human Disease	School Board, associated facilities, jurisdictions, and entities	1,2	Active	Minimal
Medium	Develop and maintain tree-trimming program in order to reduce the risk of falling branches on infrastructure and property.	Tornadoes/Windstorms, Thunderstorm/Lightning/Hail	School Board and City	3	Active	Low
Low	Develop and maintain list of interpreters in order to enhance communication barriers within the community.	Communication Failure	School Board and City	2	Active	Low
High	Maintain Procedures for Severe Weather Events	Tornado, Windstorm	School Board	1,2,3	Active/routine	Minimal
High	Maintain and evaluate existing terrorism mitigation procedures	Terrorism	School Board	5	Active/routine	Minimal

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High	Identify and evaluate Critical Facilities for accessibility, vulnerability, and risk.	Terrorism	School Board and Staff	1	Short-Term	Minimal
Low	Research and secure grant dollars for shelter and safe room construction	Tornado, Windstorm	School Board	1,2,3	Long-term	Moderate
High	Restrict water usage, as necessary, to maintain water supply	Drought	School Board and City	1,2	Active	Minimal
High	Promote awareness of the Iowa Disaster Behavioral Health Response Team (DBHRT)	ALL	Mental Health/Disability Services of the East Central Region, Staff	All	Active	Minimal

## Appendix J: Janesville Consolidated School District

### District Profile

Janesville Consolidate School District (JCSD), located in the City of Janesville, provides Pre-kindergarten through 12<sup>th</sup> grade education to nearly 450 students. The District serves the City of Janesville as well as surrounding unincorporated areas, which includes parts of both Bremer and Black Hawk counties. Figure J1 is a map of the school district's area as of the 2019-20 school year.

The school's campus is located in the northeast quadrant of the city at 505 Barrick Road, south and adjacent to Highway 218. In addition to the school building itself, the campus includes a bus barn, playground, football field and track, as well as a softball diamond and baseball diamond.

### Natural Environment

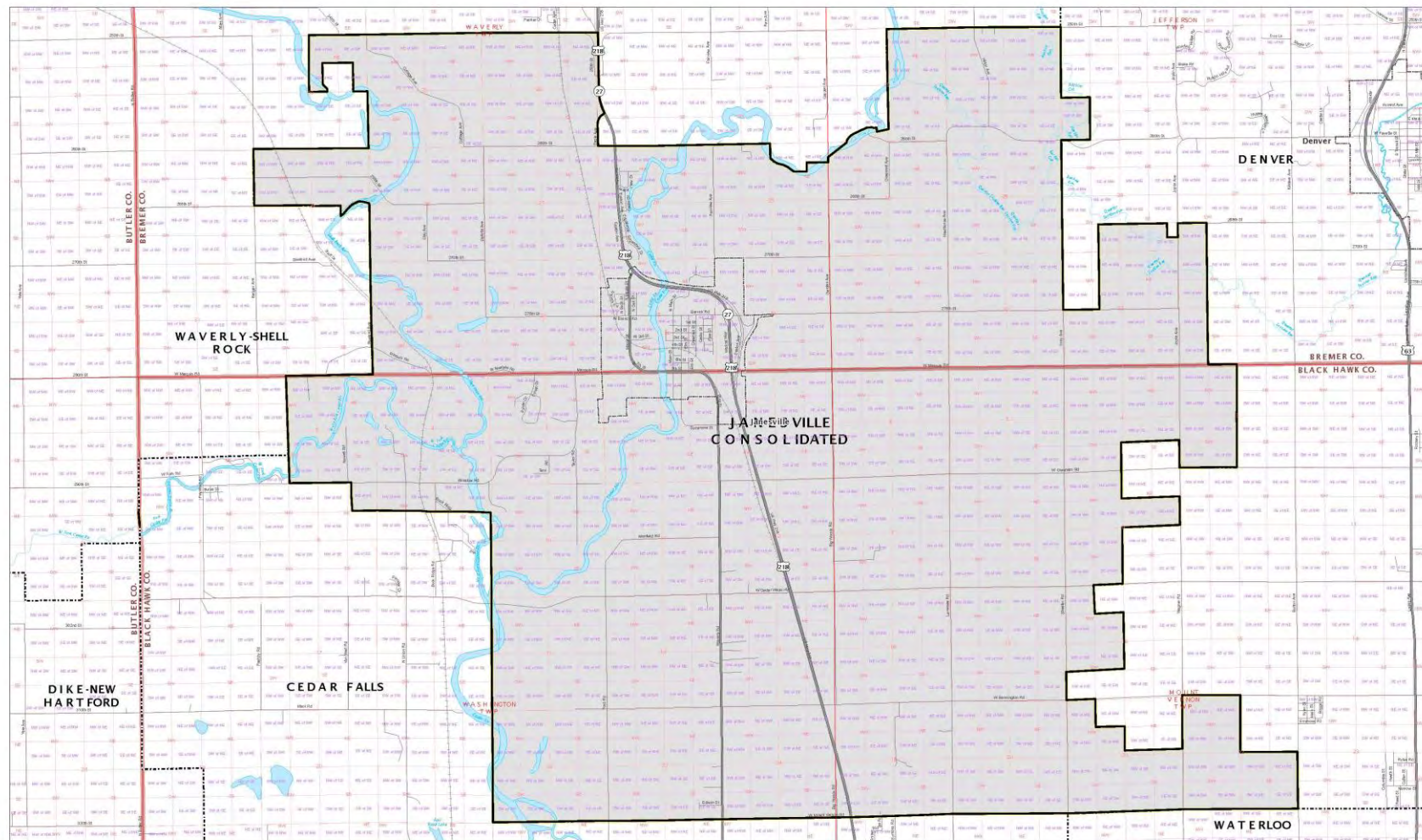
The city of Janesville is bisected by the Cedar River, which flows from north to south, with the east side of the community having been developed earlier. U.S. Highway 218 is the primary transportation route to and from the city. The city is situated approximately 4.5 miles north-northwest of the Waterloo/Cedar 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.

The City of Janesville, also a participant and member of this plan, is located in southwest Bremer County (with a small portion in Black Hawk County) and has a population of 1,034 according to the 2020 Census.

TABLE J1: HISTORIC CERTIFIED ENROLLMENT	
School Year	Certified Enrollment
2012-13	359
2013-14	375
2014-15	380
2015-16	376
2016-17	392
2017-18	403
2018-19	432
2019-20	436
2020-21	442
Source: Iowa Department of Education	

Figure J.1: Map of Janesville Consolidated School District Area

Courtesy of: Iowa Department of Education, [www.educateiowa.gov](http://www.educateiowa.gov)



Iowa Department of Education School District Boundary Verification 2019 - 2020

**JANESVILLE CONSOLIDATED**

- JANESVILLE CONSOLIDATED
- Other School District Boundary
- City
- Township
- Section
- County



The actual district boundaries represented on this map were developed by the Iowa Department of Education and are a product of the 2019-2020 School District Boundary Verification Project. The map is a general representation of the district boundaries and is not intended to be used for legal purposes. For more information, please contact the Iowa Department of Education at [www.educateiowa.gov](http://www.educateiowa.gov). This document is not a contract. Map Produced 5/10/2020

0 0.3 0.6 1.2 Miles

## Community Services

Table J2 shows the primary utility providers for the City of Janesville.

TABLE J2:JCSD UTILITY PROVIDERS						
Electric	Natural Gas	Telephone/Internet	Cable	Water	Sewer	Sanitation
MidAmerican Energy	MidAmerican Energy	Windstream	Mediacom, Butler Bremer Communications	City of Janesville	City of Janesville	Black Hawk Waste Disposal

## Hazard 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 committee evaluated the risk associated with a specific hazard, defined by probability and frequency of occurrence, magnitude, severity, exposures, and consequences. The school district's vulnerability assessment provides in-depth knowledge of the hazards and vulnerabilities that affect the school district. This analysis provides an all-hazard approach when evaluating the hazards that affect the school district 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, infrastructure, 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 human caused or technological events tend to change over time with advancement in technology and methods of operation.

The Committee assessed the defined hazards relevant to potential impact on the school district. Using the scoring criteria previously defined (Tables 19-22) the school district 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 J3 displays the school district's hazard scores. The top three hazards for the Janesville CSD are River Flooding, Flash Flood, Tornado/Windstorm.

TABLE J3: CITY OF JANESVILLE HAZARD RISK ASSESSMENT						
Hazard Rank	Hazard	Probability	Magnitude/ Severity	Warning Time	Duration	Hazard Score
1	River Flooding	3	2	1	3	2.4
1	Flash Flood	2	3	2	3	2.4
2	Tornado/Windstorm	2	2	3	2	2.15
3	Severe Winter Storm	2	2	1	2	1.85
4	Human Disease	1	2	2	4	1.75
5	Thunderstorm/Lightning/Hail	2	1	2	2	1.7
6	Extreme Heat	2	1	1	2	1.55
6	Grass/Wild land Fire	1	1	4	2	1.55
7	HAZMAT Incident	1	2	1	3	1.5
8	Infrastructure Failure	1	2	1	2	1.4
9	Transportation Incident	1	1	3	1	1.3
10	Levee/Dam Failure	1	1	2	1	1.15
11	Animal/Plant/Crop Disease	1	1	1	2	1.1
12	Drought	1	1	1	1	1
12	Earthquake	1	1	1	1	1
12	Expansive Soil	1	1	1	1	1
12	Landslide	1	1	1	1	1
12	Sinkholes	1	1	1	1	1
12	Radiological Incident	1	1	1	1	1
12	Terrorism	1	1	1	1	1

## **Vulnerability – Identifying Assets**

### **Critical Facilities**

All the school's buildings and campus areas are all considered critical facilities because of their student population. In the event of a hazard that requires seeking shelter, the school facilities themselves are utilized for sheltering in place. In the instance of hazard that requires sheltering, students and staff seek shelter "in place" within the respective school buildings. There are currently no designated tornado saferooms in the Janesville Consolidated School District and sheltering within each facility is designated to lowest level and centrally located hallways, locker rooms, and restrooms.

### **Social Asset Populations**

The nature of a school's student population congregates large populations of "at-risk" individuals. Younger residents are often not aware of the proper actions to take in the event of a disaster. In addition, very young children can be more susceptible to disasters simply due to their age. As mentioned in District Profile, there are approximately 450 students and 78 staff in the district. The district actively takes steps to reduce the threat to their student population, as described below in the "Current Activities" section.

When school is in session, hundreds of people are in the various school buildings daily. This includes people from other communities attending various events throughout the year.

### **Estimating Property Loss**

Valuations are an important component of hazard mitigation planning in so much 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 disaster.

Janesville Consolidated school buildings and their contents are fully insured. The buildings themselves are valued at \$21,222,073.

## **Mitigation Strategy**

### **Hazard Mitigation Plan Goals**

The district established the following hazard mitigation plan goals. These represent broad-based goals that would address a multitude of hazards and encompass a variety of mitigation activities. The hazard mitigation plan goals are identified as follows.

- 1) Maintain emergency services during hazard events, or if this is not possible, return to pre-disaster service levels as soon as possible.
- 2) Protect the health and welfare of students and staff by utilizing pre-disaster planning and constructing mitigation projects.
- 3) Mitigate or minimize the impact of natural, technological, and/or manmade disasters.
- 4) Minimize the occurrence of injuries and loss of life due to hazards.
- 5) Take steps to mitigate the potential of terrorism within our buildings.
- 6) Return to similar or improved pre-event conditions as quickly as possible following a disaster event.

### **Current Mitigation Activities**

This section includes an overview of the emergency response services and mitigation actions which are currently in place.

#### ***Bremer County Emergency Management Agency***

The Bremer County Emergency Management Coordinator, based out of the City of Waverly, works with cities and school districts throughout the county 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

#### ***Police Department***

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.

### ***Fire Department***

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
- 2019 Midwest Mini-Pumper
- 2011 Tanker (2000 Gallon Capacity)
- 2012 F-350 Grass Rig

The Department 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.

### ***Medical Services***

In 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 conveniently located approximately 0.25 miles southeast of the JCSD campus.

JCSD currently employs a Registered Nurse (RN) as the school nurse. In the event the school nurse is not available, the school has principals and secretaries certified as Medication Administrators via a training program provided by the Iowa Department of Education.

### ***Ambulance and EMS Services***

Emergency rescue and ambulance service is provided the city, which currently operates a small ambulance service. However, the number of volunteers serving the city and equipment used is not necessarily at this time. The cities of Waverly and Cedar Falls, and their ambulance services, are in close proximity and could be available in the event of a major event or if the city's ambulance services were not available. The school's close proximity to Highway 218 provides an efficient route for services traveling in and out of the school campus.

### Warning Systems

The City of Janesville has one warning siren, which covers the entire city, located downtown.

## Future Activities & Implementation Strategy / Action Plan

### Priority

School representatives 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: Social, Technical, Aministrative, Political, Legal, Economic, and Environmental.

The Committee was asked to discuss the STAPLEE elements (Table I4) and determine each element's ranking (High -H, Medium -M, Low-L) for each identified future mitigation activity. Afterwards, the average priority for each migration activity was recorded as the overall priority ranking for that particular future mitigation activity.

### Timeline

The Committee identified the time period each of the proposed mitigation activities will occur. Activities that occur regularly (either daily,

TABLE J4: STAPLEE ELEMENTS	
<b>S – Social</b>	<ul style="list-style-type: none"> <li>Mitigation actions are acceptable to the community if they do not adversely affect a particular segment of the populations,</li> <li>Actions do not cause relocation of lower income people,</li> <li>Actions are compatible with the community's social and cultural values.</li> </ul>
<b>T- Technical</b>	<ul style="list-style-type: none"> <li>Mitigation actions are technically most effective if they provide long-term reduction of losses and have minimal secondary adverse impacts.</li> </ul>
<b>A – Administrative</b>	<ul style="list-style-type: none"> <li>Mitigation actions are easier to implement if the jurisdiction has the necessary staffing and funding.</li> </ul>
<b>P – Political</b>	<ul style="list-style-type: none"> <li>Mitigation actions can truly be successful if all stakeholders have been offered an opportunity to participate in the planning process and if there is public support for the action.</li> </ul>
<b>L – Legal</b>	<ul style="list-style-type: none"> <li>It is critical that the jurisdiction or implementing agency have the legal authority to implement and enforce a mitigation action.</li> </ul>
<b>E – Economic</b>	<ul style="list-style-type: none"> <li>Budget constraints can significantly deter the implementation of mitigation actions. Hence, it is important to evaluate whether an action is cost-effective, as determined by a cost benefit review, and possible to fund.</li> </ul>
<b>E - Environmental</b>	<ul style="list-style-type: none"> <li>Sustainable mitigation actions that do not have an adverse effect on the environment, that comply with Federal, State, and local environmental regulations,</li> <li>Are consistent with the community's environmental goals, have mitigation benefits while being environmentally sound.</li> </ul>

weekly, monthly, or annually) were identified as Active. If the action is to occur within the next 1-5 years it was identified as Short-Term, if the activity would take 5-10 years it was labeled as Mid-Term, and any activities that would take 10 or more years were identified as Long-Term.

### ***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 School District 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.

Janesville Consolidated School District Future Mitigation Activities and Implementation Strategy are in Table J5.

## Implementation Strategy

The Committee generated a list of action steps to be implemented to mitigate the hazards discussed. In addition, the Committee identified a time line for each activity, associated hazards, estimated cost, priority, identified the responsible party or parties for each activity, and finally related each activity to at least one of the Hazard Mitigation Plan Goals listed above. Table I5, below, the school district's Implementation Strategy.

**TABLE J5: FUTURE MITIGATION ACTIVITIES-JANESVILLE CONSOLIDATED SCHOOL DISTRICT**

Priority	Mitigation Action/Program/Project	Associated Hazard(s)	Primary Agency Responsible for Implementation	Associated Goal(s)	Timeline	Estimated Cost (\$)
High	Educate the Student Population/Public through: continued cooperation with local service organizations (American Red Cross, County EMA, etc.) to educate residents on how to prepare for and respond to various hazards.	ALL	School Board, Local Fire/Police	ALL	Active/Routine	Minimal
High	Identify locations (all school facilities, shelter locations) where it would be beneficial to have backup power generation or maintain backup power generation.	Tornadoes/Windstorms, Sever Winter Storms, Thunderstorm/Lightning/Hail	School Board and City	2	Short-Term	Minimal
High	Maintain and update as needed, 28E Agreements with	ALL	School Board and associated jurisdictions	2	Active	Minimal

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	surrounding entities.					
High	Systematically review and update, as needed, Hazard Response Policies and Procedures	ALL	School Board and Staff	1	Active	Minimal
High	Continue to cooperate with local medical facilities and Health Department to increase likelihood of detection and proper response to outbreaks.	Human Disease	School Board, associated facilities, jurisdictions, and entities	1,2	Active	Minimal
Medium	Develop and maintain tree-trimming program in order to reduce the risk of falling branches on infrastructure and property.	Tornadoes/Windstorms, Thunderstorm/Lightning/Hail	School Board and City	3	Active	Low
Low	Develop and maintain list of interpreters in order to enhance communication barriers within the community.	Communication Failure	School Board and City	2	Active	Low
High	Maintain Procedures for Severe Weather Events	Tornado, Windstorm	School Board	1,2,3	Active/routine	Minimal
High	Maintain and evaluate existing terrorism mitigation procedures	Terrorism	School Board	5	Active/routine	Minimal

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High	Identify and evaluate Critical Facilities for accessibility, vulnerability, and risk.	Terrorism	School Board and Staff	1	Short-Term	Minimal
Low	Research and secure grant dollars for shelter and safe room construction	Tornado, Windstorm	School Board	1,2,3	Long-term	Moderate
High	Restrict water usage, as necessary, to maintain water supply	Drought	School Board and City	1,2	Active	Minimal
High	Promote awareness of the Iowa Disaster Behavioral Health Response Team (DBHRT)	ALL	Mental Health/Disability Services of the East Central Region, Staff	All	Active	Minimal

# Appendix K: Sumner-Fredericksburg Community School District

## District Profile

Sumner-Fredericksburg Community School District (SFCSD), headquartered in the City of Sumner, provides Pre-kindergarten through 12<sup>th</sup> grade education to nearly 800 students. The District serves the Cities of Sumner and Fredericksburg as well as surrounding unincorporated areas, which includes parts of each Bremer, Chickasaw, and Fayette counties. Figure K1 is a map of the school district's area as of the 2019-20 school year.

The district headquarters is located in the northwest quadrant of the City of Sumner at 802 West 6<sup>th</sup> Street. In addition to the 4 school buildings and 2 pre-school buildings, the district includes a bus barn, playgrounds, football field and track, as well as a softball diamond and baseball diamond.

## Natural Environment

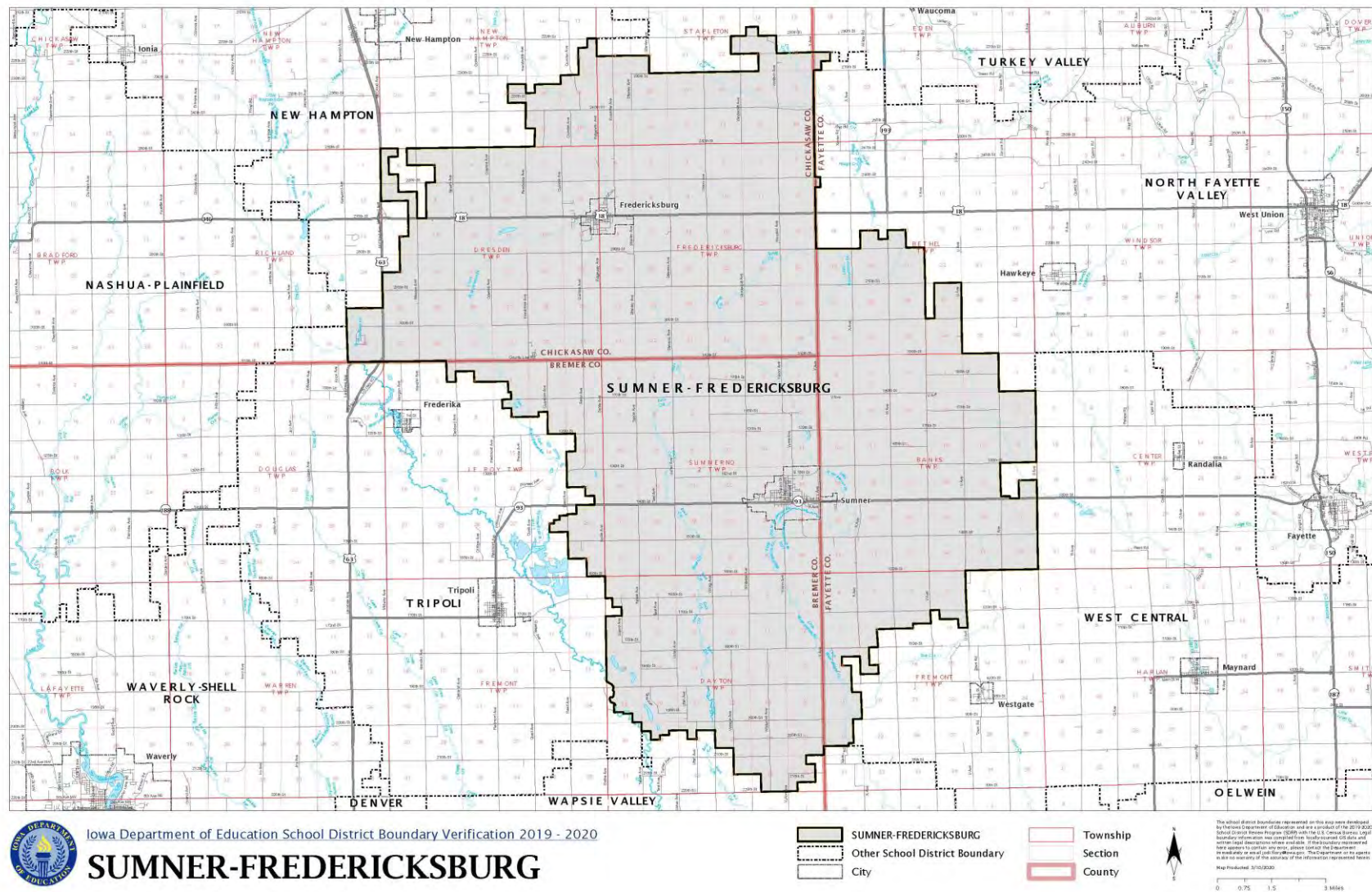
The Sumner-Fredericksburg Community School District spans three counties; Chickasaw, Bremer, and Fayette while serving two incorporated cities in Sumner and Fredericksburg. The Little Wapsipinicon River runs to the east of the City of Sumner, then curves to the west running immediately south of the community. Two highways, State Highway 93, and County Road V62, serve the City of Sumner. The terrain on which Sumner is built is relatively flat topographically. There are very few areas of steeper than normal slope dispersed throughout the community.

The terrain on which the City of Fredericksburg is built is generally the undulating topography that characterizes the agricultural areas of northeast Iowa. The surface water system in Fredericksburg is dominated by the East Branch of the Wapsipinicon River, which flows along the western edge of the community. Also, Plum Creek flows from east to west along the northern edge of the community into the East Branch of the Wapsipinicon River. The City of Fredericksburg is served by US Highway 18.

TABLE K1: HISTORIC CERTIFIED ENROLLMENT	
School Year	Certified Enrollment
2014-15	831
2015-16	832
2016-17	821
2017-18	809
2018-19	818
2019-20	797
2020-21	780
Source: Iowa Department of Education	

**Figure K.1: Map of Janesville Consolidated School District Area**

Courtesy of: Iowa Department of Education, [www.educateiowa.gov](http://www.educateiowa.gov)



Iowa Department of Education School District Boundary Verification 2019 - 2020

**SUMNER-FREDERICKSBURG**

## Community Services

Table K2 shows the primary utility providers for the City of Sumner, while Table K3 shows the primary utility providers for the City of Fredericksburg.

TABLE K2: 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

TABLE K3: FREDERICKSBURG UTILITY PROVIDERS						
Electric	Natural Gas	Telephone/Internet	Cable	Water	Sewer	Sanitation
City of Fredericksburg (Purchased from Butler County REC)	Black Hills Energy	Windstream	Mediacom	City of Fredericksburg	City of Fredericksburg	City of Fredericksburg/Jendro Sanitation

## Hazard 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 committee evaluated the risk associated with a specific hazard, defined by probability and frequency of occurrence, magnitude, severity, exposures, and consequences. The school district's vulnerability assessment provides in-depth knowledge of the hazards and vulnerabilities that affect the school district. This analysis provides an all-hazard approach when evaluating the hazards that affect the school district 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, infrastructure, 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 human caused or technological events tend to change over time with advancement in technology and methods of operation.

The Committee assessed the defined hazards relevant to potential impact on the school district. Using the scoring criteria previously defined (Tables 19-22) the school district 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 K4 displays the school district's hazard scores. The top three hazards for the SFCSD are Extreme Heat, Flash Flood, River Flooding.

TABLE K4: SUMNER-FREDERICKSBURG CSD HAZARD RISK ASSESSMENT						
Hazard Rank	Hazard	Probability	Magnitude/ Severity	Warning Time	Duration	Hazard Score
1	Extreme Heat	2	1	1	2	2.90
2	Flash Flood	2	3	2	3	2.40
2	River Flooding	3	2	1	3	2.40
3	Tornado/Windstorm	2	2	3	2	2.15
4	HAZMAT Incident	1	2	4	3	1.95
5	Severe Winter storm	2	2	1	2	1.85
5	Infrastructure Failure	1	2	4	2	1.85
6	Human Disease	1	2	2	4	1.75
7	Thunderstorm/Lightning/Hail	2	1	2	2	1.70
8	Grass/Wild land Fire	1	1	4	2	1.55
9	Earthquake	1	1	4	1	1.45
9	Landslide	1	1	4	1	1.45
9	Sinkholes	1	1	4	1	1.45
9	Radiological Incident	1	1	4	1	1.45
9	Terrorism	1	1	4	1	1.45
10	Transportation Incident	1	1	3	1	1.30
11	Levee/Dam Failure	1	1	2	1	1.15
12	Animal/Plant/Crop Disease	1	1	1	2	1.10
13	Drought	1	1	1	1	1.00
13	Expansive Soils	1	1	1	1	1.00

## Vulnerability – Identifying Assets

### Critical Facilities

All the school's buildings and campus areas are all considered critical facilities because of their student population. In the event of a hazard that requires seeking shelter, the school facilities themselves are utilized for sheltering in place. In the instance of hazard that requires sheltering,

students and staff seek shelter “in place” within the respective school buildings. The district does not have a certified tornado safe room. In a shelter “in place” event, building occupants are directed to lowest level, central locations such as basements, locker rooms, hallways, restrooms, or other rooms determined to be safest locations in their respective building.

### **Social Asset Populations**

The nature of a school’s student population congregates large populations of “at-risk” individuals. Younger residents are often not aware of the proper actions to take in the event of a disaster. In addition, very young children can be more susceptible to disasters simply due to their age. As mentioned in District Profile, there are approximately 800 students and 140 staff in the district. The district actively takes steps to reduce the threat to their student population, as described below in the “Current Activities” section.

When school is in session, hundreds of people are in the various school buildings daily. This includes people from other communities attending various events throughout the year.

### **Estimating Property Loss**

Valuations are an important component of hazard mitigation planning in so much 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 disaster.

Sumner-Fredericksburg school buildings and their contents are fully insured. The buildings themselves are valued at \$40,003,243.

## **Mitigation Strategy**

### **Hazard Mitigation Plan Goals**

The district established the following hazard mitigation plan goals. These represent broad-based goals that would address a multitude of hazards and encompass a variety of mitigation activities. The hazard mitigation plan goals are identified as follows.

- 1) Maintain emergency services during hazard events, or if this is not possible, return to pre-disaster service levels as soon as possible.
- 2) Protect the health and welfare of students and staff by utilizing pre-disaster planning and constructing mitigation projects.
- 3) Mitigate or minimize the impact of natural, technological, and/or manmade disasters.
- 4) Minimize the occurrence of injuries and loss of life due to hazards.
- 5) Take steps to mitigate the potential of terrorism within our buildings.
- 6) Return to similar or improved pre-event conditions as quickly as possible following a disaster event.

### **Current Mitigation Activities**

This section includes an overview of the emergency response services and mitigation actions which are currently in place.

#### ***Bremer County Emergency Management Agency***

The Bremer County Emergency Management Coordinator, based out of the City of Waverly, works with cities and school districts throughout the county 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](mailto:kladage@co.bremer.ia.us)

#### ***Chickasaw Emergency Management***

Fredericksburg works with the Chickasaw County Emergency Management Coordinator, based out of the City of New Hampton, 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 Austen Seely and current contact information is as follows: Chickasaw County Emergency Management Agency, 260 E. Prospect Street, New Hampton, Iowa 50659, (641) 394-2406, email: [ema@chickasawcoia.org](mailto:ema@chickasawcoia.org)

#### ***Police Department***

Police protection for the City of Fredericksburg is provided by Chickasaw County Sheriff's Department and the Iowa State Patrol.

The Sumner Police Department, Bremer County Sheriff's Department, and the Iowa State Patrol provide police protection in the City of Sumner. Currently, there are three full time officers in the Janesville Police Department.

#### ***Fire Department***

The Sumner Fire Department is a volunteer force that currently includes 30 members and has eight vehicles to protect the community. The vehicles currently owned and operated by the department include 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.

The Department provides fire and rescue services, storm watch, search, and sand bagging.

The City of Fredericksburg is provided fire protection by means of a 24 voluntary member force. At this number, the department considers itself fully staffed. Each volunteer is HAZMAT certified, with four members at Firefighter I status. The fire station is located in the central part of

Fredericksburg. Equipment used by the Fredericksburg Fire Department include the following: 1991 Pumper Truck, 1999 Rescue Truck, 2012 Gator ATV, 1995 Tanker Truck, 2018 Freightliner Tanker w/pump, 1999 Pickup, 2012 Freightliner Pumper. The Fredericksburg Fire Department maintains 28E agreements with the following communities: Sumner, Frederika, Waucoma, Alta Vista, Bassett, Ionia, Lawler, Nashua, New Hampton, and North Washington.

### ***Medical Services***

The City of Sumner has a small hospital (Sumner Medical Clinic) and three doctor's offices.

Fredericksburg is served primarily by one hospital, Mercy Medical Center, located in New Hampton. There are four other hospitals available in a 35-mile radius of the City of Fredericksburg. Furthermore, there is a medical clinic and assisted living facility located within the city limits.

SFCSD currently employs a Registered Nurse (RN) as the school nurse. In the event the school nurse is not available, the school has principals and secretaries certified as Medication Administrators via a training program provided by the Iowa Department of Education.

### ***Ambulance and EMS Services***

The City of Sumner is served by a local ambulance service of 25 volunteers and 2 ambulances.

Chickasaw Ambulance Service provides ambulance service to area hospitals for the City of Fredericksburg. Chickasaw Ambulance Service is a private company that contracts service with local entities. The company is based out of New Hampton, approximately 9 miles northwest of Fredericksburg.

Chickasaw County Rescue Squad also provides service in Fredericksburg. There are 42 EMT certified individuals who volunteer to respond to emergency calls on a need basis in the county.

### ***Warning Systems***

The outdoor early warning siren system for the City of Sumner 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.

The outdoor early warning system for the City of Fredericksburg consists of one siren that is activated by the Chickasaw County Emergency Management Office. This siren does not have battery backup, and is therefore vulnerable to failure during a power outage. In addition to this warning system, major industry and schools take advantage of weather notifications from the Chickasaw County Sheriff's Department, NOAA Weather Radios, and local media sources.

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.

## Future Activities & Implementation Strategy / Action Plan

### Priority

School representatives 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: Social, Technical, Addministrative, Political, Legal, Economic, and Environmental.

TABLE K5: STAPLEE ELEMENTS	
<b>S – Social</b>	<ul style="list-style-type: none"> <li>Mitigation actions are acceptable to the community if they do not adversely affect a particular segment of the populations,</li> <li>Actions do not cause relocation of lower income people,</li> <li>Actions are compatible with the community's social and cultural values.</li> </ul>
<b>T- Technical</b>	<ul style="list-style-type: none"> <li>Mitigation actions are technically most effective if they provide long-term reduction of losses and have minimal secondary adverse impacts.</li> </ul>
<b>A – Administrative</b>	<ul style="list-style-type: none"> <li>Mitigation actions are easier to implement if the jurisdiction has the necessary staffing and funding.</li> </ul>
<b>P – Political</b>	<ul style="list-style-type: none"> <li>Mitigation actions can truly be successful if all stakeholders have been offered an opportunity to participate in the planning process and if there is public support for the action.</li> </ul>
<b>L – Legal</b>	<ul style="list-style-type: none"> <li>It is critical that the jurisdiction or implementing agency have the legal authority to implement and enforce a mitigation action.</li> </ul>
<b>E – Economic</b>	<ul style="list-style-type: none"> <li>Budget constraints can significantly deter the implementation of mitigation actions. Hence, it is important to evaluate whether an action is cost-effective, as determined by a cost benefit review, and possible to fund.</li> </ul>
<b>E - Environmental</b>	<ul style="list-style-type: none"> <li>Sustainable mitigation actions that do not have an adverse effect on the environment, that comply with Federal, State, and local environmental regulations,</li> <li>Are consistent with the community's environmental goals, have mitigation benefits while being environmentally sound.</li> </ul>

The Committee was asked to discuss the STAPLEE elements (Table I4) and determine each element's ranking (High -H, Medium -M, Low-L) for each identified future mitigation activity. Afterwards, the average priority for each migration activity was recorded as the overall priority ranking for that particular future mitigation activity.

### Timeline

The Committee identified the time period each of the proposed mitigation activities will occur. Activities that occur regularly (either daily, weekly, monthly, or annually) were identified as Active. If the action is to occur within the next 1-5 years it was identified as Short-Term, if the activity would take 5-10 years it was labeled as Mid-Term, and any activities that would take 10 or more years were identified as Long-Term.

### ***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 School District 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.

Sumner-Fredericksburg Community School District Future Mitigation Activities and Implementation Strategy are in Table K6.

TABLE K6: FUTURE MITIGATION ACTIVITIES- SUMNER-FREDERICKSBURG COMMUNITY SCHOOL DISTRICT

Priority	Mitigation Action/Program/Project	Associated Hazard(s)	Primary Agency Responsible for Implementation	Associated Goal(s)	Timeline	Estimated Cost (\$)
High	Educate the Student Population/Public through: continued cooperation with local service organizations (American Red Cross, County EMA, etc.) to educate residents on how to prepare for and respond to various hazards.	ALL	School Board, Local Fire/Police	ALL	Active/Routine	Minimal
High	Identify locations (all school facilities, shelter locations) where it would be beneficial to have backup power generation or maintain backup power generation.	Tornadoes/Windstorms, Sever Winter Storms, Thunderstorm/Lightning/Hail	School Board and City	2	Short-Term	Minimal
High	Maintain and update as needed, 28E Agreements with surrounding entities.	ALL	School Board and associated jurisdictions	2	Active	Minimal
High	Systematically review and update, as needed, Hazard Response Policies and Procedures	ALL	School Board and Staff	1	Active	Minimal

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High	Continue to cooperate with local medical facilities and Health Department to increase likelihood of detection and proper response to outbreaks.	Human Disease	School Board, associated facilities, jurisdictions, and entities	1,2	Active	Minimal
Medium	Develop and maintain tree-trimming program in order to reduce the risk of falling branches on infrastructure and property.	Tornadoes/Windstorms, Thunderstorm/Lightning/Hail	School Board and City	3	Active	Low
Low	Develop and maintain list of interpreters in order to enhance communication barriers within the community.	Communication Failure	School Board and City	2	Active	Low
High	Maintain Procedures for Severe Weather Events	Tornado, Windstorm	School Board	1,2,3	Active/routine	Minimal
High	Maintain and evaluate existing terrorism mitigation procedures	Terrorism	School Board	5	Active/routine	Minimal
High	Identify and evaluate Critical Facilities for accessibility, vulnerability, and risk.	Terrorism	School Board and Staff	1	Short-Term	Minimal
Low	Research and secure grant dollars for shelter and safe room construction	Tornado, Windstorm	School Board	1,2,3	Long-term	Moderate

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High	Restrict water usage, as necessary, to maintain water supply	Drought	School Board and City	1,2	Active	Minimal
High	Promote awareness of the Iowa Disaster Behavioral Health Response Team (DBHRT)	ALL	Mental Health/Disability Services of the East Central Region, Staff	All	Active	Minimal



# Appendix L: Tripoli Community School District

## District Profile

Tripoli Community School District (TCSD), headquartered in the City of Tripoli, provides Pre-kindergarten through 12<sup>th</sup> grade education to nearly 400 students. The Tripoli Community School District is a public school district serving the town of Tripoli and surrounding areas in Bremer County, including the town of Fredericka, and a small section in southern Chickasaw County. Figure L1 is a map of the school district's area as of the 2019-20 school year.

The school's campus is located in the southwest quadrant of the city at 209 8<sup>th</sup> Ave SW, east of U.S. Highway 63 and south of Iowa Highway 93. In addition to the school buildings themselves, the campus includes a bus barn, playground, football field and track, as well as a softball diamond and baseball diamond.

## Natural Environment

The City of Tripoli is located in north-north central Bremer County, in the northeastern quadrant of Iowa.

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.

## Community Services

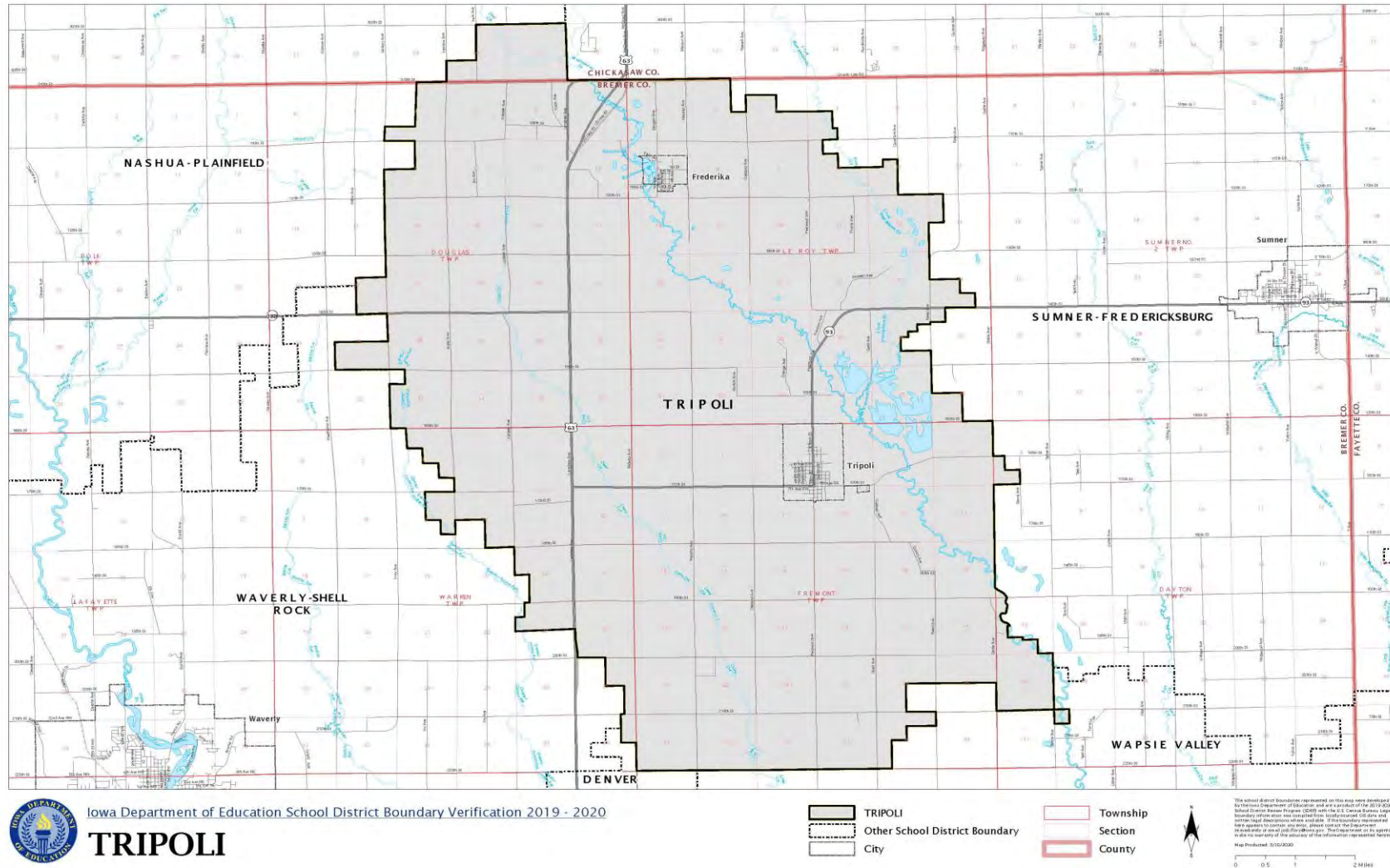
Table L2 shows the primary utility providers for the City of Tripoli.

TABLE L1: HISTORIC CERTIFIED ENROLLMENT	
School Year	Certified Enrollment
2012-13	444
2013-14	435
2014-15	435
2015-16	452
2016-17	437
2017-18	422
2018-19	410
2019-20	410
2020-21	395
Source: Iowa Department of Education	

TABLE L2: TCSD 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

**Figure L.1: Map of Tripoli Community School District Area**

Courtesy of: Iowa Department of Education, [www.educateiowa.gov](http://www.educateiowa.gov)



## Hazard 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 committee evaluated the risk associated with a specific hazard, defined by probability and frequency of occurrence, magnitude, severity, exposures, and consequences. The school district's vulnerability assessment provides in-depth knowledge of the hazards and vulnerabilities that affect the school district. This analysis provides an all-hazard approach when evaluating the hazards that affect the school district 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, infrastructure, 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 human caused or technological events tend to change over time with advancement in technology and methods of operation.

The Committee assessed the defined hazards relevant to potential impact on the school district. Using the scoring criteria previously defined (Tables 19-22) the school district 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 L3 displays the school district's hazard scores. The top three hazards for the TCSD are Flash Flooding, Tornado/Windstorm, Thunderstorm/Lightning/Hail, with a Terrorism event coming in a close fourth.

TABLE L3: HAZARD RISK ASSESSMENT FOR TRIPOLI COMMUNITY SCHOOL DISTRICT						
Hazard Rank	Hazard	Probability	Magnitude/Severity	Warning Time	Duration	Final Score
1	Flash Flood	4	3	4	2	3.50
2	Tornado/Windstorm	3	3	4	3	3.15
3	Thunderstorm/Lightning/Hail	4	2	3	2	3.05
4	Terrorism	2	4	4	3	3.00
5	Human Disease	3	3	1	4	2.80
6	Severe Winter Storm	4	1	1	3	2.55
7	Earthquake	1	3	4	2	2.15
8	Transportation Incident	2	1	4	1	1.90
9	Extreme Heat	2	1	1	3	1.65
9	Infrastructure Failure	1	1	4	3	1.65
10	Levee/Dam Failure	1	1	3	4	1.60
11	Grass/Wild land Fire	1	1	4	2	1.55
11	River Flooding	1	2	2	2	1.55
12	Landslide	1	1	4	1	1.45
12	Sinkholes	1	1	4	1	1.45
12	Radiological Incident	1	1	4	1	1.45
13	HAZMAT Incident	1	2	1	1	1.30
13	Animal/Plant/Crop Disease	1	1	1	4	1.30
14	Expansive Soils	1	1	2	1	1.15
15	Drought	0	1	2	3	0.09

## **Vulnerability – Identifying Assets**

### **Critical Facilities**

All the school's buildings and campus areas are all considered critical facilities because of their student population. In the event of a hazard that requires seeking shelter, the school facilities themselves are utilized for sheltering in place. In the instance of hazard that requires sheltering, students and staff seek shelter "in place" within the respective school buildings. The district does not have a certified tornado safe room. In a shelter "in place" event, building occupants are directed to lowest level, central locations such as basements, locker rooms, hallways, restrooms, or other rooms determined to be safest locations in their respective building.

### **Social Asset Populations**

The nature of a school's student population congregates large populations of "at-risk" individuals. Younger residents are often not aware of the proper actions to take in the event of a disaster. In addition, very young children can be more susceptible to disasters simply due to their age. As mentioned in District Profile, there are approximately 400 students and approximately 90 staff in the district. The district actively takes steps to reduce the threat to their student population, as described below in the "Current Activities" section. When school is in session, hundreds of people are in the various school buildings daily. This includes people from other communities attending various events throughout the year.

### **Estimating Property Loss**

Valuations are an important component of hazard mitigation planning in so much 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 disaster. Tripoli Community school buildings and their contents are fully insured. The buildings themselves are valued at \$17,759,114.

## Mitigation Strategy

### Hazard Mitigation Plan Goals

The district established the following hazard mitigation plan goals. These represent broad-based goals that would address a multitude of hazards and encompass a variety of mitigation activities. The hazard mitigation plan goals are identified as follows.

- 1) Maintain emergency services during hazard events, or if this is not possible, return to pre-disaster service levels as soon as possible.
- 2) Protect the health and welfare of students and staff by utilizing pre-disaster planning and constructing mitigation projects.
- 3) Mitigate or minimize the impact of natural, technological, and/or manmade disasters.
- 4) Minimize the occurrence of injuries and loss of life due to hazards.
- 5) Take steps to mitigate the potential of terrorism within our buildings.
- 6) Return to similar or improved pre-event conditions as quickly as possible following a disaster event.

### Current Mitigation Activities

This section includes an overview of the emergency response services and mitigation actions which are currently in place.

#### ***Bremer County Emergency Management Agency***

The Bremer County Emergency Management Coordinator, based out of the City of Waverly, works with cities and school districts throughout the county 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

#### ***Police Department***

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 Department***

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.

### ***Medical Services***

Tripoli 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.

### ***Ambulance and EMS Services***

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.

### ***Warning Systems***

There are two early warning sirens in the community. One 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](mailto:kladage@co.bremer.ia.us)

## **Future Activities & Implementation Strategy / Action Plan**

### ***Priority***

School representatives 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: Social, Technical, Aministrative, Political, Legal, Economic, and Environmental.

The Committee was asked to discuss the STAPLEE elements (Table I4) and determine each element's ranking (High -H, Medium -M, Low-L) for each identified future mitigation activity. Afterwards, the average priority for each migration activity was recorded as the overall priority ranking for that particular future mitigation activity.

### Timeline

The Committee identified the time period each of the proposed mitigation activities will occur. Activities that occur regularly (either daily, weekly, monthly, or annually) were identified as Active. If the action is to occur within the next 1-5 years it was identified as Short-Term, if the activity would take 5-10 years it was labeled as Mid-Term, and any activities that would take 10 or more years were identified as Long-Term.

### 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 School District 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.

TABLE I4: STAPLEE ELEMENTS	
<b>S – Social</b>	<ul style="list-style-type: none"> <li>Mitigation actions are acceptable to the community if they do not adversely affect a particular segment of the populations,</li> <li>Actions do not cause relocation of lower income people,</li> <li>Actions are compatible with the community's social and cultural values.</li> </ul>
<b>T- Technical</b>	<ul style="list-style-type: none"> <li>Mitigation actions are technically most effective if they provide long-term reduction of losses and have minimal secondary adverse impacts.</li> </ul>
<b>A – Administrative</b>	<ul style="list-style-type: none"> <li>Mitigation actions are easier to implement if the jurisdiction has the necessary staffing and funding.</li> </ul>
<b>P – Political</b>	<ul style="list-style-type: none"> <li>Mitigation actions can truly be successful if all stakeholders have been offered an opportunity to participate in the planning process and if there is public support for the action.</li> </ul>
<b>L – Legal</b>	<ul style="list-style-type: none"> <li>It is critical that the jurisdiction or implementing agency have the legal authority to implement and enforce a mitigation action.</li> </ul>
<b>E – Economic</b>	<ul style="list-style-type: none"> <li>Budget constraints can significantly deter the implementation of mitigation actions. Hence, it is important to evaluate whether an action is cost-effective, as determined by a cost benefit review, and possible to fund.</li> </ul>
<b>E - Environmental</b>	<ul style="list-style-type: none"> <li>Sustainable mitigation actions that do not have an adverse effect on the environment, that comply with Federal, State, and local environmental regulations,</li> <li>Are consistent with the community's environmental goals, have mitigation benefits while being environmentally sound.</li> </ul>

- 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.

Tripoli Community School District Future Mitigation Activities and Implementation Strategy are in Table I5.

TABLE L5: FUTURE MITIGATION ACTIVITIES-TRIPOLI COMMUNITY SCHOOL DISTRICT

Priority	Mitigation Action/Program/Project	Associated Hazard(s)	Primary Agency Responsible for Implementation	Associated Goal(s)	Timeline	Estimated Cost (\$)
High	Educate the Student Population/Public through: continued cooperation with local service organizations (American Red Cross, County EMA, etc.) to educate residents on how to prepare for and respond to various hazards.	ALL	School Board, Local Fire/Police	ALL	Active/Routine	Minimal
High	Identify locations (all school facilities, shelter locations) where it would be beneficial to have backup power generation or maintain backup power generation.	Tornadoes/Windstorms, Sever Winter Storms, Thunderstorm/Lightning/Hail	School Board and City	2	Short-Term	Minimal
High	Maintain and update as needed, 28E Agreements with surrounding entities.	ALL	School Board and associated jurisdictions	2	Active	Minimal
High	Systematically review and update, as needed, Hazard Response Policies and Procedures	ALL	School Board and Staff	1	Active	Minimal

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High	Continue to cooperate with local medical facilities and Health Department to increase likelihood of detection and proper response to outbreaks.	Human Disease	School Board, associated facilities, jurisdictions, and entities	1,2	Active	Minimal
Medium	Develop and maintain tree-trimming program in order to reduce the risk of falling branches on infrastructure and property.	Tornadoes/Windstorms, Thunderstorm/Lightning/Hail	School Board and City	3	Active	Low
Low	Develop and maintain list of interpreters in order to enhance communication barriers within the community.	Communication Failure	School Board and City	2	Active	Low
High	Maintain Procedures for Severe Weather Events	Tornado, Windstorm	School Board	1,2,3	Active/routine	Minimal
High	Maintain and evaluate existing terrorism mitigation procedures	Terrorism	School Board	5	Active/routine	Minimal
High	Identify and evaluate Critical Facilities for accessibility, vulnerability, and risk.	Terrorism	School Board and Staff	1	Short-Term	Minimal
Low	Research and secure grant dollars for shelter and safe room construction	Tornado, Windstorm	School Board	1,2,3	Long-term	Moderate

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High	Restrict water usage, as necessary, to maintain water supply	Drought	School Board and City	1,2	Active	Minimal
High	Promote awareness of the Iowa Disaster Behavioral Health Response Team (DBHRT)	ALL	Mental Health/Disability Services of the East Central Region, Staff	All	Active	Minimal

# Appendix M: Wapsie Valley Community School District

## District Profile

The Wapsie Valley Community School District (WVCSD), headquartered in the City of Fairbank, provides Pre-kindergarten through 12<sup>th</sup> grade education to nearly 680 students. The Wapsie Valley Community School District is a public school district serving the towns of Fairbank and Readlyn as well as surrounding rural areas in Bremer, Buchanan, Black Hawk, and Fayette counties. Figure M1 is a map of the school district's area as of the 2019-20 school year.

The school district is headquartered at the Junior and Senior High School in the southwest quadrant of Bremer County at 2535 Viking Ave, south of Iowa Highway 3. Both cities of Readlyn and Fairbank are also home to their own elementary campus. In addition to the school buildings themselves, the campus includes a bus barn, playgrounds, football field and track, as well as a softball diamond and baseball diamond.

## Natural Environment

The City of Fairbank is located in the northeastern quadrant of the State of Iowa. More specifically, Fairbank is located in extreme northwestern Buchanan County.

The topography of Fairbank is characterized as undulating. Much of the community is relatively flat, while other areas, primarily along established waterways, and has areas of extreme slope. The highest point in the community is located in the northeastern reaches of the city and has an elevation of approximately 1,000 feet above mean seal level. The lowest elevation, which is approximately 960 feet above mean sea level, is found along the Little Wapsipinicon River that runs through the middle of the community.

Readlyn is located in southeast Bremer County, in the northeastern quadrant of Iowa.

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

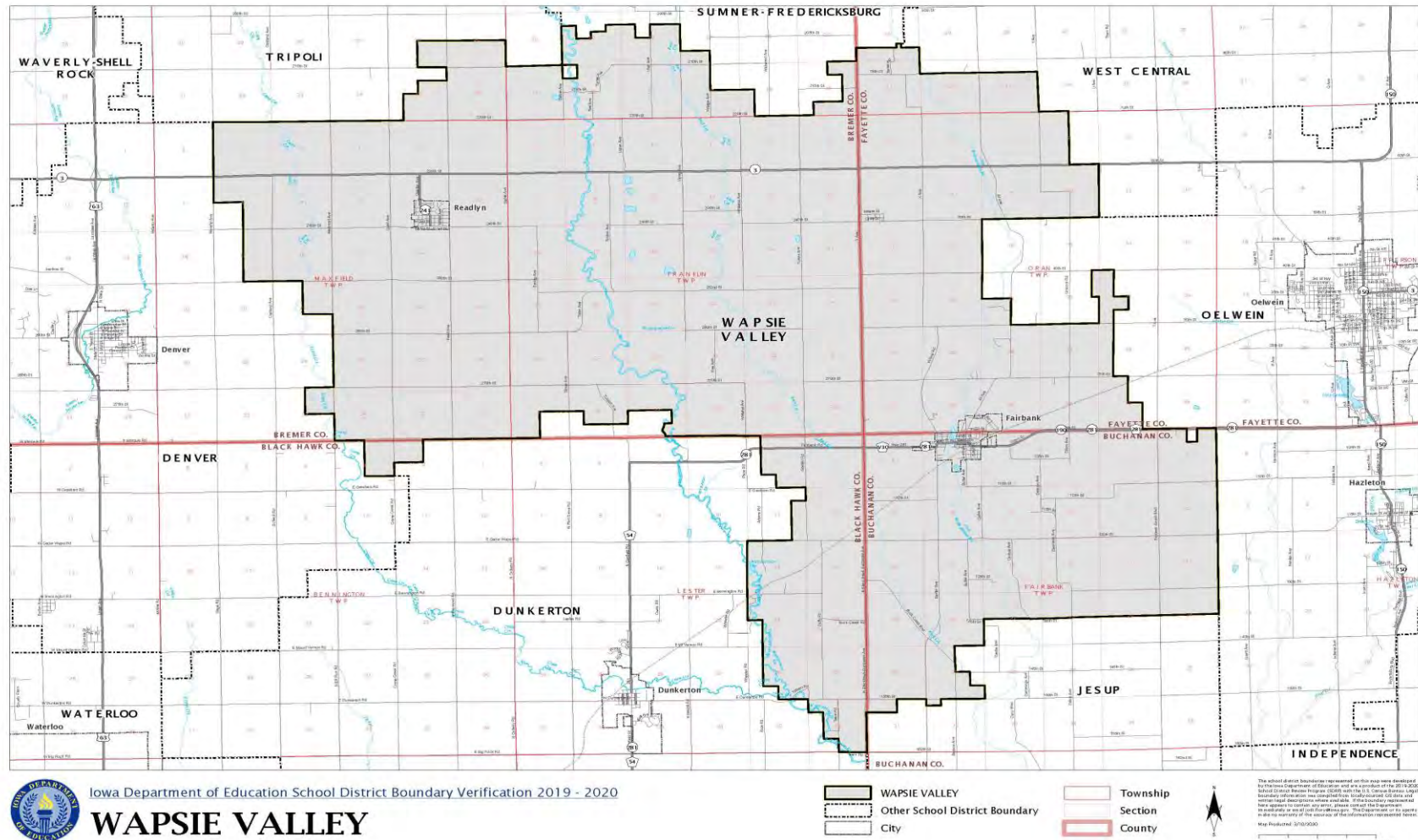
TABLE M1: HISTORIC CERTIFIED ENROLLMENT	
School Year	Certified Enrollment
2012-13	713
2013-14	717
2014-15	692
2015-16	690
2016-17	672
2017-18	680
2018-19	679
2019-20	681
2020-21	677
Source: Iowa Department of Education	

## 2022 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

approximately 1,040 feet above sea level and is located in the northern half of town.

**Figure M.1: Map of Wapsie Valley Community School District Area**

Courtesy of: Iowa Department of Education, [www.educateiowa.gov](http://www.educateiowa.gov)



## Community Services

Table M2 shows the primary utility providers for the City of Fairbank and Table M3 shows the primary utility providers for the City of Readlyn.

TABLE M2: FAIRBANK UTILITY PROVIDERS						
Electric	Natural Gas	Telephone/Internet	Cable	Water	Sewer	Sanitation
City of Fairbank	City of Fairbank	Windstream/Mediacom	Mediacom	City of Fairbank	City of Fairbank	Black Hawk Waste Disposal

TABLE M3: 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

## Hazard 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 committee evaluated the risk associated with a specific hazard, defined by probability and frequency of occurrence, magnitude, severity, exposures, and consequences. The school district's vulnerability assessment provides in-depth knowledge of the hazards and vulnerabilities that affect the school district. This analysis provides an all-hazard approach when evaluating the hazards that affect the school district 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, infrastructure, 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 human caused, or technological events tend to change over time with advancement in technology and methods of operation.

The Committee assessed the defined hazards relevant to potential impact on the school district. Using the scoring criteria previously defined (Tables 19-22) the school district 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 M4 displays the school district's hazard scores. The top three hazards for the WVCSD are Thunderstorm/Lightning/Hail, Animal/Plant/Crop Disease, Tornado/Windstorm.

<b>TABLE M4: HAZARD RISK ASSESSMENT FOR WAPSIE VALLEY COMMUNITY SCHOOL DISTRICT</b>						
<b>Hazard Rank</b>	<b>Hazard</b>	<b>Probability</b>	<b>Magnitude/Severity</b>	<b>Warning Time</b>	<b>Duration</b>	<b>Final Score</b>
1	Thunderstorm/Lightning/Hail	4	2	4	1	<b>3.10</b>
2	Animal/Plant/Crop Disease	4	2	1	4	<b>2.95</b>
3	Tornado/Windstorm	2	4	4	1	<b>2.80</b>
3	Flash Flood	4	1	4	1	<b>2.80</b>
4	Severe Winter Storm	4	1	1	3	<b>2.55</b>
4	Human Disease	3	2	2	3	<b>2.55</b>
5	Drought	3	2	1	4	<b>2.50</b>
6	Extreme Heat	3	1	1	3	<b>2.10</b>
7	Grass/Wild Land Fire	1	2	4	2	<b>1.85</b>
8	River Flooding	1	2	2	4	<b>1.75</b>
8	Earthquake	1	2	4	1	<b>1.75</b>
9	Radiological Incident	1	1	4	3	<b>1.65</b>
10	HAZMAT Incident	1	1	4	2	<b>1.55</b>
11	Terrorism	1	1	4	1	<b>1.45</b>
11	Transportation Incident	1	1	4	1	<b>1.45</b>
11	Landslide	1	1	4	1	<b>1.45</b>
11	Expansive Soil	1	1	2	4	<b>1.45</b>
12	Infrastructure Failure	1	1	1	4	<b>1.30</b>
13	Sinkholes	1	1	2	1	<b>1.15</b>
14	Levee/Dam Failure	1	1	1	1	<b>1.00</b>

## **Vulnerability – Identifying Assets**

### **Critical Facilities**

All the school's buildings and campus areas are all considered critical facilities because of their student population. In the event of a hazard that requires seeking shelter, the school facilities themselves are utilized for sheltering in place. In the instance of hazard that requires sheltering, students and staff seek shelter "in place" within the respective school buildings. The district does not have a certified tornado safe room. In a shelter "in place" event, building occupants are directed to lowest level, central locations such as basements, locker rooms, hallways, restrooms, or other rooms determined to be safest locations in their respective building.

### **Social Asset Populations**

The nature of a school's student population congregates large populations of "at-risk" individuals. Younger residents are often not aware of the proper actions to take in the event of a disaster. In addition, very young children can be more susceptible to disasters simply due to their age. As mentioned in District Profile, there are approximately 680 students and approximately 195 staff in the district. The district actively takes steps to reduce the threat to their student population, as described below in the "Current Activities" section. When school is in session, hundreds of people are in the various school buildings daily. This includes people from other communities attending various events throughout the year.

### **Estimating Property Loss**

Valuations are an important component of hazard mitigation planning in so much 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 disaster. Wapsie Valley Community school buildings and their contents are fully insured. The buildings themselves are valued at \$23,330,678.

## Mitigation Strategy

### Hazard Mitigation Plan Goals

The district established the following hazard mitigation plan goals. These represent broad-based goals that would address a multitude of hazards and encompass a variety of mitigation activities. The hazard mitigation plan goals are identified as follows.

- 1) Maintain emergency services during hazard events, or if this is not possible, return to pre-disaster service levels as soon as possible.
- 2) Protect the health and welfare of students and staff by utilizing pre-disaster planning and constructing mitigation projects.
- 3) Mitigate or minimize the impact of natural, technological, and/or manmade disasters.
- 4) Minimize the occurrence of injuries and loss of life due to hazards.
- 5) Take steps to mitigate the potential of terrorism within our buildings.
- 6) Return to similar or improved pre-event conditions as quickly as possible following a disaster event.

### Current Mitigation Activities

This section includes an overview of the emergency response services and mitigation actions which are currently in place.

#### ***Bremer County Emergency Management Agency***

The Bremer County Emergency Management Coordinator, based out of the City of Waverly, works with cities and school districts throughout the county 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](mailto:kladage@co.bremer.ia.us)

#### ***Buchanan County Emergency Management Agency***

The Buchanan County Emergency Management Agency is based out of the Buchanan County Courthouse in Independence. The Emergency Management Director 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 Rick Wulfekuhle and current contact information is as follows: Buchanan County Emergency Management Office, 210 5<sup>th</sup> Ave. NE, Independence, IA 50644, (319) 334-6411, email: [rwulfekuhle@co.buchanan.ia.us](mailto:rwulfekuhle@co.buchanan.ia.us)

### ***Police Department***

The Fairbank Police Department, Buchanan County Law Enforcement, and the Iowa State Patrol provide police protection to the City of Fairbank. The Fairbank Police Department currently employs one full-time and one part-time position. The department has a 2003 and 2004 squad car 2013 Ford Taurus Interceptor in its service.

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 Department***

Fire protection in the City of Fairbank is provided by a staff of 30 volunteer firefighters, 10 of whom are also EMT personnel. Of these firefighters, 10 are HAZMAT certified, and 15 have Firefighter I status. 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 Fairbank Fire Department maintains 28E agreements include all of Buchanan County and Fayette County.

The department currently operates the following equipment: 2000 Pumper; 1977 Pumper; 1985 Tanker; 2010 Grass Rig Pickup; 2007 Sterling Rescue Truck; and a 2014 Wheel Coach Ambulance

The fire department ensures communication through several methods. Those methods include E-911 Service, Radio Communication, Pagers, Alarm Systems, Sirens, and Cellular Phones. To date the fire department is not GPS equipped.

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.

### ***Medical Services***

The hospital nearest to Fairbank is located in Oelwein. Therefore, Mercy Hospital is the primary hospital for the community. Although Mercy Hospital in Oelwein is closer, the planning committee noted that most residents of Fairbank utilize Allen Memorial Hospital in Waterloo. There are six other hospitals available in a 30-mile radius of the City of Fairbank. There are currently 20 EMT personnel that provide service to the community. Of these 20 EMT personnel, 10 also serve as firefighters. The city purchased a new ambulance in 2014.

### ***Ambulance and EMS Services***

The City of Readlyn 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.

In the City of Fairbank there are currently 20 EMT personnel that provide service to the community. Of these 20 EMT personnel, 10 also serve as firefighters. The city purchased a new ambulance in 2014.

### ***Warning Systems***

In the event of a tornado the City of Fairbank has two outdoor warning sirens that, given enough time, can allow people to search for suitable shelter. In addition, there are a wide variety of early warnings provided through local radio and television stations and the cable Weather Channel. The sirens are also used to inform citizens of utility outages. Recently, Buchanan County began utilizing the state's new ALERT IOWA Program. Residents can sign up for voice, text, and/or email alerts in the event of an emergency or severe weather condition.

The existing early warning siren is approximately ten years old. The siren is 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).

## Future Activities & Implementation Strategy / Action Plan

### Priority

School representatives 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: Social, Technical, Addministrative, Political, Legal, Economic, and Environmental.

The Committee was asked to discuss the STAPLEE elements (Table I4) and determine each element's ranking (High - H, Medium -M, Low-L) for each identified future mitigation activity. Afterwards, the average priority for each migration activity was recorded as the overall priority ranking for that particular future mitigation activity.

### Timeline

The Committee identified the time period each of the proposed mitigation activities will occur. Activities that occur regularly (either daily, weekly, monthly, or annually) were identified as Active. If the action is to occur within the next 1-5 years it was identified as Short-Term, if the activity would take 5-10 years it was labeled as Mid-Term, and any activities that would take 10 or more years were identified as Long-Term.

### Funding

**TABLE M5: STAPLEE ELEMENTS**

TABLE M5: STAPLEE ELEMENTS	
<b>S – Social</b>	<ul style="list-style-type: none"> <li>Mitigation actions are acceptable to the community if they do not adversely affect a particular segment of the populations,</li> <li>Actions do not cause relocation of lower income people,</li> <li>Actions are compatible with the community's social and cultural values.</li> </ul>
<b>T- Technical</b>	<ul style="list-style-type: none"> <li>Mitigation actions are technically most effective if they provide long-term reduction of losses and have minimal secondary adverse impacts.</li> </ul>
<b>A – Administrative</b>	<ul style="list-style-type: none"> <li>Mitigation actions are easier to implement if the jurisdiction has the necessary staffing and funding.</li> </ul>
<b>P – Political</b>	<ul style="list-style-type: none"> <li>Mitigation actions can truly be successful if all stakeholders have been offered an opportunity to participate in the planning process and if there is public support for the action.</li> </ul>
<b>L – Legal</b>	<ul style="list-style-type: none"> <li>It is critical that the jurisdiction or implementing agency have the legal authority to implement and enforce a mitigation action.</li> </ul>
<b>E – Economic</b>	<ul style="list-style-type: none"> <li>Budget constraints can significantly deter the implementation of mitigation actions. Hence, it is important to evaluate whether an action is cost-effective, as determined by a cost benefit review, and possible to fund.</li> </ul>
<b>E - Environmental</b>	<ul style="list-style-type: none"> <li>Sustainable mitigation actions that do not have an adverse effect on the environment, that comply with Federal, State, and local environmental regulations,</li> <li>Are consistent with the community's environmental goals, have mitigation benefits while being environmentally sound.</li> </ul>

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 School District 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.

Wapsie Valley Community School District Future Mitigation Activities and Implementation Strategy are in Table M6.

TABLE M6: WAPSIE VALLEY COMMUNITY SCHOOL DISTRICT HAZARD MITIGATION ACTION STEPS						
Priority	Mitigation Action/Program/Project	Associated Hazard(s)	Primary Agency Responsible for Implementation	Timeline	Estimated Cost (\$)	Associated Goal(s)
High	Educate the Student Population/Public through: continued cooperation with local service organizations (American Red Cross, County EMA, etc.) to educate residents on how to prepare for and respond to a variety of hazards	ALL	School* and Local Fire/Police	Active	Min	All
High	Identify Locations (all school facilities, shelter locations) where it would be beneficial to have Backup Power Generation or maintain backup power generation	Tornadoes/Windstorms, Severe Winter Storms, Thunderstorm/ Lightning/Hail	School* and City	Short-Term	Min	2
High	Continue to Work to Safeguard against Potential Fire and Explosion Hazards Throughout the Community	Infrastructure Failure, Grass and Wild Land Fire, Explosion, Fixed HAZMAT Incident	School* and City	Active	Min	3, 4, 5
High	Maintain and Update as Needed, 28E Agreements with Surrounding Entities	ALL	School* and City	Active	Min	2
High	Systematically Review and Update, as needed, Hazard Responses Policies and Procedures	ALL	School*	Active	Min	1
High	Identify and Evaluate Critical Facilities for Accessibility, Vulnerability, and Risk	Terrorism	School* and City	Short-Term	Min	1

High	Continue to Cooperate with Local Medical Facilities and Health Department to increase likelihood of detection and proper response to outbreaks	Human Disease	School* and City	Active	Min	1, 2
Medium	Construct new or retrofit current facilities to include tornado safe rooms	Tornado/Windstorm	School*	Mid-Term	High	4
High	Maintain and evaluate existing terrorism mitigation procedures	Terrorism	School*, City, and Police	Active	Min	3
High	Promote awareness of the Iowa Disaster Behavioral Health Response Team (DBHRT)	ALL	Mental Health/Disability Services of the East Central Region, Staff	All	Active	Minimal

## Attachment 1: 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

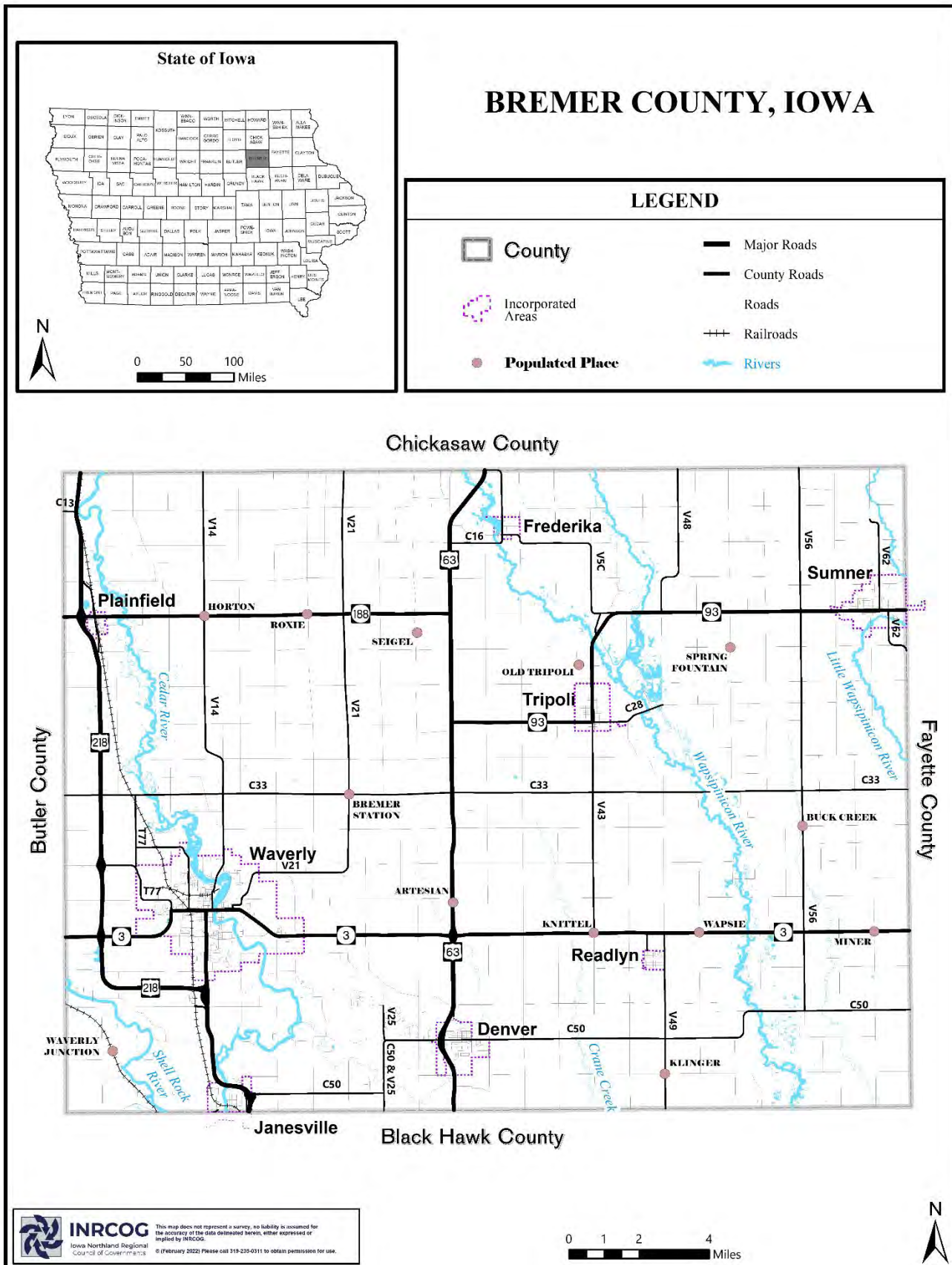
d/e Frederika  
f/g Janesville  
h/i Plainfield  
j/k Readlyn  
l/m Sumner  
n/o Tripoli  
p/q Waverly

### 5: Critical Site Maps

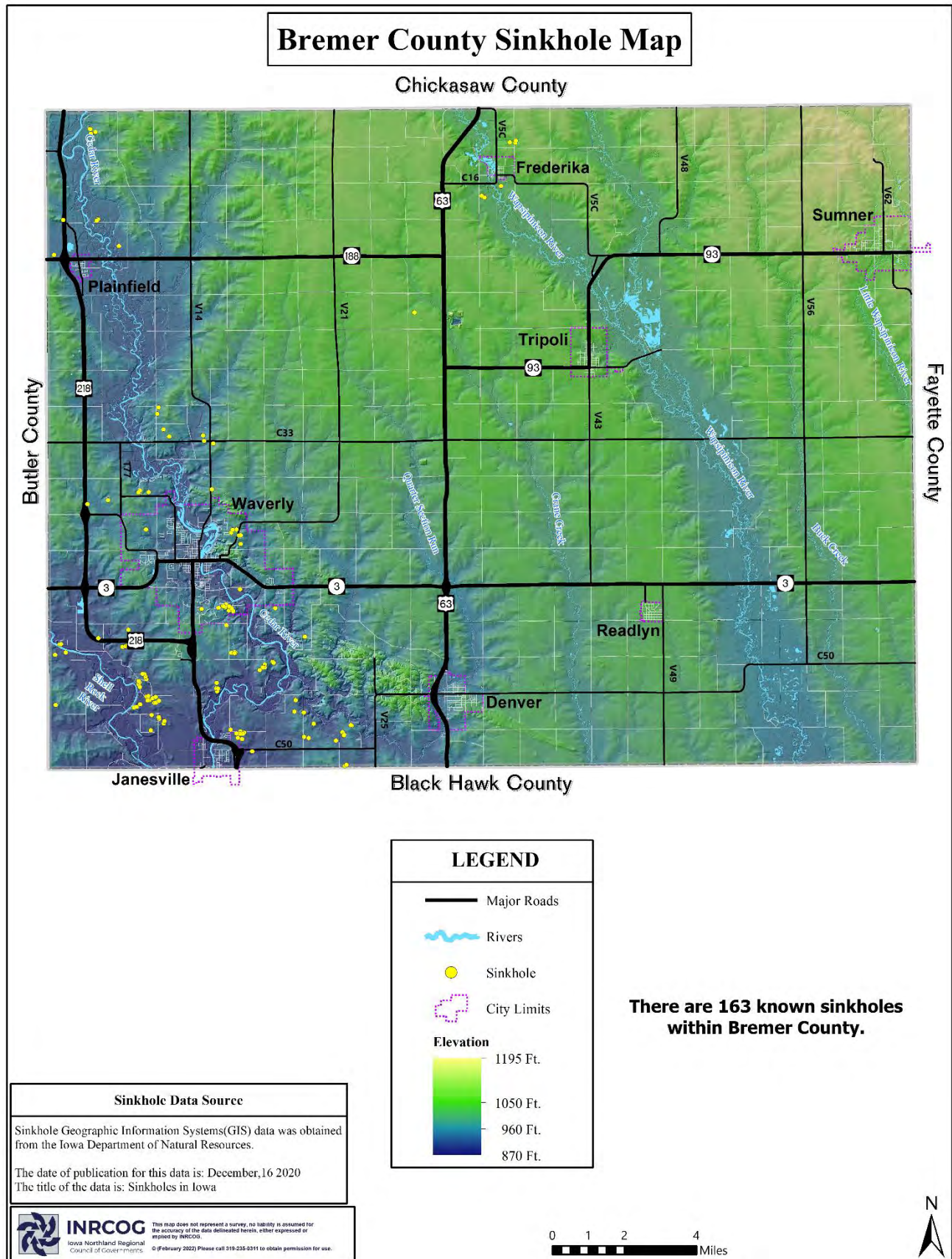
a Bremer County  
b Denver  
c Frederika  
d Janesville  
e Plainfield  
f Readlyn  
g Sumner  
h Tripoli  
i Waverly



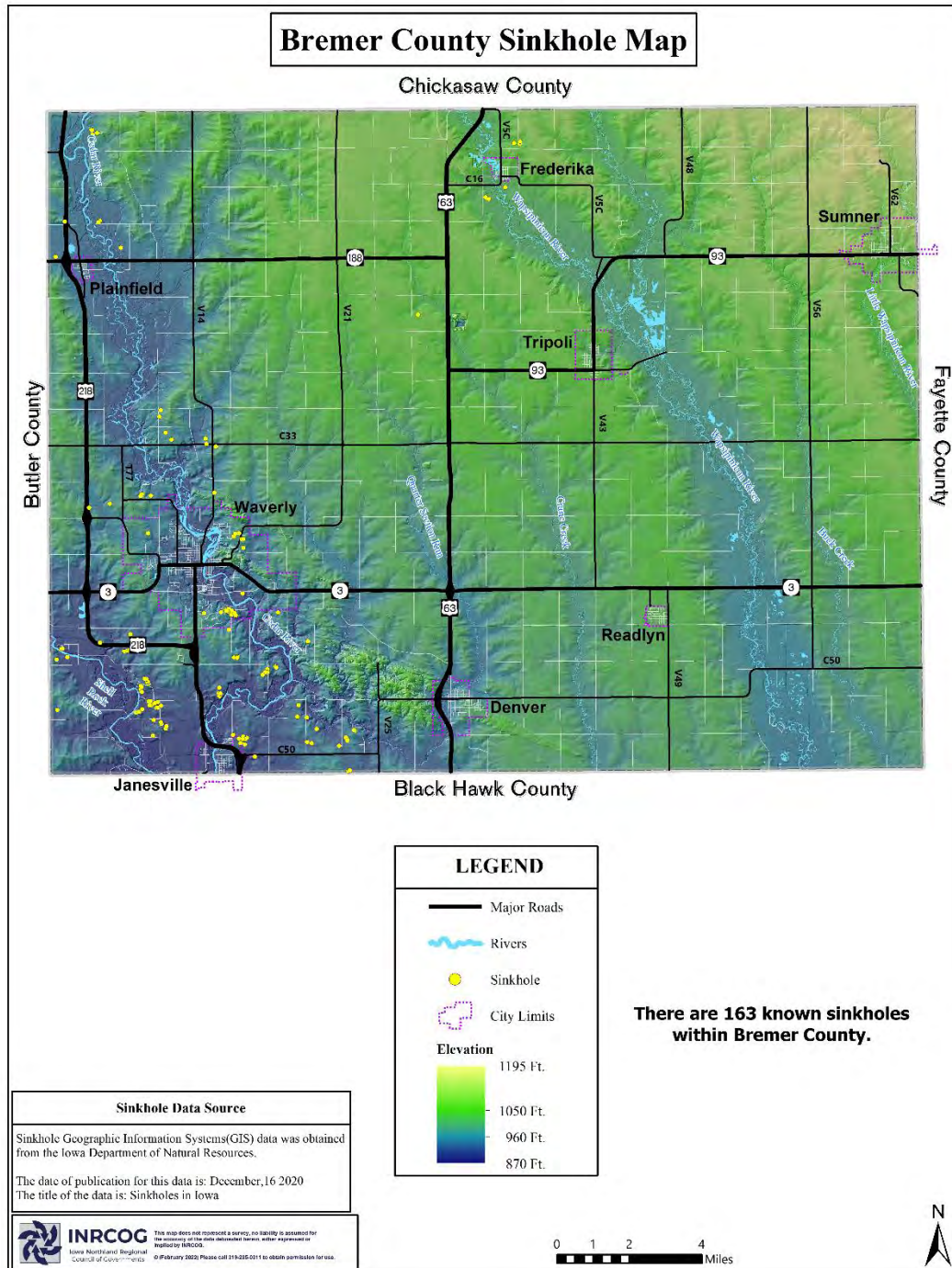
Map 1: Location of the County



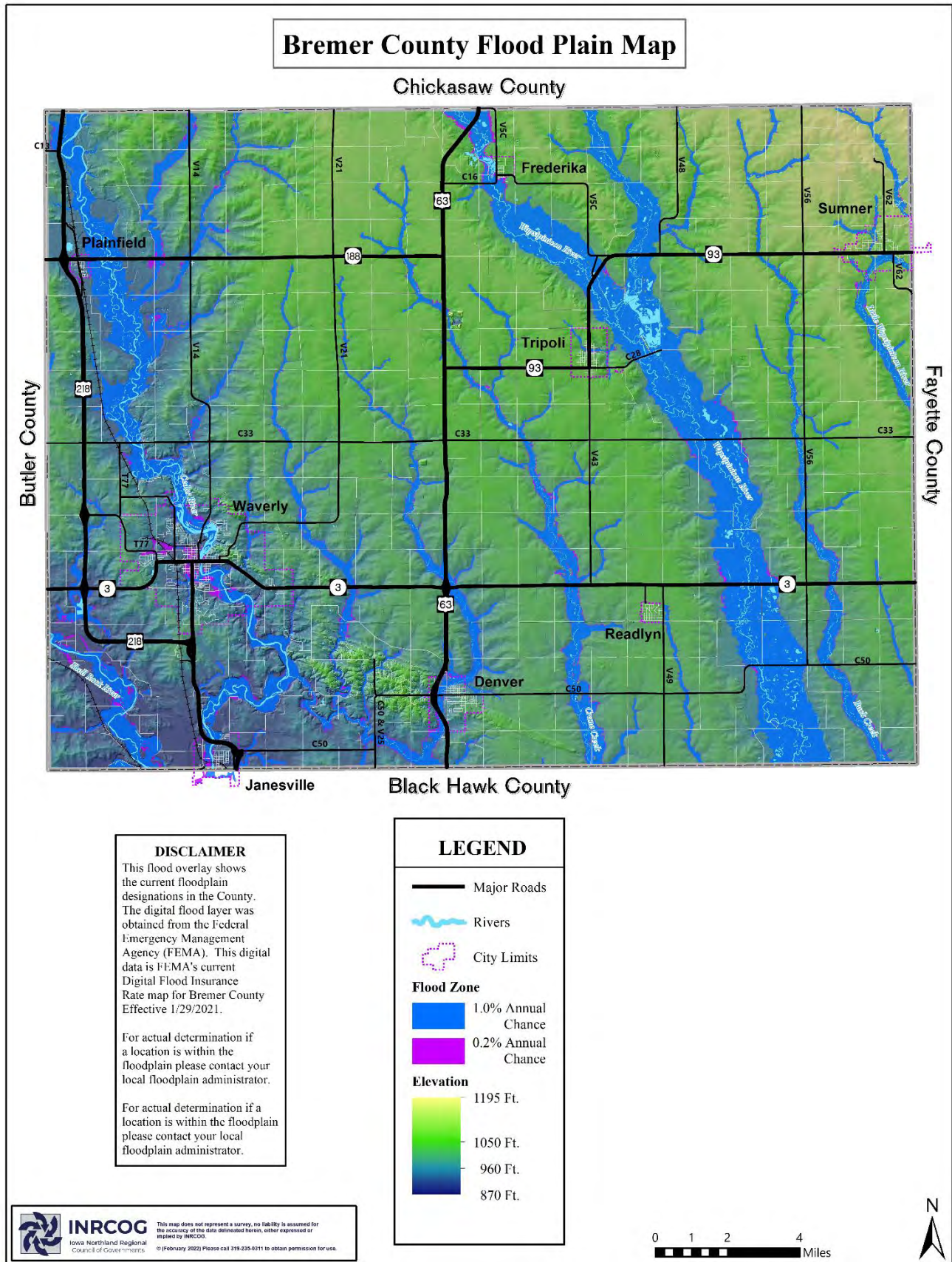
Map 2a: Topography of the County



Map 2b: Sinkholes in the County

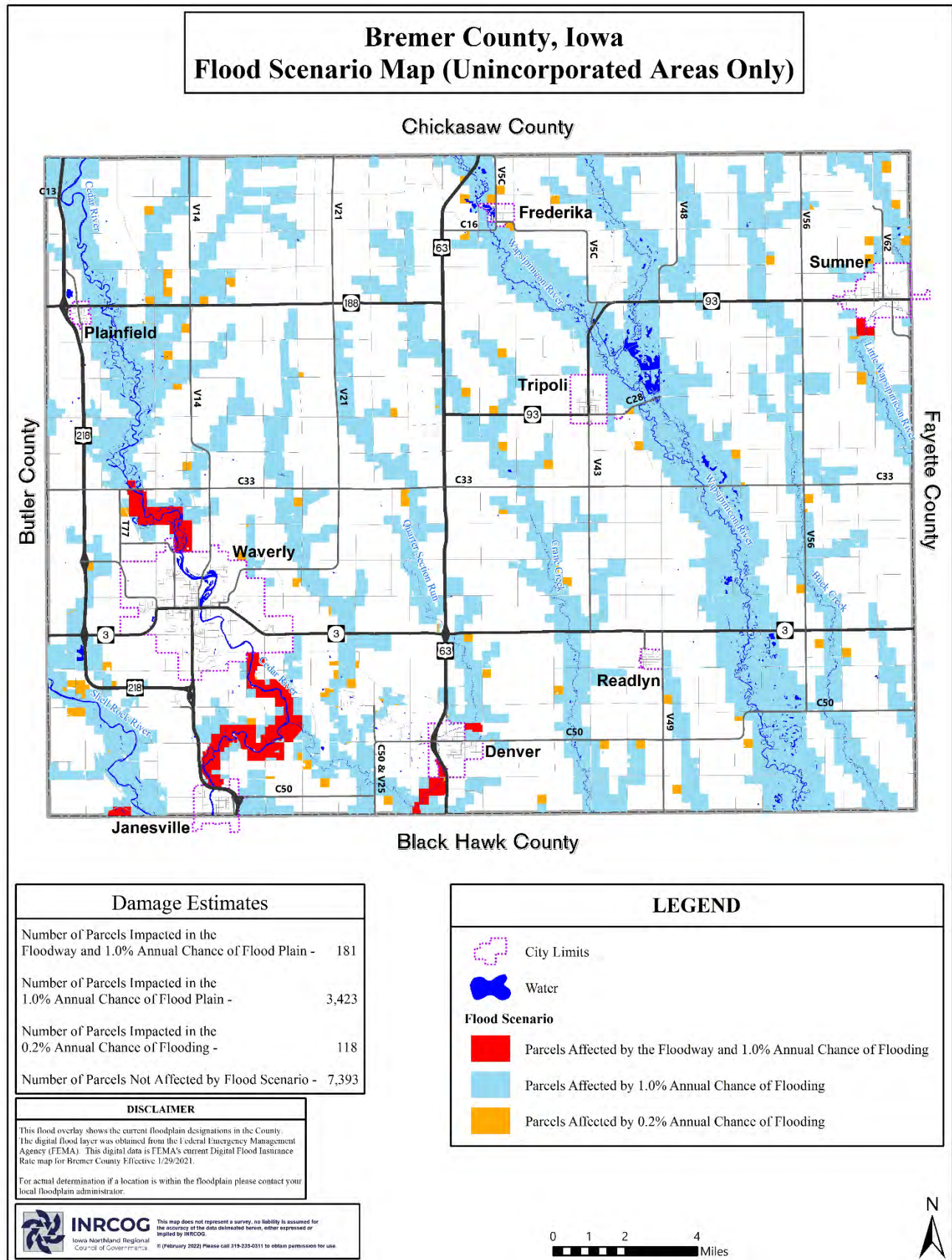


Map 3a: Flood Plain Map of the County

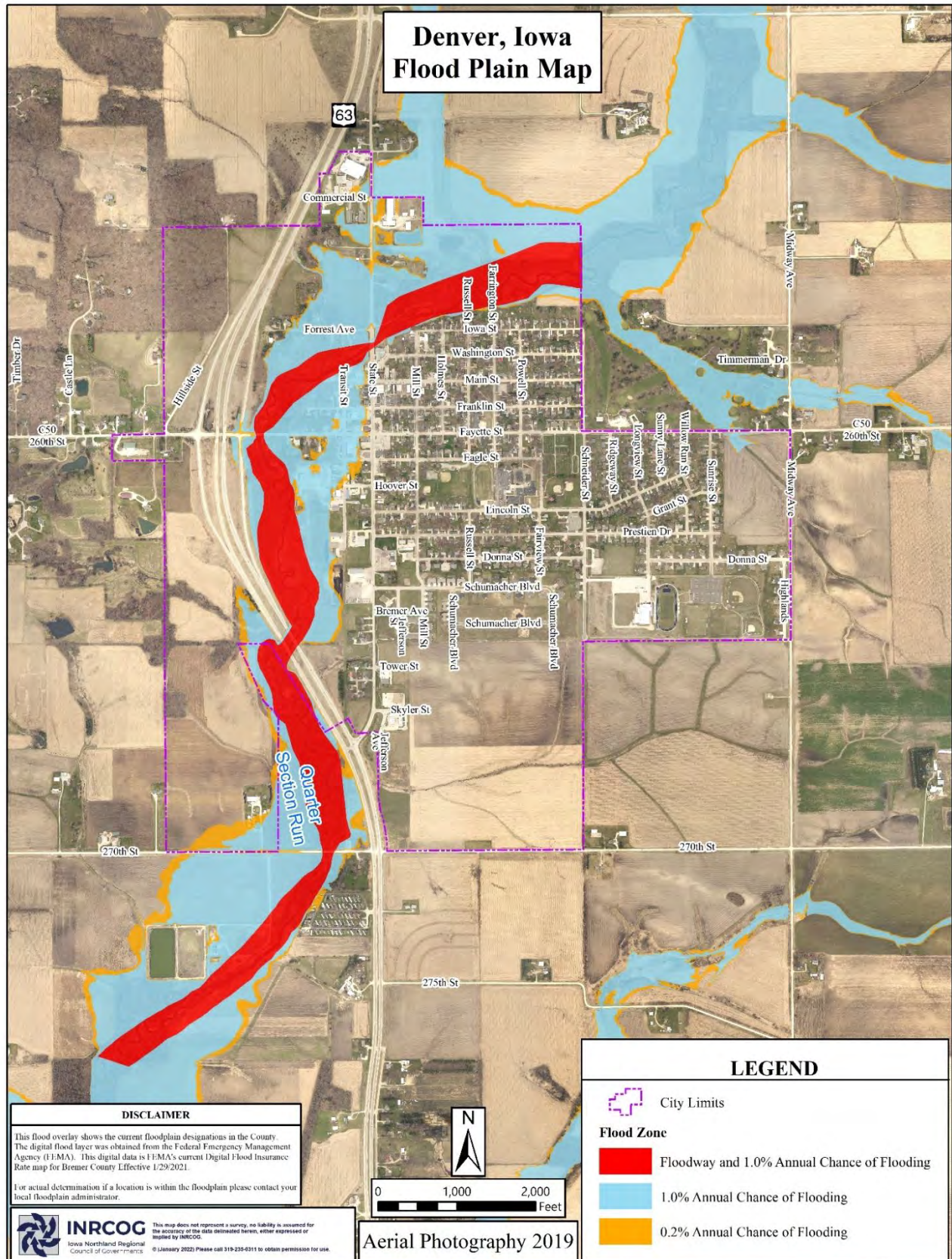


Map 3b Flood Scenario Map of the

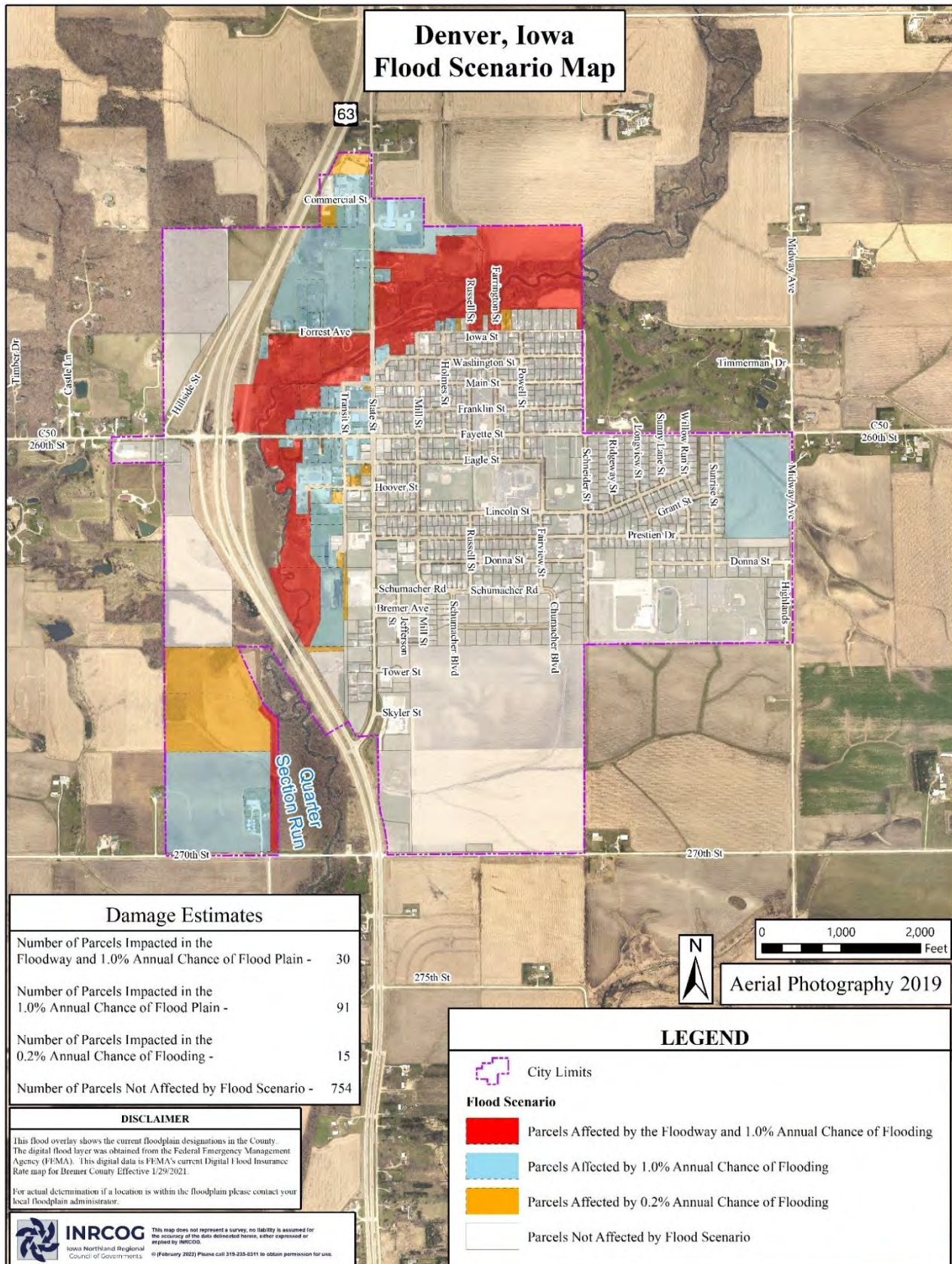
County



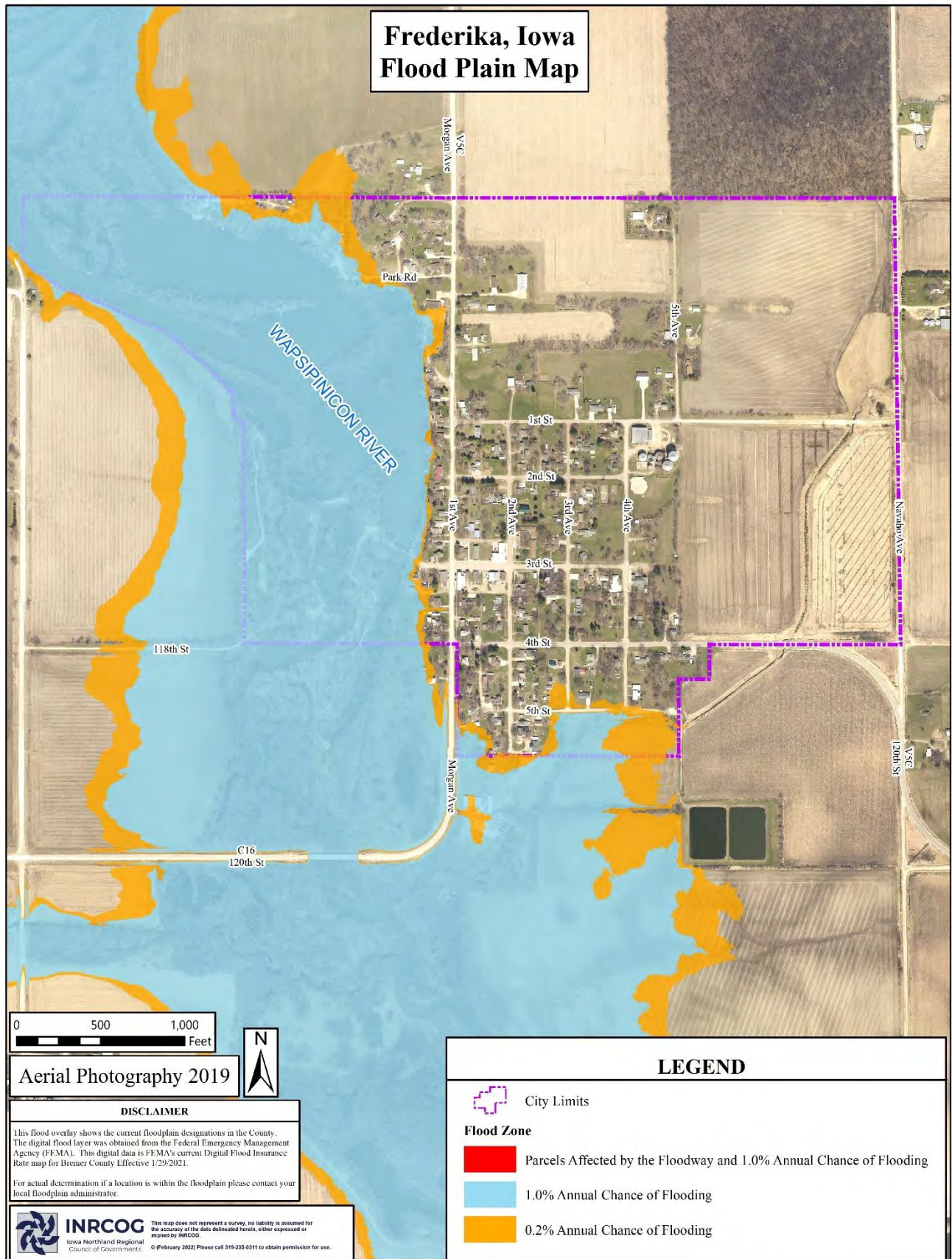
Map 3c: Flood Plain Map City of Denver



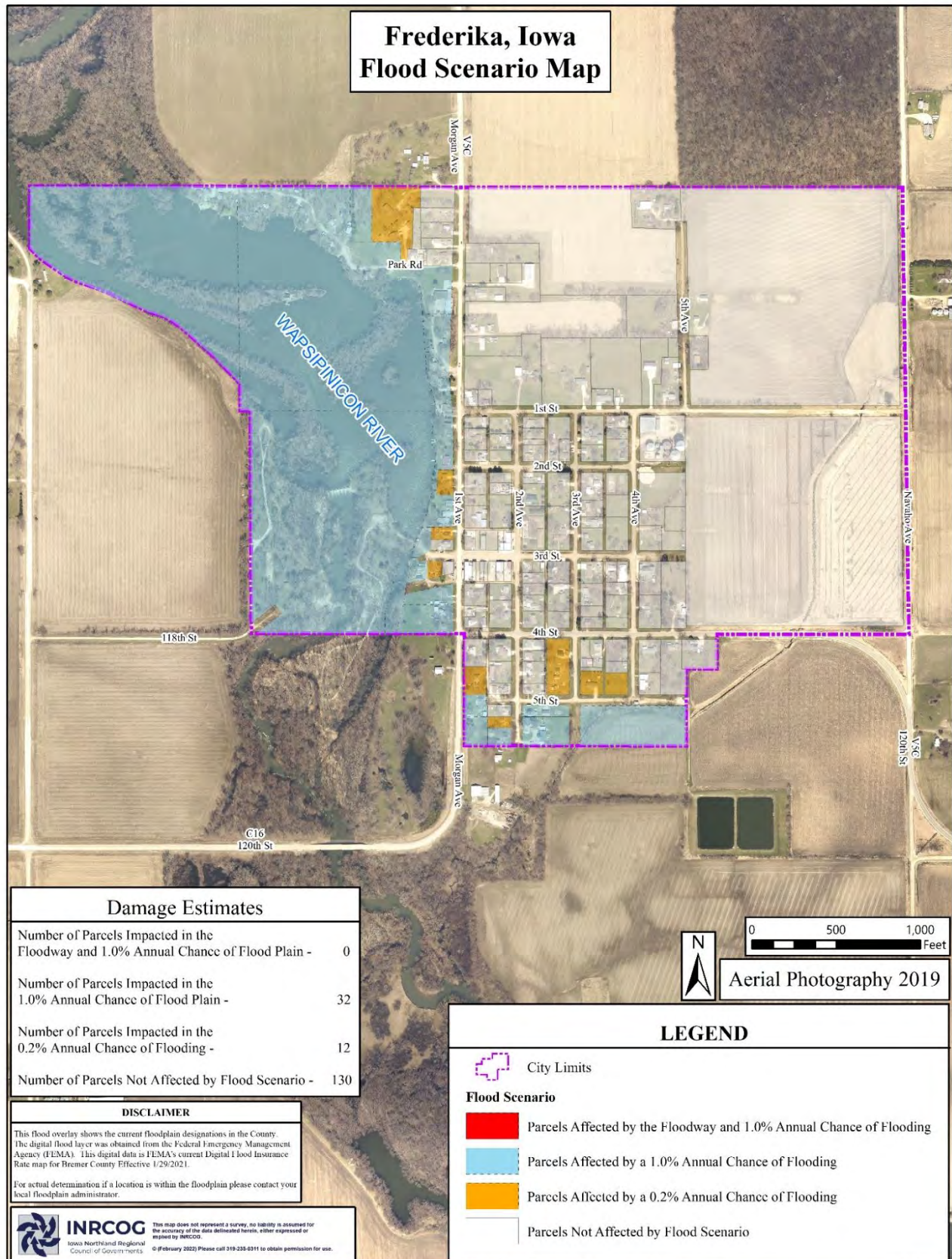
Map 3d: Flood Scenario Map City of Denver



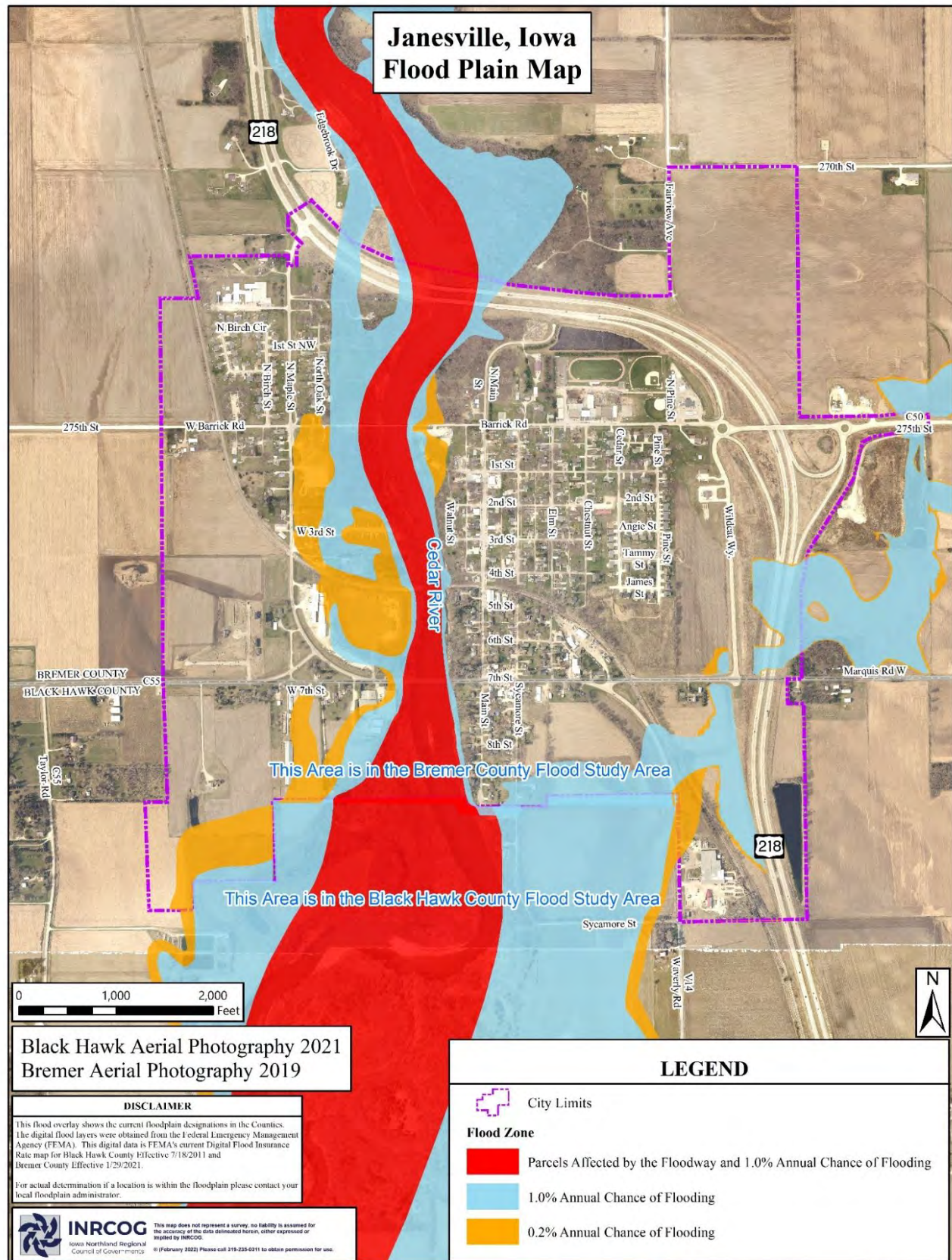
Map 3e: Flood Plain Map City of Frederika



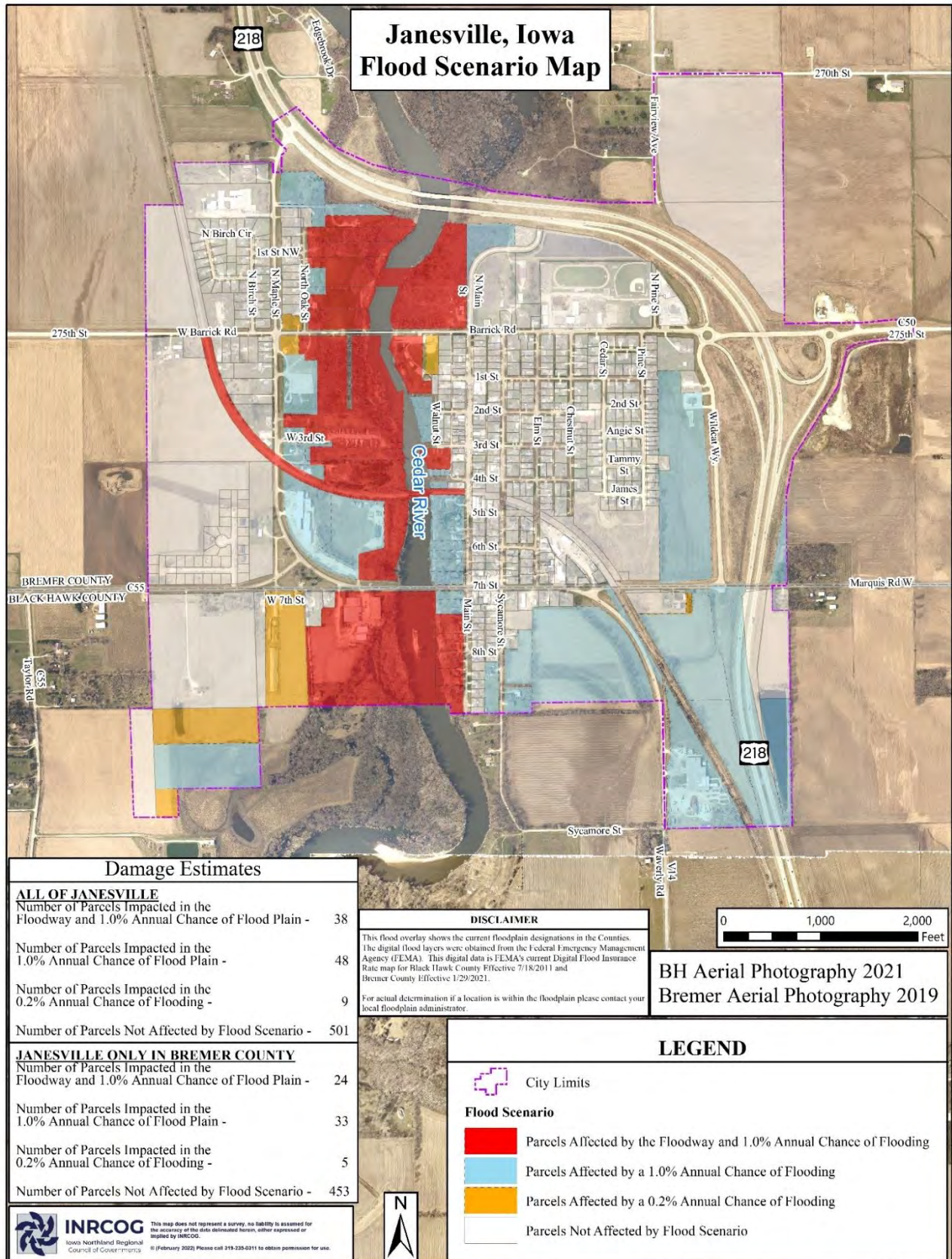
Map 3f: Flood Scenario Map City of Frederika



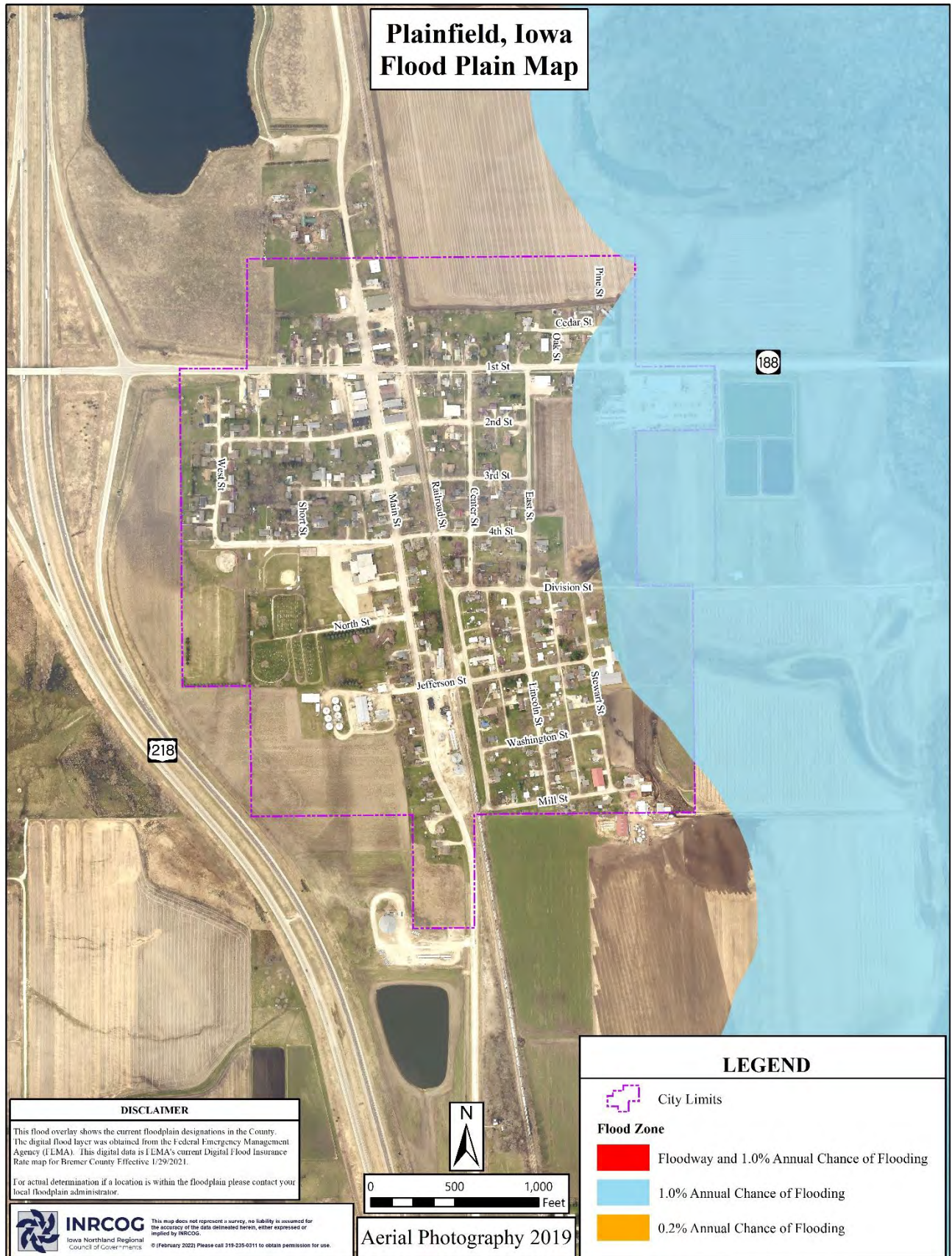
Map 3g: Flood Plain Map City of Janesville



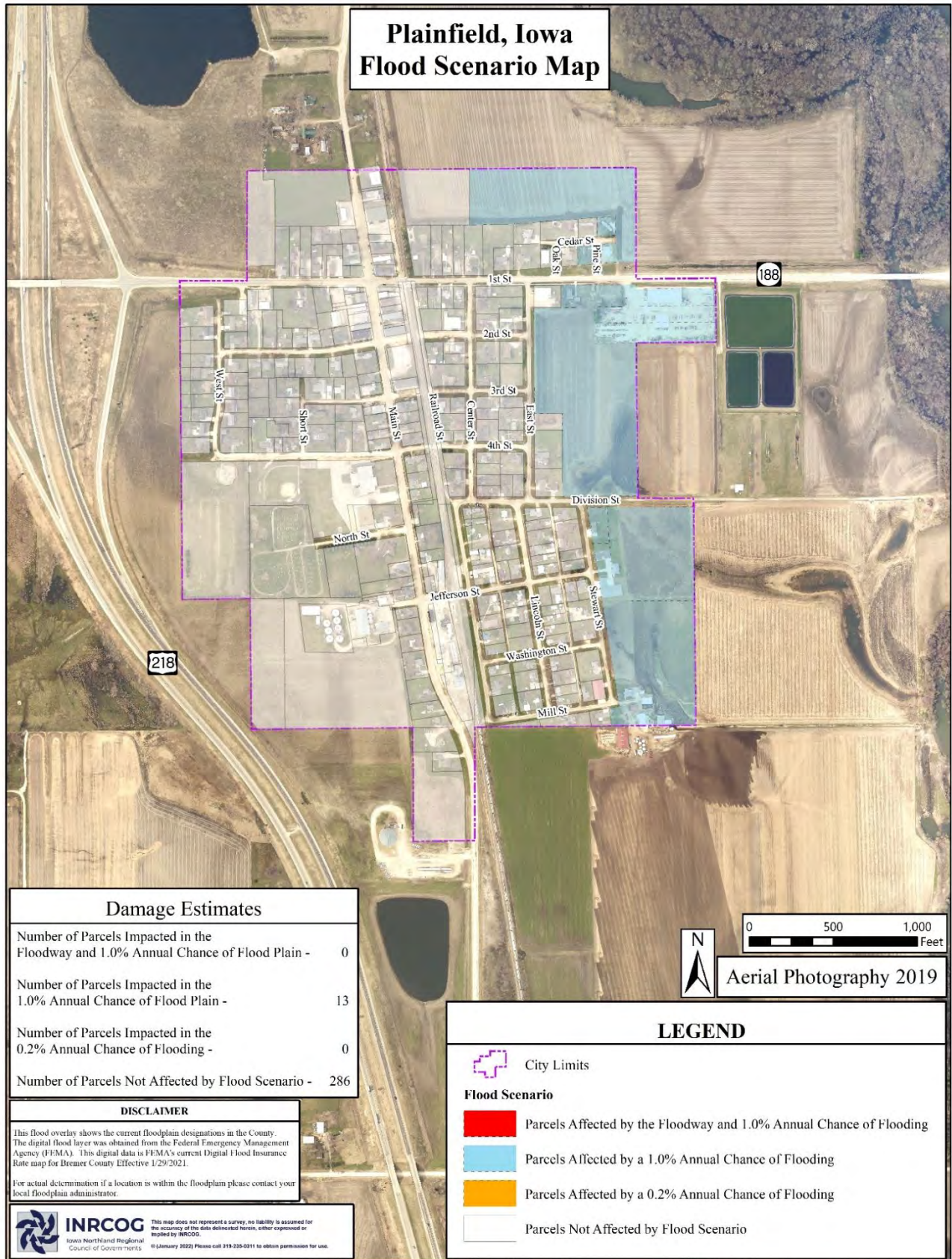
Map 3h: Flood Scenario Map City of Janesville



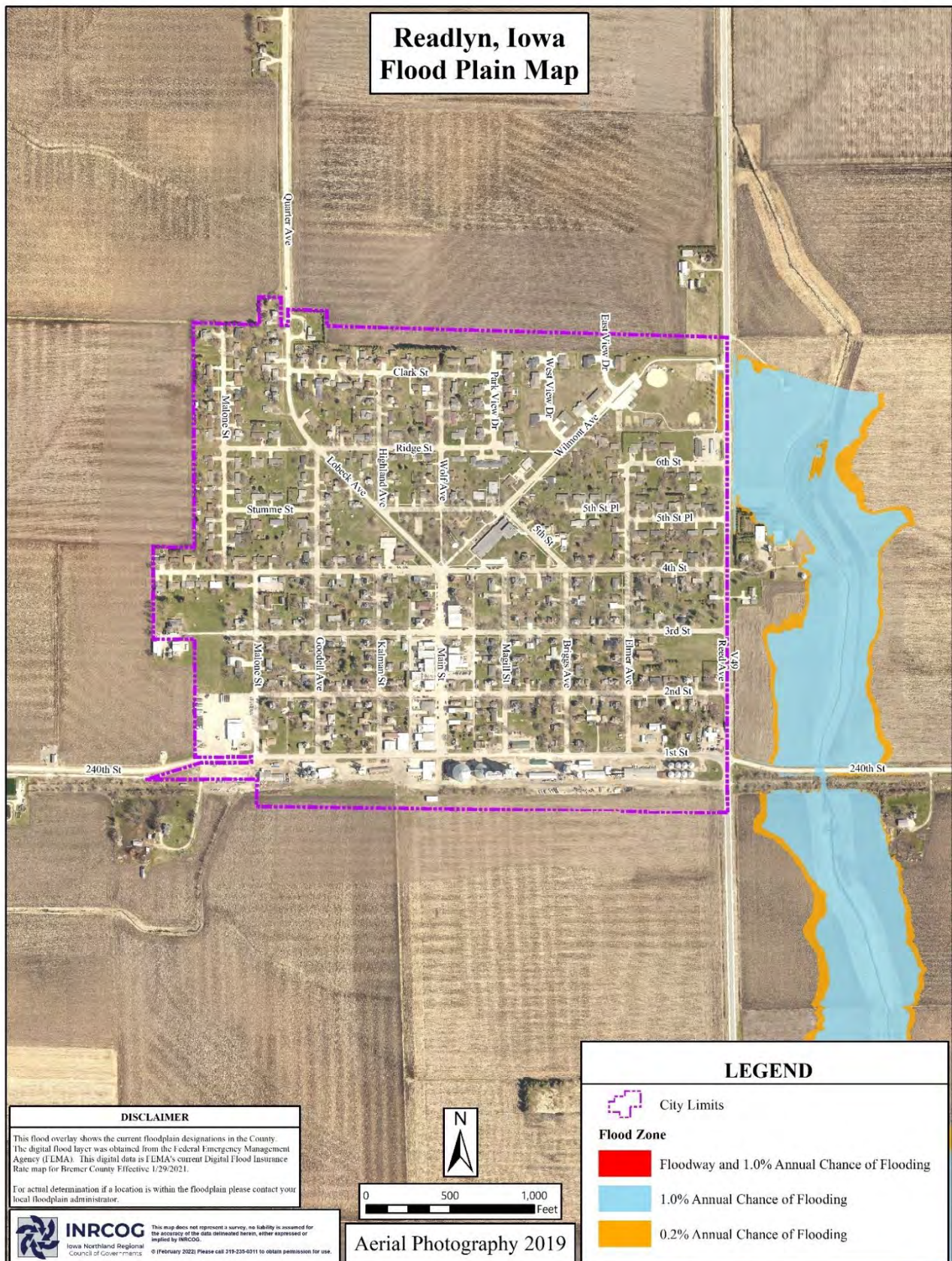
Map 3i: Flood Plain Map City of Plainfield



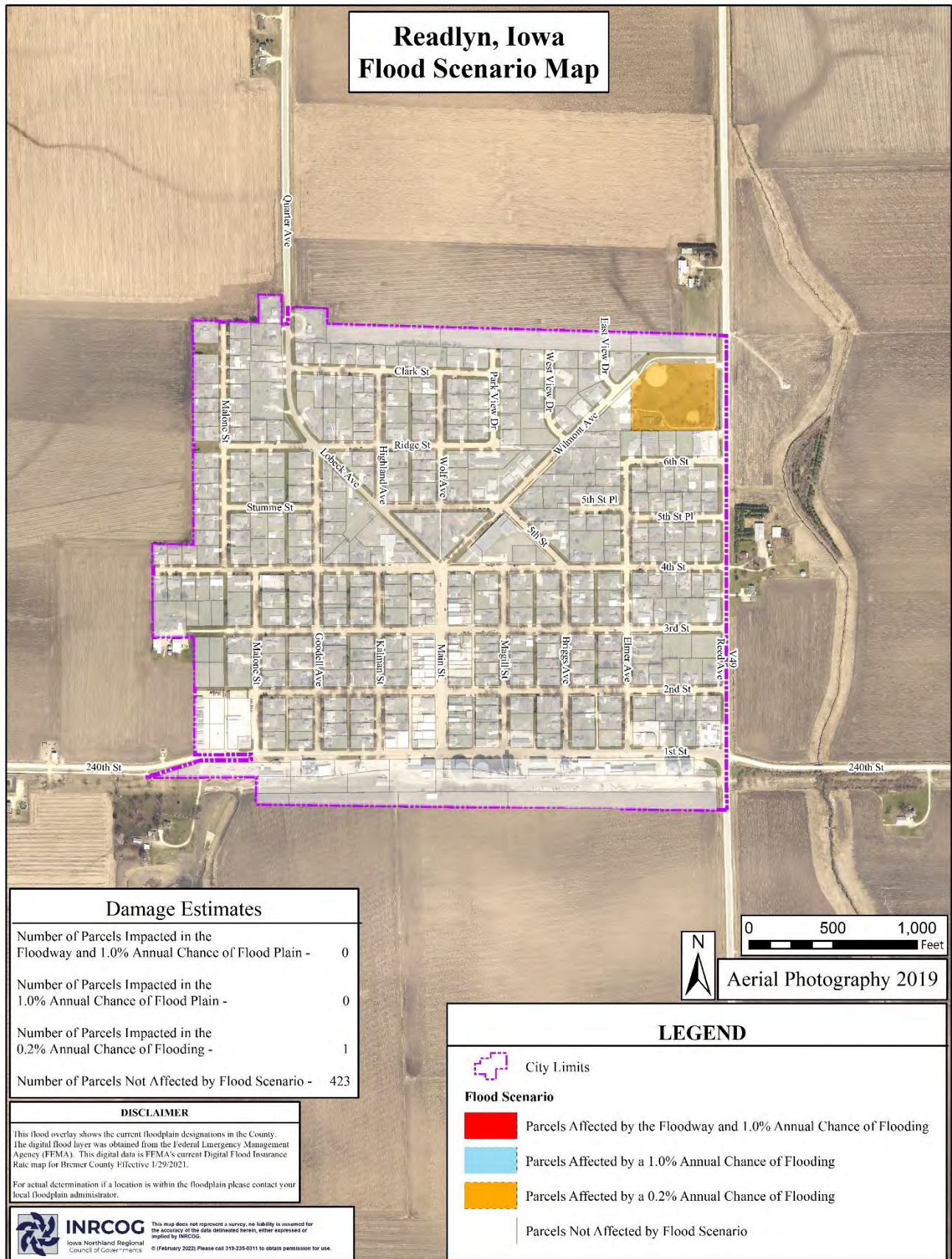
Map 3j: Flood Scenario Map City of Plainfield



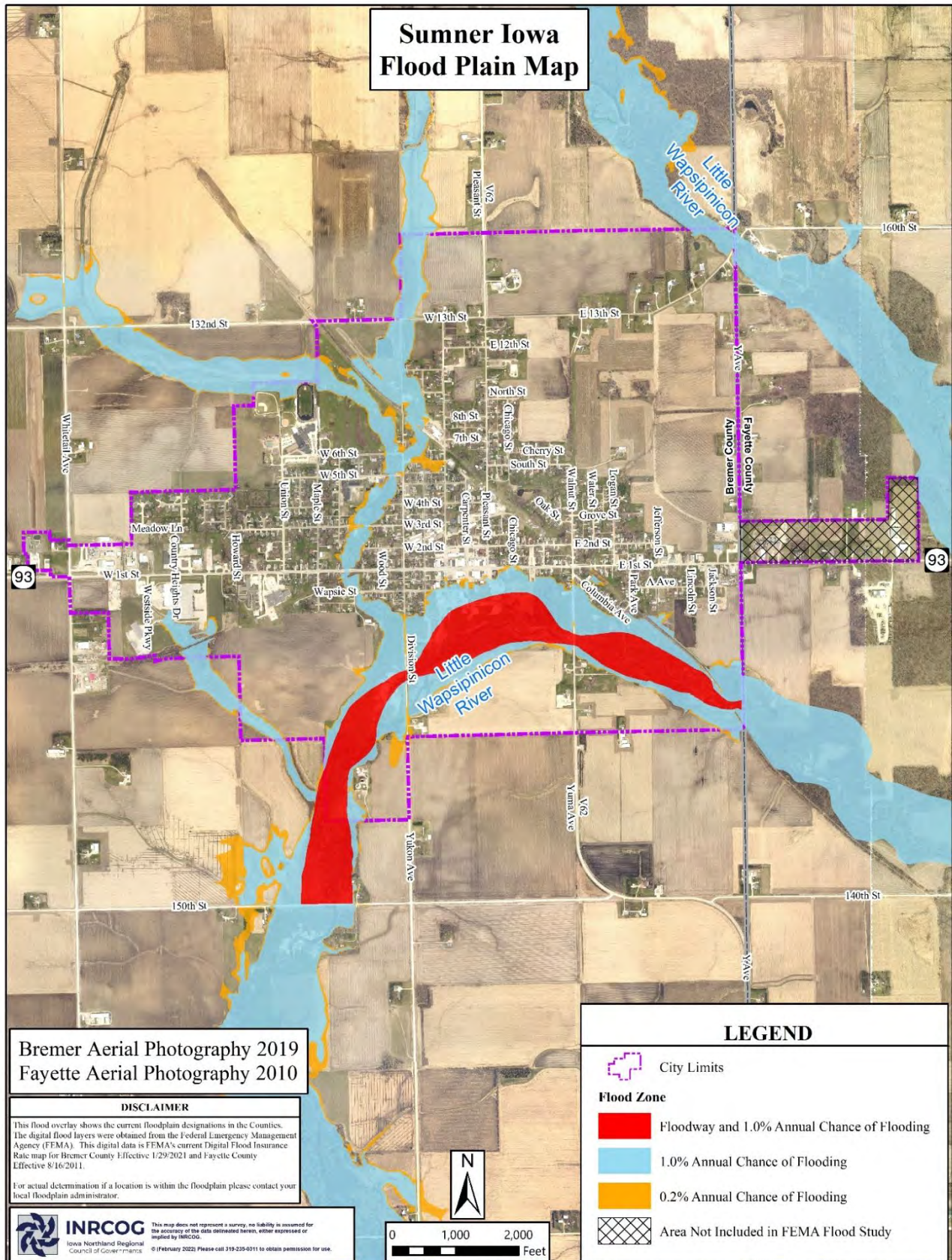
Map 3k: Flood Plain Map City of Readlyn



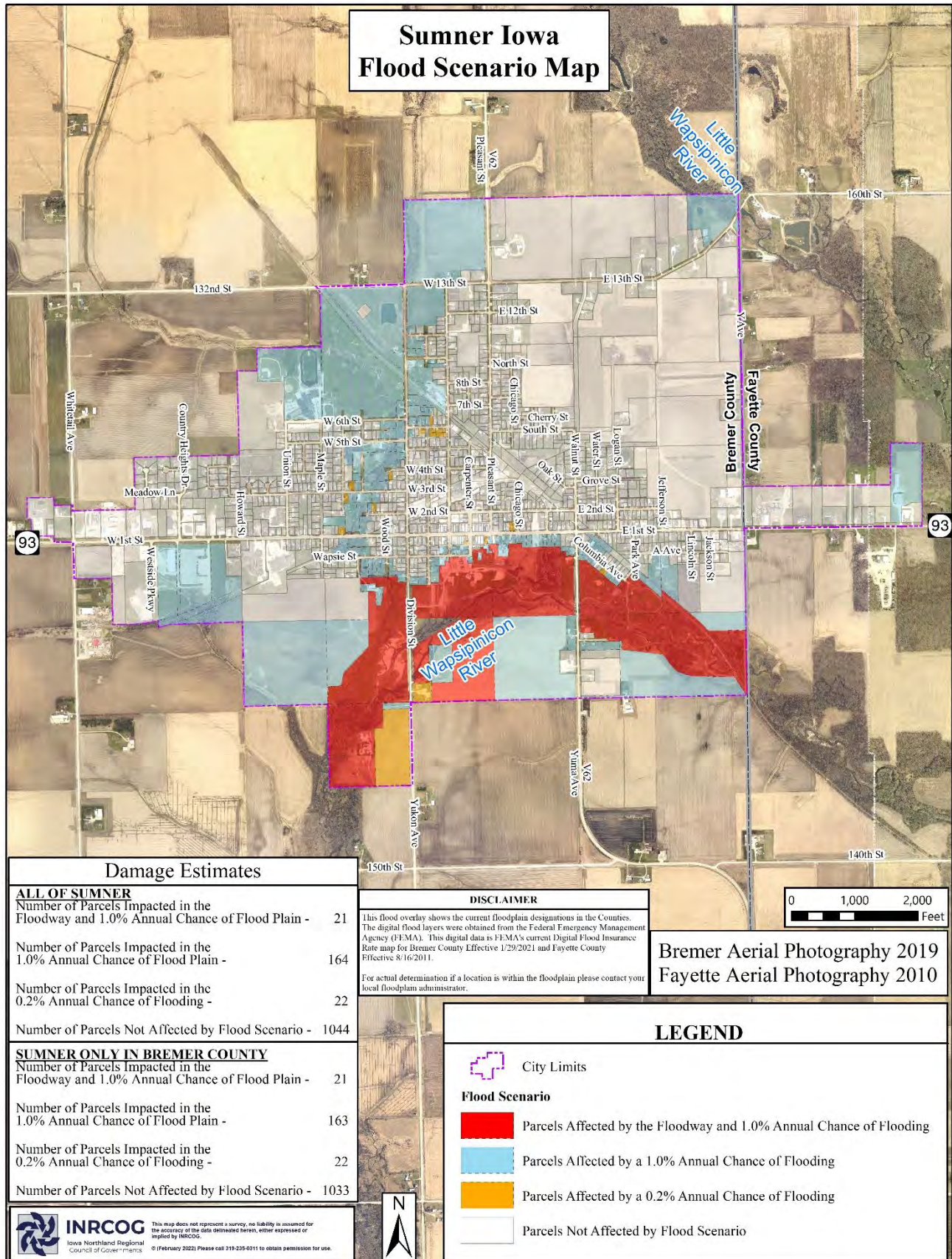
Map 3I: Flood Scenario Map City of Readlyn



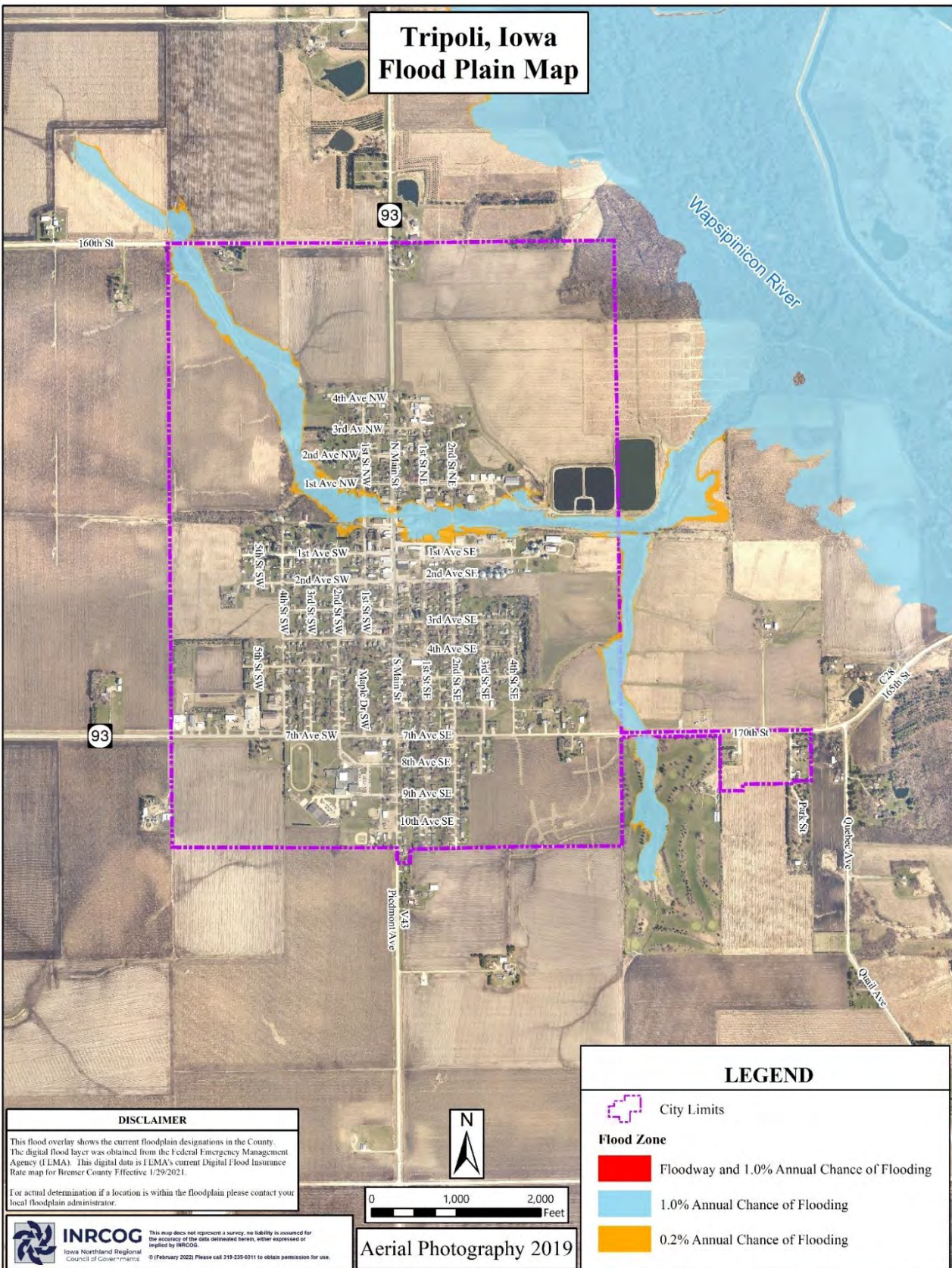
Map 3m: Flood plain Map City of Sumner



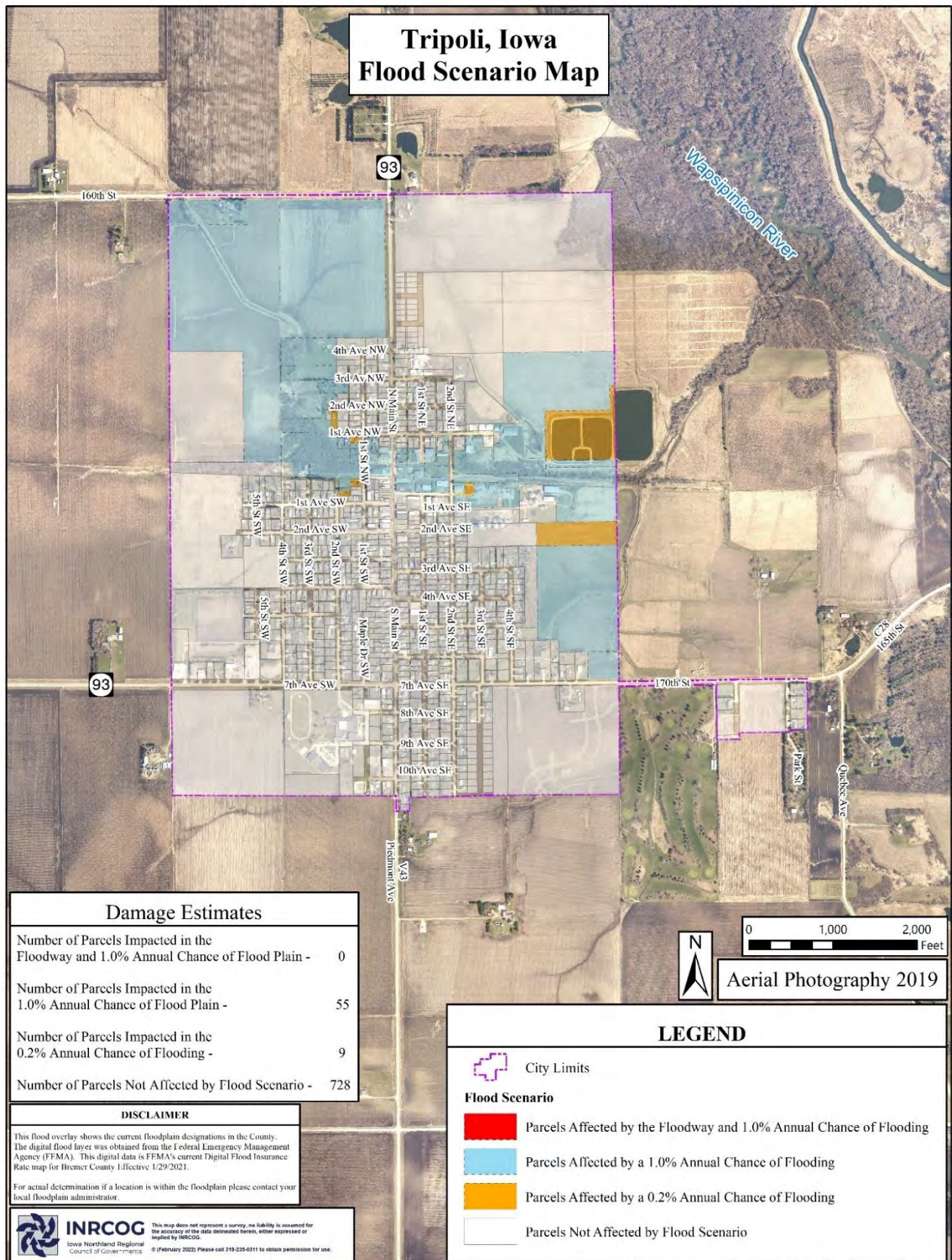
Map 3n: Flood Scenario Map City of Sumner



Map 30: Flood Plain Map City of Tripoli



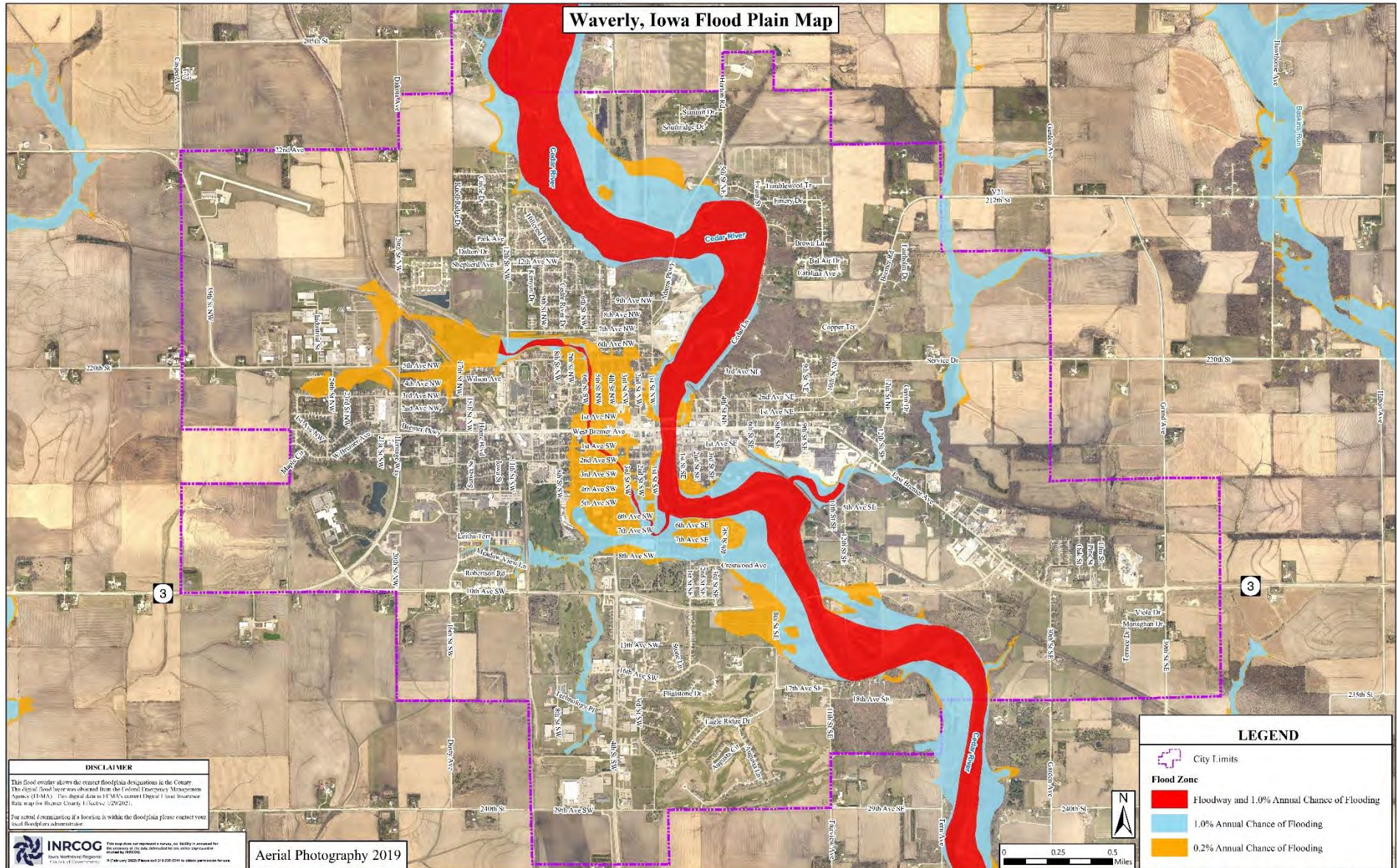
Map 3p: Flood Scenario Map City of Tripoli





## 2022 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

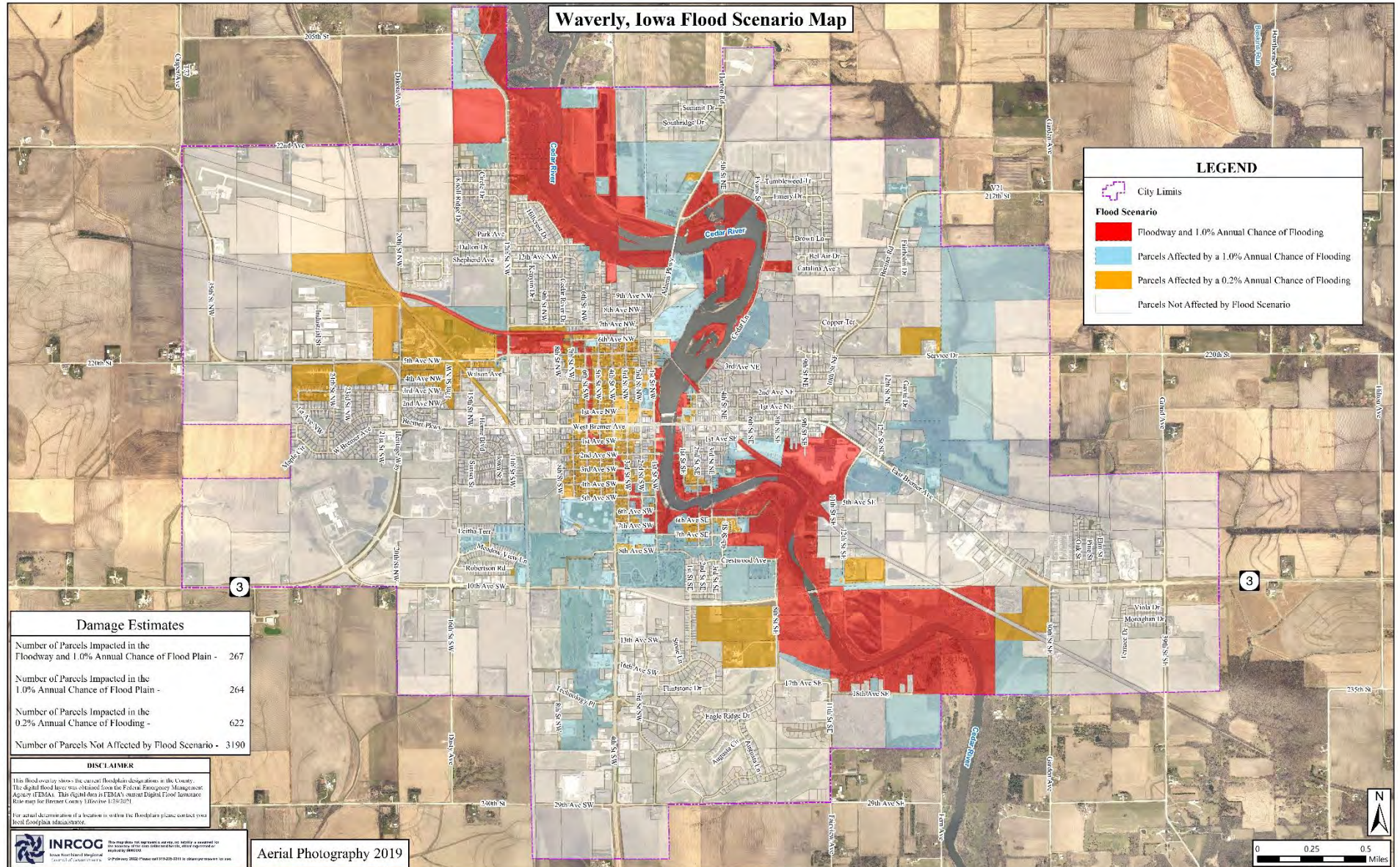
Map 3q: Flood Plain Map City of Waverly





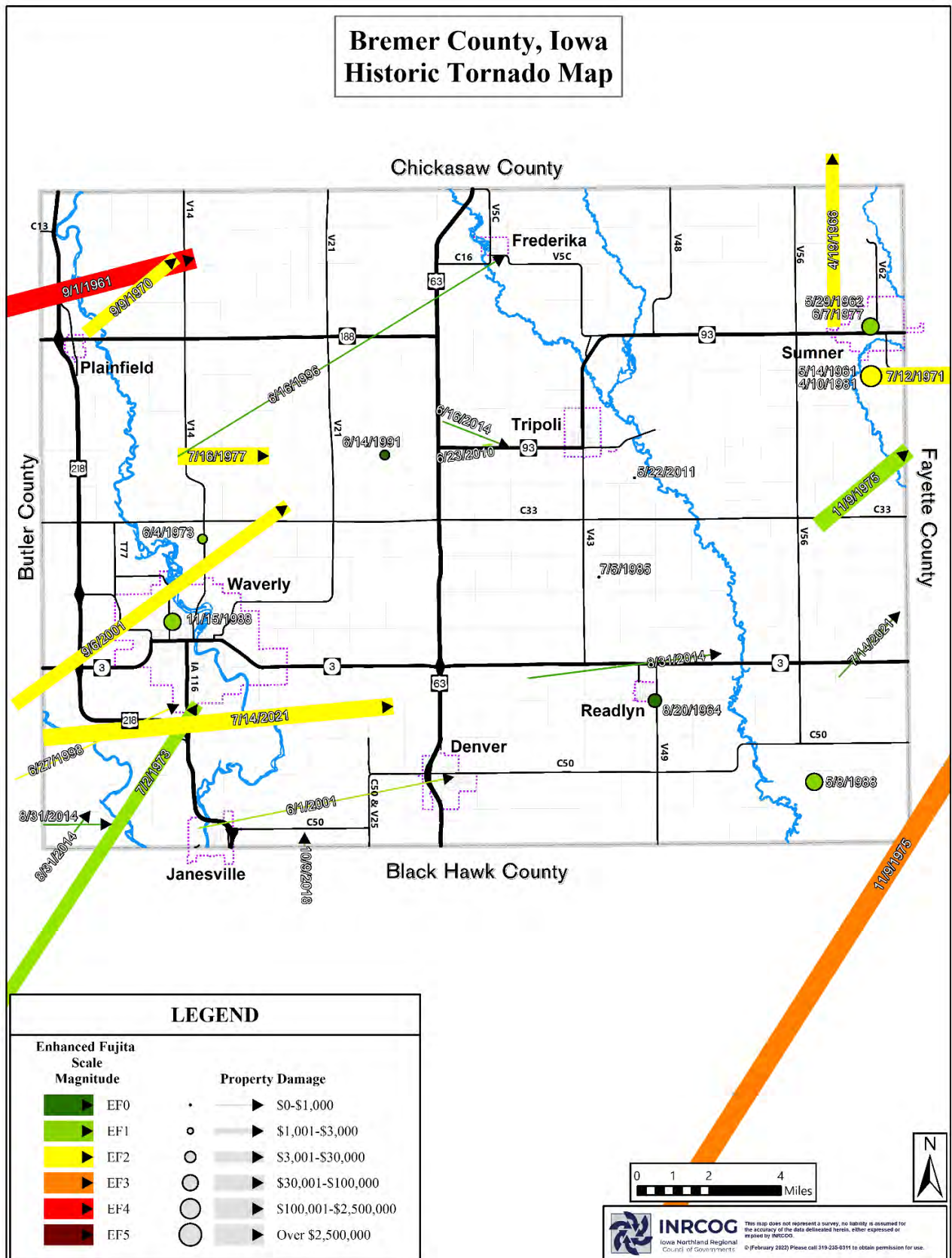
## 2022 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

Map 3r: Flood Scenario Map City of Waverly



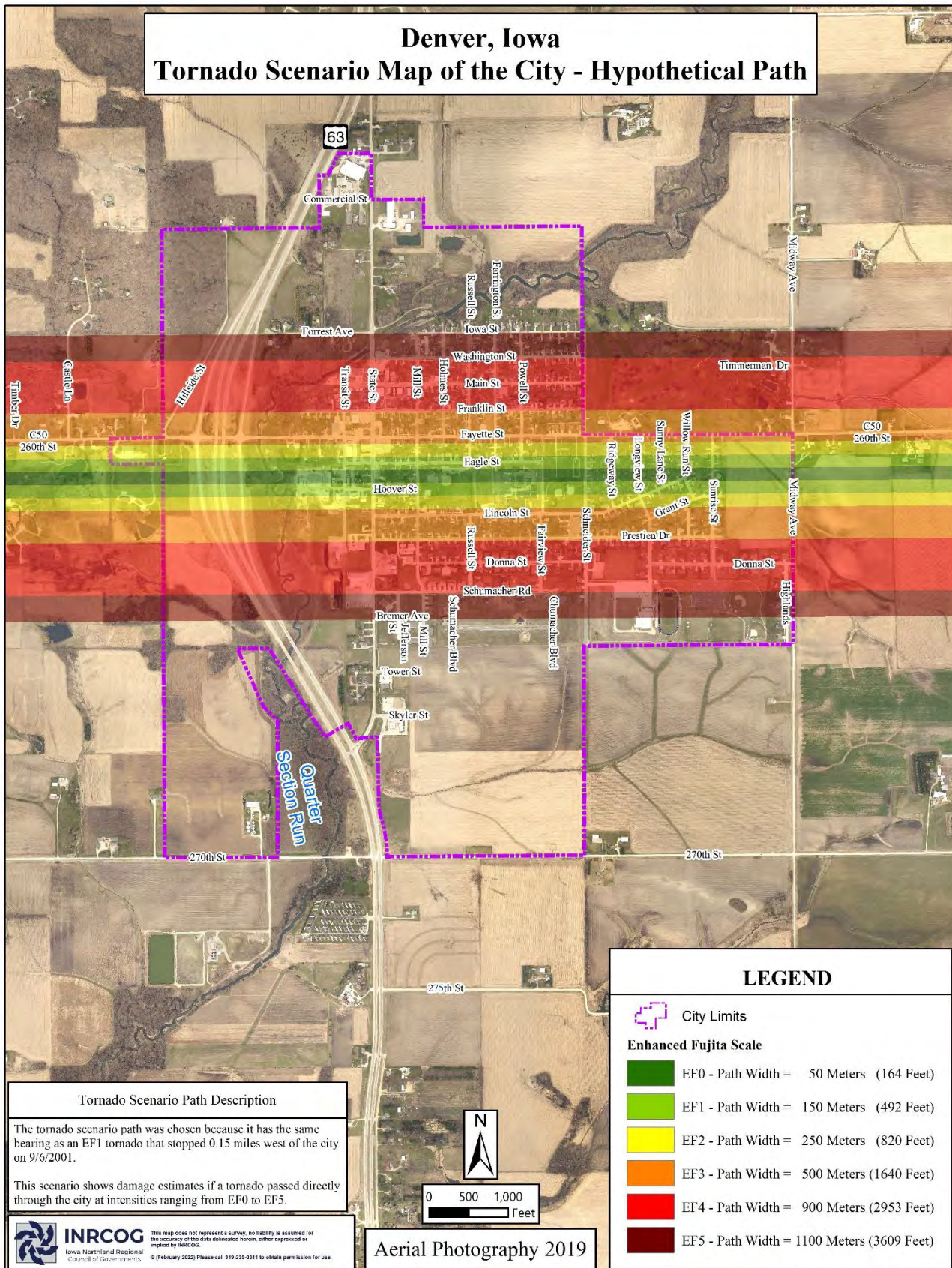


Map 4a: Historic Tornado Map of the County



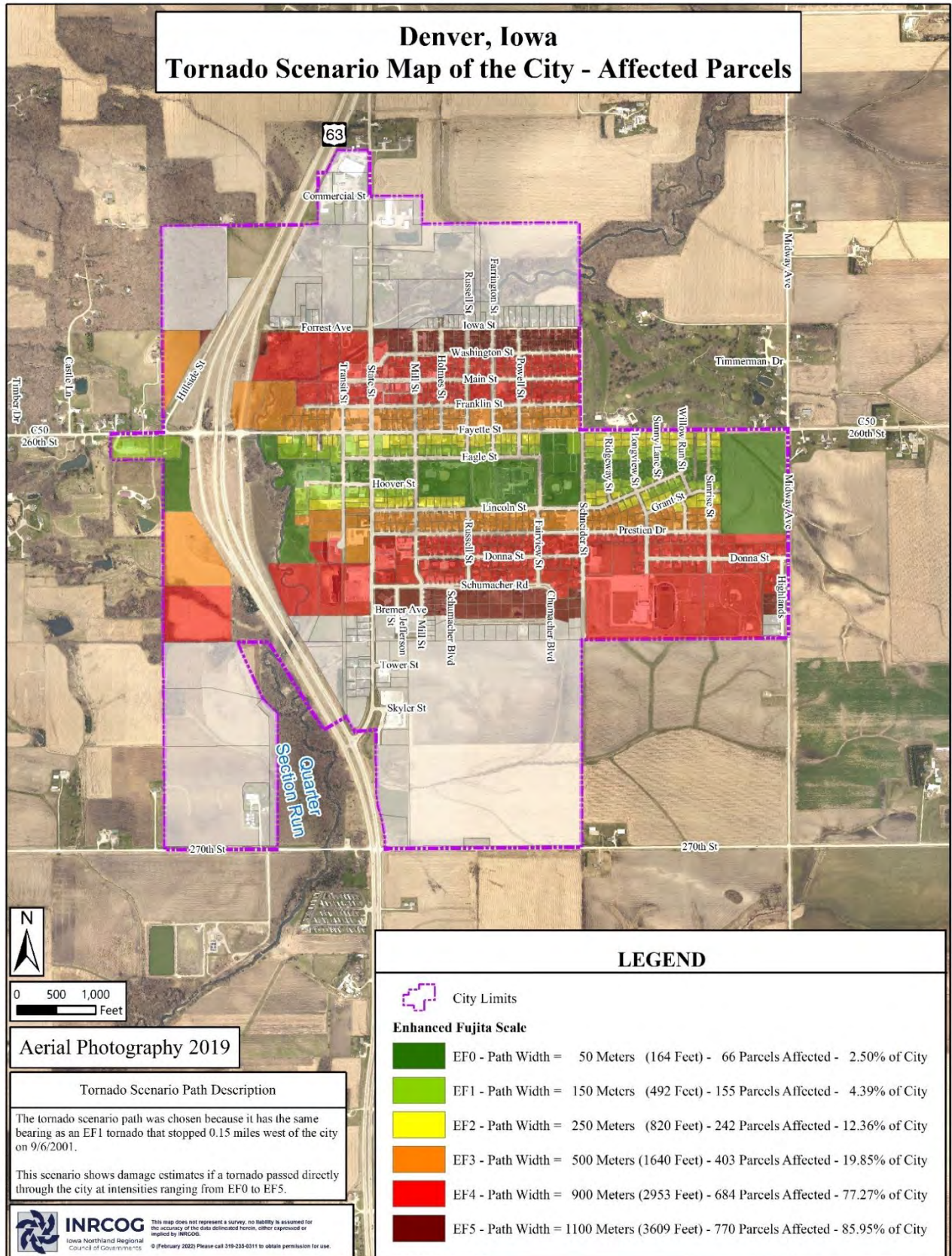
Map 4b: Tornado Scenario Map City of Denver

Hypothetical Path



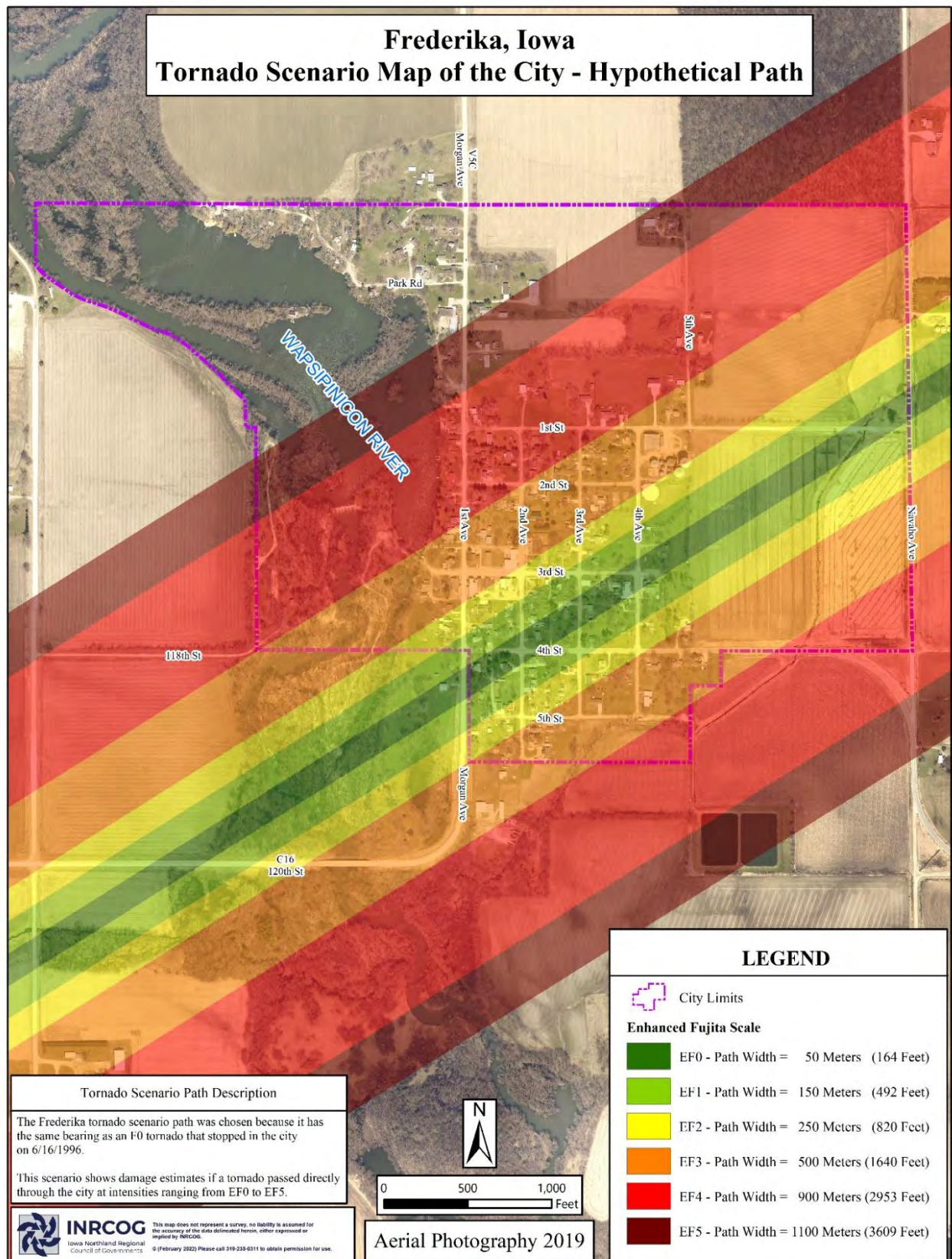
Map 4c: Tornado Scenario Map of City of

Denver-Affected Parcels



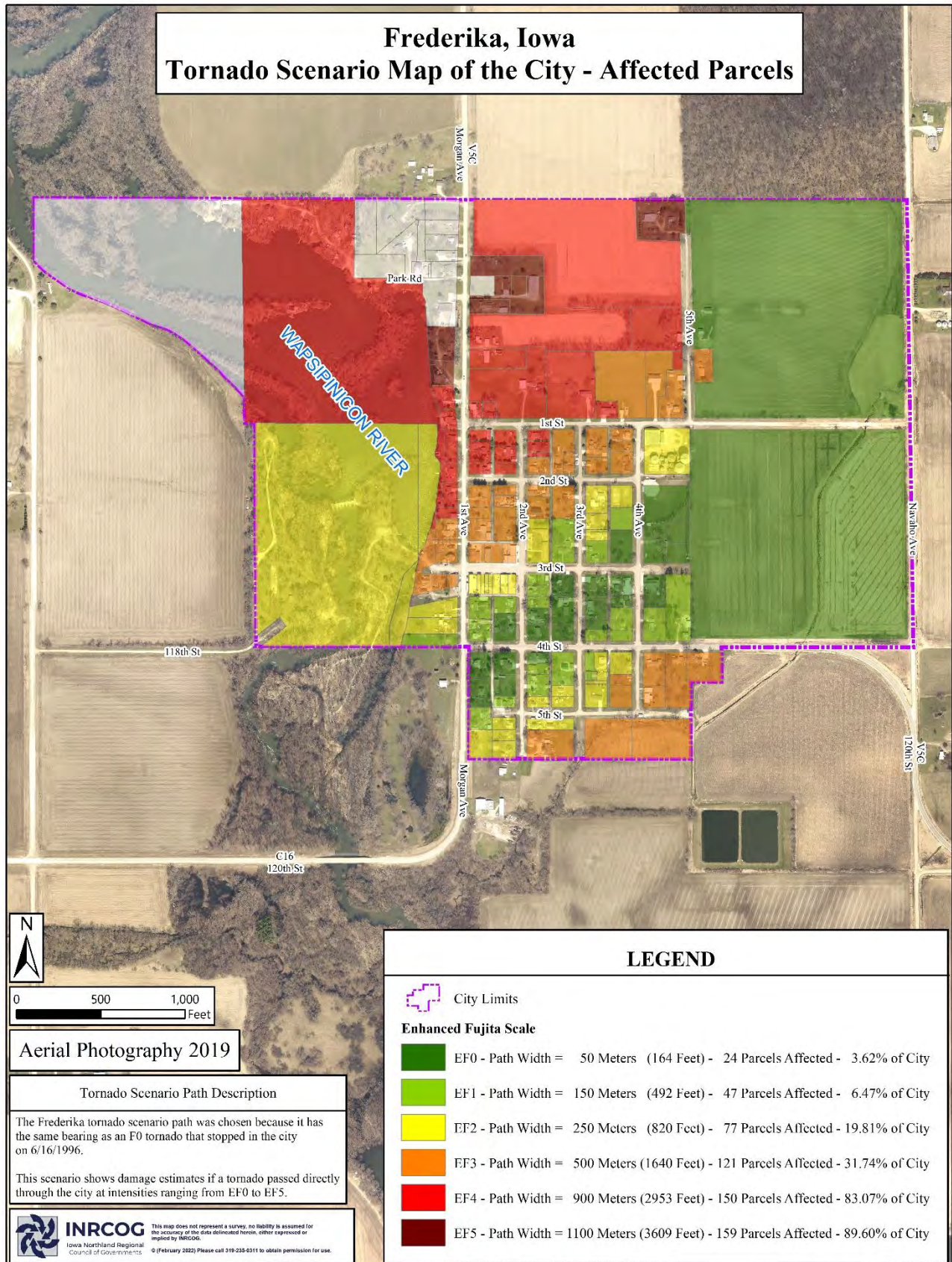
Map 4d: Tornado Scenario Map City of

Frederika Hypothetical Path



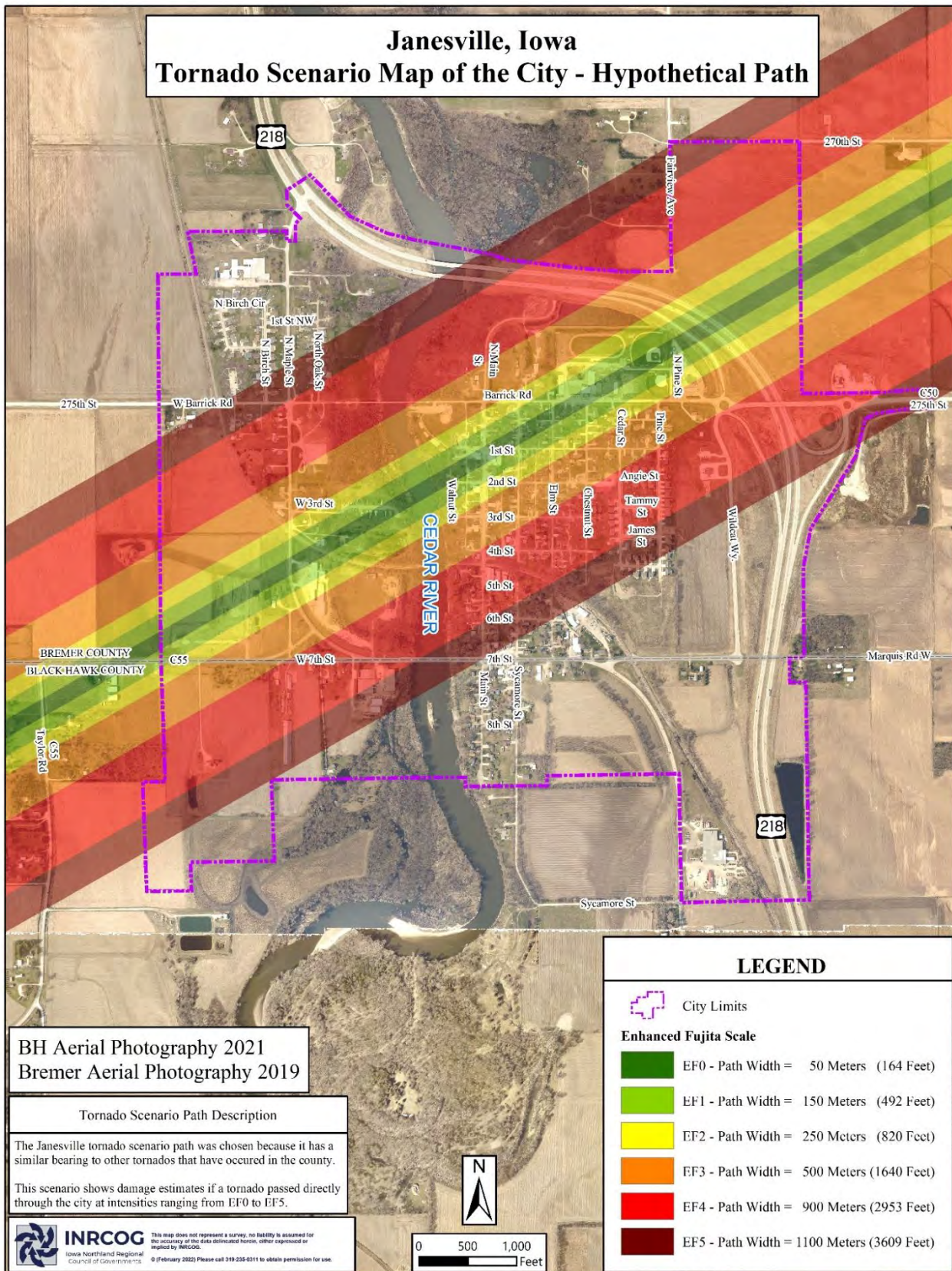
Map 4e: Tornado Scenario Map of City of

Frederika Affected Parcels



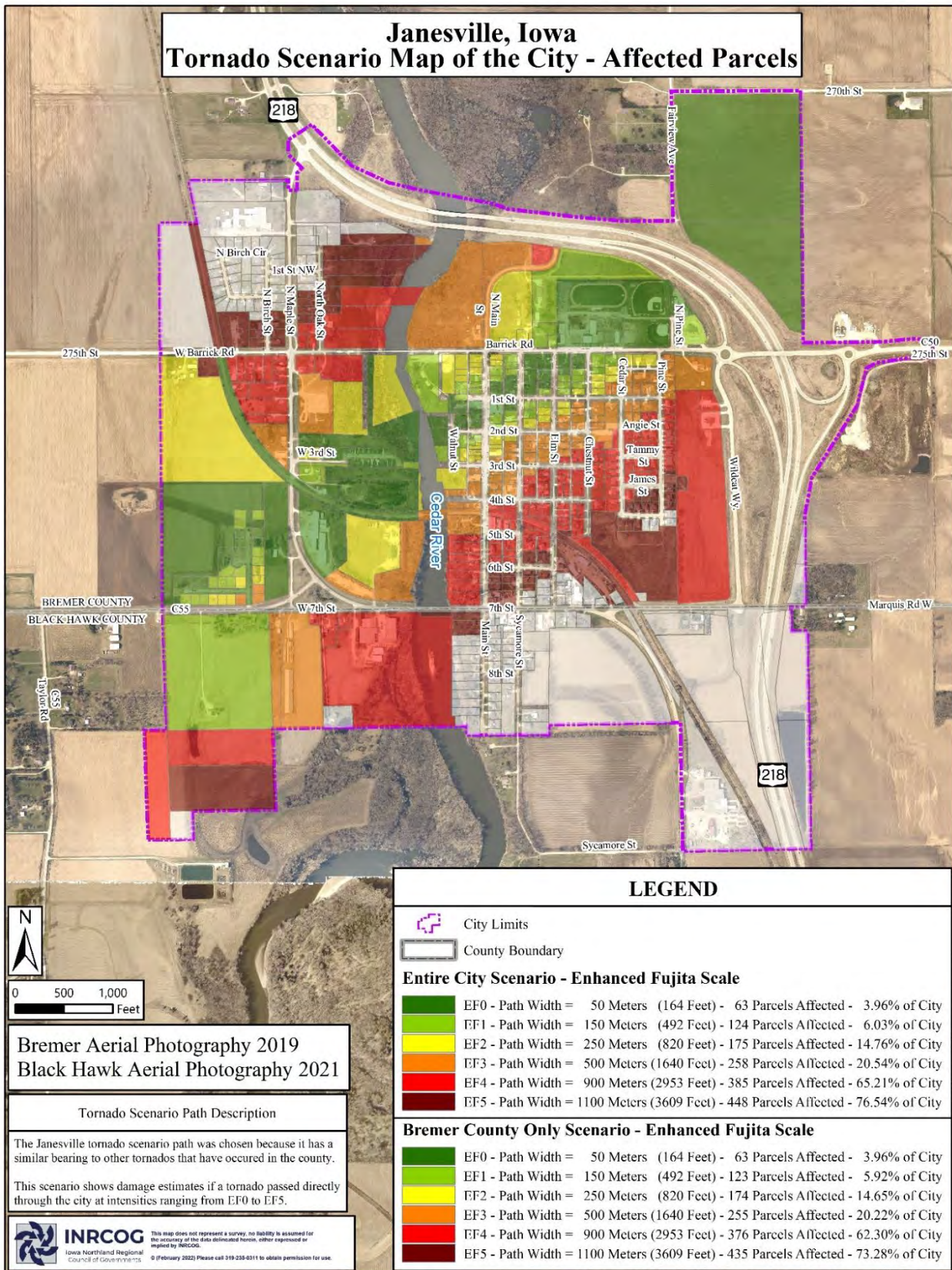
Map 4f: Tornado Scenario Map City of Janesville

Hypothetical Path



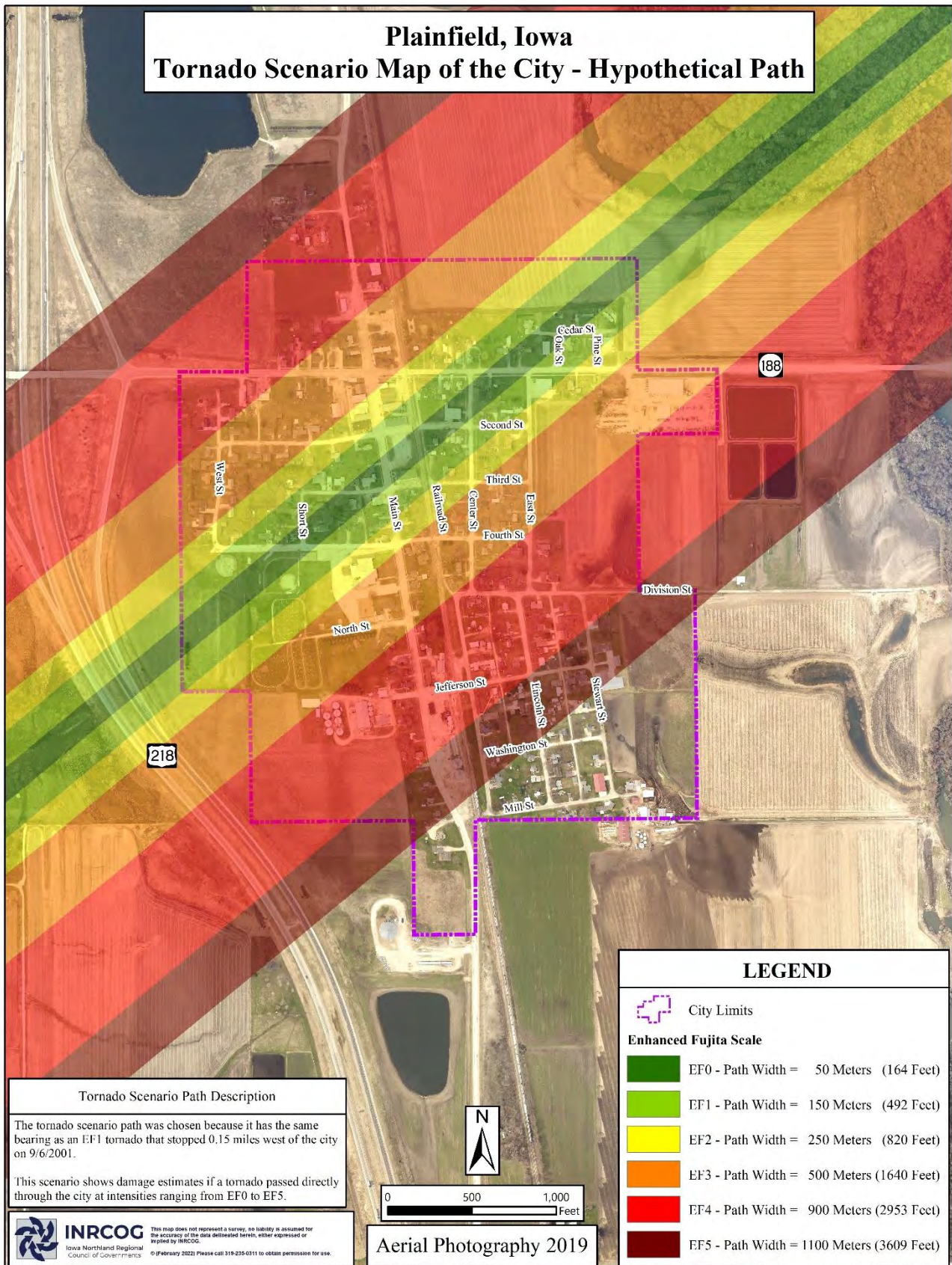
Map 4g: Tornado Scenario Map City of

Janesville Affected Parcels



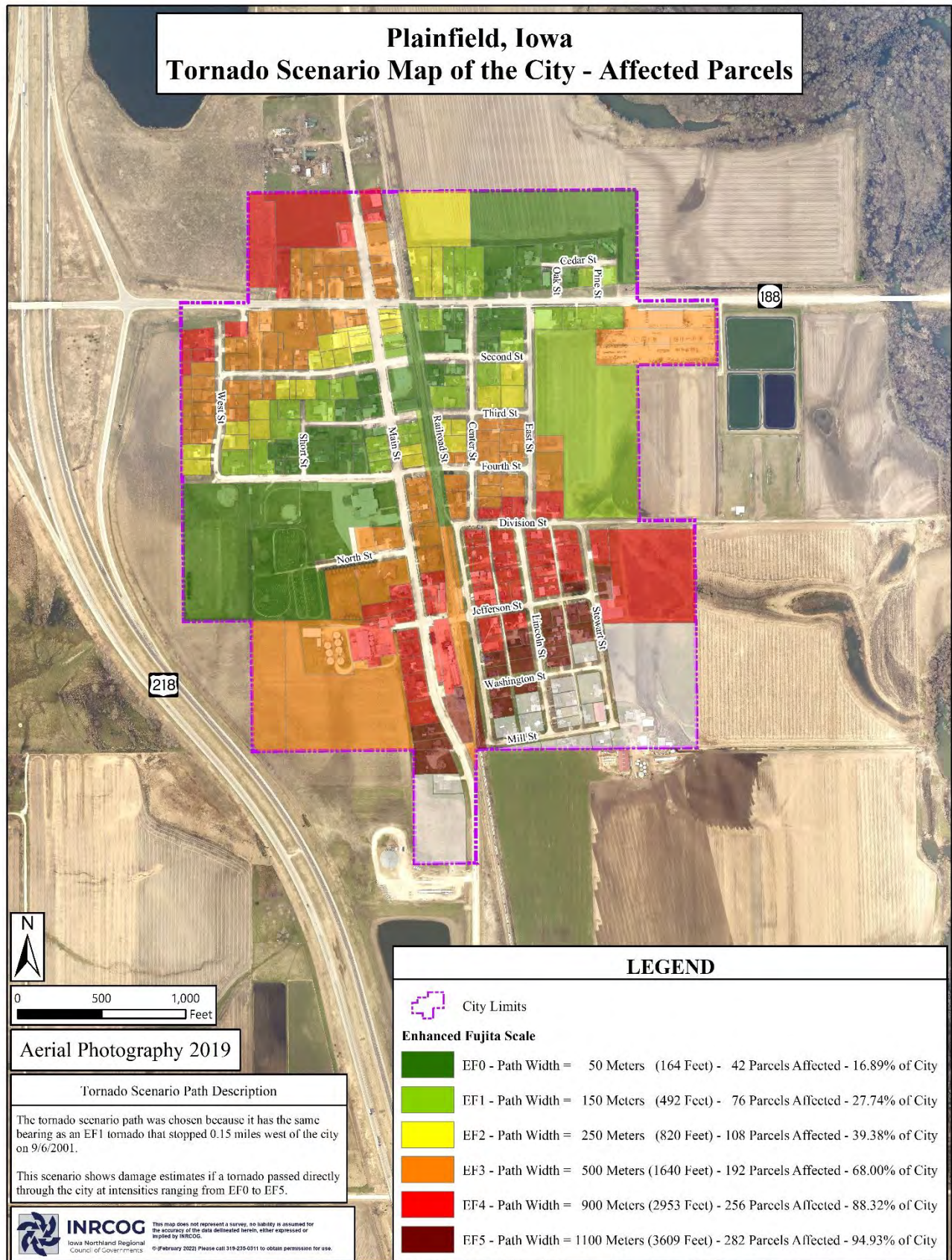
Map 4h: Tornado Scenario Map City of

Plainfield Hypothetical Path



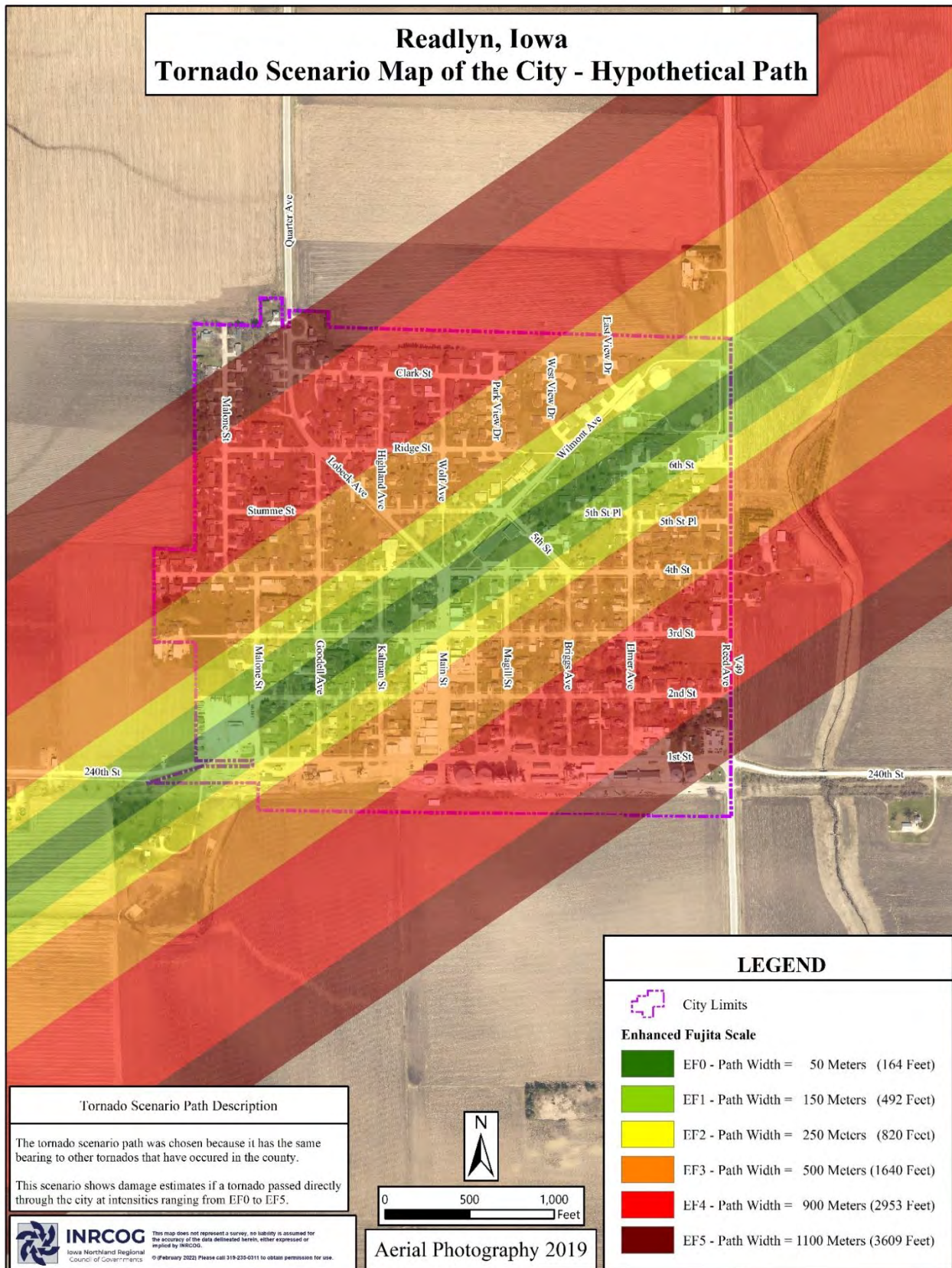
Map 4i: Tornado Scenario Map City of Plainfield

Affected Parcels



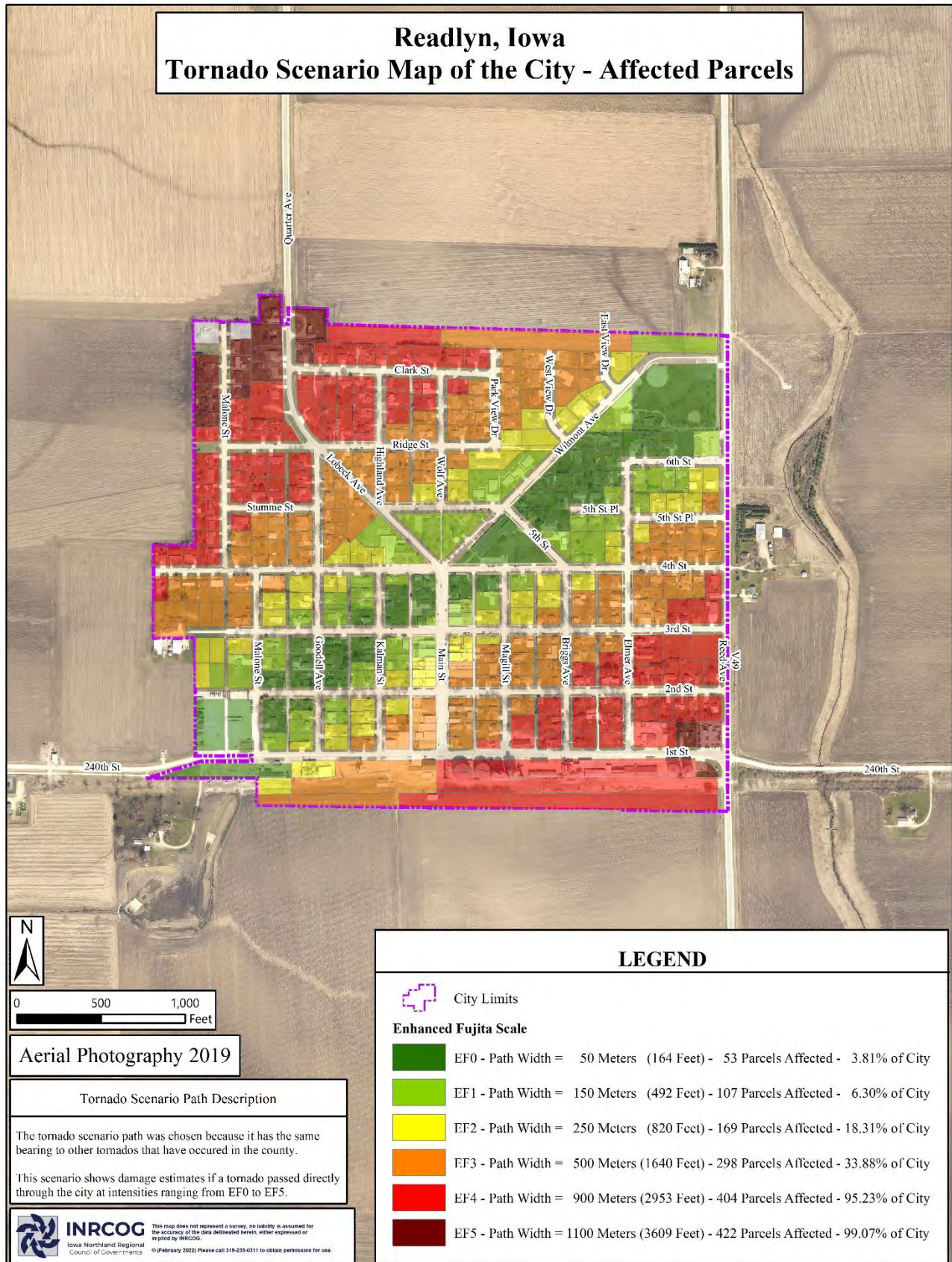
Map 4j: Tornado Scenario Map City of Readlyn

Hypothetical Path



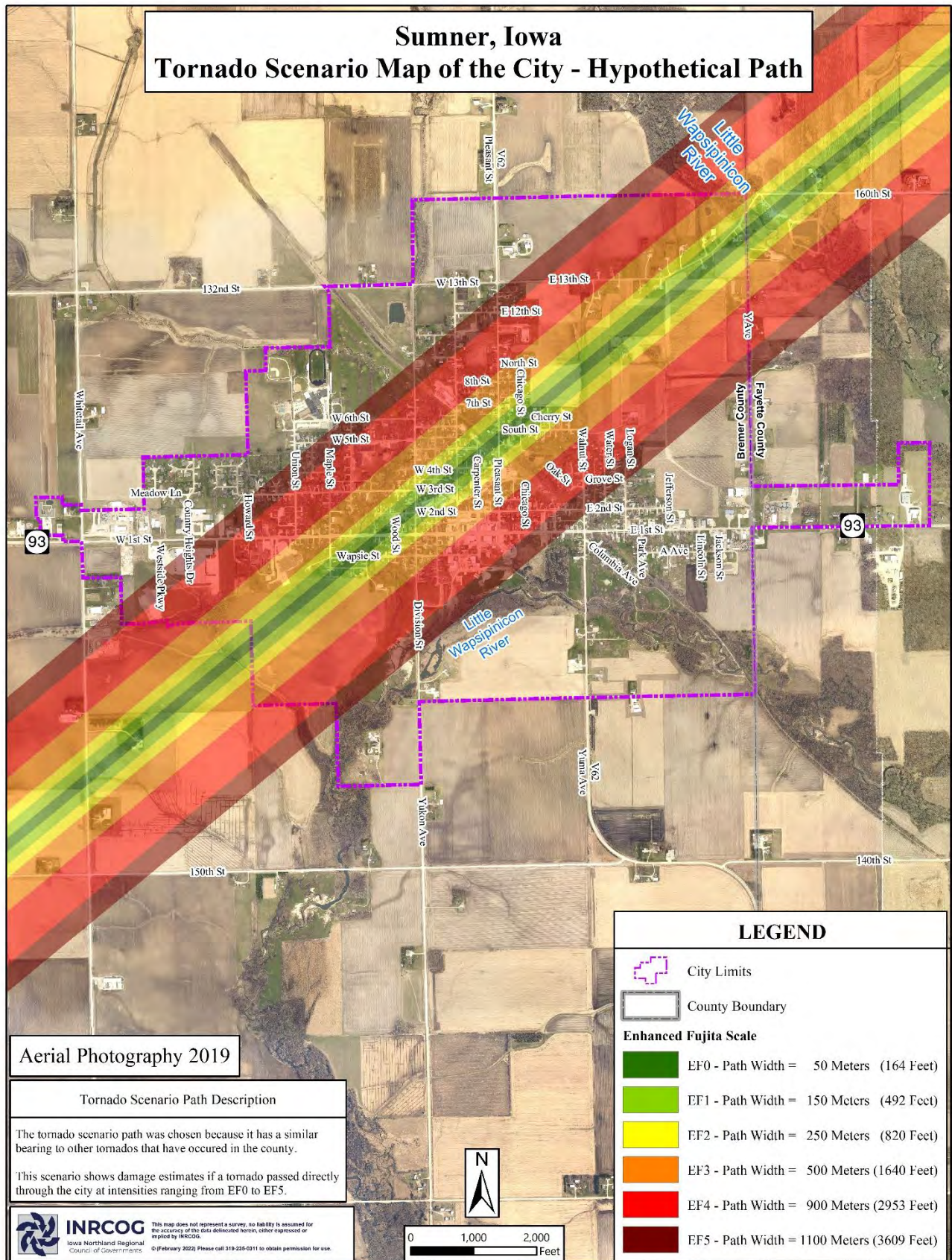
Map 4k: Tornado Scenario Map City of Readlyn

Affected Parcels



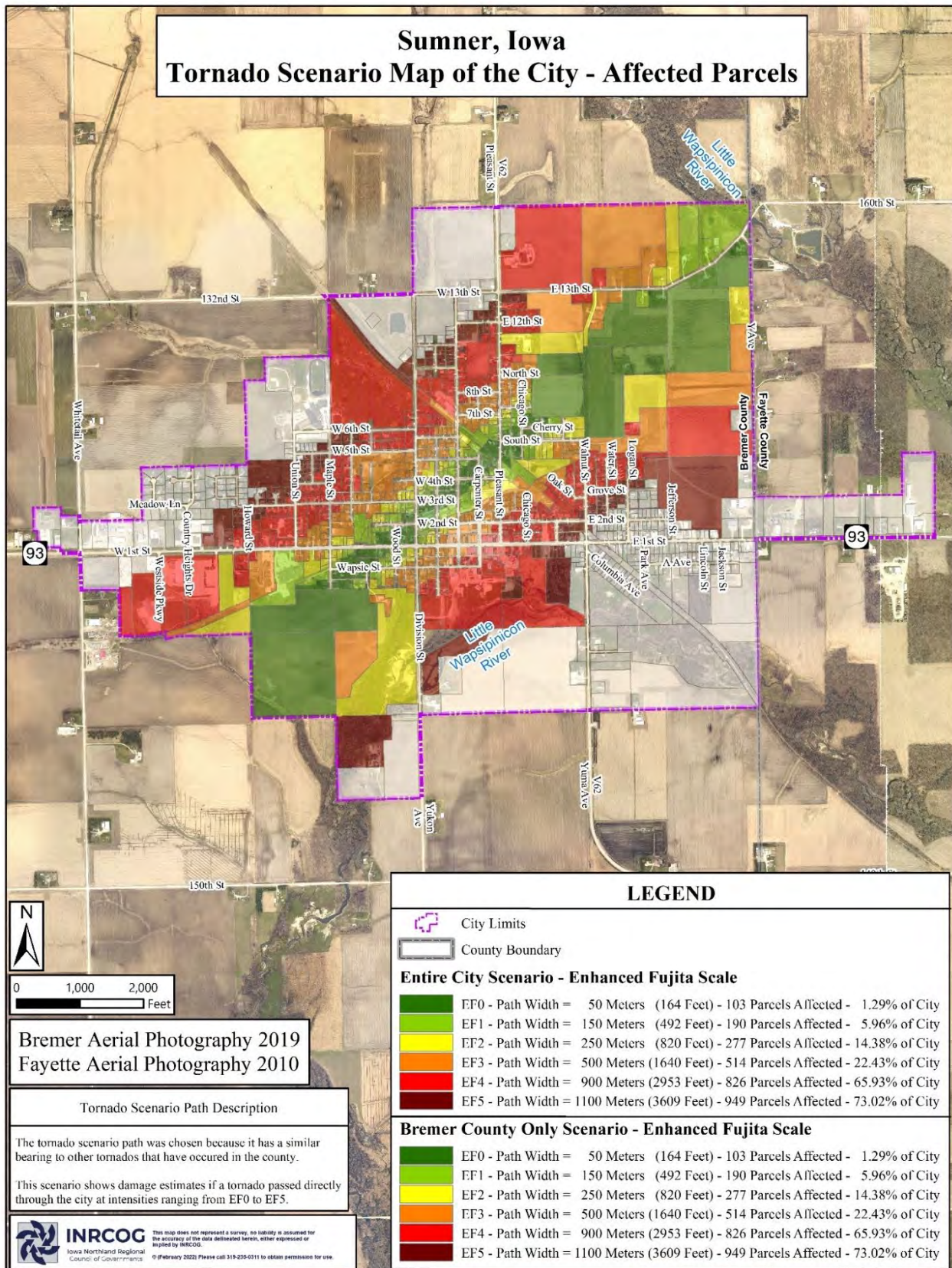
Map 4I: Tornado Scenario Map City of Sumner

Hypothetical Path



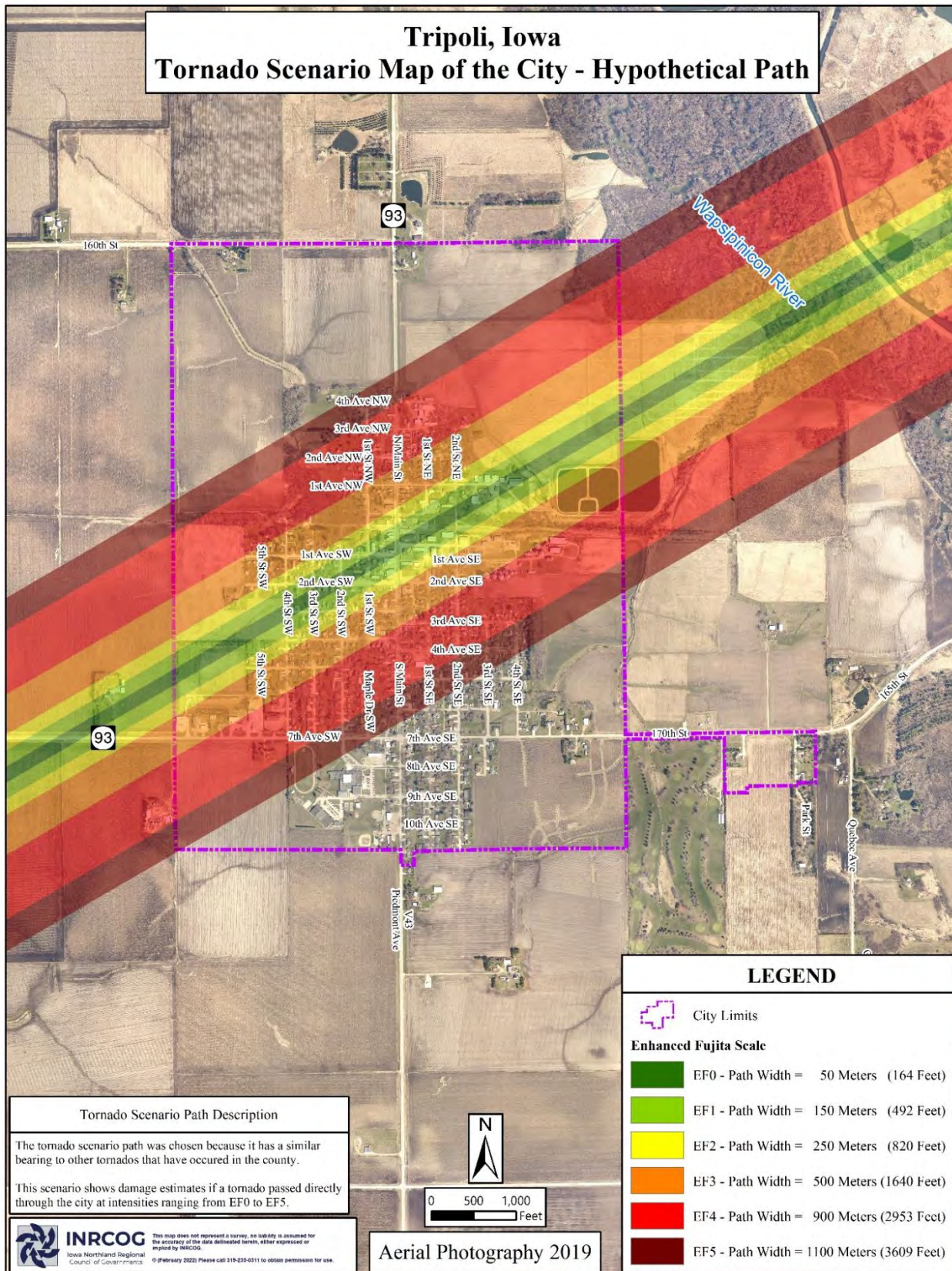
Map 4m: Tornado Scenario Map City of Sumner

Affected Parcels



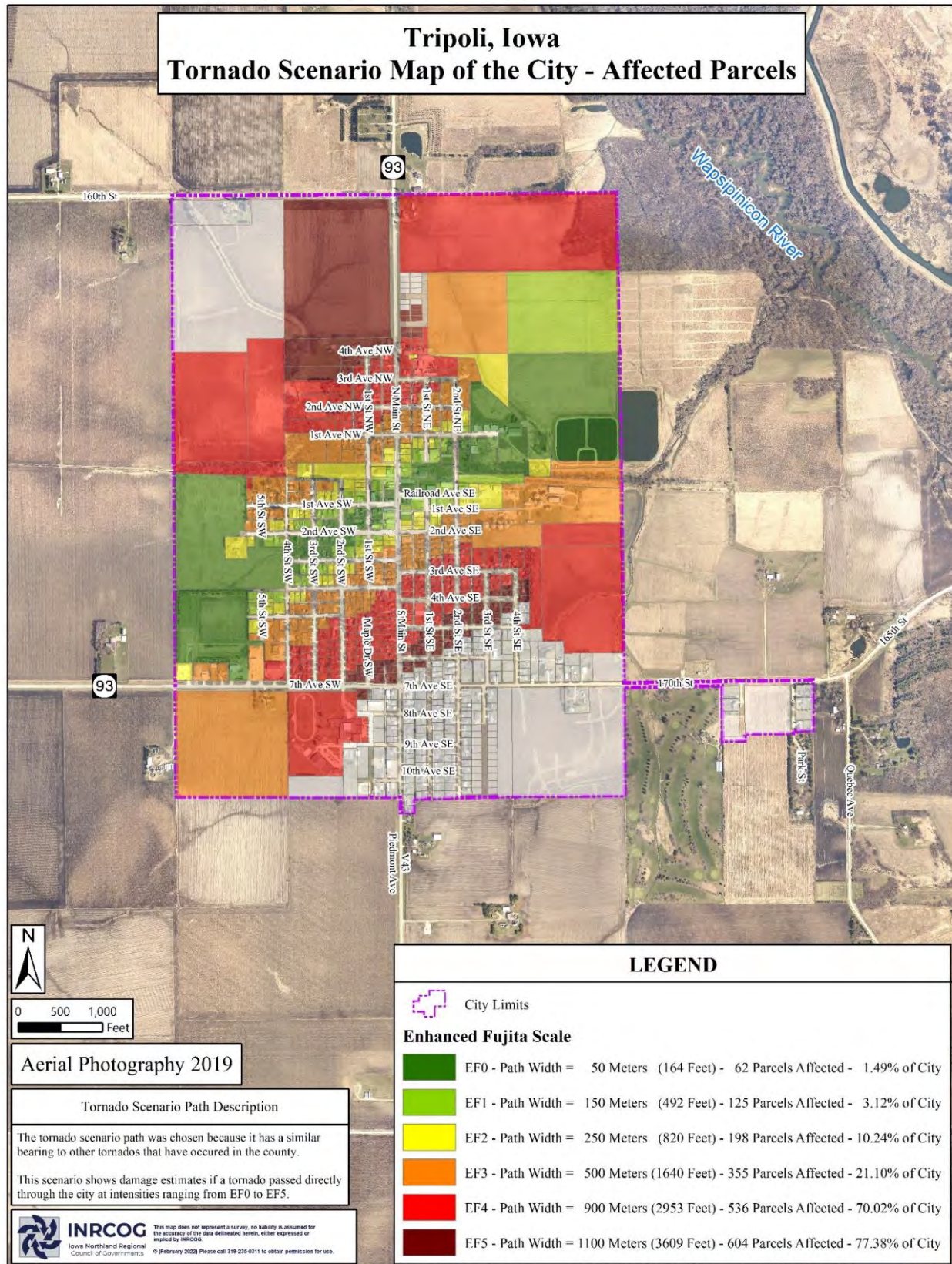
Map 4n: Tornado Scenario Map City of Tripoli

Hypothetical Path



Map 4o: Tornado Scenario Map City of Tripoli

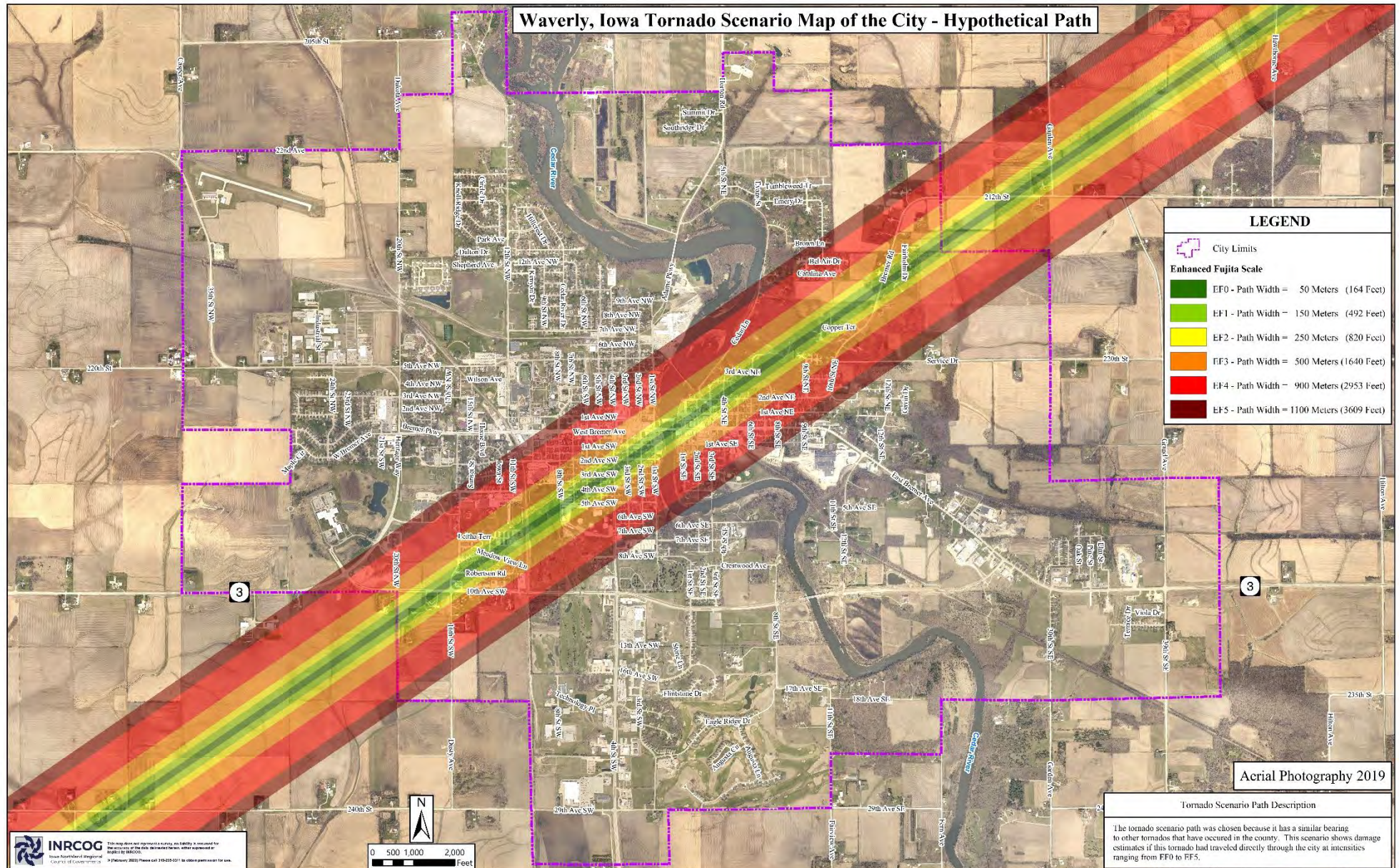
Affected Parcels





## 2022 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

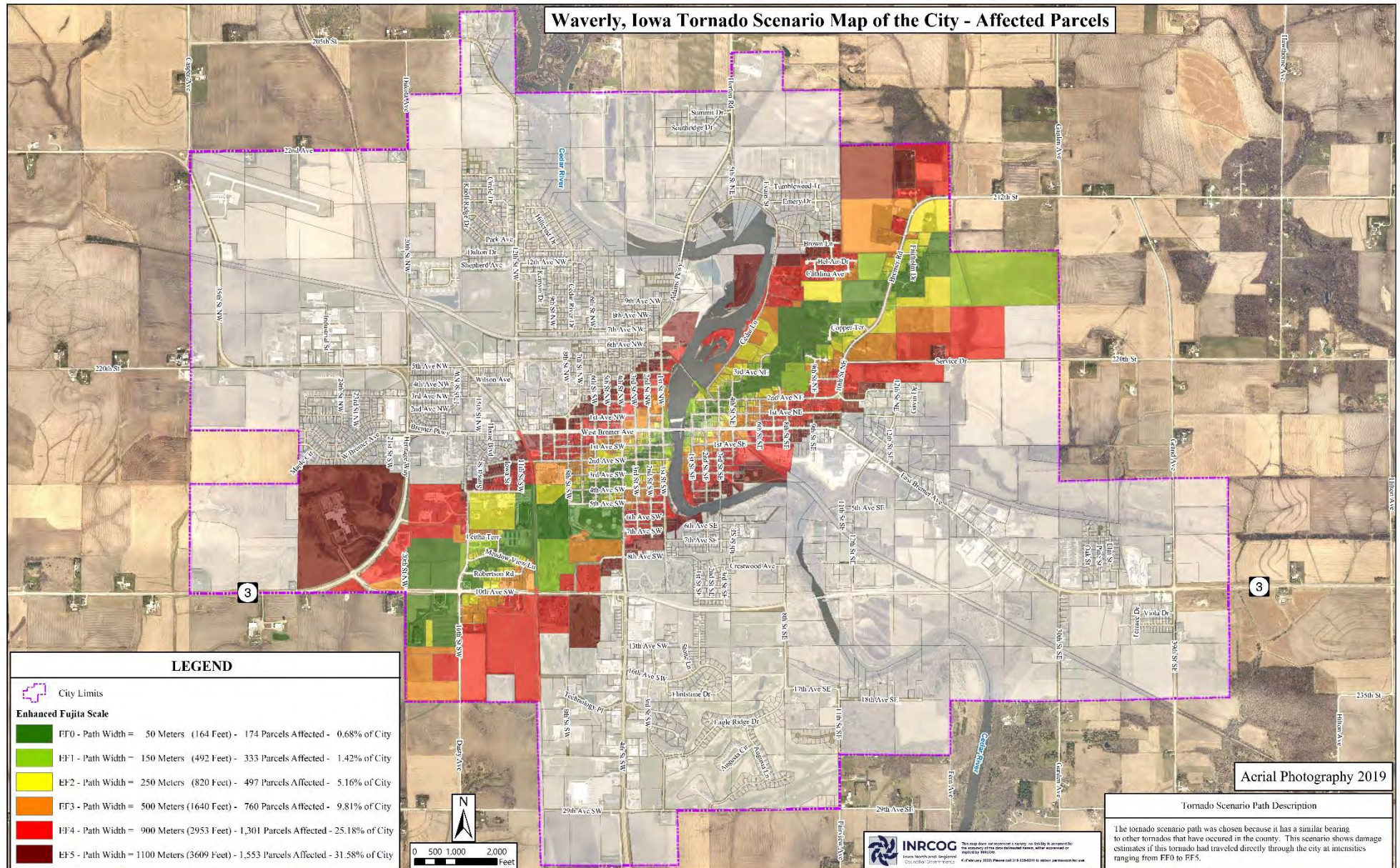
Map 4p: Tornado Scenario Map City of Waverly Hypothetical Path





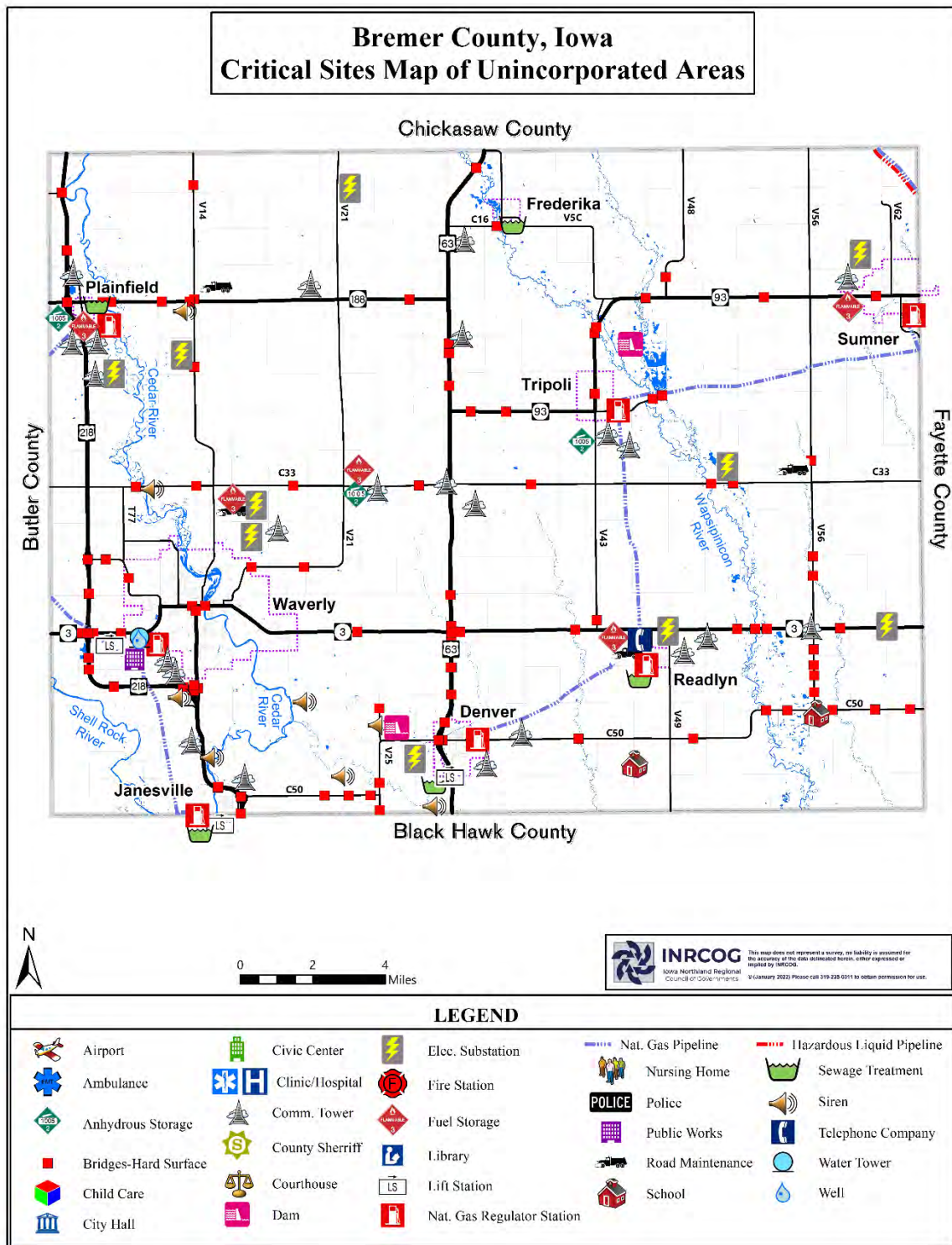
## 2022 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

Map 4q: Tornado Scenario Map City of Waverly Affected Parcels

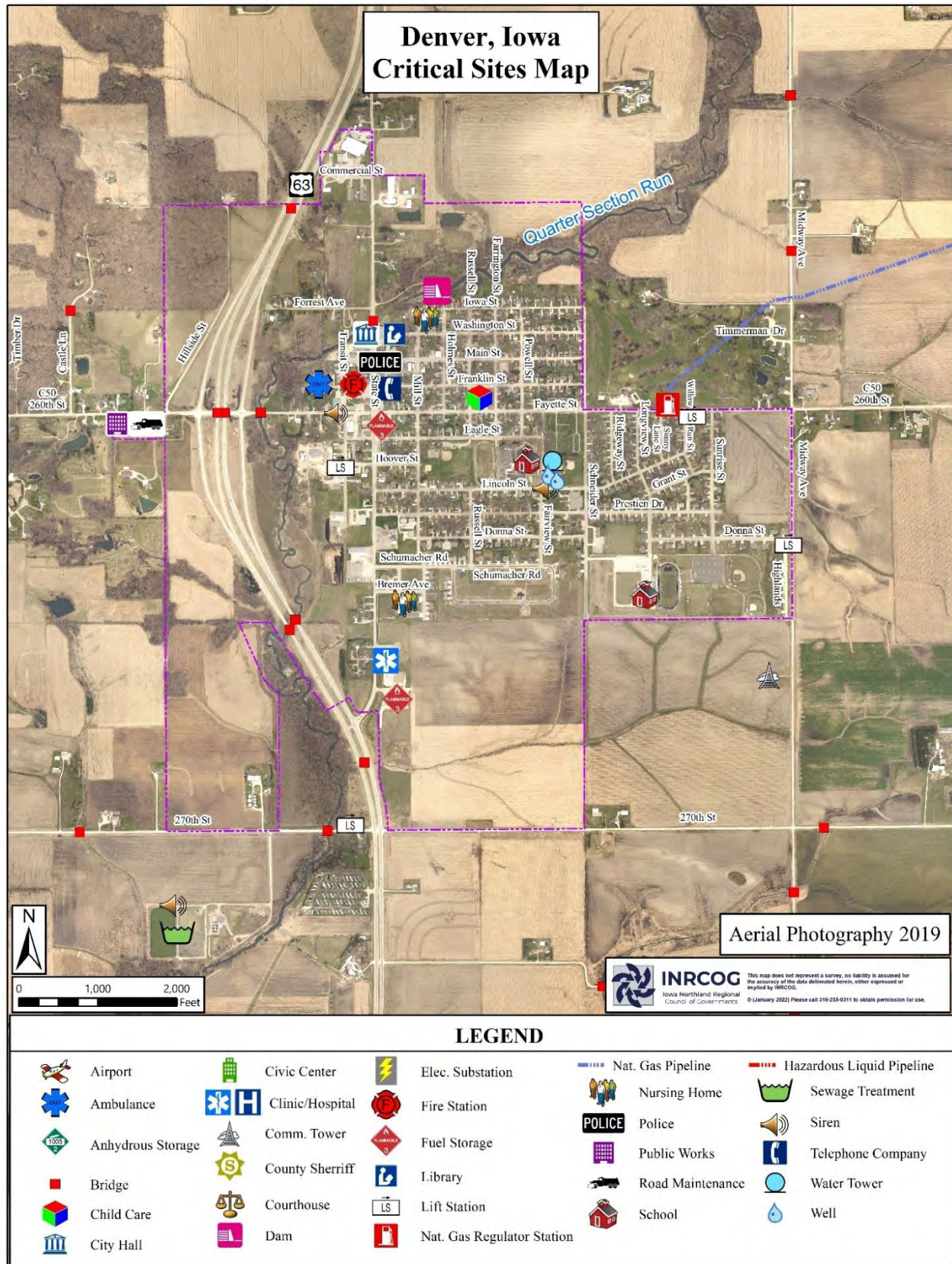




Map 5a: Critical Site Map of the County



Map 5b: Critical Sites Map City of Denver



Map 5c: Critical Sited Map City of Frederika



Map 5d: Critical Sites Map City of Janesville



Map 5e: Critical Sites Map City of Plainfield

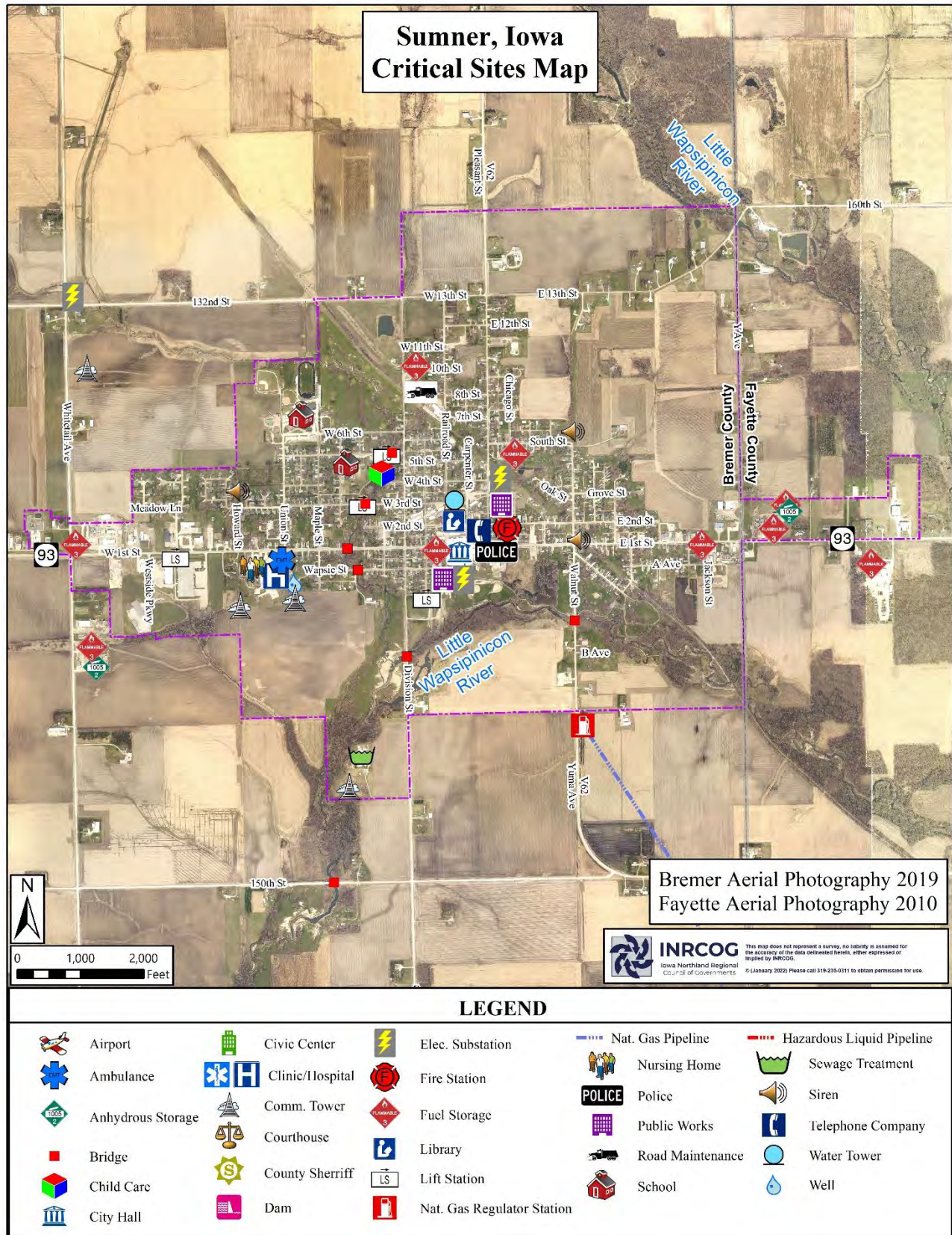




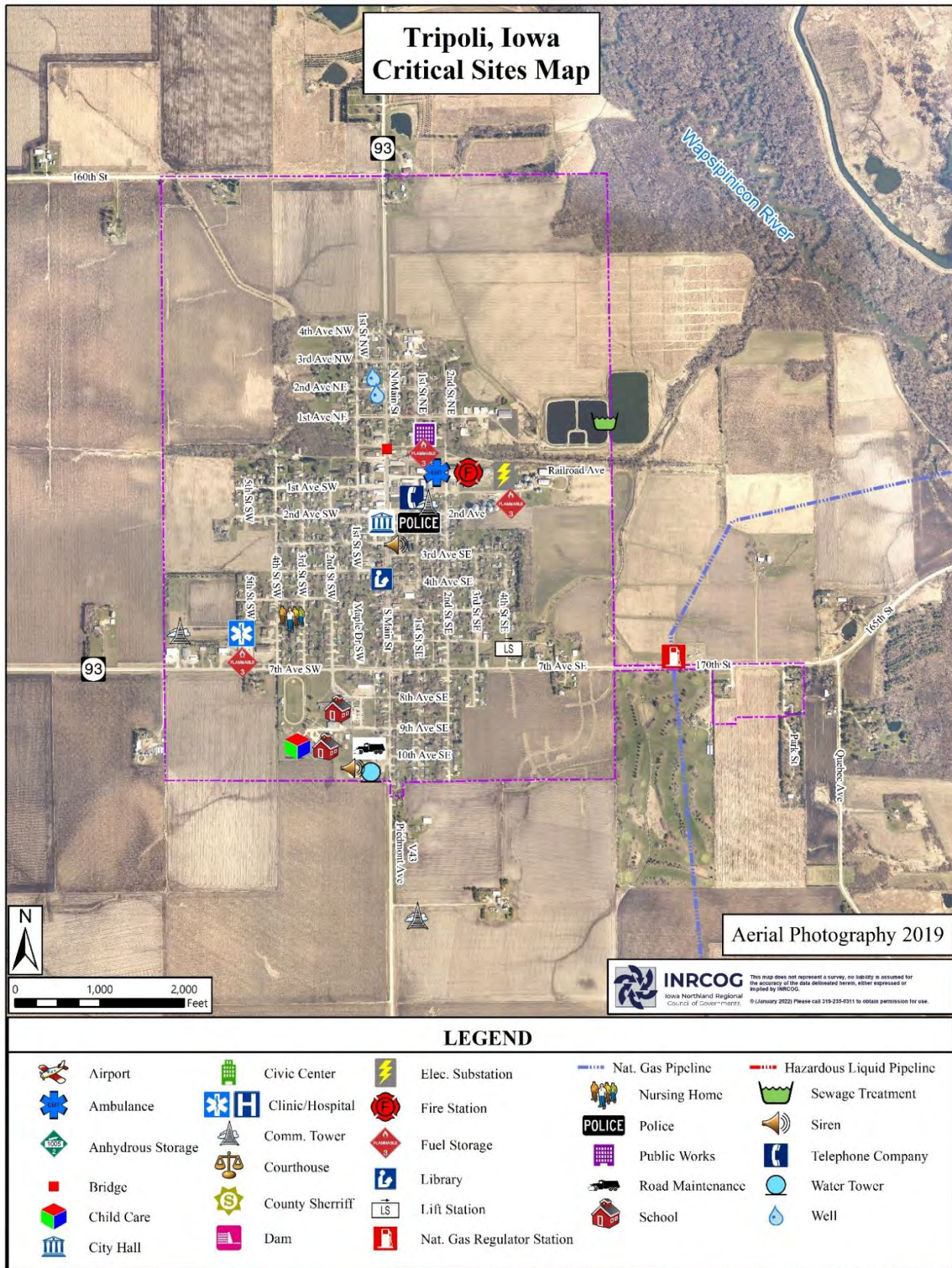
Map 5f: Critical Sites Map City of Readlyn



Map 5g: Critical Sites Map City of Sumner



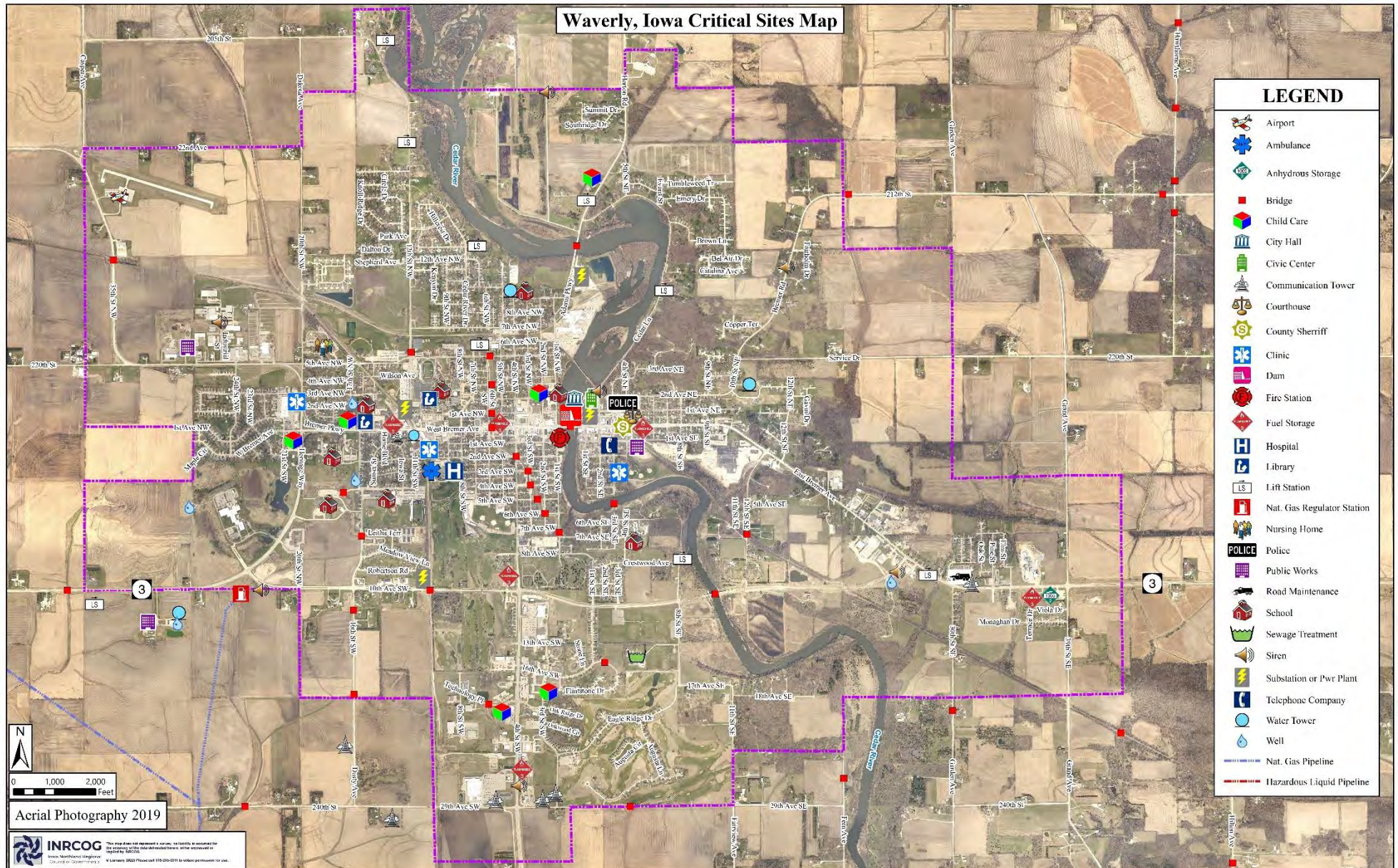
Map 5h: Critical Sites Map City of Tripoli





## 2022 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

Map 5i: Critical Sites Map City of Waverly









**Attachment 2: Plan adoption Resolutions**

<b><u>JURISDICTION</u></b>	<b><u>DATE OF PLAN ADOPTION</u></b>
Bremer County	May 9, 2022
City of Denver	June 6, 2022
City of Frederika	June 15, 2022
City of Janesville	August 8, 2022
City of Plainfield	June 14, 2022
City of Readlyn	June 13, 2022
City of Sumner	June 6, 2022
City of Tripoli	June 20, 2022
City of Waverly	June 20, 2022
Denver CSD	August 10, 2022
Janesville CSD	July 11, 2022
Sumner-Fredericksburg CSD	July 11, 2022
Tripoli CSD	June 15, 2022
Wapsie Valley CSD	July 18, 2022

Bremer County

RESOLUTION # 22-43

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 ("Plan") for Bremer County; and,

WHEREAS, Bremer County, Iowa has contracted with the Iowa Northland Regional Council of Governments for the development of said Plan; and,

WHEREAS, the Multi-Jurisdictional Hazard Mitigation Planning Committee of 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 9<sup>th</sup> day of May 2022.

Dwight Kilduff  
Chair

ATTEST:

Sherry Self  
County Auditor



City of Denver

RESOLUTION NO. 58-2022

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 provided funding 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 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 6<sup>th</sup> day of June, 2022.

Rod Diercks  
Rod Diercks, Mayor

ATTEST:

Larry Fahey  
Larry Fahey, City Clerk/Admin.

City of Frederika

RESOLUTION 202206-1

**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 provided funding 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 June 2022.

  
Mayor

ATTEST:

  
City Clerk

City of Janesville

RESOLUTION #1779-22

**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 provided funding 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 8<sup>th</sup> day of August 2022.

  
Mayor

ATTEST:

  
City Clerk

City of Plainfield

RESOLUTION NO. 2022-18

A RESOLUTION OF THE CITY COUNCIL OF THE CITY 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 provided funding 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 14<sup>th</sup> day of June, 2022.

Roll Call Vote- Ayes: 3 Nays: 0 Absent: 2

Attest: Brittney Lentz Mayor  
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 June 14, 2022, at which all Council Members were present, except

Douglas Schmalz.

I further certify that Franzen moved for adoption of said resolution and that Salvanz seconded said motion."

Brittney Lentz  
Brittney Lentz, City Clerk/Treasurer

City of Readlyn

RESOLUTION # 2022-17

A RESOLUTION OF THE CITY COUNCIL OF READLYN, IOWA,  
ADOPTING A MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN  
FOR BREMER COUNTY.

WHEREAS, the City Council of the City of Readlyn, 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 provided funding 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 Readlyn, 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 Readlyn, 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 13<sup>th</sup> day of June, 2022.

John Williams  
Mayor

ATTEST:

John J. Buelow  
City Clerk

City of Sumner

RESOLUTION #638

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 provided funding 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 6 day of June, 2022.

  
Billy Lehmkuhl, Mayor

ATTEST:

  
Lisa Oberbroeckling, City Clerk

City of Tripoli

RESOLUTION 2022-34

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 provided funding 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,

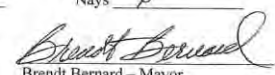
NOW THEREFORE BE IT RESOLVED THAT the City Council of the City of Tripoli, Iowa herewith adopts the Bremer County Multi-Jurisdictional Hazard Mitigation Plan, incorporating into the Plan citizen comments and future FEMA and IHSEMD recommendations.

PASSED AND ADOPTED this 20<sup>th</sup> day of June, 2022.

Roll Call Vote:

Ayes 04  
Ladage Bolt  
Christensen

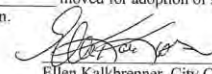
Nays 0

  
Brendt Bernard - Mayor

Attest:   
Ellen Kalkbrenner, 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 Tripoli, at a regular meeting held on this 20<sup>th</sup> day of June, 2022, at which all council members were present except na.

I further certify that Christensen moved for adoption of said resolution and that 04 seconded said motion.

  
Ellen Kalkbrenner, City Clerk/Treasurer

City of Waverly

RESOLUTION #22-82

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 provided funding 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,

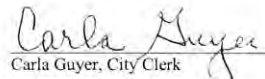
WHEREAS, a Public Hearing has been held in the City Hall for the purpose of obtaining citizen input on said Plan; and,

NOW THEREFORE BE IT RESOLVED THAT the City Council of the City of Waverly, Iowa herewith adopts the Bremer County Multi-Jurisdictional Hazard Mitigation Plan, incorporating into the Plan citizen comments and future FEMA and IHSEMD recommendations.

Passed and adopted this 20<sup>th</sup> day of June, 2022.

  
Adam P. Hoffman, Mayor

ATTEST:

  
Carla Guyer, City Clerk

Denver CSD

RESOLUTION

A RESOLUTION OF THE DENVER COMMUNITY SCHOOL DISTRICT ADOPTING A MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA.

WHEREAS, the Community School District of Denver, Iowa has agreed to participate in the development of a Multi-Jurisdictional Hazard Mitigation Plan ("Plan") for Bremer County; and,


WHEREAS, the Plan has been prepared in accordance with FEMA requirements at 44 CFR 201.6; and,

WHEREAS, the Denver Community School District 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 Plan; and,

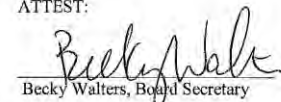
WHEREAS, a Public Hearing has been held in the Middle School Commons – 530 Lincoln Street, Denver, IA 50622 for the purpose of obtaining citizen input on said Plan; and,

NOW THEREFORE BE IT RESOLVED THAT, the Board of Directors of the Denver Community School District hereby adopts the Bremer County Multi-Jurisdictional Hazard Mitigation Plan, incorporating into the Plan the citizen comments and future FEMA and IHSEMD recommendations.

Passed and adopted this 10th day of August 2022.

  
Heather Prendergast, Vice President

ATTEST:

  
Becky Walters, Board Secretary

Passed and adopted this 10<sup>th</sup> day of August 2022.

JANESVILLE CSD

RESOLUTION #2

**A RESOLUTION OF THE JANESVILLE CONSOLIDATED SCHOOL DISTRICT ADOPTING A MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA.**

WHEREAS, the Consolidated School District of Janesville, Iowa has agreed to participate in the development of a Multi-Jurisdictional Hazard Mitigation Plan ("Plan") for Bremer County; and,

WHEREAS, the Plan has been prepared in accordance with FEMA requirements at 44 CFR 201.6; and,

WHEREAS, the Janesville Consolidated School District 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 Plan; and,

WHEREAS, a Public Hearing has been held in the CSD'S Media Center for the purpose of obtaining citizen input on said Plan; and,

NOW THEREFORE BE IT RESOLVED THAT, the Board of Directors of the Janesville Consolidated School District hereby adopts the Bremer County Multi-Jurisdictional Hazard Mitigation Plan, incorporating into the Plan the citizen comments and future FEMA and IHSEMD recommendations.

Passed and adopted this 11<sup>th</sup> day of July 2022.

Babae Reed

ATTEST:

K. Zerk

Passed and adopted this 11th day of July 2022.

SUMNER-FREDERICKSBURG CSD

RESOLUTION # 71122

**A RESOLUTION OF THE SUMNER-FREDERICKSBURG COMMUNITY SCHOOL DISTRICT ADOPTING A MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA.**

WHEREAS, the Community School District of Sumner-Fredericksburg, Iowa has agreed to participate in the development of a Multi-Jurisdictional Hazard Mitigation Plan ("Plan") for Bremer County; and,

WHEREAS, the Plan has been prepared in accordance with FEMA requirements at 44 CFR 201.6; and,

WHEREAS, the Sumner-Fredericksburg Community School District 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 Plan; and,

WHEREAS, a Public Hearing has been held in the CSD'S Administrative Office for the purpose of obtaining citizen input on said Plan; and,

NOW THEREFORE BE IT RESOLVED THAT, the Board of Directors of the Sumner-Fredericksburg Community School District hereby adopts the Bremer County Multi-Jurisdictional Hazard Mitigation Plan, incorporating into the Plan the citizen comments and future FEMA and IHSEMD recommendations.

Passed and adopted this 11 day of July 2022.

Ronnie Schult

ATTEST:

Theresa Schultz

Passed and adopted this 11th day of July 2022.

TRIPOLI CSD

**A RESOLUTION OF THE TRIPOLI COMMUNITY SCHOOL DISTRICT  
ADOPTING A MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN  
FOR BREMER COUNTY, IOWA.**

WHEREAS, the Community School District of Tripoli, Iowa has agreed to participate in the development of a Multi-Jurisdictional Hazard Mitigation Plan ("Plan") for Bremer County; and,

WHEREAS, the Plan has been prepared in accordance with FEMA requirements at 44 CFR 201.6; and,

WHEREAS, the Tripoli Community School District 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 Plan; and,

WHEREAS, a Public Hearing has been held in the Tripoli CSD'S MS/HS Media Center for the purpose of obtaining citizen input on said Plan; and,

NOW THEREFORE BE IT RESOLVED THAT, the Board of Directors of the Tripoli Community School District hereby adopts the Bremer County Multi-Jurisdictional Hazard Mitigation Plan, incorporating into the Plan the citizen comments and future FEMA and IHSEMD recommendations.

Passed and adopted this 15 day of June 2022.



ATTEST:



Passed and adopted this 15 day of June 2022.

WAPSIE VALLEY CSD

**RESOLUTION # 2**

**A RESOLUTION OF THE WAPSIE VALLEY COMMUNITY SCHOOL DISTRICT  
ADOPTING A MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR  
BREMER COUNTY, IOWA.**

WHEREAS, the Community School District of Wapsie Valley, Iowa has agreed to participate in the development of a Multi-Jurisdictional Hazard Mitigation Plan ("Plan") for Bremer County; and,

WHEREAS, the Plan has been prepared in accordance with FEMA requirements at 44 CFR 201.6; and,

WHEREAS, the Wapsie Valley Community School District 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 Plan; and,

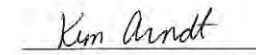
WHEREAS, a Public Hearing has been held in the Wapsie Valley CSD'S Media Center for the purpose of obtaining citizen input on said Plan; and,

NOW THEREFORE BE IT RESOLVED THAT, the Board of Directors of the Wapsie Valley Community School District hereby adopts the Bremer County Multi-Jurisdictional Hazard Mitigation Plan, incorporating into the Plan the citizen comments and future FEMA and IHSEMD recommendations.

Passed and adopted this 18<sup>th</sup> day of July 2022.

  
Board President

ATTEST:

  
Business Manager

Passed and adopted this 18<sup>th</sup> day of July 2022.

Attachment 3: Status of 2017 Hazard Mitigation Plan

OVERALL HMP UPDATE CHANGES

All of the jurisdiction's that participated in the 2022 plan update were also part of the county's first two multi-jurisdictional hazard mitigation plans developed in 2012 and 2017, however, the school districts were not included in the previous plans. The first step in the planning process was for each participating jurisdiction to review the County's 2017 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"> <li>Updated planning process, participants and schedule</li> <li>Updated identified hazards and assessment to reflect hazards and assessment criteria of State of Iowa's 2013 HMP</li> </ul>
Section 2 – Composite Community Profile	Yes	<ul style="list-style-type: none"> <li>Updated Infrastructure information, including transportation and utilities</li> <li>Updated Census and American Community Survey data</li> <li>Updated housing, income, and economy data</li> <li>Updated local jurisdictional information</li> <li>Updated all tables and local information</li> </ul>
Section 3 – Risk Assessment (includes Vulnerability Assessment)	Yes	<ul style="list-style-type: none"> <li>Identified new list of hazards (2013 State HMP hazards)</li> <li>Identified new list of hazards</li> <li>Scored new hazard list with new scoring criteria for each jurisdiction</li> <li>Updated composite assessment scores for Bremer County and all jurisdictions</li> <li>Updated disaster historical occurrences</li> <li>Updated average assessment scores for Bremer County and all jurisdictions</li> <li>Redefined subcategories describing individual hazards</li> <li>Updated and completed vulnerability assessments (identifying critical facilities and social assets) affected by flooding (river and flash) and tornados.</li> <li>Updated the estimating potential property losses and repetitive loss properties with available data</li> <li>Updated NFIP status</li> <li>Updated vulnerability assessment, including shelters, values in floodplains, and “at-risk” population data</li> </ul>

Section 4 – Mitigation Strategy	Yes	<ul style="list-style-type: none"> <li>• Reviewed and confirmed existing mitigation goals for the planning area</li> <li>• Removed completed or no longer applicable projects/actions/activities, if any</li> <li>• 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</li> <li>• Updated planning and regulatory documents</li> <li>• Updated public education and awareness mitigation actions</li> <li>• Updated emergency services mitigation actions</li> <li>• Updated to include new warning system in place</li> <li>• Reviewed, added and deleted mitigation activities analysis from the previous menu of potential strategies.</li> <li>• Identified agencies responsible for implementation of mitigation activities</li> <li>• Reorganized Mitigation Action Steps into subgroups</li> </ul>
Section 5 – Plan Maintenance	Yes	<ul style="list-style-type: none"> <li>• Updated how the MJ-HMP should be updated, evaluated and reviewed, incorporated into other planning mechanisms, and continued public participation should be met</li> </ul>
Appendices / Attachments	Yes	<ul style="list-style-type: none"> <li>• Reorganized maps/city profiles into appendixes and attachments</li> <li>• Updated all city appendixes from 2012 plan <ul style="list-style-type: none"> <li>○ Community Profiles, transportation, developments, and utility providers</li> <li>○ Demographic data</li> <li>○ New list of hazards and analysis criteria</li> <li>○ Vulnerability analysis of critical facilities, populations, and estimated property loss</li> <li>○ NFIP status and repetitive loss status, where applicable</li> <li>○ Current mitigation activities</li> <li>○ Reviewed, added and deleted mitigation activities analysis from the previous menu of potential strategies</li> </ul> </li> <li>• Added tornado scenario maps</li> <li>• Updated historic tornado map</li> <li>• Updated city flood scenario and county floodplain maps</li> <li>• Added city floodplain maps</li> <li>• Updated city critical site maps</li> <li>• Updated county-wide critical site maps and divided into individual maps for each critical site</li> <li>• Added status update of previous hazard mitigation activities</li> </ul>

In addition to the general plan updates described above, each jurisdiction documented the status of their community's action steps identified in the 2017 plan. The following tables state the status of the actions in the 2017 plan.

<b>BREMER COUNTY (UNINCORPORATED AREA) STATUS OF 2017 HAZARD MITIGATION ACTIVITIES</b>	
<b>Mitigation Action/Program/Project</b>	<b>Project/Program Status</b> (Specific actions, what has been completed, how it was implemented, not completed, % done, why not implemented, etc.)
Educate the public	Active/ On-going; Public education is an ongoing project with no completion date. Depending on the topic, the public education may be a one-time media/social media release or a continuous education process. For example – during a flood-related disaster we may issue frequent periodic announcements such as where to dispose of debris, how to sort before disposal, etc. After the incident is resolved, public education will cease. For continuous education periodic announcements are made – such as for outdoor warning system test and what they indicate or to encourage citizens to enroll in Alert Iowa.
Implement early warning notification system, Alert Iowa	Active/ On-going; Bremer County Emergency Management Agency maintains eight outdoor warning systems (sirens) in unincorporated areas of the county. Bremer County EMA coordinates the testing of community owned and county owned sirens April through November of each year. Regular press releases are issued to encourage enrollment in the Alert Iowa program.
Encourage lead-based paint and asbestos removal	On-going; Bremer County encourages the removal of lead-based paint and asbestos, but does not currently have any programs in place.
Encourage and maintain enrollment in emergency notification system	On-going; This is an ongoing effort through social media, traditional media, and through face-to-face discussions coordinated by Bremer County Emergency Management Agency.

Encourage homeowners to keep emergency kits	Active; Bremer County Emergency Management encourages safety kits on a periodic basis, especially during storm season. Bremer EMA has, in the past, provided instructions for assembling an emergency response kit one item at a time over many weeks. This project is also done through the Bremer County CERT program.
Encourage use of Iowa One call before digging	Supported, but not actively done by Bremer County
Encourage residents to keep smoke detectors, sprinkler systems and fire extinguishers maintained in their homes	Active/ On-going; Bremer EMA does include these efforts during seasonal social media posts (change smoke detector batteries when adjusting your clocks...)
Educate the public on maintaining their sump pumps	Not actively done by Bremer County EMA or Bremer County.
Encourage the public to receive vaccinations	Active/ On-going; This function is performed by the Bremer County Health Department.
Inform the public of reputable and ill reputable contractors following disasters	As needed; Generally done post disaster. Will offer encouragement to thoroughly vet contractors before committing any dollars to repair work.
Maintain the county website as a source of public information	Active/ On-going; Bremer County hosts a website for all departments. Some departments post additional information, as needed. Social media is used for public information on a near-daily basis.
Notify the media on shelter locations	As needed; Done when shelters are activated, primarily by Bremer County Emergency Management Agency.
Continue training and education for fire departments, law enforcement agencies and ambulance crew personnel	Active; Bremer County EMA assists with this type of training.
Maintain and acquire materials and equipment for fire departments, law enforcement agencies and ambulance crew personnel	Active/ On-going; Bremer County EMA assists with this, when possible.
Maintain storm spotter training for local fire departments/deputies and EMS crews	Active; Bremer County EMA coordinates with the National Weather service to make severe weather spotter training available to members of the public and to public safety organizations on an annual basis.
Make available a cleanup crew for after a storm	As needed; Bremer County EMA assists with coordinating this function when needed and requested. This may involve public agencies or private resources.
Acquire necessary response and detection equipment for city/county employees	As needed; Bremer County EMA assists with this when needed and requested.
Keep HAZMAT manuals/information current and easily accessible	Active/ On-going; Bremer County EMA coordinates with public safety agencies and the Northeast Iowa Response Group to assure training and

	supplies are available. Training is provided on an annual basis.
Maintain list of potential translators to be called upon in case of an emergency	Not complete; Bremer County EMA is attempting to coordinate translators for emergency responses.
Maintain or install GPS units in all emergency service and city/county vehicles	On-going; This project was undertaken by the Bremer County 911 Board in partnership with Bremer County Dispatch.
Maintain automatic TTY TDD machines for emergency personnel and city/county employees	Active/ On-going; TTY TDD connectivity is located in the Bremer County Dispatch Center.
Maintain list of county emergency contacts	On-going; This is an on-going project. Updated lists are maintained in Bremer County Dispatch. Bremer County Emergency Management communicates with public safety agencies to maintain updated lists.
Continue cooperation between county roads department and local fire departments during snow emergencies	Active; This is ongoing throughout the winter months.
Cooperate with any countywide mass vaccination plan	Active/ On-going; This is an ongoing project with increased emphasis due to COVID-19. Bremer County Health Department coordinates this activity.
Develop and maintain staging area for dumping during cleanup	As needed; Bremer County EMA works with interested communities for debris management planning. There are no debris dump areas in the unincorporated areas.
Set a designated number of people to be trained in post-disaster record keeping/damage assessments	Not complete; Not a project at this time.
Maintain and update emergency response plans	Ongoing; at the county level per Iowa Code requirements by Bremer County Emergency Management.
Maintain lists of personnel and equipment available to use with response plans	As needed; No specific lists of personnel and equipment are maintained due to their ever changing nature. Contact is maintained with response agencies in communities. When a need arises, appropriate personnel are contacted and arrangements made for staff and equipment. This list includes contacts throughout the region. Effort done by Bremer County Emergency Management.
Provide emergency shelters for evacuees	As needed; Emergency sheltering has been provided and will continue to be provided when needed due to disaster situations. These efforts occur in partnership with communities across the county. There are no shelters operated in unincorporated areas.

Provide fans and/or cooling shelter	As needed; No cooling shelters have been opened in the unincorporated areas of Bremer County. Bremer County Emergency Management has worked with communities to open shelters, when needed.
Participate in Watershed Management Authority	Active/ On-going; Bremer County participates in the Upper Cedar Watershed Management Authority, the Upper Wapsipinicon Watershed Management Authority, and the newly formed Shell Rock River Watershed Coalition
Participate in and cooperate with other jurisdictions in improving watersheds, including Watershed Management Authorities and Drainage Districts	Active/ On-going; Bremer County participates in the Upper Cedar Watershed Management Authority, the Upper Wapsipinicon Watershed Management Authority, and the newly formed Shell Rock River Watershed Coalition. Drainage district meetings are conducted through official Bremer County business.
Mitigate erosion along waterways and ditches through vegetation management	Active/ On-going; Bremer County participates with the Bremer County Soil and Water Conservation District to address and promote possible mitigation efforts. Bremer County Roadside Management assists with ditch maintenance projects.
Maintain tree trimming program	Active/ On-going; Bremer County EMA is now working with the City of Waverly Trees Forever group to address/promote healthy tree maintenance efforts. Bremer County Secondary Roads does some tree trimming along ditches and roadways.
Maintain and/or develop a wellhead protection program	Active/ As needed; Bremer County Environmental Health and Bremer County EMA assist with wellhead protection programs.
Monitor wells in areas of identified contamination	As needed; Bremer County Environmental Health assists with well contamination issues on an ongoing basis.
Monitor the drinking water supply	Active/ As need; Bremer County Emergency Management works with communities when there are identified water supply issues. Bremer County Environmental health works with individual well issues.
Identify and map areas of past contamination	Active/ As needed; Bremer County Emergency Management does not maintain maps of past contamination in the unincorporated areas. Water supply contamination has not been an issue of concern with no large-scale incidents.
Follow monitoring requirements set forth by the Iowa DNR	Active/ On-going; Overall water quality monitoring is performed in area streams in partnership with Bremer County SWCD. Personal well monitoring is performed in conjunction with Bremer County 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 needed; Bremer County does participate with the named partners, dependent on projects and issues. Such partnerships may include the watershed management authorities.
Clear ditches, streams, and waterways on a regular basis	Active/ As needed; Bremer County Secondary Roads maintains ditches on a regular and “as needed” basis.
Purchase additional parkland in order to increase greens space and reducing surface flow	On-going; Bremer County Conservation purchases parkland, where practical to increase green space and protect habitat.
Restrict water usage should it be necessary	As needed; Water usage in unincorporated areas is done at the private level.
Plant trees along water bodies and slopes	Active/ On-going; Bremer County Conservation and Bremer County Roadside Management attempt to prevent erosion on unincorporated areas of the county.
Maintain mutual aid agreements with the Northeast Iowa response Group	Active/ On-going; Bremer County Emergency Management maintains an agreement with the Northeast Iowa Response Group for hazardous materials responses.
Complete continuity of government plan	Not complete; Bremer County leadership recognizes the importance of continuity of government at all times. The COVID-19 pandemic generated a working plan to continue government operations during the height of the pandemic. This plan will be reviewed when all operations return to normal.
Maintain mutual aid agreements	Active/ On-going; Various departments within Bremer County maintain mutual aid agreements for use when local resources are overwhelmed.
Maintain county roads department	Active/ On-going; The Bremer County Highway Department is responsible for county road maintenance and is funded by the Secondary Road Fund.
Determine locations for potential heating shelters and volunteer organization	Active/ On-going; Bremer County Emergency Management works with communities and citizens to identify possibly shelter locations and to coordinate volunteers. Bremer County CERT is a lead agency for volunteer participation with public emergencies.
Purchase and maintain backup generators	On-going/ As needed; jurisdictions pursue and allocate funds as necessary and available
Maintain public works equipment	Active/ On-going; Bremer County Highway Department employs trained mechanics who are responsible for maintenance and repairs of public

	works equipment.
Backup all digital data	Active/On-going; Bremer County computer systems are regularly backed up for protection of critical data
Purchase NOAA weather radios	On-going/ As needed; Bremer County Emergency Management has purchased and distributed NOAA weather radios in the past. Currently, the purchase of NOAA weather radios is encouraged for citizens via press releases and social media postings.
Place alarms on storage facilities containing hazardous materials	Active; As needed; jurisdictions use own discretion
Maintain law enforcement monitoring of large storage supplies	As needed;
Provide a local hazardous waste dropoff site	Not complete; local jurisdictions may have an annual drop off but no site currently exists
Maintain, test, and replace warning sirens	Active/ On-going; Bremer County Emergency Management owns and maintains sirens in the unincorporated areas of the county. Communities own and maintain their sirens.
Identify areas throughout the county that would substantially benefit from outdoor warning sirens	Active/ On-going; Bremer County and the communities operate warning sirens in areas of highest population concentration. If funds become available, additional sirens may be installed.
Encourage backup power generation for local telephone systems and cellular operations	Active; Private and public utilities are encouraged
Enhance Standard Operating Procedures for dissemination of information/press releases in the event of a disaster	On-going; Bremer County, Bremer County Public Health, and Bremer County Emergency Management follow the Bremer County Emergency Response Plan regarding dissemination of critical information before, during, and after disasters.
Continue training and promotion of the Incident Command System	On-going; Bremer County Emergency Management promotes and facilitates periodic Incident Command training at various levels.
Upgrade radio communications equipment as needed	On-going; Bremer County Communications equipment and systems are maintained through the 911 Service Board.
Regularly review and amend fire and medical HAZMAT response standard operating procedures	On-going; Bremer County Emergency Management promotes and facilitates periodic review of emergency response plan for the county and for the communities of Bremer County.
Improve standard operating procedures for schools	Active; CSD's are encouraged to continually assess SOP's

Seek to improve communications with other agencies	Active/ On-going; Public health agencies in Service Area 6 have radios that allow us to communication between public health agencies and IDPH via ISIC channels. Bremer County Sheriff's Office and Emergency Management have radio capabilities to communicate on VHF, ISICS, and the SARA systems.
Keep supply of backup radios and cellphones	Active/ On-going; Bremer County Health Department and Bremer County Emergency Management maintain radios for communications in emergencies.
Keep the county updated on personnel changes	Active/ On-going; Bremer County Emergency Management works with public safety departments within the county to maintain an updated roster in Bremer County Dispatch.
Stockpile sand and sandbags	Active/ On-going; Bremer County Emergency Management maintains a supply of sandbags for use to protect critical infrastructure during disasters.
Maintain and improve signals/signage along roadways and at railroad crossings	Active/ On-going; Bremer County Highway Department maintains signals and signage along county roads and works with local Railroads to maintain signs and signals at crossings.
Establish alternative transportation routes should a road need to be closed	As needed; Bremer County Highway Department maintains alternative routes in case of road closure.
Ensure that all county road maintenance personnel are trained in the proper procedures for road preparation and repair	Active/ On-going; Bremer County Highway Department personnel receive training upon hire and regularly during the course of their employment.
Purchase emergency signs to be used in case of an incident	On-going; Bremer County Highway Department maintains a stock of emergency signs.
Enforce no parking designations at special events	As needed; jurisdictions enforce on as needed basis
Identify fallout shelter locations	There are no public fallout shelters in the unincorporated areas of Bremer County.
Keep communication lines open with Nuclear Plant in Palo, IA	Dropped; Duane Arnold has been closed.
Maintain and update anti-virus software	On-going; Bremer County computer systems employ anti-virus software for protection from viruses and malware.
Secure vulnerable targets, as identified by the LEPC and County EMA with alarms, security cameras and fences	Active; Private organizations and jurisdictions are encouraged to maintain security

Continue contract with county public health nursing agency	Active; The Bremer County Health Department employs a minimum of one registered public health nurse in accordance with Iowa Administrative Code Chapter 80 Local Public Health Services. The department also maintains a list of retired nurses that could be utilized as volunteers in the event of a public health emergency
Monitor disease outbreak news from the CDC and Iowa Department of Public Health	Active/As needed; The Bremer County Health Department conducts disease outbreak investigations, reportable disease follow-up and surveillance in accordance with Iowa Code chapters 135, 136A, 139A, 141 A, and 144.
Initiate and enforce burn ban in times of drought or as needed	As needed; Bremer County Emergency Management works with fire chiefs to determine if or when burn bans should be instituted. Requests are then forwarded to the State Fire Marshall's Office.
Enforce a curfew	As needed; jurisdictions are encouraged to enforce curfews as needed
Establish detour routes	Active; Bremer County Highway Department maintains detour routes during road closures.
Enforce the local zoning ordinances	Active; jurisdictions are responsible for enforcing ordinances or maintaining mutual aid agreements
Update flood maps/flood studies for areas throughout the county	On-going; Floodplain mapping is maintained across the county.
Establish transportation evacuation routes and protocols	Not completed; Bremer County Emergency Management will work with Bremer County law enforcement agencies and the Bremer County Roads Department to determine evacuation routes and protocols during a disaster.
Develop sandbagging procedures for the community	Active; jurisdictions maintain sand bagging procedures
Continue cooperation with county in developing flood mitigation efforts	Active/On-going; Continued efforts are discussed regularly
Continue working with the Bremer County Recovery Coalition	Active/On-going; Bremer County Recovery Coalition continues to exist, but is on an inactive status due to the fortunate situation of no major natural disasters (excluding COVID pandemic) occurring in Bremer County in recent months.
Encourage all communities to participate in their Local Emergency Planning Commission (LEPC)	Active/On-going; Cities are encouraged
Maintain communication with county contacts	Active/On-going; regular communication is a continuous process

Maintain NIMS compliance	Active/On-going; Public Safety Departments (Cities)
Maintain air conditioner(s) in community buildings	Active/On-going; jurisdictions service and update systems as necessary and funding allows
Keep a supply of drinking water to distribute	Active; local jurisdictions are responsible for their own supplies
Develop rationing procedures	As needed; responsibility of local jurisdictions
Maintain use of snow fences in the city/county	Active/On-going; Bremer County Highway Department installs and maintains snow fencing each fall and winter.
Use surge protectors to prevent electrical damage to critical and sensitive equipment	Active;
Enforce and update building codes, as needed	Active/On-going; best practices are reviewed to determine necessity as trends evolve
Continue fire prevention program	Active/On-going;
Maintain membership in the NFIP	Active/On-going;
Maintain, enforce and update floodplain ordinance	Active/On-going; jurisdictions update to current standards as they become available
Maintain and keep storm drains clear of debris	Active; jurisdictions Public Works departments clear debris and monitor as needed
Identify, purchase and remove structures from flood hazard areas	Active/As needed; jurisdictions participate in buy-out programs as necessary
Review and update fire codes as necessary	As needed; jurisdictions update to most current standards as they are necessary
Continue to cooperate with pipeline owners and operators to ensure locations are marked	Active/On-going;
Encourage the use of proper materials and construction techniques	Active/On-going; jurisdictions participate in mutual aid agreements for building inspections or do so on their own accord
Place barricades to close dangerous bridges	As needed; Bremer County Highway Department installs temporary or permanent barricades to close dangerous and deficient bridges.
Identify and inventory potential sinkhole sites	Active/On-going; Bremer County Emergency Management consults with Iowa Geological Survey when new sinkholes are identified.

Encourage floodproofing/elevating structures in the floodplain	Active/On-going; jurisdictions regularly update floodplain ordinances and pursue opportunities to mitigate the risk to existing structures
Encourage construction of dikes, levees, dams, and retention ponds	Active/On-going; Bremer County participates in the Upper Cedar Watershed Management Authority, the Upper Wapsipinicon Watershed Management Authority, and the newly formed Shell Rock River Watershed Coalition
Encourage utility providers and developers to place all utilities underground	Active; all new utilities are encouraged to be placed underground
Secure the area (around a sinkhole)	As needed
Inspect any utility lines that are near a sinkhole	As needed
Elevate roads and bridges to mitigate flooding	Active/On-going; Bremer County Highway Department designs all new bridges to mitigate potential flooding and monitors the need for existing bridges
Acquire property, as needed, to implement capital improvement plan infrastructure mitigation actions	Active/On-going; jurisdictions pursue as is needed
Mitigate threats of low-head dams	Active/On-going; Two low-head dams exist in the county. At this time there are no discussions or plans to alter the dams. Signs and/or fencing has been placed near the dams.
Construct or designate a safe room or storm shelter	Active/On-going; jurisdictions pursue funding and opportunities on a case-by-case basis
Pursue partnership with rural water as the system expands	Active; opportunities are explored as the system expands
Install tiling to help water move away from structures	Active/On-going; jurisdictions complete and repair as needed
Continue regular bridge inspections	Active/On-going; Bremer County Highway Department hires certified inspectors to inspect a portion of the bridges annually on an overall schedule as mandated by the National Bridge Inspection Standards.
Maintain embargos/weight limits as necessary	As needed; Bremer County Highway Department places and maintains weight restrictions/embargos as needed.
Receive education/training from DOT on the subject	Active/On-going; Bremer County Highway Department receives regular training from the Iowa DOT.

Identify bridges and culverts than can cost effectively be reengineered to reduce future flooding	Active/On-going; Bremer County replaces a portion of the bridge and culvert inventory each year and replacements are engineered to reduce future flooding.
Regularly inspect dams and levees	Active; implemented by Bremer County Conservation Board No levees currently in Bremer County
Acquire more water pumps	Active; jurisdictions pursue and set aside funds for additional pumps
Purchase additional trash pumps	Active; jurisdictions purse and set aside funds for additional pumps
Establish backup plan in case levees fail	Not complete; No active levees, not a serious concern in Bremer County at this time.

CITY OF DENVER- STATUS OF 2017 HAZARD MITIGATION ACTIVITIES	
Mitigation Action/Program/Project	Project/Program Status (Specific actions, what has been completed, how it was implemented, not completed, % done, why not implemented, etc.)
Educate the public	Active, provide community newsletter along with Facebook page and website updated regularly
Maintain storm spotter training for local fire departments/deputies and EMS crews	Active this is completed by the Denver Fire Department
Enhance Standard Operating Procedures for dissemination of information/press releases in the event of a disaster	Active, looking for innovative ways to release information to citizens such as social media
Encourage use of Iowa One call before digging	Active, City provides education to citizens during building process and coordinates with Iowa one call on building permits
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
Cooperate with any countywide mass vaccination plan	Active the Visiting Nurses utilize the Denver Community Room for Flu Shots each fall

Educate city personnel to identify risk areas	Active, education through employment of the city experience
Educate city personnel to handle a sinkhole situation	As needed, current small sinkhole location in town that is being repaired
Inform the public of reputable and ill reputable contractors following disasters	As needed, transparent with citizens on who the city uses and trust to handle disaster relief
Notify the media on shelter locations	As needed, New red cross shelter built since last update
Encourage and maintain enrollment in emergency notification system	Completed and Active we also have Alert Iowa available to our residents
Encourage homeowners to keep emergency kits	Not completed
Encourage community to plant shade trees	Active, implemented by the Denver Tree Board
Encourage the public to receive vaccinations	Not completed
Encourage all communities to participate in their Local Emergency Planning Commission (LEPC)	Active, consistently brought up during council meetings and have information on city website
Encourage lead-based paint and asbestos removal	Active through the Bremer County Health Department
Educate the public on maintaining their sump pumps	Active through our Quarterly Newsletter
Continue training and education for fire departments, law enforcement agencies and ambulance crew personnel	Active all three departments receive annual training and the City Council budgets for training every year
Provide emergency shelters for evacuees	As needed, recently built new shelter in town
Determine locations for potential heating shelters and volunteer organization	Active, identified buildings with backup generators and use city website to facilitate volunteers
Make available a cleanup crew for after a storm	Active and yes, our Public Works Department does this after storms if needed
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	Active, multiple years into future budget plan posted in public areas and complete transparency on city objectives
Maintain list of county emergency contacts	As Needed, List is updated as new contacts arise
Develop and maintain staging area for dumping during cleanup	Active, Designated area outside of town well laid out and easy to identify where your specific items go.

Set a designated number of people to be trained in post-disaster record keeping/damage assessments	Not completed
Maintain lists of personnel and equipment available to use with response plans	Completed and Active this is an ongoing activity.
Maintain or install GPS units in all emergency service and city/county vehicles	As Needed, GPS units are updated or replaced when there is a need
Purchase emergency signs to be used in case of an incident	As needed, City has reserve storage of emergency signs in public works building
Maintain automatic TTY TDD machines for emergency personnel and city/county employees	As needed, units are replaced or updated upon need
Treat and/or remove Ash trees in response to Emerald Ash Borer Disease	Active, currently working on a city-wide tree removal project
Maintain tree trimming program	Active, notify citizens of potential hazards tree limbs on private property
Monitor the drinking water supply	Active, city water/sewer operator checks water daily at multiple locations for chemical levels
Maintain and/or develop storm water management program	Active, recently cleaned out and re lined storm water drains
Eliminate and cap private and abandoned wells in the city	As needed, all current private and abandoned wells are accounted for
Eliminate the use of septic tank systems in the city limits	Active, Multi-Million-dollar upgrade to city water/sewer treatment plant
Follow monitoring requirements set forth by the Iowa DNR	Active, currently within compliance set by DNR and test water twice a week directly with the DNR
Clear ditches, streams, and waterways on a regular basis	Active as needed the city hires Denver Underground & Grading to perform this work
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	To be implemented as needed, no current wells in identified areas
Identify and map areas of past contamination	As needed, updates are made to city hall records as new information arises and new situations develop
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

Plant trees along water bodies and slopes	To be implemented as needed, Current program asses' areas to take down trees, future programs focused on re planting new trees
Purchase additional parkland in order to increase greens space and reducing surface flow	Not completed
Maintain and acquire materials and equipment for fire departments, law enforcement agencies and ambulance crew personnel	Active and Ongoing, replaced all hoses on fire pumpers, new tires on all fire trucks, purchased 2021 police utility vehicle, Denver Ambulance purchased a new Stryker Power Cot, and a Polaris Ranger for the department
Maintain mutual aid agreements	Active and updated for Police, Fire, ambulance and Public Works
Purchase and maintain backup generators	Not Completed; will consider as funds become available
Maintain public works equipment	Active and ongoing Public Works Employees are responsible for maintaining equipment
Purchase NOAA weather radios	Not completed
Maintain mutual aid agreements with the Northeast Iowa response Group	Completed
Keep HAZMAT manuals/information current and easily accessible	Active, multitude of safety manuals and information both at city hall and at the public works building
Regularly review and amend fire and medical HAZMAT response standard operating procedures	Active and regularly review annually
Seek to improve communications with other agencies	Active, mayor is consistently visiting other towns and building relationships with other agency members
Keep the county updated on personnel changes	As needed, any city employment changes or new hires are discussed openly at city council meetings and are posted on community website
Continue cooperation between county roads department and local fire departments during snow emergencies	Completed
Maintain membership in the NFIP	Completed
Maintain and keep storm drains clear of debris	As needed, street sweeper used in town along with spot cleaning by city employees as necessary
Stockpile sand and sandbags	Active, large number of sandbags at public works building
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

Establish alternative transportation routes should a road need to be closed	As needed, road construction as well as detour signs and cones are at public works building
Identify fallout shelter locations	Not completed, lack of funding
Maintain and update anti-virus software	Active and Completed the City of Denver contracts ACES to keep our anti-virus software updated
Provide fans and/or cooling shelter	Completed, Denver City Hall and Denver Community Schools
Maintain air conditioner(s) in community buildings	As needed, air conditioning units are maintained or updated as need by city staff hired assistance
Develop rationing procedures	Not completed
Initiate and enforce burn ban in times of drought or as needed	Fire Department
Restrict water usage should it be necessary	Not completed
Secure the area (around a sinkhole)	As needed, public works building has stockpile of safety equipment such as cones and caution tape
Inspect any utility lines that are near a sinkhole	Not completed
Update flood maps/flood studies for areas throughout the county	Not completed, lack of funding
Develop sandbagging procedures for the community	As needed, no new plan has been implemented in recent history
Maintain and update emergency response plans	As needed, changes are made to plan depending on resources available and available staff members
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
Acquire necessary response and detection equipment for city/county employees	As needed, equipment has been updated or replaced as needed
Maintain, test, and replace warning sirens	Active, First Tuesday of every month at 11am we test the towns tornado warning sirens
Upgrade radio communications equipment as needed	As needed, equipment has been replaced or updated in order to achieve

	effective communication
Maintain and improve signals/signage along roadways and at railroad crossings	Not applicable, no train tracks in town
Keep communication lines open with Nuclear Plant in Palo, IA	As needed; Nuclear Plant has been deactivated
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	Not completed
Monitor disease outbreak news from the CDC and Iowa Department of Public Health	Not completed
Establish detour routes	Active and As Needed depending on construction schedule and streets affected by construction and the public is informed
Enforce the local zoning ordinances	Active, Bremer County Building & Zoning is contracted by the City of Denver to administer Denver's Zoning Ordinances
Establish transportation evacuation routes and protocols	Completed
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
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, public works has large storage of snow fence that is placed at high-risk locations before winter
Backup all digital data	Completed
Place alarms on storage facilities containing hazardous materials	Active, all potentially hazardous facilities have automatic alarms that can shut off systems and notify city hall and authorities immediately if needed
Maintain law enforcement monitoring of large storage supplies	Not completed
Provide a local hazardous waste drop-off site	Not completed, lack of funding
Identify areas throughout the county that would substantially benefit from outdoor warning sirens	Completed by Bremer County Emergency Management

Maintain list of potential translators to be called upon in case of an emergency	Completed
Improve standard operating procedures for schools	Not sure what is done at the Denver Community School District
Keep supply of backup radios and cellphones	Active, City Hall building has backup supply of radio and cellphone equipment as well as devices
Enforce no parking designations at special events	Active and completed by the Denver Police department
Secure vulnerable targets, as identified by the LEPC and County EMA with alarms, security cameras and fences	Not completed
Keep a supply of drinking water to distribute	Active, water chemical level monitored Everyday and have multiple aquifers that we can pull water from if need
Enforce a curfew	As needed; Police Department
Identify and inventory potential sinkhole sites	Not completed; will identify as needed
Use surge protectors to prevent electrical damage to critical and sensitive equipment	Completed
Placement of lighting arrestors on power lines	Active and completed by the Electric Department
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
Continue an annual inspection program for commercial and industrial properties	Completed
Continue fire prevention program	Completed
Maintain, enforce and update floodplain ordinance	Active and updated and is enforced by the Bremer County Building & Zoning
Acquire more water pumps	On-going Rebuilt 1 water pump
Purchase additional trash pumps	Not completed
Continue regular bridge inspections	Completed
Place barricades to close dangerous bridges	Not completed
Maintain pump station	Completed all four lift stations are checked daily and cleaned and vacuumed annually by Municipal Pipe & Too
Regularly inspect levees	No levees

Review and update fire codes as necessary	Completed
Maintain embargos/weight limits as necessary	Active/as needed
Regularly inspect dams	Not completed
Install a snow fence around the wastewater treatment facility	Completed, facility has chain link fence
Identify, purchase and remove structures from flood hazard areas	As needed
Install rip rap around wastewater treatment facility	Completed with new Waste Water Treatment Facility
Receive education/training from DOT on embargos/weight limits	Not completed
Encourage floodproofing/elevating structures in the floodplain	Not active
Establish backup plan in case levees fail	No levees
Continue enforcement of city sump pump discharge ordinance	Completed
Maintain a list of potential storm sewer projects	Completed in our Capital Improvement Plan
Construct or designate a safe room or storm shelter	Not completed
Continue with improvement to the storm water system	Completed
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 and 2013
Encourage the use of proper materials and construction techniques	Active the City uses SUDAS Specifications for constructing public projects
Install tiling to help water move away from structures	Not completed
Encourage utility providers and developers to place all utilities underground	Active all new subdivisions are required to install all utilities underground
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
Improve water system to enhance firefighting capacity/ability	Active as water mains are replaced larger diameter pipe of at least 8" is installed
Pursue partnership with rural water as the system expands	Not completed

Encourage construction of dikes, levees, dams, and retention ponds	Not completed
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CITY OF FREDERIKA – STATUS OF 2017 HAZARD MITIGATION ACTIVITIES	
Mitigation Action	Committee Determination/Comments
Educate the public	Active, Local TV phone applications provide storm warnings and news events. Bremer County EMS sends alerts via email and text.
Notify the media on shelter locations	Not completed. Do not have local media.

Encourage use of Iowa One call before digging	As needed when building permit issued
Encourage residents to keep smoke detectors, sprinkler systems and fire extinguishers maintained in their homes	Active, TV commercials and news provide periodic awareness and encouragement.
Educate the public on maintaining their sump pumps	Active, adopted ordinance for inspections and corrective actions
Encourage the public to receive vaccinations	Not completed. Rely on Bremer County Public Health Department.
Encourage the use of proper materials and construction techniques	Active. Have building permit process with building requirements reviewed by Building Official.
Set a designated number of people to be trained in post-disaster record keeping/damage assessments	Not completed. Rely on Bremer County Emergency Management Coordinator to establish training.
Encourage utility providers and developers to place all utilities underground	Not completed. Alliant Energy does not see value of replacing existing above ground service. No new development has occurred in the past 5 years.
Encourage and maintain enrollment in emergency notification system	Completed. Siren has been implemented and is tested monthly by Bremer County EMA.
Encourage homeowners to keep emergency kits	Not Completed. Lack guidance on what an emergency kit should consist of.
Encourage community to plant shade trees	Not Completed. Not high priority. Should be incorporated with tree trimming as to what type of trees are permissible.
Educate city personnel to identify risk areas	Not Completed. Need to work with Bremer County Emergency Management Coordinator to establish training.
Educate city personnel to handle a sinkhole situation	Not Completed. Need to work with Bremer County Emergency Management Coordinator to establish training.
Inform the public of reputable and ill reputable contractors following disasters	Not Completed. Have not had a disaster where this is need.
Encourage lead-based paint and asbestos removal	On-going. This should come from the Northeast Iowa Response Group through flyers and TV commercials. Sometimes this is addressed when home sells occurs.
Continue training and education for fire departments, law enforcement agencies	On-going. All departments have established training

and ambulance crew personnel	programs.
Provide emergency shelters for evacuees	Part of the Bremer County EMA activities.
Determine locations for potential heating shelters and volunteer organization	Completed. Community Building and Fire Station are connected to standby generator to provide heating/cooling and command center operations.
Make available a cleanup crew for after a storm	Not completed. Bremer County services would be needed as City has no equipment or employees.
Continue training and promotion of the Incident Command System	On-going. Mayor and Council member completed training on ICS completed within the past 5 years. Need to reschedule additional training with Bremer County EMA.
Complete continuity of government plan	Not completed. Mayor Pro Tem is appointed to replace Mayor. Appointment or election to replace Council member. Is there more to this?
Maintain list of county emergency contacts	Completed by Bremer County EMA.
Develop and maintain staging area for dumping during cleanup	Not Completed. Tiny town that would need assistance the Bremer County EMA.
Set a designated number of people to be trained in post-disaster record keeping/damage assessments	Not Completed. Tiny town that would need assistance the Bremer County EMA.
Maintain lists of personnel and equipment available to use with response plans	On-going. Updated 5 Emergency Support Functions in 2019 with Bremer County EMA.
Maintain or install GPS units in all emergency service and city/county vehicles	Completed by Fire Department and Bremer County Sheriff Department.
Purchase emergency signs to be used in case of an incident	Unsure. Fire Department has not. Believe Bremer County Sheriff Department may.
Maintain automatic TTY TDD machines for emergency personnel and city/county employees	Unsure. Fire Department has not. Believe Bremer County Sheriff Department may.
Monitor wells in areas of identified contamination	Ongoing. Bremer County Building and Sanitation periodically provides free private well testing and record keeping to Frederika residents.
Monitor the drinking water supply	Ongoing. Iowa Rural Utilities Association (IRUA)

	monitors, testing and reporting of water supplied to Frederika.
Follow monitoring requirements set forth by the Iowa DNR	Completed by IRUA.
Maintain and/or develop a wellhead protection program	Not completed. All wellheads are privately owned.
Identify and map areas of past contamination	Not completed. Not aware of any past contamination.
Maintain and/or develop storm water management program	Not completed. Need to understand what is needed.
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. Working with Bremer County Conservation Board concerning erosion control measures around the dam in Alcock Park.
Restrict water usage should it be necessary	Not completed. Most residents have private wells. Drought has not occurred for IRUA to ask for restricted usage. IRUA requests contact whenever large amount of water is required (e.g. Fire Pumper & Tanker truck, Sewer line cleaning truck)
Plant trees along water bodies and slopes	Not completed. Have not identified opportunity.
Clear ditches, streams, and waterways on a regular basis	Not completed. Farmers and/or property owner have done this.
Eliminate and cap private and abandoned wells in the city	Active. Two wells were recently identified. Developing plan to have them capped.
Eliminate the use of septic tank systems in the city limits.	Not completed. Septic tanks have been eliminated in majority of dwellings and business within City limits. Septic tanks remain in the Indian Pond cabin area along Wapsipinicon River due to costs. Ordinance adopted making sewer connection if building with 200 feet from existing sewer lines.
Purchase additional parkland in order to increase greens space and reducing surface flow	Not completed. Lack of funding and resources.
Maintain mutual aid agreements	On 06/01/2018 filed a 28E Fire Protection agreement between City Frederika, and Frederika, Douglas and Leroy Townships, and the Frederika Fire Department with the State. On 06/08/2017 filed 28E Fire Response and EMS

	agreements with other cities located in Bremer. On 05/25/2015 filed 28E Police Protection agreement with Bremer County Sheriff.
Purchase and maintain backup generators	Installed backup generator in 2019 for Fire Station and Community Building with automatic weekly testing. Sewer lift pumps have backup generators with automatic weekly testing.
Maintain mutual aid agreements with the Northeast Iowa response Group	Completed. 28E Agreements in place since last review.
Maintain, test, and replace warning sirens	Completed. Warning Siren is tested monthly by Bremer County EMA.
Encourage backup power generation for local telephone systems and cellular operations	Not Completed. No local telephone franchise. Cellular and fiber cable have backup power policies
Upgrade radio communications equipment as needed	Active. Fire and Police Departments work together with Bremer County E911 board to purchase radio communications. In 2019, a new E911 tower was installed as the previous one was taken down when the Coop closed and took down the elevator.
Regularly review and amend fire and medical HAZMAT response standard operating procedures	On-going. Fire Department has periodic meeting with Northeast Iowa Response Group. Believe Bremer County Sheriff departments also participates.
Keep the county updated on personnel changes	On-going. Last completed in March 2021 for E911 board.
Continue cooperation between county roads department and local fire departments during snow emergencies	Active. Installed connection of standby generator to Fire Station to mitigate lost of power during weather or man-made hazards.
Establish alternative transportation routes should a road need to be closed	Not Completed. Limited entrances/exits to City. Only alternative routes needed were caused by County Projects.
Identify fallout shelter locations	Not Completed. None known to be in nearby area.
Keep communication lines open with Nuclear Plant in Palo, IA	Not Completed. Rely on Bremer County EMA alerts and communication. Nuclear plant is no longer

	producing energy. Frederika is outside of the immediate area.
Provide fans and/or cooling shelter	Completed. Installed emergency standby generator to support the Community Building as a cooling and heating shelter.
Maintain air conditioner(s) in community buildings	Active. Yearly check-ups.
Keep a supply of drinking water to distribute	Not completed. No water tower installed when IRUA installed water within Frederika. Bottled water inventory assessment is needed along with understanding Bremer County EMA agreements with local business that bottled water.
Cooperate with any countywide mass vaccination plan	Bremer County Public Health and EMA coordinated with State on vaccination plan.
Monitor disease outbreak news from the CDC and Iowa Department of Public Health	Rely on Bremer County Public Health for alerts and notifications
Establish detour routes	Not Completed. Only detours needed were caused by County Projects.
Establish transportation evacuation routes and protocols	Not Completed. Community of less than 200 people with only 4 entrances/exits exist to the City.
Continue cooperation with county in developing flood mitigation efforts	On-going. Joined the Upper Wapsipinicon Watershed Management Authority with Bremer County departments. Funding has not yet been for efforts within Bremer County.
Maintain communication with county contacts	On-going. Mayor is a member of the Bremer County Emergency Management Commission and Fire and Police Chiefs are members of the Bremer County E911 Board.
Maintain NIMS compliance	On-going. Mayor and Council members attended training in 2016. Rely on Bremer County EMA.
Purchase NOAA weather radios	Not completed. The fire department does not have any. The Bremer County Sheriff Department may have.
Provide a local hazardous waste dropoff site	Not completed. Waste Management does not handle

	and have not determined appropriate hazardous waste flow once collected.
Identify areas throughout the county that would substantially benefit from outdoor warning sirens	Completed with Bremer County EMA.
Seek to improve communications with other agencies	On-going. Member of Bremer County Emergency Commission, Bremer County E911 Board, Iowa North Region Council of Governments (INRCOG), Iowa League of Cities, and Upper Wapsipinicon River Water Management Authority.
Keep supply of backup radios and cellphones	Completed. Fire Department has this as a policy. Bremer County Sheriff Department may do this.
Stockpile sand and sandbags	Not completed. City of less than 200 people with limited resources.
Maintain and improve signals/signage along roadways and at railroad crossings	On-going. Annual review and replacement of signs using State program. No railroad in town.
Enforce no parking designations at special events	Completed. Install street block aids and temporary no parking signs along parade routes.
Develop rationing procedures	Not Completed. Rely on Bremer County EMA.
Enforce the local zoning ordinances	On-going. Have Restricted Residential District ordinance, no zoning ordinance.
Develop sandbagging procedures for the community	Not completed. City has limited resources to address affected property. Majority of buildings in floodplain are cabins which are being raised to be 1 foot over the 100-year flood.
Maintain public works equipment	Completed. Contract to have yearly sewer lift station pump maintenance. No other public works equipment owned by the City.
Enforce sidewalk clearance ordinance	Completed. Periodic review and notices sent to property owners.
Backup all digital data	Completed. Utilize Carbonite application.
Place alarms on storage facilities containing hazardous materials	Not completed. City has no storage locations with hazardous materials. Coop closed.

Maintain law enforcement monitoring of large storage supplies	On-going. Bremer County Deputy Sheriff make daily patrols and business checks.
Improve standard operating procedures for schools	Not completed. Frederika is part of the Tripoli Community School District with a School Board and Administration to address this. All school buildings are in Tripoli.
Maintain and update anti-virus software	Complete. Microsoft Windows.
Secure vulnerable targets, as identified by the LEPC and County EMA with alarms, security cameras and fences	Completed. Fire department installed security camera on the fire station. Farmer Saving Bank and Locker have installed security cameras. Fences has been installed around the E911 and cellular towers located within Frederika.
Purchase a new tanker and/or pumper	Not Completed. No requirement is last 5 years.
Enforce a curfew	Not Completed. None have been enacted.
Update flood maps/flood studies for areas throughout the county	Completed February 2021. Adopted the new IDNR Flood map and Floodplain regulations.
Continue working with the Bremer County Recovery Coalition	On-going. Frederika has not suffered through an event requiring a recovery.
Encourage all communities to participate in their Local Emergency Planning Commission (LEPC)	On-going. Attended meetings with the Bremer County Emergency Management Commission and E911 Board.
Continue enforcement of city sump pump discharge ordinance	On-going. City adopted ordinance to address process, fines, and responsibility to the Sanitary Sewer Superintendent due to impact on the sewer system.
Continue fire prevention program	On-going. Managed by Fire Department, not Council. Filed 28E Fire Response Agreement between City of Frederika, Township of Frederika, Douglas, and Leroy and the Fire Department.
Maintain membership in the NFIP	Membership renewed in February 2021.
Maintain, enforce and update floodplain ordinance	Completed. February 2021. Part of Building Permit process.
Initiate and enforce burn ban in times of drought or as needed	On-going. Adhere to Bremer County setting of burn bands.

Place barricades to close dangerous bridges	No bridges with the city limits of Frederika.
Secure the area (around a sinkhole)	No sinkholes have been identified within the City limits.
Inspect any utility lines that are near a sinkhole	No sinkholes have been identified within the City limits.
Maintain tree trimming program	On-going. Annual review and trimming performed.
Placement of lighting arrestors on power lines	City does not own a power station. Alliant Energy has policies addressing this.
Continue an annual inspection program for commercial and industrial properties	Not Completed. City has no building code.
Review and update fire codes as necessary	Not Completed. City has no fire code.
Identify and inventory potential sinkhole sites	On-going. No sinkholes have been identified.
Install a snow fence around the wastewater treatment facility	Not Completed. Minimal benefit with limited resources. Access to lift station building and sewer lagoons are impacted by flooding not snow.
Maintain use of snow fences in the city/county	Not implemented. Limited resources and funding to install and remove.
Use surge protectors to prevent electrical damage to critical and sensitive equipment	Not completed. Will have one purchased and installed.
Identify, purchase and remove structures from flood hazard areas	Not completed. Have not pursued do to structures are cabins or managed by Bremer County Conservation Board or property owner not willing.
Purchase additional trash pumps	Completed. The Fire Department purchased an additional trash pump that allow a trash pump to be allocated to the sewer department for usage when high water levels occur within the lift station pit.
Continue to cooperate with pipeline owners and operators to ensure locations are marked	Not Completed. Frederika does not have natural gas or oil pipelines.
Encourage floodproofing/elevating structures in the floodplain	On-going. Part of the building permit process.
Maintain a list of potential storm sewer projects	On-going. Have prioritize and implement as funding is available.

Acquire more water pumps	Not completed. Minimal impact.
Continue with improvement to the storm water system	On-going. Have prioritize and implement as funding is available.
Maintain and keep storm drains clear of debris	On-going. City has minimal storm water system. Outlets need to be address due to dirt and debris deposited impacting the storm water flow.
Maintain pump station	Only pump station in Frederika is for sewage.
Construct or designate a safe room or storm shelter	Not complete. Tiny community with limited resources or funding to complete.
Pursue partnership with rural water as the system expands	Completed. Iowa Regional Utilities Association has brought rural water to Frederika in a limited fashion.
Improve water system to enhance firefighting capacity/ability	Not Completed. Iowa Regional Utilities Association implementation did not include a water tower or water lines to support firefighting capacity/ability.
Install tiling to help water move away from structures	Not completed. City has limited resource and funding to preform this.
Continue regular bridge inspections	No Bridges exist in Frederika city limits.
Maintain embargos/weight limits as necessary	Completed. Installed weight limit signs on appropriate streets.
Encourage construction of dikes, levees, dams, and retention ponds	Joined the Upper Wapsipinicon Watershed Management Authority to address this.
Regularly inspect dams	Dam located in Alcock Park is managed by Bremer County Conservation Board which performs periodic inspections.
Prevent inflow and infiltration into the sanitary sewer	On-going. All sewer lines have had camera completed as of 2020. Plan to address inflow and infiltration in process.
Identify bridges and culverts than can cost effectively be reengineered to reduce future flooding	On-going. Part of storm water drainage planning and implemented as funding is available.

CITY OF JANESVILLE STATUS OF 2017 HAZARD MITIGATION ACTIVITIES	
Mitigation Action/Program/Project	Project/Program Status (Specific actions, what has been completed, how it was implemented, not completed, % done, why not implemented, etc.)
Educate the public	Active; Public is kept up to date via city website, Facebook page, and mass emails. Notifications can also be placed on the back of the monthly water bills.
Notify the media on shelter locations	To be implemented as needed; Loss of power, floods, tornado warnings, etc. Town sirens are set off, Community Center (emergency shelter) can be used along with City Hall and Fire Station. Both places have emergency generators.
Keep HAZMAT manuals/information current and easily accessible	Completed, will be continued; Information is kept at City Hall
Encourage use of Iowa One call before digging	Active; Community is informed and reminded via City website, Facebook page, permit issues, signs that say, "Call Before You Dig".
Encourage residents to keep smoke detectors, sprinkler systems and fire extinguishers maintained in their homes	Active, Repetitive; Fire Department reminds citizens twice a year on their Facebook page to check/change the batteries and test their smoke alarms. If residents need help with installing new smoke alarms or batteries, Firemen will volunteer to do so.
Encourage the public to receive vaccinations	Active; Posts are shared to the public via the City Website/Facebook as well as Janesville Responder page and IDPH posters are hung up in the Library and Bulletin board outside City Hall.
Educate city personnel to identify risk areas	Active; Daily, City personnel and the mayor check all areas of town, including the Sewer plant for any down trees, problem areas.
Inform the public of reputable and ill reputable contractors following disasters	As needed; the City shall maintain communications with the public as soon as the City is aware of any issues. Permits are also required for construction/repairs, etc.
Encourage lead-based paint and asbestos removal	Active; Inspections by the Bremer County Inspector, or Fire Department, property owners are informed of the danger & encouraged to safely

	remove these hazards.
Encourage and maintain enrollment in emergency notification system	Active, Repetitive; Links are provided on the City Website and posts from Bremer County Emergency Management are shared on the City Website and Facebook page. Also sent out via email or back of the water bill.
Encourage homeowners to keep emergency kits	Active, Repetitive; Information is shared via social media
Educate the public on maintaining their sump pumps	Active; public is made aware
Encourage community to plant shade trees	Dropped; Homeowners do their own landscaping.
Continue training and education for fire departments, law enforcement agencies and ambulance crew personnel	Active, Repetitive; The Fire Department holds training exercises at least once a month and sometimes more. Police are encouraged to attend any training classes when offered and the First Responders meet and train month.
Maintain and acquire materials and equipment for fire departments, law enforcement agencies and ambulance crew personnel	Active; All departments maintain and acquire equipment as items become worn, damaged, expired, etc.
Provide emergency shelters for evacuees	To be implemented as needed; Emergency Shelter is located at the Riviera Roose (Community) Event Center. City Hall and the Library can also be used, if necessary, in the event of an emergency.
Maintain storm spotter training for local fire departments/deputies and EMS crews	Active; On-going as needed or when offered
Enhance Standard Operating Procedures for dissemination of information/press releases in the event of a disaster	To be implemented as needed; Janesville Emergency Services has a SOP in place.
Maintain list of county emergency contacts	Completed, will be continued and updated as needed; Located at City Hall
Set a designated number of people to be trained in post-disaster record keeping/damage assessments	To be implemented as needed; Receive help/advice from Bremer County Emergency Management, as needed
Maintain and update emergency response plans	Completed, will be continued; Emergency Operation plan available at City Hall
Maintain lists of personnel and equipment available to use with response plans	Completed, will be continued; Lists are available at City Hall (Emergency Operation Plan)
Make available a cleanup crew for after a storm	To be implemented as needed; City Personnel and Volunteers gather in the event of storm damage

Continue training and promotion of the Incident Command System	Active, repetitive; When offered, encourage new employees/council members/ Fire and Responder personnel to participate.
Keep a supply of drinking water to distribute	Completed, will be continued; A supply is kept at the Fire Station
Cooperate with any countywide mass vaccination plan	To be implemented as needed; In the event of a mass vaccination, City Hall, Community Center, or School for vaccination areas
Maintain list of potential translators to be called upon in case of an emergency	Completed, will be continued; Bremer County EMA keeps a list on file
Maintain or install GPS units in all emergency service and city/county vehicles	Completed, will be continued; GPS is Installed on City Vehicles, police vehicles, and Fire Trucks
Maintain automatic TTY TDD machines for emergency personnel and city/county employees	Completed, Maintained by Bremer County Law Enforcement Center.
Complete continuity of government plan	will be continue.
Maintain and/or develop a wellhead protection program	Active; City purchases water from Rural Water Association but tests and reports each day
Monitor wells in areas of identified contamination	To be implemented as needed; no contamination currently identified
Monitor the drinking water supply	Active, repetitive; Water is tested daily by our Water personnel
Identify and map areas of past contamination	Completed, will be continued; records of past contamination are documented
Maintain and/or develop storm water management program	Last updated 2020, City has a storm water plan in place along with a list of areas that need to be repaired.
Eliminate and cap private and abandoned wells in the city	To be implemented as needed; Bremer County caps private and abandoned wells within the city as they are identified
Follow monitoring requirements set forth by the Iowa DNR	Active, repetitive; drinking water quality is tested daily
Restrict water usage should it be necessary	To be implemented as needed; in the event of a shortage or contamination
Clear ditches, streams, and waterways on a regular basis	To be implemented as needed; in the event of high water
Eliminate the use of septic tank systems in the city limits	To be implemented as needed; new construction is not permitted to use septic systems nor are permits issued for replacement of failed systems within proximity to city services

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, to be implemented as needed; communications are kept open between each organization and best practices maintained
Plant trees along water bodies and slopes	Not completed; as funds are available and need arises
Purchase additional parkland in order to increase greens space and reducing surface flow	Completed, will be continued; Land was purchased to expand our city park area on the west side of the river and possibly more areas in the future.
Maintain mutual aid agreements	Completed, will be continued; Fire Department (except for Cedar Falls Fire) and First Responders have mutual agreements with surrounding communities.
Determine locations for potential heating shelters and volunteer organization	Completed, will be continued; locations identified at Janesville City Hall, Library, Fire Station, and Riviera Roose Event Center.
Purchase and maintain backup generators	Complete, will be continued; All lift stations have backup generators and maintained on a regular schedule
Maintain public works equipment	Active, repetitive; Maintenance is scheduled according to equipment standards
Purchase NOAA weather radios	Not completed; lack of funds
Place alarms on storage facilities containing hazardous materials	Dropped, Wastewater Treatment Plant has no hazardous storage areas.
Maintain law enforcement monitoring of large storage supplies	Completed, will be continued; Cameras are in place at City Hall, Library, Public works shop, Park and Wastewater Treatment Plant.
Maintain mutual aid agreements with the Northeast Iowa response Group	Completed, will be continued
Maintain, test, and replace warning sirens	Active, repetitive; Monthly tests of town sirens and twice weekly tests for Responder & Fire Dept. radios
Upgrade radio communications equipment as needed	Completed, will be continued; upgrades are addressed as they become necessary and available
Regularly review and amend fire and medical HAZMAT response standard operating procedures	Active, as needed
Seek to improve communications with other agencies	Active, as needed
Keep the county updated on personnel changes	Active, Repetitive; City Hall maintains a list of current personnel, which includes all employees, council members, Fire Department and Responders.

Continue cooperation between county roads department and local fire departments during snow emergencies	To be implemented as needed; When storm warnings are issued. City personnel and Janesville Fire Department communicate with the County Road dept.
Pursue partnership with rural water as the system expands	Completed, will be continued.
Maintain and update anti-virus software	Completed, will be continued; daily anti-virus and backups are installed
Secure vulnerable targets, as identified by the LEPC and County EMA with alarms, security cameras and fences	Completed, will be continued; fence surrounds the water tower and lagoon. Gate is kept locked at the sewer plant.
Provide fans and/or cooling shelter	Completed, will be continued; City Hall, Library, Fire Station, and Riviera Event Center will provide.
Develop rationing procedures	To be implemented as needed; should circumstances warrant such action
Establish detour routes	To be implemented as needed; in case of emergencies such as floods, bridge closed, vehicle accidents.
Update flood maps/flood studies for areas throughout the county	Completed, will be continued; ongoing
Establish transportation evacuation routes and protocols	To be implemented as needed; in case of emergencies such as flooding, bridge washed out, fires, etc.
Develop sandbagging procedures for the community	To be implemented as needed; Sandbagging locations have been established and all Sandbagging volunteers are documented
Develop and maintain staging area for dumping during cleanup	To be implemented as needed; Areas will be established when needed.
Continue cooperation with county in developing flood mitigation efforts	Active, Repetitive; updated as necessary due to past flooding experiences
Continue working with the Bremer County Recovery Coalition	Active, Repetitive; communication as needed during recovery efforts
Encourage all communities to participate in their Local Emergency Planning Commission (LEPC)	To be implemented as needed; when workshops, classes are offered, city encourages employees and citizens to participate.
Maintain communication with county contacts	Active; list is kept and updated as needed at City Hall.
Maintain NIMS compliance	Active, encourage new employees, Fire Dept. Personnel, Responders, council members to attend NIMS training when it is offered.
Acquire necessary response and detection equipment for city/county employees	Active, when circumstances warrant the need

Provide a local hazardous waste drop-off site	Not completed; Currently no available area identified
Identify areas throughout the county that would substantially benefit from outdoor warning sirens	Active; City of Janesville just received a grant for a new siren to be located at the new 7 <sup>th</sup> Street lift station on the East side of town.
Improve standard operating procedures for schools	Not completed; school maintains own operating procedures
Keep supply of backup radios and cellphones	Completed, will be continued when replacements are needed.
Stockpile sand and sandbags	Completed, will be continued yearly or as needed.
Maintain and improve signals/signage along roadways and at railroad crossings	Active, Repetitive; updated as needed
Establish alternative transportation routes should a road need to be closed	To be implemented as needed; due to flooding, accident, or unexpected circumstances
Purchase emergency signs to be used in case of an incident	Completed, will be continued; more will be ordered if needed
Enforce no parking designations at special events	To be implemented as needed; football games or other large events held at the school. Parades, large weddings and/ or funerals.
Keep communication lines open with Nuclear Plant in Palo, IA	Dropped; Nuclear plant closed
Maintain air conditioner(s) in community buildings	Completed, will be continued. Air conditioning is checked yearly and repaired as needed
Monitor disease outbreak news from the CDC and Iowa Department of Public Health	Active; City personnel monitor covid 19 updates on a daily basis and any other outbreaks that should occur.
Enforce a curfew	To be implemented as needed when complaints are received.
Enforce the local zoning ordinances	Active, Repetitive; local zoning is enforced thru permits issued by the city or county. City council action if changes are necessary.
Enforce sidewalk clearance ordinance	To be implement as needed when complaints are received.
Backup all digital data	Active, Repetitive; computers backup daily
Identify fallout shelter locations	Not completed; No fallout shelters in town at this time
Purchase a new tanker and/or pumper	Completed, Fire Department updates equipment as needed. Last tanker purchased in 2019.
Use surge protectors to prevent electrical damage to critical and sensitive equipment	Active, used on a daily basis

Continue an annual inspection program for commercial and industrial properties	Completed, will be continued; Fire Inspections and County Inspections are ongoing
Continue fire prevention program	Completed, will be continued; Fire Department holds “Fire prevention week” at the school yearly.
Improve water system to enhance firefighting capacity/ability	Last updated in 2017. A new water main was installed from the water tower, under the river, up to the school along Barrick Road, to improve water volume and create better firefighting capacity in that area.
Maintain membership in the NFIP	Completed; last updated January 28, 2021.
Maintain, enforce and update floodplain ordinance	Completed; last updated January 28, 2021.
Initiate and enforce burn ban in times of drought or as needed	To be implemented as needed; when County or Fire Department initiates or recommends the ban
Initiate and enforce burn ban in times of drought or as needed	To be implemented as needed; when County or Fire Department initiates or recommends the ban
Encourage the use of proper materials and construction techniques	Active, Repetitive; Information is shared on City Permits & County permits
Place barricades to close dangerous bridges	To be implemented as needed; due to accidents, flooding, or under other circumstances
Maintain embargos/weight limits as necessary	Completed, will be continued; on the 7 <sup>th</sup> street bridge can be replaced. Expected replacement with the next 2-3 years.
Receive education/training from DOT on the subject of embargo/weight limits	Completed, will be continued as needed
Secure the area (around a sinkhole)	To be implemented as needed, when a sinkhole is identified in the area
Inspect any utility lines that are near a sinkhole	To be implemented as needed, when a sinkhole is identified in the area
Maintain pump station	Dropped; Janesville doesn’t have a pump station.
Encourage utility providers and developers to place all utilities underground	Completed, will be continued as the need arises.
Continue enforcement of city sump pump discharge ordinance	Active, citizens are reminded via social media, messages on back of water bill, etc.
Encourage backup power generation for local telephone systems and cellular operations	Not completed; utility companies are not owned by the city, however the City does have generators for City use.

Identify, purchase and remove structures from flood hazard areas	Completed; will be continued as needed
Install rip rap around wastewater treatment facility	Active; currently working on updates to WWTP.
Review and update fire codes as necessary	Active, Repetitive; reviews are done annually.
Continue to cooperate with pipeline owners and operators to ensure locations are marked	Active, Repetitive; as needed.
Identify and inventory potential sinkhole sites	Active, Repetitive; City personnel check city property daily
Educate city personnel to handle a sinkhole situation	Active; done annually
Encourage floodproofing/elevating structures in the floodplain	To be implemented as needed; when flooding is expected.
Install a snow fence around the wastewater treatment facility	Active, Repetitive; Public Works department installs yearly
Maintain use of snow fences in the city/county	Active, Repetitive, Public Works department installs as needed
Placement of lighting arrestors on power lines	Dropped; The utility company does this.
Prevent inflow and infiltration into the sanitary sewer	Active; Repetitive; City personnel do daily checks of the sewer system.
Continue regular bridge inspections	Active, bridges are inspected annually or if damaged between inspections.
Identify bridges and culverts than can cost effectively be reengineered to reduce future flooding	Completed; 2021
Regularly inspect dams	Dropped, Janesville does not have a dam.
Maintain a list of potential storm sewer projects	Active, Repetitive, A list has been established and updated as needed
Construct or designate a safe room or storm shelter	Completed, will be continued: there is a basement in the City Hall Building. Any future construction, will have a safe room/storm shelter, if possible.
Acquire more water pumps	To be implemented as needed; if flooding is expected and pumps are needed.
Continue with improvement to the storm water system	To be implemented as needed, when areas are identified
Maintain and keep storm drains clear of debris	Active, Done on a regular schedule
Purchase additional trash pumps	Completed; last purchased in 2016
Install tiling to help water move away from structures	Completed, will be continued as needed. Park building completed 2018, Shelter house, 2021.
Encourage construction of dikes, levees, dams, and retention ponds	Active, Repetitive; policy in place per ordinance. Retention/detention ponds encouraged in new developments if needed.

CITY OF PLAINFIELD STATUS OF 2017 HAZARD MITIGATION ACTIVITIES	
Mitigation Action/Program/Project	Project/Program Status (Specific actions, what has been completed, how it was implemented, not completed, % done, why not implemented, etc.)
Continue training and education for fire departments, law enforcement agencies and ambulance crew personnel	Active; training/education done by Fire Chief, etc
Encourage use of Iowa One call before digging	Active; notice on building permits
Keep the county updated on personnel changes	Active; Clerk updates the County as needed
Maintain and improve signals/signage along roadways and at railroad crossings	Active; replacing signs as need
Cooperate with any countywide mass vaccination plan	Active; as need by FD, 1 <sup>st</sup> Responders & Council
Educate city personnel to identify risk areas	Active; review and train annually
Inform the public of reputable and ill reputable contractors following disasters	Active; as needed by Council, Clerk and PW
Encourage all communities to participate in their Local Emergency Planning Commission (LEPC)	Active; encouraged by County EMA and Council
Educate the public	Active; education topics sent to public viz quarterly newsletter, social media, website, etc
Encourage utility providers and developers to place all utilities underground	Active; Council and PW
Notify the media on shelter locations	To be implemented as needed
Encourage lead-based paint and asbestos removal	Active; reminder on building permit form
Encourage and maintain enrollment in emergency notification system	Active; reminders posted on social media, newsletter, website and sent out by EMA
Encourage homeowners to keep emergency kits	Active; reminder added to quarterly newsletter to citizens
Encourage residents to keep smoke detectors, sprinkler systems and fire extinguishers maintained in their homes	Active; annual reminders put out by FD during fire safety month
Educate the public on maintaining their sump pumps	Active; reminders/education in quarterly newsletter
Encourage the public to receive vaccinations	Done by Bremer County Health Department and shared via social media

Educate city personnel to handle a sinkhole situation	As needed; Public Works places barricades with flashing lights
Maintain and acquire materials and equipment for fire departments, law enforcement agencies and ambulance crew personnel	Active; acquired with budget and fundraiser money
Provide emergency shelters for evacuees	Active; shelter provided as needed
Maintain storm spotter training for local fire departments/deputies and EMS crews	Active; FD/1 <sup>st</sup> Responder members are trained as needed
Enhance Standard Operating Procedures for dissemination of information/press releases in the event of a disaster	Active; Bremer County EMA and Mayor
Continue training and promotion of the Incident Command System	Active; trained through EMA
Maintain list of county emergency contacts	Active/Completed; City Clerk maintains the list of emergency contacts
Provide fans and/or cooling shelter	Active/Completed; City Hall and the Library serve as cooling shelter when needed
Develop and maintain staging area for dumping during cleanup	Active; as needed at yard waste site
Set a designated number of people to be trained in post-disaster record keeping/damage assessments	Active; Clerk trained through FEMA
Maintain lists of personnel and equipment available to use with response plans	Active; list maintained annually
Make available a cleanup crew for after a storm	As needed
Maintain automatic TTY TDD machines for emergency personnel and city/county employees	Utilize local hospital for devices
Complete continuity of government plan	Formal plan is in the works- 10% completed
Keep supply of backup radios and cellphones	Active; FD and 1 <sup>st</sup> Responders house the supply of radios
Maintain list of potential translators to be called upon in case of an emergency	Not completed; will call EMA if needed
Maintain or install GPS units in all emergency service and city/county vehicles	Not completed; lack of funding (could use GPS on cell phones if needed)
Maintain mutual aid agreements	Active/Repetitive; mutual aid agreements updated every 5 years
Purchase and maintain backup generators	Completed; all critical facilities have stationary generators plus 2 mobile generators housed at City Hall
Maintain public works equipment	Active; annual maintenance performed on all equipment

Backup all digital data	Active; all data is backed-up to the cloud via iDrive
Maintain mutual aid agreements with the Northeast Iowa response Group	Active/On-going
Keep HAZMAT manuals/information current and easily accessible	Active; updated as needed
Maintain, test, and replace warning sirens	Active; warning sirens are tested monthly by the County and maintained quarterly by White Electric
Identify areas throughout the county that would substantially benefit from outdoor warning sirens	Active; Work with Br Co EMA (could suggest a siren at North Cedar Park)
Regularly review and amend fire and medical HAZMAT response standard operating procedures	Active; SOPS are regularly reviewed
Improve standard operating procedures for schools	Plainfield does not have a school
Seek to improve communications with other agencies	Active;
Continue cooperation between county roads department and local fire departments during snow emergencies	Active;
Continue fire prevention program	Active; program in place, open burning times set via ordinance, etc
Maintain membership in the NFIP	Active; ordinance recently updated for participation
Maintain and keep storm drains clear of debris	Active; PW clears storm drains seasonally
Stockpile sand and sandbags	Completed; have a pile of sandbags already filled and stacked on pallets in the heated shop at City Hall
Purchase additional trash pumps	Completed; have 3 trash pumps
Initiate and enforce burn ban in times of drought or as needed	Active; County initiates and City helps enforce
Establish alternative transportation routes should a road need to be closed	As needed
Identify fallout shelter locations	Completed; basement of The Ole 707
Maintain and update anti-virus software	Completed/Active; virus protection is maintained and updated as needed
Secure vulnerable targets, as identified by the LEPC and County EMA with alarms, security cameras and fences	Active; tower and lagoon are locked/gated, but no cameras due to lack of service
Review and update fire codes as necessary	Active; reviewed/updated annually
Continue to cooperate with pipeline owners and operators to ensure	Active; City Clerk completed pipeline training

locations are marked	
Maintain air conditioner(s) in community buildings	Active; air conditioners are maintained annually in all city buildings
Keep a supply of drinking water to distribute	As needed; will purchase when needed
Monitor disease outbreak news from the CDC and Iowa Department of Public Health	Active; notified by Public Health
Secure the area (around a sinkhole)	As needed; will fence off and place barricades with flashing lights
Inspect any utility lines that are near a sinkhole	Done by MAE or B-B Communications
Update flood maps/flood studies for areas throughout the county	Flood maps are updated by FEMA
Establish transportation evacuation routes and protocols	Active/As Needed; traffic directed by FD or Sheriff's deputies
Continue cooperation with county in developing flood mitigation efforts	Active; working with EMA
Continue working with the Bremer County Recovery Coalition	Active
Maintain and update emergency response plans	Active; updated as needed
Maintain communication with county contacts	Active; maintained
Maintain NIMS compliance	Active; testing through EMA
Determine locations for potential heating shelters and volunteer organization	Active/Completed; City Hall will be used as heating shelters
Enforce sidewalk clearance ordinance	Active; enforcement letters sent as needed
Maintain law enforcement monitoring of large storage supplies	Active; monitored by Bremer County Sheriff's Dept
Acquire necessary response and detection equipment for city/county employees	Active; purchased as able due to budget restraints
Provide a local hazardous waste dropoff site	Not completed; City residents are able to use the County dropoff site
Upgrade radio communications equipment as needed	Active; completed as need
Enforce no parking designations at special events	Active; enforced by the Sheriff's Dept
Develop rationing procedures	Not completed; 0%
Enforce a curfew	Active/Completed; enforced by Sheriff's Dept/ordinance in place
Identify and inventory potential sinkhole sites	Active; no sites in City limits

Enforce the local zoning ordinances	Active; enforced by Council, PW and Clerk
Purchase NOAA weather radios	Not completed; lack of funding
Place alarms on storage facilities containing hazardous materials	Not completed; facilities are locked but not alarmed due to lack of funds
Continue enforcement of city sump pump discharge ordinance	Active; enforced by PW as needed
Maintain, enforce and update floodplain ordinance	Active; updated/enforced as needed
Develop sandbagging procedures for the community	Active
Maintain pump station	Active- maintained annually, pumps monitored daily and backup generator in place
Use surge protectors to prevent electrical damage to critical and sensitive equipment	Completed; surge protectors in place
Enforce and update building codes, as needed	Active; annually updated and enforcement tags/letters sent as needed
Identify, purchase and remove structures from flood hazard areas	N/A
Install a snow fence around the wastewater treatment facility	Not completed; do not feel it is needed
Maintain use of snow fences in the city/county	Not completed; do not feel it is needed
Placement of lighting arrestors on power lines	Completed as needed by MAE
Construct or designate a safe room or storm shelter	Not Completed; lack of funding
Encourage backup power generation for local telephone systems and cellular operations	Active; B-B Comm has stationary and portable generators
Pursue partnership with rural water as the system expands	Active; current Rural Water members
Improve water system to enhance firefighting capacity/ability	Active; currently completing improvement projects
Acquire more water pumps	Completed; trash pumps have been purchased
Continue with improvement to the storm water system	Active; just on-going maintenance
Prevent inflow and infiltration into the sanitary sewer	Active; currently completing improvement projects
Purchase emergency signs to be used in case of an incident	Completed; purchased barricades and signage with flashing lights

Encourage floodproofing/elevating structures in the floodplain	N/A
Encourage construction of dikes, levees, dams, and retention ponds	Active; flood mitigation plan
Identify bridges and culverts than can cost effectively be reengineered to reduce future flooding	N/A
Dig drainage ditch to west side of town, to river	Completed; storm drain goes to river
Regularly inspect dams	N/A
Regularly inspect levees	N/A
Establish backup plan in case levees fail	N/A
Maintain a list of potential storm sewer projects	Not completed- 0%
Continue an annual inspection program for commercial and industrial properties	N/A- we do not inspect properties
Encourage the use of proper materials and construction techniques	Active; added reminder on building permit form
Install tiling to help water move away from structures	N/A
Install rip rap around wastewater treatment facility	Do not feel it is needed
Maintain and/or develop a wellhead protection program	Active; maintaining wellhead protection plan/program
Monitor wells in areas of identified contamination	N/A
Monitor the drinking water supply	Active; monitored daily by PW via DNR requirements
Identify and map areas of past contamination	N/A
Maintain and/or develop storm water management program	Not completed
Eliminate and cap private and abandoned wells in the city	N/A
Eliminate the use of septic tank systems in the city limits	Active; enforced by ordinance
Follow monitoring requirements set forth by the Iowa DNR	Active; requirements are followed by PW
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	As needed
Restrict water usage should it be necessary	As needed

Purchase additional parkland in order to increase greens space and reducing surface flow	Not complete; lack of funding
Maintain tree trimming program	Active; trees are monitored and trimmed as needed by ordinance
Encourage community to plant shade trees	Encouraged by MAE tree planting program
Plant trees along water bodies and slopes	N/A
Clear ditches, streams, and waterways on a regular basis	N/A

CITY OF READLYN STATUS OF 2017 HAZARD MITIGATION ACTIVITIES

Mitigation Action/Program/Project	Project/Program Status (Specific actions, what has been completed, how it was implemented, not completed, % done, why not implemented, etc.)
Continue training and education for fire departments, law enforcement agencies and ambulance crew personnel	Active; Ongoing training and education
Maintain and acquire materials and equipment for fire departments, law enforcement agencies and ambulance crew personnel	As Needed: New police car purchased in 2020
Provide emergency shelters for evacuees	As needed; Fire Station currently designated and equipped with backup generator
Maintain mutual aid agreements	Active;
Maintain storm spotter training for local fire departments/deputies and	Active; trainings attended as available

EMS crews	
Maintain law enforcement monitoring of large storage supplies	Active; monitored by Readlyn PD & Bremer Co. Sherriff
Maintain mutual aid agreements with the Northeast Iowa response Group	Active, repetitive; Mutual aid agreements with neighboring jurisdictions for police, fire, and EMS assistance
Keep HAZMAT manuals/information current and easily accessible	Active; updated as needed
Maintain or install GPS units in all emergency service and city/county vehicles	Active; City Police Cruiser equipped with GPS
Continue training and promotion of the Incident Command System	Active, repetitive; Annual training for police, fire, EMS
Complete continuity of government plan	Active; City government meets monthly discussing and making legislation & ordinances
Upgrade radio communications equipment as needed	As needed; radios are maintained and upgraded as budget permits
Regularly review and amend fire and medical HAZMAT response standard operating procedures	Active, repetitive; Annual training, most recent 2-18-21
Improve standard operating procedures for schools	Active; Police Chief active in school building and attends all school board meetings
Keep supply of backup radios and cellphones	Active, not completed; As funds become available
Maintain list of county emergency contacts	Active; list maintained and updated annually
Improve water system to enhance firefighting capacity/ability	Active; Water mains on main street will be upgraded with Main Street Project 2023
Purchase emergency signs to be used in case of an incident	Completed; Emergency signs have been upgraded
Set a designated number of people to be trained in post-disaster record keeping/damage assessments	As needed; After moving into new city hall, city is focusing on finding backups for staff
Maintain and update emergency response plans	Active; every 5 years when Hazard Mitigation Plan is reviewed
Maintain lists of personnel and equipment available to use with response plans	Active and ongoing; the City maintains a list of personnel and departments maintain and share list of equipment
Maintain communication with county contacts	Ongoing; City maintains a working relationship with County contacts
Maintain NIMS compliance	Ongoing as new city officials and city personnel are hired
Make available a cleanup crew for after a storm	To be implemented as needed; (flood, tornado, wind, fire)

Maintain automatic TTY TDD machines for emergency personnel and city/county employees	Active; equipment is maintained by Bremer County Sherriff and available to the City of Readlyn
Enhance Standard Operating Procedures for dissemination of information/press releases in the event of a disaster	Complete; Fire Chief or Chief of Police address the public in small scale disasters while Bremer County Emergency Management is designated in larger scale events
Stockpile sand and sandbags	Active and repetitive; sand is stockpiled at local recycle site
Develop sandbagging procedures for the community	Not complete; County Emergency Management Coordinator will lead efforts with local fire department
Develop and maintain staging area for dumping during cleanup	To be implemented as needed; fire, flooding, tornado
Maintain list of potential translators to be called upon in case of an emergency	Active and repetitive; Bremer County Sherriff maintains a list of translators
Continue with improvement to the storm water system	Active; City employees continually monitor levels, maintain licensing and trainings
Prevent inflow and infiltration into the sanitary sewer	Active; City adopted Ordinance #218 Chapter 97 of Municipal Code to prevent extra, unwanted inflow into sanitary sewer
Maintain and keep storm drains clear of debris	Active; Street Department Staff clear manholes and drains when blocked by debris
Maintain and/or develop a wellhead protection program	Active; wellheads are routinely inspected, maintained, and repaired
Monitor wells in areas of identified contamination	Active; no areas of identified contamination
Monitor the drinking water supply	Active and repetitive; minimum twice daily (every morning and late afternoon)
Identify and map areas of past contamination	Complete; will be continued as needed and information shared with Iowa DNR
Maintain and/or develop storm water management program	Active; maintained by two members of City Street and Sewer Employees
Eliminate and cap private and abandoned wells in the city	Completed; Active and ongoing
Eliminate the use of septic tank systems in the city limits	Completed; Active and ongoing
Follow monitoring requirements set forth by the Iowa DNR	Completed; Active and 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	Completed; Active and ongoing

Develop rationing procedures	Not complete; the City has no storage space, will seek aid from Bremer County Emergency Management as needed
Restrict water usage should it be necessary	To be implemented as needed; City can start and stop water supply as needed
Maintain tree trimming program	Active and ongoing; City Ordinance 151.03-Enforced by Police Department
Determine locations for potential heating shelters and volunteer organization	Active; Fire Department is shelter rated, Elementary School building also listed as an option
Purchase and maintain backup generators for lift station, water tower, fire station, and other sites as determined	Completed; Active and ongoing; multiple generators purchased 2019/2020
Maintain public works equipment	Active and ongoing; equipment maintained by city staff
Backup all digital data	Active and ongoing; City utilities backed up to Cloud storage; police backed up bi-monthly; street and sewer copied and Cloud based
Enforce and update building codes, as needed	Active and ongoing; in conjunction with Bremer County Building and Zoning
Continue enforcement of city sump pump discharge ordinance	Active and ongoing; Chapter 97 of Readlyn Code of Ordinances
Place alarms on storage facilities containing hazardous materials	Not complete; limited funding
Acquire necessary response and detection equipment for city/county employees	Active and ongoing; City and County have equipment with multiple 28E agreements so equipment and personnel can be shared
Maintain, test, and replace warning sirens	Complete; Active and ongoing; will continue to replace electronics and batteries, tested monthly by county, tested daily by city
Seek to improve communications with other agencies	Active and ongoing; city staff strives to maintain an open relationship and establish partnerships
Continue cooperation between county roads department and local fire departments during snow emergencies	Active; As needed; communication by radio and Bremer County Dispatch
Establish snow ordinance requiring vehicles to be remove from streets for clearing	Complete; Ordinance #69.12
Continue fire prevention program	Active and ongoing; Volunteer Fire Department trains often and holds a weeklong training with school kids and staff annually
Maintain membership in the NFIP	Active; city's insurance agency maintains a membership with NFIP
Maintain, enforce and update floodplain ordinance	Active; when directed by insurance agency
Identify, purchase and remove structures from flood hazard areas	To be implemented as needed

Initiate and enforce burn ban in times of drought or as needed	Active as needed; Counties release burn ban schedules and city officials enforce
Enforce no parking designations at special events	Active; enforced by Readlyn Police Department
Keep communication lines open with Nuclear Plant in Palo, IA	Active; Bremer County Emergency Management and Dispatch
Maintain and update anti-virus software	Active and repetitive; internet provider and Readlyn Telephone Company
Review and update fire codes as necessary	Active; as needed; in conjunction with the State Fire Marshall
Purchase a new tanker and/or pumper	Complete; pumper replaced 2019
Provide fans and/or cooling shelter	Complete; Fire station is rated as cooling shelter; no funding for fans
Maintain air conditioner(s) in community buildings	Active; continued as needed
Keep a supply of drinking water to distribute	Active; Police, Fire, EMS
Initiate and enforce burn ban in times of drought or as needed	Active; as needed; Counties release burn ban schedules and city officials enforce
Encourage the use of proper materials and construction techniques	Active; City Ordinances enforced pertaining to construction procedures and materials in conjunction with Bremer County Building and Zoning
Enforce a curfew	Active; as needed; Ordinance #'s 46.01 & 47.05
Identify and inventory potential sinkhole sites	To be implemented as needed
Secure the area (around a sinkhole)	To be implemented as needed by Fire Department, Police Department, City Staff and Bremer County Emergency Management
Enforce the local zoning ordinances	Active/repetitive- Bremer County Building and Zoning works with the City of Readlyn
Develop water conservation policy to take effect in event of water rationing	Not completed- limited funding
Clear ditches, streams, and waterways on a regular basis	Active/as needed- city staff
Update flood maps/flood studies for areas throughout the county	Active/repetitive- City follows state guidance under the direction of Bremer County
Continue cooperation with county in developing flood mitigation efforts	Active/repetitive- every 5 years during this exercise
Continue working with the Bremer County Recovery Coalition	Active/as needed
Enforce sidewalk clearance ordinance	Active/as needed- Chapter 136 & 151 of Readlyn's Ordinances

Maintain use of snow fences in the city/county	Active/limited- limited funding and permission from property owners
Install a snow fence around the wastewater treatment facility	Not complete- has a fence but not a snow rated fence
Provide a local hazardous waste dropoff site	Complete- Approximately 2002
Identify areas throughout the county that would substantially benefit from outdoor warning sirens	Active- All Board, Local Fire Dept., and Bremer County Emergency Management
Educate the public	Active/repetitive- every chance that is appropriate
Notify the media on shelter locations	Active- Bremer County Emergency management via Facebook
Encourage and maintain enrollment in emergency notification system	Active- Facebook, dispatch
Encourage home owners to keep emergency kits	Active- All Board, Emergency Management
Encourage use of Iowa One call before digging	Active- Police/Fire, City Employees, Readlyn Telephone Company, Black Hills Energy
Keep the county updated on personnel changes	Active/As needed
Encourage residents to keep smoke detectors, sprinkler systems and fire extinguishers maintained in their homes	Active- fire department in schools annually
Educate the public on maintaining their sump pumps	Active/as needed- City Ordinance 97
Maintain and improve signals/signage along roadways and at railroad crossings	Active/repetitive- as needed- City Street Dept., Readlyn Police Dept.
Establish alternative transportation routes should a road need to be closed	As needed- Street Department/Police Department
Continue to cooperate with pipeline owners and operators to ensure locations are marked	Active- Annual Training with Fire, EMS, Police and Pipeline Company
Encourage community to plant shade trees	Active-City workers, not ash trees
Encourage the public to receive vaccinations	Active- EMS and Police encourage others
Cooperate with any countywide mass vaccination plan	Active/as needed- In conjunction with Bremer County Emergency Management
Monitor disease outbreak news from the CDC and Iowa Department of Public Health	Active/As needed

Educate city personnel to identify risk areas	Active/repetitive- during licensing, recertifications, and trainings of City Employees, Fire, EMS, Police
Educate city personnel to handle a sinkhole situation	Active- training for city employee's police, emergency management
Establish transportation evacuation routes and protocols	Active- protocols in place, routes are fluid to the situation
Inform the public of reputable and ill reputable contractors following disasters	Active/as needed-Police, Facebook, and local insurance companies
Encourage all communities to participate in their Local Emergency Planning Commission (LEPC)	Active- as needed
Purchase NOAA weather radios	Not completed-limited funding
Encourage lead based paint and asbestos removal	Active- City Code, Bremer County Building and Zoning
Identify fallout shelter locations	Active- Bremer County Emergency Management
Implement storm water user fee/ordinance to generate funds for future improvements	Active- here in Readlyn
Increase capacity of storm water drainage system	Completed- Readlyn 2018 sewer plant, and again in 2020 wetlands projects
Develop redundancies/plan in event the city's one well becomes compromised	Active 28E agreements with Bremer County and Bremer County Emergency Management
Encourage utility providers and developers to place all utilities underground	Not Completed- 50% underground
Use surge protectors to prevent electrical damage to critical and sensitive equipment	Complete
Placement of lighting arrestors on power lines	Active- Butler/Bremer REC
Construct or designate a safe room or storm shelter	Complete- Storm shelter designated at Readlyn Fire Dept. Building
Encourage backup power generation for local telephone systems and cellular operations	Complete local, 50% complete in county
Inspect any utility lines that are near a sinkhole	Active/as needed
Maintain pump station	Complete- will be continued
Maintain a list of potential storm sewer projects	Active- budgeted annually
Acquire more water pumps	Not complete- limited budget

Purchase additional trash pumps	Not complete- limited budget
Pursue partnership with rural water as the system expands	Active- as needed
Encourage floodproofing/elevating structures in the floodplain	Active- Bremer County Building and Zoning
Encourage construction of dikes, levees, dams, and retention ponds	N/A in Readlyn
Identify bridges and culverts than can cost effectively be reengineered to reduce future flooding	Active- Bremer County Building and Zoning

CITY OF SUMNER STATUS OF 2017 HAZARD MITIGATION ACTIVITIES	
Mitigation Action/Program/Project	Project/Program Status (Specific actions, what has been completed, how it was implemented, not completed, % done, why not implemented, etc.)
Continue training and education for fire departments, law enforcement agencies and ambulance crew personnel	Active, Repetitive; The Fire Department holds training exercises at least once a month and sometimes more. Police are encouraged to attend any training classes when offered and the First Responders meet and train month.
Maintain and acquire materials and equipment for fire departments, law enforcement agencies and ambulance crew personnel	Active; All departments maintain and acquire equipment as items become worn, damaged, expired, etc.
Maintain mutual aid agreements	Completed, will be continued; Fire Department and First Responders have mutual agreements with surrounding communities.
Maintain storm spotter training for local fire departments/deputies and EMS crews	Active; On-going as needed or when offered
Make available a cleanup crew for after a storm	To be implemented as needed; City Personnel and Volunteers gather in the event of storm damage
Maintain mutual aid agreements with the Northeast Iowa response Group	Completed, will be continued
Keep HAZMAT manuals/information current and easily accessible	Completed, will be continued; Information is kept at City Hall

Maintain or install GPS units in all emergency service and city/county vehicles	Completed, will be continued; GPS is Installed on City Vehicles, police vehicles, and Fire Trucks
Maintain automatic TTY TDD machines for emergency personnel and city/county employees	Completed, Maintained by Bremer County Law Enforcement Center.
Continue training and promotion of the Incident Command System	Active, repetitive; When offered, encourage new employees/council members/ Fire and Responder personnel to participate.
Upgrade radio communications equipment as needed	Completed, will be continued; upgrades are addressed as they become necessary and available
Maintain list of county emergency contacts	Completed, will be continued and updated as needed; Located at City Hall
Continue cooperation between county roads department and local fire departments during snow emergencies	To be implemented as needed; When storm warnings are issued. City personnel and Sumner Fire Department communicate with the County Road dept.
Improve water system to enhance firefighting capacity/ability	Continue to replace old fire hydrants with new to improve the water capacity at each hydrant
Maintain and keep storm drains clear of debris	Active, Done on a regular schedule
Initiate and enforce burn ban in times of drought or as needed (grass/wildfire, drought)	To be implemented as needed; when County or Fire Department initiates or recommends the ban
Enforce no parking designations at special events	To be implemented as needed; football games or other large events held at the school. Parades, large weddings and/ or funerals.
Maintain air conditioner(s) in community buildings	Completed, will be continued. Air conditioning is checked yearly and repaired as needed
Initiate and enforce burn ban in times of drought or as needed (drought)	To be implemented as needed; when County or Fire Department initiates or recommends the ban
Develop sandbagging procedures for the community	To be implemented as needed; Sandbagging locations have been established and all Sandbagging volunteers are documented
Develop and maintain staging area for dumping during cleanup	To be implemented as needed; Areas will be established when needed.
Maintain and update emergency response plans	Ongoing, will be continued; Emergency Operation plan available at City Hall
Maintain lists of personnel and equipment available to use with response plans	Ongoing, will be continued; Lists are available at City Hall
Maintain NIMS compliance	Active, encourage new employees, Fire Dept. Personnel, Responders, council members to attend NIMS training when it is offered.

Provide emergency shelters for evacuees	To be implemented as needed; Emergency Shelter is located at the Sumner High School. St John's Lutheran Church and United Methodist Church can also be used, if necessary, in the event of an emergency.
Acquire necessary response and detection equipment for city/county employees	Active, when circumstances warrant the need
Enhance Standard Operating Procedures for dissemination of information/press releases in the event of a disaster	To be implemented as needed; Sumner Emergency Services has an SOP in place.
Complete continuity of government plan	Ongoing, will continue to develop updated strategic plan by Council and department head
Regularly review and amend fire and medical HAZMAT response standard operating procedures	Active, as needed
Set a designated number of people to be trained in post-disaster record keeping/damage assessments	To be implemented as needed; Receive help/advice from Bremer County Emergency Management, as needed
Maintain list of potential translators to be called upon in case of an emergency	Completed, will be continued; Bremer County EMA keeps a list on file
Stockpile sand and sandbags	Completed, will be continued yearly or as needed.
Purchase additional trash pumps	completed 2 new trash pumps added to city inventory
Purchase emergency signs to be used in case of an incident	Completed, will be continued; more will be ordered if needed
Purchase a new tanker and/or pumper	Not complete, Fire Department updates equipment as needed and funds are available.
Provide fans and/or cooling shelter	Completed, will be continued.
Maintain and/or develop a wellhead protection program	Continue plan to update buildings and equipment
Monitor wells in areas of identified contamination	Continue to monitor wells and cap when no longer in use
Monitor the drinking water supply	Continue to test weekly and monthly
Maintain and/or develop storm water management program	Completed city has established a stormwater utility, and collects a monthly fee to be used toward stormwater improvements
Follow monitoring requirements set forth by the Iowa DNR	Continue to follow the requirements of DNR through water, sewer, and stormwater requirements.

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, to be implemented as needed; communications are kept open between each organization and best practices maintained
Secure the area (around a sinkhole)	To be implemented as needed, when a sinkhole is identified in the area city staff will coordinate
Identify and map areas of past contamination	Completed, will be continued; records of past contamination are documented
Restrict water usage should it be necessary	To be implemented as needed; in the event of a shortage or contamination
Clear ditches, streams, and waterways on a regular basis	To be implemented as needed; in the event of high water
Eliminate and cap private and abandoned wells in the city	To be implemented as needed; Bremer County caps private and abandoned wells within the city as they are identified
Eliminate the use of septic tank systems in the city limits	To be implemented as needed; new construction is not permitted to use septic systems nor are permits issued for replacement of failed systems within proximity to city services
Encourage community to plant shade trees	To be implemented as needed.
Keep a supply of drinking water to distribute	Completed, will be continued; A supply is kept at the Fire Station
Develop rationing procedures	To be implemented as needed; should circumstances warrant such action
Plant trees along water bodies and slopes	Not completed; as funds are available and need arises
Purchase additional parkland in order to increase greens space and reducing surface flow	Dropped
Maintain public works equipment	Active, repetitive; Maintenance is scheduled according to equipment standards
Continue fire prevention program	Completed, will be continued; Fire Department holds "Fire prevention week" at the school yearly.
Maintain membership in the NFIP	Completed; last updated floodplain ordinance in December of 2020 to maintain compliance
Enforce a curfew	To be implemented as needed or when complaints are received.
Identify and inventory potential sinkhole sites	Active, Repetitive; City personnel check city property daily
Enforce the local zoning ordinances	Active, Repetitive; local zoning is enforced thru permits issued by the city or county. City council action if changes are necessary.

Continue working with the Bremer County Recovery Coalition	Active, Repetitive; communication as needed during recovery efforts
Maintain tree trimming program	Active, Repetitive; city staff maintains a trimming schedule
Enforce sidewalk clearance ordinance	To be implement as needed when complaints are received.
Enforce and update building codes, as needed	Continue to review building codes, and enforce any additional codes adopted by the Council
Continue enforcement of city sump pump discharge ordinance	Active, implement program for smoke testing of stormsewer
Maintain a list of potential storm sewer projects	Active, Repetitive, A list has been established and updated as needed
Continue an annual inspection program for commercial and industrial properties	Completed, will be continued; Fire Inspections and County Inspections are ongoing
Maintain, enforce and update floodplain ordinance	Completed; last updated December 2020
Encourage the use of proper materials and construction techniques	Active, Repetitive; Information is shared on City Permits & County permits
Update flood maps/flood studies for areas throughout the county	Completed, will be continued; ongoing
Determine locations for potential heating shelters and volunteer organization	Completed, will be continued; locations identified at Sumner High School, St. John's Lutheran Church, and United Methodist Church
Purchase and maintain backup generators	Complete, will be continued; All lift stations have backup generators and maintained on a regular schedule
Maintain use of snow fences in the city/county	Active, Repetitive, Public Works department installs as needed
Backup all digital data	Active, Repetitive; computers backup daily
Maintain law enforcement monitoring of large storage supplies	Completed, will be continued monitoring as changes occur
Encourage backup power generation for local telephone systems and cellular operations	Not completed; utility companies are not owned by the city, however the City does have generators for City use.
Keep supply of backup radios and cellphones	Completed, will be continued when replacements are needed.
Maintain and update anti-virus software	Completed, will be continued; daily anti-virus and backups are installed
Secure vulnerable targets, as identified by the LEPC and County EMA with alarms, security cameras and fences	Completed, will be continued; fence surrounds the water tower and lagoon. Gate is kept locked at the sewer plant.
Review and update fire codes as necessary	Active, Repetitive; reviews are done annually.
Educate the public	Active; Public is kept up to date via city website, Facebook page, and mass emails. Notifications can also be placed on the back of the monthly water

	bills.
Maintain, test, and replace warning sirens	Active, repetitive; Monthly tests of town sirens and twice weekly tests for Responder & Fire Dept. radios
Identify areas throughout the city that would substantially benefit from outdoor warning sirens	Active;
Encourage and maintain enrollment in emergency notification system	Active, Repetitive; Links are provided on the City Website and posts from Bremer County Emergency Management are shared on the City Website and Facebook page. Also sent out via email or back of the water bill.
Encourage use of Iowa One call before digging	Active; Community is informed and reminded via City website, Facebook page, permit issues, signs that say, "Call Before You Dig".
Improve standard operating procedures for schools	Not completed; school maintains own operating procedures but have been included in this planning process
Seek to improve communications with other agencies	Active, as needed
Keep the county updated on personnel changes	Active, Repetitive; City Hall maintains a list of current personnel, which includes all employees, council members, Fire Department and Responders.
Encourage residents to keep smoke detectors, sprinkler systems and fire extinguishers maintained in their homes	Active, Repetitive; Fire Department reminds citizens twice a year on their Facebook page to check/change the batteries and test their smoke alarms. If residents need help with installing new smoke alarms or batteries, Firemen will volunteer to do so.
Keep communication lines open with Nuclear Plant in Palo, IA	Dropped; Nuclear plant closed
Cooperate with any countywide mass vaccination plan	To be implemented as needed; In the event of a mass vaccination, City Hall, Community Center, or School for vaccination areas
Monitor disease outbreak news from the CDC and Iowa Department of Public Health	Active; City personnel monitor covid 19 updates on a daily basis and any other outbreaks that should occur.
Educate city personnel to handle a sinkhole situation	Active; done annually
Continue cooperation with county in developing flood mitigation efforts	Active, Repetitive; updated as necessary due to past flooding experiences
Encourage all communities to participate in their Local Emergency Planning Commission (LEPC)	To be implemented as needed; when workshops, classes are offered, city encourages employees and citizens to participate.
Maintain communication with county contacts	Active; list is kept and updated as needed at City Hall.
Purchase NOAA weather radios	Completed. NOAA weather radios installed at City Hall, Aquatic Center, Library and other city buildings

Encourage lead-based paint and asbestos removal	Active; Inspections by the Bremer County Inspector, or Fire Department, property owners are informed of the danger & encouraged to safely remove these hazards.
Encourage homeowners to keep emergency kits	Active, Repetitive; Information is shared via social media
Establish alternative transportation routes should a road need to be closed	To be implemented as needed; due to flooding, accident, or unexpected circumstances
Identify fallout shelter locations	Continue to identify and update shelters available
Encourage the public to receive vaccinations	Active; Posts are shared to the public via the City Website/Facebook as well as SEMS page and IDPH posters are hung up in the Library and Bulletin board at City Hall.
Educate city personnel to identify risk areas	Active; Daily, City personnel and the mayor check all areas of town, including the Sewer plant for any down trees, problem areas.
Establish detour routes	To be implemented as needed; in case of emergencies such as floods, bridge closed, vehicle accidents.
Establish transportation evacuation routes and protocols	To be implemented as needed; in case of emergencies such as flooding, bridge washed out, fires, etc.
Inform the public of reputable and ill reputable contractors following disasters	As needed; the City shall maintain communications with the public as soon as the City is aware of any issues. Permits are also required for construction/repairs, etc.
Notify the media on shelter locations	To be implemented as needed; Loss of power, floods, tornado warnings, etc.
Educate the public on maintaining their sump pumps	Active; public is made aware
Relocate Sumner Municipal Light Plant	Complete; Drop
Replace/make improvements (widen or raise) at 3 <sup>rd</sup> and 5 <sup>th</sup> Street bridges to increase river flow capacity	Continue The city has placed the bridges on the state bridge replacement program
Relocate Public Works Building	Not complete, as funds are made available
Use surge protectors to prevent electrical damage to critical and sensitive equipment	Active, used on a daily basis
Placement of lightning arrestors on power lines	Dropped. City will continue to look for new locations as buildings become available, at this time city has a plan in place to clear buildings prior to flood

Pursue partnership with rural water as the system expands	Dropped
Continue with improvement to the storm water system	To be implemented as needed, when areas are identified
Prevent inflow and infiltration into the sanitary sewer	Active; Repetitive; City personnel do daily checks of the sewer system.
Continue to cooperate with pipeline owners and operators to ensure locations are marked	Active, Repetitive; as needed.
Continue regular bridge inspections	Active, bridges are inspected annually or if damaged between inspections.
Place barricades to close dangerous bridges	To be implemented as needed; due to accidents, flooding, or under other circumstances
Maintain embargos/weight limits as necessary	Completed, will be continued;
Inspect any utility lines that are near a sinkhole	To be implemented as needed, when a sinkhole is identified in the area
Encourage construction of dikes, levees, dams, and retention ponds	Active, Repetitive; policy in place per ordinance. Retention/detention ponds have been added on the northeast corner of the city
Maintain pump station	Continue to monitor condition of stations
Encourage utility providers and developers to place all utilities underground	Active, City is converting to all underground utilities with approximately 25% of work completed.
Construct or designate a safe room or storm shelter	Active, On going
Identify, purchase and remove structures from flood hazard areas	Active; will be continued as needed. 12 structures have been removed from the floodplain since last plan cycle.
Install tiling to help water move away from structures	Active, will be continued as needed.
Encourage floodproofing/elevating structures in the floodplain	Active, Ongoing.
Identify bridges and culverts that can cost effectively be reengineered to reduce future flooding	Active, ongoing. The City began work in 2020 on stormwater improvements including detention basins and stormwater drainage systems. Improvement are continually explored throughout the process
Protect wastewater treatment facility from flooding	Active, The City is working to build up the dirt in low areas
Place alarms on storage facilities containing hazardous materials	Not complete; will implement as funding is available
Acquire more water pumps	Not complete; will implement as funding is available

Receive education/training from DOT on the subject of embargo/weight limits	Completed, will be continued as needed
Work with DOT to replace South Division Street Bridge	Active/on-going, the city is working to complete the initial paperwork with IDOT to move forward with the design phase in the spring of 2022

CITY OF TRIPOLI-STATUS OF 2017 HAZARD MITIGATION ACTIVITIES	
Mitigation Action/Program/Project	Project/Program Status (Specific actions, what has been completed, how it was implemented, not completed, % done, why not implemented, etc.)
Continue training and education for fire departments, law enforcement agencies and ambulance crew personnel	Ongoing
Maintain and acquire materials and equipment for fire departments, law enforcement agencies and ambulance crew personnel	Ongoing
Provide emergency shelters for evacuees	Ongoing
Maintain storm spotter training for local fire departments/deputies and EMS crews	Ongoing
Maintain automatic TTY TDD machines for emergency personnel and city/county employees	NA
Continue training and promotion of the Incident Command System	Ongoing
Complete continuity of government plan	Improvement Action
Upgrade radio communications equipment as needed	Ongoing
Regularly review and amend fire and medical HAZMAT response standard operating procedures	Ongoing
Keep supply of backup radios and cellphones	Ongoing
Maintain list of county emergency contacts	Ongoing
Develop and maintain staging area for dumping during cleanup	Ongoing

Conduct a fire and ambulance mass disaster training	Ongoing
Maintain mutual aid agreements	Ongoing
Make available a cleanup crew for after a storm	Ongoing
Improve water system to enhance firefighting capacity/ability	Ongoing
Stockpile sand and sandbags	Ongoing
Purchase additional trash pumps	As funds available
Purchase a new tanker and/or pumper	As funds available
Develop sandbagging procedures for the community	As needed
Acquire necessary response and detection equipment for city/county employees	Ongoing
Maintain list of potential translators to be called upon in case of an emergency	Partnership with Bremer County Emergency Management
Maintain or install GPS units in all emergency service and city/county vehicles	Ongoing in primary emergency response vehicles
Keep the county updated on personnel changes	Ongoing
Continue enforcement of city sump pump discharge ordinance	Ongoing
Maintain and/or develop storm water management program	Ongoing
Restrict water usage should it be necessary	Ongoing
Provide a local hazardous waste dropoff site	Partnership with Bremer County Landfill
Plant trees along water bodies and slopes	Ongoing
Clear ditches, streams, and waterways on a regular basis	Ongoing

Develop rationing procedures	As needed
Purchase additional parkland in order to increase greens space and reducing surface flow	NA
Maintain tree trimming program	Ongoing
Maintain and enforce building codes	Ongoing
Determine locations for potential heating shelters and volunteer organization	Ongoing
Purchase and maintain backup generators	Ongoing
Place alarms on storage facilities containing hazardous materials	Ongoing
Maintain law enforcement monitoring of large storage supplies	Ongoing
Maintain mutual aid agreements with the Northeast Iowa response Group	Ongoing through Bremer County Emergency Management
Encourage backup power generation for local telephone systems and cellular operations	Ongoing
Seek to improve communications with other agencies	Ongoing
Maintain and keep storm drains clear of debris	Ongoing
Follow monitoring requirements set forth by the Iowa DNR	Ongoing
Maintain air conditioner(s) in community buildings	Ongoing
Secure the area (around a sinkhole)	If needed
Establish transportation evacuation routes and protocols	Ongoing

Maintain lists of personnel and equipment available to use with response plans	Ongoing
Install a snow fence around the wastewater treatment facility	As needed
Enforce sidewalk clearance ordinance	Ongoing
Maintain use of snow fences in the city/county	Ongoing
Enforce and update building codes, as needed	Ongoing
Encourage lead based paint and asbestos removal	Ongoing
Maintain, test, and replace warning sirens	Ongoing with partnership with Bremer County Emergency Management
Continue cooperation between county roads department and local fire departments during snow emergencies	Ongoing
Continue an annual inspection program for commercial and industrial properties	Ongoing
Continue fire prevention program	Ongoing
Maintain membership in the NFIP	Ongoing
Maintain, enforce and update floodplain ordinance	Ongoing
Identify, purchase and remove structures from flood hazard areas	Ongoing
Keep communication lines open with Nuclear Plant in Palo, IA	NA – closed
Maintain and/or develop a wellhead protection program	Ongoing
Monitor the drinking water supply	Ongoing
Eliminate and cap private and abandoned wells in the city	As needed
Eliminate the use of septic tank systems in the city limits	As needed

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
Maintain and update anti-virus software	Ongoing
Review and update fire codes as necessary	Ongoing
Provide fans and/or cooling shelter	Ongoing
Encourage community to plant shade trees	Ongoing
Identify and inventory potential sinkhole sites	As needed
Educate city personnel to handle a sinkhole situation	As needed
Enforce the local zoning ordinances	Ongoing
Update flood maps/flood studies for areas throughout the county	Ongoing
Continue cooperation with county in developing flood mitigation efforts	Ongoing
Continue working with the Bremer County Recovery Coalition	As needed in partnership with Bremer County Emergency Management
Maintain and update emergency response plans	In partnership with Bremer County Emergency Management outside local capability
Maintain NIMS compliance	Ongoing
Conduct Mosquito Spraying	Ongoing
Inspect and ensure vacant structures do not have rodents or infestations	Ongoing
Backup all digital data	Ongoing
Identify areas throughout the county that would substantially benefit from outdoor warning sirens	NA to City of Tripoli

Enforce no parking designations at special events	Ongoing
Monitor wells in areas of identified contamination	As needed
Identify and map areas of past contamination	As needed
Secure vulnerable targets, as identified by the LEPC and County EMA with alarms, security cameras and fences	Ongoing
Keep a supply of drinking water to distribute	Minimal drinking water maintained through Fire and EMS
Monitor disease outbreak news from the CDC and Iowa Department of Public Health	In partnership with Bremer County Health Department
Educate city personnel to identify risk areas	Ongoing
Enforce a curfew	As needed
Encourage flood proofing/elevating structures in the floodplain	Ongoing
Educate the public	Ongoing
Purchase NOAA weather radios	As needed
Keep HAZMAT manuals/information current and easily accessible	Ongoing in partnership with Bremer County Emergency Management
Enhance Standard Operating Procedures for dissemination of information/press releases in the event of a disaster	Ongoing in partnership with Bremer County Emergency Management
Encourage use of Iowa One call before digging	Ongoing
Improve standard operating procedures for schools	As needed In partnership with school district
Educate the public on maintaining their sump pumps	Ongoing
Initiate and enforce burn ban in times of drought or as needed	Ongoing
Maintain and improve signals/signage along roadways and at railroad crossings	Ongoing

Establish alternative transportation routes should a road need to be closed	Ongoing
Encourage the public to receive vaccinations	Ongoing
Cooperate with any countywide mass vaccination plan	Ongoing
Initiate and enforce burn ban in times of drought or as needed	Ongoing
Maintain communication with county contacts	Ongoing
Notify the media on shelter locations	Ongoing
Encourage and maintain enrollment in emergency notification system (ALERT IOWA)	Ongoing
Encourage homeowners to keep emergency kits	Ongoing in partnership with Bremer County Emergency Management
Encourage residents to keep smoke detectors, sprinkler systems and fire extinguishers maintained in their homes	Ongoing
Purchase emergency signs to be used in case of an incident	Ongoing
Set a designated number of people to be trained in post-disaster record keeping/damage assessments	In progress with Bremer County Emergency Management
Inform the public of reputable and ill reputable contractors following disasters	Ongoing
Routinely test/maintain sirens and educate public on what to do when sirens activated	Ongoing
Spread public awareness on importance of immunizations	Ongoing in partnership with Bremer County Health
Identify fallout shelter locations	Not at this time
Encourage the use of proper materials and construction techniques	Ongoing
Encourage all communities to participate in their Local Emergency Planning Commission (LEPC)	Via Bremer County Emergency Management

Install new or retrofit existing facilities to have a storm shelter/safe room	As funds available
Encourage utility providers and developers to place all utilities underground	Ongoing
Maintain public works equipment	Ongoing
Use surge protectors to prevent electrical damage to critical and sensitive equipment	Ongoing
Maintain a list of potential storm sewer projects	Ongoing
Construct or designate a safe room or storm shelter	As funds available
Acquire more water pumps	As funds available
Continue with improvement to the storm water system	As funds available
Prevent inflow and infiltration into the sanitary sewer	Ongoing
Make upgrades to prevent sanitary sewer/storm sewer cross contamination	As funds available
Install rip rap around wastewater treatment facility	Ongoing
Maintain pump station	Ongoing
Placement of lighting arrestors on power lines	Ongoing
Pursue partnership with rural water as the system expands	Under discussion
Continue to cooperate with pipeline owners and operators to ensure locations are marked	Ongoing
Inspect any utility lines that are near a sinkhole	As needed
Encourage construction of dikes, levees, dams, and retention ponds	As needed
Maintain and enforce policy that manufactured homes must be anchored	Ongoing

Identify bridges and culverts than can cost effectively be reengineered to reduce future flooding	As funds available
Install tiling to help water move away from structures	Ongoing

CITY OF WAVERLY-STATUS OF 2017 HAZARD MITIGATION ACTIVITIES	
Mitigation Action/Program/Project	Project/Program Status (Specific actions, what has been completed, how it was implemented, not completed, % done, why not implemented, etc.)
Train and educate emergency service personnel	Active, Repetitive; The Fire Department holds training exercises at least once a month and sometimes more. Police are encouraged to attend any training classes when offered and the First Responders meet and train month.
Maintain and acquire materials and equipment for emergency service personnel	Active; All departments maintain and acquire equipment as items become worn, damaged, expired, etc.
Maintain mutual aid agreements	Completed, will be continued; Fire Department and First Responders have mutual agreements with surrounding communities.
Continue to recruit volunteer first responders and promote these opportunities	Active/on-going; networking takes place regularly, social media and web-based presence
Continue working relationship with Tri-County Drug Task Force	On-going, the community actively participates.
Regularly review and amend fire, medical, and HAZMAT response standard operating procedures	Active/on-going; SOP's are reviewed regularly and as needed

Review and update Incident Command procedures	On-going, the city maintains procedural updates on a regular basis through Lexipol
Update Emergency Response Plan	On-going, updates are completed as needed.
Develop a Continuity of Operations Plan	Continuity plans are discussed during staff meetings and training at city and schools
Upgrade radio communications equipment as needed	As needed and funds are available.
Improve water system to enhance firefighting capacity/ability	Active/on-going; city has installed looped water mains and replaced water mains on Bremer Ave. Improved needs are monitored and addressed as needed and funds are available
Develop a comprehensive list of alternative routes for different fire scenarios	Active/on-going; Fire Dept. trains regularly on fire response throughout the city
Maintain a flood response protocol for response, sand bagging, and evacuation procedures	Active/on-going; Emergency service provider routinely coordinate emergency response procedures
Maintain inter-governmental cooperation, e.g. cost sharing	On-going, Waverly has multiple 28E Agreements with surrounding jurisdictions.
Evaluate equipment and personnel capacity	On-going; the necessity for updated or additional equipment and personnel is evaluated on a case-by-case basis
Install Automatic Vehicle Locators (AVL) in all emergency vehicles	Not implemented
Determine possible sheltering locations to be used in the event of a nuclear emergency	N/A Nuclear Power Plant in Palo decommissioned
Monitor the transportation of radioactive chemicals to the best of the city's ability	On going and as needed.
Continue further development of and update Storm Water Management Program	On-going. New subdivisions are required to meet SUDAS standards for storm water management.
Create a regional plan to address flooding concerns including wetland areas and detention ponds	Not complete; this has been addressed as an active goal in this plan, City participates in the Upper Cedar River Watershed Protection Coalition
Monitor and enforce drainage regulations on residential, commercial, and industrial developments	On going and as needed, planning and zoning monitors developments and applies regulations.
Follow monitoring requirements set forth by the Iowa DNR	On going and as needed,
Acquire and maintain equipment for debris removal of drainage areas and post disaster	Active/on-going; PWD has equipment and assesses the need for additional equipment and budgets as funds are available

Reduce groundwater nitrate contamination	Active/on-going, City continues to monitor and address nitrate concerns in City-owner wells.
Consider dredging the river	On-going.
Identify alternative water sources such as dry hydrants and ponds	Active/ on-going; Fire Department routinely identifies alternative water sources in those areas without fire hydrants
Continue Wastewater Facility Storm Water Program	On-going
Discourage the clearing of trees and shrubbery from cliffs and steep sloping hills.	As needed and on-going; latest example is Whitetail Bluffs
Maintain tree trimming program	On-going; Currently building database of trees in public areas and when they were last trimmed and/or pruned.
Systematically review, make necessary updates to, and enforce building code requirements	On-going; update to latest Building Code Standards, Bremer County Building Department is the enforcement mechanism.
Continue enforcement of snow ordinance	On-going and as needed.
Acquire and maintain staff and equipment for snow removal	On-going; seasonal.
Continue an annual inspection program for commercial and industrial properties	Not pursued. Economic Development does walk throughs at local businesses but not an inspection. Waverly contracts all building inspections out to Bremer County Building Department.
Enforce existing laws	On-going
Enforce City guidelines for burning	On-going
Continue annual fire inspection program	Active/on-going
Research railway concerns	Looked into but have not proceeded due to cost.
Evaluate current terrorism mitigation efforts	On-going; city supports state and national efforts, cyber terrorism is addressed through IT Dept.
Establish local “cooling sites” for at risk populations such as the elderly and/or the disabled	As-needed. Have used City Hall and Public Library as “cooling sites”.
Adhere to the Quarantine Plan	As needed; per direction of Public Health Departments
Adhere to the current FAD (foreign animal disease) Plan	On-going; guidance taken from Public Health Department

Continue to enforce City and County guidelines for burning	On-going; burn permit requirements.
Create a zoning ordinance restricting building near the top and bottom of steep sloping cliffs and hills	Not completed.
Educate the public	Not sure what this is in reference to.
Distribute emergency alerts and information through local media	Use Facebook page to update citizens of emergency alerts
Test and maintain outdoor warning system	On-going.
Develop and distribute annual hazard mitigation newsletter	Not completed.
Continue to promote NOAA Weather Radio awareness program	Active/on-going; City Public Services includes information about weather radios through the newsletter to utility customers
Continue to utilize ALERT IOWA notification system	Active/on-going
Expand weather spotter training	Active/on-going; City Fire personnel and other volunteers are provided with periodic weather spotter training
Maintain Crisis Communication Plan	On-going; in conjunction with Bremer County Emergency Management and other agencies
Enhance coordination of disaster plans in the community	On-going; in conjunction with Bremer County Emergency Management and other local agencies
Enhance communication amongst the private sector, public sector, media outlets and citizens	On-going; the city uses various methods of communication including radio, TV, newsletter, and social media
Ensure proper training and certification of Floodplain Manager(s)	Not completed. Staff turnover in the Zoning office.
Review and improve education plans and file with the Community Emergency Response Team (CERT)	
Develop a "Tornado Safe Room" awareness program	Not complete; a specific program has not been implemented but parents and students are made aware of new facilities at schools
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	Not completed.
Develop the proper steps to be taken in the event of an earthquake and communicate these procedures to the public	Not completed.

Continue participation in the NFIP	On-going, maintained status with update to floodplain ordinance.
Maintain, enforce and update floodplain ordinances as needed	On-going, completed floodplain ordinances update in January 2021.
Develop the Cedar River Parkway/Bridge	Completed.
Encourage the inclusion of tornado safe rooms in newly constructed public facilities	As needed, raised concerns when discussing new school buildings.
Complete the Dry Run Creek obstruction and flash flooding analysis and consider other mitigation activities such as removal of the 3 <sup>rd</sup> St Bridge and Cedar River Trail Bridge	Proceeded with the removal of the 3 <sup>rd</sup> Street Bridge.
Encourage local utilities to upgrade equipment used to locate and identify underground utility lines	Active; all utilities are encouraged to be placed underground
Continue bridge inspection program	On-going.
Explore replacement alternative for bridges	On-going. Green Bridge will be removed. Cedar River Parkway and Adams Parkway bridge will provide access when Bremer Avenue bridge is under construction. Has begun discussions regarding future of the Rail Trail Bridge.
Continue to make necessary inspections and repairs to existing dam	On-going.
Inspect, and make upgrade as needed, to maintain safe operations of sanitary sewer collection system and treatment facility	On-going.
Inspect/repair/replace water mains	On-going.
Work with local utility companies to encourage burying of utility lines	On-going, new subdivision are burying utility lines.
Continue to install and update surge protectors on major electric lines	Responsibility of service provider
Research and secure grant dollars for shelter and safe room construction	Not completed. Staff turnover.
Construct additional storm shelters and tornado safe rooms	Not completed, not budgeted for.
Flood proof of structures in the floodplain	Not completed, not budgeted.
Replace or increase capacity of 3 <sup>rd</sup> Street bridge	On-going. City Council will have vote to award a contract to remove the 3 <sup>rd</sup> Street bridge.

Implement projects identified for the Cedar Lane Bike Path	Cedar Lane Bike Path considered on-road bike path.
Enhance and maintain storm sewer capacity	On-going.
Increase measures taken to protect and secure the city's critical infrastructure	On-going.
Maintain a list of structures and sites to be used as gathering sites in the event of an emergency situation	On-going.
Retrofit current facilities to include tornado safe rooms	Not completed, not budgeted for.
Continue acquisition and removal of homes from the floodplain	On-going when economically feasible.
Construct a dike and levee system in SE Waverly, near SE 7 <sup>th</sup> Avenue	Not pursuing any longer.



Attachment 4: Planning Committee & Public Involvement Materials

MEETING #1: MARCH 18, 2021

TO: Official Publication Outlets of Bremer County

FROM: Kip Ladage  
Bremer County EMA Coordinator  
(319) 352-0133

(Note: Please publish this press release in the next edition of your newspaper. Thank you.)

**BREMER COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN  
KICK-OFF PLANNING SESSION MEETING**

Bremer County is beginning the process of updating its 2017 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 the Federal Emergency Management Agency (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 and man-made 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, updating information from the existing plan, and the dates and locations of future meetings. The meeting will take place on Thursday, March 18, 2021 at 4:30 PM, virtually, using the GoToMeeting link or dial in option provided.  
<https://global.gotomeeting.com/join/437749621>  
1 (872) 240-3311 - Access Code: 437-749-621

If you have any questions, please feel free to contact Kip Ladage, (319) 352-0133.

**Bremer County Multi-Jurisdictional Hazard Mitigation Plan  
2022 Plan Update | Task Force Meeting #1**

Date: March 18, 2021

Time: 4:30 P.M.

Location: <https://global.gotomeeting.com/join/437749621>

You can also dial in using your phone.  
(For supported devices, tap a one-touch number below to join instantly.)

United States: +1 (872) 240-3311  
- One-touch: <tel:+18722403311.437749621#>

Access Code: 437-749-621

Agenda:

1. Welcome and Introductions
2. Overview of the planning process
3. Provide updates on existing mitigation actions
4. Review and update community profiles
5. Adjourn

*Note: This is a public meeting. Members of the community are invited to attend and participate in this meeting.*

Nick Fratzke | Community Development Specialist  
Iowa Northland Regional Council of Governments  
229 East Park Avenue | Waterloo, IA 50703  
(319) 235-0311 | [nfratzke@inrcog.org](mailto:nfratzke@inrcog.org)

### 2022 Bremer County Multi-Jurisdictional Hazard Mitigation Plan Update: Task Force

#### Meeting #1 Minutes

March 18<sup>th</sup>, 2021

The Bremer County Multi-Jurisdictional Hazard Mitigation Plan Update Task Force met on Thursday, March 18<sup>th</sup>, 2021, at 4:30 PM, virtually, using GoToMeeting.

The following jurisdictions were represented: Bremer County; cities of Denver, Frederika, Plainfield, Readlyn, Sumner, Waverly; school districts of Wapsie Valley. Those jurisdictions invited but not represented were cities of Janesville and Tripoli.

Schoon called the meeting to order at 4:32 PM.

Schoon provided an overview of the Multi-Jurisdictional Hazard Mitigation Planning Update, including the process, purpose, basis of doing so, and a timeline. He also reviewed the role of the Task Force in this effort and explained the funding and return on investment regarding the plan. Handouts were provided that offered more detailed information. Prior to the meeting, templates for Existing Mitigation Action Steps and Community Profile Updates were provided to each community or jurisdiction. Schoon provided an explanation of the impact and benefits to providing timely and accurate information for these updates.

Schoon discussed the first round of homework for each jurisdiction being the Existing Mitigation Action Steps and Community Profile Updates. Specifically, those present, discussed the evaluation of each Action Step and the format for which each Step would need to be presented for compliance with evaluation of the Final Document. Task Force members were asked to return their feedback, via email, to either Bremer County Emergency Management coordinator or INRCOG staff.

The next meeting of the Task Force is scheduled for 4:30 PM on Thursday, April 15<sup>th</sup>, 2021. Said meeting will also be held virtually using GoToMeeting.

The meeting adjourned at 5:18 pm.

Respectfully Submitted,  
Nick Fratzke  
Community Planner

#### ATTENDANCE RECORD

Meeting: Bremer County Hazard Mitigation Plan 2020 Update Meeting #1

Date: March 18, 2021 Time: 4:30 P.M. Location: Virtual using GoToMeeting

	<u>Name</u>	<u>Representing</u>
1.	Nick Fratzke	INRCOG
2.	Brian Schoon	INRCOG
3.	Alicia Smith	Sumner EMS
4.	Brittney Lentz	City of Plainfield
5.	Lisa Oberbroeckling	City of Sumner
6.	Kip Ladage	Bremer County Emergency Management
7.	Duane Michost	City of Frederika
8.	Tom Geise	City of Plainfield
9.	Blake Franzen	City of Plainfield
10.	Tim Duhrkopf	Sumner Fire Dept.
11.	Larry Farley	City of Denver
12.	Steve Aiello	City of Readlyn Police Dept./Wapsie Valley CSD
13.	Isaac Pezley	City of Waverly
14.	Lois Buhr	City of Readlyn
15.	Joel Wikner	City of Denver

**Public Notice**  
**BREMER COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN KICK-OFF PLANNING SESSION MEETING**  
 Bremer County is beginning the process of updating its 2017 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 the Federal Emergency Management Agency (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 and man-made 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, updating information from the existing plan, and the dates and locations of future meetings. The meeting will take place on Thursday, March 18, 2021 at 4:00 PM, virtually, using the GoToMeeting link or dial in option provided. <https://global.potomacmeeting.com/join/43774921>  
 1 (877) 240-3311 • Access Code: 437-749-621  
 If you have any questions, please feel free to contact Kip Ladage, 319 355-0153.  
 Published in the Waverly Democrat on March 11, 2021.

STATE OF IOWA

ss:

Bremer County.

**CERTIFICATION OF PUBLICATION**

I, Kim L. Hansen, 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 1 week(s), commencing on the 11  
 day of March, 2021, and ending on the 11 day of  
March, 2021.

Kim K. Hansen  
 Subscribed and sworn to before me this 9  
 day of December, 2021.

De Ann Amy Meyer  
 Notary Public and for Bremer County, Iowa

Printer's Fee, \$ 24.12 \*

\*Charge for additional certificates



### MEETING #2: APRIL 15, 2021

TO: Official Publication Outlets of Bremer County

FROM: Kip Ladage  
Bremer County EMA Coordinator  
(319) 352-0133

(Note: Please publish this press release in the next edition of your newspaper. Thank you.)

#### BREMER COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN KICK-OFF PLANNING SESSION MEETING

Bremer County is continuing its process of updating its 2017 Hazard Mitigation Plan by conducting a second planning meeting. As was stated in prior notices and the first meeting, the purpose of the plan is two-fold. The plan is a federal requisite to remain eligible for other mitigation grant programs offered by the Federal Emergency Management Agency (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 and man-made hazards within the county and the incorporated jurisdictions.

This second meeting will include assessing hazard risks, updating information from the existing plan, including goals and action steps. The meeting will take place on Thursday, April 15, 2021 at 4:30 PM, virtually, using the GoToMeeting link or dial in option provided.  
<https://global.gotomeeting.com/join/503958293>

1 (646) 749-3122  
- Access Code: 503-958-293

If you have any questions, please feel free to contact Kip Ladage, (319) 352-0133.

#### Bremer County Multi-Jurisdictional Hazard Mitigation Plan 2022 Plan Update | Task Force Meeting #2

Date: April 15, 2021

Time: 4:30 P.M.

Location:

<https://global.gotomeeting.com/join/503958293>

You can also dial in using your phone.  
(For supported devices, tap a one-touch number below to join instantly.)

United States: +1 (646) 749-3122  
- One-touch: <tel:+16467493122,503958293#>

Access Code: 503-958-293

#### Agenda:

1. Welcome and Introductions
2. Overview of previous planning meeting
  - a. Updated Mitigation Actions to date
  - b. Updated Community profile information
3. Review and Update Hazard Risk Assessments
4. Review and Update Hazard Mitigation goals
  - a. Review 2017 Goals
  - b. Identify 2022 Goals
5. Identify potential mitigation actions
  - a. Review Table
  - b. Keep or Drop Existing Action
  - c. Add new Actions
6. NEXT STEPS
  - a. Email will be sent to Communities with information to complete
  - b. Return updates by May 3 to [nfratzke@inrcog.org](mailto:nfratzke@inrcog.org)

*Note: This is a public meeting. Members of the community are invited to attend and participate in this meeting.*

## 2022 Bremer County Multi-Jurisdictional Hazard Mitigation Plan Update: Task Force

### Meeting #2 Minutes

April 15<sup>th</sup>, 2021

The Bremer County Multi-Jurisdictional Hazard Mitigation Plan Update Task Force met on Thursday, April 15<sup>th</sup>, 2021, at 4:30 PM, virtually, using GoToMeeting.

The following jurisdictions were represented: Bremer County; cities of Denver, Frederika, Plainfield, Readlyn, Sumner; school districts of Denver, Sumner-Fredericksburg, and Tripoli. Those in attendance included: Brittney Lentz, Kip Ladage, Duane Miehost, Tom Geise, Blake Franzen, Tim Duhrkopf, Larry Farley, Lois Buhr, Fred Matlage, Jay Marley, Brad Laurs, Nick Fratzke and Brian Schoon, INRCOG.

Fratzke called the meeting to order at 4:32 PM.

Fratzke provided an overview of the Multi-Jurisdictional Hazard Mitigation Planning Update materials covered in Meeting #1, including the updating the Existing Mitigation Action Steps and Community Profile Updates. Opportunity was given for participants to ask any questions regarding the previous meetings assignment.

Fratzke discussed the second round of homework for each jurisdiction being the Hazard Risk Assessment Review, Update of Future Mitigation Actions, and Review and Update of Hazard Mitigation Goals. Specifically, those present, discussed the evaluation of the Hazard Mitigation Goals and proposed additions regarding Emergency Communications Interoperability and collaboration between unincorporated and incorporated area on flood mitigation where action or inaction by one affects the other. Also discussed was the review of Future Mitigation Actions and the format for which each Step would need to be presented for compliance with evaluation of the Final Document. Task Force members were asked to return their feedback, via email, to INRCOG staff.

The next meeting of the Task Force is scheduled for 4:30 PM on Thursday, May 20<sup>th</sup>, 2021. Said meeting will also be held virtually using GoToMeeting.

The meeting adjourned at 5:15 pm.

Respectfully Submitted,  
Nick Fratzke  
Community Development Specialist

### ATTENDANCE RECORD

Meeting: Bremer County Hazard Mitigation Plan 2022 Update Meeting #2

Date: April 15, 2021 Time: 4:30 P.M. Location: GoToMeeting

<u>Name</u>	<u>Representing</u>
Nick Fratzke	INRCOG
Brian Schoon	INRCOG
Duane Miehost	City of Frederika
Brittney Lentz	City of Plainfield
Kip Ladage	Bremer County Emergency Management
Tim Duhrkopf	City of Sumner
Lois Buhr	City of Readlyn
Tom Geise	City of Plainfield
Blake Franzen	City of Plainfield
Fred Matlage	Sumner-Fredericksburg Community School District
Jay Marley	Tripoli Community School District
Brad Laurs	Denver Community School District
Larry Farley	City of Denver

**PUBLIC NOTICE  
BREMER COUNTY  
MULTI-JURISDICTIONAL  
HAZARD MITIGATION PLAN  
KICK-OFF PLANNING SESSION MEETING**

Bremer County is continuing its process of updating its 2017 Hazard Mitigation Plan by conducting a second planning meeting. As was stated in prior notices, at the first meeting, the purpose of the plan is two-fold. The plan is a federal requisite to remain eligible for other mitigation grant programs offered by the Federal Emergency Management Agency (FEMA). FEMA requires 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 and man-made hazards within the county and the incorporated jurisdictions. This second meeting will include assessing hazard risks, updating information from the existing plan, including goals and action steps. The meeting will take place on Thursday, April 15, 2021 at 4:30 PM, virtually, using the GoToMeeting link or dial in option provided. <https://global.gotomeeting.com/join/50309024>  
1 (845) 749-3122  
- Access Code: 503-058-293  
If you have any questions, please feel free to contact Kip Ladega, (319) 352-0133.  
Published in the Waverly Democrat on April 8, 2021.

STATE OF IOWA

ss:

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 in

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 8

day of April, 2021, and ending on the 8 day of

April, 2021.

Kim K Franzen

Subscribed and sworn to before me this 9

day of December, 2021

DeAnn Amy Meyer  
Notary Public in and for Bremer County, Iowa

Printer's Fee, \$ 24.12.

\*Charge for additional certificates



### MEETING #3: MAY 20, 2021

TO: Official Publication Outlets of Bremer County

FROM: Kip Ladage  
Bremer County EMA Coordinator  
(319) 352-0133

(Note: Please publish this press release in the next edition of your newspaper. Thank you.)

#### BREMER COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN PLANNING SESSION MEETING #3

Bremer County is continuing its process of updating its 2017 Hazard Mitigation Plan by conducting a third planning meeting. As was stated in prior notices and the first meeting, the purpose of the plan is two-fold. The plan is a federal requisite to remain eligible for other mitigation grant programs offered by the Federal Emergency Management Agency (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 and man-made hazards within the county and the incorporated jurisdictions.

This third meeting will include finalizing and prioritizing mitigation actions and finalizing community profiles. The meeting will take place on Thursday, May 20, 2021 at 4:30 PM, virtually, using the GoToMeeting link or dial in option provided.  
<https://global.gotomeeting.com/join/468097061>

1 (224) 501-3412  
- Access Code: 468-097-061

If you have any questions, please feel free to contact Kip Ladage, (319) 352-0133.

#### Bremer County Multi-Jurisdictional Hazard Mitigation Plan 2022 Plan Update | Meeting #3

Date: May 20, 2021

Time: 4:30 P.M.

Location:

<https://global.gotomeeting.com/join/468097061>

You can also dial in using your phone.  
(For supported devices, tap a one-touch number below to join instantly.)

United States: +1 (224) 501-3412  
- One-touch: <tel:+12245013412,468097061#>

Access Code: 468-097-061

#### Agenda:

1. Welcome and Introductions
2. Overview of previous meeting
3. Review Plan Timeline
4. Address any missing information needed for plan
5. Discuss next steps of planning process
  - a. Plan development
  - b. Plan adoption (Bremer County/Cities / School Districts)
  - c. Submittal to IHSEM & FEMA
6. Adjourn

*Note: This is a public meeting. Members of the community are invited to attend and participate in this meeting.*

Nick Fratzke, Community Development Specialist  
Iowa Northland Regional Council of Governments  
229 East Park Avenue | Waterloo, IA 50703  
(319) 235-0311 | [nfratzke@inrcog.org](mailto:nfratzke@inrcog.org)

## 2022 Bremer County Multi-Jurisdictional Hazard Mitigation Plan Update: Task Force

### Meeting #3 Minutes

May 20<sup>th</sup>, 2021

The Bremer County Multi-Jurisdictional Hazard Mitigation Plan Update Task Force met on Thursday, May 20<sup>th</sup>, 2021, at 4:30 PM, virtually, using GoToMeeting.

Those jurisdictions with representation present included: Bremer County; cities of Denver, Frederika, Plainfield, Readlyn, Sumner, Tripoli, Waverly; school district of Denver. Those in attendance included: Kip Ladage, Duane Michost, Tom Geise, Larry Farley, Lois Buhr, Brad Laues, Ellen Kalkbrenner, Isaac Pezley, Lisa Oberbroeckling, Nick Fratzke and Brian Schoon, INRCOG.

Fratzke called the meeting to order at 4:32 PM.

Fratzke provided a review of the Multi-Jurisdictional Hazard Mitigation Planning Update materials covered in Meetings 1 & 2, including the update of the Existing Mitigation Action Steps, Community Profile Updates, Hazard/Risk Assessments, Future Mitigation Action Activities, and Hazard Mitigation Plan Goals. Opportunity was given for participants to ask any questions regarding the previous meetings assignments.

Fratzke discussed the timeline and tasks for draft review by FEMA, IHSEMD and adoption by jurisdictions. Task Force members were asked to return their feedback by May 28<sup>th</sup>, 2021, via email, to INRCOG staff.

Discussion was had regarding the participation of school districts whose jurisdictions cross into multiple planning areas. Brian Schoon of INRCOG, explained that the goal is to ensure all jurisdictions and school districts are represented in a plan and that the planning area in which they are included would not effect the continuity of the plan itself.

The necessity for a fourth meeting will be determined based on jurisdictions response to the May 28<sup>th</sup> feedback request date.

The meeting adjourned at 5:10 pm.

Respectfully Submitted,  
Nick Fratzke  
Community Development Specialist

### ATTENDANCE RECORD

Meeting: Bremer County Hazard Mitigation Plan 2022 Update Meeting #3

Date: May 20, 2021 Time: 4:30 P.M. Location: GoToMeeting

Name	Representing
Nick Fratzke	INRCOG
Brian Schoon	INRCOG
Duane Michost	City of Frederika
Kip Ladage	Bremer County Emergency Management
Lois Buhr	City of Readlyn
Ellen Kalkbrenner	City of Tripoli
Tom Geise	City of Plainfield
Larry Farley	City of Denver
Isaac Pezley	City of Waverly
Brad Laues	Denver Community School District
Lisa Oberbroeckling	City of Sumner

**Public Notice**  
**BREMER COUNTY**  
**MULTI-JURISDICTIONAL**  
**HAZARD MITIGATION PLAN**  
**PLANNING SESSION**  
**MEETING #3**

Bremer County is continuing its process of updating its 2017 Hazard Mitigation Plan by conducting a third planning meeting. As was stated in prior notices and the first meeting, the purpose of the plan is to remain eligible for other mitigation grant programs offered by the Federal Emergency Management Agency (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 and man-made hazards within the county and the incorporated jurisdictions.

The meeting will include information on prioritizing mitigation strategies, finalizing communications, and the meeting will take place on Tuesday, May 20, 2021 at 1:30 P.M. virtually, using the Zoom Meeting link or dial in option at <https://global.gotomeet.com/join/6567001>.  
 1-822-501-3412 - Access Code: 468-097-061.

If you have any questions, please feel free to contact Kip Ledge, (319) 352-0133.  
 Published in the Waverly Democrat on May 13, 2021.

STATE OF IOWA

ss:

Bremer County.

**CERTIFICATION OF PUBLICATION**

I, Kim Fritzen being duly sworn

depone 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 1 week(s), commencing on the 13

day of May, 2021, and ending on the 13 day of

May, 2021.

Kim K Fritzen  
 9

Subscribed and sworn to before me this

day of December, 2021.

DeAnn Amy Meyer  
 Notary Public in and for Bremer County, Iowa

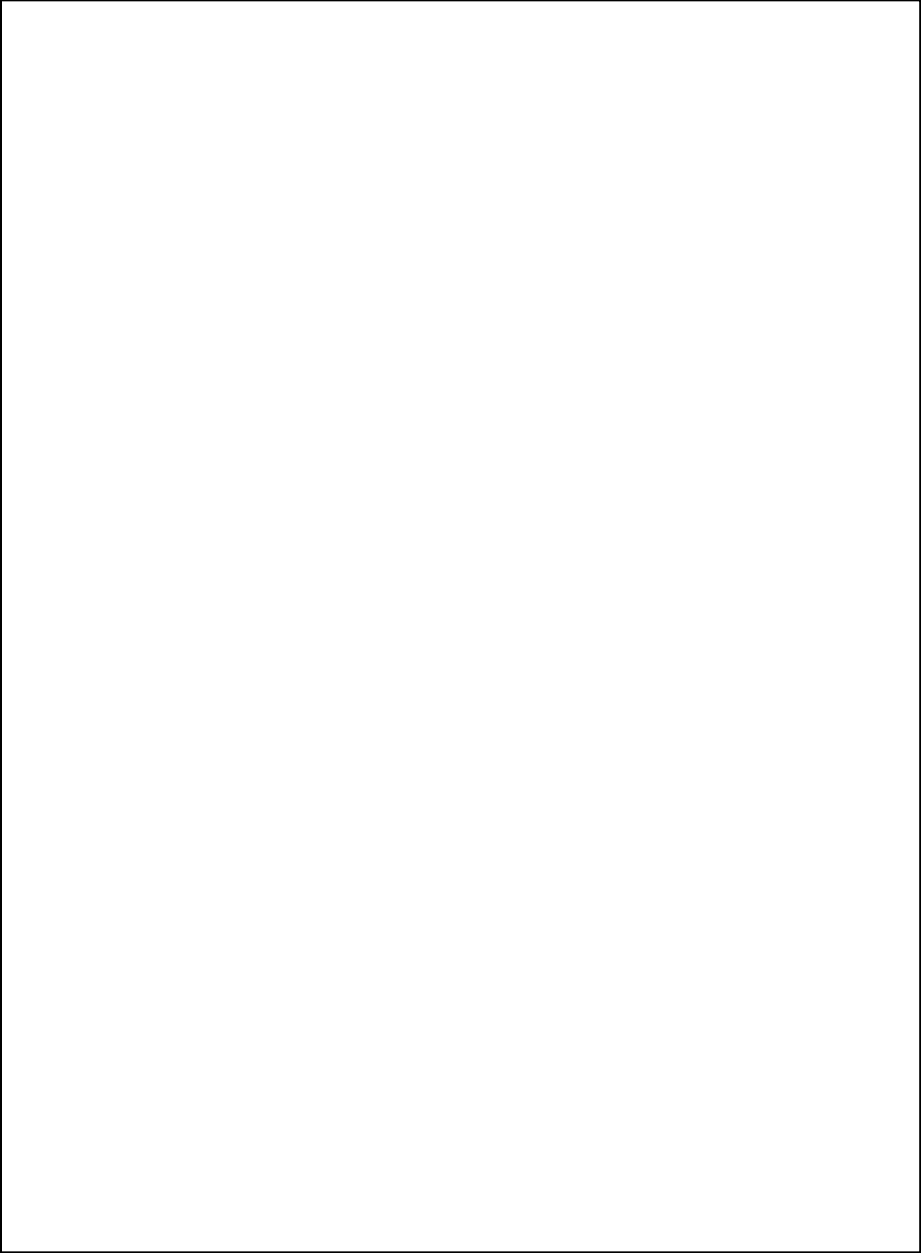
Printer's Fee, \$ 23.64.

\*Charge for additional certificates



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## Attachment 5: Hazard Mitigation Plan Approval and Review Documents



June 28, 2022

John Benson  
Director  
Iowa Homeland Security & Emergency Management Division  
7900 Hickman Road, Suite 500  
Windsor Heights, IA 50324

Subject: Review of Bremer County, Iowa Multi-jurisdiction Hazard Mitigation Plan

Dear John Benson:

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. After the review or revisions are completed, the plan will need to be resubmitted for approval by FEMA in order to continue to be eligible for mitigation project grant funding.

Plan Name	Date Received	Date Approved	Date of Plan Adoption	Date of Plan Expiration	Review Status
Bremer County	May 17, 2022	June 28, 2022	May 9, 2022	June 28, 2027	Approved

If you should have any questions or concerns, please contact Joe Chandler, Planning Team Lead, at (816) 283-7071.

Sincerely,

LAURIE L BESTGEN  
Digitally signed by LAURIE L BESTGEN  
Date: 2022.06.29 10:08:27 -0500

For Catherine R. Sanders, Director  
Mitigation Division

www.fema.gov

#### HAZARD MITIGATION PLAN REVIEW TOOL

Bremer County, IOWA

APPROVED PENDING ADOPTION

FEMA Region VII  
1<sup>st</sup> Review

<b>Jurisdiction:</b> Bremer County; Cities of Denver, Frederika, Readlyn, Janesville, Plainfield, Sumner, Tripoli, Waverly; Denver CSD, Janesville CSD, Sumner-Fredericksburg CSD, Tripoli CSD, Wapsie Valley CSD		<b>Title of Plan:</b> 2022 Updated Multi-Jurisdictional Hazard Mitigation Plan for Bremer County, Iowa	<b>Date of Plan:</b> May 2022
<b>Local Point of Contact:</b> Nick Fratzke		<b>Address:</b> 229 E Park Ave Waterloo, IA 50703	
<b>Title:</b> Community Development Specialist		<b>E-Mail:</b> nfratzke@inrcog.org	
<b>Agency:</b> INRCOG			
<b>Phone Number:</b> 319-265-0311			
<b>Funding Source:</b> Bremer County			
<b>State Reviewer:</b> Mat Noble	<b>Title:</b> Deputy SHMO	<b>Date:</b> 5.17.22	
<b>FEMA Reviewer:</b> Diana Mendoza Cauley/Collette Linder		<b>Title:</b> Community Planner	<b>Date:</b> 06/28/2022
<b>Date Received in FEMA Region VII</b>		05/17/2022	
<b>Plan Not Approved</b>			
<b>Plan Approvable Pending Adoption</b>			
<b>Plan Approved</b>		June 28, 2022	

Jurisdiction:	NFIP Status*	
	Y	NP
Bremer County (adopted May 9, 2022)	Y	
Denver	Y	
Frederika	Y	
Janesville	Y	
Plainfield	Y	
Readlyn	Y	
Sumner	Y	
Tripoli	Y	
Waverly	Y	
Readlyn/Wapsi Valley CSD		
Sumner-Frederika CSD		
Tripoli CSD		

JULY 1, 2008 (W/D FIRM) A-1

## 2022 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR BREMER COUNTY, IOWA

HAZARD MITIGATION PLAN REVIEW TOOL		FEMA Region VII
Bremer County, IOWA		1 <sup>st</sup> Review
Approved Pending Adoption		
Denver CSD		

\* Notes: Y = Participating NP = Not Participating in NFIP S- Sanctioned R-Rescinded

HAZARD MITIGATION PLAN REVIEW TOOL	FEMA Region VII
Bremer County, IOWA	1 <sup>st</sup> Review

APPROVED PENDING ADOPTION

### 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	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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	<input checked="" type="checkbox"/>	<input type="checkbox"/>
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))		Page 6	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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 105-107	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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 105-107	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ELEMENT A				
<b>Strengths</b> <ul style="list-style-type: none"> <li>Meeting attachments with notes provide accomplishments and representation from the jurisdictions.</li> </ul> <b>Opportunities for Improvement</b> <ul style="list-style-type: none"> <li>Pages from Q10 – Q12 show blank. Unsure if these attachments are meant to provide details on meeting attendance, topic, and outcome. Missing attachments for the following meetings: 3/23/2022. The other meetings may occur after plan is approved (5/2/2022, and Various).</li> <li>For the future, provide brief summary of how existing plans and expand on how they were integrated into the hazard mitigation plan – limited description is provided on page 105-106.</li> </ul>				

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 23-85 Appendices A-M	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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)(i))		Pages 23-85 Appendices A-M	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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)(ii))		Pages 23-85 Appendices A-M Attachment 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>

1

JULY 1, 2022 (WEDNESDAY) 2

HAZARD MITIGATION PLAN REVIEW TOOL Bremer County, IOWA		FEMA Region VII 1 <sup>st</sup> Review	
APPROVED PENDING ADOPTION			
<b>1. REGULATION CHECKLIST</b>			
<b>Regulation</b> (44 CFR 201.6 Local Mitigation Plans)	<b>Location in Plan</b> (section and/or page number)	<b>Met</b>	<b>Not Met</b>
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 89-90 Appendices A-M	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>ELEMENT B:</b>			
<b>Opportunities for Improvement</b>			
<ul style="list-style-type: none"> <li>The description of how the risk assessment presented in three parts is not accurate. Suggest deleting this as a more accurate description is presented in the Methodology located on page 26.</li> <li>Check links that are referenced in foot notes. Some lead to current events such as this link <a href="http://db.desmoinesregister.com/iowa-boatng-accidents">http://db.desmoinesregister.com/iowa-boatng-accidents</a></li> <li>NFIP /RL SRL section &amp; table are missing from Appendix C: City of Janesville Risk Assessment.</li> <li>Future Recommendation: It would be helpful to provide a section in the Bremer Co risk assessment that states each community identifies and conducts risk assessment and vulnerability analysis based on selected hazards. Also noting that flooding and Tornado were the most common.</li> <li>Page 26 notes that the Iowa State HMP used the same methodology for the risk assessment. This methodology was used by the State in 2013, but not the updated 2018 plan.</li> </ul>			
<b>ELEMENT C. MITIGATION STRATEGY</b>			
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))	Page 88 Appendices A-M	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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 89-90 Appendices A-M	<input checked="" type="checkbox"/>	<input type="checkbox"/>
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))	Page 86 & 95-104 Appendices A-M	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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)(ii))	Pages 95-104 Appendices A-M	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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 95-104 Appendices A-M	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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)(iii))	Pages 105-107 Appendices A-M	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>ELEMENT C:</b>			
<b>Opportunities for Improvement</b>			
<ul style="list-style-type: none"> <li>Provide explanation how goals were developed an updated from previous plan. Were they voted on by planning committee and were there any changes similar to the exercise that was conducted for identifying hazards?</li> <li>Explain how planning and regulatory documents presented in Table 4.1 are administered by County and each community similar to the County's Floodplain Management Ordinance and Building Permits that are described in "Prevention Mitigation Actions" on page 87.</li> <li>Many of the actions identified are routine maintenance, operational preparedness or emergency response in nature. While these need not be removed, they are not eligible activities for FEMA mitigation funding. In future plan updates, the planning team is encouraged to focus efforts on developing mitigation strategies that reduce long-term vulnerability and are eligible for FEMA mitigation grants.</li> </ul>			

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HAZARD MITIGATION PLAN REVIEW TOOL Bremer County, IOWA		FEMA Region VII 1 <sup>st</sup> Review	
APPROVED PENDING ADOPTION			
<b>1. REGULATION CHECKLIST</b>			
<b>Regulation</b> (44 CFR 201.6 Local Mitigation Plans)	<b>Location in Plan</b> (section and/or page number)	<b>Met</b>	<b>Not Met</b>
<b>ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION</b> (applicable to plan updates only)			
D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))	Pages 95-104 Appendices A-M Attachment 3	<input checked="" type="checkbox"/>	<input type="checkbox"/>
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))	Attachment 3	<input checked="" type="checkbox"/>	<input type="checkbox"/>
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))	Pages 95-104 Appendices A-M	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>ELEMENT D:</b>			
<b>Opportunities for Improvement</b>			
<ul style="list-style-type: none"> <li>Even though described in Attachment 3 in Table 4.4 and subsequent community mitigation action tables distinguish what action items are new and those that were carried over and updated from the previous plan (recommend color coding method). This addition would clarify more clearly steps taken to meet Requirement D2 and D3 without going into the Attachments.</li> <li>At the end of this PRT the 2010 HMP is referenced as a resource.</li> </ul>			
<b>ELEMENT E. PLAN ADOPTION</b>			
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	<input checked="" type="checkbox"/>	<input type="checkbox"/>
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))	Will begin all other jurisdiction adoption during review	Pending	<input type="checkbox"/>
<b>ELEMENT E:</b>			
Bremer County adopted the plan on May 9, 2022. Written proof that all jurisdictions' governing bodies have formally adopted the plan (usually by a resolution) must be submitted to FEMA within the year. See <i>Local Multi-Hazard Mitigation Planning Guidance</i> (July 2008) pages 17-18.			
<b>Note:</b> 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, BRIC, FMA, and SRL.			

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HAZARD MITIGATION PLAN REVIEW TOOL Bremer County, IOWA	APPROVED PENDING ADOPTION	FEMA Region VII 1 <sup>st</sup> Review
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### SECTION 2: PLAN ASSESSMENT

#### A. Plan Strengths and Opportunities for Improvement

*This section provides a discussion of the strengths of the plan document and identifies areas where these could be improved beyond minimum requirements.*

##### Element A: Planning Process

###### *Plan Strengths*

###### *Opportunities for Improvement*

##### Element B: Hazard Identification and Risk Assessment

###### *Plan Strengths*

###### *Opportunities for Improvement*

##### Element C: Mitigation Strategy

###### *Plan Strengths*

###### *Opportunities for Improvement*

#### 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](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 (FY11 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](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 2010 State Hazard Mitigation Plan.

