Des Moines County, Iowa
Multi-Jurisdictional
Pre-Disaster Mitigation Plan

October 2015




EMERGENCY MANAGEMENT
DES MOINES COUNTY



Des Moines County Pre-Disaster Mitigation Plan Participants

Des Moines County Board of Supervisors:

Robert Beck, Supervisor
Tim Broeker, Supervisor
Jim Cary, Supervisor

Des Moines County Communities and Entities that will Adopt Plan

City of Burlington
City of West Burlington
City of Danville
City of Mediapolis
City of Middletown
DESCOM
Iowa Army Ammunition Plant (IAAAP)

Des Moines County Schools that will Adopt the Plan

Burlington Community School District
Burlington Notre Dame Catholic Schools
Danville Community School District
Mediapolis Community School District
Southeastern Community College
West Burlington Independent School District

Des Moines County Levee Districts that will Adopt the Plan

North Bottoms Levee District
Two Rivers Levee and Drainage Association

Southeast Iowa Regional Planning Commission

Zach James, Planning Director
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Travis Kraus, Regional Planner

Table of Contents

Tables and Figures

I. Des Moines County | Introduction

1.1 Purpose of this Plan

Hazard mitigation is the effort to reduce loss of life and property by lessening the impact of disasters. This can be achieved through risk analysis, which results in information that provides a foundation for mitigation measures that reduce risk and protect financial investment. This plan represents Des Moines County's commitment to reducing risks from disasters and serves as a guide for local officials, decision-makers, and the entire Des Moines County community in their efforts to reduce the negative effects of natural and man-made hazards.

The Des Moines County Pre-Disaster Mitigation Plan update also brings existing planning documents back into accordance with the Federal Emergency Management Agency (FEMA) requirements. To remain eligible for hazard mitigation grant assistance through FEMA's Hazard Mitigation Grant Program (HMGP), the Plan must be maintained, reviewed, updated, and submitted for approval every 5 years. The previous plan received FEMA approval on January 28, 2011. Upon approval of the plan update, all participating jurisdictions will be eligible for HMGP grant money for the ensuing 5-year planning cycle.

This Pre-Disaster Mitigation Plan Update has been prepared in order to:

- ✓ Comply with both Federal and State Pre-Disaster Mitigation plan requirements;
- ✓ Provide an update to the comprehensive hazard analysis/risk assessment that helps identify the hazards most likely to impact Des Moines County, Iowa;
- ✓ Evaluate the monetary value of hazard mitigation measures being considered; and
- ✓ Outline a strategy for the implementation of hazard mitigation projects in Des Moines County.

1.2 Basis for Plan Development

The Robert T. Stafford Disaster Relief and Emergency Assistance Act, signed into law November 23, 1988, constitutes the statutory authority for most disaster response activities, especially as they pertain to FEMA and FEMA programs. The purpose of the Stafford Act, as amended by the Disaster Mitigation Act of 2000, is "to reduce the loss of life and property, human suffering, economic disruption, and disaster assistance costs resulting from natural disasters." Section 322 of the Act specifically addresses mitigation planning and requires state and local governments to prepare multi-hazard mitigation plans as a precondition for receiving FEMA mitigation project grants.

1.3 Participating Communities

The following communities and organizations participated in developing the Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan:

- City of Burlington
- City of Danville
- City of Mediapolis
- City of Middletown
- City of West Burlington
- Des Moines County
- Burlington Community School District
- Danville Community School District
- Mediapolis Community School District
- West Burlington Independent School District
- Burlington Notre Dame Catholic Schools
- Southeastern Community College
- Two Rivers Levee and Drainage Association
- North Bottom Levee and Drainage District
- DESCOM
- Iowa Army Ammunition Plant (IAAAP**)**

Each participating community was represented by their respective community members at one or more planning meetings. Individuals who participated in the development of this plan come from a wide range of backgrounds and include local officials, community leaders, business leaders, educators, interested public, hospital/healthcare professionals, planners, fire department officials, law enforcement officials, and emergency management officials. The planning committee is comprised of all those in attendance at the meetings. The Des Moines County Emergency Management Agency and Southeast Iowa Regional Planning Commission worked collaboratively to conduct all public meetings and to produce the planning document. A complete list of all the planning team that assisted with the development of the plan can be found in Appendix A.

1.4 Plan Goals

The ultimate goal of this plan is to create an effective, disaster resistant, and disaster resilient community. The plan also includes more specific goals that help guide hazard mitigation efforts in Des Moines County communities. These goals, shown in the Figure 1.1, were based off of the State of Iowa Hazard Mitigation Plan from 2013. The planning committee reviewed the goals from the previous planning document and the current state plan, finding the goals below to be the most relevant and appropriate for the current plan update. The evaluation of future mitigation measures identifies how each action relates to these goals.

Figure 1.1 Plan Goals

DES MOINES COUNTY GOALS	
Goal 1	Protect the health, safety, and quality of life for Des Moines County citizens while reducing or eliminating property losses, economic costs, and damage to the natural environment caused by a disaster
Goal 2	Ensure local government operations, communication, response, and recovery are not significantly disrupted by disasters
Goal 3	Expand public awareness and encourage intergovernmental cooperation, coordination, and communication to build more resilient communities against all hazards.
Goal 4	Assist local governments in attaining funding and advancing hazard mitigation projects.

1.5 Plan Organization

The Des Moines County Pre-Disaster Mitigation Plan is organized into six sections: Introduction, Prerequisites, Planning Process, Community Profiles, Risk Assessment, Mitigation Strategies, and Plan Maintenance.

Section I: Introduction

This section explains the purpose and goals of the plan, identifies the participating jurisdictions, outlines the plan organization, and provides a summary of updates and revisions to the previously adopted plan.

Section II: Prerequisites

This section includes documentation of formal adoption by the governing authority for all jurisdictions.

Section III: Planning Process

This section describes the process for plan development, public participation, organization of the planning committee, and the steps involved for updating the previously adopted plan.

Section IV: Community Profiles

This section details relevant data and trends in the participating communities, such as population trends, socio-demographic characteristics, development trends, climate, critical facilities, and so on.

Section V: Hazard Analysis and Risk Assessment

This section profiles hazards most likely to impact Des Moines County and an evaluation of risk posed by those hazards. Additionally, this section provides details about historical occurrences of each hazard and an assessment of vulnerability for Des Moines County and participating jurisdictions.

Section VI: Mitigation Strategies

This section includes the hazard mitigation measures for Des Moines County and the participating jurisdictions as well supplemental information to encourage participation and implementation of mitigation measures. A five-year plan matrix incorporates the action items into mitigation strategies, including evaluations of costs, funding sources, responsible parties, and timelines. Mitigation measures are grouped into prioritization categories following a systematic scoring process.

Additionally, this section includes a discussion of the status of current mitigation activities. The discussion explains how the plan was implemented since the approval of the last plan.

Section VII: Plan Maintenance

This section describes the method and schedule of monitoring, evaluating, and updating the mitigation plan within the five-year cycle.

1.6 Summary of Updates and Revisions

This section explains updates and revisions to the previous FEMA-adopted plan. Figure 1.2 shows changes to the plan by section. One notable change is the document formatting, which has been updated to make the plan more readable and accessible. More visual elements have been incorporated to compliment the text.

Figure 1.2
Plan Updates and Revisions

Plan Section	Updates and Revisions
I. Introduction/Purpose	Updated to reflect new information, as well as establishing new goals.
II. Prerequisites	New resolutions from participating communities were substituted for previous resolutions.
III. Planning Process	Updates reflect steps and outcomes of the current planning process.
IV. Community Profiles	Data was updated using the 2010 US Census, the American Community Survey 2008-2012, and various other sources. New relevant data is presented. The section is now organized by profile characteristic with brief introductory community summaries. Other specific changes include: • Location map added • Regional climate data added • Demographic characteristics updated • Household characteristics updated • Employment and income data updated • Unemployment data added • List of Regional industries updated • Housing data updated • Agricultural trends added • Community facilities, vulnerable sites updated including maps • Transportation infrastructure and network info updated • Transportation network map added • County-wide pipeline data added • Communications profile updated • Community services updated • Dam information added

V. **Hazard Analysis and Risk Assessment**	Data was updated using the Iowa State Hazard Mitigation Plan of 2013, the National Climactic Data Center, and various other sources. Other specific changes include: • Modification to the list of hazard types, discussed in detail. • Omission of Sinkholes, Expansive Soils, and Radiological incident from the list of hazards. • Inclusion of previously omitted hazard- Terrorism, Landslide, Human Disease Epidemic, and Animal/Plant/Crop Disease, Earthquakes. • Hazard scoring methodology uses new weighted risk assessment formula based on 4 factors, discussed in detail. • Hazard profiles are updated to reflect current understanding of hazard impacts, updated historical occurrences, and updated vulnerability assessments when applicable. • Specific areas of concern for flash flooding and landslides are discussed and mapped. • The hazard scoring summary reflects updated hazard rankings based on the planning process and scoring outcomes. • The effects of applying an additional methodology to analyze the effects of cascading hazards was determined to have little significant impact on the overall scoring of hazards and analysis of vulnerability to individual hazards, and was not included.
VI. **Current Mitigation Activities**	• Changes include updates for all mitigation measures from the previous FEMA-approved plan for Des Moines County.
VI. **Future Mitigation Measures**	• Measures were updated based on outcomes from the planning process and planning committee input. • The STAPLEE process is no longer used to evaluate each mitigation alternative because, outside of funding obstacles, the Des Moines County future mitigation activities are unlikely to have “unfavorable” impacts. • The prioritization methodology has changed and follows the methods used in the Iowa State Mitigation Plan, as discussed in detail.
VII. **Plan Maintenance**	• Identified opportunities to integrate this Plan into other planning mechanisms. • Replaced previous review and evaluation form with FEMA worksheets. • Changed the frequency of reviews from every six months to annually.

II. Des Moines County | Prerequisites

2.1 Adoption of the Plan

This step assumes successful adoption of the plan by all participating communities.

The Pre-Disaster Mitigation Plan Update will be adopted by resolution by the Des Moines County Board of Supervisors and by separate resolution by the City Councils of Burlington, West Burlington, Danville, Mediapolis, and Middletown. The plan update will be adopted by resolution by the school boards of Burlington Community District, Danville Community School District, Mediapolis Community School District, West Burlington Independent School District, Burlington Notre Dame Catholic Schools, and Southeastern Community College. Additionally, the plan update will be adopted by the North Bottoms Levee and Drainage District and the Two Rivers Levee and Drainage Association. The plan was adopted after public notification by posting the public hearing notices at city halls, schools, and at the Des Moines County Board of Supervisors office. Copies of adoption resolutions can be found in Appendix K.

The Board of Supervisors, City Councils, and School boards listed above have full legal authority and jurisdiction under the Iowa Constitution to adopt the Des Moines County Pre-Disaster Mitigation Plan. Participation of communities planning to adopt the multi-jurisdictional Des Moines County Pre-Disaster Plan Update, and citizen participation of residents in those communities, was included in the plan development throughout the planning process through interactive public comment sessions in each incorporated community covered under the Plan. Members of the public and elected officials of the covered communities were invited to share ideas and concepts about disaster mitigation to assist in the development of mitigation and plan implementation goals through their invitation to join the Hazard Mitigation Planning Committee. Additionally, all communities planning to adopt the Des Moines County Pre-Disaster Mitigation Plan were included in the public information and outreach efforts during the planning process.

III. Des Moines County | Planning Process

3.1 Coordinating Body

The Des Moines County Emergency Management Commission and the Des Moines County Emergency Management Agency is responsible for coordinating the implementation of the plan mitigation measures and conducting the Plan Review and Evaluation Form process. The Committee will ensure that the appropriate representatives from County departments and other first responder agencies in the community provide on-going review, maintenance, and evaluation of the pre-disaster mitigation plan.

3.2 Organization of Planning Committee

This Plan was developed based on the input of elected local officials, community leaders, business leaders, educators, interested public, hospital/healthcare professionals, fire departments, law enforcement departments, planners, state and federal agencies, and the Des Moines County Emergency Management Agency.

The Pre-Disaster Mitigation Plan Update has been developed with the assistance of the Southeast Iowa Regional Planning Commission (SEIRPC). Planners from Southeast Iowa Regional Planning Commission and the Des Moines County Emergency Management Coordinator collaborated to conduct initial interviews and develop a planning committee involving key stakeholders from each participating jurisdiction. Each community in the County was requested to have two representatives from varying backgrounds to serve on the committee and was notified of scheduled meetings through e-mail, mailers or received a phone call prior to each of the scheduled meetings. As a result, the hazard mitigation planning committee is comprised of representatives from local government agencies, special districts and authorities, state agencies, and non-governmental organizations, and the general public. A sign-in sheet was used to document participation.

Planning committees were comprised of all those in attendance at each meeting. The planning committee held meetings at the SEIRPC offices in West Burlington, with multiple community meetings held throughout the County. Both day and evening meeting times were scheduled in order to facilitate plan participation and to provide an opportunity for local officials and other community leaders to contribute to the plan development and to complete their respective sections of the plan.

Public participation played a key role in the development of goals and action items. The meetings were held pursuant to schedule shown on Figure 3.1.

Figure 3.1
Planning Meeting Schedule

COMMUNITY AND COMMITTEE MEETINGS			
DATE	**TIME**	**LOCATION**	**AGENDA/OUTCOMES**
January 28, 2015	5:30 PM – 7:15 PM	SEIRPC offices West Burlington	Review of Multi-Jurisdictional PDM update, review of previous plan goals and discussion for goals for future update.
March 25, 2015	5:30 PM – 7:25 PM	SEIRPC office West Burlington	Reviewed previous meeting, identified critical facilities, critical infrastructure, and vulnerable sites. Discussed community capabilities description, hazard analysis, and risk assessment.
April 9, 2015	10:00 AM-11:00 AM	City Hall, West Burlington	Review of capabilities, review of critical facilities/vulnerable sites/critical infrastructure, identify areas of landslide/flash flooding, and discuss mitigation strategies.
April 10, 2015	2:00 PM-3:30 PM	Two Rivers Levee and Drainage Association Offices, Kingston	Review of capabilities, review of critical facilities/vulnerable sites/critical infrastructure, identify areas of landslide/flash flooding, and discuss mitigation strategies.
April 16, 2015	12:00 PM-1:30 PM	City Hall, Mediapolis	Review of capabilities, review of critical facilities/vulnerable sites/critical infrastructure, identify areas of landslide/flash flooding, and discuss mitigation strategies.
April 22, 2015	5:30 PM – 7:15 PM	SEIRPC offices West Burlington	Completed hazard analysis risk assessment scoring, reviewed and scored hazards for inclusion in plan.
May 4, 2015	11:00 AM-12:30 PM	City Hall, Danville	Review of capabilities, review of critical facilities/vulnerable sites/critical infrastructure, identify areas of landslide/flash flooding, and discuss mitigation strategies.
May 11, 2015	10:00 AM-11:00 AM	SEIRPC offices, West Burlington	Review of capabilities, review of critical facilities/vulnerable sites/critical infrastructure, identify areas of landslide/flash flooding, and discuss mitigation strategies.
May 13, 2015	10:00 AM-12:00 PM	City of Burlington Public Works Department, Burlington	Review of capabilities, review of critical facilities/vulnerable sites/critical infrastructure, identify areas of landslide/flash flooding, and discuss mitigation strategies.
May 13, 2015	1:30 PM-2:30 PM	Des Moines County Roads Department, West Burlington	Review of capabilities, review of critical facilities/vulnerable sites/critical infrastructure, identify areas of landslide/flash flooding, and discuss mitigation strategies.
May 15, 2015	1:30 PM – 2:30 PM	City Hall, Middletown	Review of capabilities, review of critical facilities/vulnerable sites/critical infrastructure, identify areas of landslide/flash flooding, and discuss mitigation strategies.
May 26, 2015	1:00 PM – 2:00 PM	Hoth Law Offices, Burlington	Review of capabilities, review of critical facilities/vulnerable sites/critical infrastructure, identify areas of landslide/flash flooding, and discuss mitigation strategies.
May 27, 2015	5:30 PM – 7:20 PM	SEIRPC offices, West Burlington	Reviewed hazard risk analysis from previous meeting, completed activity for reviewing mitigation strategies from previous plan as well as selecting new ones for the plan update.
June 24, 2015	5:30 PM – 7:30 PM	SEIRPC offices, West Burlington	Review of entire planning document including goals, planning process, adoption process, community capabilities, identified hazards, hazard risk assessment, and mitigation strategies
August 19, 2015	5:30 PM – 6:30 PM	Public Input Meeting, Burlington Public Library	Review and gather input for the entire planning document including goals, planning process, adoption process, community capabilities, identified hazards, hazard risk assessment, and mitigation strategies

3.3 Plan Development

The previous FEMA-approved multi-jurisdictional mitigation plan for Des Moines County was used to update this planning document. In particular, the planning committee evaluated mitigation strategies from the previous plan, which were updated as necessary, and new mitigation measures were considered. The last update received FEMA approval on 1/28/2011.

Other existing local plans were used to help update the detailed local data found throughout this plan update, particularly the Henry County Hazard Mitigation Plan.

This plan also relies heavily on the State of Iowa Hazard Mitigation Plan, developed by Iowa Homeland Security & Emergency Management and completed in September, 2013. In particular, the Iowa Hazard Mitigation Plan was used to help complete the hazard analysis and risk assessment.

Data was obtained from a variety of public sources, particularly for the Community Profiles. Sources include: the US Census Bureau, the American Community Survey 2008-2012, the National Oceanic and Atmospheric Administration (NOAA), Iowa Climatology Bureau, Iowa Department of Education, the US Bureau of Labor Statistics, Iowa State University Community Indicators Program (ICIP), among others.[1]

3.4 Multi-jurisdictional Planning Participation

Each jurisdiction participated in the development of the Des Moines County Pre-Disaster Mitigation Plan by participating in planning meetings. Details of the meetings can be found in the agenda, meeting minutes, and sign in sheets located in Appendix I at the end of this plan. Resolutions officially adopting the plan can be found in Section II. Participation by specific jurisdiction is explained below.

Des Moines County (unincorporated): The Des Moines County Board of Supervisors is the governing body for this jurisdiction. The county was represented at planning meetings by the Des Moines County Emergency Management Coordinator, a member of the Board of Supervisors, Des Moines County Engineer, and the Des Moines County Conservation Operations Supervisor.

City of Burlington: The city was represented at planning meetings by the City of Burlington Public Works Director, Burlington Fire Chief, Property Maintenance Supervisor, Streets and Sewer Maintenance Supervisor, and the Assistant City Planner.

City of West Burlington: The city was represented at planning meetings by the City of Burlington Public Works Director, City Administrator, and Mayor.

[1] A Note about Data – Much of the data used in Des Moines County Pre-Disaster Mitigation Plan comes from 5-year estimates of the American Community Survey (ACS). The ACS gathers information previously included in the decennial census. ACS data provides estimates based on samples rather than full counts of the population, and therefore typically contains margins of error.

City of Danville: The city was represented at planning meetings by the City Clerk of Danville, the Public Works Director, a former council member, and a current city council member.

City of Middletown: The city was represented at planning meetings by the City Clerk of Middletown, the Emergency Manager with the Iowa Army Ammunition Plant, and the Water/Wastewater Supervisor (same person as the Danville Public Works Director).

City of Mediapolis: The city was represented at planning meetings by the City Clerk of Mediapolis, the Public Works Director, and a volunteer member of the fire department.

Burlington Community School District: The Burlington Community School District was represented by the District's Superintendant.

West Burlington Independent School District: The West Burlington Independent School District was represented by the District's Superintendant and Principal.

Danville Community School District: The Danville Community School District was represented by the District's Superintendant and Maintenance Director.

Mediapolis Community School District: The Mediapolis Community School District was represented by the District's Superintendant.

Southeastern Iowa Community College: Southeastern Community College was represented by the Director of Physical Plant.

Burlington Notre Dame Catholic Schools: The Burlington Notre Dame Catholic Schools were represented by a Principal and Foundation Representative.

Two Rivers Levee and Drainage Association: The Two Rivers Levee and Drainage Association were represented by their Administrator.

North Bottoms Levee District: The North Bottoms Levee District was represented by a Board member.

DESCOM: DESCOM was represented by their Executive Director.

Iowa Army Ammunition Plant (IAAAP): IAAAP was represented by their Antiterrorism Officer.

3.5 Public Participation

Public input was sought through posting of the committee meeting (posted in local newspaper, The Hawkeye and agendas in SEIRPC lobby), through individual community meetings, a 30 day public comment period, public input meetings, and a public hearing during the Board of Supervisors meeting. Feedback from the public is valuable during plan development, particularly in regards to understanding the community knowledge about hazards, mitigation efforts, and best ways to provide evacuation and shelter information to the residents of Des Moines County.

The county, cities, non-profits, the business community, and other interested parties were invited to participate in planning efforts through public notifications and personal e-mail invitations. Iowa Army Ammunition Plant, a major manufacturer and employer located in Middletown, was represented by their Emergency Manager, to discuss the planning process and plan status update, identify critical facilities and infrastructure, identify current mitigation activities, and select mitigation measures for recommendation.

Neighboring community leaders, such as elected officials, were encouraged to participate and invited to attend meetings through personal invitations and media notifications. The meetings were advertised in the local newspaper, The Hawkeye, whose distribution covers the entire Des Moines County region (public notices are included in Attachment H).

Public input was also sought during the 30 day public review periods that preceded adoption of the plan in the county and each community. Notices were published in local media and on local websites. A copy of the plan was made available for review on the website ISSUU, SEIRPC's website, and the Des Moines County Emergency Management website. Pursuant to State of Iowa Open Meetings Laws, all actions and discussions at meetings of governmental bodies were conducted in open session to which all members of the public had access.

3.6 Plan Implementation

The Plan is intended to become a living, working document that will be incorporated in the planning strategies of the participating jurisdictions in various aspects of community development and management. To this end, the incorporation of the Plan into existing planning efforts such as Comprehensive Plans, Capital Improvement Plans, Zoning plans, Transportation plans, and Building Codes is detailed in the plan maintenance section. Plan implementation includes a schedule for monitoring, evaluating, and assessing mitigation measures annually, and revising the plan every five years utilizing the attached review and evaluation form. This implementation process also includes public participation and a mechanism for ensuring the continued integration of the Plan into other agencies and their disaster planning efforts through an established Hazard Committee. A group of individuals from communities throughout Des Moines County will continue serving as the Hazard Mitigation Committee and will guide plan implementation.

IV. Des Moines County | Community Profiles

4.1 Introduction

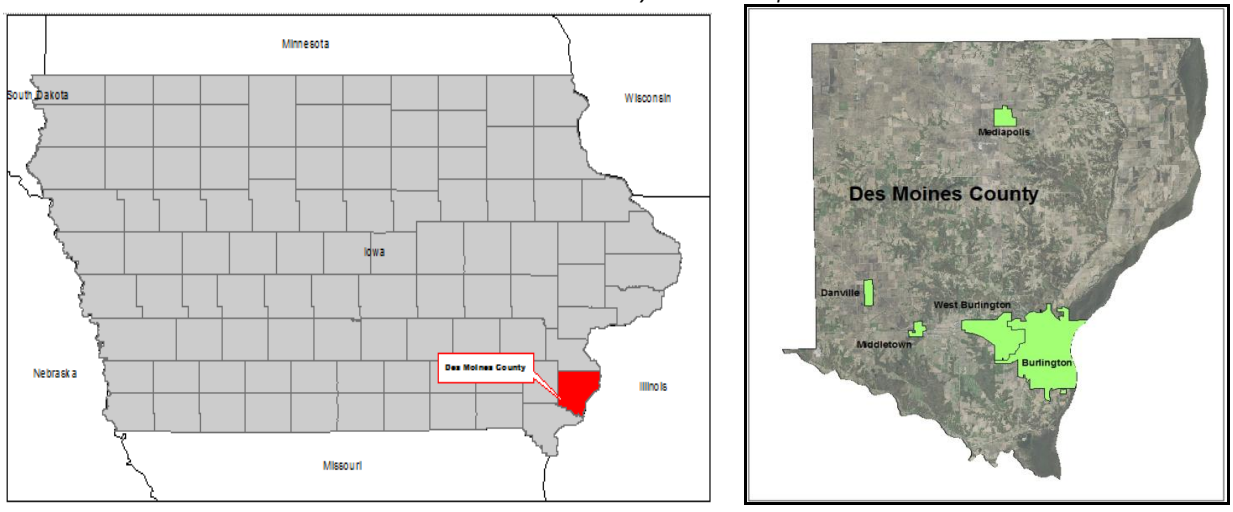
This section provides the context for understanding risk and developing mitigation strategies. After brief individual community summaries, profile characteristics are considered cumulatively for all participating jurisdictions. In other words, subheadings generally include information for all communities throughout the county, as opposed to separate discussions of the information for each specific community.

4.2 Background

Des Moines County was formed in September of 1834 and it originally contained much of present day southern Iowa. However, the County was subsequently subdivided and its present boundaries were set in 1839. Today, Des Moines County is comprised of 12 townships and five incorporated communities: Burlington, Danville, Mediapolis, Middletown, and West Burlington. Burlington serves as county seat.

Des Moines County has strong roots in the agricultural and manufacturing industries. The accessibility and proximity to Midwestern metropolitan areas, enhanced and supported by a well-connected transportation system, make Des Moines County a focal point for industry and commerce. Education and health care are also vital components of Des Moines County's economy. The quality public education system and small town values of the area offer a high quality of life for residents.

Figure 4.1
Des Moines County Location Map



4.3 Location

The study area for this plan includes all lands within Des Moines County. The County is approximately 275,200 acres (430 square miles), of which 266,240 acres (416 square miles) is land and 8,960 acres (14 square miles) is water. Figure 4.1 shows the location of Des Moines County relative to the State of Iowa and neighboring areas, as well as the incorporated city boundaries within Des Moines County.

4.4 Community Summaries

Burlington

Burlington, located along the Mississippi River was the first capital of the Iowa Territory and is one of the oldest, most historic communities in Iowa. Today, the city, with a population of 25,663 at the 2010 Census prominently anchors the Burlington IA-IL Micropolitan Statistical Area and serves as a regional center for employment, shopping, education, healthcare and recreation.

US Hwy 61 runs north and south through the city while US Hwy 34 runs east to west through the city before crossing into Illinois. Burlington is also home to the Southeast Iowa Regional Airport, a commercial service airport with daily flights to St. Louis and Chicago. The Amtrak California Zephyr line, which runs daily between California and Chicago, includes a stop in Burlington as part of its route.

West Burlington

Located west of the intersection of US Highway 61 and US Highway 34, West Burlington has a population of 2968 at the 2010 Census. West Burlington is home to the Westland Mall as well as several other big box retailers. The community is also home to the Great River Medical Center, a 378-bed regional medical facility. The city is served by the West Burlington Independent School District. The City of West Burlington has a mayor and 5-member council form of government. The Police Department is located at City Hall and is staffed by the police chief and eight officers.

Danville

Danville, founded in 1854, has a population of 934 residents according to the 2010 census and is located in the southwest corner of the county, just to the east of US Highway 34. The community is home to the Danville Community School District, Danville Public Library, and the Danville Museum. The city has city council form government and is served by a 22 member Fire & EMS squad which covers an eighty-five square mile area.

Mediapolis

Mediapolis, located in the north central part of Des Moines County along US Hwy 61, has a population of 1560 at the 2010 census. The city was founded in 1869 to serve as a train station along the Burlington, Cedar Rapids and Minnesota Railway. The city is governed by a mayor and a five person city council. The community is served by Mediapolis Community School district. The community also has a municipal pool and public library as well as a volunteer fire department.

Middletown

One of the older communities in Des Moines County, Middletown has a population of 318 residents. Located along US Highway 34, Middletown is just north of the Iowa Army Ammunition Plant (IAAAP), a major manufacturer of large caliber items for the Department of Defense. Production at the plant began in 1941 as part of the war effort. At the close of WWII, production was halted but was resumed in 1947 and has been active ever since. Recently, the city has started development on a brand new housing subdivision on land acquired from the IAAAP.

4.5 Community Capabilities

This subsection provides a snapshot of each jurisdiction's existing authorities, policies, programs, and resources available to accomplish hazard mitigation planning.

Des Moines County

The **Des Moines County Board of Supervisors** consists of three elected district representatives. As the legislative body of the county, the board is empowered to approve budgets of county officials, establish and vacate public highways, allow claims against the county and order same paid, levy taxes to raise revenue for county expenses, fill vacancies in office of elected officials except their own board, constitute a drainage board for the drainage district of the county, approve ordinances and amendments to ordinances, enter into leases and insurance agreements, and more.

The **Des Moines County Public Health Department** provides a variety of services designed to accomplish a mission of promoting physical and mental health and preventing disease, injury and disability. They offer an immunization clinic and environmental health services, such as: disaster preparedness, needle collection program, free well water testing, grant funding for closing abandoned wells and cisterns, well construction and rehabilitation, radon test kits and information, lead testing of homes and children, food safety information, licensing and inspections, on-site waste water treatment systems, and health inspections of pools, spas, tanning facilities, tattoo parlors, and hotels and motels.

The goal of the **Des Moines County Conservation Board** is the establishment of a quality park, recreation, conservation, and environmental education system that serves the residents of Des Moines County and the State of Iowa, and to ensure that in coming years, all visitors may have ample opportunity to enjoy the scenic beauty and recreational potential of the area. To reach these objectives, they energetically promote programs and interest in conservation of natural resources.

The **Des Moines County Engineer** administers the construction and maintenance of the secondary road system in Des Moines County. The road system also includes bridges and culverts.

Des Moines County Emergency Management supports citizens and first responders to ensure cooperation to build, sustain and improve our capability to prepare for, protect against, respond to, recover from and mitigate all hazards. The EMA is a county-wide agency representing all unincorporated areas of the County and all incorporated cities. The emergency management Coordinator has the responsibility for coordinating all the components of the emergency management system in the jurisdiction. These components consist of fire and police, emergency medical service, public works, volunteers, and other groups contributing to the management of emergencies. This also includes the local volunteer Community Emergency Response Team. Des Moines County Emergency Management Agency assists public officials, schools, hospitals, business, and industry and the public to promote preparedness, disaster response, and recovery operations and will encourage mitigation efforts in all jurisdictions and to ensure the safety of all the residents of Des Moines County.

The **Des Moines County Sheriff** is an elected official serving a four year term, and is responsible for enforcing state and county laws within the county. The Sheriff's Office patrols the 430 square miles of the county and is the chief law enforcement for the cities of Middletown, Mediapolis, Danville, and all other unincorporated areas of Des Moines County.

DESCOM provides 24 hour dispatching of Law Enforcement, Fire and EMS Services for all public safety emergency entities within Des Moines County. Staffing includes one Executive Director, ten full time communication operators, and four part time communication operators.

Household hazardous materials in Des Moines County are handled by **Des Moines County Regional Waste Commission** and **HazChem Center of Southeast Iowa**

Burlington Fire Department assists with confined space rescue, high angle rope rescue, and technician level hazardous materials response.

The **Cedar Rapids Area Chapter of the Greater Iowa American Red Cross** is the branch serving Des Moines County. The Red Cross is a humanitarian organization led by volunteers that provides relief to victims of disasters and helps people prevent, prepare for, and respond to emergencies. It does this through services that are consistent with its congressional charter and principles of the International Red Cross movement.

Several guiding documents in Des Moines County can support hazard mitigation efforts. The Des Moines County Code of Ordinances serves as a guide for future housing, transportation, and economic development. It also specifies emergency declaration authorities and permits.

Burlington

Burlington has a **mayor/council form government.** The city also has City Manager, who is responsible for day-to-day city operations.

The **Burlington Fire Department** has two fire stations and a force of 42 firefighters headed by a full time Fire Chief. The department is responsible for first due fire response for an area of 111 square miles for the City of Burlington as well as the townships of Burlington, Flint River, Union, Tama, and Concordia. The department is also the primary 911 ambulance responder for the city of Burlington as well as neighboring communities. The fire department also provides county-wide Hazmat Team services, airport protection, fire inspections, and plan reviews.

The **Burlington Police Department** has 49 employees. This number includes the chief, two majors, three lieutenants, five detectives, one parking officer, and twenty-four patrol officers. Civilian staff includes four clerks.

The **Burlington Community Development Department** is responsible for safeguarding the health, safety and general welfare of the public through enforcement of the adopted construction codes and zoning regulations of the city. The department issues permits on new construction and remodeling of buildings. This includes the building structure, plumbing and electrical components. The department also ensures compliance of zoning regulations and the comprehensive plan by providing assistance and information regarding zoning designations for properties, permitted uses in the zoning districts, building setbacks, subdivisions and developments, site plans, signs, parking, landscaping, fences, special use permits, home occupations and other topics covered in the City Code Zoning Chapter. Assistance is also provided to the City Council, Boards and Commissions, which enact new code requirements and hear appeals. The Building and Zoning Department is also responsible for inspections of construction projects, dangerous buildings and building nuisances

The **Burlington Waterworks** is the primary source of drinking water for Burlington and West Burlington as well as the surrounding areas. Through a series of agreements with other cities and private water vendors, water from this plant is also sent to other communities and customers in the county.

West Burlington

The city of West Burlington has a **mayor/council form of government.**

The **West Burlington Fire Department** consists of a volunteer force, led by a full time paid Fire Chief/Fire Marshal/Building Inspector. The Fire Chief/Building Inspector also coordinates the operations and activities of the **Community Development Department** for items such as rental housing permits, zoning, and business licenses.

The **West Burlington Police Department** includes a police chief, nine full time officers, one part time officer, three reserve offices, and an administrative assistant.

The **West Burlington Public Works Department** is responsible for the city streets, sanitary & storm sewers.

Danville

The City of Danville is governed by a **mayor/council** form of government.

Danville Fire & EMS is comprised of 22 members with 4 paramedics that respond to approximately 110 calls per year over an area of 85 square miles which includes service to nearby communities and surrounding departments through mutual aid agreements.

The **Des Moines County Sheriff's Department** is in charge of local law enforcement.

The Danville Fire Station is backed up by an emergency generator.

Mediapolis

The City of Mediapolis has a **mayor/council form of government.** The council is comprised of 5 members from the community.

The **Mediapolis Volunteer Fire Department** provides fire emergency services to the area. The Fire Department is a 21 member volunteer unit led by a volunteer Fire Chief which covers the City of Mediapolis as well as the townships of Benton, Franklin, Huron, Jackson, and Yellow Springs.

The **Community Ambulance Service** provides emergency services for the City of Mediapolis as well as the townships of Benton, Franklin, Huron, Jackson, Yellow Springs, and Washington.

The **Des Moines County Sheriff's Department** is in charge of local law enforcement.

Water and sewer service is a municipal service as well as refuse collection.

In the case of energy failure, the City has three generators to power the wastewater lagoon, water tower, and both the City Hall and Fire Station buildings.

Middletown

The City of Middletown is governed by a **mayor and council**.

The **Des Moines County Sheriff's Department** is in charge of local law enforcement.

Danville Fire & EMS is comprised of 22 members with 4 paramedics that respond to approximately 110 calls per year over an area of 85 square miles which includes service to Middletown through mutual aid agreement.

The tables below summarize planning documents, staff, regulations, technical abilities, and other mitigation support mechanisms by jurisdiction. Based on guidance from FEMA's *Local Mitigation Planning Handbook,* the tables provide examples of people or mechanisms by which mitigation activities can be implemented, and also indicate whether or not communities possess certain capabilities. Most information was provided by employees of each jurisdiction.

Generally speaking, powers and duties of incorporated cities in Des Moines County are described in Iowa Code. A city may, except as expressly limited by the Constitution of the State of Iowa, and if not inconsistent with the laws of the general assembly, exercise any power and perform any function it deems appropriate to protect and preserve the rights, privileges, and property of the city or of its residents, and to preserve and improve the peace, safety, health, welfare, comfort, and convenience of its residents. Examples of municipal powers relevant to hazard mitigation include eminent domain powers, taxing authority, police powers, and issuances of bonds.

The following supporting mechanisms do not exist in any Des Moines County community:

- Community Wildlife Protection Plan;
- Firewise Certification;
- Natural Hazard Specific Ordinances;
- Storm water utility fees;
- Regulation for acquisition of land for open space and public recreation uses;
- Impact fees for new development; and
- HAZUS analyses.

Planning Capabilities	Des Moines County	Burlington	West Burlington	Danville	Mediapolis	Middletown
Comprehensive Plan	Yes	Yes	Yes	Yes	Yes	Yes
Capital Improvements Plan	Yes	Yes	Yes	Yes	No	No
Local Emergency Plan	Yes – Des Moines County Emergency Management has a Local Emergency Plan for all of Des Moines County.					
Local Recovery Plan	Yes – Des Moines County Emergency Management has a Local Recovery Plan for all of Des Moines County.					
Debris Management Plan	No	No	No	No	No	No
Past Local Mitigation Plans	Yes – Des Moines County Emergency Management has a Local Recovery Plan for all of Des Moines County.					
Economic Development Plans	No	No	No	No	No	No
Continuity of Operations Plan	Yes – Emergency Management only	No	No	No	No	No
Watershed Plans	No	No	No	No	No	No
Transportation Plan	Yes	Yes	No	No	No	No
Storm water Management Plan	No	No	No	No	No	No

Policies/Ordinances	Des Moines County	Burlington	West Burlington	Danville	Mediapolis	Middletown
Zoning Code	Yes – Within 2 miles of Burlington only	Yes	Yes	Yes	Yes	Yes
Building Codes	No	Yes	Yes	Yes	No	Yes
Floodplain Ordinances	Yes	Yes	No	No	Yes	No
Subdivision Ordinance	Yes	Yes	Yes	Yes	Yes	Yes
Tree and Shrub Ordinance	No	Yes	Yes	Yes	Yes	No
Storm Water Ordinances	No	Yes	No	No	No	No
Site Plan Review Requirements	Yes	Yes	Yes	Yes	Yes	No
Historic Preservation Ordinance	No	No	No	No	No	No

Staffing	Des Moines County	Burlington	West Burlington	Danville	Mediapolis	Middletown
Building Inspector	No	Yes	Yes	Yes	No	No
Mapping Specialist/GIS	Each entity contributes dues to the County GIS Commission, which is staffed to collect, create, update, and maintain countywide GIS data. Data is displayed at www.dmcgis.com			No	No	No
Engineer	Yes	Yes	Yes – Contract	Yes – Contract	Yes – Contract	Yes – Contract
Community or Economic Development Planner	No	Yes	No	No	No	No
Public Works Official	Yes	Yes	Yes	Yes	Yes	Yes
Emergency Management Coordinator	Des Moines County Emergency Management Commission is tasked with hiring an Emergency Management Coordinator to serve for all of Des Moines County. The board involved in the hiring processed includes members from each community.					
NFIP Administrator	Yes	Yes	No	No	No	No
Bomb/Arson Squad/SWAT	The Burlington Police Department, West Burlington Police Department, and Des Moines County Sherriff will join forces if needed in an emergency developing a Special Weapons and Tactics (SWAT) Team. Services for bomb or arson squad are not provided within the county and would come to the area from another community.					
Emergency Response Team	Des Moines County Emergency Management has a countywide group of volunteers to serve as the Emergency Response Team. This group of volunteers performs a variety of tasks such as hazard education, sandbagging, traffic control, siren testing, etc.					
Hazardous Materials Expert	Yes – The Burlington Fire Department has a team trained in Hazardous Materials response and cleanup. This team will respond to any hazardous material needs within all of Des Moines County.					
Local Emergency Planning Committee	Yes – Des Moines County Emergency Management has a countywide Local Emergency Planning Committee. This committee is comprised mostly of local business and industry, emergency responders, and volunteer agencies meeting two times per year to discuss planning for emergencies at their respective workplaces.					

Programs	Des Moines County	Burlington	West Burlington	Danville	Mediapolis	Middletown
National Flood Insurance Program (NFIP)	Yes	Yes	Yes	No	Yes	No
Community Rating System	No	No	No	No	No	No
National Weather Service Storm Ready	Yes – Des Moines County was designated as National Weather Service Storm Ready County approximately 10 years ago. Storm Ready Counties must meet a certain set of criteria to be designated that makes them more equipped to save lives and property before, during, and after storm events.					
ISO Fire Ratings (State Fire Marshal's Office)	Yes	Yes	Yes	Yes	Yes	Yes
Property Acquisitions	Yes	No	No	No	No	No
Mutual Aid Agreements (28E Agreements)	Yes	Yes	Yes	Yes	Yes	Yes
Building Code Effectiveness Grading (BCEGs)	No	No	No	No	No	No

Staffing	Des Moines County	Burlington	West Burlington	Danville	Mediapolis	Middletown
County Emergency Management Commission	Yes – Des Moines County Emergency Management Agency is led by the Des Moines County Emergency Management Commission which is comprised of the mayor or designee from each community, a member of the county board of supervisors, and the county sheriff.					
Sanitation Department	Yes	Yes	Yes	Yes	Yes	Yes - Contract
Economic Development Organization/Chamber of Commerce	Yes - The Greater Burlington Partnership is the identity for the organization which includes the Chamber of Commerce, Economic Development, Convention and Visitors Bureau and Downtown Partners, Inc. Each division has a separate mission, but the entities share one vision: to ensure Greater Burlington is a growing regional center of commerce, industry, education, health care, entertainment and culture which provides a great place to live and work. They provide services for the entire Des Moines County area.					
Housing Program Staff	None of the communities have housing program staff; however they are provided some housing program assistance through the Southeast Iowa Regional Housing Authority. The housing authority is a federally funded agency operating under the guidelines set forth by the US Department of Housing & Urban Development. SEIRHA administers a Section 8 Rental Assistance Program, also known as the Housing Choice Voucher Program. The program allows qualified applicants the freedom to choose quality privately owned housing throughout their community while maintaining rent payments that they can afford.					
Regional Planning Agency/ Planning Commission	Yes – The Southeast Iowa Regional Planning Commission serves four counties and 33 municipalities in Southeast Iowa including Des Moines County and all of the communities within. Their mission is to facilitate and solve regional development issues related to community planning, economic development, housing, and transportation.					
Historic Preservation Commission	No	Yes	No	No	No	No

Non-governmental Organizations	Des Moines County	Burlington	West Burlington	Danville	Mediapolis	Middletown
American Red Cross	Yes – Des Moines County is served by the American Red Cross of Iowa Chapter based out of Cedar Rapids. The American Red Cross Iowa Region prevents and alleviates human suffering in the face of emergencies by mobilizing the power of volunteers and the generosity of donors.					
Salvation Army	Yes – Des Moines County is served by the Burlington Iowa Corps Community Center. They provide disaster related services for all communities within Des Moines County.					
Veteran's Groups	Yes – Des Moines County Veteran Affairs Office was established per Chapter 35B of the Code of Iowa. The Commission was established to assist all Des Moines County Veterans who have other than a dishonorable discharge, and served on active duty at least 90 consecutive days.					
Environmental Organizations	No	No	No	No	No	No
Utility Company	Yes	Yes	Yes	Yes	Yes	Yes
Homeowner Associations	Yes	Yes	No	No	No	No
Neighborhood Associations	No	Yes	No	No	No	No

Studies & Maps	Des Moines County	Burlington	West Burlington	Danville	Mediapolis	Middletown
Flood Insurance Rate Maps	Yes	Yes	Yes	No	Yes	No
Flood Insurance Study	No	No	No	No	No	No
Evacuation Route Map	No	No	No	No	No	No
Critical Facilities Inventory	Yes	Yes	Yes	Yes	Yes	Yes
Existing and/or Future Land Use Map	Yes	Yes	Yes	Yes	Yes	Yes

Technical	Des Moines County	Burlington	West Burlington	Danville	Mediapolis	Middletown
Warning systems/services	Yes	Yes	Yes	Yes	Yes	Yes
Website	Yes	Yes	Yes	Yes	Yes	Yes
Social Media	Yes – Emergency Management, Conservation, Two River Levee and Drainage Association, and DESCOM	Yes	Yes	No	No	No
Grant Writing	In addition to "in-house" grant writing capabilities, Des Moines County and each of the incorporated communities are due-paying members of Southeast Iowa Regional Planning Commission (SEIRPC) and therefore entitled to SEIRPC grant writing services at no additional cost.					

Funding Resource	Des Moines County	Burlington	West Burlington	Danville	Mediapolis	Middletown
Authority to levy taxes for specific purposes	Iowa Code Chapter 384.12 (Cities) and Chapter 331.424 (County) enable municipalities to levy taxes for the identified specific purposes.					
Fees for water, sewer, gas, or electric services	No	Yes	Yes	Yes	Yes	Yes
Incur debt through bonds or private activities	Iowa Code Chapters 384.25 and 384.26 (Cities) and Chapters 331.443 and 331.445 (County) enable municipalities to contract indebtedness and issue general obligation bonds to provide funds to pay all or any part of the costs of a project, both for any general corporate purpose or essential corporate purpose within or without its corporate limits, subject to provisions of the code.					
Community Development Block Grant	Des Moines County has no communities with populations greater than 50,000 and therefore no CDBG entitlement communities. Des Moines County communities can access CDBG funds through a competitive bidding process for water/sewer projects, public facilities, housing, job creation, etc. Additionally, communities can access CDBG funds through disaster appropriations.					
Other federal funding programs	FEMA's Hazard Mitigation Assistance (HMA) grant programs provide funding opportunities for pre- and post-disaster mitigation, with three sub-programs: Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM) Program, and Flood Mitigation Assistance (FMA) Program.					
State funding programs	Authorized under the Flood Mitigation Bill, the Flood Mitigation Program (FMP) is funded by the Flood Mitigation Fund or the use of Sales Tax Revenues to provide funding to governmental entities to implement long-term flood mitigation projects.					

Des Moines County School Districts

The four public school districts in Des Moines County (Burlington CSD, West Burlington CSD, Danville CSD, and Mediapolis CSD), Burlington Notre Dame Catholic schools, and the Southeastern Community College all have similar capabilities in terms of implementing hazard mitigation activities. Specific capabilities include:

	Burlington	West Burlington	Danville	Mediapolis
# of students	4,200	900	700	860
# of staff	850	125	100	125
# of Board Members	7	5	5	7
# of buildings	10	3	2	1
District area	86.9 square miles	2.6 square miles	72.7 square miles	234.9 square miles
Local Emergency Operations Plan	Yes	Yes	Yes	Yes
Continuity of Operations Plan	Yes	No	No	No
Long Range Planning Committee	No	Yes	Yes	Yes
Facilities Manager	Yes	Yes	Yes	Yes
Transportation Director	Yes	Yes	Yes	Yes
Warning Systems	Yes	Yes	Yes	Yes
District Website	Yes	Yes	Yes	Yes
Ability to bond	Yes	Yes	Yes	Yes
Ability to levy taxes	Yes	Yes	Yes	Yes
Website	Yes	Yes	Yes	Yes
Social Media	Yes	Yes	Yes	Yes
Grant Writing	No	Yes	No	No

	Notre Dame Schools	Southeastern Community College
# of students	465	2,114
# of staff	54	274
# of Board Members	9	5
# of buildings	1	17 including fairgrounds
District area	N/A	7 counties
Local Emergency Operations Plan	Yes	Yes
Continuity of Operations Plan	No	Yes
Long Range Planning Committee	No	Yes
Facilities Manager	Yes	Yes
Transportation Director	Yes	Yes
Warning Systems	Yes	Yes
District Website	Yes	Yes
Ability to bond	No	Yes
Ability to levy taxes	No	Yes
Website	Yes	Yes
Social Media	Yes	Yes
Grant Writing	No	Yes

4.6 Climate and Weather

The State of Iowa has a continental climate with hot, moist summers and cold, generally dry winters. The average annual temperatures range from about 45 degrees Fahrenheit in the north to about 52 degrees Fahrenheit in the south. The recorded temperature in the state has ranged from –47 degrees Fahrenheit in 1912 to 118 degrees Fahrenheit in 1934. The average annual precipitation is 34 inches for the state, ranging from about from about 26 inches in the northwest to about 38 inches in the southeast. Although most of the annual precipitation falls in the warm months, snowstorms, ice storms, and occasional blizzards occur during the winter. Thunderstorms are common in summer. Droughts severe enough to cause widespread crop losses have a 5% chance of occurring in a given year.

Evidence trends towards Iowa's climate growing warmer with more precipitation and more frequent severe weather events. Iowa data shows small increases in average temperatures, but nighttime lows have been increasing at a much higher rate in the last 100 years. Seasonal cycles and ranges of species have been observed to be shifting. For example, cold-water species of fish populations have been dropping due to groundwater temperatures and sedimentation.[2]

Figure 4.2 includes seasonal and annual average temperatures and average precipitation for Iowa and Southeast Iowa from 1981 to 2010. As shown, Southeast Iowa generally has more precipitation and higher temperatures relative to the State of Iowa as a whole. The table also compares temperature and precipitation statewide for the year 2014 to the long term averages, and indicates that temperature averages were slightly higher than normal and that precipitation averages were slightly lower than normal.

[2] From State of Iowa Hazard Mitigation Plan 2013.

Figure 4.2 Seasonal and Annual Average Temperature and Precipitation 1981 - 2010

Iowa and Southeast Iowa Climate Statistics Long-term Averages (1981-2010) and Most Recent Year (2014)[3]		
Average Temperature (degrees F) December/January/February	Iowa	22.1
	SE Iowa	26.3
Average Temperature (degrees F) March/April/May	Iowa	48.3
	SE Iowa	51.2
Average Temperature (degrees F) June/July/August	Iowa	71.6
	SE Iowa	73.6
Average Temperature (degrees F) September/October/ November	Iowa	50.2
	SE Iowa	53.0
Average Annual Temperature (degrees F)	Iowa	48.1
	SE Iowa	51.0
Average Precipitation (inches) December/January/February	Iowa	3.31
	SE Iowa	4.65
Average Precipitation (inches) March/April/May	Iowa	10.22
	SE Iowa	11.01
Average Precipitation (inches) June/July/August	Iowa	13.71
	SE Iowa	13.59
Average Precipitation (inches) September/October/ November	Iowa	8.03
	SE Iowa	9.36
Average Annual Precipitation (inches)	Iowa	35.14
	SE Iowa	38.55
Average Temperature In Iowa (degrees F), 2014*		45.4
Temperature Departure from Average In Iowa (degrees F), 2014*		-2.7
Average Precipitation In Southeast Iowa (inches), 2014*		39.61
Precipitation Departure from Average In Southeast Iowa (inches), 2014*		-4.34

*Departures are computed from 1981-2010 normals based upon information collected by NOAA

[3] Sources: NOAA,; Iowa Climatology Bureau , http://www.iowaagriculture.gov/climatology/weatherSummaries/2013/pmstable201312.pdf

Figure 4.3 shows the annual temperature trends in Southeast Iowa from 1895 to 2014. The graph illustrates that average annual temperatures have trended higher. Average annual precipitation has also trended higher since from 1895 to 2014, as illustrated on Figure 4.4.

Figure 4.3
Annual Temperature Trends 1895-2014
Southeast Iowa (Iowa Climate Division 9)

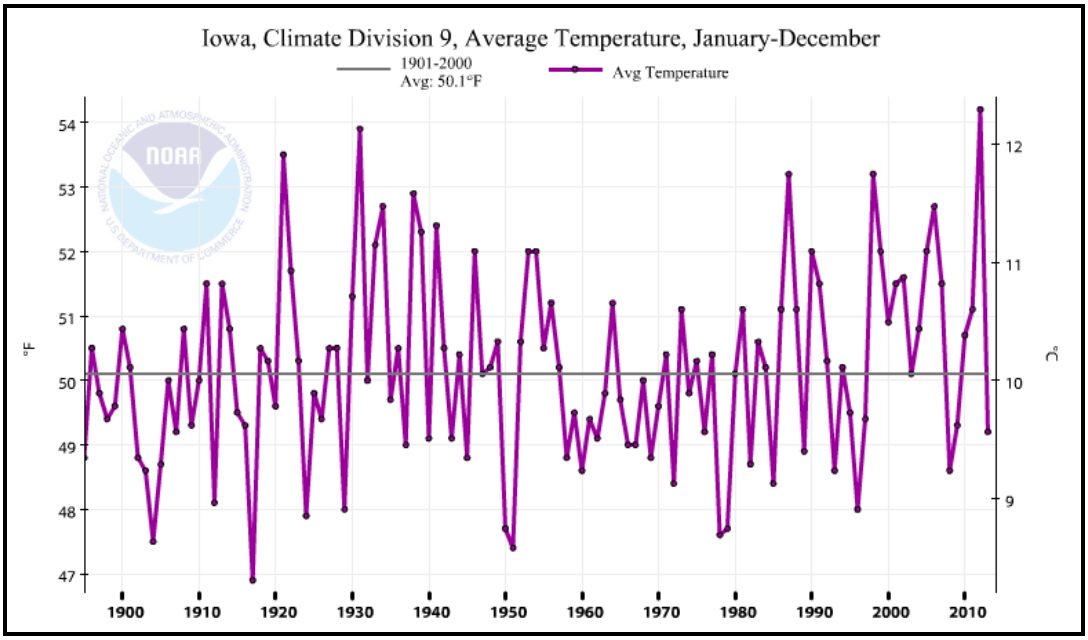
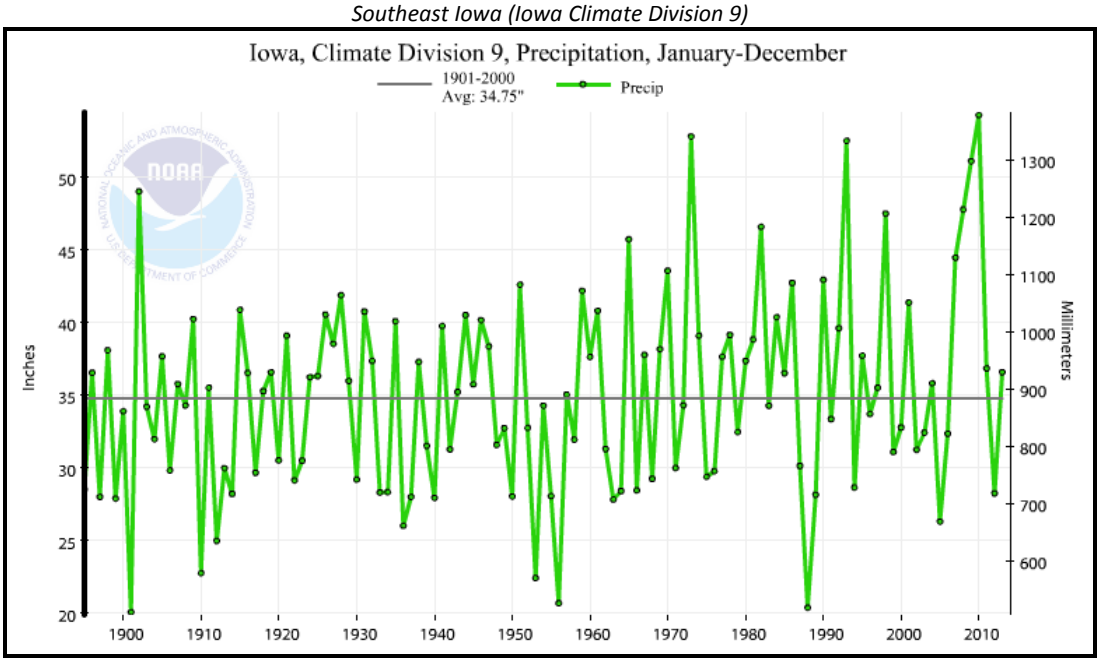


Figure 4.4
Annual Precipitation Trends 1895-2014
Southeast Iowa (Iowa Climate Division 9)



4.7 Demographic Characteristics

Population

The population in Des Moines County was 40,325 at the 2010 census. Figure 4.5 shows that the total population in Des Moines County decreased slightly from 2000 to 2010, a decrease of 0.5%. In comparison, the State of Iowa and United States populations increased 4.1% and 9.7% during the same time period, respectively.

Figure 4.5
Population Comparison for Des Moines County, Iowa, and United States, 2000 and 2010

Des Moines County:	2010	2000	Change
Total population	40,325	42,351	(2,026)
In households	39,640	41,431	(1,791)
In group quarters	685	920	(235)
Institutionalized	518	688	(170)
Noninstitutionalized	167	232	(65)
State of Iowa	3,046,355	2,926,324	120,031
United States	308,745,538	281,421,906	27,323,632

Residents of correctional facilities, nursing homes, dormitories, and other types of group quarters are counted among the total population.

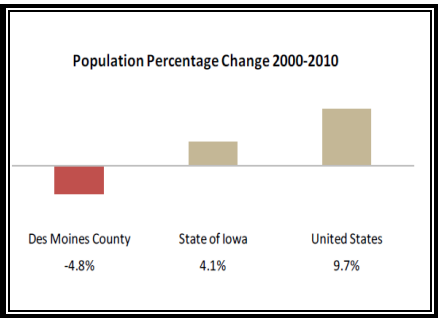


Figure 4.6 illustrates population trends in Des Moines County between 1900 and 2010. The population peaked in 1970 and has generally decreased in recent decades.

Figure 4.6
Des Moines County Population Trend 1900-2010

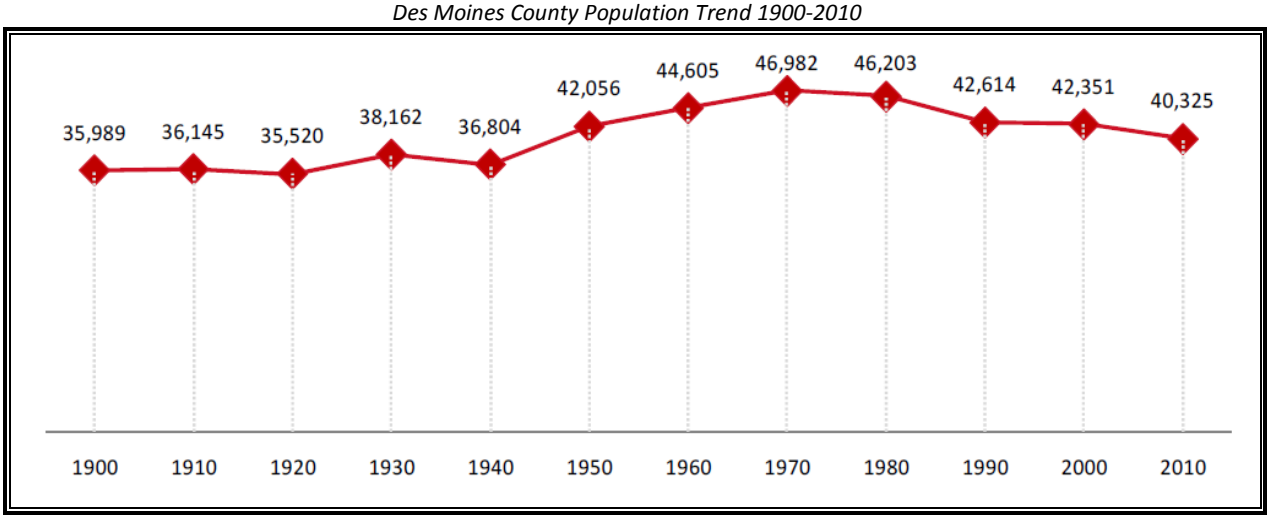


Figure 4.7 includes US Census decennial population totals for Des Moines County and all incorporated cities within the County. As the table indicates, Burlington is the largest population center, with approximately 26,000 residents, while all other communities have significantly smaller populations.

Only one incorporated community, Danville, had population growth between 2000 and 2010, although growth was very minimal.

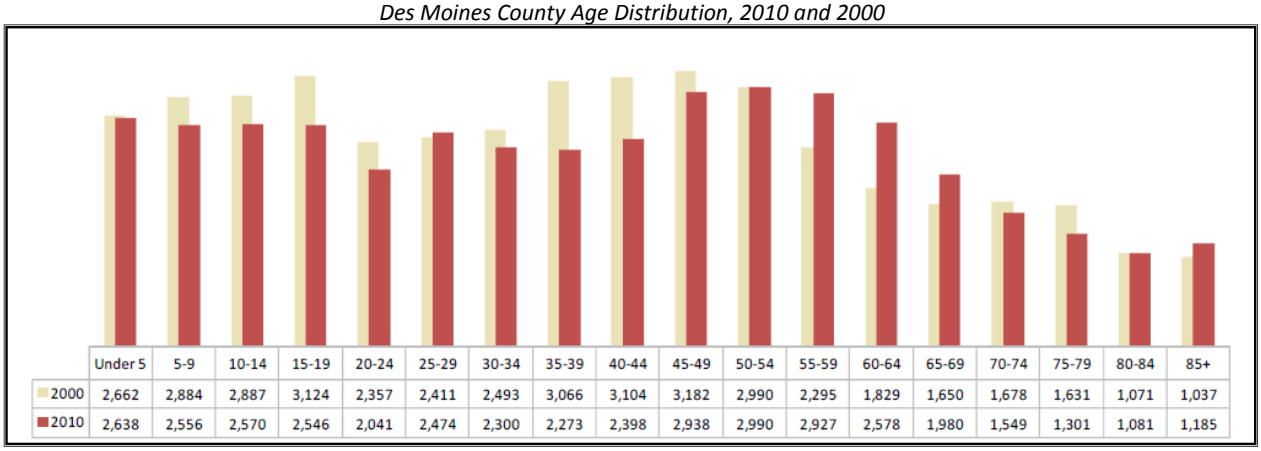
Figure 4.7
Population of Des Moines County communities, 1940-2010

	1940	1950	1960	1970	1980	1990	2000	2010
Burlington	25,832	30,613	32,430	32,366	29,529	27,208	26,839	25,663
West Burlington	1,323	1,614	2,560	3,139	3,371	3,083	3,161	2,968
Danville	450	579	948	948	994	926	914	934
Mediapolis	806	834	1,040	1,242	1,685	1,637	1,644	1,560
Middletown	134	212	232	443	487	386	535	318
Des Moines County	***36,804***	***42,056***	***44,605***	***46,982***	***46,203***	***42,614***	***42,351***	***40,325***

Age Distribution

Figure 4.8 illustrates the breakdown of Des Moines County's population by gender and age groups for 2000 and 2010. The graph shows that populations declined in nearly all age bins below age 45 while nearly all age bins for residents 45 years and older increased. However, the age bin for 25-29 had a slight increase. Overall, the data is indicative of an increasingly older population. The median age in Des Moines County increased between 2000 and 2010, from 38.9 years old to 40.6 years old.

Figure 4.8
Des Moines County Age Distribution, 2010 and 2000



	Under 5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
2000	2,662	2,884	2,887	3,124	2,357	2,411	2,493	3,066	3,104	3,182	2,990	2,295	1,829	1,650	1,678	1,631	1,071	1,037
2010	2,638	2,556	2,570	2,546	2,041	2,474	2,300	2,273	2,398	2,938	2,990	2,927	2,578	1,980	1,549	1,301	1,081	1,185

Racial and Ethnic Composition

Des Moines County is a predominantly white community with a relatively small proportion of minority residents. Approximately 9% of the population is non-white, similar to 9% in the State of Iowa but less than the 28% nation-wide. In 2010, 91.0% of the Des Moines County population was white, with 4,266 residents of another race. Figure 4.9 shows the population composition by race for 2000 and 2010. For both counts, Black and Asian residents comprised the second and third highest racial populations in the County.

Des Moines County had 1,042 Hispanic residents, which equaled approximately 2.6% of the total population, compared to 5% in Iowa and 16% in the United States.

Figure 4.9
Des Moines County Racial Composition, 2010 and 2000

Des Moines County:	2010	2000
White Alone	91.0%	93.7%
Other Race Alone or in Combination	9.0%	6.3%
Black Alone	5.1%	3.6%
American Indian/Alaska Native alone	0.2%	0.2%
Asian Alone	0.7%	0.6%
Native Hawaiian/Pacific Islander alone	0.1%	0.0%
Some Other Race Alone	0.6%	0.7%
Two or More Races	2.3%	1.2%

4.8 Household Characteristics

According to the 2010 Census, there were 17,003 households, and 10,919 family households in Des Moines County. The average household size was 2.33. Of the 17,666 households:

- 4,481 (26.4%) had children under the age of 18 living with them
- 8,063 (47.4%) were married couples living together
- 2063 (12.1%) had a female householder with no husband present
- 6,084 (35.8%) were non-families
- 5,144 (30.3%) were made up of householders living alone
- 4,999 (29.4%) had someone living alone who was 65 years of age or older

4.9 Employment and Income

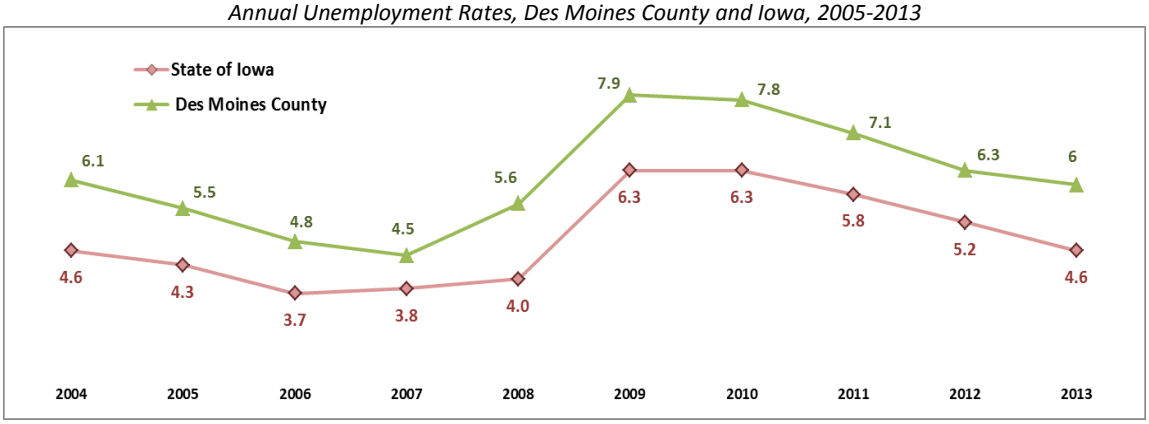
With Southeast Iowa Community College, four public school districts, and the Great River Medical Center all located in Des Moines County, the employment sector including educational services, health care, and social assistance together make up the largest sector for residents, supporting 22.1% of the working adults. Manufacturing, which has historically been an important part of the local economy, remains the second largest sector by total percentage of workforce for the county, supporting 20.3% of the total jobs. Figure 4.10 shows the workforce by industry according to the 2009-2013 American community Survey. Of all Des Moines County workers, 81.7% are private wage and salary workers, 13.1% are government workers, and 5.2% are self-employed workers. Approximately 57% of the population age 16 years and older in Des Moines County participate in the workforce.

Figure 4.10
Workforce by Industry (Source: 2009-2013 American Community Survey Census)

	Des Moines County		State of Iowa
	#	%	%
Civilian employed population 16 years and over	**9,330**	**100.0%**	**100.0%**
Agriculture, forestry, fishing and hunting, mining	346	1.9%	4.0%
Construction	1,128	6.2%	6.1%
Manufacturing	3,803	20.8%	14.7%
Wholesale trade	275	1.5%	3.0%
Retail trade	2,568	14.1%	11.7%
Transportation and warehousing, and Utilities	1,009	5.5%	4.6%
Information	289	1.6%	1.9%
Finance and insurance, real estate and rental	648	3.6%	7.6%
Professional, scientific, management, administrative, waste mgmt.	967	5.3%	7.0%
Educational services, health care, social assistance	4,029	22.1%	24.1%
Arts, entertainment, recreation, accommodation, and food services	1,752	9.6%	7.6%
Other services, except Public Administration	839	4.6%	4.4%
Public administration	597	3.3%	3.3%

Des Moines County unemployment rates have been higher than statewide averages in the last decade. Unemployment rates spiked after the 2008 economic downturn, but have been decreasing in recent years. Figure 4.11 illustrates the unemployment trend for Des Moines County and the State of Iowa from 2004 to 2013.

Figure 4.11
Annual Unemployment Rates, Des Moines County and Iowa, 2005-2013



Source: U.S. Bureau of Labor Statistics

Figure 4.12 shows unemployment rates for all Iowa counties in November 2013 and November 2014. Unemployment rate has slightly decreased in Des Moines County.

Figure 4.12
Annual Unemployment Rates, Iowa Counties, 2013-2014
Source: http://www.iowaworkforce.org/trends/

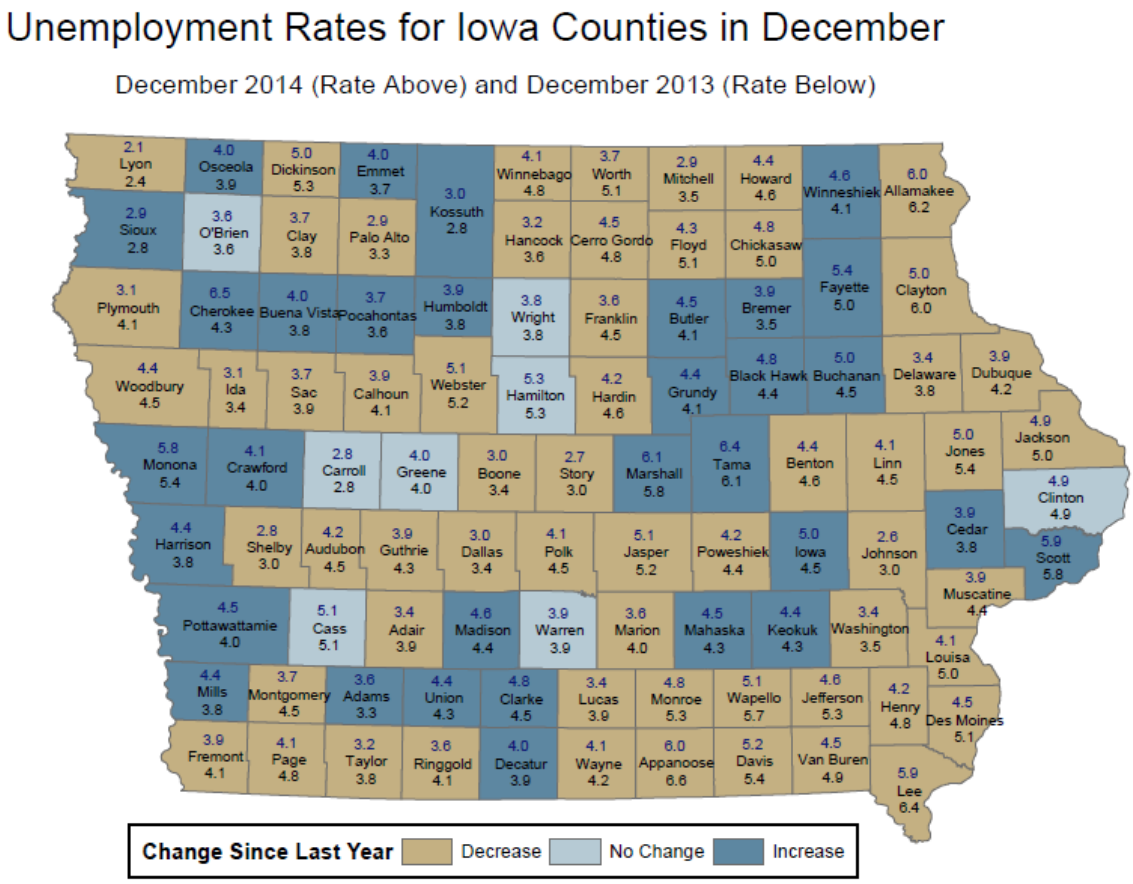


Figure 4.13 shows income and poverty in Des Moines County and Iowa, based on 2009-2013 American Community Survey estimates. Median household income, median family income, and per capita income are all lower in Des Moines County compared to statewide averages. About 58% of Des Moines County households had incomes less than $50,000. The proportion of people living below the poverty line is higher in Des Moines County (13.8%) than the statewide average (12.4%).

Figure 4.13
Selected Income Characteristics, Des Moines County and Iowa 2013

	Des Moines County		State of Iowa
	#	#	%
Total Households	**16,993**	**100.0%**	**100.0%**
less than $10,000	1,273	7.5%	6.2%
$10,000-$14,999	1,225	7.2%	5.3%
$15,000-$24,999	2,190	12.9%	10.8%
$25,000-$34,999	1,997	11.8%	11.0%
$35,000-$49,999	3,201	18.8%	14.9%
$50,000-$74,999	3,223	19.0%	20.0%
$75,000-$99,999	1,844	10.9%	13.5%
$100,000-$149,999	1,435	8.4%	12.0%
$150,000-$199,999	286	1.7%	3.4%
$200,000 or more	319	1.9%	2.8%
Median Household Income (dollars)	$42,451		$51,843
Median Family Income (dollars)	$53,237		$65,802
Per capita Income (dollars)	$24,408		$27,027
Poverty Rate	13.8%		12.4%

4.10 Local Industries

The leading employers in Des Moines County are the following industries:

- **Great River Medical Center, West Burlington,** regional medical center
- **American Ordinance, LLC, Middletown,** premier manufacture of medium and large caliber ammunition to the United States Military
- **CNH America, Burlington**, Manufacturing center for backhoes, tractor landscapers, and rough terrain forklifts for Case and New Holland Brands.
- **General Electric Co., West Burlington,** Manufacturer of electrical components
- **Shearer Foods, Burlington,** Bakery production for national snack food company
- **Federal Mogul,** Manufacturer of spark plugs
- **Hope Haven Development Center, Burlington,** a private non-profit organization offering services to mentally and physically challenged persons in the region.
- **Winegard Company, Burlington,** manufacturer of quality antenna products

- **Hawkeye Pedershaab**, Producer of concrete fabrication machinery and concrete technology products
- **Carl A Nelson & Company, Burlington,** Company offering design-build, construction management, and general contracting.
- **Pzazz! Resort Hotel, Burlington,** Hotel, restaurant, casino, spa, waterpark entertainment complex
- **Burlington Community School District**
- **Southeast Iowa Community College**
- **Two Rivers, Inc., Burlington**, Banking and insurance institution
- **Dresser-Rand Company, Burlington,** mechanical and machinery manufacturing
- **United States Gypsum Company, Mediapolis,** Production and manufacture of gypsum products

4.11 Housing Characteristics

Single family detached homes are the most prevalent type of housing in the area, existing in multiple forms, from the large turn of the century estates that line the bluffs of the Mississippi River to the smaller tract lot homes that make up most of the local communities.

Figure 4.14
Housing Tenure and Occupancy, Des Moines County and Iowa

	Des Moines County		State of Iowa
	#	%	%
Owner-Occupied	12,427	73.1%	72.2%
Renter-Occupied	4,566	26.9%	27.8%
Vacant Housing Units	1,506	8.1%	8.5%

Owner-occupied homes account for 73.1% of the total occupied housing units in Des Moines County, and 26.9% are renter-occupied homes. Figure 4.14 shows that Des Moines County deviates slightly from the State of Iowa in terms of tenure proportions, and has a slightly lower proportion of vacant housing units (8.1%) compared to Iowa (8.5%).

Figure 4.15 shows the age of housing structures in Des Moines County and Iowa. Of the estimated 18,499 housing units in Des Moines County, 44.7% are more than 70 years old. Construction of housing units spiked the 1970's. Housing construction by decade has been relatively consistent with state-wide trends, although fewer than 2000 units (5.9%) have been constructed since 2000, a slightly slower rate than the rest of the state. The median year built shows that housing units in Des Moines County are, on average, older than the state average.

Figure 4.15
Age of Housing Structures, Des Moines County and Iowa

Year Built	Des Moines County #	Des Moines County %	State of Iowa %
2010 or later	61	0.3	0.7
2000 to 2009	1,029	5.6	11.6
1990 to 1999	1,291	7.0	10.8
1980 to 1989	894	4.8	7.2
1970 to 1979	2.812	17.3	15.2
1960 to 1969	2,048	11.1	10.6
1950 to 1959	2,099	11.3	11.1
1940 to 1949	1,329	7.2	6.4
Before 1940	6,936	37.5	26.9
TOTAL	**18,499**	**100**	**100**
Median Year Built	1955		1965

Source: ACS 2008-2012

As shown in Figure 4.16, the average value of owner-occupied homes is $93,900 in Des Moines County, about 25% lower than the statewide average of $124,300. Approximately 55% of Des Moines County owner-occupied housing units are valued below $100,000, and approximately 87% are valued below $200,000.

Figure 4.16
Value of Owner-Occupied Housing Units

Home Value	Des Moines County #	Des Moines County %	State of Iowa %
Less than $50,000	1,761	14.2	11.6
$50,000 to $99,999	5,031	40.5	25.7
$100,000 to $149,999	2,659	21.4	23.5
$150,000 to $199,999	1,367	11.0	16.8
$200,000 to $299,999	1,085	8.7	14.3
$300,000 to $499,999	363	2.9	6.1
$500,000 to $999,999	69	0.6	1.6
$1,000,000 or more	92	0.7	0.4
TOTAL	**5,502**	**100**	**100**
Median Home Value	$93,900		$124,300

Source: ACS 2008-2012

Figure 4.17 shows that an estimated 61.3% of Des Moines County owner-occupied households with mortgages spend less than 25% of their income on housing costs, while 18.0% of households are considered “housing cost-burdened” and spend 35% or more of their monthly income on housing costs. The prevalence of households spending large proportion of their incomes on housing may be reason for concern about potential home foreclosures.

A much larger proportion of renters in Des Moines County (36.5%) spend more than 35% of household income on housing costs, as shown in Figure 4.18. Average rent costs are lower in Des Moines County ($614) than across Iowa ($670). The proportional breakdown of housing costs relative to income in Des Moines County does not deviate greatly from proportions across the state.

Figure 4.17
Housing Costs as a Percentage of Household Income for Units with a Mortgage, Des Moines County and Iowa

Income spent on Housing Costs	Des Moines County #	Des Moines County %	State of Iowa %
Less than 20%	3,330	47.4	48.6
20.0% to 24.9%	977	13.9	17.5
25.0% to 29.9%	856	12.2	10.9
30.0% – 34.9%	598	8.5	6.7
35% or more	1,264	18.0	16.2
TOTAL	**7,025**	**100**	**100**
Median Home Value		$93,900	$124,300

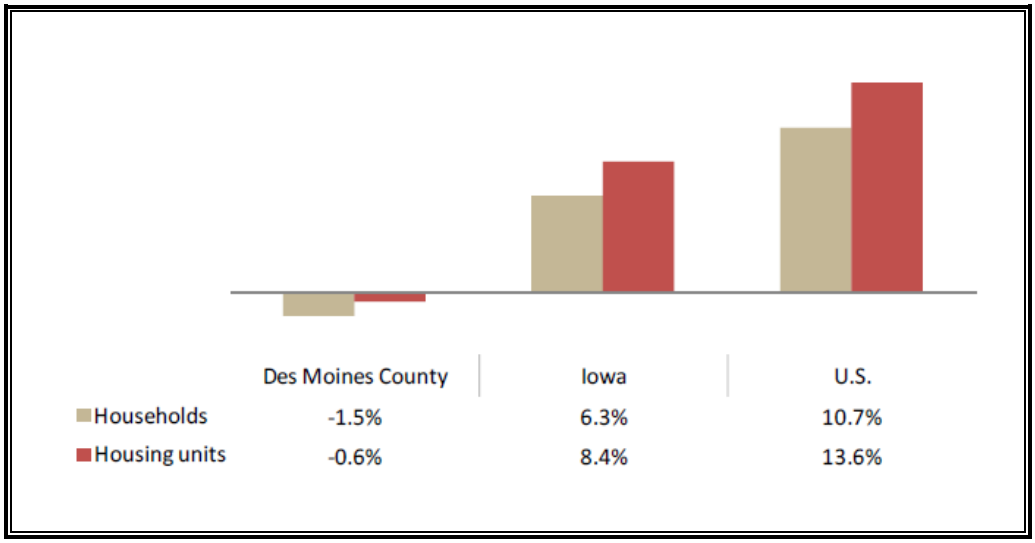
Source: ACS 2008-2012

Figure 4.18
Housing Costs as a Percentage of Household Income for Units Paying Rent, Des Moines County and Iowa

Income spent on Housing Costs	Des Moines County #	Des Moines County %	State of Iowa %
Less than 20%	1,095	26.3	31.2
20.0% to 24.9%	572	13.7	12.8
25.0% to 29.9%	636	15.3	10.8
30.0% – 34.9%	343	8.2	8.4
35% or more	1,522	36.5	36.9
TOTAL	**4,168**	**100**	**100**
Median Gross Rent		$614	$670

Figure 4.19 compares the change in households and housing units between 2000 and 2010 in Des Moines County, Iowa, and the United States. The number of households and units in Des Moines County decreased slightly during that time period, in contrast to the increases at the state and national levels.

Figure 4.19
Percentage Change in Households and Housing Units 2000-2010, Des Moines County, Iowa, and US



4.12 Agricultural Trends

Figures 4.20 through 4.23 show agriculture-related trends in Des Moines County and Iowa. Agricultural land values were lower in the two decades following the 1980 count, but have since rebounded. The value of land in dollars per acre has increased significantly in both Des Moines County and Iowa since 2010, rising nearly 60% in four years. Agricultural trends also show a shift toward fewer and larger farms in both Des Moines County and Iowa since the mid-20th century, as well as a decreasing trend in the number of full and part-time employees in the agriculture industry over the last four decades.

Figure 4.20
Agricultural Land Value in Dollars per Acre
Source: Farmland Value Survey, Iowa State University

	1980	1990	2000	2010	2013	2014
State of Iowa	$2,066	$1,214	$1,857	$5,064	$8,716	$7,943
Des Moines County	$2,007	$1,137	$1,773	$4,845	$7,433	$7,911

Figure 4.21
Number of Farms
Source: Census of Agriculture, U.S. Department of Agriculture and U.S. Census Bureau

	1950	1982	1992	2002	2012
State of Iowa	203,159	115,413	96,543	90,655	88,637
Des Moines County	1,521	815	681	674	663

Figure 4.22
Average Farm Size in Acres
Source: Census of Agriculture, U.S. Department of Agriculture and U.S. Census Bureau

	1900	1950	1982	2002	2012
State of Iowa	151	169	283	350	345
Des Moines County	114	151	276	269	260

Figure 4.23
Farm Employment (Number of Full and Part-Time Jobs)
Source: Regional Economic Accounts, U.S. Bureau of Economic Analysis (BEA)

County	1980	1990	2000	2013
State of Iowa	161,699	130,807	109,851	91,661
Des Moines County	1,126	876	743	525

4.13 Critical Facilities, Vulnerable Sites, and Critical Infrastructure

The built environment includes existing structures, infrastructure systems, critical facilities, and cultural resources. All structures are exposed to risk, but certain buildings or concentrations of buildings may be more vulnerable because of their location, age, construction type, condition, or use. Through the planning process, extensive research and input was provided to identify critical facilities, vulnerable sites, and critical infrastructure throughout Des Moines County. Below is additional information on each of these three topics, with maps and tables identifying locations of these sites, facilities, and infrastructure located in Appendix G.

Critical Facilities

Critical facilities are structures and institutions necessary for a community's response to and recovery from emergencies. Critical facilities must continue to operate during and following a disaster to reduce the severity of impacts and accelerate recovery. Examples include hospitals, police and fire stations, emergency operations centers, evacuation shelters, schools, and airports. The following table lists all the critical facilities in Des Moines County. A listing and location of these facilities can be found in Appendix G.

Vulnerable Sites

High density population areas, locations with large numbers of people, large concentration of people with disabilities, or areas of secluded populations may be more vulnerable to the negative impacts of disasters. Many of these sites can also be considered critical facilities as well. Examples include campsites, apartment complexes, schools, daycares, preschools, etc. A listing and location of these sites can be found in Appendix G.

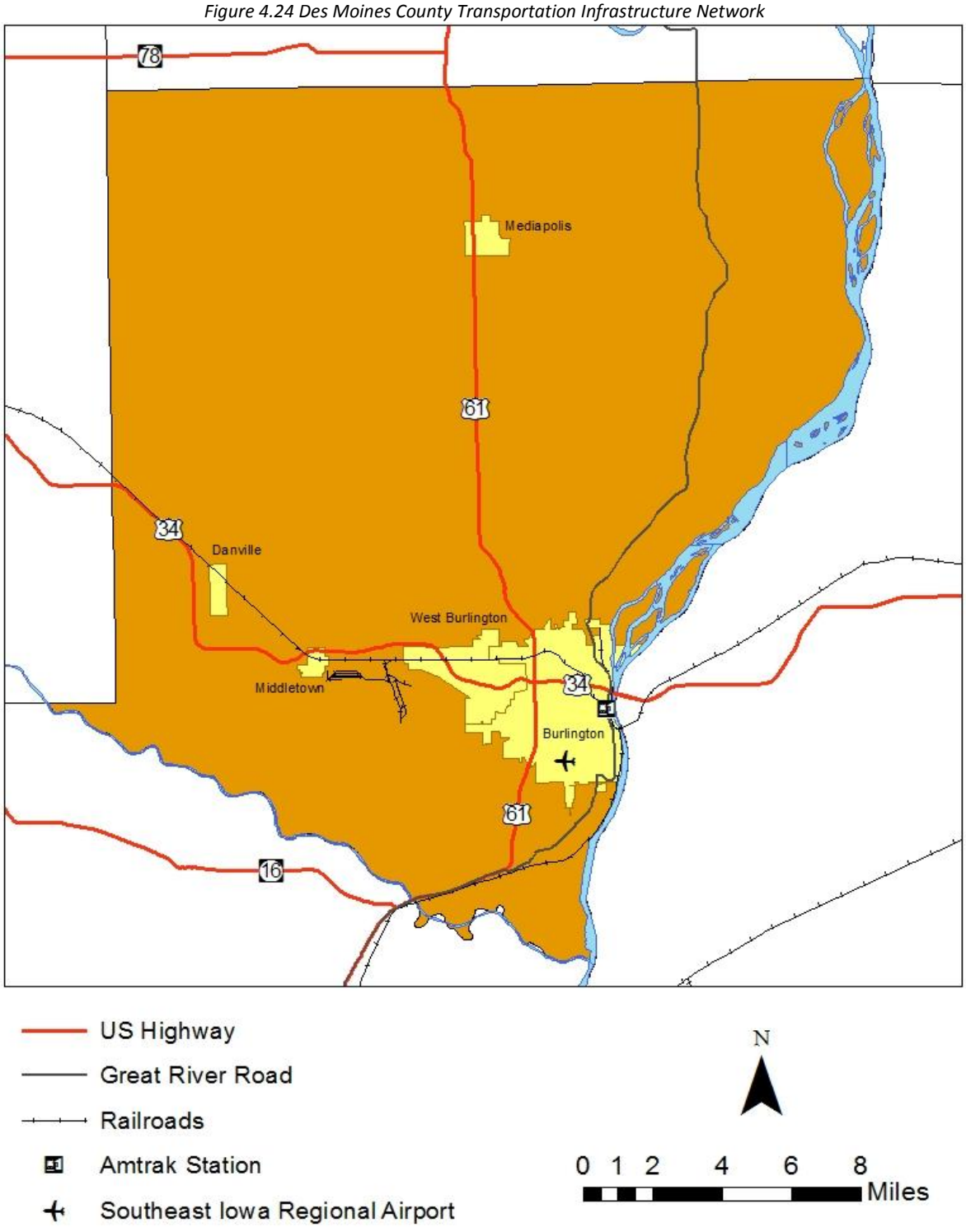
Critical Infrastructure

Critical infrastructure are community assets necessary for a community's response to and recovery from emergencies. Critical infrastructure must continue to operate during and following a disaster to reduce the severity of impacts and accelerate recovery. Examples include water and wastewater, power utilities, transportation infrastructure, communications systems, and energy pipelines and storage. A listing and location of local critical infrastructure, such as pumping stations, water treatment facilities, etc. can be found in Appendix G. The following pages provide additional information on county wide critical infrastructure such as transportation assets, levees, dams, and bridges.

4.14 Transportation Network

Figure 4.24 includes a map of the Des Moines County Transportation Network.

Figure 4.24 Des Moines County Transportation Infrastructure Network



Highways and Roads

Des Moines County is hugely impacted by State and U.S. Highways. U.S. 61 and U.S. 34 (Iowa 163) are both major highways which are critical for efficient travel in and around Des Moines County for both citizens and freight haulers. U.S. 61 also serves as part of the Great River Road route which extends from Minnesota to Louisiana. U.S. Route Highway 34 crosses the Mississippi River in Burlington, providing a connection from Des Moines County, Iowa to Henderson County, Illinois.

Railroads

Iowa's rail transportation system provides both freight and passenger service. Rail serves a variety of trips, including those within Iowa and those to other states as well as to foreign markets. While rail competes with other modes, it also cooperates with those modes to provide intermodal services to Iowans.

Iowa railroad mileage peaked in 1911 at approximately 10,500 miles. In 2009 Iowa had 3,945 miles, which is 37.6 percent of the peak mileage. While rail accounts for only 3 percent of the Iowa's 130,000 mile intermodal freight system, it carries 43 percent of Iowa's freight tonnage. Most of the Iowa rail shipments consist of bulk commodities, including grain, grain products, coal and fertilizers. The railroad network performs an important role in moving bulk commodities produced and consumed in the state to local processors, livestock feeders, river terminals and ports for foreign export. The railroad's ability to haul large volumes, long distances at low costs will continue to be a major factor in moving freight and improving the economy of Iowa.[4]

The Burlington Northern/Santa Fe Railroad provides freight service for the Des Moines County community and surrounding region. Amtrak provides passenger services throughout southern Iowa, operating its California Zephyr daily in both directions between Chicago, Illinois, and the San Francisco Bay Area. Locally, Amtrak connects Mount Pleasant, Burlington, Fort Madison, Ottumwa, Osceola, Creston, and more. One Amtrak station is located in Des Moines County, located at 300 S. Main St. in Burlington.

Airports

Des Moines County offers commercial air service, through the Southeast Iowa Regional Airport, located in Burlington. The airport is the only commercial-service airport within a 75-mile radius and offers daily services to both Chicago O'Hare and St. Louis Airports. The function of the airport is to serve the commercial aviation needs of the area as well as general aviation. General aviation includes every type of civil flying activity. The closest international airports are located in Peoria and the Quad Cities, within a two hour drive of Des Moines County.

[4] *State of Iowa Hazard Mitigation Plan*

Transit

Countywide transit service is provided through the regional Southeast Iowa Bus (SEIBUS) program. SEIBUS is operated by the Southeast Iowa Regional Planning Commission and serves Des Moines, Des Moines, Louisa and Lee Counties. SEIBUS offers general public transportation in the southeast Iowa region in several forms. Much of the SEIBUS services are based on providing transportation to county mental health and disabled clients, while operating open to the general public during these trips. Basic general public services are also offered to all cities and counties in the SEIBUS service region. These services are demand-response and are available at a consistent rate for all types of trip purposes. Part of the general public service includes the Medical Shuttle to the University of Iowa Hospital three days weekly. SEIBUS also contracts with other private transportation providers to provide general public transportation. These providers are often elder care, sheltered workshop or assisted living facilities that have access to transit vehicles. SEIBUS also provides general public services via fixed routes for several regional events.

The City of Burlington operates the Burlington Urban Service, which provides a public transit option for city residents. Nearly 90% of all residents live within 3 city blocks of a bus route. The system operates between the hours of 9:00 AM and 5:15 PM, Monday thru Friday and from 9:00 AM to 4:30 PM on Saturdays.

4.15 Pipelines

The pipeline network in Iowa, consisting of 12,379 miles, and currently owned and operated by 17 private companies, will continue to provide for the safe and efficient movement of natural gas, petroleum products and anhydrous ammonia to locations throughout the state.[5] Approximately 73 miles of natural gas transmission pipelines crisscross Des Moines County, the status and conditions of which can be accessed through the National Pipeline Mapping Service (NPMS) by eligible parties with special permission. Figure 4.25 to the right highlights the locations of pipelines in Des Moines County accessed through the NPMS public viewing system.

Figure 4.25 Des Moines County Pipelines

[5] *Source: State of Iowa Hazard Mitigation Plan 2013*

4.16 Communications

Figure 4.26 lists local media coverage providers serving Des Moines County. Other radio stations, television stations and print originating from outside the area are not listed.

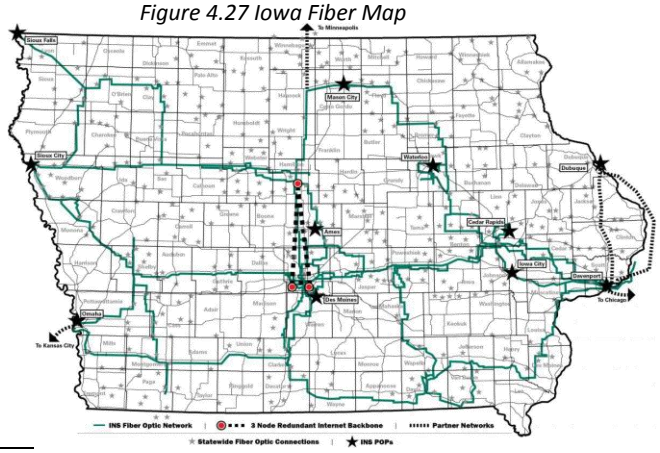
Figure 4.26 Local Media Providers

Media Type	Agency	Location
Radio	**WQKQ**	Burlington
	KBUR/KGRS	Burlington
	KCPS	Burlington
	KDMG	Burlington
	KBKB	Burlington
	KAYP	Burlington
	KKMI	Burlington
	KHDK	Burlington
Print	**The Hawk Eye**	Burlington
	Des Moines County News	West Burlington
	Mediapolis News	Mediapolis
Cable TV	**Medicaom**	Cedar Rapids

The State of Iowa has 128 public safety answering points (PSAPs) that are the first line of response to a 911 call, with at least one PSAP in each county. All 99 Iowa counties have the capability of accepting wireless enhanced 9-1-1 Phase II service, which provides the call taker at the public safety answering point with latitude and longitude coordinates so they can more readily locate the person who has placed the 9-1-1 call.[6]

The Iowa Communications Network (ICN) is a state agency that administers a statewide fiber optics network. The capacity of the Network enables authorized users such as hospitals, state and federal government, public defense armories, libraries, schools, and higher education institutions to communicate via high quality, full-motion video; high-speed Internet connections; and telephones. Each day across the state, the ICN is used in a variety of ways by a variety of Iowans. The ICN provides a wide range of services and benefits to its authorized users such as voice, data, video, and Internet services. As illustrated in Figure 4.27, ICN passes through Des Moines County.

Figure 4.27 Iowa Fiber Map



[6] Source: Iowa Homeland Security & emergency Management, http://homelandsecurity.iowa.gov/programs/e_911.html

4.17 Dams and Levees

Seven publicly owned dams are located in Des Moines County area, as seen in Figure 4.28 on the following page.

The most critical dam in Des Moines County is US Lock & Dam #18, located approximately ten miles north of the City of Burlington, near the community of Gladstone, Illinois. The lock is 110 feet wide by 600 feet long, with an average lift of 6.9 ft. The structure has been operational since 1937 and is operated by the U.S. Army Corps of Engineers, Rock Island District, which is responsible for the management of Lock & Dam #18 as well as 11 other sites on a 314 mile section of the Upper Mississippi River extending from Dubuque, Iowa to Saverton, Missouri. The Henderson River was diverted to flow to a point beneath the dam.

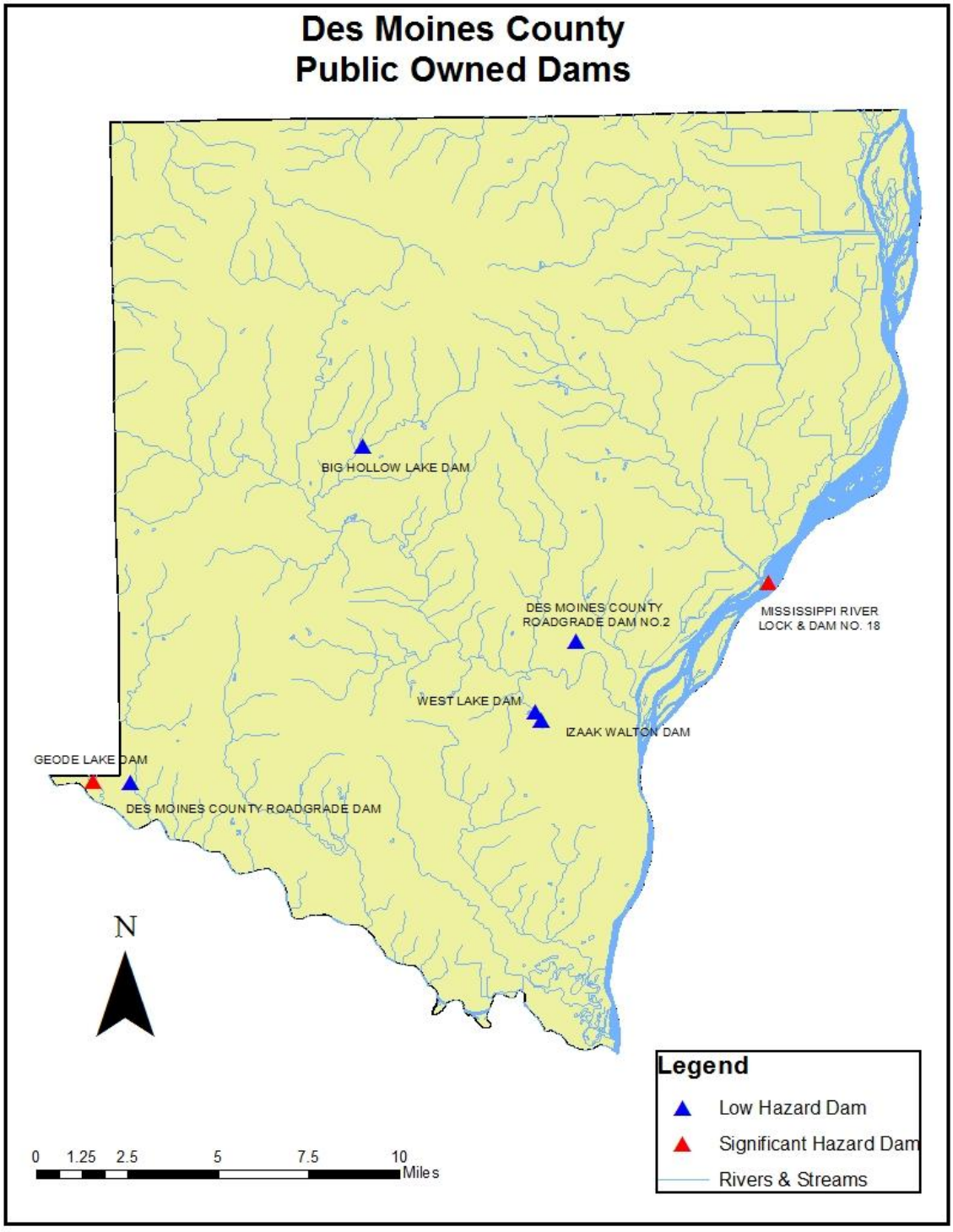
Lock & Dam #18, as well as other dams upstream on the Mississippi River, are vital for the protection of lives and property from floodwaters. According to the US Army Corps of Engineers, infrastructure on the Lock & Dam system has largely exceeded its expected lifespan, stating

> "The maintenance needs of the aging infrastructure are increasing at a rate much greater than the operations and maintenance funding provided for the system which adversely affects reliability of the system. Long-established programs for preventative maintenance of major lock components have essentially given way to a fix-as-fail strategy, with repairs, sometimes requiring weeks or months to complete. Depending on the malfunction, extended repairs can have major consequences for shippers, manufacturers, consumers, and commodities investors.

Additionally, the system's 600-foot locks do not accommodate today's modern tows without splitting and passing through the lock in two operations. This procedure requires uncoupling barges at a midpoint which triples lockage times and exposes deckhands to increased accident rate.

According to the National Levee Database, there are six levees entirely or partly located in Des Moines County, as seen in Figures 4.29, 4.30, 4.31, and 4.32. The levees in Des Moines County are managed by levee districts. Two Rivers Levee and Drainage Association based in Kingston, Iowa has six employees and manages 37 miles of main-stem levee, 17 miles of diversion ditches, and between 400-500 miles of ditches in Des Moines County as well as neighboring Louisa County. By square area, it is the second largest drainage district on the Upper Mississippi. The district was organized by the State of Iowa to help combat flood prevention and its budget is entirely driven on tax paid by landowners within the district's boundaries. The North Bottom Levee District is a separate system of levees within Des Moines County which protects an industrial area just north of Burlington.

Figure 4.28 Des Moines County Dams



Source: US Army Corps of Engineers, http://www.mvr.usace.army.mil/Portals/48/docs/CC/FactSheets/Miss/Mississippi%20River%20Locks%20and%20Dams%20(2012).pdf

Figure 4.29 North Bottoms Levee, Scale 1:27,084

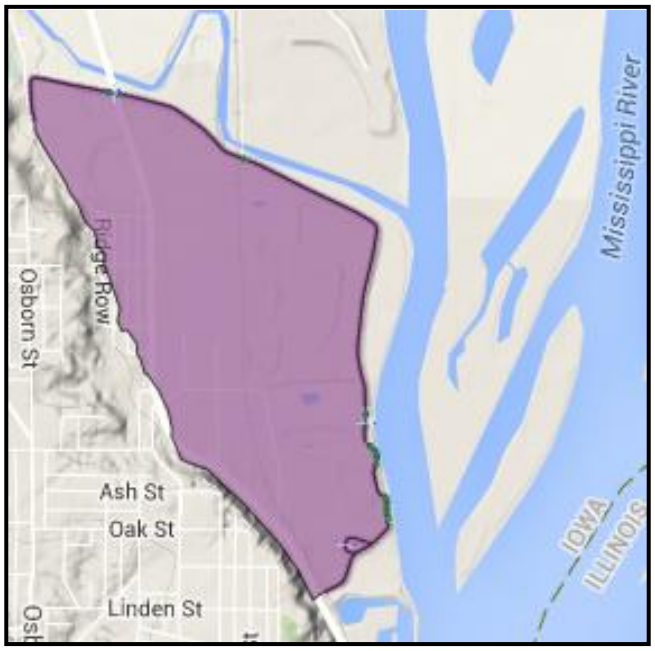


Figure 4.30 Flint River Levee #16 Segment 1 & Scale 1:108,336

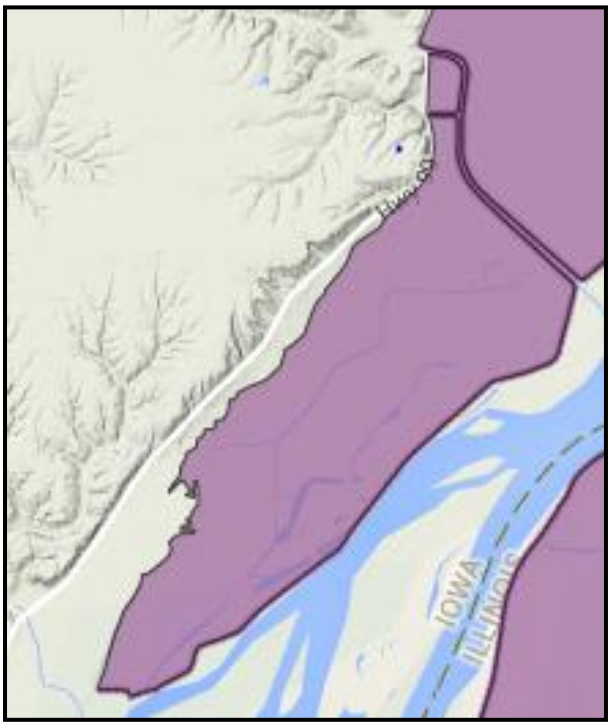


Figure 4.31 Brush Creek East & Brush Creek West, Scale 1:27,084

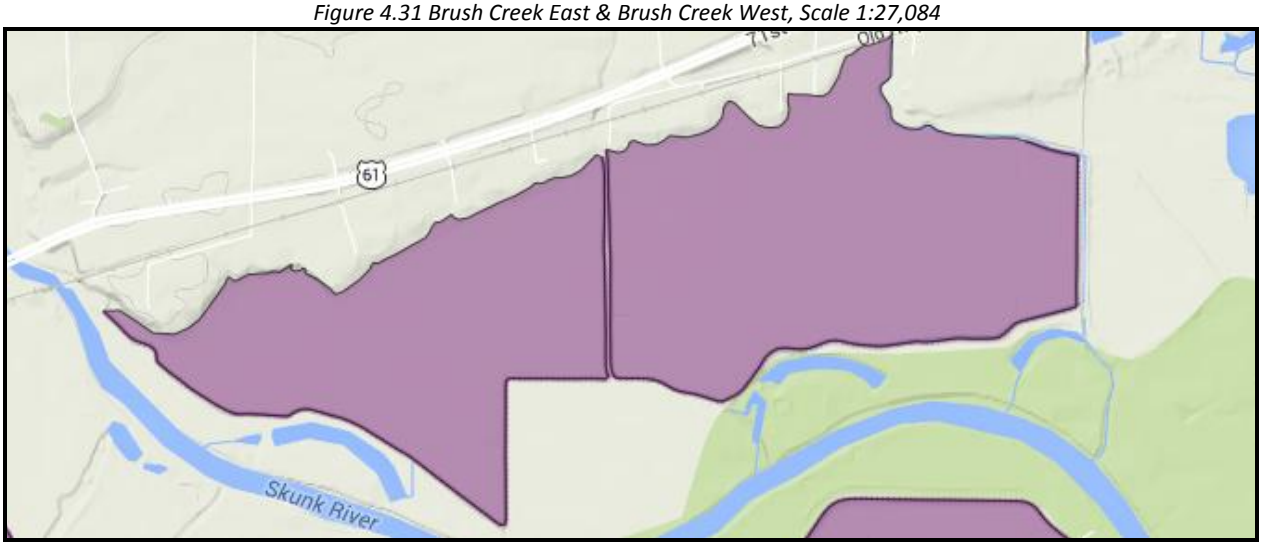


Figure 4.32 IRFC LD # 16 Louisa-Des Moines Co, Scale 1:433,344

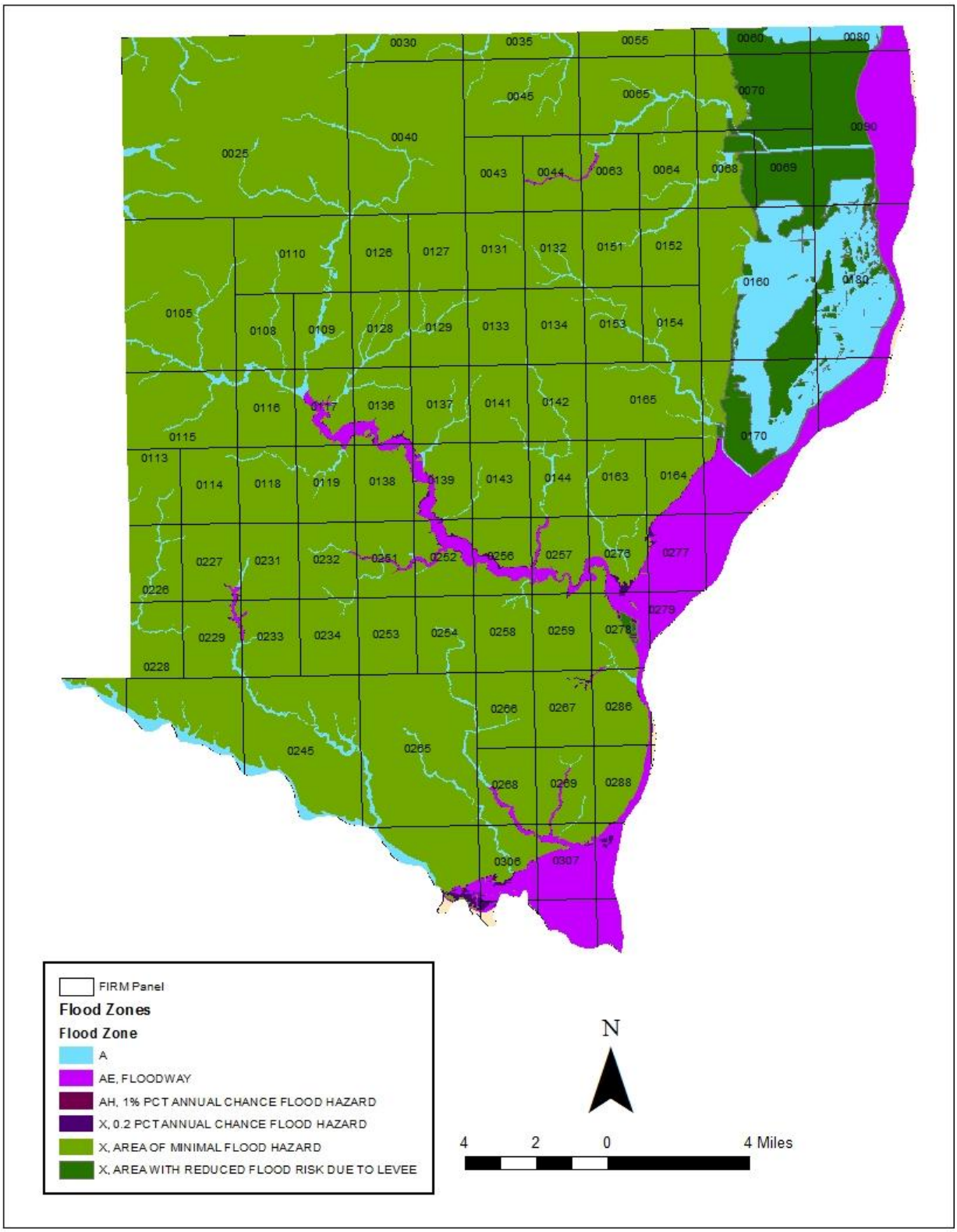
4.18 Flood Plain

The Mississippi River, Flint Creek, and Skunk River are the three most significant waterways in Des Moines County. Flooding of these waterways, particularly the Mississippi River, represents a significant potential hazard to the people of Des Moines County and their property.

FEMA records indicate that Des Moines County, City of Burlington, City of Danville, City of Mediapolis, and City of West Burlington all participate in the National Flood Insurance Program (NFIP). The community of Middletown does not participate. Figure 4.33 identifies FIRM Panes and Flood Zones within Des Moines County, with all FIRM maps located in Appendix F.

The 2013 State of Iowa Hazard Mitigation Plan identifies "Repetitive Loss Properties" that are vulnerable to multiple flood losses due to flooding, based on The National Flood Insurance Program (NFIP) Repetitive Loss Properties (REP) report. The report identifies 25 specific repetitive loss properties in all of Des Moines County. Vulnerability to river flooding is discussed in more detail in Section V of this Plan.

Figure 4.33
Des Moines County FIRM Panels and Flood Zones



4.20 Land Use Development Trends

For this plan update, limited data access and resources inhibit the ability to conduct a robust assessment of land use development since the previous planning cycle. The data and examples mentioned below describe significant facts that may help illustrate overall land use development trends. Generally speaking, Des Moines County growth is best-described as slow. Many communities have planning mechanisms in place to guide land use development, such as Zoning Ordinances and Future Land Use Plans.

As discussed in Section 4.11 of this Plan, new housing construction since 2000 has lagged behind state and national averages. According to Census data, approximately 1,090 new housing units have been built after 2000, and the total number of housing units increased by only 5.6% between 2000 and 2010 while the total number of housing units increased at the state level by 10.8% for the same time period. The Iowa Fertilizer Plant in Lee County is currently under construction, and provides employment for more than 2,000 workers, which has had a significant impact on local housing markets in recent years, but is anticipated to slow end of year 2015.

Industrial growth has been occurring in Burlington with recent expansions of Shearer Foods, Winegard Corporation, CNH, and the recent announcement of a new employer Silgan Company. Commercial development is continuing to occur as well, but at a slow rate.

Land use and hazard mitigation planning will be increasingly important as development occurs throughout the county in all sectors (residential, commercial, and industrial). Significant development will be discussed and documented using annual review and evaluation forms as described in Section VII of this Plan.

V. Des Moines County | Risk Assessment

5.1 Hazard Identification

In an effort to develop effective mitigation strategies, the Hazard Committee discussed the potential natural, technological, and human-caused purposeful hazards that could impact the community. The initial list of hazards, shown in Figure 5.1, is derived from the State of Iowa Hazard Mitigation Plan of 2013, which identifies hazards relevant to the state.

Figure 5.1 Hazard Categories and Types

Hazard Categories and Types	
NATURAL	
River Flood	Drought
Tornado	Human Disease Epidemic
Windstorm	Extreme Heat
Severe Winter Storm	Grass or Wildfire
Flash Flood	Sink Holes
Animal/Plant/Crop Disease	Landslide
Thunderstorms & Lightning	Earthquake
Hailstorms	Expansive Soils
TECHNOLOGICAL	
Dam Failure	Radiological Incident
Levee Failure	Transportation Incident
HAZMAT Incident	Infrastructure Failure
HUMAN CAUSED	
Terrorism	

The hazards were analyzed through discussion with the Hazard Committee, the planning agency coordinating the plan development, and reference documents available through the State Department of Homeland Security and Emergency Management, FEMA, and other reliable research sources. The planning committee narrowed the list down to those hazards considered relevant specifically to Des Moines County, and excluded hazards based on lack of historical occurrence, low likelihood of a future occurrence, and less potential for mitigation. Omitted hazards include:

1. Expansive Soils: The community has a remote chance of sustaining any damage from this hazard, but given the geological composition of the soils in the County, this hazard does not pose enough of a risk for the committee to include it in the mitigation measures of the County.

2. Sinkholes: The community has a remote chance of sustaining any damage from this hazard, but given the geological composition of the soils in the County, this hazard does not pose enough of a risk for the committee to include it in the mitigation measures of the County.

3. Radiological Incident: No major fixed radiological facilities, transfer stations, or receiving stations for radiological material are located in or near Des Moines County. Although facilities within Des Moines County, such as the Great River Medical Center, may create some slight radiological exposure, the risk posed by such exposure is of such minor proportions that the committee has decided to remove this hazard from those that required mitigation measures.

Additionally, hazards considered to have similar impacts and similar mitigation measures were combined in order to reduce redundancy. Combined hazards include:

- Thunderstorms / Lightning/Hail/Windstorm
- Animal/Plant/Crop Disease
- Levee/Dam Failure

Figure 5.2 shows the final list of hazards considered for this Plan. The final list of seventeen hazards being assessed applies to all participating jurisdictions.

Figure 5.2
Des Moines County Area Hazards

Animal/Plant/Crop Disease	Hazardous Materials	Severe Winter Storms
Drought	Human Disease	Terrorism
Earthquakes	Infrastructure Failure	Thunderstorms/Lightning/Windstorm/Hail
Extreme Heat	Landslide	Tornado
Flash Flood	Levee Failure/Dam Failure	Transportation Incident
Grass or Wildfire	River Flood	

5.2 Multi-Jurisdictional Risk Assessment

Because of the similar characteristics of the participating jurisdictions, the Hazard Planning Committee considers that hazard risks and profiles are essentially the same across all communities, with few exceptions. Exceptions are described in more detail in the "vulnerability" elements of hazard profiles. The communities covered under this Plan are generally small towns or rural communities with a great deal of dependence on each other for mutual aid in the event of any of these hazards occurring. The Planning Committee was comprised of representatives familiar with each area who accurately address whether there was uniqueness in risk assessments.

Hazard profile details for descriptions of hazards, historical occurrences, probability of occurrence, maximum threat, severity of impact, vulnerability of population and structures, geographic impact, and speed of onset, and extent of impact are generally applied throughout the county. Differences in the populations, socio-demographics, and land use among participating communities, which are described in detail in Section IV of this Plan, inherently convey the notion that each participating community has unique risks to the identified hazards. In general, the Hazard Planning Committee agreed that the communities were similar enough (in terms of probability, severity, duration and warning time relative to identified hazards) that these elements of the risk assessment need not be discussed for each participating jurisdiction in order to avoid redundancy. Unique risk and vulnerability is, however, discussed when appropriate. Community representatives and local officials had the option to revise hazard rankings, scoring, and prioritization to best reflect risk and vulnerability in their communities.

5.3 Hazard Scoring Methodology

The assessment of risk to people and property in Des Moines County follows the methodology used in the State of Iowa Hazard Mitigation Plan from September, 2013. To accomplish the hazard scoring objectively, a number of factors were taken into account for scoring purposes:

- Probability of occurrence in any given year
- Magnitude and severity of impact
- Amount of warning time before the hazard occurs
- Duration of the hazard's impact on the area

This hazard analysis and risk assessment in Des Moines County involves a systematic evaluation of hazards based on probability and impact. For example, the most worrisome hazards would have both high probability of occurrence and high severity of impact, while the least significant hazards would have low probability and low impact. Hazards might also be determined to have high probability with low impact, as well as low probability with high impact.

Each category of a particular hazard is rated on a scale of one (1) through four (4). Each hazard was scored as a single event, and impacts from that particular hazard were considered in the analysis. The potential for cascading hazards was discussed, and an additional methodology to analyze the effects of cascading hazards was determined to have little significance on the overall scoring of hazards and analysis of vulnerability to individual hazards. Consequently, a cascading hazard analysis is not included in this plan update.

The scale of one (1) through four (4) was used in all of the scoring guide tables outlined in Figure 5.3 because of the large variation in historical occurrences, probabilities, percentages of vulnerabilities, spatial extent, the number of casualties, or the value of property damaged. Often this data is either not available or would have been impossible to extract from aggregate data. Using this scale provides an intuitive option for comparison of vastly different types of threats and hazards.

This plan uses a formula for weighting certain hazard categories relative to the other categories, following the methodology in the Iowa Mitigation Plan. The formula allows for a higher priority to be placed on hazards that have a higher occurrence in the area and have a high potential for adverse impact. The formula is consistent from the previous plan, which also provides continuity between plan drafts by continuing to use the same criteria weighting system.

Using the four elements described above, the formula determined to be the most effective for the HARA is based on the notion that probability and historical occurrence (respectively) of a hazard best reflect Iowa's highest priorities for mitigation, while hazard warning time and duration are secondary considerations. The formula used for this risk assessment is as follows:

(Probability x .45) + (Magnitude/Severity x .3) + (Warning Time x .15) + (Duration x .10) = Final Hazard Assessment Score

Finally, hazards are ranked by total score, highest to lowest. The hazards are further sorted into categories of high, medium, and low risk. Hazard risk categories divide the entire list of hazards into thirds, and the resulting groups help illustrate relative risk among hazards in Des Moines County. The hazard analysis and risk assessment scoring process helps the planning committee understand hazards in terms of prioritization, but the planning committee makes the final determination of the priority group in which a hazard is placed.

Individual committee member scores for each factor (probability, magnitude/severity, warning time, and duration) were averaged prior to applying the weighted formula. The "total score" shows the final hazard assessment score after applying the weighted formula for each hazard. Committee members' scores were averaged primarily because scores were collected from members on various dates, making a single consensus score for each hazard difficult to obtain. This method resulted in hazard scores with decimals rather than whole numbers, which proved useful for ranking hazards.

Members of the planning committee were asked to review and discuss each of the hazards, and to score hazards according to the factors in the weighted formula. Worksheets were given to each member with directions about the scoring criteria.

The results of the scoring process and subsequent steps (ranking, grouping, and prioritization of mitigation measures) were presented to committee members. Participating jurisdictions had the option to revise the outcome to best reflect their community's risks, vulnerability, and approaches to mitigation.

The factors considered during the Hazard Assessment and Risk Analysis process are described in detail below, and summarized in Figure 5.3.

Probability

Probability is more than just a measure of how many times has a hazard has occurred in the past. Each hazard may or may not have a comprehensive documented historical record. Local, state, and federal government agencies have increasingly improved record-keeping with respect to incidents, accidents, and disasters which affect people and property. The National Weather Service, a division of the National Oceanic and Atmospheric Administration (NOAA) maintains a history of weather events, as does the State Climatologist's office. Additional hazard specific sources include USDA, National Interagency Fire Center, and a variety of areas of expertise at the Iowa DNR. Agencies in recent years have initiated record-keeping efforts in the areas of hazardous materials incidents, transportation accidents, and fires.

The probability score reflects the likelihood of the hazard occurring again in the future, considering both the hazard's historical occurrence and the projected likelihood of the hazard occurring in any given year. Many times the historical occurrence can be extrapolated into the future using best available data. Some threats or hazards are more difficult to estimate the probability of future occurrence. Mitigation efforts can reduce vulnerability to hazards and enhance resiliency, potentially enough to change a hazard score. Conversely, hazards that have not occurred in the past could still present themselves to the community in the future.

Probability of hazard occurrence in Des Moines County analysis considered two factors: 1) historical occurrences, whenever possible; and 2) committee assessment of available information in the absence of adequate data.

Historical data shows the average number of events per year for a particular hazard, as well as the percentage of years in which an event occurred. The study period used in this analysis begins with the date of the earliest event on record through the end of 2014. A hazard that occurs, on average, at least once every 5 years is considered "highly likely" to occur within the current planning period and is therefore scored as a probability of 4.

Committee members considered factual information, such as historical occurrences, to inform their assessment of probability. Available data was presented and discussed during planning meetings. Local residents and leaders, particularly emergency response representatives, also used their own prior knowledge and expertise when assessing probability, which can be very valuable when data is limited or otherwise difficult to obtain.

Magnitude/Severity

Magnitude of a hazard event reflects the range of intensity of the hazard based on lower and upper thresholds.

For the purposes of this plan, scoring of magnitude reflects the intersection of hazard intensity and vulnerability. Committee members scored magnitude, using available data and knowledge, based on their understanding of the community's risks in the event of a high-intensity event. The committee's evaluation of the upper level of intensity stems from historical data, knowledge, and expertise.

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. The scale for this plan is countywide.

Warning Time

The speed of onset reflects 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, considerable amount of warning time precedes the event, as opposed to the human caused or accidental hazards that occur instantaneously or with little warning time.

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.

Figure 5.3
Hazard Scoring Criteria

Probability: The likelihood of the hazard occurring again in the future, considering both the hazard's historical occurrence and the projected likelihood of the hazard occurring in any given year		
Score	**Description**	
1	Unlikely	Less than 10% probability in any given year (below 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 19% probability in any given year (less than 1 in 5 chance of occurring), history of events is greater than or equal to 10% but less than 20% for 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 or equal to 20% and not more than 33% 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

Duration: A measure of the duration of time that the hazard will likely affect the area.	
Score	**Description**
1	Less than 6 hours
2	Less than 1 day
3	Less than one week
4	More than one week

Warning Time: The potential amount of warning time available before the hazard occurs.	
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

Magnitude/Severity: Potential severity of the damage relative to vulnerability of the community, in terms of injuries and fatalities, property loss, and impact on infrastructure		
Score	**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 services for more than a week, and/or injuries/illnesses that do not result in permanent disability
3	Critical	More than 25% and up to 50% of property severely damaged, shutdown of facilities and services for at least 2 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

5.4 Summary of Historical Events for Selected Hazards

Figure 5.4 provides a summary of data available through the National Climatic Data Center Storm Events Database, including the following hazards: drought, frost/freeze, flash flood, river flood, hail, thunderstorms/wind/lightning, severe winter weather, and tornados. Grass and wildland fire events are also summarized from data provided by the Iowa Department of Natural Resources. Appendices C and D provide additional information about specific events. The hazards identified in the table are not necessarily organized in the same fashion as the hazards used to create this plan.

The purpose of the table is to understand the frequency of significant events in order to prepare for and address, as effectively as possible, the hazards that may happen in our community. The time period used to determine annual averages and percentages begins with the earliest event on record continuing until the end of the most recent year (2014). While longer study periods can provide a better assessment of probability, this analysis is limited by available data.

The table also shows total property and crop damages sustained as a result of each hazard over the entire study period, and also identifies the years in which major events with high losses occurred. Historical events are discussed in more detail in Section 5.7.

Figure 5.4
Summary of Historical Events for Selected Hazards (Source: NOAA and Iowa DNR)

Hazard	Time Period earliest event on record to 12/2014	# Events	Events/Year (average)	# years with an event	% years with an event	Total Damages	Major Events
Drought	08/2003 – 12/2013 (11.3 years)	17	1.50	6	53%	$23,630,000 (crops)	2003, 2005
Frost/Freeze	05/2005 – 12/2014 (9.6 years)	5	0.52	4	42%	$825,000 (crops)	2005
Flash Flood	02/1997 – 12/2014 (17.8 years)	18	1.01	9	51%	$4,200,000 (property)	2010
River Flood	05/1996 – 12/2014 (18.6 years)	43	2.31	14	75%	$7,085,000 (property) $500,000 (crops)	2003, 2008. 2009, 2010
Hail	04/1965 – 12/2014 (49.7 years)	88	1.77	26	52%	$14,454,000 (property)	1995, 2000, 2003 2006
Thunderstorms, Wind, Lightning	05/1969 – 12/2014 (45.6 years)	155	3.40	41	90%*	$1,260,000 (property) $41,000 (crops)	1993, 1995, 1997, 2003, 2009, 2010
Severe Winter Weather	1/1996 – 12/2014 (19 years)	100	5.26	17	89%	$6.000 (property)	2006
Tornado	04/1954 – 12/2014 (57.6 years)	16	0.28	12	21%	$4,452,000 (property)	1963, 1965, 1966, 1974, 1980,1983,1988, 2011
Grass or Wildland Fire	01/2011-12/2014 (4 years)	6	1.5	3	75%	n/a	n/a

*Thunderstorms, wind, and lightning are observed each year. The number shown reflects years in which a significant event was reported. At least one record has been reported every year since 1986.

5.5 Assessor Data

Property and building value data for 2014 was provided by the Des Moines County Assessor's office. Figure 5.5 shows the total number of parcels by community as well as the total assessed value land and existing structures. Public property and crop values are not included due to limited data availability.

Figure 5.5 is intended to be used in conjunction with vulnerability assessments of hazards that impact the built environment. For example, if 100% of structures are vulnerable to a particular hazard, the total private structural property loss could be equal to the total value of structures listed in the table.

Figure 5.5 Number of parcels and 2014 Assessed Building Values

		Agricultural Realty	Residential	Commercial	Industrial	TOTAL
Burlington	Number of Parcels	191	11,514	1,411	52	**13,168**
	Value of Structures	$59K	$670M	$212M	$50.6M	**$932.7M**
	Land Value	$6M	$140.8M	$44.6M	$6.1M	**$197.5M**
West Burlington	Number of Parcels	92	1,176	254	11	**1,533**
	Value of Structures	$76K	$86.8M	$87M	$13M	**$186.9M**
	Land Value	$3.3M	$19M	$16.6M	$2.1M	**$41M**
Danville	Number of Parcels	23	369	51	0	**443**
	Value of Structures	$16K	$29.7M	$2.4M	$0	**$32.1M**
	Land Value	$635K	$5.6M	$374K	$0	**$6.6M**
Mediapolis	Number of Parcels	25	714	153	10	**902**
	Value of Structures	$4.6K	$49.5M	$9M	$3.2M	**$61.7M**
	Land Value	$803K	$10M	$1.6M	$333K	**$12.7M**
Middletown	Number of Parcels	15	204	13	1	**233**
	Value of Structures	$2.6K	$11.8M	$749K	$72.8K	**$12.6M**
	Land Value	$244K	$2.5M	$111K	$9.3K	**$2.9M**
Unincorporated Des Moines County	Number of Parcels	3,073	3,771	362	17	**6,870**
	Value of Structures	$3.4M	$398.7M	$20.6M	$22.5M	**$445.2M**
	Land Value	$394.8M	$91M	$5.4M	$2.5M	**$493.7M**

5.6 Data Limitations

In assessing the historical occurrences of hazards and in determining probability of future occurrences, there was a limitation of available data and statistical forecasting models. Utilization of National Weather Service and corresponding severe weather alerts allows for short-term preparation and evacuation of the community. But for a mitigation strategy, the assumption that the hazard could reasonably occur at any point in time is considered sufficient to justify discussions of mitigation strategies that address that hazard.

Public property is tax exempt and therefore not assessed for tax purposes. Value of public land and structures, therefore, was not available through data provided by the Des Moines County Assessor.

The hazard planning committee will explore opportunities to refine the data for future updates.

5.7 Hazard Profiles

This section includes hazard profiles for the hazards considered relevant to Des Moines County. Profiles include a description of the hazard, an assessment of magnitude and severity of the hazard, historical occurrences, vulnerability to the hazard, and an assessment of warning time prior to the event. Profiles are listed alphabetically by hazard type. For each hazard type, hazard soring outcomes are shown in the included tables.

5.7.1 Animal/Crop/Plant Disease

Animal/Crop/Plant Disease – Hazard Score Calculation				
Probability	**Magnitude/Severity**	**Warning Time**	**Duration**	**Weighted Score**
1.73	2.45	1.55	3.73	2.12

Description: An outbreak of disease transmitted from animal to animal or plant to plant represents an animal/crop/plant disease.

Magnitude/ Severity: A high impact animal, plant, or crop disease would have severe economic implication and/or public health impact well beyond the borders of Iowa. For the purposes of this plan, a high impact disease event would cause major disruption or shut down statewide processing sectors, halt international trade, and last multiple years. Livestock and crops farms are prevalent throughout Des Moines County and, as part of the world food and energy supply, constitute a substantial portion of the local economy. Due the agricultural importance of the area, a high impact occurrence of disease would impact the entire county and beyond.

Animal health emergencies can take many forms- disease epidemics, large-scale incidents of feed or water contamination, extended periods without adequate water, harmful exposure to chemical, radiological or biological agents, and large-scale infestations of disease-carrying insects or rodents- to name a few. One of the principal dangers of disease outbreaks is that they can rapidly overwhelm the local animal care system. Conditions related to scope and magnitude can escalate quickly and area resources can be drained of vets, medications, and vaccinations rather quickly. Perhaps the greatest emerging animal health hazard would be the intentional release of a foreign animal disease agent to adversely impact a large number of animals (this relates to the Terrorism hazard).

The introduction of some high consequence diseases could significantly limit or eliminate the ability to move, slaughter, and export animals and animal products. A local outbreak will have wide spread economic and societal implications for Des Moines County, the State of Iowa, and potentially the world. Response and recovery to infectious animal disease outbreaks would be lengthy, and many producers may never be able to return to business. Even rumors of an infection animal disease can also cause indirect effects on the economy.

Pest infestations can cause widespread crop/plant loss and resulting economic hardships on farmers, landowners, and related businesses. Once infestation occurs, the pest may become endemic, causing repeated losses in subsequent growing years. Loss of production could affect all related industries including fuel, food, synthetics, processors, etc.

Historical Occurrence: Rumors of an infectious animal disease outbreak could cause significant damage to the markets, as was evidenced in an incident in Kansas in 2003, where just the rumor of a Foot and Mouth Disease outbreak caused the market to plummet. Further evidence of this occurred in the 2009 H1N1 (Swine Flu) influenza outbreak where lack of understanding about the transmission caused market loss in Iowa's pork markets.

Wet soil conditions are cited as cause for the epidemic of soybean sudden death syndrome that occurred in Iowa in 2010. Other crop diseases and pests (such as Soybean Asian rust) have not been observed in Iowa as of yet, but if warmer winters persist could expand their ranges to include Iowa.

Recent news concerning the threat to ash trees in the area from the emerald ash borer was mentioned often during Des Moines County hazard mitigation discussions. The emerald ash borer is an invasive insect known to be highly destructive to ash trees. Emerald Ash Borer has been confirmed in Des Moines County, according to the Iowa DNR. Experts suggest that emerald ash borer infestation will become more widespread, which will significantly impact trees and forested areas in Des Moines County, creating the need for tree inventories from local communities to minimize damages.

As of July 1, 2013, 14 states, including Iowa, have confirmed cases of Porcine Epidemic Diarrhea Virus (PEDv).[7] PEDv is a virus that affects only pigs (primarily piglets) and is not a human safety issue or a supply food safety concern. The economic impacts are not considered devastating, and preventative measures are available.

On May 2, 2015, Iowa Governor Terry Branstad declared a state of emergency for the State of Iowa citing risk from the rapidly spreading bird flu outbreak. As of July 16, 2015, this outbreak has affected 75 Iowa farmers and caused the loss of about 32 million chickens, turkeys, and ducks for the nation's top egg producer.[8]

Vulnerability: U.S. agriculture is vulnerable to the introduction of a foreign animal disease. Outbreaks can occur by being inadvertently introduced by contaminated material carried by an international traveler, or by the importation of infected animals and animal products. Foreign animal diseases could enter the U.S. vectored by wild animals, insects, or migratory birds or they could be intentionally introduced to cause severe economic problems or to target human health.

Iowa is the nation's number one producer of corn, soybeans, eggs, hogs, and Iowa farmers/producers know the importance of securing America's food supply. With hundreds of thousands of head of livestock produced and transported in the state each year, Iowa could be a rich environment for a disease epidemic to take hold if precautions such as vaccinations and handling procedures are not rigorously followed.

[7] http://www.iowapork.org/FileLibrary/States/IA/News/Headlines%20Newsletter/Headlines%20Summer%202013.pdf

[8] http://www.heartlandconnection.com/news/story.aspx?id=1230714#.VaIXwPlVhBc

Recent trends indicate that surface wind speeds (standard measurement height of 32 feet) over Iowa have been declining, which means less crop ventilation and more heat stress for plants and animals. Reduced winds also create favorable conditions for survival and spread of unwanted weeds, fungi, pests and pathogens. Waterlogged soil conditions during early plan growth often result in shallower root systems that are more prone to disease, nutrient deficiencies, and drought stress later in the season.

State and federal animal health programs have been very successful in preventing, or limiting the scope and magnitude of animal emergencies. However, because the nature of the threats to animal health is always changing, and because the animal population is mobile, the possibility always exists for a local, regional, or statewide animal health emergency to occur. Des Moines County health officials should be able to quickly identify and contain a disease epidemic.

In Des Moines County, an animal disease epidemic could result in widespread impact since a large percentage of the county is rural or agricultural. Many Des Moines County farms have livestock and would be affected by an animal disease epidemic. The risk for an animal disease outbreak would likely be higher at an animal feeding operation (AFO). AFOs are areas where many animals are kept in a small area, which results in higher levels of manure, as well as higher risk of disease transmission among the animals. Des Moines County has 38 active AFO sites which house a total of 30,851 pigs and 670 head of cattle. The increased density of animals is why these sites would likely be at a higher risk than other agricultural operations in the county. To see values for possible damage to agricultural property and operations, please refer to Figure 5.5 which shows assessed property values for Des Moines County.

In terms of risk to the human population, there is only a negligible risk to Des Moines County residents, because the risk is largely isolated to people that come into contact with the animals and as mentioned in the employment and agricultural data in the community profile, fewer than 2% of Des Moines County residents work in the agricultural industry, and even fewer handle animals. The critical facilities of Des Moines County should not experience damage due to the type of hazard other than the economic impact and loss of revenue due to an epidemic.

Warning Time: The private practitioner is the first line of defense and will likely be the first to witness the symptoms of animal disease epidemics. The United States Department of Agriculture monitors reports submitted by veterinarians and labs to identify patterns. The department is proactive in providing information to the agricultural community on medical concerns. Every year the Iowa Department of Agriculture and Land Stewardship (IDALS) conduct numerous animal disease investigations.

Scoring Analysis: The Planning Committee determined the probability of animal/crop/plant disease hazards to be “unlikely” in any given year in Des Moines County and the impact severity to be “limited” in terms of injuries, fatalities, and property damage.

5.7.2 Drought

Drought – Hazard Score Calculation				
Probability	**Magnitude/Severity**	**Warning Time**	**Duration**	**Weighted Score**
2.45	2.64	1.00	3.91	2.44

Description: 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.

Magnitude/ Severity: 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 some may have been more severe than others, agricultural areas are impacted much more than the metropolitan areas where impacts were mostly indirect. While droughts are generally associated with extreme heat, droughts can and do occur during cooler months.

Drought severity is measured by multiple monitoring indices, as described in the image below.

Drought Severity	Return Period (years)	Description of Possible Impacts	Drought Monitoring Indices		
			Standardized Precipitation Index (SPI)	NDMC* Drought Category	Palmer Drought Index
Minor Drought	3 to 4	Going into drought; short-term dryness slowing growth of crops or pastures; fire risk above average. Coming out of drought; some lingering water deficits; pastures or crops not fully recovered.	-0.5 to -0.7	D0	-1.0 to -1.9
Moderate Drought	5 to 9	Some damage to crops or pastures; fire risk high; streams, reservoirs, or wells low, some water shortages developing or imminent, voluntary water use restrictions requested.	-0.8 to -1.2	D1	-2.0 to -2.9
Severe Drought	10 to 17	Crop or pasture losses likely; fire risk very high; water shortages common; water restrictions imposed.	-1.3 to -1.5	D2	-3.0 to -3.9
Extreme Drought	18 to 43	Major crop and pasture losses; extreme fire danger; widespread water shortages or restrictions.	-1.6 to -1.9	D3	-4.0 to -4.9
Exceptional Drought	44+	Exceptional and widespread crop and pasture losses; exceptional fire risk; shortages of water in reservoirs, streams, and wells creating water emergencies.	less than -2	D4	-5.0 or less

*NDMC - National Drought Mitigation Center

A severe drought would likely affect most of Iowa if not the Midwest as a whole. Because of their dependence on precipitation and water, the agricultural community would be the most adversely effected, but the entire state would likely feel some impact.

Historical Occurrence:

Drought is a normal part of climate fluctuations. 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.

According to the National Climactic Data Center (NCDC), Des Moines County experienced 17 periods of drought from August 2003 to December 2013. Appendix B includes a record of historical occurrences from the National Climatic Data Center.

Droughts in 2003 and 2005 resulted in substantial crop damages in the County totaling nearly $21 million. The NCDC storm events database provides this additional detail for the three drought events:

"Dry conditions that began in September 2002 and continued through 2003, manifested into a moderate to severe drought at the start of August 2003 which is a crucial time for soybean development and corn in filling out the ears with large kernels. The last significant widespread rainfall in Eastern Iowa occurred on July 20th with general rainfalls of around an inch. According to data from the Iowa State Climatologist, August 2003 was the driest on record with a statewide average of only 0.96 inches of rainfall, which was 3.23 inches below the normal for August. Hot and humid conditions arrived for the second half of August placing extreme stress on crops that were already suffering from a lack of rainfall. Earlier predictions of a near record or record harvest fell by the wayside by late August. Estimates of yield reduction were 10% for the corn crop. Soybean loses were estimated at 30%." Crop Damage: $14.88M

"The drought that began back in June 2005 continued through July and into August 2005 and spread into Eastern Iowa and Northeast Missouri. The drought became severe across Eastern Iowa and Northeast Missouri. The drought combined with high heat during the second half of the month decimated the corn crop. At one point during the month of July, the dryness for the calendar year across parts of the area equaled or exceeded the dry conditions during the drought of 1988. Crop loss estimates varied across the entire area. In Iowa, losses rapidly decreased the further west one went from the Mississippi River Valley and were near or just slightly below normal upon reaching an Independence to Oskaloosa Iowa line." Crop Damage: $3.99M

"The 2005 drought that started in June continued through the month of August 2005 and into September 2005. Severe to extreme drought continued across the northern half of Illinois, eastern third of Iowa, and northeast Missouri. Although rainfall was more plentiful during the month, it continued to remain widely scattered.

What rainfall did occur helped keep soybean losses to a minimum and preserved what was left of the corn crop. The severe dryness of the drought continued to place it equal to or exceeding the drought of 1988. By the end of August the governor of Iowa had requested areas south and east of a line from Dubuque, to Independence, to Ottumwa (save Buchanan County) be declared an agricultural disaster area. Soybean crop losses generally were estimated at a 10-15% reduction in yield across Illinois, eastern Iowa, and northeast Missouri. There were pockets across eastern Iowa and northeast Missouri where an estimated 20-30% reduction in yield for soybeans was expected." Crop Damage: $1.84M

Vulnerability: Those dependent on rain would be the most vulnerable to a drought. 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 citizens draw their drinking water from surface water and ground water sources, a prolonged severe drought may impact all citizens if there was a dramatic drop in the stream flow coupled with the drop in the water table. Fire suppression can also become a problem due to the dryness of the vegetation and possible lack of water.

Drought in the U.S. seldom results directly in the loss of life, and more directly affects agricultural crops, livestock, natural vegetation, wildlife, and stream flows (fish and aquatic vegetation). Impacts are costly economically, environmentally, and socially. Many areas could be impacted by drought within Des Moines County, particularly local farms. Additionally, other agriculturally-based communities impacted by drought could affect the economic welfare of Des Moines County. For possible damages to agricultural realty, please refer to Figure 5.5, which shows assessed values for agricultural property in Des Moines County.

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. Research and observations of the El Nino/La Nina climatic events are resulting in more predictable climatic forecasts, but high number of variables can affect the outcome of climatic interactions and make it difficult to predict a drought. 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.

Scoring Analysis: The Planning Committee determined that probability of a drought is best categorized as "occasional" to occur in Des Moines County. The impact severity of droughts in Des Moines County is considered "limited". The score for drought initially placed it in Priority Group I but after discussion within the committee, it was determined that this hazard was a better fit for Priority Group II.

5.7.3 Earthquakes

Earthquakes – Hazard Score Calculation				
Probability	**Magnitude/Severity**	**Warning Time**	**Duration**	**Weighted Score**
1.09	1.82	4.00	1.00	1.74

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. It is a sudden, rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth's surface. This shaking can cause buildings and bridges to collapse; disrupt gas, electric, and phone service; it sometimes triggers landslides, flash floods, and fires. The three (3) general classes of earthquakes are, tectonic, volcanic, and artificially produced.

Magnitude/ Severity: Estimated effects of a Richter scale 6.5 magnitude earthquake along the New Madrid Fault Zone suggest that Iowans in four southeast counties could experience trembling buildings, some broken dishes and cracked windows. Specific parts of central Iowa could sustain different levels of damage due to the soundness of the structures. FEMA published a report in 2008 using the HAZUS-MH software that determined the loss associated with such an event would result in approximately $1,068,000 in damages to the State of Iowa. These losses are mainly attributed to the extreme southeastern portion of the State.

Historical Occurrence: Iowa as a whole has experienced the effects of few earthquakes in the past 175 years. The epicenters of thirteen (13) earthquakes have been located in the state with the majority along the Mississippi River. The first known occurrence was in 1867 near Sidney in southwest Iowa; the most recent occurrence was in 2004 near Shenandoah in southwest Iowa. While more than twenty (20) earthquakes have occurred in or around Iowa, over the past 175 years they have not seriously impacted the state.

The great New Madrid Missouri earthquakes of 1811-12 were the first reported earthquakes felt in Iowa. The absence of historical records from the territory prevents an accurate assessment of the actual effects from these earthquakes. The strongest earthquake in Iowa occurred in Davenport in 1934 and resulted in only slight damage.

Four events are significant to southeast Iowa. The 1895 tremor, centered near Charleston, Missouri, did some slight damage to a few chimneys in Keokuk. This earthquake was felt noticeably in the southeastern part of Iowa, and probably felt over the whole State. An intensity V shock was reported at Keokuk on April 13, 1905. Buildings were shaken, but no serious damage was done. The shock was apparently local in character. On October 20, 1965, an earthquake in eastern Missouri affected a 160,000 square mile area, and reportedly caused large cracks in a house foundation at Indianola, Iowa. Intensity V effects were also noted at Ottumwa. The earthquake of November 9, 1968, centered in Illinois, produced Intensity V effects in Iowa at Albia, Bloomfield, Burlington, Clinton, Elkader, Muscatine, and Wapello.

Vulnerability: Most structures in Iowa are not built to earthquake standards, but because of the relatively low magnitude of the possible quake, property damage would likely be minor foundational damage. The most vulnerable structures are those built on poorly consolidated substrate, particularly floodplain materials. Most of Iowa is located in Seismic Zone 0, the lowest risk zone in the United States. This does not mean that the county is not vulnerable to earthquake effects.

Seismologists attempt to forecast earthquake size and frequency based on data from previous events in the New Madrid Fault Zone, and estimate a 90% chance of a Richter scale 6.0 magnitude earthquake in the New Madrid Fault Zone by the year 2040. A magnitude 6.5 earthquake on the New Madrid Fault would create a Modified Mercalli intensity magnitude four (4) effect in most of Iowa resulting in minimal damages.

In the unlikely event of a major earthquake in Des Moines County, it is safe to assume that the impact would be devastating considering a majority of the structures in the County are older structures not built to codes that encourage resistance to earthquakes. As seen in the community profile, nearly 40% of all homes in Des Moines County were built before 1940. The age of the housing stock in Des Moines County represents a significant risk for damage from this hazard. Additionally, new construction does not have to comply with any additional codes to ensure earthquake resistance. Overall, the community would suffer severe structural failure, injuries and death if a major earthquake occurred. A majority of people and buildings could be injured or experience property damage from this hazard. The amount of possible property damage can be seen in Figure 5.5 which shows the value of all assessed property in Des Moines County. All structures would have equal vulnerability to this hazard since the hazard is not confined to a specific geographic area within Des Moines County.

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.

Scoring Analysis: The Planning Committee determined that Earthquakes are best categorized as “unlikely” to occur in any given year in Des Moines County, with impact severity determination as “limited”

5.7.4 Extreme Heat

Extreme Heat – Hazard Score Calculation				
Probability	**Magnitude/Severity**	**Warning Time**	**Duration**	**Weighted Score**
2.36	1.45	1.00	2.73	1.92

Description: Conditions for extreme heat are defined by summertime weather that is substantially hotter and/or more humid than average for a location at that time of year. This includes temperatures (including heat index) in excess of 100 degrees Fahrenheit for at least three (3) successive days of 90+ degrees Fahrenheit. The heat index is a number in degrees Fahrenheit that tells how hot it really feels when relative humidity is factored into actual air temperature. Exposure to full sunshine can increase the heat index by at least 15 degrees. The National Weather Service can issue a Heat Advisory or Excessive Heat Warning.

- Heat Advisory

  A heat index of 100°F or higher is expected for a period of 3 hours or more. A heat advisory shall be continued through the overnight hours, following a day with excessive heat, if the heat index is not expected to fall below "around 75°F". A heat advisory can be issued for a heat index less than 100°F when the cumulative effect of successive days of near advisory heat leads to potentially life threatening conditions.

- Excessive Heat Warning

  A heat index of 105°F or higher is expected for a period of 3 hours or more. An excessive heat warning shall be continued through the overnight hours, following a day with excessive heat, if the heat index is not expected to fall below "around 75°F". An excessive heat warning can be issued for a heat index less than 105°F when the cumulative effect of successive days of near warning heat leads to life threatening conditions.

The NCDC storm events no longer report extreme heat, and the closest substitute was excessive heat. Excessive heat event documentation covers a much shorter time series, but is the best data available.

Magnitude/ Severity: Extreme heat has broad and far-reaching impacts, including significant loss of life and illness, and economic costs in transportation, agriculture, production, energy, and infrastructure. Nationally, over the last 30 years, excessive heat accounts for more reported deaths annually than hurricanes, floods, tornadoes, and lightning combined.

Extreme heat can impose stress on humans and animals. Heatstroke, sunstroke, cramps, exhaustion, and fatigue are possible with prolonged exposure and/or physical activity due to the body's inability to dissipate the heat. Urban areas are particularly at risk because of air stagnation and large quantities of heat absorbing materials such as streets and buildings.

Extreme heat can pose a threat to livestock and crops. High temperatures have been shown to reduce summer milk production, impair immunological and digestive function of animals, and increase mortality of livestock. High temperatures at the wrong time inhibit crop yields as well.

Extreme heat can also result in distortion and failure of structures and surfaces such as roadways and railroad tracks. Transportation impacts include the loss of lift for aircrafts, softening of asphalt roads, buckling of highways and railways, and stress on automobiles and trucks (increase in mechanical failures). Electric transmission systems are impacted when power lines sag in high temperatures. High demand for electricity also outstrips supply, causing electric companies to have rolling blackouts. The demand for water also increases sharply during periods of extreme heat. This can contribute to fire suppression problems for both urban and rural fire departments.

Historical Occurrence:

In 1995, livestock-related economic losses due to heat stress were estimated to be $31 million in Iowa. According to The Iowa Cattlemen's Association approximately 4,000 cattle died due to extreme heat in July, 2011. Extreme heat can also cause pavement to buckle and rupture. A 2011 article states that in a typical year, Iowa DOT maintenance equipment operators spend 2,000 to 4,000 hours making temporary repairs of pavement blowups and another 6,000 hours replacing these pavement sections, costing an average of $400,000 annually.

Historical records from the NCDC show six heat related events impacting Des Moines County between July 1997 and December 2014. Most recently, "excessive heat" impacted the County during the Fourth of July holiday in 2012, when 100+ degree Fahrenheit temperatures prompted heat warnings in many parts of the state. No property damage or injuries were reported. Appendix B includes a record of historical occurrences from the National Climatic Data Center.

Based on historical information, Iowa will likely experience around 26 days a year with temperatures above 90 degrees. There is a very good chance that there will also be a period of 3 consecutive days or more with temps in the 90s. It is also common for the temperature to hit 100 degrees or more once every three years during the summer months.

Vulnerability: In Des Moines County, the majority of the community is at risk to extreme heat, especially elderly persons, small children, chronic invalids, those on certain medications or drugs (especially tranquilizers and anticholinergics), and persons with weight and alcohol problems to. Healthy individuals working outdoors in the sun and heat are vulnerable as well. Low-income individuals and families are also susceptible due to poor access to air-conditioned rooms and as mentioned in the community profile, this would likely include the 13.8% of the population of Des Moines County that lives below the poverty level.

There are a few designated locations that have backup generators to provide shelter from extreme heat in the event of energy disruption, but additional generators are needed at critical and vulnerable facilities to ensure heat protections for vulnerable populations. Special attention should be given to nursing homes, senior housing facilities, K-12 schools, preschool facilities, and hospitals in the County during extreme heat conditions because of the number of vulnerable residents being served in those institutions. In addition, the rural nature of the county also creates an elevated risk for vulnerable populations such as low-income, elderly, and children, who may or may not have adequate transportation to the shelter locations.

Warning Time: Periods of extreme heat are predictable within a few degrees within 3 days or so. Variations in the local conditions can affect the actual temperature within a matter of hours or even minutes. The National Weather Service will initiate alert procedures when the heat index is expected to exceed 105 degrees Fahrenheit for at least two consecutive days.

Scoring Analysis: The Planning Committee determined that the probability of a Heat or Extreme Heat event is best categorized as “occasional”, with severity impact between “negligible” and “limited”.

5.7.5 Flash Flood

Flash Flood – Hazard Score Calculation				
Probability	**Magnitude/Severity**	**Warning Time**	**Duration**	**Weighted Score**
2.91	1.91	2.64	2.18	2.50

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.

Magnitude/ Severity: Flash floods are the number one weather-related killer in the United States. They can quickly inundate areas thought to be out of flood-prone areas. Potential 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. Hazards of fire, health and transportation accidents, and contamination of water supplies are likely effects of flash flooding situations.

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. Often, aging storm sewer systems are not designed to carry the capacity currently needed to handle the increased storm runoff in certain areas. Flash flooding often results in higher loss of life, both human and animal, than slower developing river and stream flooding.

Historical Occurrence: Floods are the most common and widespread of all-natural disasters except fire. In Iowa, as much as 21 inches of rain has fallen in a 24 hour period. The National Climatic Data Center lists 14 flash flooding events from 1997-2013 in Des Moines County, causing $4.2 million in property damage. Appendix B includes a record of historical occurrences from the National Climatic Data Center.

One significant flash flood event reported by the NCDC caused $3.95 million in property damage in Des Moines County. The storm events database provides this additional detail for the event:

"Heavy rains resulted in the flash flooding of parts of Des Moines County during the early morning hours of May 12, 2010. The Burlington area and locations north were some of the hardest hit areas. The flood waters were 10 to 12 inches deep, south of Agency Road. In addition, the intersection of Highway 61 and Roosevelt Avenue were flooded with some vehicles stalled out in the flood waters. Several homes and business had water in basements with some flooded with over 7 feet of water. Parts of Tama Road and Plank Road were washed out. In other areas, landslides spilled onto some streets. Several businesses along Jefferson Street also sustained flood damage and loss of property. Property Damage: $3.95 million

Vulnerability: Areas in a flood plain, downstream from a dam or levee, or in low-lying areas can certainly be impacted. People and property located in areas with narrow stream channels, saturated soil, or land with large amounts of impermeable surfaces are likely to be impacted in the event of a significant rainfall. Unlike areas impacted by a river/stream flood, flash floods can impact areas a good distance from the stream itself. Flash flood prone areas are not particularly those areas adjacent to rivers and streams. Streets can become swift moving rivers and basements can become deathtraps because flash floods can fill them with water in a manner of minutes. People and property in areas with insufficient storm sewers and other drainage infrastructure can also be put at risk because the drains cannot rid the area of the runoff quick enough.

Nearly half of all flash flood fatalities are auto related. Motorists often try to traverse water-covered roads and bridges and are swept away by the current. 6" of swiftly moving water can knock a person off of their feet and only 2' of water can float a full-sized automobile. Recreational vehicles and mobile homes located in low-lying areas can be swept away by the water also.

As land is converted from fields or woodlands to roads and parking lots, it loses its ability to absorb rainfall. Urbanization increases runoff two (2) to six (6) times over what would occur on natural terrain. As more development occurs in the watersheds the amount of runoff produced also increases. If measures are not taken to reduce the amount of runoff (or slow its movement), flash floods will continue to occur and may become more frequent. In certain areas, aging storm sewer systems were not designed to carry the capacity currently needed to handle the increased storm runoff. This combined with rainfall trends (that seem to be moving upwards) and rainfall extremes (that also seem to be patterning higher) all demonstrate the high likelihood, yet unpredictable nature, of flash flooding in the state

In certain areas of Des Moines County, water drainage is not sufficient to prevent flash flooding. Especially during the severe downpours, flash flooding can occur on primary streets. Des Moines County has been able to reroute traffic from the main street areas and to barricade dangerous areas to prevent any injuries or deaths due to flash flooding, so the extent of damage from this hazard is limited to minor property damage due to sewer backups and basement flooding since many of the communities in Des Moines County still have a combined storm water and sewer system.

SEIRPC staff met with local officials to identify areas of concern with respect to flash flooding. All communities expressed concerns about flash flooding, and provided examples of specific areas of concern. Appendix E includes maps illustrating the locations identified by local officials. Further details are described below:

The Des Moines County Engineer identified several areas of concern in unincorporated Des Moines County, especially within the Flint River watershed. The damages from a previous flood event in this watershed can be seen in Photo C.

The West Burlington City Administrator stated that flash flooding is problematic along the low-lying areas along the creek flowing through Luer's Park, as well as another creek on the northwest edge of city limits. In addition, runoff from fields west of the Westland Mall has created problems with standing water in the mall parking lot off of Gear Avenue. Damages are mostly limited to roadways and land areas. Property damage is minimal.

The City of Mediapolis has significant flash flooding concerns, primarily along US Highway 61, and especially near Jacara Drive, according to the City Public Works Director. There is a ditch on the west side of the highway but no storm sewer to carry away the water. Therefore, heavy rains create runoff from fields west of the City which at times has flooded US Highway 61, and resulted in road closures. The creek on the north side of the city, is another area of flash flood concern. Water from this creek has flooded the Iowa Street bridge and homes on Jacara Drive on several occasions. The two major obstacles to flood control is that the relatively flat topography of the city and the lack of a storm sewer system.

Public officials from the City of Burlington indicated areas of flash flooding risk near Tama Road and Highway 99, as well as south of Plank St. The City of Burlington is in the process of separating their sewer system, which will hopefully reduce the community's vulnerability to flash flood events.

The public works director of Danville provided locations of multiple locations of flash flood risk zones within the community. Runoff from nearby fields and overflow from creek beds has caused flash flooding in several areas of town, including the lift station and locations near the school and a nursing home, as well as near City Hall. Flash flooding in these locations can be seen in Photos A & B.

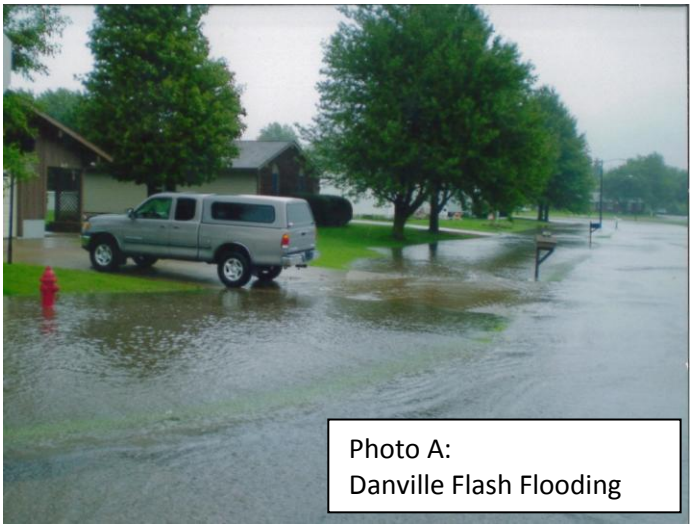


Photo A:
Danville Flash Flooding

Photo B:
Danville Flash Flooding

Photo C:
Tama Road Flash Flooding

The City of Middletown also identified areas of flash flood concern. These areas are located near Des Moines County Highway 34 as well as on Washington Street, just south of the railroad tracks on the north end of the city.

Identified areas are not meant to be an exhaustive list of all potentially impacted areas, nor are all properties included in the analysis necessarily vulnerable to this hazard. Additionally, flash flooding can impact a structure without damaging the entire building. Water in basements and lower levels is the most common cause of property damage. Of course, another major concern regarding flash flooding is the risk to people and animals, as fast moving water can quickly become overwhelming. Further data is needed to better assess vulnerability, and this plan includes a future mitigation activity to "identify areas prone to flash flooding" as part of a more in-depth study. Plans and ordinances by local communities are needed to minimize the impact of heavy rain events and the cost associated with cleanup.

Warning Time: Flash floods are somewhat unpredictable, but there are factors that can point to the likelihood of a flood occurring in the area. Warnings may not always be possible for these sudden flash floods. Predictability of flash floods depends on knowledge of the watershed characteristics, modeling, monitoring, and warning systems increase the predictability of flash floods. Depending on the location in the watershed, warning times can be increased. The National Weather Service forecasts the height of flood crests, the data, and time the expected flow is to occur at a particular location.

Scoring Analysis: The Planning Committee determined that Flash Flood is best categorized as "likely" to occur in Des Moines County, and that impact severity is best categorized as "limited" in terms of injuries, fatalities, and property damage.

5.7.6 Grass or Wildland Fire

Grass or Wildland fire – Hazard Score Calculation				
Probability	**Magnitude/Severity**	**Warning Time**	**Duration**	**Weighted Score**
2.18	1.18	3.82	1.73	2.08

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

Magnitude/ Severity: Wildland fires have proven to be most destructive in the Western States, and have become an increasingly frequent and damaging phenomenon nationwide. Due to increase development in undeveloped settings, people and property are becoming more vulnerable to wildland fires. Iowa is less vulnerable to the wildland fire because of the its large percentage of land that is developed. Grass fires are often more easily contained and extinguished before there is damage to people or developed property. At times, fires burn large portions of field crops in the fall when the crops are dry and the harvesting equipment overheats or throws sparks. This can be quite costly to the farmer in terms of lost production.

Most grass fires are contained to highway right-of-way and rail right-of-way ditches and are less than a few acres in size. High winds can bring a small flame to a multi-acre grassfire within a matter of minutes. The extent is dependent upon conditions such as land use/land cover, moisture, and wind.

Most grassfires burn only the grasses, crops, or other low land cover. Injuries and deaths most often occur by natural causes such as heart attack or stroke through fighting the fire. Property damage is usually limited to grass, small trees, etc. Occasionally a house or outbuilding can be damaged or destroyed. In Des Moines County, unless the grass or wild-land fire was adjacent to a residential or commercial area, severe impact is unlikely. Even in that event, the fire department would be able to contain the fire and would therefore limit the loss of life and property.

Historical Occurrence: It is highly likely that there will be a grass fire in each county in the state each year. According to the National Interagency Fire Center there have been 1,817 wildland fires spanning 33,122 acres and 1,884 prescribed fires spanning 14,079 acres from 2002 until 2012 in Iowa. During that period, the State of Iowa average roughly 165 wildland fires and 171 prescribed fires each year. However, no event reported has been a historically significant wildland fire.

Since Des Moines County does have significant open space, it is reasonable to assume that a fire incident could occur at any time.

Data from the Iowa Department of Natural Resources indicates that 3 grass or wildfire events (excluding controlled burns) occurred between January 2011 and December 2014. Additionally, 3 successful controlled burns occurred during that same time period. Losses, in terms of dollar values, were not included in the data. Data from the Burlington Fire Department indicates that there have been 21 total events between 2011 and 2014. Event details are listed in Appendix C. Of all the identified events, no injuries or deaths occurred.

A total of 37.5 acres were impacted by the 6 events over a 3 year period. Event details show that one fire was caused by a controlled burn that got out of control, and one was caused by discarded smoking material next to roadway.

Vulnerability: In Des Moines County, there is moderate risk to the structures in the County due to grass or wildland fires. Locations which are at the most risk are housing developments outside of corporate limits. These houses are often in close proximity to undeveloped land and tend to be located in areas which have a longer fire response time. However, it is likely that any event from this hazard would be small and limited in scope and would not cause significant damage to life or property.

Warning Time: As mentioned above, most grassfires occur without warning and travel at a moderate rate. This situation depends upon conditions at the time such as moisture, wind, and land cover.

Scoring Analysis: As seen in the Summary of Historical Events for Selected Hazards (figure 5.4), Grass or Wildland Fire events have occurred, on average, roughly every other year in Des Moines County. The Planning Committee determined that probability of a Grass/Wildfire event is best categorized as “occasional”, and that impact severity as “negligible”

5.7.7 Hazardous Materials Incidents

Hazardous Materials – Hazard Score Calculation				
Probability	**Magnitude/Severity**	**Warning Time**	**Duration**	**Weighted Score**
2.18	1.55	3.91	2.09	2.24

Description: This hazard encompasses fixed hazardous materials, pipeline transportation, and transportation hazardous materials. This can include the accidental release of flammable or combustible, explosive, toxic, noxious, corrosive, oxidizable, irritant, or radioactive substances or mixtures that can pose a risk to life, health, or property possibly requiring evacuation. Chemicals are manufactured and used in ever-increasing types and quantities and as many as 500,000 products pose physical or health hazards and can be defined as "hazardous chemicals."

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

A **transportation hazardous materials incident** occurs when chemical substances or mixtures which present a danger to the public health or safety are accidentally released during their transportation via highway transport, barge transport, or air transport. Due to the mobile nature of transportation, these incidents can be difficult to predict.

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.

Magnitude/ Severity: Immediate dangers from hazardous materials include fires and explosion. The release of some toxic gases may cause immediate death, disablement, or sickness if absorbed through the skin, injected, ingested, or inhaled. Contaminated water resources may be unsafe and unusable, depending on the amount of contaminant. Some chemicals cause painful and damaging burns to skin if they come in direct contact with your body. Contamination of air, ground, or water may result in harm to fish, wildlife, livestock, and crops. The release of hazardous materials into the environment may cause debilitation, disease, or birth defects over a long period of time. Loss of livestock and crops may lead to economic hardships within the community. The occurrence of a hazmat incident many times shuts down transportation corridors for hours at a time while the scene is stabilized, the product is off-loaded, and reloaded on a replacement container.

Large areas may need to be evacuated to remove people from the threat of fire, explosion, or exposure. These evacuations potentially save lives and limit injury, but they also disrupt businesses and inconvenience residents. A break in water pipelines may impact fire protection, continuity of operations at business and industry, affects the area by saturating the soil and causing rapid erosion. Depending on the location of the leak, in Des Moines County, the severity would depend on whether the leak occurred in a rural area or in one of the communities within the County.

A high impact occurrence is one defined as an environmental emergency by the Environmental Protection Agency. An environmental emergency is a sudden threat to the public health or the well-being of the environment, arising from the release or potential release of oil, radioactive materials or hazardous chemicals into the air, land, or water. Petroleum and natural gas pipelines can leak or erupt and cause property damage, environmental contamination, injuries, and even loss of life. Accidents may be caused by internal or external corrosion, defective welds, incorrect operation, outside damage, or other defective pipeline or equipment. Most incidents involve crude oil, gasoline, or natural gas pipelines. All petroleum liquids pose dangers from fire or explosion and the fire may produce poisonous or irritating gasses. Toxic fumes and direct contact can cause health hazards. Vapor clouds can travel a distance and settle in low-lying areas where the fumes may overcome people and animals. Released products should be treated as any other hazardous material.

Though often overlooked, petroleum and natural gas pipelines pose a real threat in the community. Most incidents affect only the area directly above or near the damaged pipeline. Depending on the size of pipeline and amount of product released, the extent of impact could be several hundred feet in diameter. Large areas may need to be evacuated to remove people from the threat of fire, explosion, or exposure. Pipelines have automatic shutoff valves installed so that damaged sections can be isolated and limit the volume of product from escaping. Identification and caution signs are posted wherever pipelines pass under roads, streams, fence lines, or at any aboveground utilities. The threat would likely be contained in Des Moines County to the area surrounding the location of the leak.

A Serious Pipeline Event is defined by the Pipeline & Hazardous Materials Safety Administration (PHMSA) as those incidents that involve a fatality or injury requiring in-patient hospitalization. A Significant Pipeline Event is defined by the PHMSA as those incidents reported by pipeline operators when any of the following specifically defined consequences occur:

1. fatality or injury requiring in-patient hospitalization
2. $50,000 or more in total costs, measured in 1984 dollars
3. highly volatile liquid releases of 5 barrels or more or other liquid releases of 50 barrels or more
4. liquid releases resulting in an unintentional fire or explosion

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 5 square miles or more. Many times, additional regions outside of 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.

Historical Occurrence: The Iowa DNR Hazardous Substance Incident Tracking Database[9] provides reported hazardous materials spill data. Between March 1995 and December 2014, 169 incidents of spills were reported, averaging at least one spill per year. Reported Des Moines County events are listed in Appendix D.

Vulnerability: When managed and regulated properly, 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. Des Moines County has a high degree of hazardous materials being transported through and adjacent to the County on the highways, local street, waterways, and pipeline networks.

In Des Moines County, pipelines cut through several areas of the county, placing residents and property at risk. Typically, most pipeline incidents that occur are caused by third party damage to the pipeline, often due to construction or some other activity that involves trenching or digging operations. With development occurring at an unprecedented rate and the ground becoming more and more congested with utilities, the probability of an underground pipeline incident is significant. Petroleum and natural gas pipeline accidents occur with some regularity, but they usually have a limited impact and are quickly and adequately handled by pipeline company emergency crews and local and state responders. Pipeline operators are required to coordinate all safety preparedness and response activities with the communities. Continuing to plan, train, and exercise emergency procedures help to limit the occurrence and severity of incidents.

About 60 interstate pipelines operate in the state under federal pipeline jurisdiction. There are many high-pressure gas mains throughout the state which supply residential and industrial users. People and property with pipelines on their land or nearby are the most at risk. In the event of a pipeline incident, those downwind and downhill of the release are most vulnerable. People excavating earth near a pipeline are also at risk. Private homes and business are served by natural gas have smaller diameter pipelines connected to their structure. The underground pipelines cross public streets, roads, and

[9] https://programs.iowadnr.gov/hazardousspills/Introductory.aspx#&&BasicPageIndex=0

highways as well as streams. The natural environment of Des Moines County is also vulnerable to contamination from an underground pipeline incident.

The increase in shipping of crude oil from the Bakken Shale Formation also represents a significant risk to the residents of Des Moines County. The crude oil carried by these trains is more volatile than other types and is not only flammable but explosive as well. The movement of this hazardous material through Des Moines County, especially through populated areas such as downtown Burlington, is a significant potential risk. Since 2013, there have been six railway incidents involving crude oil in the US and Canada. Increased safety standards and awareness will help to alleviate some of the risk but the potential for a disaster remains with the movement of large volumes of this volatile material through Des Moines County. In addition to movement of hazardous material by rail, inland waterways are also used to transport a variety of certain hazardous materials.

A hazardous materials accident can occur almost anywhere so any area is considered vulnerable to an accident. Hazardous materials incidents generally affect a localized area and the use of planning and zoning can minimize the area of impact. People, pets, livestock, and vegetation in close proximity to facilities producing, storing, or transporting hazardous substances are at higher risk. 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 Des Moines County Emergency Management Agency keeps a map of those businesses that have a high risk of hazardous materials in a fixed location.

Since Des Moines County has limited fixed hazardous material locations in the County, it is reasonable to assume that a leak or explosion could occur at any time. A fixed hazardous materials incident would prove of little damage to the structures unless it involved an explosion of some kind. Any explosion will cause damage to the structure that housed the fixed hazardous materials. None of the critical structures reside next to any large supply of fixed hazardous materials and therefore should not experience any large scale damage. There is minor threat due to explosions of small hazardous materials even within the critical structures, but any damage should be minor and would not limit the ability of the structure to continue to operate. The biggest risk of the fixed hazardous materials is to the employees working in the commercial properties that house the materials. These are listed on the EPCRA map at the Des Moines County Emergency Management Agency.

In Des Moines County, a pipeline incident could result in an evacuation of a significant geographic area which would involve a number of people if it occurred in or near a community. Damages from a pipeline would be very dependent on location and magnitude of the event. As seen in the community profile, the existing pipelines are located near some of the major transportation routes in the county, and in the case of a pipeline incident, transportation could be negatively affected.

Warning Time:

Hazardous materials 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 to be warned and evacuated. During some events, sheltering in-place is the best alternative to evacuation because the material has already affected the area and there is no time to evacuate safely. Public address systems, television, radio, and the NOAA Weather Alert Radios are used to disseminate emergency messages about hazardous materials incidents.

A pipeline incident may occur suddenly, but sight, sound, and smell can alert individuals that there may have been damage done to a pipeline in the area. Products may bubble up from the ground, collect in low-lying areas, a roaring or hissing noise may be heard, and most products give off a distinct odor. These warning signs can alert individuals not to use any devices that may act as ignition sources and could cause a fire or explosion. Des Moines County does not currently have the ability to be alerted to a leak prior to it occurring.

Scoring Analysis:

Based on available data, the Planning Committee considered the combined risk of fixed hazardous materials incidents and pipeline transportation incidents during the scoring analysis and determined that probability of a Hazardous Material incident is best categorized as “occasional”. Severity impact falls is considered “limited” in terms of potential damage to property or potential injury or loss of life. Additionally, the Planning Committee determined that little or no warning time would precede a hazardous materials incident.

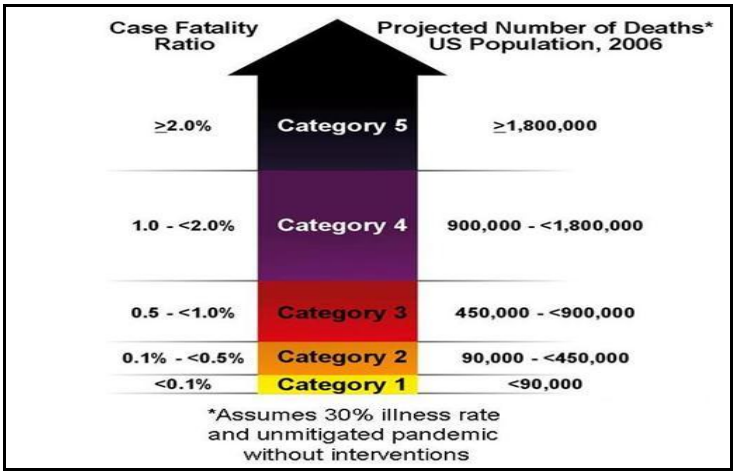
5.7.8 Human Disease Epidemic

Human Disease – Hazard Score Calculation				
Probability	**Magnitude/Severity**	**Warning Time**	**Duration**	**Weighted Score**
1.27	2.82	2.27	3.91	2.15

Description: A human disease incident is defined as a medical, health, or sanitation threat to the general public including contamination, epidemics, plagues, or infestations. Public health action to control infectious diseases in the 21st century is based on the 19th century discovery of microorganisms as the cause of many serious diseases (e.g., cholera and TB). Disease control resulted from improvements in sanitation and hygiene, the discovery of antibiotics, and the implementation of universal childhood vaccination programs. Scientific and technologic advances played a major role in each of these areas and are the foundation for today's disease surveillance and control systems.

Magnitude/ Severity: Scientific findings have contributed to a new understanding of the evolving relationship between humans and microbes. There are 67 infectious diseases designated for 2013 as notifiable at the national level. A notifiable infectious disease is one which must be reported to authorities because regular, frequent, and timely information regarding individual cases is considered necessary for the prevention and control of the disease.

A pandemic human disease is a disease that is prevalent over a whole country, region, continent, or world. A pandemic will have wide spread economic and societal implications for our state. Response and recovery to a pandemic will likely be lengthy if Iowa is severely infected. The Death Rate of a pandemic depends on the number of people infected, the virulence of the virus, characteristics and vulnerability of the population, and availability and effectiveness of preventative measures. Future pandemics will be assigned to one of five discrete categories of increasing severity that correspond with appropriate steps to take.



The Pandemic Severity Index chart from the Center for Disease Control shows fatality rates and projected deaths for each category. An example of the corresponding steps to take would be if the case-fatality rate during a pandemic is less than 1 percent (with estimated deaths nationwide under 90,000), the pandemic would be considered a category 1 and the only recommended community measure would be voluntary isolation of ill persons. However, communities could choose to take additional measures. In contrast, a category 5 pandemic (i.e., case fatality rate of 2 percent or higher and estimated deaths nationwide of nearly 2 million) would warrant recommendation of all of the community mitigation strategies.

Historical Occurrence: Many diseases throughout the history of the world have been pandemic. The 1918 influenza pandemic killed an estimated 50 million people. More than 25% of United States population was afflicted and in one calendar year average life expectancy dropped by 12 years! Influenza pandemics in 1957 and 1968 killed 70,000 and 34,000 people respectively worldwide. The H1N1 pandemic flu may have killed as many as 18,000 people in 2009-2010.

Vulnerability: The Iowa Department of Public Health tracks epidemiological statistics in Iowa. Public health agencies work to protect Iowans from infectious diseases and preserve the health and safety of Iowans through disease surveillance, investigation of suspect outbreaks, education and consultation to county, local, and health agencies. Public health agencies also work to reduce the impact of communicable diseases in Iowa and to eliminate the morbidity associated with these diseases. Programs guide community-based prevention planning, monitor current infectious disease trends, prevent transmission of infectious diseases, provide early detection and treatment for infected persons, and ensure access to health care for refugees in Iowa. Iowans remain vulnerable to diseases known and unknown even though vaccines exist for many modern diseases.

In Des Moines County, a large majority of residents would be at risk, especially the elderly and children. The biggest challenge would be in evacuating or establishing a quarantine since Des Moines County is a largely rural area with only one hospital. If there was a large scale human disease epidemic (either terrorist or otherwise), the community, with only one hospital, may not have the resources to respond in time to contain the epidemic. Another factor that places the community at risk, as shown in the community profile on pages 21 and 27, is that none of the city governments and not all schools have a continuity of operations plan in place. Having these plans in place would improve the ability of those jurisdictions to react and respond to this hazard.

It would be expected that the entire community would be exposed before any significant assistance could be provided by the State. Des Moines County communities do not stockpile enough vaccinations and could not quickly access sources in less than 24 hours.

Warning Time: The private practitioner is the first line of defense and will undoubtedly be the first to witness the symptoms of human disease epidemics. The Iowa Department of Public Health monitors diseases to identify patterns. The department is proactive in providing information to the community on medical concerns. Conditions related to scope and magnitude can escalate quickly and area resources can be drained of medical staff, medications, and vaccinations rather quickly.

Scoring Analysis: The Planning Committee determined that the probability of Human Disease incidents in Des Moines County is "unlikely" in any given year. Impact severity is best categorized as "limited" in terms of injuries and fatalities.

5.7.9 Infrastructure Failure

Infrastructure Failure – Hazard Score Calculation				
Probability	**Magnitude/Severity**	**Warning Time**	**Duration**	**Weighted Score**
1.64	2.36	3.82	2.45	2.26

Description: This hazard encompasses a variety of occurrences including communication failure, energy failure, structural failure, and structural fire. This includes an extended interruption, widespread breakdown, or collapse (part or all) of any public or private infrastructure that threatens life and property. One potential cause of infrastructure failure is space weather/solar flare.

Communication failure is the widespread breakdown or disruption of normal communication capabilities. Major telephone outages, loss of local government radio facilities, long-term interruption of electronic broadcast services, emergency 911, 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. Business and industry rely heavily on various communication media as well. Mechanical failure, traffic accidents, power failure, line severance, solar flares, and severe weather can affect communication systems and disrupt service.

Energy failure is an extended interruption of electric, petroleum, or natural gas service, which by an actual or impending acute shortage of usable energy, could create a potential health problem for the population and possibly even mass panic.

Structural failure includes the collapse (partial or total) of any 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 also cause the roof of a building to collapse (under the weight of snow). Heavy rains and flooding can undercut and washout a road or bridge. This occurred twice in 2008 when railway bridges failed in Waterloo and Cedar Rapids due to flooding. 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.

Structural fire is an uncontrolled fire in a populated area that threatens life and property and is beyond normal day-to-day response capability. 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 fire-fighting equipment, training, and techniques lessen the chance and impact of a major urban fire. Most structural fires 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 of the volume or type of the material involved. Less severe structural fires are almost a common occurrence in some communities. Nearly all are extinguished by on-site personnel or local fire departments.

Magnitude/ Severity:

Communication failure can range from localized and temporary to widespread and long-term. If switching stations are affected, the outage could be more widespread. A communications failure would not directly result in injuries or fatalities. Most financial losses would be incurred due to the direct damage to electronic equipment and the communication system infrastructure. If 911 systems were to fail due to phone communication disruption, secondary impacts could occur by the inability of citizens to alert responders of their needs. Inter-agency and intra-agency communications would be limited. Data transmission could also be affected. This could disrupt business and financial transactions resulting in potential loss of business.

An **energy failure** would not directly cause injuries and fatalities, but injuries and fatalities could occur if energy was not available for heating during extreme cold periods or for cooling during extreme heat. Hospitals, shelters, emergency response vehicles and facilities, and other critical facilities would have priority during energy shortages. Rotating blackouts, voluntary conservation measures, and possibly mandatory restrictions could be used to limit the severity of an energy shortage. Effects could range from minor heating and air conditioning disruptions to transportation limitations all the way to civil unrest due to the high demand, low supply, and subsequent high price. Business disruption and increased cost of business would have far-reaching financial implications across many sectors of the economy.

International events could potentially affect supplies of energy producing products while local conditions could affect distribution of electricity, petroleum, or natural gas. The magnitude and frequency of energy shortages are associated with international markets. Local and state events such as ice storms can disrupt transportation and distribution systems; if disruptions are long lasting, public shelters may need to be activated to provide shelter from extreme cold or extreme heat. Stockpiles of energy products eliminate short disruptions but can increase the level of risk to the safety of people and property near the storage site.

Structure failure may occur for a variety of reasons. The unprecedented growth in technology has resulted in a host of problems related to complex structures, special materials, and severe operational and environmental loads. These include fire, excessive vibrations, explosion, high-energy piping failures, missiles, and earthquakes. With some possible exceptions (misuse, accidental or environmental loads), the causes of failure may be found in deficiencies of design, detailing, material, workmanship, or inspection. With the aging structures in the country and problems with new materials discussed above, structural failures will continue to occur. Efforts to inspect and maintain these structures will lessen the probability of failure, but not guarantee that it will not occur. Internal weaknesses can be hidden from inspectors and may not be realized until it is too late.

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. There is no central collection point for this information, but news articles document infrastructure failure.

The impacts of the failed structure would be contained to the immediate area and adjacent properties. This could be as small as the house and yard of a fallen chimney, or the area could be relatively extensive if the structure that failed was a multi-story building of a downtown high-rise or a tall communication tower. Dam and levee failures would affect a much larger area and are discussed as separate hazards.

Bridge failures and debris in the streets and sidewalks would interrupt normal routes of travel. Functional purpose of the building would be terminated or suspended until the integrity of the structure could be restored. Personal injury, death, and property damage may occur in the collapse itself or by falling debris from nearby structures. There would also be a considerable price tag to replace or fix the structure, not to mention the loss of revenue that would occur because the structure could not be used. Utilities may be cut off to surrounding areas and communication transmissions may be lost for a period of time.

With modern training, equipment, fire detection devices, and building regulations and inspections, most **structural fires** can be quickly contained and limited to the immediate structure involved. Certain circumstances such as the involvement of highly combustible materials or high winds can threaten a larger area. The age and density of a particular neighborhood can also make it more vulnerable to fire due to the spreading of fire from neighboring structures.

Historical Occurrence: No major widespread communication failures have occurred in Iowa. Local incidents; due to weather conditions, equipment failure, excavation incidents, or traffic accidents have been reported, but the outages were usually resolved in a timely manner. While there are frequent down times, the communication services in Des Moines County have not been down for more than 24 hours at any point in time.

The energy crisis of the 1970s had significant impact on many consumers in Iowa. High inflation and unemployment were associated with the excessive dependence on foreign oil during the early and mid-1970s. An energy shortage of that magnitude has not affected Iowa in recent years.

Des Moines County experiences minor interruptions of power during severe weather. This occurs on average of about three times per year. The interruption of the electric has not exceeded 24 hours and is due in large part to the high percentage (90%) of power lines that are above ground. These lines accumulate ice during severe weather and often come down due to the ice and hailstorms. The power company provides quick repair and the electric is back up within a few hours.

There have been several sporadic structural failures across the state. They have included homes, commercial structures, and communications towers. There is no central collection point for this information. Des Moines County has not experienced any structural failure, and most structures considered unsafe were condemned and then torn down.

There have been 326 deaths in Iowa from fires from 2006 to December of 2014 according to the State Fire Marshall Division. During that same time period, there have been 38 fire related injuries and 3 fire related fatalities within Des Moines County.

Vulnerability: Most communications failures would be limited to localized areas. In the event of a widespread communications failure, only portions of Des Moines County would be impacted, but this is highly unlikely due to the support of other jurisdictions and secondary communication devices. Widespread communications losses are unlikely with backup systems and redundant system designs in place. Local communications failures are likely to affect small areas of the county. While there are frequent down times, the communication failures have not been down for more than 24 hour hours at any point in time.

Citizens of the community would be impacted only indirectly. Phone and data transmission could be impacted. Most communication systems that are highly necessary have backup and redundant designs to provide continuity of service.

Des Moines County has several communication providers (see community profile section) including a 911 dispatch center (DESCOM). DESCOM is provided backup service by Lee County, as well as assurance for backup from the State of Iowa within 2 hours of a cease of operations. Base radio at sheriff's officewould also be utilized in the event of communication failure. These radios have limited range and would prove insufficient if there was a secondary hazard such as a tornado or a terrorist event.

In Des Moines County, the majority of the community could be at risk or experience property damage from this hazard. Communication failure would not impact the actual building structures, simply their ability to provide the services necessary as described above. However, the loss of communication capability poses significant risk to both first responders and the residents of Des Moines County since it increases response time. All structures would have equal vulnerability to this hazard since the hazard is not confined to a specific geographic area within Des Moines County.

State and federal government strategies exist to respond to energy shortages, but are generally called upon only when free market forces are unable to provide for health, welfare, and safety of citizens. The State of Iowa has multiple strategies to limit the likelihood of an energy shortage and keep energy supply and demand in check. These strategies include:

- Voluntary and mandatory demand reduction mechanisms
- Substitution of alternative energy sources when possible
- State government programs to curtail excessive use

The federal government has a strategic petroleum reserve to supplement the fuel supply during energy emergencies. Shortages, especially electrical shortages, can be unpredictable with immediate effects. Natural events, human destruction, price escalation, and national security energy emergencies can cause unavoidable energy shortages.

Because Iowa is almost entirely dependent on out of state resources for energy, Iowans must purchase oil, coal, and natural gas from outside sources. In Iowa, petroleum represents 97% of transportation fuel, which means that any price fluctuations have an immediate effect on the agricultural, industrial, and transportation sectors, as well as individual consumers, especially commuters. In addition, low-income populations are particularly vulnerable to sudden cost increases for fuel.

In Des Moines County, because of the large percentage of residents that are elderly, it would be expected that prolonged interruption of electric or gas would create an immediate risk to life due to heat exposure or cold exposure depending on the time of year.

Des Moines County does not have enough shelters with generator backup to house the elderly residents during prolonged energy disruption, so if the disruption was due to severe damage of a primary hazard such as an earthquake or a tornado, the only recourse would be to evacuate the residents to larger neighboring communities. The time it would take to do so would indicate the level of loss of life due to energy disruption. In Des Moines County, injury and/or property damage from this hazard could be widespread. Energy transportation failure should not impact the structures, critical or otherwise, simply the operation of the structures.

Many structures in Iowa, especially older construction, may become hazardous in the event of an earthquake, fire, high winds, or other natural events. As seen on page 39 of the community profile, nearly 40% of the housing stock in Des Moines County was built before 1940. These older homes are at a higher risk of infrastructure failure, such as a roof collapsing or a systematic failure such as outdated wiring causing a fire. All bridges are vulnerable to the effects of the elements and the deterioration that results. Increases in the amount and weight of traffic they are expected to support increase their vulnerability to failure. In Des Moines County, structural failure could cause extensive damage to commercial, residential and critical facilities (except the hospital) since the fire, police stations and city hall within the communities are in close proximity to older structures that could potentially collapse. The collapse of any structure next to a critical structure would likely also cause structural damage to those structures as well.

The severity of a structural collapse in Des Moines County would depend upon whether the structure where occupied or not. The biggest concern would be the limited search and rescue ability of Des Moines County. As demonstrated in the community profile, many of the county's fire departments have mutual aid agreements, which can result in large coverage areas and longer response times. In the time it would take for assistance to arrive, there could be substantial loss of life.

Much of the fire prevention efforts have gone into non-residential fires and the results have been highly effective. Even with an increase in the prevention efforts in residential fires, both residential and non-residential fires will continue to occur. During colder months, clogged chimneys and faulty furnaces and fireplaces can increase the probability of structural fires.

Older structures with outdated electrical systems not built to current fire codes are particularly vulnerable to fire. 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 deaths per million residents.

The fire death risk for the elderly is more than 2 times that of the average population. The fire death risk is nearly 2 times that of the average population for children of age 5 or less.

Warning Time:

A communications failure would likely occur with little or no warning. It is usually impossible to predict a communications failure. Some communications may be shut down for a short while for improvements or maintenance. These disruptions are usually made during periods of low demand and those who rely on them are given previous notice that the system will be out of service.

The Iowa Department of Natural Resources Energy Bureau monitors domestic and international energy situations and has developed a plan to deal with an energy crisis. Signs that an energy shortage may be developing can be recognized months in advance, but energy shortages/emergencies can rise suddenly and unexpectedly. Supply distribution problems in other countries and local weather situations can lead to low supply coupled with high demand in a matter of a day or two.

The actual failure of a structure would likely occur suddenly with little or no warning. There are several events that could lead up to the failure and these have various warning times and are discussed in separate hazard worksheets. Casual hazards can include fire, explosion, overloading of ice and snow, vibration, earthquakes, flooding, high wind, erosion, chemical corrosion, subsidence, and lack of general upkeep.

While fires usually start with little or no warning time, alert devices can allow time for responders to contain the fire before spreading and allow occupants to evacuate the area.

Scoring Analysis:

The Planning Committee considered the combined risk of *significant* infrastructure failure incidents during the scoring analysis and determined that Infrastructure Failures best fits the “occasional” classification. Impact severity is best categorized as “limited” in terms of injuries, fatalities, and property damage. Additionally, the Planning Committee determined that less than 12 hours warning time would precede an infrastructure failure incident.

5.7.10 Landslides

Landslide – Hazard Score Calculation				
Probability	**Magnitude/Severity**	**Warning Time**	**Duration**	**Weighted Score**
1.36	1.55	3.91	1.91	1.85

Description: Landslides occur when susceptible rock, earth, or debris moves down a slope under the force of gravity and water. Landslides may be very small or very large, and can move at slow to very high speeds. A natural phenomenon, landslides have been occurring in slide-prone areas of Iowa since long before the state was created. Landslides can occur due to rainstorms, fires, or human activities that modify slope and drainage.

Magnitude/ Severity: Landslides are limited to localized areas. A landslide could result in injuries or fatalities of both residents and first responder personnel. This would create significant damage to property and loss of lives due to the initial landslide and potential risks associated with search and rescue efforts.

Historical Occurrence: There have been no reported landslide events in Iowa resulting in injury or death. The geographic extent of the documented historic events in the state has been limited to less than a city block in size and has "run out" over the stretch of less than 100 yards.

Landslides occur in Des Moines County along river banks and steep ditches, which may cause damage to roadways and other infrastructure. There have been no catastrophic landslide incidents in the County.

Vulnerability: There is a slight chance that a landslide could occur if there was a triggering event such as excessive rain or an earthquake in Des Moines County. Given the limited first responder capacity of Des Moines County, there would be additional risk to any personnel providing assistance.

SEIRPC staff met with local officials to identify areas of concern with respect to landslides. Public officials from the City of Burlington expressed concerns about potential landslides on roads. The Des Moines County Engineer identified two areas in unincorporated Des Moines County that were at a risk for a possible landslide. The noted that unstable banks have caused movement in pavement along the identified areas of concern. Appendix E includes a map illustrating the locations identified by the Des Moines County Engineer and City of Burlington officials. One location in particular was along Highway 99, which serves as the secondary north-south route in the county and is part of the Great River Road.

Identified areas are not meant to be an exhaustive list of all potentially impacted areas, nor are all properties included in the analysis necessarily vulnerable to this hazard. Further data is needed to better assess vulnerability, and this plan includes a future mitigation activity to "identify areas at risk for landslides" as part of a more in-depth study.

Warning Time: Because of the nature of landslides, there would potentially be advance warning of a day depending on the nature of the rain patterns.

Scoring Analysis: The Planning Committee determined that landslides are best categorized as "unlikely" to occur in Des Moines County, and that impact severity is best categorized as "negligible" in terms of injuries, fatalities, and property damage.

5.7.11 Levee Failure/Dam Failure

Levee Failure- Hazard Score Calculation				
Probability	**Magnitude/Severity**	**Warning Time**	**Duration**	**Weighted Score**
1.64	3.45	3.36	3.45	2.62

Description: Dam or levee failure is the uncontrolled release of water resulting from a structural failure in a dam, wall, dike, berm, or area of elevated soil that causes flooding. Possible causes of the breach could include flooding, earthquakes, blockages, landslides, lack of maintenance, improper operation, poor construction, vandalism, terrorism, erosion, piping, saturation, or under seepage. Dams are constructed for a variety of uses, including flood control, erosion control, water supply impoundment, hydroelectric power generation, and recreation..

Magnitude/ Severity: In Iowa, dams are classified according to the downstream damages that would occur if that dam were to fail. The more risk, the higher the standards that have to be met when that dam is constructed or modified. The severity of damage could range from property damage, if a low hazard dam failed, to multiple deaths, injuries, and extensive property damage if a high hazard dam failed.

The area impacted following a dam failure would be limited to those areas in and near the floodplain. People and property outside the floodplain could also be impacted depending on the proximity to the dam and the height above the normal stream level.

There are three dam classifications: High Hazard, Moderate Hazard and Low Hazard. These classifications do not describe the current condition of the dam or what materials was used to construct the dam. High Hazard class dams have to meet the state's highest level of criteria and are inspected on a 2 year cycle. 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. Below are the hazard classifications defined by Iowa Department of Natural Resources (DNR):

- High Hazard – Dams are classified as High Hazard when it is located in an area where dam failure may create a serious threat of loss of human life.
- Moderate (Significant) Hazard – A Moderate Hazard Dam is where failure may damage isolated homes or cabins, industrial or commercial buildings, moderately traveled roads, interrupt major utility services, but are without substantial risk of loss of human life. Dams are also classified as Moderate Hazard where the dam and its impoundment are themselves of public importance, such as dams associated with public water supply systems, industrial water supply or public recreation or which are an integral feature of a private development complex.

- Low Hazard – Low Hazard dams are classified as such where damages from a failure would be limited to loss of the dam, livestock, farm outbuildings, agricultural lands and lesser used roads and where loss of human life is considered unlikely.

Historical Occurrence: The flooding of 1993 and again in 2008 tested the limit of many levees. Nationwide, of the 275 Corps of Engineers levees affected by the 1993 flood, 85% held, of the 15% that failed, 31 overtopped, 8 eroded and ruptured, and three breached. The performance of non-federal levees was worse: only 43% withstood the trauma, and 800 of 1,400 failed. In 2008, two levee pumping stations in Des Moines County belonging to the Two Rivers Levee and Drainage Association were lost to flooding. In 2008, some levees were also purposely broken in order to relieve pressure elsewhere in the district. The rate of failure of a levee or floodwall is difficult to predict with sudden failure a possibility. Proper design and construction can limit the probability of a levee failure. Development in the watershed can raise flood levels and make a levee designed and constructed under previous characteristics inadequate for current runoff conditions.

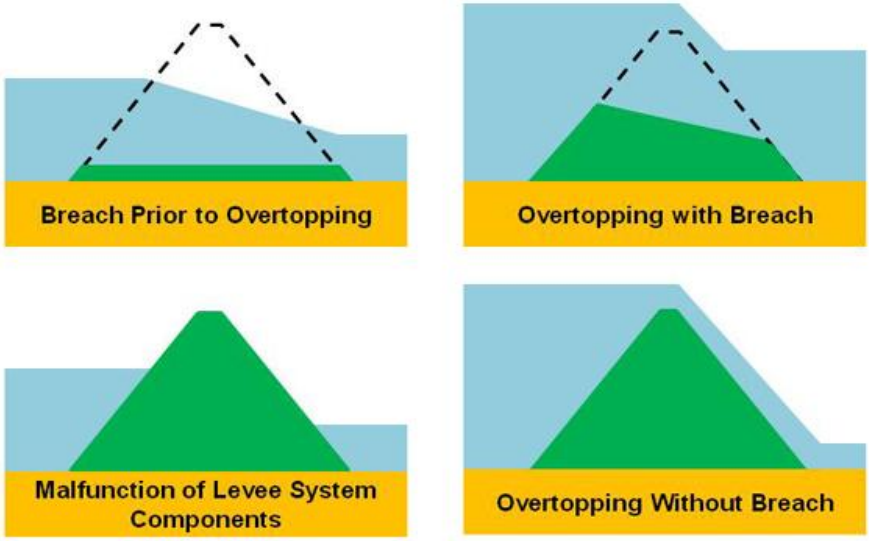
There have been two historical occurrences of dam failure in the State of Iowa; one occurred in 1968 in Waterloo when the Virden Creek Dam failed. The incidence claimed one life, and the dam is no longer in existence. The second occurrence happened at the Lake Delhi in July of 2010 when a 92 year old dam was breached at a nine mile long lake owned by a local homeowner's recreation association. The Delhi breach caused significant property loss, an evacuation of as many as 700 near the dam, as well as severe economic impacts to the tourism industry in the area. There are no historical occurrences of dam failure in Des Moines County.

The Two Rivers Levee and Drainage Association had a levee breach in 2008 which caused significant damage to several homes. It also destroyed crops and agriculture buildings in that area. The North Bottoms Levee had some seepage in 2008, but caused little to no damage to the facilities within their boundaries.

Vulnerability: Levees constructed of compacted clay with a high plasticity tend to crack during long dry spells. During heavy rainfalls that follow dry periods, water fills the cracks and fissures. This increases hydrostatic forces, and the water also is slowly absorbed by the clay causing 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, in levee failure 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 the deepening of the cracked clay zone; cracks may reach a depth of 9 feet 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.

Within the county, the Two Rivers Levee and Drainage Association and the North Bottoms Levee District manage and maintain the system of levees and drainage systems which protect areas of Des Moines County from flooding. The Two Rivers Levee and Drainage Association covers much of the northeastern part of the County, which is mostly farmland while the North Bottom Levee District protects the northeast part of the City of Burlington, an area with several major employers and industrial locations. Another levee, although not approved by the US Army Corps of Engineers, is located in Union Township. Levee failure would cause significant damage to property as well as negatively impact the economy of Des Moines County.



As previously stated dam hazard potential classifications have nothing to do with the material condition of a dam, only the potential for death and/or destruction due to the size of the dam, the size of the impoundment, and the characteristics of the area downstream of the dam. There are approximately 3,800 dams on the State of Iowa Dam Inventory. There are 269 classified as “major dams” subject to periodic inspections. Major dams are all high hazard dams, plus significant hazard dams that have a permanent storage volume exceeding 100 acre-feet or a total water storage volume to the top of the dam exceeding 250 acre-feet, and low hazard dams with a product of storage (acre-feet) times height (feet) which exceeds 30,000 acre ft.

As seen in Figure 4.28 on page 48 there are seven publicly owned dams located in Des Moines County, two of which are “significant hazard” dams according to the Iowa DNR’s classification system. These two dams are the Mississippi Lock & Dam #18 and Geode Lake Dam on the Skunk River. Geode Lake Dam is 450 feet long, 22 feet high, and has a normal storage capacity of 4,700 acre feet.

Mississippi Lock & Dam #18, is 7,330 feet long, 41 feet high, and has a capacity of 90,000 acre feet. Each of these dams represent a potential hazard as any failure would likely result in significant flood damage.

Lock & Dam #18 was constructed in 1937 and has withstood years of use, including several major floods. However, the risk of a possible failure is always present. Like many other aging locks and dams on the Upper Mississippi River, Lock & Dam #18 requires a great deal of maintenance to keep the 78 year old structure functional. Unfortunately, the required maintenance is not always completed. A September 18, 2015 report from the U.S. Army Corps of Engineers Rock Island District listed three maintenance projects on their backlog for Lock & Dam #18: general major rehabilitation/maintenance, auxiliary bay gate bulkhead slot, and dam concrete repair for safety. These three projects, in addition to projects for other dams, comprised a total of nearly $1 billion in backlogged projects for just the Rock Island District. Lock & Dam #18 may be functional today but if this lack of maintenance continues the chance for a future failure will only increase with time

The failure of Lock & Dam #18 would be a significant event which poses a serious threat to the residents and economy of Des Moines County. An inundation map would best quantify vulnerability to dam failure and identify specific at-risk areas in Des Moines County. However, in the absence of that information, a scenario-based analysis in which dam failure inundates the 500-year floodplain along the Mississippi River helps us assess vulnerability for failure of the Mississippi Lock & Dam #18. Countywide, 2.4% of all parcels are located within the 500-year floodplain. The majority of these parcels along the Mississippi River are used for primarily for agriculture and do not contain many residences or commercial properties.

A flood from a dam failure in this area could have a negative impact on the local economy as the crop loss from such an event would likely be quite significant, impacting in excess of 5,000 acres of agriculture property in the county. In addition to valuable agricultural lands, there are several critical facilities, vulnerable sites, and critical infrastructure installations, including the regional wastewater and water treatment plants that are located within the 500-year flood plain. The failure of the lock and dam would also have additional adverse economic effects as it would require hundreds of millions of dollars to rebuild the dam, as well as impede the navigation of the river. This would have a negative effect on regional businesses that rely on the river transportation network, forcing goods to be shipped by at least partially by truck, adding significant time and cost to the shipping process. For further detail refer to the vulnerability section in the hazard description for River Flood on pages 106 to 109. These pages, specifically Figure 5.7, provide specific information on the sites, facilities, and infrastructure that would be impacted within the 500 year floodplain. Additional maps of flood zones are included in Appendix F.

The Geode Lake Dam was built in 1950 to create Geode Lake for recreational purposes. Today the lake is the centerpiece of Geode Lake State Park, which is one of the most popular recreational sites in Des Moines County and Southeast Iowa. If the dam were to fail, there likely would be a negative economic impact due to loss of the recreational site. In addition, the failure of the dam would also likely result in damages to important infrastructure. County Highway J20 passes over the dam on the south side of the lake and would likely experience significant damage if the dam were to fail. In addition, the large amount of water from the lake which would enter the Skunk River watershed could also result in flooding further downstream, with possible damages to county roads, county bridges, campgrounds, recreational sites, agricultural lands, and possibly even residences near the Skunk River.

Warning Time: A levee or dam failure can be immediate and catastrophic leaving little or no time to warn those downstream of the imminent hazard. With maintenance and monitoring, weak areas and possible failure points can be identified allowing time for evacuation and securing of the dam. Most dams and levees are only inspected periodically thus allowing problems to go undetected until a failure occurs.

Scoring Analysis: The Planning Committee determined that Levee Failure is best categorized as "unlikely" to occur in Des Moines County, but its impact severity as "critical" in terms of injuries, fatalities, and property damage.

5.7.12 River Flood

River Flood – Hazard Score Calculation				
Probability	**Magnitude/Severity**	**Warning Time**	**Duration**	**Weighted Score**
2.64	3.09	1.27	4.00	2.70

Description: River flooding describes 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. Most communities in the United States can experience some kind of flooding after spring rains, heavy thunderstorms, winter snow thaws, waterway obstructions, or levee or dam failures. Often it is a combination of these elements that cause damaging floods.

Magnitude/ Severity: 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.

The Federal Emergency Management Agency has delineated the probable extent of the 100 year flood hazard areas in most areas. These Flood Insurance Rate Maps (FIRMs) show properties affected by the floods that have at least a 1% chance of occurring in any particular year. Generally, these areas are in the floodplain or adjacent areas. Much of these areas are parkland, agricultural areas, or conservation land, but residential and commercial areas are impacted by river flooding as well. Des Moines County participates in the NFIP, as do the communities of Burlington, West Burlington , Danville, and Mediapolis.

Flooding impacts include potential loss of life; property damage and destruction, damage and disruption of communications, transportation, electric service, and community services; crop and livestock losses; and interruption of businesses. Hazards of fire, health and transportation accidents; and contamination of water supplies are potential effects of flooding situations as well. The primary water source for the community, the Burlington Waterworks, could also be affected by extensive flooding as the facility is located within the 500 year flood plain.

Historical Occurrence: The Floods of 2008 and the recovery from the losses associated with it as well as the devastating flooding that occurred in 1993 stress the importance of mitigation against river flooding in the State of Iowa. Even the losses associated with smaller flooding events, such as the floods in 2004, resulted in 65 counties declared state disaster areas and 14 of the 65 counties declared presidential disaster areas.

The 2008 floods resulted in 86 of the State's 99 counties included in Governor's disaster declarations, and 84 being declared presidentially. The event resulted in 18 fatalities and 106 injuries, the evacuation of approximately 38,000 Iowans and impacting 21,000 housing units.

Iowa had 2 presidentially declared disasters in 2010, both of which included flooding and severe storms. Over half of Iowa's 99 counties were included in one (or both) of these declarations. In 2011 Iowa had 3 separate presidentially declared disasters due to flooding (as well as severe storms and straight-line winds). Counties covered in the 2011 disasters ranged from the western borders due to flooding on the Missouri River to eastern counties along the Mississippi River.

Iowa has been involved in 36 Presidential Declarations for major disasters related to flooding since 1953. Given the history of river flooding in Iowa, it is likely that there will be many minor events in any given year and a high likelihood that a major flooding event requiring federal assistance will occur in the next five years.

NOAA data shows that Des Moines County has sustained over $6.1 million in property damages since 2008, with over half that amount occurring during the 2008 floods. In that year floods caused $4.8 million in damages to crops and property.

Vulnerability: The National Flood Insurance Program (NFIP) Repetitive Loss Properties (REP) report identifies properties vulnerable to multiple flood losses. According to the report, Des Moines County has twenty five REP properties which are as follows: One residential property in Huron Township, one residential property in Oakville, nine residential properties greater Des Moines County, four residential properties in the City of Burlington, and ten non-residential properties in the City of Burlington.

Analysis reveals that 2.4% of all parcels and 4.5% of the total square area of Des Moines County lies within the 500-year floodplain. Analysis also shows that 17.5% of all parcels and 13.7% of the total square area of Des Moines County lies within the 100-year floodplain. Vulnerability to this amount of river flooding will significantly impact structures that lie within the flood plain. Damage to these structures often includes dry wall damage, flooring damage, and in severe cases structural damage. With extensive clean-up, most structures could be inhabitable again once the waters subside.

In, Des Moines County analysis of structural vulnerability correlates with floodplain mapping as seen in Appendix F. Figures 5.6 and 5.7 show the number and total value of parcels affected by 100-year and 500-year flood events for Burlington, West Burlington, Danville, and greater Des Moines County. The values are based on an analysis done by SEIRPC, which visually identified structures within the floodplains using aerial photography and GIS shapefiles. The analysis does not account for the possibility that structures are elevated or have some form of flood protection. The results may also be imperfect due to the difficulties discerning building locations with available aerial photography.

Figure 5.6

*Number (#) and Value ($) of Structures within the **100 Year** Floodplain*

		Residential	Commercial	Industrial	TOTAL
Burlington	#	100	183	13	**296**
	$	$3,619,800	$8,891,530	$14,619,800	**$27,131,130**
West Burlington	#	13	1	0	**14**
	$	$784,600	$50,200	$0	**$834,800**
Danville	#	5	3	0	**8**
	$	$282,800	$0	$0	**$282,800**
Des Moines County	#	637	65	1	**703**
	$	$33,083,900	$7,216,700	$0	**$40,300,600**

*Source: Des Moines County Assessor, SEIRPC

*At-risk structures were visually identified using aerial photography and floodplain shapefiles. The analysis does not account for elevation and flood protection.

Figure 5.7

*Number (#) and Value ($) of Structures within the **500 Year** Floodplain*

		Residential	Commercial	Industrial	TOTAL
Burlington	#	109	18	1	**138**
	$	$5,512,100	$842,600	$756,900	**$7,111,600**
Danville	#	1	1	0	**2**
	$	$72,200	$0	$0	**$72,200**
Des Moines County	#	133	20	2	**155**
	$	$13,099,500	$5,335,500	$430,000	**$18,865,000**

*Source: Des Moines County Assessor, SEIRPC

*At-risk structures were visually identified using aerial photography and floodplain shapefiles. The analysis does not account for elevation and flood protection.

In addition, as seen in Figure 5.8, several critical facilities, vulnerable sites, and critical infrastructure are also located in both the 100-year and 500-year floodplain. Figure 5.8 shows each facility's location in the flood zones with their corresponding ID numbers found in the table below the figure. Descriptions of these critical facilities and vulnerable sites are as follows:

Tama Road Pumping Station: Damage to this facility would inhibit the ability of the Two Rivers Levee and Drainage Association to pump out any water from flooding behind the levee system.

Pumping Station #4: Damage to this facility would inhibit the ability of the Two Rivers Levee and Drainage Association to pump out any water from flooding behind their levee system.

Conger Trailer Park: Based on aerial photographs, there are approximately 30 mobile home units located in this residential area. The location of the park, in the floodplain and situated within a steep ravine, places it at risk for flooding.

Memorial Auditorium: Located on Burlington Riverfront, this building serves as a large gathering place for concerts, speakers, and other demonstrations. This building would also serve as a shelter in a time of disaster and is designated as an overflow triage center in the possibility that the Great River Medical Center is overwhelmed by a disaster or hazard.

Market Street Lift Station: Integral part of the City of Burlington water system. Flooding of this facility could result in sewer backups, a significant health hazard.

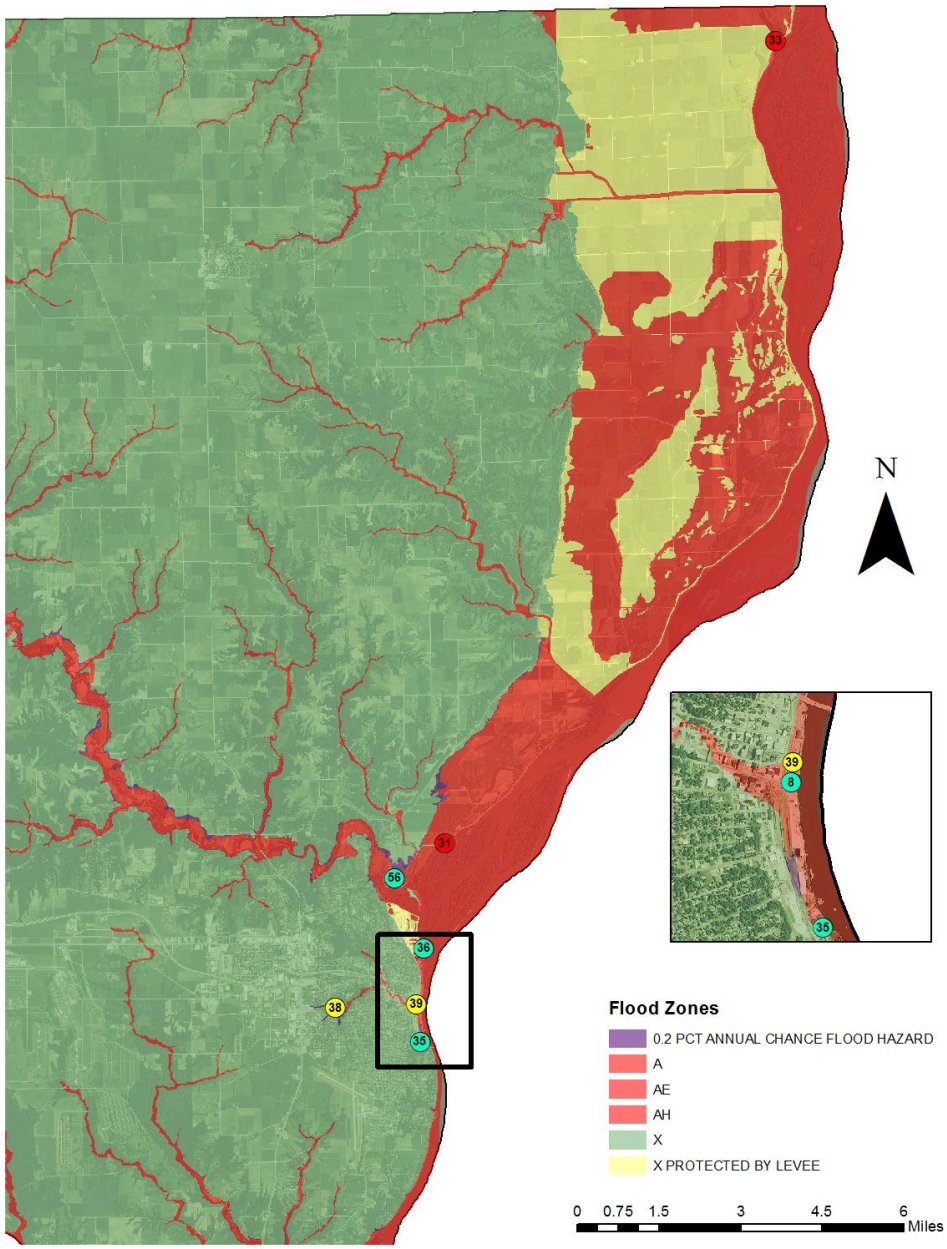
Burlington Waterworks Intake Pipe: This is where the Burlington Waterworks draws water from the Mississippi River for use.

Burlington Waterworks Facility: This facility treats drinking water for use in Burlington, West Burlington, and through a series of agreements, a large portion of the rest of the county.

Burlington Wastewater Treatment Plant: This facility treats wastewater from the City of Burlington. Flooding of this facility could result in untreated sewage mixing with floodwaters, which would create a significant public health hazard.

Although homes and businesses across Iowa, and including in Des Moines County, have been removed from the floodplain, many opportunities for mitigation remain. While all the mitigation work Iowa has done may not be enough to significantly alter vulnerability statewide, at a local level, risk has been substantially reduced

Figure 5.8
*Name and Location of Critical Facilities, Vulnerable Sites, and Critical Infrastructure within the **100 Year** and **500 Year** Floodplain*



Map ID	Type	Name	Location	Floodplain Level
31	Critical Facility	Tama Road Pumping Station	Des Moines County	100 Year
33	Critical Facility	Pumping Station #4	Des Moines County	100 Year
38	Vulnerable Site	Conger Trailer Park	Burlington	500 Year
39	Vulnerable Site	Memorial Auditorium	Burlington	100 Year
8	Critical Infrastructure	Market Street Lift Station	Burlington	100 Year
35	Critical Infrastructure	Burlington Wastewater Treatment Plant	Burlington	100 Year
36	Critical Infrastructure	Burlington Waterworks Intake Pipe	Burlington	100 Year
56	Critical Infrastructure	Burlington Waterworks Facility	Burlington	500 Year

Warning Time: Gages along streams and rain gages throughout the state provide for an early flood warning system. River flooding usually develops over the course of several hours or even days depending on the basin characteristics and the position of the particular reach of the stream. The National Weather Service provides flood forecasts for Iowa. Flood warnings are issued over emergency radio and television messages as well as the NOAA Weather Radio. People in the paths of river floods may have time to take appropriate actions to limit harm to themselves and their property.

Scoring Analysis: As seen in the Summary of Historical Events for Selected Hazards (Figure 5.4), River Flood events have occurred, on average, roughly every other year in Des Moines County. The Planning Committee determined that River Flood is best categorized as "likely" to occur in Des Moines County, and that impact severity is best described as "critical" in terms of injuries, fatalities, and property damage.

5.7.13 Severe Winter Storm

Severe Winter Storm – Hazard Score Calculation				
Probability	**Magnitude/Severity**	**Warning Time**	**Duration**	**Weighted Score**
3.73	1.73	1.36	2.64	2.66

Description: Severe winter weather conditions that can affect day-to-day activities include blizzard conditions, heavy snow, blowing snow, freezing rain, heavy sleet, and extreme cold. Winter storms are common during the months of October through April in Iowa.

Magnitude/ Severity: The various types of severe winter weather can cause considerable damage. Winter storms can immobilize transportation systems, down trees and power lines, collapse buildings, and cause the loss of livestock and wildlife. Blizzard conditions are winter storms lasting at least three hours with sustained winds of 35 mph or more, reduced visibility of 1/4 mile or less, and white out conditions. Heavy snows of more than six inches in a 12 hour period or freezing rain greater than 1/4 inch accumulation can cause hazardous conditions in the community by slowing or stopping the flow of vital supplies as well as disrupting emergency and medical services.

Loose snow begins to drift when wind reaches a speed of 9 to 10 mph under freezing conditions. The potential for drifting is substantially higher in open country than in urban areas where buildings, trees, and other features obstruct the wind.

Ice storms have resulted in fallen trees, broken tree limbs, downed power lines and utility poles, fallen communications towers, and impassable transportation routes. Severe ice storms have caused power outages over large areas of Iowa; they have also shut down or made roadways impassable, and as a result, have prevented first responders from providing emergency services to people in need of assistance.

Historical Occurrence: According to the National Oceanic and Atmospheric Administration, winter storms regularly move easterly and use both the southward plunge of arctic cold air from Canada and the northward flow of moisture from the Gulf of Mexico to produce heavy snow and sometimes blizzard conditions in Iowa. Most Iowa counties can expect two or three winter storms a season with an extreme storm, on average, every three to five years.

Eight winter storm related Presidential Declarations for Major Disaster have been declared in Iowa since 1991. The first declaration related to winter storms occurred in 1991 resulting from an ice storm that affected 16 counties. Extensive damage occurred to power lines, including the collapse of numerous high-tension towers in north-central Iowa.

The second declaration occurred in 1997 resulting from a severe winter storm that affected 13 counties. In 2007 the third declaration (3/14/2007) affected 48 counties and the fourth declaration (3/30/2007) affected 23 counties with five (5) counties counted in both declarations. These declarations resulted from a major winter storm with ice and heavy snow combined with strong winds gusting to 50-55 mph causing blizzard conditions. Some areas in Iowa received 16 inches of snow, and coupled with the strong winds caused already weakened ice lined power lines to crumble and interstate highways to close due to drifting snow. This situation left approximate 250,000 plus Iowa citizens without electricity for ten plus days. Due to the severity of the winter blizzard, the Governor signed a Governor's Emergency Declaration for all 99 counties in Iowa. Another disaster was declared in January of 2008, affecting 30 counties in southern Iowa. The remaining two Presidential Declarations occurred in late February 2010, impacting 27 counties, and in early March of 2010, impacting 27 counties in western Iowa.

According to the National Climactic Data Center (NCDC), Des Moines County experienced 114 winter storm-related events from January 1996 to December 2013. Events include 42 winter weather, 42 winter storm, 3 blizzard, 10 ice storm/sleet, 12 heavy snow, 6 cold/extreme cold/wind chill, and 5 frost/freeze events. Some of these may overlap, but it is clear that in Iowa a variety of winter weather related hazards are commonplace. Appendix B includes a record of historical occurrences from the National Climatic Data Center.

In terms of property damage, the most significant event on record occurred on February 24, 2007 and caused $227,000 in property damage.

Vulnerability: Hazardous driving conditions due to snow and ice on highways and bridges lead to many traffic accidents. The leading cause of death during winter storms is transportation accidents. About 70% of winter related deaths occur in automobiles and about 25% are people caught out in the storm. The majority of these are males over 40 years of age. Emergency services such as police, fire, and ambulance are unable to respond due to road conditions. Emergency needs of remote or isolated residents for food or fuel, as well as feed, water and shelter for livestock, are unable to be met. The Iowa Department of Transportation, county road departments, and local public works agencies are responsible for the removal of snow and treatment of snow and ice with sand and salt on the hundreds of miles of streets and highways in the county.

Cold temperatures can cause frostbite and hypothermia, especially when combined with wind chills that further reduce the perceived air temperature to exposed skin. Frostbite and hypothermia can affect anyone, but the elderly and the very young are particularly vulnerable. People engaged in outdoor activity (shoveling snow, digging out vehicles, or assisting stranded motorists) also have risk from prolonged exposure. Schools often close during extreme cold or heavy snow to protect children and bus drivers. As seen in

the community profile, the school districts in Des Moines County are large in square area, which could place bus drivers and children at risk in transit to school.

Water pipes, livestock, fish, wildlife, and pets are also affected by the dangers of extremely cold weather.

Immobilized transportation (including emergency vehicles) downed trees and electrical wires, building and communication tower collapse, and bodily injury/death are just a few of the impacts of a severe winter storm. Vehicle batteries and diesel engines are stressed and the fuel often gels in extreme cold weather, which can impact transportation, trucking, and rail traffic. Rivers and lakes freeze and subsequent ice jams threaten bridges and can close major highways. Ice jams can also create flooding problems when temperatures begin to rise. Ice coating at least one-fourth inch in thickness is heavy enough to damage trees, overhead wires, and similar objects and to produce widespread power outages. Buried water pipes can burst causing massive ice problems and loss of water and subsequent evacuations during sub-zero temperatures. Fire during winter storms presents a great danger because water supplies may freeze and firefighting equipment may not function effectively, or personnel and equipment may be unable to get to the fire. If power is out, interiors of homes become very cold and lead to pipes freezing and possibly bursting. Citizens' use of kerosene heaters and other alternative forms of heating create other hazards such as structural fires and carbon monoxide poisoning.

Cold temperature impacts on agriculture are frequently discussed in terms of frost and freeze impacts early or late in growing seasons and unprotected livestock. The cost of snow removal, repairing damage, and loss of business can have large economic impacts on the community. The loss of revenue and the economic impact due to property damage and crop damage could prove devastating for Des Moines County if they experienced several severe storm events within a short period of time since they are a small community dependent upon every source of revenue.

In Des Moines County, a large majority of the community could be injured or experience property damage from this hazard. Winter storms damage the roofs of the structures and can cause the collapse of the roofs when ice and snow build up to a substantial level. This roof collapse could occur in a majority of the homes due to the age and state of deterioration of many of the commercial and residential structures in the county. The old age of housing stock in Des Moines County, as seen on page 39 of the community profile, represents a significant risk to roof collapse. The critical structures, however, are cleared of snow frequently to prevent this damage. The major risk is a secondary event of power loss due to the above ground power lines. This would cripple the communication ability of the critical facilities. All structures would have equal vulnerability to this hazard since the hazard is not confined to a specific geographic area within Des Moines County. There is particular risk to the elderly and children since major storms can trigger loss of electricity and thus and heat in winter months.

Total damages from severe winter weather, according to NCDC data, amount to $455,000 since 1996.

Warning Time: The National Weather Service has developed effective weather advisories that are promptly and widely distributed. Radio, TV, and All Hazards 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.

Scoring Analysis: As seen in the Summary of Historical Events for Selected Hazards (Figure 5.4), multiple severe winter weather events occur every year in Des Moines County. The Planning Committee determined that Severe Winter Storms are best categorized as "likely" to occur in Des Moines County, and that impact severity is best categorized as "limited" in terms of injuries, fatalities, and property damage.

5.7.14 Terrorism

Terrorism – Hazard Score Calculation				
Probability	**Magnitude/Severity**	**Warning Time**	**Duration**	**Weighted Score**
1.00	2.82	4.00	2.36	2.13

Description: This hazard encompasses a wide variety of human caused threats including enemy attack, biological terrorism, agro-terrorism, chemical terrorism, conventional terrorism, cyber terrorism, radiological terrorism, and public disorder. This includes the use of multiple outlets to demonstrate unlawful force, violence, and/or threat against persons or property causing intentional harm for purposes of intimidation, coercion or ransom in violation of the criminal laws of the United States. These actions may cause massive destruction and/or extensive casualties.

Public disorder examples include mass demonstrations, or direct conflict by large groups of citizens, as in marches, protest rallies, riots, and non-peaceful strikes. These are groups of people assembling together to substantially interfere with public peace and constitute a threat. Use of unlawful force or violence against another person, causing property damage or attempting to interfere with, disrupting, or destroying the government, political subdivision, or group of people are potential methods employed. Labor strikes and work stoppages are not considered in this hazard unless they escalate into a threat to the community. Vandalism is usually initiated by a small number of individuals and limited to a small target group or institution. Most events are within the capacity of local law enforcement.

Biological terrorism can be described as the use of biological agents against persons or property in violation of the criminal laws of the United States for purposes of intimidation, coercion or ransom. Liquid or solid contaminants can be dispersed using sprayers/aerosol generators or by point of line sources such as munitions, covert deposits and moving sprayers.

Agro-terrorism involves intentional harm to an agricultural product or vandalism of an agricultural/animal related facility. Activities could include: intentional introduction of disease, animal rights activists who release animals; disgruntled employees who intentionally contaminate bulk milk tanks or poison animals; eco-terrorists who destroy crops/facilities; theft of agricultural products, machinery, or chemicals; or criminals who vandalize agricultural facilities. Depending upon the type of action taken, the implications will vary greatly.

Chemical terrorism involves the use or threat of chemical agents against persons or property in violation of the criminal laws of the United States for purposes of intimidation, coercion or ransom. Liquid/aerosol or dry contaminants can be dispersed using sprayers or other aerosol generators; liquids vaporizing from puddles/containers; or munitions. Chemical agents may pose viable threats for hours to weeks depending on the agent and the conditions in which it exists. Contamination can be carried out of the initial target area by persons, vehicles, water and wind. Chemicals may be corrosive or otherwise damaging over time if not mitigated.

Conventional terrorism is the use of conventional weapons and explosives against persons or property in violation of the criminal laws of the United States for purposes of intimidations, coercion, or ransom. Hazard effects are instantaneous; additional secondary devices may be used, lengthening the time duration of the hazard until the attack site is determined to be clear. The extent of damage is determined by the type and quantity of explosive. Effects are generally static other than cascading consequences, incremental structural failures, etc. Conventional terrorism can also include tactical assault or sniping from remote locations.

Cyber-terrorism is an electronic attack using one computer system against another in order to intimidate people or disrupt other systems. Cyber terrorism may last from minutes to days depending upon the type of intrusion, disruption, or infection. Inadequate security can facilitate access to critical computer systems, allowing them to be used to conduct attacks.

Magnitude/ Severity:

The intent of the terrorist is to cause fear based on illness, injury, and death. Depending on the agent used and the effectiveness with which it is deployed, contamination can be spread via wind and water. Infections can be spread via human or animal vectors. The geographic extent can become quite broad before the incident is recognized as a terrorist act, and the impacted area could be a room, building, or the entire community.

Enemy attack is an incident that would cause massive destruction and extensive casualties. An all-out war would affect the entire population. Some areas would experience direct weapons' effects: blast, heat, and nuclear radiation; others would experience indirect weapons' effect, primarily radioactive fallout.

Public disorder in the form of large-scale civil disturbances rarely occur, but when they do they are usually an offshoot or result of one or more of the following events: 1) labor disputes where there is a high degree of animosity between the participating parties; 2) high profile/controversial laws or other governmental actions; 3) resource shortages caused by a catastrophic event; 4) disagreements between special interest groups over a particular issue or cause; or 5) a perceived unjust death or injury to a person held in high esteem or regard by a particular segment of society.

Although large-scale destructive civil disturbances are rare, the potential is always there for an incident to occur. This is even more true today, where television, radio, and the internet provide the ability to instantly broadcast information (factual or not), in real time, to the entire community. Often times that coverage helps to spread the incident to other, uninvolved or unaffected areas, exacerbating an already difficult situation. This also allows insightful people, previously not involved, to participate in the disturbance for no other reason than to riot, loot, burn, and destruct property. Alcohol is often involved in public disorder, especially related to college campuses, sporting events, and concerts.

Civil unrest often results in injuries, deaths, and property damage. Perhaps even more tragic has been the lingering, negative impact and loss of investment in the communities ravaged by the uprisings. Many riot areas do not fully recover from the damage, destruction, and negative image brought on by such events. Looting, burning, and sniping can occur during severe civil disturbances. Fires can sometimes burn uncontrolled because firefighters and equipment are unable to respond due to resistance from rioters.

Biological terrorism through the use of biological agents may pose viable threats from hours to years depending upon the agent and the conditions in which it exits. Depending on the agent used and the effectiveness with which it is deployed, contamination can be spread via wind and water. Infections can be spread via human or animal vectors.

Economic impacts from an **agro-terrorism** incident would be far-reaching and severely damaging because of loss of production and long-term disruption of commodity flows.

Combatting **cyber-terrorism** with cyber-security and critical infrastructure protection are among the most important national security issues facing our country today, and they will only become more challenging in the years to come. Recent attacks on our infrastructure components have taught us that security has been a relatively low priority in the development of computer software and internet systems. These attacks not only have disrupted electronic commerce, but have also had a debilitating effect on public confidence in the internet.

Historical Occurrence:

There have been no attacks on or in Iowa in modern times. The only history of hostile attack dates back to the days of settlement and the Civil War in the 1800s.

There have been numerous labor disputes and protests in Iowa, but these have remained fairly non-violent. Large-scale civil disturbances rarely occur; but when they do, they are usually an offshoot or result of one or more of the following events: 1) labor disputes in which there is a high degree of animosity between the participating parties; 2) high profile/controversial laws or other governmental actions; 3) resources shortages caused by a catastrophic event; 4) disagreements between special interest groups over a particular issue or cause; or 5) a perceived unjust death or injury to a person held in high esteem or regard by a particular segment of society. There have been numerous labor disputes and protests in Iowa, but these have remained fairly nonviolent. Other non-peaceful incidents have occurred in the state, but were within the response capabilities of local law enforcement.

Iowa has not been immune to acts of terrorism or sabotage, the state has experienced many threats in the past. Most incidents have been limited to reported "suspect" powders, actual threats, and hoaxes. Beginning in October 2001, following the original "Amerithrax" scares, Iowa experienced a large number of responses for suspicious powders. Following the development of a threat assessment/response protocol the number of responses was reduced.

Incidents of agro-terrorism have occurred in the state of Iowa. Over the past 10 years Iowa has experienced incidents in which animal rights activists have vandalized or released animals in our agricultural facilities. Most prominently in 2004 animals were released at the University of Iowa. Recent clashes between activists and so-called factory farms have also been in the news recently. There has also been vandalism to agricultural facilities or incidents of disgruntled employees causing damage to animals and animal products. There are frequent cases of theft of agricultural machinery, products, and chemicals.

The chemical terrorism history, fortunately, has been limited. There have been recent instances where public officials nationally have received suspicious letters, and this certainly can happen in Iowa. In 2005 a subject mailed "rat poison" to a number of state and local officials. There have been recent instances where public officials nationally have received suspicious letters, and this certainly could happen in Iowa. One of the letters was torn open in a mail sorting machine in Des Moines, which led to the closure of the Main Post Office and the Emergency Room of Mercy Medical Center. Iowa experienced at least one event were subjects broke into a city's water supply and it was suspected that chemicals may have been deposited in the water supply. There have been many releases of anhydrous ammonia by persons engaged in clandestine drug manufacturing.

The state has experienced many bomb threats. During the spring of 2002, 18 pipe bombs were found in mailboxes in five states stretching from Illinois to Texas, including Iowa. Six people were injured in the bombings in Iowa and Illinois. In 2005 and 2006, pipe bombs were used in attempted murder cases in two Iowa cities. In 1991 there was a murder suicide at the University of Iowa. Recent national events have increased awareness pertaining to school safety, workplace safety, and vulnerability at public gatherings.

Documentation of the number of instances is difficult in the case of cyber terrorism, but there certainly are many instances where account information has been jeopardized. Many of these notifications are concerning private companies where there could be financial concerns with data breach. Iowa is home to large targets due to the financial and insurance industries located within its borders.

In Des Moines County, a majority of people and buildings could be injured or experience property damage from this hazard. The damage to structures due to terrorist attacks in Des Moines County would depend on the method and the level of the attack. It can be assumed that there would be large scale structural damage to the critical structures rather than residential structures since the intent is to hinder the functions of government. These critical structures include the Lock and Dam and the rail/automobile bridge that connects Illinois and Iowa.

Des Moines County has not experienced any confirmed terrorist or enemy attacks or activities. There is no history of radiological terrorism in Iowa.

Vulnerability: The federal government monitors the international political and military activities of other nations and would notify the State of Iowa of escalating military threats. There are many small military installations in Iowa; most are Iowa National Guard assets spread throughout the state comprised of various military units and functions. The Iowa Army Ammunition Plant is an example of a potential target within Des Moines County. Although, it is unlikely that any site in Des Moines County would be a primary target during a conventional attack.

Civil disturbances are often difficult for local communities to handle. There is a fine line between the Constitutional right of individuals and groups to assemble and air their grievances and the overall needs of the community to provide essential services, ensure personal safety of citizens, prevent property damage, and facilitate normal commerce. Fortunately, most demonstrations and large public gatherings are held in a peaceful, responsible manner. However, there never seems to be a shortage of groups (drugs and alcohol are often involved) whose primary objective is to disrupt normal activities and perhaps even cause injury and property damage. People at risk are mainly the willing participants and law enforcement officials. Innocent bystanders and their property can be at risk as well.

There could be a health risk to the residents of the community where the disorder occurs if violence breaks out, but this would likely be confined to the residents within the few block radius of the event.

Because of the limited number of law enforcement within Des Moines County, a large scale public disorder event would quickly strain the capacity of the communities and could become severe in terms of property damage, injury to first responders and residents. However, that damage should be confined to the small area of the incident.

Another type of event associated with this hazard would be a public shooting, such as in a school, shopping mall, or another public place where people gather. Based on past history of these events in the United States, the most likely places at risk would be school buildings. An active shooter at any one of these facilities could inflict substantial damages. Furthermore, the schools in greater Des Moines County, such as Danville CSD and Mediapolis CSD would likely be at a greater risk due to law enforcement response times. As seen in the community profile section, the Des Moines County Sheriff's Department is the law enforcement agency for both of those communities, in addition to the rest of the county, which would likely result in response times to an event at either one of those schools to be longer than if the event were to occur in Burlington or West Burlington. In addition to schools, other critical facilities such as local government offices could also be targets for this type of terrorism.

Unfortunately, there will never be a way to totally eliminate all types of these clandestine activities. If person or persons are inclined to cause death and destruction, they are usually capable of finding a way to carry out their plans. As perpetrators of terrorism improve their ability to collect information, raise money, and issue rhetoric, implementation of effective counter measures becomes even more important.

Since there is almost no record of acts of nuclear terrorism, an approach other than the traditional approach to probability of occurrence is needed to estimate the probability of occurrence. With no prior events by which to judge probability, it becomes necessary to consider the technical feasibility of radiological terrorism. Given that the radiation would kill anyone before they could amass enough material to produce a weapon, the threat is relatively low. Technical feasibility is important because whatever is feasible might also be realized, and might happen. The threat is relatively low because it is technically infeasible to construct such a weapon for terrorist uses.

Innocent people are often victims of terrorist activity targeted at certain organizations and activities. Based on the method of delivery, the general public is vulnerable to bioterrorism. The American public is not vaccinated for many of the agents used as weapons by terrorist groups.

Because of the unpredictable nature of a terrorist attack, it is reasonable to assume that Des Moines County is susceptible to such an attack. However, it is difficult to predict the severity and magnitude of a terrorist event on Des Moines County. It is reasonable

to say that because of the limited response personnel (see community profile section of this plan) and the limited equipment and training beyond the hazardous materials response team, the impact of a terrorist attack could be severe. Since the intent is to do the most damage and since Des Moines County only has three locations for the dispatch sheriff's office, and police departments, if a critical facility was struck the impact would be devastating in terms of both loss of life and property damage. There is a bridge and lock and dam that, if damaged, would severely impact the interstate commerce of the country with both rail and barge traffic needing to be diverted. Particularly vulnerable populations include the government employees housed in the critical facilities and public buildings, which are identified in the Community Profile section of this plan.

Warning Time:

Acts of terrorism can be immediate and often come after little or no warning. There are occasions where terrorists have warned the targeted organization beforehand, but often the attack comes without previous threat. Terrorists threaten people and facilities through "bomb threats" and other scare tactics. Even if it is a shallow threat, precautions must be taken to ensure the safety of the people and property involved.

Events that incite such activity can build up over hours, days, or years, and the violent disturbance is a culmination of the long-term situation. Civil disruptions can also escalate very rapidly following events where people are gathered such as sporting events, concerts, or speeches.

Scoring Analysis:

The Planning Committee considered the combined risk of all terrorism incidents during the scoring analysis and determined that Terrorism best fits the "unlikely" classification" and would have a "limited" severity impact. Additionally, the Planning Committee determined that little or no warning time would precede a terrorism incident.

5.7.15 Tornado

Tornado – Hazard Score Calculation				
Probability	**Magnitude/Severity**	**Warning Time**	**Duration**	**Weighted Score**
1.91	2.64	3.82	1.55	2.38

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.

Magnitude/ Severity: Generally the destructive path of tornadoes span a couple hundred feet in width, but stronger tornadoes can leave a path of devastation up to a mile wide. Normally a tornado will stay on the ground for no more than 20 minutes; however, one tornado can touch ground several times in different areas. Large hail, strong straight-line winds, heavy rains, flash flooding, and lightning are also associated with severe storms and may cause significant damage to a wider area.

EF Rating	Wind Speeds	Expected Damage
EF-0	65-85 mph	'Minor' damage: shingles blown off or parts of a roof peeled off, damage to gutters/siding, branches broken off trees, shallow rooted trees toppled.
EF-1	86-110 mph	'Moderate' damage: more significant roof damage, windows broken, exterior doors damaged or lost, mobile homes overturned or badly damaged.
EF-2	111-135 mph	'Considerable' damage: roofs torn off well constructed homes, homes shifted off their foundation, mobile homes completely destroyed, large trees snapped or uprooted, cars can be tossed.
EF-3	136-165 mph	'Severe' damage: entire stories of well constructed homes destroyed, significant damage done to large buildings, homes with weak foundations can be blown away, trees begin to lose their bark.
EF-4	166-200 mph	'Extreme' damage: Well constructed homes are leveled, cars are thrown significant distances, top story exterior walls of masonry buildings would likely collapse.
EF-5	> 200 mph	'Massive/incredible' damage: Well constructed homes are swept away, steel-reinforced concrete structures are critically damaged, high-rise buildings sustain severe structural damage, trees are usually completely debarked, stripped of branches and snapped.

The Enhanced Fujita Scale (EF) is used to assign a tornado a 'rating' based on estimated wind speeds and related damage. When tornado-related damage is surveyed, it is compared to a list of Damage Indicators and Degrees of Damage which help estimate better the range of wind speeds the tornado likely produced. From that, a rating (from EF0 to EF5) is assigned.

The National Weather Service is the only federal agency with authority to provide 'official' tornado EF Scale ratings. The Beaufort Wind Scale, shown on page 128, explains the relationship between structure damage and wind speeds as it pertains to EF tornado ratings.

Historical Occurrence:

Iowa is generally considered to be included in tornado alley, or on the edge of the geographic area. Between 2000 and 2013, Iowa has averaged more than 17 tornadoes per year. In Iowa, most tornadoes occur in the spring and summer months, but can also occur in the fall and winter seasons. Tornadoes tend to be the most common in the late afternoon or evening, but they can occur at any time of day.

The most recent strong-violent tornado in Iowa was an EF-4 tornado that struck Pocahontas County on April 9, 2011 with estimated wind speeds of 170 mph and a base around 600 yards wide that caused $2.5 million in damages according to the NCDC. On May 25, 2008 an EF-5 tornado struck the cities of Parkersburg, Dunkerton, and New Hartford, killing nine people. The tornado destroyed 296 buildings and caused damages of approximately $75 million. This was followed by an EF-2 tornado that struck the town of Attica on May 30, damaging dozens of homes and injuring ten people. The final tornado to affect Iowa in this string of summer storms occurred on June 11 when an EF-3 tornado struck a Boy Scout camp in the western Iowa town of Little Sioux, killing four scouts and injuring 48 people. In 2011 Iowa had two Presidentially Declared Disasters that included straight line winds in the disaster description.

The NCDC identifies 13 tornado events in Des Moines County from 1957-2013. Appendix B includes a record of historical occurrences from the National Climatic Data Center dating back to 1950.

In terms of property damage, one event stands out. The most significant event on record occurred on June 29, 1983 and caused $2,500,000 in property damage. The event details are described on the NCDC website:

> *"Tornado struck at midday in Burlington, moving along Roosevelt Avenue, a major business thoroughfare, at the lunch hour. Although the tornado was not fierce by most standards, the lack of fatalities on such a busy street can only be ascribed to Providence. Most of the injuries were minor, due to broken glass and only one person, apparently, required overnight care.*
>
> *Most of the damage to business was serious, but not devastating. This includes broken windows, minor roof damage, blown-down signs and the like. About three buildings lost part of their roofs. Tree and utility wires were downed. One home was badly damaged, the roof was taken off and walls buckled. Another 18 homes had minor damage. Estimates of damage that occurred ranged from $1.5 million to $4 million. Sheriff's Deputies followed the funnel along the Highway to Mediapolis, but after lifting up in Burlington, it only descended once near Sperry and again near Mediapolis, and caused damage to road signs.*

Vulnerability Those most at risk from tornadoes include people living in mobile homes, campgrounds, and other dwellings without secure foundations or basements. People in automobiles are also very vulnerable to twisters. The elderly, very young, and the physically and mentally handicapped are most vulnerable because of the lack of mobility to escape the path of destruction. People who may not understand watches and warnings due to language barriers are also at risk.

In Des Moines County, possible injury and/or property damage due to this hazard would be widespread. The amount of possible property damage can be seen in Figure 5.5 which shows the value of all assessed property in Des Moines County. A tornado would prove devastating to any structure it hit, regardless of whether it was a critical structure or not. The level of damage would be a total collapse of the structure in the most intense situation, with wind damage to roofs and siding to those structures not directly hit. Also, damage from flying debris could shatter windows and cause roof damage. The critical structures in Des Moines County are susceptible to wind damage and if hit directly, would not be able to function. Older buildings, buildings in poor condition, and mobile homes would be especially susceptible.

Mobile home parks would be of particular concern as they are home to a high density of residents with structures not built to withstand high wind speeds. In addition, places with high densities of people such as schools, nursing homes, and large apartment buildings are also vulnerable. Furthermore, several are located on the edges of communities where they are more susceptible to damages from tornados or high wind events. Appendix G lists and maps the locations of mobile home parks in Des Moines County.

Warning Time: Tornadoes strike with an incredible velocity. Wind speeds may approach 300 miles per hour and the storm can travel across the ground at more than 70 mph. These winds can uproot trees and structures and turn harmless objects into deadly missiles, all in a matter of seconds. The advancement in weather forecasting has allowed watches to be delivered to those in the path of these storms up to hours in advance. The best lead-time for a specific severe storm and tornado is about 30 minutes. Tornadoes have been known to change paths very rapidly and thus limiting the time needed to take shelter. Tornadoes may not be visible on the ground due to blowing dust or driving rain and hail.

Scoring Analysis: As seen in the Summary of Historical Events for Selected Hazards (figure 5.4), Tornado events have occurred, on average, slightly less than 1 out of 5 years in Des Moines County and are considered “occasional” risk. Impact severity was categorized as “limited” Additionally, the Planning Committee determined that little or no warning time would precede a tornado.

5.7.16 Transportation Incident

Transportation Incident – Hazard Score Calculation				
Probability	**Magnitude/Severity**	**Warning Time**	**Duration**	**Weighted Score**
1.82	1.73	4.00	1.73	2.11

Description: This hazard encompasses air transportation, highway transportation, and railway transportation, and waterway incidents. A transportation incident is described as an accident involving any mode of transportation that directly threatens life, property damage, injury, or adversely impacts a community's capabilities to provide emergency services.

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.

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. Hundreds of thousands of trips a day are made on the streets, roads, highways, and interstates in the state. 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. Numerous traffic accidents occur daily in Iowa and result in property damage and injury, major accidents involving multiple vehicles and serious injury are not uncommon.

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.

A **railway transportation incident** is a train accident that directly threatens life, property, or adversely impacts a community's capabilities ability to provide emergency services. Railway incidents may include derailments, collisions, and highway/rail crossing accidents. Train incidents can result from a variety of causes including human error, mechanical failure, faulty signals, or problems with the track. Results of an incident can range from minor "track hops" to catastrophic hazardous material incidents with human/animal casualties. With the many miles of track in Iowa, there are numerous at-grade crossings at which vehicles must cross the railroad tracks.

Magnitude/ Severity:

A significant **air transportation incident** can happen anywhere, but would most likely occur near an airport. Statistics from the National Transportation Safety Board and the airline industry show that the majority (over 75%) of airplane crashes and accidents occur during the takeoff or landing phases of a flight. Accordingly, the spatial extent of the majority of incidents would occur on airport grounds or adjacent areas. Compared to many other hazards, an air transportation accident would occupy a relatively small area.

The level of severity would depend on the type of aircraft involved, the type of cargo being transported, and the area on the ground on which the accident occurred. For example, if a cargo plane transporting volatile or hazardous substances were involved in an accident, the area of concern would be significantly larger than for an accident involving a small personal aircraft carrying stable materials. The largest share of accidents would likely affect only a few city blocks.

Despite the increase in the number of people using air travel, incidents that require response personnel and involve casualties are not likely to increase due to advances in the quality of training, equipment, and safety. Proper land-use near the airport will also decrease the chance that people and property on the ground will suffer significant impacts in the event of an air transportation accident.

Railway incidents can occur on the numerous railways crisscross Iowa. Vehicle/train collisions are usually limited to areas in and near the intersection. Rarely, the incident will result in widespread effects. The direct area of impact is usually quite small, but depending on the products and materials involved, the area could become extensive. If hazardous materials are involved, the effects could reach areas up to 1.5 miles from the scene. Harmful products may contaminate streams, rivers, water distribution systems, and storm water systems. If this occurs a large portion of the community could be affected. The ability of response agencies to contain the product on-scene usually limits the area affected.

Highway transportation incidents occur frequently, although traffic engineering, inspection of traffic facilities, land use management of adjacent areas to roads and highways, and the readiness of local response agencies has improved. The combination of large numbers of people on the road, unpredictable weather conditions, potential mechanical problems, and human error create the potential for a transportation accident.

Highway and railway incidents can result in death, injury, and property damage. Deaths and injuries can range from those directly involved, to citizens in the community affected by hazardous materials. If a railway incident occurred in the communities or other densely populated areas of Des Moines County, the health and welfare of thousands of people could be put in jeopardy. Damage may be limited to the train, railcars, and cargo involved, but it can also include loss of production, business disruption due to evacuations, and business disruptions of those served by the railroad. Business and traffic disruptions could last several days until the clean-up efforts are complete.

The maximum extent of a **waterway incident** would be limited. Impacts would not extend beyond the immediate incident scene. The only exception would include a search and rescue event that could expand downstream. In the case of a hazardous material being released to the waterway, the impact could expand considerably.

Historical Occurrence:

From 1962 to 2010, there were approximately 2,035 (around 40 per year) **air transportation incidents/accidents** in Iowa according to the National Transportation Safety Board. Since the year 2000 only 214 air transportation incidents (around 16 per year), so the number of incidents is dropping due to advances in air transportation safety. Probably the most significant air transportation incident occurred in 1989 when one hundred eleven (111) fatalities were recorded in the crash of United Flight 232 in Sioux City, Iowa.

Des Moines County has one publicly owned airport, the Southeast Iowa Regional Airport in Burlington, which provides commercial service to Chicago and St. Louis as well as general aviation services.

With the 3,945 miles of track in Iowa in 2010, vehicles must cross the railroad tracks at numerous at-grade crossings. In 2012 there were 6,943 railroad crossings in Iowa with 4,348 public crossings, and 2,558 private crossings. In 2011 there were 37 highway/rail crashes. Derailments are also possible, while a major derailment would occur less frequently. In 2011 there were 45 derailments in Iowa with no injuries or fatalities reported. Des Moines County has not experienced any non-hazardous materials **railway incidents** in the recent years, however the increase in shipping of Bakken crude oil via rail networks represents a significant risk to the communities of Des Moines County.

Oil being shipped from the Bakken Shale Formation is more volatile than other types of crude and because it is both flammable and explosive, has the potential to cause a severe transportation incident. Improved safety standards and awareness will help alleviate this risk but the movement of such material through Des Moines County still represents a significant potential hazard to the region.

There have been no large-scale disasters causing waterway incidents in Iowa or Des Moines County. There have been numerous search and rescue events involving a single person or small boats with only a few people on board. Small-scale incidents on the state's lakes and rivers have resulted in the loss of life from pleasure craft collisions and/or falls from vessels.

Vulnerability: The lives and health of the pilot, crew, passengers, and the population on the ground would be at risk by an **air transportation incident**. There are very few injuries and fatalities when compared to the number of people involved in travel as a whole, but if there is an accident, it is very likely that the injuries will be serious or fatal.

Significant damage can also occur to property on the ground. Developed areas adjacent to the airports and in airport flight paths are particularly vulnerable to an air transportation incident. For areas away from the airport, a smaller percentage of the population would be directly in the area of impact. Because of the infrequency of aircraft in the skies above areas away from the airport, these areas would not be considered as vulnerable. Often buildings, fences, utility lines, and trees are damaged or destroyed in the event of a plane crash. The cargo aboard a plane that has crashed can also sustain damage or destruction. This too can be extremely costly. Damage to the aircraft itself is costly to the owner in terms of direct value lost and amount lost because the airplane is now out of commission.

The severity and magnitude of a substantial air transportation event in Des Moines County would depend upon where one occurred. If the aircraft struck a critical facility, the response capability of the County could be pushed beyond its limit and delayed response could increase the likelihood of deaths and injuries. Any direct hit to a structure would be devastating, regardless of whether it was a critical structure or a commercial or residential structure. Structures underneath the flight paths would be more vulnerable than others. This includes the hospital, the community college, and a number of residential structures. The Southeast Iowa Regional Airport, which is the region's primary airport, borders a residential community in the City of Burlington. An aviation accident at this airport could fairly easily affect the population living nearby.

People and property in close proximity to the railway lines, crossings, sidings, switching stations, and loading/unloading points or near the vehicle highways are most at risk from **railway transportation incidents** and **highway transportation incidents**. Those away from the highways or railroad tracks and facilities are vulnerable only to large-scale incidents including those in which hazardous materials are involved.

As detailed in the community profile section, Des Moines County has a very high amount of freight and passenger rail traffic going through the communities within the County on a daily basis. If there was derailment next to a business or at a key intersection, there could be extensive loss of life. The increase in shipping of Bakken crude oil via rail represents an even higher risk to the residents of Des Moines County that live near railroad tracks. Another possible impact would be the loss of life if there was a transportation incident involving a passenger train, such as the California Zephyr Amtrak route which passes through Des Moines County. Des Moines County has equipment to evacuate the passengers; however, if there is also a hazardous materials risk, this would delay the response capabilities of the fire department until they could determine the extensiveness of the risk.

Des Moines County has significant highway and railway traffic, with several railroad lines cutting through highly populated areas, most notably in Burlington and West Burlington. Burlington has an active railroad track which cuts right through its central business district, which represents a significant risk of property damage and potential loss of life if there were an accident, especially if it involved hazardous materials. Des Moines County also has significant barge traffic on the Mississippi River, which has the potential to damage important infrastructure such as bridges. A specific example of a potential disaster would be a waterway accident involving the Highway 34 bridge. If the four lane bridge had to close due to a waterway accident, this would have a significant impact on the economy of the region. Damages to the railroad bridge in Burlington, just south of the Highway 34 bridge, would be similarly disruptive to the economy of the region.

Warning Time:

The amount of warning time prior to an aircraft accident could vary from tens of minutes to a matter of seconds. Crew aboard a troubled aircraft can radio to ground crew to prepare for the incident, but little can be done to lessen the direct effects of the impact. Rarely is there adequate time to do more than position on-site response personnel and alert mass casualty care providers of the possible event.

Like other transportation incidents, a highway or railway incident would occur with no warning. There may be a limited amount of time to warn those in the pathway of the harmful effects.

Waterway Incidents would occur with little or no warning. Leading causes of waterway incidents are inclement weather and operator error. Weather forecasts are usually available days in advance and would give ample time to take shelter off the water.

Scoring Analysis:

The Planning Committee considered the combined risk of all transportation incidents during the scoring analysis and determined that Transportation Incident is best categorized as an “occasional” risk with a “limited” impact severity. Additionally, the Planning Committee determined that little or no warning time would precede a transportation incident.

5.7.17 Thunderstorms / Lightning / Hail / Windstorms

Thunderstorms/Lightning/Hail/Wind – Hazard Score Calculation				
Probability	**Magnitude/Severity**	**Warning Time**	**Duration**	**Weighted Score**
4.00	1.00	3.00	2.00	2.75

Description:

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. Most thunderstorms produce thunder, lightning, and rain. Severe storms can also produce tornadoes, straight-line winds above 58 mph, microburst, 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. Thunderstorms also may occur singly, in clusters, or in lines, so it is possible that several thunderstorms may affect the same area in the course of a few hours.

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 fall with rain. Hail is produced in many strong thunderstorms by strong rising currents of air carrying water droplets to a height where freezing occurs, the ice particles grow in size until they are too heavy to be supported by the updraft and fall back to earth. Hail can be smaller than a pea or as large as a softball and can be very destructive to humans, animals and livestock, plants and crops, and personal property. Pets and livestock are particularly vulnerable to hail.

Windstorms are extreme winds associated with severe winter storms, severe thunderstorms, downbursts, and very steep pressure gradients.

Magnitude/ Severity:

Like tornadoes, thunderstorms and lightning can cause death, serious injury, and substantial property damage. Severe thunderstorms can bring a variety of associated hazards with them including straight-line winds in excess of 100 mph. Straight-line winds are responsible for most thunderstorm damage. High winds can damage trees, homes (especially mobile homes), businesses, and can knock vehicles off of the road. The power of lightning's electrical charge and intense heat can electrocute people and livestock on contact, split trees, ignite fires, and cause electrical failures.

Thunderstorms can also bring large hail that can damage homes and businesses, break glass, destroy vehicles, and cause bodily injury to people, pets, and livestock. One or more severe thunderstorms occurring over a short period (especially on saturated ground) can lead to flooding and cause extensive power and communication outages as well as agricultural damage.

Severe thunderstorms can be quite expansive with areas of localized severe conditions. Most severe thunderstorm cells are 5 to 25 miles wide with a larger area of heavy rain and strong winds around the main cell. Most non-severe thunderstorms have a life span of 20 to 30 minutes while severe thunderstorms last longer than 30 minutes.

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.

Beaufort Wind Scale

Windspeed in MPH	Description - Visible Condition
0	Calm smoke rises vertically
1 - 4	Light air direction of wind shown by smoke but not by wind vanes
4 - 7	Light breeze wind felt on face; leaves rustle; ordinary wind vane moved by wind
8 - 12	Gentle breeze leaves and small twigs in constant motion; wind extends light flag
13 - 18	Moderate breeze raises dust and loose paper; small branches are moved
19 - 24	Fresh breeze small trees in leaf begin to sway; crested wavelets form on inland water
25 - 31	Strong breeze large branches in motion; telephone wires whistle; umbrellas used with difficulty
32 - 38	Moderate gale whole trees in motion; inconvenience in walking against wind
39 - 46	Fresh gale breaks twigs off trees; generally impedes progress
47 - 54	Strong gale slight structural damage occurs; chimney pots and slates removed
55 - 63	Whole gale trees uprooted; considerable structural damage occurs
64 - 72	Storm very rarely experienced; accompanied by widespread damage
73+	Hurricane devastation occurs

The Beaufort Wind Scale describes expected conditions given various wind speeds. Since 1988, four events with wind speeds in excess of 50 knots have occurred in Des Moines County. Appendix B includes a record of historical occurrences from the National Climatic Data Center.

Historical Occurrence: Data collected from the NCDC shows Iowa experiences many thunderstorm and lightning events every year. With Iowa's location in the interior of the U.S., there is a very high likelihood that a few of these summer storms will become severe and cause damage. The humid continental climate of Iowa frequently provides the ingredients for a severe thunderstorm. These ingredients include moisture to form clouds and rain, relatively warm and unstable air that can rise rapidly, and weather fronts and convective systems that lift air masses.

In 2011 Iowa had two Presidentially Declared Disasters that included straight line winds in the disaster description. The NCDC shows Iowa has experienced 4 instances where recorded wind speeds equaled or exceeded 100 knots since 2009. Since 2000 Iowa has experienced 78 instances of wind speeds at or exceeding 70 knots.

The NCDC lists thunderstorm-related events in Des Moines County, and one storm can be listed as multiple events. The NCDC data is not perfect, but represents best available data. Associated hazards related to thunderstorms are discussed further as individual hazards (tornado and various kinds of flooding). Appendix B includes a record of historical occurrences from the National Climatic Data Center.

Vulnerability: Thunderstorms are hazards unto themselves, but can cause other hazards such as flash flooding, river flooding, and tornadoes. Those in unprotected areas, mobile homes, or automobiles during a storm are especially at risk. Sudden strong winds often accompany a severe thunderstorm and may blow down trees across roads and power lines. Lightning presents the greatest immediate danger to people and livestock during a thunderstorm. It is the second most frequent weather-related killer in the U.S. with nearly 100 deaths and 500 injuries each year (after flash floods). Livestock and people who are outdoors, especially under a tree (or other natural lightning rods); in or on water; or on or near hilltops are at risk from lightning. Hail can be very dangerous to people, pets, and livestock if shelter is not available. People who are in automobiles or along low-lying areas when flash flooding occurs and people who are in mobile homes are vulnerable to the impacts of severe thunderstorms.

In Des Moines County, a majority of people and buildings are vulnerable and may be injured or experience property damage from this hazard. The amount of possible property damage can be seen in Figure 5.5 which shows the value of all assessed property in Des Moines County. Damage caused by a severe thunderstorm will likely most impact personal property, particularly older structures. Over 80% of the residential and commercial buildings in Des Moines County were built prior to 1980, and may be

more likely to experience roofing damage and damage to the siding during high winds and lightening.

Many critical facilities are older structures, including city halls and fire and the police stations, and may be more susceptible to damage. However, critical facilities should be able to continue to operate. Mobile home parks may also sustain wind damage and are at risk for toppling over in high winds. All of the structures within the county, regardless of whether they are critical facilities or not, are at risk of damage due to this hazard.

These hazards could affect a large majority of the population and area of Des Moines County. However, there is particular risk to the elderly population since lightning and windstorms can trigger loss of electricity and thus air conditioning in the summer and heat in the cooler winter months. Elderly and children under 18 are populations that would be more adversely affected by loss of power than the remainder of the population.

Critical facilities such as the water treatment plant, the hospital, and some government buildings all have generator backup. However, come critical facilities do not have generators.

Warning Time:

Some thunderstorms can be seen approaching, while others hit without warning. The National Weather Service issues severe thunderstorm watches and warnings as well as statements about severe weather and localized storms. These messages are broadcast over NOAA Weather Alert Radios and area TV and radio stations. Advances in weather prediction and surveillance have increased warning times. The resolutions of radar and Doppler radar have increased the accuracy of storm location and direction. Weather forecasting and severe weather warnings issued by the National Weather Service usually provide residents and visitors alike adequate time to prepare. Isolated problems arise when warnings are ignored.

The National Weather Service has developed a windstorm warning system similar to other events such as, tornado, winter storm, and thunderstorm. Watches are issued when conditions are favorable for windstorms to develop and they come 12 to 24 hours in advance. Advisories are issued when existing or imminent windstorms cover part or all of the area and pose an inconvenience. Windstorm warnings are issued when existing or imminent high winds cover part or all of the forecast area and pose a threat to life and property.

Scoring Analysis:

The Planning Committee considered the combined risk of thunderstorm, lightning, hail, and windstorm incidents during the scoring analysis and determined that this hazard is “highly likely” to occur. Impact severity is best categorized as “negligible” in terms of injuries, fatalities, and property damage.

5.8 Hazard Scoring Summary

Using calculated scores and scores collected from individual members of the planning committee, Figure 5.6 shows the scoring results for probability, magnitude/severity, warning time, and duration for each hazard relevant to Des Moines County. The "total score" shows the final hazard assessment score after applying the weighted formula for each hazard.

Figure 5.6 Hazard Ranking by Risk Assessment Score

RANK	HAZARD TYPE	Probability (.45)	Magnitude/Severity (.30)	Warning Time (.15)	Duration (.10)	Total Score	
1	Thunderstorms/Lightning/ Windstorm/Hail	4.00	1.00	3.00	2.00	2.75	PRIORITY GROUP I
2	River Flood	2.64	3.09	1.27	4.00	2.70	
3	Severe Winter Storms	3.73	1.73	1.36	2.64	2.66	
4	Levee Failure/Dam Failure	1.64	3.45	3.36	3.45	2.62	
5	Flash Flood	2.91	1.91	2.64	2.18	2.50	
6	Tornado	1.91	2.64	3.82	1.55	2.38	
7	Drought	2.45	2.64	1.00	3.91	2.44	PRIORITY GROUP II
8	Infrastructure Failure	1.64	2.36	3.82	2.45	2.26	
9	Hazardous Materials	2.18	1.55	3.91	2.09	2.24	
10	Human Disease	1.27	2.82	2.27	3.91	2.15	
11	Terrorism	1.00	2.82	4.00	2.36	2.13	
12	Animal/Plant/Crop Disease	1.73	2.45	1.55	3.73	2.12	
13	Transportation Incident	1.82	1.73	4.00	1.73	2.11	
14	Grass or Wildfire	2.18	1.18	3.82	1.73	2.08	
15	Extreme Heat	2.36	1.45	1.00	2.73	1.92	PRIORITY GROUP III
16	Landslide	1.36	1.55	3.91	1.91	1.85	
17	Earthquakes	1.09	1.82	4.00	1.00	1.74	

The table ranks hazards by total score, highest to lowest, which a considered "hazard rankings". The hazards are further sorted into categories of "priority group I", "priority group II", and "priority group III". The resulting groups help illustrate relative risk among hazards in Des Moines County. The planning committee discussed adjustments to the rankings after scores were calculated and ranked the hazards as grouped above. The committee placed drought in the Priority Group II and tornado in Priority Group I, as the committee felt that the scores of each hazard did not accurately place the hazards.

"Priority Group I" hazards include: thunderstorms/lightning/windstorm/hail, river flood, severe winter storms, levee failure/dam failure, flash flood, tornado

"Priority Group II" hazards include: drought, infrastructure failure, hazardous materials, human disease, terrorism, animal/plant/crop disease, transportation incident, and grass/wildfire

"Priority Group III" hazards include: extreme heat, landslide, and earthquakes

VI. Des Moines County | Mitigation Strategies

This section identifies how the Des Moines County mitigation activities has been implemented since FEMA-approval of the previous plans. In addition to the activity status updates, this section includes future mitigation measures to be pursued by each participating jurisdiction during the upcoming planning cycle. Implementation of future activities depends upon the resources and support available.

6.1 Current Mitigation Measure Status

Participating jurisdictions have completed or are currently implementing activities pursuant to previously identified measures. The following table explains steps taken toward implementation of existing mitigation strategies. Additionally, the table identifies the jurisdictions adopting each strategy.

Activity Status Updates

Activities from prior plans may be or may not be relevant to this plan update. The "activity status update" explains whether or not the activity will be included as a mitigation measure for the next planning cycle. Activities status descriptions include:

- **Completed:** Activities will not be carried over to the next planning cycle
- **Deleted:** Activities were not implemented and will not be pursued in the next planning cycle. *No existing activities have been deleted.*
- **Carried Over:** Activities that have not started or are in progress
- **Completed & Carried Cover:** Activities are on-going or otherwise carried over based on new information.

At community and planning meetings, attendees were given worksheets describing activities adopted by their respective jurisdictions for the previous planning cycle. The current mitigation measure status table includes information provided by committee members, which may not be a full account of all mitigation activity.

This section also includes a list of mitigation measures completed or in progress, but not identified in previous plans.

Mitigation Measure / Update	Activity Status Update	Adopted By	Hazard addressed
Obtain and implement Code Red Capabilities throughout Des Moines County. • Documents have been signed to begin implementation of Iowa Alerts, which will actually replace Code Red.	Carried Over	Des Moines County City of Burlington City of Danville City of Mediapolis City of Middletown City of West Burlington Burlington CSD Danville CSD Mediapolis CSD West Burlington ISD Southeastern Community College Two Rivers Levee District	Multiple Hazards
Develop and implement natural and technological hazard education and outreach programs to increase awareness through the following means: Masters of Disasters, Blood Drives, Senior Health Fair, Crime Prevention Week, Safe Boating, Fire Safety Awareness Week, Meth Lab Awareness, and National Incident Management Systems. • Burlington CSD has a variety of education awareness weeks in addition to a health fair and blood drives	Completed & Carried Over	Des Moines County City of Burlington City of Danville City of Mediapolis City of Middletown City of West Burlington Burlington CSD Danville CSD Mediapolis CSD West Burlington ISD Southeastern Community College	Multiple Hazards
Obtain an All-Terrain-Vehicle for first responders/emergency purposes • City of Mediapolis still waiting for funding for purchase of vehicle • Des Moines County received a grant for Burlington Fire Department but a unit is needed for Sheriff's Office.	Completed & Carried Over	Des Moines County City of Mediapolis	Multiple Hazards

Mitigation Measure / Update	Activity Status Update	Adopted By	Hazard addressed
Saferoom development • Both Burlington CSD and Danville CSD have built a saferoom	Completed	Danville CSD Burlington CSD	Multiple Hazards
	Carried Over	City of Mediapolis City of Danville City of Burlington City of Middletown Southeastern Community College	
	Deleted	West Burlington ISD Mediapolis CSD City of West Burlington	
Special needs assessment • City of Burlington has installed a number of ADA ramps on sidewalks	Completed & Carried Over	Des Moines County City of Burlington City of Danville City of Mediapolis City of West Burlington Burlington CSD Danville CSD West Burlington ISD Southeastern Community College	Multiple Hazards
Digital mapping of community and infrastructure	Carried Over	City of Danville	Multiple Hazards
Obtain necessary information for future vulnerability assessments	Carried Over	Des Moines County City of Burlington City of Danville City of Mediapolis City of Middletown City of West Burlington Burlington CSD Danville CSD Mediapolis CSD Southeastern Community College	Multiple Hazards
Assess the current state, map location of, and study possible affected areas for all existing dams within Des Moines County • County Conservation completed a dam failure plan for the Big Hollow Dam.	Completed & Carried Over	Des Moines County	Levee/Dam Failure

Mitigation Measure / Update	Activity Status Update	Adopted By	Hazard addressed
Implement a fire awareness campaign during dry conditions to discourage leaf burning and yard waste burning in order to protect existing buildings and infrastructure • County has utilized news releases to notify the public during past drought incidents	Completed & Carried Over	Des Moines County	Drought
Equip and train local authorities to be able to appropriately respond to a large scale enemy attack including sniper rifles, and continued operation and training for Tactical Response Unit (TRU) • Some equipment has been purchased but additional equipment and training is needed.	Completed & Carried Over	Des Moines County	Enemy Attack
Equip local authorities to be able to appropriately respond to a large scale enemy attack such as a Bearcat vehicle for IAAAP response • County was able to purchase an ATV vehicle but additional vehicles are needed.	Completed & Carried Over	Des Moines County	Enemy Attack
Educate the public regarding: a) shelter locations b) hot weather precautions c) free fan distribution d) providing sufficient shade and water for animals • City of Mediapolis publicizes the use of City Hall as a cooling shelter in newsletters and the newspaper.	Completed & Carried Over	Des Moines County Burlington CSD Danville CSD Mediapolis CSD West Burlington CSD City of Danville City of Burlington City of Mediapolis City of Middletown City of West Burlington	Extreme Heat

Mitigation Measure / Update	Activity Status Update	Adopted By	Hazard addressed
Educate the public regarding: a) proper us e and disposal of household, commercial, and industrial hazardous waste; b) reporting requirements of use, storage, and spills of hazardous materials; c) proper handling of hazardous materials; d) information on who to contact in the event of a spill or hazmat incident; e) public shelters • Des Moines County Landfill has outreach efforts to educate public on hazardous waste disposal	Completed & Carried Over	Des Moines County City of Burlington City of Danville City of Mediapolis	Hazardous Materials
Ensure the training, equipment, and knowledge of the existing HazMat team is maintained. • County HazMat team trains on a regular basis. Equipment has been purchased but additional items are needed.	Completed & Carried Over	Des Moines County City of Burlington City of Danville City of Mediapolis City of Middletown City of West Burlington	Hazardous Materials
Disease surveillance and awareness program in collaboration with the Iowa Department of Public Health to alert local doctors, day care centers, and schools of potential warnings and disease characteristics • Public Health Department continually conducts outreach programs	Completed & Carried Over	Des Moines County	Human Disease
Conduct mass immunization drills to ensure proper procedures and supplies are in place and to ensure collaboration between state, county, and local health departments, local emergency responders, Red Cross and other non-profit agencies and assess agency cost of response.	Completed & Carried Over	Des Moines County	Human Disease

Mitigation Measure / Update	Activity Status Update	Adopted By	Hazard addressed
Educate the public and health care providers on information regarding communicable diseases and outbreaks and immunization clinics and locations	Completed & Carried Over	Des Moines County	Human Disease
Update current law enforcement and first responder radio equipment • Some computer/radio systems for county vehicles were updated for the Conservation Department. • Law enforcement in the county is currently going through the process to update radio equipment.	Completed & Carried Over	Des Moines County City of Burlington City of Mediapolis City of Danville City of West Burlington	Infrastructure Failure
Develop a comprehensive shelter list	Competed & Carried Over	Des Moines County City of Burlington City of Danville City of Mediapolis City of Middletown City of West Burlington Burlington CSD Danville CSD Mediapolis CSD West Burlington ISD Southeastern Community College	Infrastructure Failure
Ensure a generator backup is available in critical facilities including schools and shelters • Mediapolis applied for grant for generator. • Burlington CSD has a generator for their saferoom	Completed & Carried Over	Danville CSD City of Danville	Infrastructure Failure
	Carried Over	Des Moines County City of Burlington City of Mediapolis City of Danville City of Middletown Burlington CSD Mediapolis CSD West Burlington CSD Southeastern Community College	

Mitigation Measure / Update	Activity Status Update	Adopted By	Hazard addressed
Educate the public on installation/update of smoke detectors, fire awareness and prevention campaigns in the schools, use of the 911 system, and who to contact in case of gas leak or fire • Outreach through Burlington Fire Department • Annual fire safety week at Burlington CSD	Completed & Carried Over	Des Moines County City of Burlington City of Danville City of Mediapolis City of Middletown City of West Burlington Burlington CSD Danville CSD Mediapolis CSD West Burlington CSD Southeastern Community College	Infrastructure Failure
Update and enforce building codes through required inspection in order to protect new and existing buildings and infrastructure • Some communities lack the personnel in order to effectively meet this mitigation measure.	Completed & Carried Over	City of Burlington City of West Burlington	Infrastructure Failure
	Carried Over	City of Danville City of Middletown	
	Deleted	City of Mediapolis	
Regionalize public safety communications ability through enhanced technology and infrastructure and dispatch capability including conducting a benefit cost/analysis of a regional public safety community function.	Completed & Carried Over	Des Moines County City of Mediapolis City of Danville City of Burlington City of Middletown City of West Burlington	Infrastructure Failure
Educate the Public regarding a) requirements of the floodplain ordinance b) flood water hazard precautions c) maintaining status with NFIP d) levee certifications	Completed & Carried Over	Des Moines County City of Burlington Two Rivers Levee and Drainage Association	River Flood
Elevation of structures, acquisition of structures, elevation of roadways, addition of culverts, and addition of lift stations	Completed and Carried Over	Des Moines County City of Burlington Two Rivers Levee and Drainage Association	River Flood

Mitigation Measure / Update	Activity Status Update	Adopted By	Hazard addressed
Educate the public on precautions to take in event of severe, storms and about dangerous routes and roads.	Completed & Carried Over	Des Moines County City of Burlington City of Danville City of Mediapolis City of Middletown City of West Burlington Burlington CSD Danville CSD Mediapolis CSD West Burlington ISD Southeastern Community College	Severe Winter Storms
Encourage utility companies to increase the percentage of cables that are underground	Completed & Carried Over	Des Moines County City of Burlington City of Danville City of Mediapolis City of Middletown	Severe Winter Storms
	Deleted	City of West Burlington	
Educate the Public regarding a) precautions to take when outdoors during severe weather; b) driving precautions and advisories; c) use of NOAA weather radios d) safe room locations	Completed & Carried Over	Des Moines County City of Burlington City of Danville City of Mediapolis City of Middletown City of West Burlington Burlington CSD Danville CSD Mediapolis CSD West Burlington ISD Southeastern Community College	Thunderstorms/ Lightning/Hail/ Windstorms
Cooperate with utility companies and residents to ensure tree-trimming around power lines and structures in order to protect new and existing buildings and infrastructure • Alliant Energy does most of work with communities assisting as necessary.	Completed & Carried Over	Des Moines County City of Burlington City of Danville City of Mediapolis City of Middletown City of West Burlington	Thunderstorms/ Lightning/Hail/ Windstorms

Mitigation Measure / Update	Activity Status Update	Adopted By	Hazard addressed
Acquire wood chipper to quickly handle storm debris. • City of Burlington has a chipper • City of Mediapolis did not have funds	Completed & Carried Over	City of Burlington	Thunderstorms/ Lightning/Hail/ Windstorms
	Deleted	City of Mediapolis	
	Carried Over	City of Danville City of Middletown	
Update storm sewer capacity and sewer lining, and develop storm retention basins.	Carried Over	City of Danville City of Mediapolis City of Middletown City of West Burlington (basisns)	Thunderstorms/ Lightning/Hail/ Windstorms
	Completed & Carried Over	City of Burlington City of West Burlington (capacity & lining)	
Educate the Public regarding a) driving precautions during severe weather conditions and b) precautions for boating and water sports safety.	Completed & Carried Over	Des Moines County City of Danville City of Mediapolis City of Burlington City of Middletown	Transportation Incidents
Ensure cooperation with railway industry to ensure quick response and adequate information regarding number of passengers and type of product being transported.	Completed & Carried Over	Des Moines County	Transportation Incidents
Test and expand the siren warning system in the County • Mediapolis has applied for a siren grant (2015)	Carried Over	City of Danville City of Mediapolis City of West Burlington	Tornado
Educate the public on proper response to sirens, tornado safe room locations, assessing watch and warning information, and weather advisories and warnings by the National Weather Service	Completed & Carried Over	Des Moines County City of Burlington City of Danville City of Mediapolis City of Middletown City of West Burlington Burlington CSD Danville CSD Mediapolis CSD West Burlington ISD Southeastern Community College	Tornado

6.2 Future Mitigation Alternatives

While the participating jurisdictions have undertaken several mitigation measures in an effort to address the hazards that impact the community, they recognize that there are additional measures that can be taken to protect the citizens, property, and the environment by reducing potential impacts of natural and man-made disasters. These mitigation measures can also assist in the community's ability to recover from a disaster.

The list of mitigation alternatives consists of mitigation alternatives carried over from the previous FEMA-adopted plan for Des Moines County (some of which were slightly revised for the update), new mitigation alternatives identified during planning meetings, new "best practices" contributed by SEIRPC and Des Moines County Emergency Management, and new alternatives derived from priorities identified in the State of Iowa Hazard Mitigation Plan.

The Hazard Committee evaluated the mitigation alternatives for the County and the participating communities to consider. All of the mitigation alternatives were considered by the Hazard Committee, unincorporated Des Moines County, and the communities of Burlington, West Burlington, Mediapolis, Danville, and Middletown, Two Rivers Levee and Drainage Association, Southeastern Community College, Burlington CSD, West Burlington ISD, Danville CSD, Mediapolis CSD, and Notre Dame Schools. Commitee members completed worksheets for recommending that mitigation alternatives be adopted by their respective communities and responses from the worksheets were compiled by SEIRPC and were used to make recommendations to the Board of Supervisors, City Councils, and School Boards, who could consider the recommendations when making decisions about which mitigation measures to formally adopt.

Organization of Mitigation Alternatives

The future mitigation alternatives identified in this section are categorized by the specific hazard being addressed. Hazard types are organized by ranking, with the highest ranked hazard being discussed first. Mitigation alternatives are listed below each hazard type.

Detailed information can be found below each mitigation alternative, including which jurisdictions adopted the alternative[10], the short and long term goals addressed by the alternative, an assessment of costs and funding sources, prioritization, parties responsible for implementation, and target completion dates. Target completion dates reflect the general timeframe for completion. Types of information used to explain the mitigation alternative are described here in more detail:

[10] Until the mitigation measures have been formally adopted, as evident the Resolutions included in Section II of this Plan, "Jurisdictions Adopting Activity" indicates that the mitigation alternative is recommended to the governing bodies of the named jurisdictions.

Analysis: Action items are those specific mitigation measures the Committee felt would align with the stated goals in the Pre-Disaster Mitigation Plan and would address the identified hazards that could impact the community. The analysis addresses key areas affecting obstacles, prioritization, and other information relevant to implementation of the action item.

Cost/Funding Source: Each action item includes approximation, when known, of the cost of the project and any potential areas of funding that is or could be pursued.

Additional Hazards Addressed: While the action was developed specifically for the primary hazard, the mitigation measures can also help mitigate other hazards. Additional hazards addressed by the activity are listed in the table, and are used to determine scores for the purpose of determining prioritization of activities.

Prioritization: Following the methodology from the 2013 Iowa Hazard Mitigation, measures were scored according to the hazard priority group classification (see Section 5.6) of the hazard(s) in which the measure is designed to address. A measure that addresses a hazard listed in priority group I was given a score of 3 points, priority group II a score of 2 points, and priority group III a score of 1 point. Additional hazards addressed by the activity are factored into the total score. While all mitigation measures are important, higher priority activities reflect increased risk or vulnerability and/or mitigate multiple disasters. Activities are categorized as high, medium, or low priorities based the following breakdown: Low Priority (0 to 5 points); Medium Priority (6 to 10 points); High Priority (more than 10 points).

The scoring was applied generally across all mitigation measures. Each jurisdiction, through their respective members on the planning committee and through the adoption process, had the option to reprioritize and activity based on their specific risk or vulnerability to the hazard.

No other revisions were suggested.

Timeline: Action items include both short and long-term activities. Each action item includes an estimate of the timeline for implementation. Many activities are **on-going** with no specific target date, but remain an important part of the mitigation plan moving forward. **Short-term** action items are activities which city agencies are capable of implementing with existing resources and authorities within one to two years. **Medium-term** action items may require new or additional resources or authorities, and may be between one and five years to implement. **Long-term** action items may not be fully realized for more than five years.

Responsible Parties: The coordinating organization is the public agency representative with regulatory responsibility to address the hazard, or that is willing and able to organize resources, find appropriate funding, or oversee activity implementation, monitoring, and evaluation. The title of the individual(s) responsible for each mitigation measure is applicable to a participating jurisdiction only when the position exists. The identified parties may appoint a designee to assume responsibility for a mitigation action.

Plan goals addressed: The plan goals addressed by each action item are identified as a means for monitoring and evaluating how well the mitigation plan is achieving its goals following implementation.

1. Multiple Hazards

1.1 Develop, implement, and maintain natural and technological hazard education and outreach programs to increase awareness through but not limited to, the following means: Masters of Disasters, Blood Drives, Senior Health Fair, Crime Prevention Week, Safe Boating, Fire Safety Awareness Week, Meth Lab Awareness, and National Incident Management Systems.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, City of Danville, City of Mediapolis, City of Middletown, City of West Burlington, Burlington CSD, Danville CSD, Mediapolis CSD, West Burlington ISD, Southeastern Community College

Goals Addressed: 3

Analysis	Education provides the public with most recent information regarding risk and response to natural disasters, and does not involve any changes to structures or infrastructure.
Cost/Funding Source	A qualitative assessment suggests that the costs versus benefits of education are difficult to measure. This program is already fundable under current operating budgets.
Additional Hazards Addressed	All hazards are addressed
Prioritization	HIGH (37 points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Police Chiefs, Fire Chiefs, Mayors, American Red Cross Regional Director, Des Moines County Public Health Director, Superintendents
Timeline	On-going, no specific target completion date

1.2 Obtain an All-Terrain Vehicle for first responders/emergency purposes.

Jurisdictions Adopting Activity: Des Moines County, City of Mediapolis

Goals Addressed: 1, 2, 4

Analysis	All-terrain vehicles will enhance the local governments' ability to respond to disasters.
Cost/Funding Source	A qualitative assessment suggests that the costs for this activity will need to be provided by seeking additional grant funding.
Additional Hazards Addressed	All hazards are addressed
Prioritization	MEDIUM (37 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Mayors
Timeline	Medium-term

1.3 Digital mapping of community and infrastructure.

Jurisdictions Adopting Activity: City of Danville, City of Middletown, City of Mediapolis

Goals Addressed: 4

Analysis	Digital mapping of community and infrastructure will enable local governments to more easily assess and better respond to emergency situations.
Cost/Funding Source	A qualitative assessment suggests that the costs for this activity will need to be provided by seeking additional grant funding.
Additional Hazards Addressed	All hazards are addressed
Prioritization	HIGH (37 points)
Responsible Parties	Public Works Directors , Mayors
Timeline	Long-term

1.4 Development of saferooms.

Jurisdictions Adopting Activity: City of Mediapolis, City of Danville, City of Burlington, City of Middletown, Southeastern Community College, West Burlington ISD, Mediapolis CSD, Notre Dame Schools, Burlington CSD, DESCOM

Goals Addressed: 4

Analysis	Construction of safe room locations will involve significant structural changes or new buildings
Cost/Funding Source	A qualitative assessment suggests that the costs for this activity will need to be provided by seeking additional grant funding.
Additional Hazards Addressed	Thunderstorms/Lightening/Windstorm/Hail, Tornado, Terrorism
Prioritization	MEDIUM (8 points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Mayors, Superintendents
Timeline	Long-term

1.5 Assessment of special needs population.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, City of Danville, City of Mediapolis, City of West Burlington, Burlington CSD, Danville CSD, West Burlington ISD, Southeastern Community College

Goals Addressed: 4

Analysis	Assessing the needs of the special needs population, especially building and transportation accessibility, is an important consideration in responding to emergency situations and disasters.
Cost/Funding Source	A qualitative assessment suggests that the costs versus benefits of a special needs assessment are difficult to measure. This program is already fundable under current operating budgets.
Additional Hazards Addressed	All hazards are addressed
Prioritization	HIGH (37 points)
Responsible Parties	Des Moines County Emergency Management Coordinator Superintendents, Mayors
Timeline	On-going, no specific target completion date

1.6 Develop and maintain Alert Iowa system and other alert systems necessary to quickly disseminate emergency messages to residents.

Jurisdictions Adopting Activity: All Plan Participants

Goals Addressed: 1,2,3,4

Analysis	This item does not require any changes to existing or future structures or infrastructure
Cost/Funding Source	A qualitative assessment suggests this program is already fundable under current operating budgets. The current funding is through Iowa Homeland Security and Emergency Management.
Additional Hazards Addressed	All hazards are addressed
Prioritization	HIGH (37 points)
Responsible Parties	Des Moines County Emergency Management Coordinator
Timeline	On-going, no specific target completion date

1.7 Retrofitting fire, police, and dispatch stations to become hazard resistant.

Jurisdictions Adopting Activity: Des Moines County, City of Mediapolis, City of Danville, City of West Burlington, City of Burlington, DESCOM

Goals Addressed: 4

Analysis	Retrofitting current fire and police stations would involve significant structural changes or new buildings
Cost/Funding Source	A qualitative assessment suggests that the costs for this activity will need to be provided by seeking additional grant funding.
Additional Hazards Addressed	Thunderstorms/Lightning/Windstorm/Hail, River Flood, Severe Winter Storms, Levee/Dam Failure, Flash Flood, Tornado, Infrastructure Failure, Terrorism, Earthquakes, Extreme Heat
Prioritization	HIGH (24 points)
Responsible Parties	Des Moines County Emergency Management Coordinator , Mayors, Police Chiefs, Fire Chiefs, Des Moines County Sheriff
Timeline	Long-term

1.8 Establish charging stations for electronics at various locations for use by the public after a disaster.

Jurisdictions Adopting Activity: Des Moines County, City of Mediapolis, Danville CSD, Burlington CSD

Goals Addressed: 2, 3,4

Analysis	Charging stations will provide access for the general public to electric power, which may require modifications to existing structures and infrastructure. Generators would be necessary in case of widespread power outages.
Cost/Funding Source	A qualitative assessment suggests that the costs of this item will need to be paid for by seeking additional grant funding.
Additional Hazards Addressed	Thunderstorms/Lightning/Hail/Windstorm, River Flood, Infrastructure Failure, Severe Winter Storms, Earthquakes, Terrorism
Prioritization	HIGH (13 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Mayors, Superintendents
Timeline	Medium-term

1.9 Obtain necessary information for future vulnerability assessments.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, City of Danville, City of Mediapolis, City of Middletown, City of West Burlington, Burlington CSD, Danville CSD, Mediapolis CSD, Southeastern Community College

Goals Addressed: 3

Analysis	This item does not require any changes to existing or future structures or infrastructure
Cost/Funding Source	A qualitative assessment suggests this program is already fundable under current operating budgets
Additional Hazards Addressed	All Hazards
Prioritization	HIGH (37 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Mayors, Superintendents
Timeline	On-going, no specific target completion date

2. Animal/Plant/Crop Disease

2.1 Educate the public regarding existing diseases, existing and new invasive species, and best prevention and care.

Jurisdictions Adopting Activity: Des Moines County, City of Mediapolis, Danville CSD, Burlington CSD, Mediapolis CSD, Southeastern Community College

Goals Addressed: 3

Analysis	Education provides the public with most recent information regarding risk and response to animal/plant/crop disease, and does not involve any changes to structures or infrastructure.
Cost/Funding Source	A qualitative assessment suggests that the costs versus benefits of education are difficult to measure. This program is already fundable under current operating budgets.
Additional Hazards Addressed	Human disease
Prioritization	LOW (2 points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Des Moines County Conservation Director, Superintendents
Timeline	On-going, no specific target completion date

2.2 Conduct a tree inventory and remove diseased or dying trees as necessary.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, City of Mediapolis, City of West Burlington

Goals Addressed: 1, 4

Analysis	Inventory will not involve structural or infrastructure changes to existing or new buildings, although the landscape may be altered due to removal of diseased trees.
Cost/Funding Source	A qualitative assessment suggests that the costs of this item will need to be paid for by seeking additional grant funding.
Additional Hazards Addressed	Thunderstorms/Lightning/Windstorm/Hail, Tornado, Severe Winter Storms
Prioritization	HIGH (11 points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Mayors
Timeline	Long-term

3. Drought

3.1 Establish a drought emergency plan which will identify and develop criteria or triggers for drought related actions.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, City of Mediapolis, Burlington CSD, Mediapolis CSD, Southeastern Community College

Addressed: 1, 2, 3

Analysis	This activity requires collaboration among local officials and does not require changes to existing or future structures or infrastructure other than those required by drought related actions.
Cost/Funding Source	A qualitative assessment suggests that the cost of this activity is already fundable under current operation budgets.
Additional Hazards Addressed	n/a
Prioritization	LOW (2 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Mayors
Timeline	On-going, no specific target completion date

3.2 Develop an ordinance to restrict non-essential use of public water sources.

Jurisdictions Adopting Activity: Des Moines County

Goals Addressed: 1, 2, 4

Analysis	There is no change to existing or future structures or infrastructures other than limitation imposed by the ordinance.
Cost/Funding Source	A qualitative assessment suggests that this program is already fundable under current operating budgets.
Additional Hazards Addressed	n/a
Prioritization	Low (2 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator
Timeline	On-going, no specific target completion date

4. Earthquakes

4.1 Educate the public on need to purchase earthquake insurance.

Jurisdictions Adopting Activity: Des Moines County

Short Term Goals Addressed: 1
Long Term Goals Addressed: 1, 2, 3

Analysis	Education provides the public with most recent information regarding earthquake risk and need to purchase earthquake insurance.
Cost/Funding Source	A qualitative assessment suggests that there is no direct cost to participating jurisdictions for this item.
Additional Hazards Addressed	n/a
Prioritization	LOW (2 points))
Responsible Parties	Des Moines County Emergency Management Coordinator
Timeline	On-going, no specific target completion date

5. Extreme Heat

5.1 Educate the public regarding: a) shelter locations b) hot weather precautions c) free fan distribution d) providing sufficient shade and water for animals.

Jurisdictions Adopting Activity: Des Moines County, City of Danville, City of Burlington, City of Mediapolis, City of Middletown, City of West Burlington, Burlington CSD, Danville CSD, Mediapolis CSD, West Burlington ISD, Notre Dame Schools

Goals Addressed: 1, 3

Analysis	Education provides the public with most recent information regarding risk posed by extreme heat.
Cost/Funding Source	A qualitative assessment suggests that the costs versus benefits of education are difficult to measure. This program is already fundable under current operating budgets.
Additional Hazards Addressed	n/a
Prioritization	LOW (2 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Mayors, Superintendents
Timeline	On-going, no specific target completion date

5.2 Organizing outreach to vulnerable populations, including establishing accessible cooling centers in the community.

Jurisdictions Adopting Activity: Des Moines County, City of Mediapolis, City of West Burlington, Burlington CSD, West Burlington ISD, Mediapolis CSD, Southeastern Community College

Goals Addressed: 1, 3, 4

Analysis	Potential structural changes to existing or future buildings may be necessary for this activity to create accessible cooling centers.
Cost/Funding Source	A qualitative assessment suggests that establishing accessible cooling centers may require additional grant funding.
Additional Hazards Addressed	Infrastructure Failure
Prioritization	LOW (4 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Mayors
Timeline	On-going, no specific target completion date

6. Flash Flood

6.1 Creating an ordinance to regulate dumping in streams and ditches.

Jurisdictions Adopting Activity: City of Burlington, City of Mediapolis, City of Danville

Goals Addressed: 1, 2, 3

Analysis	This item encourages best practices through the passing of an ordinance and does not involve any direct changes to structures or infrastructure.
Cost/Funding Source	A qualitative assessment suggests that the cost of this activity is already fundable under current operating budget
Additional Hazards Addressed	Dam/Levee Failure
Prioritization	MEDIUM (6 points)
Responsible Parties	Des Moines County Emergency Management Coordinator, County Engineer, County Conservation Director
Timeline	On-going, no specific target completion date

6.2 Preparing and adopting a stormwater drainage plan and ordinance.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, City of Mediapolis, City of Danville

Goals Addressed: 1, 4

Analysis	This item encourages best practices through design of a drainage plan. It would not involve changes to structures or infrastructure unless required by provisions of the plan or ordinance.
Cost/Funding Source	A qualitative assessment suggests that the cost of this activity is likely already fundable under current operation budget.
Additional Hazards Addressed	Thunderstorms/Lightning/Hail/Windstorm
Prioritization	MEDIUM (6 Points)
Responsible Parties	Des Moines County Board of Supervisors, Des Moines County Emergency Coordinator, Mayors
Timeline	On-going, no specific target completion date

6.3 Maintain flood awareness signs at low water crossings and flash flooding areas.

Jurisdictions Adopting Activity: Des Moines County, City of Mediapolis, Two Rivers Levee and Drainage Association

Goals Addressed: 1, 3

Analysis	Promoting awareness of low water crossings and flash flooding areas does not require changes to existing structures or infrastructure. However, physical improvements such as additional or improved signage may be necessary.
Cost/Funding Source	A qualitative assessment suggests promoting flood awareness is already fundable under current operation budgets. However, if additional signage is needed, additional grant funding may prove necessary
Additional Hazards Addressed	River Flood, Dam/Levee Failure
Prioritization	MEDIUM (9 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Public Works Directors, County Engineer
Timeline	On-going, no specific target completion date

7. Grass or Wildfire

7.1 Encourage all fire districts in the planning area to implement a fire awareness campaign and pass burn ordinances to discourage leaf burning and yard waste burning in order to protect existing buildings and infrastructure.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, City of Mediapolis, City of Danville, City of West Burlington

Goals Addressed: 1, 2,3

Analysis	This item encourages best practices through the passing of an ordinance and does not involve any direct changes to structures or infrastructure.
Cost/Funding Source	A qualitative assessment suggests this measure is already fundable under current budget levels.
Additional Hazards Addressed	n/a
Prioritization	LOW (2 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Mayors, Fire Chiefs
Timeline	Medium term

7.2 Create defensible zones around power lines, oil lines, gas lines, and other infrastructure systems.

Jurisdictions Adopting Activity: Des Moines County, City of Mediapolis

Goals Addressed: 1

Analysis	Creating defensible zones around critical infrastructure involves physical action, including the possibility of minor alteration to infrastructure systems.
Cost/Funding Source	A qualitative assessment suggests that the cost of this activity is already fundable under current operating budgets, and that corresponding actions will need to be paid for by seeking additional grant funding.
Additional Hazards Addressed	n/a
Prioritization	LOW (2 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Local Public Works Director, County Engineer's Office, Mayors, Fire Chiefs
Timeline	Short-term

7.3 Install signage indicating fire rating.

Jurisdictions Adopting Activity: Des Moines County, City of Mediapolis

Goals Addressed: 3

Analysis	This activity involves the acquisition of equipment in order to share information and does not involve any direct changes to structures or infrastructure.
Cost/Funding Source	A qualitative assessment suggests that the costs of this activity will need to be provided by seeking additional grant funding
Additional Hazards Addressed	n/a
Prioritization	LOW (2Points)
Responsible Parties	Des Moines County Emergency Coordinator, Des Moines County Conservation, Fire Chiefs
Timeline	Short term

8. Hazardous Materials

8.1 Educate the public regarding: a) proper use and disposal of household, commercial, and industrial hazardous waste; b) reporting requirements of use, storage, and spills of hazardous materials; c) proper handling of hazardous materials; d) information on who to contact in the event of a spill or hazmat incident; e) public shelters.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, City of Danville, City of Mediapolis, City of Middletown, City of West Burlington

Goals Addressed: 3

Analysis	Education provides the public with most recent information regarding risk and response to hazardous materials, and does not involve any direct changes to structures or infrastructure.
Cost/Funding Source	A qualitative assessment suggests that the costs versus benefits of education are difficult to measure. This program is already fundable under current operating budgets.
Additional Hazards Addressed	n/a
Prioritization	LOW (2 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Des Moines County Public Health Director, Superintendents, Fire Chiefs
Timeline	On-going, no specific target completion date

8.2 Ensure the training, equipment, and knowledge of the existing HazMat team is maintained.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, City of Mediapolis, City of West Burlington, City of Mediapolis, City of Danville, City of Middletown

Goals Addressed: 1, 2, 4

Analysis	This is an operational rather than a structural mitigation item involving acquisition of equipment and providing an increased availability of training for local and neighboring fire and police departments
Cost/Funding Source	A qualitative analysis suggests that additional grant funding is necessary to provide any increased training or large equipment purchases over current levels. Challenges also include maintenance and upkeep of vehicles, and to ultimately find a funding mechanism for long term operating costs.
Additional Hazards Addressed	Transportation Incident
Prioritization	Low (2 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Mayors, Des Moines County Board of Supervisors
Timeline	On-going, no specific target completion date

8.3 Identify locations and conditions of above ground chemical storage tanks.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, City of Mediapolis

Goals Addressed: 1

Analysis	This activity involves data collection and management, mapping , and collaboration between public and private entities in order to assess the need for possible further action. This activity does not require direct changes to structure or infrastructure.
Cost/Funding Source	A qualitative assessment suggests that this activity is already fundable under current operating budgets.
Additional Hazards Addressed	Infrastructure Failure
Prioritization	LOW (4 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator
Timeline	On-going, no specific target completion date

8.4 Plan for alternate transportation such as school district buses in case evacuations are required.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, City of Mediapolis

Goals Addressed: 1, 2

Analysis	This activity involves collaboration between public officials to coordinate the logistics for such a plan.
Cost/Funding Source	A qualitative assessment suggests that this activity is already fundable under current operating budgets.
Additional Hazards Addressed	Infrastructure Failure, Terrorism, River Flood
Prioritization	MEDIUM (9 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Mayors, Police Chiefs, Fire Chiefs, Superintendents
Timeline	On-going, no specific target completion date

8.5 Maintain communication with IDOT and Iowa State Patrol regarding hazardous material transportation.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, City of Mediapolis, City of West Burlington, Burlington CSD, Mediapolis CSD, Southeastern Community College

Goals Addressed: 1, 2

Analysis	This activity involves collaboration between public officials to ensure all necessary parties are aware of the movement of hazardous materials through communities in the planning area.
Cost/Funding Source	This activity is an operational activity not structural and would be already fundable under current budgets
Additional Hazards Addressed	Infrastructure Failure, Terrorism, River Flood
Prioritization	MEDIUM (9 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Mayors, Police Chiefs, Fire Chiefs, Superintendents
Timeline	On-going, no specific target completion date

9. Human Disease

9.1 Disease surveillance and awareness program in collaboration with the Iowa Department of Public Health to alert local doctors, day care centers, and schools of potential warnings and disease characteristics.

Jurisdictions Adopting Activity: Des Moines County

Goals Addressed: 1, 2

Analysis	This item does not require any changes to existing or future structures or infrastructure. This activity involves collaboration between public and private sectors, particularly with involvement of local hospitals and physicians.
Cost/Funding Source	A qualitative assessment suggests that this cost is covered through existing education programs out of operating budgets
Additional Hazards Addressed	n/a
Prioritization	LOW (2 Points)
Responsible Parties	Iowa Department of Public Health, Des Moines County Public Health Director, Des Moines County Emergency Management Coordinator
Timeline	On-going, no specific target completion date

9.2 Conduct mass immunization drills to ensure proper procedures and supplies are in place and to ensure collaboration between state, county, and local health care departments, local emergency responders, Red Cross and other non-profit agencies, and the public.

Jurisdictions Adopting Activity: Des Moines County

Goals Addressed: 1, 3

Analysis	This item does not require any changes to existing or future structures or infrastructure
Cost/Funding Source	A qualitative assessment suggests that this cost is indirect for many of the participating agencies for use of personnel and equipment. Implementing this item is not limited by any changes in funding.
Additional Hazards Addressed	n/a
Prioritization	Low (1 Points)
Responsible Parties	Iowa Department of Public Health, Des Moines County Public Health Director, Des Moines County Emergency Management Coordinator
Timeline	On-going, no specific target completion date

9.3 Provide Personal Protective Equipment (PPE) for emergency responders.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, City of Mediapolis, City of Danville, City of West Burlington

Goals Addressed: 1, 4

Analysis	This activity involves the acquisition of equipment in order to respond to disasters, and does not involve any direct changes to structures or infrastructure
Cost/Funding Source	A qualitative assessment suggests that the costs of acquiring equipment will need to be paid for by seeking additional grant funding.
Additional Hazards Addressed	n/a
Prioritization	Low (2 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Police Chiefs, Fire Chiefs, Des Moines County Sheriff's Department
Timeline	Medium-term

9.4 Identify and acquire more equipment for supporting immunization areas.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, City of Mediapolis, City of West Burlington

Goals Addressed: 1, 4

Analysis	This activity involves the acquisition of equipment in order to respond to disasters, and does not involve any direct changes to structures or infrastructure
Cost/Funding Source	A qualitative assessment suggests that the costs of acquiring equipment will need to be paid for by seeking additional grant funding.
Additional Hazards Addressed	n/a
Prioritization	Low (2 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Des Moines County Public Health Director, Police Chiefs, Fire Chiefs, Des Moines County Sheriff's Department
Timeline	Short-term

9.5 Educate the public and health care providers regarding communicable diseases and outbreaks and immunization clinics and locations.

Jurisdictions Adopting Activity: Des Moines County

Goals Addressed: 3

Analysis	Education provides the public with most recent information regarding risk and response to hazardous materials, and does not involve any direct changes to structures or infrastructure
Cost/Funding Source	A qualitative assessment suggests that the costs versus benefits of education are difficult to measure. This program is already fundable under current operating budgets.
Additional Hazards Addressed	n/a
Prioritization	Low (2 Points)
Responsible Parties	Iowa Department of Public Health, Des Moines County Public Health Director, Des Moines County Emergency Management Coordinator
Timeline	Short-term

10. Infrastructure Failure

10.1 Develop a comprehensive shelter list.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, City of Danville, City of Mediapolis, City of Middletown, City of West Burlington, Burlington CSD, Danville CSD, Mediapolis CSD, West Burlington ISD, Southeastern Community College

Goals Addressed: 1, 3

Analysis	This activity involves data collection and management, mapping , and collaboration between public and private entities in order to assess the need for possible further action. This activity does not require direct changes to structure or infrastructure.
Cost/Funding Source	A qualitative assessment suggests that this activity is already fundable under current operating budgets.
Additional Hazards Addressed	Tornado, Thunderstorm/Lightning/Windstorm/Hail
Prioritization	MEDIUM (8 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Des Moines County Public Health Director, Superintendents
Timeline	On-going, no specific target completion date

10.2 Ensure a generator back up is available for critical facilities, critical infrastructures, and vulnerable sites such as schools, hospitals, shelters, lift stations, water treatment plans, wastewater treatment plans, radio towers, pumping stations, etc.

Jurisdictions Adopting Activity: Des Moines County, City of Danville, City of West Burlington, City of Burlington, City of Mediapolis, City of Middletown, Burlington CSD, Danville CSD, Mediapolis CSD, West Burlington ISD, Notre Dame Schools, Two Rivers Levee and Drainage Association, Southeastern Community College, North Bottoms Levee District, DESCOM

Goals Addressed: 1, 2, 4

Analysis	The availability of generators is crucial to mitigation and response. While many of the agencies that should have generators are not directly regulated or under the authority of Mayors, efforts to encourage the purchase of generators can be made through existing networks such as the chamber of commerce and Homeland Security and Emergency Management Division.
Cost/Funding Source	A qualitative assessment suggests that generators are available in many public structures already, the purchase of additional generators will have to be paid for by the private agency.
Additional Hazards Addressed	Tornado, River Floods, Severe Winter Storms, Earthquakes, Terrorism
Prioritization	HIGH (14 Points)
Responsible Parties	Des Moines County Emergency Coordinator, Mayors, Superintendents
Timeline	Short-term

10.3 Educate the public on installation/update of smoke detectors, fire awareness and prevention campaigns in the schools, use of the 911 system, and who to contact in case of a gas leak or fire.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, City of Danville, City of Mediapolis, City of Middletown, City of West Burlington, Burlington CSD, Danville CSD, Mediapolis CSD, West Burlington ISD, Notre Dame Schools, Southeastern Community College

Goals Addressed: 3

Analysis	Education provides the public with most recent information regarding risk and response to hazardous materials, and does not involve any direct changes to structures or infrastructure.
Cost/Funding Source	A qualitative assessment suggests that the costs versus benefits of education are difficult to measure. This program is already fundable under current operating budgets.
Additional Hazards Addressed	Grass or Wildfire, Earthquake
Prioritization	Medium (5 Points)
Responsible Parties	Mayors, Fire Chiefs, DESCOM, Superintendents
Timeline	On-going, no specific target completion date

10.4 Update and enforce building codes through required inspection in order to protect new and existing buildings and infrastructure.

Jurisdictions Adopting Activity: City of Burlington, City of West Burlington, City of Danville, City of Middletown

Goals Addressed: 1

Analysis	There is no change to existing or future structures or infrastructures other than limitations imposed by existing codes for new or rehabilitated structures.
Cost/Funding Source	A qualitative assessment suggests that there would need to be an increase in funding through grants in order to increase the level of inspections over current levels.
Additional Hazards Addressed	River Flood, Earthquake
Prioritization	Medium (6 Points)
Responsible Parties	Mayors, Fire Chiefs, Building Inspectors
Timeline	On-going, no specific target completion date

10.5 Regionalize public safety communications ability through enhanced technology and infrastructure and dispatch capability including conducting a benefit/cost analysis of a regional public safety community function.

Jurisdictions Adopting Activity: Des Moines County, City of Mediapolis, City of Danville, City of Burlington, City of Middletown, City of West Burlington, DESCOM

Goals Addressed: 2, 4

Analysis	Regional public safety communications abilities involve a high degree of political and economic collaboration. This proves to be a challenge when establishing management and operation functions for the center
Cost/Funding Source	A qualitative assessment suggests that the costs versus benefits are difficult to measure. This program is already fundable under current operating budgets but would involve extensive assessments as to the actual cost analysis
Additional Hazards Addressed	Transportation Incident
Prioritization	Low (4 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, DESCOM
Timeline	On-going, no specific target completion date

10.6 Identify alternate fueling sites/sources for emergency vehicles.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, City of Mediapolis, City of West Burlington, Burlington CSD, West Burlington ISD, Mediapolis CSD

Goals Addressed: 2

Analysis	Alternate fueling sites/sources are crucial for mitigation and response. Developing alternate fueling sites and sources would likely require additional infrastructure.
Cost/Funding Source	A qualitative assessment suggests that there would need to be an increase in funding through grants in order to increase the level of inspections over current levels.
Additional Hazards Addressed	n/a
Prioritization	Low (4 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, DESCOM, Fire Chief, Police Chief, Public Works Directors
Timeline	On-going, no specific target completion date

10.7 Ensure that school buses have two way radios on board for communication.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, Burlington CSD

Goals Addressed: 2

Analysis	Enhanced communication on school buses ensures better response and preparedness to emergency events, especially in the case of evacuations.
Cost/Funding Source	A qualitative assessment suggests that there would need to be an increase in funding through grants in order to increase the level of inspections over current levels.
Additional Hazards Addressed	Terrorism, Transportation Incident
Prioritization	HIGH (6 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Superintendents
Timeline	Short-term

10.8 Update current law enforcement and first responder radio equipment.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, City of Mediapolis, City of Danville, City of West Burlington, DESCOM

Goals Addressed: 2, 4

Analysis	Enhanced communication ensures better response and preparedness to emergency events.
Cost/Funding Source	A qualitative assessment suggests that there would need to be an increase in funding through grants in order to increase the level of inspections over current levels.
Additional Hazards Addressed	Terrorism, Transportation Incident
Prioritization	HIGH (6 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, DESCOM, Fire Chiefs, Police Chiefs, Des Moines County Sheriff's Department
Timeline	Short-term

11. Landslide

11.1 Adopt sediment and erosion control regulations to manage development in erosion and landslide hazard areas.

Jurisdictions Adopting Activity: City of Burlington, City of Mediapolis

Goals Addressed: 1, 3

Analysis	This item encourages best practices through policies, programs, and other incentives, and does not involve any direct changes to structure or infrastructures
Cost/Funding Source	A qualitative assessment suggests that it is already fundable under current operation budgets
Additional Hazards Addressed	Transportation Incident
Prioritization	Low (4 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, County Engineer, Mayors, Public Works Directors
Timeline	On-going, no specific target completion date

11.2 Complete inventory of locations where critical facilities, vulnerable sites, and critical infrastructure are vulnerable to landslides.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington

Goals Addressed: 2, 3

Analysis	This activity involves data collection and management, mapping , and collaboration between public and private entities in order to assess the need for possible further action. This activity does not require direct changes to structure or infrastructure.
Cost/Funding Source	A qualitative assessment suggests that this activity is already fundable under current operating budgets.
Additional Hazards Addressed	n/a
Prioritization	Low (1 Points)
Responsible Parties	Des Moines County Emergency Management, County Engineer, Public Works Director
Timeline	On-going, no specific target completion date

12. Levee Failure/Dam Failure

12.1 Assess the current state of all existing dams and levees within Des Moines County and create a levee/dam failure map, including dams and levees located upstream of Des Moines County, to better identify potential loss.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, City of West Burlington, Two Rivers Levee and Drainage Association, North Bottoms Levee District

Goals Addressed: 1, 4

Analysis	There are no changes to existing or future structures or infrastructure related to this item. Changes may be suggested as an outcome of the evaluation process. Mapping will involve close collaboration with the Rock Island District U.S. Army Corps of Engineers and the Iowa Department of Natural Resources
Cost/Funding Source	A qualitative assessment suggests that the costs for this activity will need to be provided by seeking additional grant funding.
Additional Hazards Addressed	River Flood
Prioritization	HIGH (6 Points)
Responsible Parties	Des Moines County Emergency Management , Public Works Directors, Two River Levee and Drainage Association, North Bottoms Levee District
Timeline	Short-term

13. River Flood

13.1 Educate the public regarding: a) requirements of floodplain ordinances; b) flood water hazard precautions; c) maintaining status with the NFIP; d) levee certifications.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, Two Rivers Levee and Drainage Association, North Bottoms Levee District

Goals Addressed: 3

Analysis	Education provides the public with most recent information regarding risk and response to natural disasters, and does not involve any direct changes to structures or infrastructure.
Cost/Funding Source	A qualitative assessment suggests that the costs versus benefits of education are difficult to measure. This program is already fundable under current operating budgets.
Additional Hazards Addressed	Flash Flood, Levee/Dam Failure
Prioritization	HIGH (9 Points)
Responsible Parties	Des Moines County Emergency Management, County Engineer, County Conservation Director, Two River Levee and Drainage Association, North Bottoms Levee District, Southeast Iowa Regional Planning Commission
Timeline	On-going, no specific target completion date

13.2 Elevation and/or stabilization of structures, acquisition of structures, elevation and/or stabilization of roadways, addition of culverts, addition of lift stations and/or pumping stations, erosion control methods along waterway, etc.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, Two Rivers Levee and Drainage Association, North Bottoms Levee District

Goals Addressed: 1

Analysis	This activity requires significant physical changes to existing structures and infrastructure as necessary to mitigate damage from this hazard
Cost/Funding Source	A qualitative assessment suggests that the costs for this activity will need to be provided by seeking additional grant funding.
Additional Hazards Addressed	Flash Flood, Levee/Dam Failure
Prioritization	HIGH (9 Points)
Responsible Parties	Des Moines County Emergency Management, Des Moines County Conservation Director, Mayors, Public Works Director, County Engineer, Two Rivers Levee and Drainage Association,
Timeline	On-going, no specific target completion date

13.3 Forming a regional watershed council to help bring together resources for comprehensive analysis, planning, decision-making, and cooperation.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, City of Mediapolis, City of West Burlington, Danville CSD, Burlington CSD, Mediapolis CSD

Goals Addressed: 3

Analysis	Establishing a regional council would require collaboration among local public officials and as an organizational activity would not require changes to existing or future structures or infrastructures.
Cost/Funding Source	A qualitative assessment suggests that the cost for this activity is fundable under current operation budgets.
Additional Hazards Addressed	Flash Flood, Levee/Dam Failure
Prioritization	HIGH (9 Points)
Responsible Parties	Des Moines County Emergency Coordinator, Des Moines County Conservation Director, Public Works Directors, County Engineers, City Engineers
Timeline	On-going, no specific target completion date

13.4 Adopting ASCE-24-05 *Flood Resistant Design and Construction,* a referenced standard in the International Building Code that specifies minimum requirements and expected performance for the design and construction of buildings and structures in flood hazard areas.

Jurisdictions Adopting Activity: City of Burlington, City of West Burlington

Goals Addressed: 1

Analysis	Adoption of ASCE-24-05 has a direct impact on new construction in flood hazard areas, as all new structures would have to meet the referenced standards.
Cost/Funding Source	A qualitative assessment suggests that the cost for this activity would need additional grant funding in order to fund additional inspections and review.
Additional Hazards Addressed	Flash Flood, Levee/Dam Failure
Prioritization	HIGH (9 Points)
Responsible Parties	Mayors, Building Inspectors
Timeline	On-going, no specific target completion date

13.5 Requiring standard tie-downs for propane tanks.

Jurisdictions Adopting Activity: Des Moines County, City of West Burlington

Goals Addressed: 1

Analysis	There is no change to existing or future structures or infrastructure other than limitations imposed by the requirement
Cost/Funding Source	A assessment suggests that the cost for this activity is fundable under current operating levels.
Additional Hazards Addressed	Flash Flood, Levee/Dam Failure
Prioritization	HIGH (9 Points)
Responsible Parties	Mayors, Building Inspectors
Timeline	On-going, no specific target completion date

13.6 Participate in NFIP

Jurisdictions Adopting Activity: Des Moines County, City of Mediapolis, City of West Burlington

Goals Addressed: 1, 4

Analysis	NFIP compliance means reviewing and enforcing floodplain ordinances as development in the flood zones occurs. Responsible parties should periodically review the permitting process and ordinances to ensure compliance. This mitigation activity has a direct impact on new construction in the flood plain.
Cost/Funding Source	FEMA documents that the benefits of NFIP participation far outweigh the cost of participation.
Additional Hazards Addressed	Flash Flood, Levee/Dam Failure
Prioritization	HIGH (9 Points)
Responsible Parties	Mayors, Des Moines County Board of Supervisors
Timeline	On-going, no specific target completion date

13.7 Acquire Jon boats and other flood emergency rescue equipment.

Jurisdictions Adopting Activity: Des Moines County

Goals Addressed: 1, 4

Analysis	This activity involves the acquisition of equipment in order to respond to disasters and does not involve any direct changes to structures or infrastructure.
Cost/Funding Source	A qualitative assessment suggests that the costs of this item will need to be paid for by seeking additional grant funding
Additional Hazards Addressed	Transportation Incident, Flash Flood, Dam Failure
Prioritization	HIGH (11 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Des Moines County Sheriff's Department, Fire Chiefs, Police Chiefs
Timeline	Short-term

13.8 Mitigate future potential flood damage through buying out Repetitive Loss Properties.

Jurisdictions Adopting Activity: Des Moines County

Goals Addressed: 1,4

Analysis	This activity involves the acquisition of property in order to mitigate disasters and may involve any direct changes to structures or infrastructure located on acquired properties
Cost/Funding Source	A qualitative assessment suggests that the costs of this item will need to be paid for by seeking additional grant funding
Additional Hazards Addressed	Flash Flood, Dam/Levee Failure
Medium	HIGH (9 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Mayors, Board of Supervisors, City Council
Timeline	Long-term

14. Severe Winter Storm

14.1 Encourage utility companies to increase the percentage of cables that are underground.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, City of Danville, City of Mediapolis, City of West Burlington, City of Middletown

Goals Addressed: 1

Analysis	Preferably, all new construction of power lines for new residential communities will be underground. The challenge is in converting the lines in existing areas. There would be no significant changes to the structures or the infrastructure of existing and future buildings.
Cost/Funding Source	A qualitative analysis suggests that this item would involve the increase of rates changed by the utility companies to the residents to offset the costs of converting the lines
Additional Hazards Addressed	Tornado, Thunderstorms/Lighting/Hail/Windstorm, Infrastructure Failure
Prioritization	HIGH (11 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Des Moines County Board of Supervisors, Mayors
Timeline	On-going, no specific target completion date

14.2 Organize outreach to vulnerable populations, including establishing and promoting accessible heating centers in the community.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, City of Mediapolis, City of West Burlington, Burlington CSD, West Burlington ISD, Mediapolis CSD, Southeastern Community College

Goals Addressed: 3

Analysis	Education provides the public with most recent information regarding risk and response to natural disasters, and does not involve any direct changes to structures or infrastructure
Cost/Funding Source	A qualitative assessment suggests that the cost of this activity is already fundable under current operation budgets.
Additional Hazards Addressed	Infrastructure Failure, Extreme Heat
Prioritization	MEDIUM (7 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Police Chiefs, Fire Chiefs, Mayors, Public Health Director
Timeline	Short-term

14.3 Encourage all citizens to install carbon monoxide monitor and alarms.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, City of Mediapolis, City of Danville, City of West Burlington, Burlington CSD, West Burlington ISD, Mediapolis CSD

Goals Addressed: 3

Analysis	Education provides the public with most recent information regarding risk and response to natural disasters, and does not involve any direct changes to structures or infrastructure
Cost/Funding Source	A qualitative assessment suggests that the cost of this activity is already fundable under current operation budgets.
Additional Hazards Addressed	Infrastructure Failure, Extreme Heat
Prioritization	MEDIUM (7 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Police Chiefs, Fire Chiefs, Mayors
Timeline	Short-term

15. Terrorism

15.1 Equip and train local authorities to be able to appropriately respond to large scale enemy attack. Equipment and training include but not limited to sniper rifles, continued operation, Bearcat, and training for the Tactical Response Unit (TRU).

Jurisdictions Adopting Activity: Des Moines County, Iowa Army Ammunition Plant

Goals Addressed: 1

Analysis	This is an operational rather than a structural mitigation item involving acquisition of equipment and providing an increased availability of training.
Cost/Funding Source	A qualitative analysis suggests that additional grant funding is necessary to provide any increased training or large equipment purchases over current levels. Challenges also include maintenance and upkeep of vehicles, and to ultimately find a funding mechanism for long term operating costs.
Additional Hazards Addressed	n/a
Prioritization	Low (2 Point)
Responsible Parties	Des Moines County Emergency Management Coordinator, Police Chiefs, Iowa Army Ammunition Plan, Des Moines County Sheriff's Department
Timeline	On-going, no specific target completion date

15.2 Educate the Public regarding a) creating a Family Disaster Plan; b) the National Terrorism Advisory System; c) how to respond to a terrorist event; d) where to get vital information.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, City of Mediapolis, Burlington CSD, Mediapolis CSD

Goals Addressed: 1

Analysis	Education provides the public with the most recent information regarding risk and response to disasters, and does not involve any direct changes to structures or infrastructure.
Cost/Funding Source	A qualitative analysis suggests that the costs versus benefits of education are difficult to measure. This program is already fundable under current operating budgets
Additional Hazards Addressed	n/a
Prioritization	Low (2 Point)
Responsible Parties	Mayors, Des Moines County Emergency Management Coordinator, American Red Cross Regional Director
Timeline	On-going, no specific target completion date

15.3 Ensure critical services and information is protected from cyber-attacks; educate local officials about cyber security.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, City of Mediapolis, City of West Burlington, Burlington CSD

Goals Addressed: 3

Analysis	There are no changes to existing or future structures or infrastructure related to this item. Changes may be suggested as an outcome of the evaluation process
Cost/Funding Source	A qualitative analysis suggests that costs for this activity will need to be provided by seeking additional grant funding.
Additional Hazards Addressed	n/a
Prioritization	Low (2 Point)
Responsible Parties	Mayors, Des Moines County Emergency Management Coordinator, Des Moines County Board of Supervisors
Timeline	On-going, no specific target completion date

15.4 Develop and implement Continuity of Government plan.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, City of Mediapolis, Burlington CSD, West Burlington ISD

Goals Addressed: 2, 3

Analysis	There are no changes to existing or future structures or infrastructure related to this item. Changes may be suggested as an outcome of the planning process
Cost/Funding Source	A qualitative analysis suggests that costs for this activity are fundable under current operating levels
Additional Hazards Addressed	Tornado, Hazardous Materials Incident, Infrastructure Failure, Earthquakes
Prioritization	Low (10 Point)
Responsible Parties	Mayors, Des Moines County Emergency Management Coordinator, Des Moines County Board of Supervisors
Timeline	Short-term

15.5 Improve security measures at emergency response facilities and other sensitive facilities.

Jurisdictions Adopting Activity: Des Moines County, City of Mediapolis, City of West Burlington, Burlington CSD, Iowa Army Ammunition Plant, DESCOM

Goals Addressed: 1, 2

Analysis	There are potential changes to existing or future structures or infrastructure related to this item. Changes may be suggested as an outcome of the evaluation process
Cost/Funding Source	A qualitative analysis suggests that costs for this activity will need to be provided by seeking additional grant funding
Additional Hazards Addressed	n/a
Prioritization	Low (2 Point)
Responsible Parties	Mayors, Des Moines County Emergency Management Coordinator, Police Chiefs, Des Moines County Board of Supervisors, Des Moines County Sheriff's Department, Iowa Army Ammunition Plant
Timeline	On-going, no specific target completion date

16. Thunderstorm/Lightning/Windstorm/Hail

16.1 Educate the public regarding: a) precautions to take outdoors during severe weather; b) driving precautions and advisories; c) use of NOAA weather radios; d) safe room locations.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, City of Danville, City of Mediapolis, City of Middletown, City of West Burlington, Burlington CSD, Danville CSD, Mediapolis CSD, West Burlington ISD, Southeastern Community College

Goals Addressed: 3

Analysis	Education provides the public with most recent information regarding risk and response to natural disasters, and does not involve any direct changes to structures or infrastructure
Cost/Funding Source	A qualitative assessment suggests that the costs versus benefits of education are difficult to measure. This program is already fundable under current operation budgets.
Additional Hazards Addressed	Tornado, Extreme Heat, Flash Flood, Severe Winter Storms
Prioritization	HIGH (14 Points
Responsible Parties	Des Moines County Emergency Management Coordinator, Police Chiefs, Fire Chiefs, Des Moines County Sheriff's Department
Timeline	On-going, no specific target completion date

16.2 Cooperate with utility companies and residents to ensure tree-trimming around power lines and structures.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, City of Danville, City of Mediapolis, City of Middletown, City of West Burlington

Goals Addressed: 1, 2,

Analysis	There are no changes to existing infrastructure for this item
Cost/Funding Source	A qualitative assessment suggests that there is no direct cost to participating jurisdictions for this item
Additional Hazards Addressed	Infrastructure Failure
Prioritization	Low (5 Points)
Responsible Parties	Public Works Directors, County Engineer
Timeline	On-going, no specific target completion date

16.3 Acquire wood chipper to quickly handle storm debris.

Jurisdictions Adopting Activity: City of Burlington, City of Danville, City of Middletown

Goals Addressed: 1, 4

Analysis	This activity involves the acquisition of equipment in order to respond to disasters and does not involve any direct changes to structures or infrastructure
Cost/Funding Source	A qualitative assessment suggests that the costs of this item will need to be paid for by seeking additional grant funding
Additional Hazards Addressed	Severe Winter Storms
Prioritization	Medium (6 Points)
Responsible Parties	Public Works Directors, County Engineer
Timeline	Short-term

16.4 Update storm sewer capacity and sewer lining, develop storm water retention basins, and implement other storm water management techniques.

Jurisdictions Adopting Activity: City of Danville, City of Mediapolis, City of Middletown, City of Burlington, City of West Burlington

Goals Addressed: 1, 4

Analysis	This activity involves significant improvements to current infrastructure in addition to new construction
Cost/Funding Source	A qualitative assessment suggests that the cost the costs of acquiring equipment will need to be paid for by seeking additional grant funding.
Additional Hazards Addressed	Flash Flood
Prioritization	Medium (6 Point)
Responsible Parties	Des Moines County Emergency Management Coordinator, Mayors, Public Works Directors
Timeline	Medium-term

16.5 Locate safe rooms to minimize damage.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, City of Mediapolis, City of Danville, Burlington CSD, Mediapolis CSD, Southeastern Community College, DESCOM

Goals Addressed: 1, 4

Analysis	This activity involves significant improvements to current infrastructure in addition to new construction
Cost/Funding Source	A qualitative assessment suggests that the cost the costs of acquiring equipment will need to be paid for by seeking additional grant funding.
Additional Hazards Addressed	Tornado, Terrorism
Prioritization	Medium (8 Point)
Responsible Parties	Des Moines County Emergency Management Coordinator, Mayors, Superintendents
Timeline	Medium-term

17. Tornado

17.1 Test, replace, and expand the siren warning system in the county.

Jurisdictions Adopting Activity: City of Danville, City of Mediapolis, City of Middletown, City of Burlington, City of West Burlington, DESCOM

Goals Addressed: 1,2,3,4

Analysis	The upgrades of the sirens will involve installation of new poles and could involve structural or infrastructure changes to existing or new buildings. Some existing sirens are old and new sites can be added
Cost/Funding Source	A qualitative assessment suggests that the costs for this activity will need to be provided by seeking additional grant funding.
Additional Hazards Addressed	Thunderstorms/Lightning/Hail/Windstorm, Extreme Heat, Severe Winter Storms, Terrorism
Prioritization	HIGH (13 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Mayors, Des Moines County Board of Supervisors
Timeline	Medium-tern

17.2 Promote use of NOAA weather radios and create a program to purchase and distribute weather radios to citizens.

Jurisdictions Adopting Activity: City of Danville, City of Mediapolis

Goals Addressed: 1,2,3,4

Analysis	Education provides the public with most recent information regarding risk and response to hazards and does not involve any changes to structures or infrastructure
Cost/Funding Source	A qualitative assessment suggests that the costs for this activity will need to be provided by seeking additional grant funding.
Additional Hazards Addressed	Thunderstorms/Lightning/Hail/Windstorm, Extreme Heat, Severe Winter Storms, Terrorism
Prioritization	HIGH (13 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Mayors, Des Moines County Board of Supervisors
Timeline	Medium-tern

17.3 Educate the public regarding: a) proper response to sirens; b) tornado safe room locations; c) assessing watch and warning information; d) developing and maintaining countywide storm spotter education and training.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, City of Danville, City of Mediapolis, City of Middletown, City of West Burlington, Burlington CSD, Danville CSD, Mediapolis CSD, West Burlington ISD, Southeastern Community College

Goals Addressed: 1,2,3,4

Analysis	Education provides the public with most recent information regarding risk and response to hazards and does not involve any changes to structures or infrastructure
Cost/Funding Source	A qualitative assessment suggests that the costs versus benefits of education are difficult to measure. This program is already fundable under current operating budgets.
Additional Hazards Addressed	Thunderstorms/Lightning/Hail/Windstorm, Extreme Heat, Severe Winter Storms, Terrorism
Prioritization	HIGH (13 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Mayors, Police Chiefs, Fire Chiefs, American Red Cross Regional Director, Des Moines County Public Health Director, Superintendents
Timeline	Medium-tern

17.4 Develop shelters and saferoom facilities for campgrounds.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, Two Rivers Levee and Drainage Association

Goals Addressed: 1,4

Analysis	Construction of safe room and shelter locations will involve significant structural changes or new buildings
Cost/Funding Source	A qualitative assessment suggests that the cost of this item will need to be paid for by seeking additional grant funding
Additional Hazards Addressed	Thunderstorms/Lightning/Hail/Windstorm, Extreme Heat, Severe Winter Storms, Terrorism
Prioritization	HIGH (13 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Des Moines County Conservation Director, Des Moines County Board of Supervisors
Timeline	Medium-tern

17.5 Create ordinance requiring all manufactured homes to be secured to the ground.

Jurisdictions Adopting Activity: Des Moines County, City of Burlington, City of West Burlington, Burlington CSD

Goals Addressed: 1,4

Analysis	This item encourages best practices through policies, programs, and other incentives
Cost/Funding Source	A qualitative assessment suggests that the cost of this item is already fundable under current operating budgets
Additional Hazards Addressed	Thunderstorms/Lightning/Hail/Windstorm
Prioritization	MEDIUM (6 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Des Moines County Board of Supervisors, Mayors
Timeline	On-going, no specific target completion date

17.5 Develop saferooms to ensure campus safety.

Jurisdictions Adopting Activity: Southeastern Community College

Goals Addressed: 1,4

Analysis	Construction of a new safe room location will involve significant structural changes and/or new buildings
Cost/Funding Source	A qualitative assessment suggests that the cost of this item will need to be provided by seeking additional grant funding.
Additional Hazards Addressed	Thunderstorms/Lightning/Hail/Windstorm, Severe Winter Storms, Terrorism
Prioritization	HIGH (12 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Superintendents
Timeline	Medium-term

18.Transportation Incident (air, highway, water, rail)

18.1 Educate the Public regarding a) driving precautions during severe weather conditions; b) dangerous routes and roads during severe weather; c) precautions for water and boating safety.

Jurisdictions Adopting Activity: Des Moines County, City of Danville, City of Mediapolis, City of Burlington, City of Middletown

Goals Addressed: 3

Analysis	Education provides the public with most recent information regarding risk and response to natural disasters, and does not involve any direct changes to structures or infrastructure.
Cost/Funding Source	A qualitative assessment suggests that the costs versus benefits of education are difficult to measure. This program is already fundable under current operating budgets.
Additional Hazards Addressed	Tornado, Thunderstorms/Lightning/Hail/Windstorm, Flash Flood, Severe Winter Storms
Prioritization	High (11 Points)
Responsible Parties	Mayors, Des Moines County Emergency Management Coordinator, Des Moines County Sheriff's Department, Police Chiefs
Timeline	On-going, no specific target completion date

18.2 Ensure cooperation with the railway industry to ensure quick response and adequate information regarding number of passengers and type of products being transported.

Jurisdictions Adopting Activity: Des Moines County

Goals Addressed: 1,2,3

Analysis	There is no change to existing or future structures or infrastructure associated with this item
Cost/Funding Source	A qualitative assessment suggests that there are no direct costs associated with this item
Additional Hazards Addressed	Infrastructure Failure, Hazardous Materials Incident
Prioritization	MEDIUM (6 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Fire Chiefs, Police Chiefs, Des Moines County Sheriff's Department
Timeline	On-going, no specific target completion date

18.3 Install mobile and/or fixed real-time electronic signage along critical roadway and highway points to communicate messages to drivers.

Jurisdictions Adopting Activity: Des Moines County, City of West Burlington, City of Burlington

Goals Addressed: 1,2,3

Analysis	This action involves collaboration between state and local officials, and does not require any direct changes to structures or infrastructure
Cost/Funding Source	A qualitative assessment suggests that the costs of this item will need to be paid by seeking additional grant funding
Additional Hazards Addressed	Tornado, Thunderstorms/Lightning/Hail/Windstorm, Flash Flood, Severe Winter Storms
Prioritization	High (14 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Iowa Department of Transportation District 5 Director, Police Chiefs, Des Moines County Sheriff's Department
Timeline	Medium-term

18.4 Improve safety where railroads intersect with roads and trails.

Jurisdictions Adopting Activity: Des Moines County, City of Danville, City of Burlington, City of West Burlington, City of Middletown, City of Danville

Goals Addressed: 1

Analysis	This action involves collaboration between state and local officials, as well as representatives from the private sector, and may require changes to current and/or future structures and infrastructure
Cost/Funding Source	A qualitative assessment suggests that improvement may be paid for by the railroad industry
Additional Hazards Addressed	Hazardous Materials, Terrorism
Prioritization	Medium (6 Points)
Responsible Parties	Des Moines County Emergency Management Coordinator, Fire Chiefs
Timeline	On-going, no specific target completion date

VII. Des Moines County | Plan Maintenance

7.1 Making the Plan Work

The Pre-Disaster Mitigation Plan is a guide for policy and decision-making regarding mitigation actions within Des Moines County. The Plan considers population trends and projections, community background information, current and future mitigation measures, and overall important goals and objectives for the area. The goals and objectives have been developed to reflect the consensus of the Pre-Disaster Mitigation Plan Committee, the City Councils, the Board of Supervisors, and the citizens of Des Moines County. These recommendations have been developed to look five years into the future with the expectation that periodic updates will occur in order to reflect changes within the County.

The success of this Plan will require the support of the residents and staff from each of the participating communities. Cooperation from the public and private sectors will allow implementation of the recommendations that will provide long-term benefits for the entire region.

Integrating the Plan

The Pre-Disaster Mitigation Plan will be most effective when integrated into other planning mechanisms when appropriate. In Des Moines County, participating jurisdictions have varying degrees of planning needs and capabilities, and will therefore integrate hazard mitigation differently. The following steps describe ways in which this Plan will be implemented into other planning mechanisms:

- As part of the annual review and evaluation process, the Hazard Mitigation Committee will meet and discuss opportunities to integrate this Plan into other planning mechanisms. The annual assessment helps keep this Plan relevant as new planning efforts arise, and will be documented on the review and evaluation form as described later in this Section.
- Southeast Iowa Regional Planning Commission (SEIRPC) frequently provides planning services to Des Moines County communities that may lack staffing and resources to produce local plans. Regional planners have a lead role in mitigation planning for Des Moines County communities, and will proactively seek out opportunities for integrating hazard mitigation as new planning mechanisms develop.
- SEIRPC will integrate this Plan in some form into the Great River Region Comprehensive Economic Development Strategies (CEDS) plan, which is the long range plan for the Southeast Iowa Region. The CEDS plan was last updated in November 2012 and is updated every 5 years.
- All participating jurisdictions will review adopted mitigation measures during annual budgeting and dedicate funding as appropriate. The review and recommendations for budgeting will be done by the responsible parties.

- Participating jurisdictions will review and consider ways to integrate this Mitigation Plan into Comprehensive Plans when those plans are being created or updated. Similarly, adopted hazard mitigation projects will be integrated into Capital Improvement Plans and other local plans as appropriate.
- Integration of this Plan into other planning mechanisms will adhere to the public input process required for those planning mechanisms.

7.2 Monitoring, Evaluating, and Updating the Plan

Defining a method of monitoring the PDM Plan and establishing a schedule for evaluation and updating of the plan is essential in successful mitigation strategies. This plan proposes that the Hazard Mitigation Commission monitor the plan, promote implementation, facilitate public input, and report to the governing bodies of each participating jurisdiction and the Des Moines County Supervisors. The PDM Plan will need to be revised and re-adopted by the Board of Supervisors and the participating communities every five years.

Hazard Mitigation Commission

The Des Moines County Emergency Management Commission will be responsible for promoting and encouraging the implementation of the Pre-Disaster Mitigation Plan. The Emergency Management Commission is comprised of elected members from communities throughout Des Moines County. Participation from other departments including fire protection, law enforcement, and public works will is encouraged to provide technical support to the Commission.

The primary responsibilities of the Commission in regards to the Hazard Mitigation Plan will be to dedicate time at one meeting annually to monitor and implement the hazard plan, address the mitigation goals and the extent the mitigation strategies have been implemented, assess current and expected conditions of each hazard, discuss the nature of any change in risks posed by the hazards, evaluate current resources being allocated to implement the plan, discuss the outcomes that have occurred from plan implementation, ensure agencies are participating as proposed in the mitigation measures section, address any implementation problems that have occurred, and provide an annual progress report on the implementation status. The Commission will utilize the attached Plan Review and Evaluation Form to conduct the review as indicated by date and year on the form.

The Commission will also serve as a resource to other city councils and public agencies involved in Hazard Mitigation measures.

Continued Public Involvement

The time and location of the Des Moines County Emergency Management Commission meetings to conduct the Plan Review and Evaluation Form process will be posted in advance in order to encourage public participation and feedback. In addition, the annual report provided by the Committee will be offered in a public hearing format in order to encourage the community to share ideas and express concerns and opinions about the mitigation strategies and the implementation of the plan. The adopted Pre-Disaster Mitigation Plan will be available online and at the Des Moines County Board of Supervisors office for the public to review and comment.

Evaluation

This Plan will be continuously reviewed and will be updated as necessary. A substantial review, update and re-adoption will occur every five years. A statement of progress will be attached to the Plan after the periodic review is completed and the following evaluation form will be used as a tool to conduct the update. The form will be completed by the Des Moines County Emergency Management Commission and representatives from each agency identified as a Responsible Agency in the Future Mitigation measures section of this Plan.

In addition to addressing each of the areas on the form, the review group must also discuss other planning mechanisms that could be used to incorporate this Plan into the broad planning efforts within the planning area. This includes things such as any revisions to Comprehensive Plans, and pending zoning or code changes, and any changes in policies. During each review session, the review session date, location and time will be printed in the local newspaper and posted at the city halls so that the public can attend and provide comment during the review process. Once the review form is completed, it will be presented to the Des Moines County Board of Supervisors, and the City Councils and the Mayors and to the public for comment and attached to the Pre-Disaster Mitigation Plan as an Addendum.

Plan review will be documented using FEMA worksheets included in Appendix J.

Appendix A. Des Moines County | Planning Team

The table below identifies the planning team organized to provide leadership and input for the Des Moines County Pre-Disaster Mitigation Plan Process:

	Organization	Committee Member	Committee Member
1	SEIRPC – Lead Staff	Zachary James Planning Director	Emery Ellingson Regional Planner
3	Des Moines County	Gina Hardin Emergency Management Coordinator	Alex Buhmeyer County Conservation
4	Des Moines County	Tom Broeker County Board of Supervisors	Brian Carter County Engineer
5	Burlington	Steve Hoambrecker Public Works Director	Charlie Nichols Assistant City Planner
6	Danville	Jerry Strause City Council Member	Allen Schille Public Works Director
7	Mediapolis	Julie Tribbey City Clerk	Ray Wilson Volunteer Fire Department
8	Middletown	Dale Culler City Clerk	Allen Buren IAAAP Emergency Manager
9	West Burlington	Dan Gifford City Administrator	Hans Trousil Mayor
10	Burlington CSD	Pat Coen Superintendant	
11	Danville CSD	Gary DeLacy Superintendant	
12	Mediapolis CSD	Greg Ray Superintendant	
13	West Burlington ISD	Dave Schmitt Superintendant	
14	Notre Dame Schools	Ron Glascow	Bill Maupin
15	SCC	Kevin Carr VP of Administrative Services	Byron Whittlesey
16	Two Rivers Levee and Drainage Association	Vicki Stoller Administrator	

Appendix B. Des Moines County | Historical Weather Data

Data from January 1950 through December 2014 was obtained from the National Climatic Data Center (NCDC) Storm Events Database: http://www.ncdc.noaa.gov/stormevents/.

The following tables include all historical weather event data available from the National Climactic Data Center (NCDC) Storm Events Database, as of December 2014. The NCDC data includes only reported events and therefore may not be a comprehensive list of all events that have impacted Des Moines County. The tables include date, time, hazard type, magnitude, number of deaths and injuries, and property and crop damage. Abbreviations are explained below.

Many of the events are hyperlinked to the NCDC website and provide more detailed descriptions of individual events (applies to digital copies of this Plan only). The additional online information can be accessed by clicking the links in the "Location or County" column.

Abbreviation	Definition		
Mag	Magnitude	**MG**	Measured Gust (Wind)
Dth	Deaths	**EG**	Estimated Gust (Wind)
Inj	Injuries	**MS**	Measured Sustained (Wind)
PrD	Property Damage	**ES**	Estimated Sustained (Wind)
CrD	Crop Damage		

DROUGHT								
Location or County	**Date**	**Time**	**Type**	**Mag**	**Dth**	**Inj**	**PrD**	**CrD**
DES MOINES (ZONE)	8/1/2003	12:00 AM	Drought		0	0	0.00K	14.880M
DES MOINES (ZONE)	7/1/2005	12:00 AM	Drought		0	0	0.00K	7.080M
DES MOINES (ZONE)	8/1/2005	12:00 AM	Drought		0	0	0.00K	1.670M
DES MOINES (ZONE)	9/1/2005	12:00 AM	Drought		0	0	0.00K	0.00K
DES MOINES (ZONE)	10/1/2005	12:00 AM	Drought		0	0	0.00K	0.00K
DES MOINES (ZONE)	11/1/2005	12:00 AM	Drought		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/1/2005	12:00 AM	Drought		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/1/2006	12:00 AM	Drought		0	0	0.00K	0.00K
DES MOINES (ZONE)	2/1/2006	12:00 AM	Drought		0	0	0.00K	0.00K
DES MOINES (ZONE)	3/1/2006	12:00 AM	Drought		0	0	0.00K	0.00K
DES MOINES (ZONE)	9/1/2011	12:00 AM	Drought		0	0	0.00K	0.00K
DES MOINES (ZONE)	10/1/2011	12:00 AM	Drought		0	0	0.00K	0.00K
DES MOINES (ZONE)	7/17/2012	12:00 AM	Drought		0	0	0.00K	0.00K
DES MOINES (ZONE)	8/7/2012	12:00 AM	Drought		0	0	0.00K	0.00K
DES MOINES (ZONE)	11/1/2012	12:00 AM	Drought		0	0	0.00K	0.00K
DES MOINES (ZONE)	9/3/2013	12:00 AM	Drought		0	0	0.00K	0.00K
DES MOINES (ZONE)	10/1/2013	12:00 AM	Drought		0	0	0.00K	0.00K

EXTREME HEAT								
Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
DES MOINES (ZONE)	7/25/1997	4:00 AM	Heat		0	0	0.50K	0.00K
DES MOINES (ZONE)	7/19/1999	4:00 AM	Heat		0	0	0.00K	0.00K
DES MOINES (ZONE)	8/31/2000	4:21 AM	Heat		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/6/2008	12:00 PM	Heat		0	0	0.00K	0.00K
DES MOINES (ZONE)	7/4/2012	12:00 PM	Excessive Heat		0	0	0.00K	0.00K
DES MOINES (ZONE)	8/26/2013	11:00 AM	Heat		0	0	0.00K	0.00K

FOG								
Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
DES MOINES (ZONE)	12/12/1999	11:00 PM	Dense Fog		0	0	0.00K	0.00K
DES MOINES (ZONE)	3/15/2000	3:45 AM	Dense Fog		0	0	0.00K	0.00K
DES MOINES (ZONE)	5/2/2000	1:00 AM	Dense Fog		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/20/2007	1:25 PM	Dense Fog		0	0	0.00K	0.00K
DES MOINES (ZONE)	2/4/2008	9:10 AM	Dense Fog		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/26/2008	6:00 PM	Dense Fog		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/16/2010	11:00 PM	Dense Fog		0	0	0.00K	0.00K
DES MOINES (ZONE)	11/20/2012	3:40 AM	Dense Fog		0	0	0.00K	0.00K
DES MOINES (ZONE)	11/21/2012	12:00 AM	Dense Fog		0	0	0.00K	0.00K

FLOODING								
Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
DES MOINES (ZONE)	5/9/1996	8:00 PM	Flood		0	0	0.00K	0.00K
COUNTYWIDE	2/20/1997	4:00 PM	Flash Flood		0	0	0.00K	0.00K
DES MOINES (ZONE)	4/8/1997	6:00 AM	Flood		0	0	0.00K	0.00K
COUNTYWIDE	10/17/1998	3:48 PM	Flash Flood		0	0	0.00K	0.00K
DES MOINES (ZONE)	5/17/1999	9:00 AM	Flood		0	0	0.00K	0.00K
DES MOINES (ZONE)	7/3/1999	7:00 PM	Flood		0	0	0.00K	0.00K
DES MOINES (ZONE)	7/23/1999	7:00 AM	Flood		0	0	0.00K	0.00K
DES MOINES (ZONE)	6/1/2000	7:30 AM	Flood		0	0	0.00K	0.00K
COUNTYWIDE	2/24/2001	9:00 AM	Flood		0	0	0.00K	0.00K
BURLINGTON	4/5/2001	9:50 AM	Flood		0	0	0.00K	0.00K
DES MOINES (ZONE)	4/14/2001	5:30 AM	Flood		0	0	0.00K	0.00K
DES MOINES (ZONE)	5/1/2001	1:00 AM	Flood		0	0	0.00K	0.00K

FLOODING								
Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
BURLINGTON	5/14/2001	7:47 AM	Flood		0	0	0.00K	0.00K
DES MOINES (ZONE)	4/21/2002	6:27 PM	Flood		0	0	0.00K	0.00K
DES MOINES (ZONE)	5/1/2002	12:00 AM	Flood		0	0	0.00K	0.00K
DES MOINES (ZONE)	5/12/2002	3:33 AM	Flood		0	0	0.00K	0.00K
BURLINGTON	6/12/2002	9:35 PM	Flash Flood		0	0	0.00K	0.00K
BURLINGTON	6/12/2002	10:45 PM	Flash Flood		0	0	0.00K	0.00K
WEST BURLINGTON	6/13/2002	5:40 AM	Flash Flood		0	0	0.00K	0.00K
BURLINGTON	8/23/2002	12:30 AM	Flash Flood		0	0	0.00K	0.00K
DES MOINES (ZONE)	5/21/2003	3:22 AM	Flood		0	0	1.000M	0.00K
DES MOINES (ZONE)	5/26/2004	6:08 AM	Flood		0	0	0.00K	0.00K
DES MOINES (ZONE)	6/1/2004	12:00 AM	Flood		0	0	0.00K	0.00K
SPERRY	6/22/2007	6:15 AM	Flash Flood		0	0	0.00K	0.00K
LENOX PARK	6/22/2007	6:15 AM	Flash Flood		0	0	0.00K	0.00K
BURLINGTON	4/1/2008	12:00 AM	Flood		0	0	0.00K	0.00K
KINGSTON	5/1/2008	12:00 AM	Flood		0	0	0.00K	0.00K
HURON	6/1/2008	12:00 AM	Flood		0	0	3.800M	0.00K
WEST BURLINGTON	6/3/2008	11:06 PM	Flash Flood		0	0	0.00K	0.00K
WEST BURLINGTON	8/28/2008	7:30 AM	Flash Flood		0	0	0.00K	0.00K
MEDIAPOLIS	9/13/2008	7:07 AM	Flash Flood		0	0	0.00K	0.00K
ST PAUL	9/13/2008	6:00 PM	Flood		0	0	500.00K	500.00K
BURLINGTON ARPT	4/30/2009	4:00 AM	Flood		0	0	10.00K	0.00K
(BRL)BURLINGTON MUNI	4/30/2009	7:25 AM	Flood		0	0	0.00K	0.00K
DODGEVILLE	5/15/2009	12:59 PM	Flood		0	0	0.00K	0.00K
DANVILLE WILSON ARPT	5/15/2009	11:00 PM	Flood		0	0	150.00K	0.00K
YARMOUTH	6/22/2009	12:01 AM	Flash Flood		0	0	0.00K	0.00K
DANVILLE WILSON ARPT	8/28/2009	12:30 AM	Flood		0	0	250.00K	0.00K
DANVILLE WILSON ARPT	4/24/2010	4:30 PM	Flash Flood		0	0	0.00K	0.00K
PLEASANTGROVE	5/12/2010	11:09 PM	Flash Flood		0	0	3.950M	0.00K
DANVILLE WILSON ARPT	5/13/2010	1:00 AM	Flood		0	0	250.00K	0.00K
DANVILLE WILSON ARPT	6/14/2010	12:00 PM	Flood		0	0	250.00K	0.00K
LENOX PARK	6/22/2010	1:30 PM	Flood		0	0	250.00K	0.00K
BEAVERDALE	7/19/2010	7:37 PM	Flash Flood		0	0	250.00K	0.00K
NORTHFIELD	7/25/2010	9:30 PM	Flood		0	0	125.00K	0.00K

FLOODING								
Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
DANVILLE WILSON ARPT	8/13/2010	1:00 PM	Flood		0	0	250.00K	0.00K
BURLINGTON	10/2/2010	4:45 PM	Flood		0	0	0.00K	0.00K
SPRING GROVE	4/19/2011	12:00 AM	Flood		0	0	250.00K	0.00K
LENOX PARK	5/25/2011	3:40 PM	Flash Flood		0	0	0.00K	0.00K
DES MOINES CO.	6/14/2011	11:00 PM	Flash Flood		0	0	0.00K	0.00K
NORTHFIELD	4/19/2013	2:25 AM	Flood		0	0	0.00K	0.00K
DANVILLE WILSON ARPT	4/19/2013	8:40 AM	Flood		0	0	0.00K	0.00K
AUGUSTA	5/30/2013	2:00 AM	Flood		0	0	0.00K	0.00K
HURON	5/31/2013	1:30 AM	Flood		0	0	0.00K	0.00K
BURLINGTON	6/1/2013	12:00 AM	Flood		0	0	0.00K	0.00K
AUGUSTA	6/1/2013	12:00 AM	Flood		0	0	0.00K	0.00K
BURLINGTON	6/28/2013	3:00 PM	Flood		0	0	0.00K	0.00K
DANVILLE WILSON ARPT	2/20/2014	5:30 PM	Flood		0	0	0.00K	0.00K
LENOX PARK	6/19/2014	3:51 PM	Flood		0	0	0.00K	0.00K
LENOX PARK	6/19/2014	3:51 PM	Flash Flood		0	0	0.00K	0.00K
SPRING GROVE	6/26/2014	11:00 PM	Flood		0	0	0.00K	0.00K

HAIL								
Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
DES MOINES CO.	8/25/1965	6:30 PM	Hail	4.00 in.	0	0	0.00K	0.00K
DES MOINES CO.	4/21/1973	4:00 PM	Hail	3.00 in.	0	0	0.00K	0.00K
DES MOINES CO.	6/20/1974	7:10 PM	Hail	1.75 in.	0	0	0.00K	0.00K
DES MOINES CO.	6/20/1974	7:45 PM	Hail	1.75 in.	0	0	0.00K	0.00K
DES MOINES CO.	6/13/1975	4:45 PM	Hail	1.75 in.	0	0	0.00K	0.00K
DES MOINES CO.	4/29/1981	5:30 PM	Hail	0.88 in.	0	0	0.00K	0.00K
DES MOINES CO.	5/23/1981	9:05 PM	Hail	1.75 in.	0	0	0.00K	0.00K
DES MOINES CO.	10/28/1982	12:35 PM	Hail	0.75 in.	0	0	0.00K	0.00K
DES MOINES CO.	10/28/1982	12:35 PM	Hail	0.75 in.	0	0	0.00K	0.00K
DES MOINES CO.	8/29/1990	12:34 AM	Hail	0.75 in.	0	0	0.00K	0.00K
DES MOINES CO.	9/9/1991	7:30 PM	Hail	1.75 in.	0	0	0.00K	0.00K
DES MOINES CO.	6/17/1992	11:17 AM	Hail	1.75 in.	0	0	0.00K	0.00K
DES MOINES CO.	6/23/1992	7:13 PM	Hail	1.75 in.	0	0	0.00K	0.00K
West Burlington	4/10/1995	2:30 AM	Hail	1.75 in.	0	0	350.00K	0.00K
BURLINGTON	4/18/1996	4:25 PM	Hail	1.00 in.	0	0	0.00K	0.00K

HAIL								
Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
DANVILLE	4/19/1996	4:00 PM	Hail	0.75 in.	0	0	0.00K	0.00K
DANVILLE	4/19/1996	4:41 PM	Hail	1.75 in.	0	0	0.00K	0.00K
HURON	4/19/1996	4:47 PM	Hail	1.00 in.	0	0	0.00K	0.00K
MEDIAPOLIS	4/19/1996	4:49 PM	Hail	1.00 in.	0	0	0.00K	0.00K
YARMOUTH	3/30/1998	7:58 PM	Hail	0.75 in.	0	0	0.00K	0.00K
BURLINGTON	6/4/1999	2:10 PM	Hail	0.75 in.	0	0	0.00K	0.00K
BURLINGTON	6/4/1999	2:15 PM	Hail	0.88 in.	0	0	0.00K	0.00K
BURLINGTON	4/19/2000	11:35 PM	Hail	0.88 in.	0	0	0.00K	0.00K
BURLINGTON	4/19/2000	11:45 PM	Hail	0.75 in.	0	0	0.00K	0.00K
BURLINGTON	6/13/2000	2:47 PM	Hail	0.75 in.	0	0	0.00K	0.00K
BURLINGTON	9/22/2000	8:05 PM	Hail	2.75 in.	0	0	50.00K	0.00K
BURLINGTON	9/22/2000	8:06 PM	Hail	1.75 in.	0	0	0.00K	0.00K
BURLINGTON	9/22/2000	8:13 PM	Hail	0.75 in.	0	0	0.00K	0.00K
BURLINGTON	4/5/2001	9:40 AM	Hail	1.00 in.	0	0	0.00K	0.00K
BURLINGTON	4/5/2001	10:08 AM	Hail	1.75 in.	0	0	0.00K	0.00K
BURLINGTON	5/1/2002	3:57 PM	Hail	0.75 in.	0	0	0.00K	0.00K
BURLINGTON	6/1/2002	12:09 AM	Hail	0.75 in.	0	0	0.00K	0.00K
PLEASANTGROVE	6/1/2002	3:55 AM	Hail	0.75 in.	0	0	0.00K	0.00K
MIDDLETOWN	5/8/2003	7:40 PM	Hail	1.75 in.	0	0	1.000M	0.00K
BURLINGTON	5/8/2003	7:45 PM	Hail	2.50 in.	0	0	2.000M	0.00K
WEST BURLINGTON	5/8/2003	7:49 PM	Hail	1.00 in.	0	0	1.000M	0.00K
BURLINGTON	5/8/2003	7:53 PM	Hail	2.75 in.	0	0	10.000M	0.00K
WEST BURLINGTON	5/14/2003	5:12 PM	Hail	0.88 in.	0	0	0.00K	0.00K
COUNTYWIDE	3/12/2006	6:24 PM	Hail	1.00 in.	0	0	10.00K	0.00K
YARMOUTH	3/12/2006	6:24 PM	Hail	1.00 in.	0	0	3.00K	0.00K
PLEASANTGROVE	3/12/2006	7:17 PM	Hail	1.00 in.	0	0	5.00K	0.00K
YARMOUTH	3/12/2006	7:19 PM	Hail	1.00 in.	0	0	5.00K	0.00K
PLEASANTGROVE	3/12/2006	8:55 PM	Hail	0.75 in.	0	0	0.00K	0.00K
MIDDLETOWN	3/12/2006	9:49 PM	Hail	0.88 in.	0	0	0.00K	0.00K
BURLINGTON	3/12/2006	9:50 PM	Hail	1.75 in.	0	0	20.00K	0.00K
MEDIAPOLIS	3/12/2006	9:50 PM	Hail	0.88 in.	0	0	0.00K	0.00K
BURLINGTON ARPT	3/12/2006	9:50 PM	Hail	1.75 in.	0	0	10.00K	0.00K
DANVILLE	4/2/2006	3:50 PM	Hail	0.75 in.	0	0	0.00K	0.00K
DANVILLE	4/2/2006	3:53 PM	Hail	0.75 in.	0	0	0.00K	0.00K
MIDDLETOWN	4/2/2006	3:59 PM	Hail	0.88 in.	0	0	0.50K	0.00K
WEST BURLINGTON	4/6/2006	11:40 AM	Hail	0.75 in.	0	0	0.00K	0.00K

HAIL								
Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
BURLINGTON	4/6/2006	11:45 AM	Hail	0.88 in.	0	0	0.00K	0.00K
MEDIAPOLIS	5/26/2007	11:14 AM	Hail	1.00 in.	0	0	0.00K	0.00K
SPERRY	6/21/2007	11:35 PM	Hail	0.88 in.	0	0	0.00K	0.00K
LENOX PARK	7/9/2007	1:54 PM	Hail	0.75 in.	0	0	0.00K	0.00K
BEAVERDALE	6/15/2008	12:25 PM	Hail	0.88 in.	0	0	0.00K	0.00K
WEST BURLINGTON	6/15/2008	12:31 PM	Hail	0.75 in.	0	0	0.00K	0.00K
MIDDLETOWN	8/5/2008	2:37 AM	Hail	0.75 in.	0	0	0.00K	0.00K
BURLINGTON ARPT	3/7/2009	2:30 AM	Hail	0.75 in.	0	0	0.00K	0.00K
LENOX PARK	3/7/2009	2:37 AM	Hail	1.25 in.	0	0	0.00K	0.00K
LENOX PARK	3/7/2009	2:38 AM	Hail	1.00 in.	0	0	0.00K	0.00K
HURON	6/1/2009	3:30 PM	Hail	0.88 in.	0	0	0.00K	0.00K
HURON	6/1/2009	3:48 PM	Hail	1.00 in.	0	0	0.00K	0.00K
LENOX PARK	6/27/2009	6:06 PM	Hail	1.00 in.	0	0	0.00K	0.00K
LENOX PARK	6/27/2009	6:10 PM	Hail	1.25 in.	0	0	0.00K	0.00K
LENOX PARK	4/4/2010	10:30 AM	Hail	0.88 in.	0	0	0.00K	0.00K
LENOX PARK	5/7/2010	12:42 AM	Hail	0.75 in.	0	0	0.00K	0.00K
LENOX PARK	5/7/2010	12:50 AM	Hail	0.88 in.	0	0	0.00K	0.00K
DANVILLE	6/1/2010	10:30 PM	Hail	1.00 in.	0	0	0.00K	0.00K
MIDDLETOWN	6/1/2010	10:37 PM	Hail	1.00 in.	0	0	0.00K	0.00K
BURLINGTON ARPT	6/21/2010	8:51 PM	Hail	1.00 in.	0	0	0.00K	0.00K
MIDDLETOWN	3/22/2011	10:52 PM	Hail	0.75 in.	0	0	0.00K	0.00K
BEAVERDALE	5/25/2011	3:59 PM	Hail	0.75 in.	0	0	0.00K	0.00K
BURLINGTON ARPT	10/11/2011	3:12 PM	Hail	0.75 in.	0	0	0.00K	0.00K
BEAVERDALE	6/29/2012	7:14 PM	Hail	0.75 in.	0	0	0.00K	0.00K
MEDIAPOLIS	6/29/2012	7:16 PM	Hail	1.00 in.	0	0	0.00K	0.00K
LENOX PARK	5/19/2013	4:05 PM	Hail	1.75 in.	0	0	0.00K	0.00K
BURLINGTON ARPT	5/19/2013	4:06 PM	Hail	1.00 in.	0	0	0.00K	0.00K
LENOX PARK	5/19/2013	4:07 PM	Hail	1.75 in.	0	0	0.00K	0.00K
BURLINGTON ARPT	5/19/2013	4:08 PM	Hail	1.50 in.	0	0	0.00K	0.00K
BURLINGTON	5/19/2013	4:09 PM	Hail	0.75 in.	0	0	0.00K	0.00K
BURLINGTON ARPT	5/19/2013	4:09 PM	Hail	1.00 in.	0	0	0.00K	0.00K
LENOX PARK	5/28/2013	3:46 PM	Hail	0.75 in.	0	0	0.00K	0.00K
HURON	5/28/2013	5:31 PM	Hail	1.00 in.	0	0	0.00K	0.00K
(BRL)BURLINGTON MUNI	4/3/2014	12:46 AM	Hail	0.75 in.	0	0	0.00K	0.00K
MEDIAPOLIS	5/11/2014	4:31 PM	Hail	1.75 in.	0	0	0.00K	0.00K
MEDIAPOLIS	5/11/2014	4:40 PM	Hail	0.88 in.	0	0	0.00K	0.00K
HURON	5/11/2014	4:43 PM	Hail	0.88 in.	0	0	0.00K	0.00K

THUNDERSTORM, WIND, & LIGHTNING								
Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
DES MOINES CO.	5/13/1969	2:30 AM	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
DES MOINES CO.	5/9/1970	3:15 PM	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
DES MOINES CO.	6/2/1973	2:25 PM	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
DES MOINES CO.	5/29/1974	5:10 AM	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
DES MOINES CO.	6/20/1974	7:10 PM	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
DES MOINES CO.	5/20/1975	5:00 PM	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
DES MOINES CO.	3/11/1977	9:15 AM	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
DES MOINES CO.	4/20/1977	1:14 PM	Thunderstorm Wind	70 kts.	0	0	0.00K	0.00K
DES MOINES CO.	6/27/1978	4:00 AM	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
DES MOINES CO.	6/28/1978	6:55 PM	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
DES MOINES CO.	8/18/1978	10:00 PM	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
DES MOINES CO.	6/12/1979	7:40 PM	Thunderstorm Wind	65 kts.	0	0	0.00K	0.00K
DES MOINES CO.	6/14/1980	8:05 PM	Thunderstorm Wind	52 kts.	0	0	0.00K	0.00K
DES MOINES CO.	7/5/1980	12:57 AM	Thunderstorm Wind	70 kts.	0	0	0.00K	0.00K
DES MOINES CO.	8/13/1980	4:55 PM	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
DES MOINES CO.	8/13/1980	4:55 PM	Thunderstorm Wind	52 kts.	0	0	0.00K	0.00K
DES MOINES CO.	8/13/1980	5:07 PM	Thunderstorm Wind	52 kts.	0	0	0.00K	0.00K
DES MOINES CO.	4/13/1981	9:06 PM	Thunderstorm Wind	60 kts.	0	0	0.00K	0.00K
DES MOINES CO.	4/16/1982	2:32 PM	Thunderstorm Wind	52 kts.	0	0	0.00K	0.00K
DES MOINES CO.	6/29/1983	11:12 AM	Thunderstorm Wind	52 kts.	0	0	0.00K	0.00K
DES MOINES CO.	8/18/1983	4:30 PM	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
DES MOINES CO.	10/16/1984	6:45 PM	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
DES MOINES CO.	3/27/1985	11:00 PM	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
DES MOINES CO.	5/8/1986	6:33 PM	Thunderstorm Wind	52 kts.	0	0	0.00K	0.00K
DES MOINES CO.	8/4/1988	4:25 PM	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
DES MOINES CO.	8/18/1988	4:30 PM	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
DES MOINES CO.	4/26/1989	5:45 PM	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
DES MOINES CO.	4/26/1989	7:03 PM	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
DES MOINES CO.	5/24/1989	3:30 AM	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
DES MOINES CO.	7/9/1990	8:20 PM	Thunderstorm Wind	52 kts.	0	0	0.00K	0.00K
DES MOINES CO.	7/22/1991	9:30 PM	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
DES MOINES CO.	9/9/1991	8:15 PM	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
DES MOINES CO.	11/29/1991	10:30 PM	Thunderstorm Wind	65 kts.	0	0	0.00K	0.00K
DES MOINES CO.	4/20/1992	7:45 PM	Thunderstorm Wind	70 kts.	0	0	0.00K	0.00K
DES MOINES CO.	6/19/1992	5:00 PM	Thunderstorm Wind	61 kts.	0	0	0.00K	0.00K

THUNDERSTORM, WIND, & LIGHTNING								
Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
Danville	4/19/1993	4:00 PM	Thunderstorm Wind	52 kts.	0	0	50.00K	0.00K
Danville	4/19/1993	4:45 PM	Thunderstorm Wind	60 kts.	0	0	50.00K	0.00K
Burlington	6/2/1995	6:10 PM	Thunderstorm Wind	61 kts.	0	0	15.00K	0.00K
Burlington	8/8/1995	11:35 AM	Thunderstorm Wind	50 kts.	0	0	75.00K	1.00K
Mediapolis	8/9/1995	7:30 PM	Thunderstorm Wind	50 kts.	0	0	10.00K	1.00K
Middletown	8/15/1995	5:00 PM	Thunderstorm Wind	50 kts.	0	0	30.00K	5.00K
Burlington	8/15/1995	5:10 PM	Thunderstorm Wind	50 kts.	0	0	75.00K	2.00K
BURLINGTON	5/24/1996	12:30 PM	Thunderstorm Wind	60 kts.	0	0	0.00K	0.00K
DES MOINES (ZONE)	10/29/1996	4:30 PM	High Wind	52 kts.	0	0	0.00K	0.00K
BURLINGTON	4/5/1997	2:30 PM	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
DES MOINES (ZONE)	4/6/1997	8:00 AM	High Wind	47 kts.	0	0	100.00K	0.00K
BURLINGTON	5/18/1997	7:53 PM	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
BURLINGTON ARPT	6/21/1997	4:14 AM	Thunderstorm Wind	59 kts.	0	0	0.00K	0.00K
DES MOINES (ZONE)	9/29/1997	11:00 AM	High Wind	52 kts.	0	0	0.00K	0.00K
BURLINGTON	6/18/1998	4:15 PM	Thunderstorm Wind	54 kts.	0	0	0.00K	0.00K
COUNTYWIDE	6/29/1998	2:22 PM	Thunderstorm Wind	56 kts.	0	0	0.00K	0.00K
DES MOINES (ZONE)	11/9/1998	4:00 AM	High Wind	51 kts.	0	0	0.00K	0.00K
BURLINGTON ARPT	6/11/1999	3:31 PM	Thunderstorm Wind	53 kts.	0	0	0.00K	0.00K
BURLINGTON	9/22/2000	8:05 PM	Thunderstorm Wind	61 kts. E	0	0	20.00K	0.00K
WEST BURLINGTON	10/3/2000	8:30 PM	Thunderstorm Wind	52 kts. E	0	0	0.00K	0.00K
DES MOINES (ZONE)	2/25/2001	2:00 AM	High Wind	46 kts. M	0	0	0.00K	0.00K
BURLINGTON	6/14/2001	4:15 PM	Thunderstorm Wind	70 kts. E	0	0	0.00K	0.00K
WEST BURLINGTON	6/14/2001	4:28 PM	Thunderstorm Wind	52 kts. E	0	0	0.00K	0.00K
BURLINGTON	6/14/2001	4:29 PM	Thunderstorm Wind	57 kts. M	0	0	0.00K	0.00K
BURLINGTON	7/24/2001	8:32 PM	Thunderstorm Wind	52 kts. E	0	0	0.00K	0.00K
BURLINGTON	8/2/2001	3:15 PM	Thunderstorm Wind	70 kts. E	0	0	0.00K	0.00K
WEST BURLINGTON	8/9/2001	5:28 PM	Thunderstorm Wind	52 kts. E	0	0	0.00K	0.00K
BURLINGTON	3/9/2002	2:30 AM	Thunderstorm Wind	52 kts. M	0	0	0.00K	0.00K
WEST BURLINGTON	3/9/2002	2:30 AM	Thunderstorm Wind	52 kts. E	0	0	0.00K	0.00K
BURLINGTON	3/9/2002	2:35 AM	Thunderstorm Wind	52 kts. E	0	0	0.00K	0.00K
DANVILLE	10/1/2002	11:20 PM	Thunderstorm Wind	61 kts. E	0	0	0.00K	0.00K
BURLINGTON	5/14/2003	5:26 PM	Thunderstorm Wind	52 kts. EG	0	0	100.00K	0.00K
BURLINGTON	7/8/2003	12:30 PM	Thunderstorm Wind	52 kts. EG	0	0	70.00K	0.00K
MEDIAPOLIS	7/8/2003	12:38 PM	Heavy Rain	2.5	0	0	10.00K	0.00K
BURLINGTON	7/9/2003	8:15 PM	Thunderstorm Wind	55 kts. EG	0	0	50.00K	0.00K

THUNDERSTORM, WIND, & LIGHTNING								
Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
DANVILLE	8/18/2004	6:28 PM	Thunderstorm Wind	57 kts. EG	0	0	3.00K	5.00K
BURLINGTON	8/18/2004	6:41 PM	Thunderstorm Wind	57 kts. EG	0	0	3.00K	2.00K
MEDIAPOLIS	10/29/2004	8:48 PM	Heavy Rain	1.1	0	0	0.00K	0.00K
MEDIAPOLIS	10/29/2004	8:48 PM	Thunderstorm Wind	57 kts. MG	0	0	1.00K	0.00K
COUNTYWIDE	6/8/2005	11:25 AM	Thunderstorm Wind	57 kts. EG	0	0	60.00K	25.00K
HURON	8/18/2005	7:48 AM	Thunderstorm Wind	61 kts. EG	0	0	10.00K	0.00K
WEST BURLINGTON	9/8/2005	2:55 PM	Thunderstorm Wind	52 kts. EG	0	0	4.00K	0.00K
MIDDLETOWN	9/8/2005	3:00 PM	Thunderstorm Wind	52 kts. EG	0	0	3.00K	0.00K
BURLINGTON	9/8/2005	3:03 PM	Thunderstorm Wind	52 kts. EG	0	0	15.00K	0.00K
BURLINGTON	11/5/2005	8:20 PM	Heavy Rain		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/24/2006	2:00 PM	Strong Wind	45 kts. EG	0	0	1.00K	0.00K
MIDDLETOWN	3/12/2006	9:49 PM	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
BURLINGTON	3/12/2006	9:50 PM	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
BURLINGTON	3/12/2006	10:03 PM	Heavy Rain		0	0	0.00K	0.00K
DANVILLE	4/2/2006	8:45 PM	Heavy Rain		0	0	0.00K	0.00K
WEST BURLINGTON	6/22/2006	4:20 AM	Thunderstorm Wind	61 kts. EG	0	0	10.00K	0.00K
MIDDLETOWN	6/22/2006	4:30 AM	Thunderstorm Wind	52 kts. EG	0	0	1.00K	0.00K
BURLINGTON	6/22/2006	4:48 AM	Thunderstorm Wind	57 kts. EG	0	0	5.00K	0.00K
BURLINGTON	8/3/2006	1:43 AM	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
BURLINGTON	3/31/2007	4:05 PM	Thunderstorm Wind	52 kts. MG	0	0	0.00K	0.00K
LENOX PARK	3/31/2007	4:30 PM	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
DES MOINES (ZONE)	4/3/2007	4:15 PM	Strong Wind	35 kts. EG	0	0	1.00K	0.00K
MEDIAPOLIS	6/21/2007	7:27 PM	Thunderstorm Wind	52 kts. EG	0	0	0.50K	0.00K
BURLINGTON	6/21/2007	7:30 PM	Thunderstorm Wind	60 kts. EG	0	0	0.50K	0.00K
MEDIAPOLIS	6/21/2007	7:40 PM	Thunderstorm Wind	65 kts. EG	0	0	0.50K	0.00K
LENOX PARK	8/23/2007	11:43 AM	Thunderstorm Wind	56 kts. EG	0	0	0.00K	0.00K
LENOX PARK	8/23/2007	7:30 PM	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
YARMOUTH	5/25/2008	11:17 PM	Thunderstorm Wind	56 kts. EG	0	0	5.00K	0.00K

THUNDERSTORM, WIND, & LIGHTNING								
Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
LENOX PARK	5/25/2008	11:19 PM	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
(BRL)BURLINGTON MUNI	6/6/2008	2:28 AM	Thunderstorm Wind	52 kts. MG	0	0	0.00K	0.00K
SPERRY	6/8/2008	7:27 PM	Thunderstorm Wind	70 kts. EG	0	0	0.00K	0.00K
BEAVERDALE	6/8/2008	7:28 PM	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
WEST BURLINGTON	6/8/2008	7:30 PM	Thunderstorm Wind	52 kts. EG	0	0	0.50K	0.00K
(BRL)BURLINGTON MUNI	6/8/2008	7:35 PM	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
WEST BURLINGTON	6/8/2008	7:44 PM	Thunderstorm Wind	56 kts. EG	0	0	0.00K	0.00K
WEST BURLINGTON	6/8/2008	7:45 PM	Thunderstorm Wind	56 kts. EG	0	0	0.50K	0.00K
BURLINGTON ARPT	6/8/2008	7:47 PM	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
WEST BURLINGTON	7/27/2008	6:40 PM	Thunderstorm Wind	52 kts. EG	0	0	1.00K	0.00K
WEST BURLINGTON	7/27/2008	6:40 PM	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
BURLINGTON ARPT	7/29/2008	3:40 PM	Thunderstorm Wind	56 kts. EG	0	0	0.00K	0.00K
LENOX PARK	8/5/2008	2:38 AM	Thunderstorm Wind	56 kts. EG	0	0	0.00K	0.00K
DES MOINES (ZONE)	10/26/2008	11:00 AM	High Wind	50 kts. EG	0	0	0.00K	0.00K
LENOX PARK	4/25/2009	9:20 PM	Thunderstorm Wind	52 kts. EG	0	0	10.00K	0.00K
(BRL)BURLINGTON MUNI	4/30/2009	7:25 AM	Heavy Rain		0	0	0.00K	0.00K
BURLINGTON	6/18/2009	2:40 AM	Thunderstorm Wind	61 kts. EG	0	0	150.00K	0.00K
SPERRY	6/19/2009	4:15 PM	Thunderstorm Wind	61 kts. EG	0	0	25.00K	0.00K
MEDIAPOLIS	6/19/2009	4:20 PM	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
DANVILLE WILSON ARPT	6/23/2009	5:49 PM	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
LENOX PARK	6/23/2009	5:55 PM	Thunderstorm Wind	61 kts. EG	0	0	0.00K	0.00K
LENOX PARK	6/23/2009	5:56 PM	Thunderstorm Wind	61 kts. EG	0	0	25.00K	0.00K
BURLINGTON ARPT	6/23/2009	6:00 PM	Thunderstorm Wind	61 kts. EG	0	0	0.00K	0.00K
BURLINGTON	8/4/2009	6:35 AM	Thunderstorm Wind	56 kts. EG	0	0	1.00K	0.00K
LENOX PARK	8/4/2009	7:00 AM	Thunderstorm Wind	56 kts. EG	0	0	0.00K	0.00K
MIDDLETOWN	8/19/2009	12:50 PM	Thunderstorm Wind	61 kts. EG	0	0	50.00K	0.00K
BURLINGTON	4/23/2010	8:40 PM	Thunderstorm Wind	52 kts. EG	0	0	5.00K	0.00K

THUNDERSTORM, WIND, & LIGHTNING								
Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
DES MOINES (ZONE)	5/10/2010	4:00 PM	Strong Wind	43 kts. EG	0	0	10.00K	0.00K
LENOX PARK	6/1/2010	10:49 PM	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
YARMOUTH	6/23/2010	4:00 PM	Thunderstorm Wind	61 kts. EG	0	0	0.00K	0.00K
MEDIAPOLIS	6/23/2010	4:08 PM	Thunderstorm Wind	55 kts. MG	0	0	0.00K	0.00K
BURLINGTON	6/23/2010	4:15 PM	Thunderstorm Wind	56 kts. EG	0	0	5.00K	0.00K
MEDIAPOLIS	3/22/2011	10:23 PM	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
BEAVERDALE	5/25/2011	3:58 PM	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
WEST BURLINGTON	6/5/2011	5:28 AM	Thunderstorm Wind	50 kts. MG	0	0	0.00K	0.00K
WEST BURLINGTON	7/23/2011	5:30 PM	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
WEST BURLINGTON	7/23/2011	5:38 PM	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
MIDDLETOWN	9/3/2011	1:58 PM	Thunderstorm Wind	56 kts. EG	0	0	0.00K	0.00K
LENOX PARK	9/3/2011	2:00 PM	Thunderstorm Wind	56 kts. EG	0	0	5.00K	0.00K
LENOX PARK	6/16/2012	5:05 PM	Thunderstorm Wind	61 kts. EG	0	0	0.00K	0.00K
WEST BURLINGTON	6/16/2012	5:10 PM	Thunderstorm Wind	61 kts. EG	0	0	25.00K	0.00K
WEST BURLINGTON	7/1/2012	7:08 AM	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
WEST BURLINGTON	7/1/2012	7:08 AM	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
MEDIAPOLIS	9/5/2012	3:50 AM	Thunderstorm Wind	56 kts. EG	0	0	0.00K	0.00K
WEST BURLINGTON	9/5/2012	4:02 AM	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
LENOX PARK	9/5/2012	4:02 AM	Thunderstorm Wind	61 kts. EG	0	0	1.00K	0.00K
MIDDLETOWN	5/19/2013	9:47 PM	Thunderstorm Wind	52 kts. MG	0	0	0.00K	0.00K
LENOX PARK	5/19/2013	10:07 PM	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
(BRL)BURLINGTON MUNI	5/30/2013	3:00 PM	Thunderstorm Wind	70 kts. MG	0	0	0.00K	0.00K
LENOX PARK	5/30/2013	3:00 PM	Thunderstorm Wind	70 kts. EG	0	0	0.00K	0.00K
LENOX PARK	11/17/2013	11:04 AM	Thunderstorm Wind	52 kts. MG	0	0	0.00K	0.00K
HURON	5/11/2014	4:43 PM	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
LENOX PARK	6/22/2014	11:35 AM	Thunderstorm Wind	55 kts. EG	0	0	0.00K	0.00K
LENOX PARK	6/30/2014	7:40 PM	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K

TORNADIC ACTIVITY								
Location or County	**Date**	**Time**	**Type**	**Mag**	**Dth**	**Inj**	**PrD**	**CrD**
DES MOINES CO.	4/30/1954	3:45 PM	Tornado	F2	0	0	25.00K	0.00K
DES MOINES CO.	4/18/1963	5:26 PM	Tornado	F1	0	0	250.00K	0.00K
DES MOINES CO.	8/25/1965	6:00 PM	Tornado	F3	0	1	250.00K	0.00K
DES MOINES CO.	5/23/1966	4:00 PM	Tornado	F2	0	0	250.00K	0.00K
DES MOINES CO.	6/16/1973	6:45 PM	Tornado	F0	0	0	25.00K	0.00K
DES MOINES CO.	5/13/1974	9:30 PM	Tornado	F1	0	0	25.00K	0.00K
DES MOINES CO.	5/13/1974	10:00 PM	Tornado	F2	0	0	250.00K	0.00K
DES MOINES CO.	5/4/1977	2:56 PM	Tornado	F2	0	0	25.00K	0.00K
DES MOINES CO.	7/5/1980	12:26 AM	Tornado	F1	0	0	2.50K	0.00K
DES MOINES CO.	7/5/1980	12:29 AM	Tornado	F1	0	0	25.00K	0.00K
DES MOINES CO.	7/5/1980	12:45 AM	Tornado	F1	0	0	250.00K	0.00K
DES MOINES CO.	12/2/1982	12:13 AM	Tornado	F1	0	0	25.00K	0.00K
DES MOINES CO.	6/29/1983	10:58 AM	Tornado	F1	0	27	2.500M	0.00K
DES MOINES CO.	5/8/1988	2:20 PM	Tornado	F1	0	0	250.00K	0.00K
WEST BURLINGTON	6/29/1998	2:37 PM	Funnel Cloud		0	0	0.00K	0.00K
YARMOUTH	4/30/2003	5:25 PM	Funnel Cloud		0	0	0.00K	0.00K
BURLINGTON	5/14/2003	5:16 PM	Funnel Cloud		0	0	0.00K	0.00K
MIDDLETOWN	7/9/2003	8:00 PM	Funnel Cloud		0	0	0.00K	0.00K
BURLINGTON	8/18/2004	4:52 PM	Funnel Cloud		0	0	0.00K	0.00K
DANVILLE	6/8/2005	11:38 AM	Funnel Cloud		0	0	0.00K	0.00K
BEAVERDALE	6/8/2005	11:40 AM	Funnel Cloud		0	0	0.00K	0.00K
DANVILLE	4/2/2006	3:50 PM	Funnel Cloud		0	0	0.00K	0.00K
AUGUSTA	5/25/2011	3:45 PM	Tornado	EF1	0	0	250.00K	0.00K
DODGEVILLE	5/25/2011	4:00 PM	Tornado	EF1	0	0	50.00K	0.00K

WINTER WEATHER								
Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
DES MOINES (ZONE)	1/18/1996	4:30 AM	Heavy Snow		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/26/1996	4:00 AM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/30/1996	8:00 PM	Cold/wind Chill		0	0	0.00K	0.00K
DES MOINES (ZONE)	2/1/1996	12:00 AM	Cold/wind Chill		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/27/1996	6:00 PM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/9/1997	4:00 AM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/10/1997	4:00 AM	Cold/wind Chill		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/15/1997	4:00 AM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/17/1997	4:00 AM	Cold/wind Chill		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/24/1997	4:00 AM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	2/3/1997	8:00 PM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	4/10/1997	6:00 AM	Heavy Snow		0	0	0.00K	0.00K
DES MOINES (ZONE)	10/26/1997	2:00 AM	Heavy Snow		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/9/1997	5:00 PM	Heavy Snow		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/24/1997	11:00 AM	Heavy Snow		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/8/1998	10:00 AM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	2/28/1998	4:00 PM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/30/1998	4:00 PM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/1/1999	5:17 AM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/18/1999	4:05 AM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	3/5/1999	1:00 PM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	3/8/1999	3:00 PM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/15/1999	4:00 AM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/16/1999	7:00 PM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/19/1999	3:00 PM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/23/1999	2:00 PM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/3/2000	3:00 PM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/17/2000	8:00 AM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/19/2000	10:00 AM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/29/2000	3:00 PM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	2/17/2000	7:00 PM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/1/2000	12:00 AM	Cold/wind Chill		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/1/2000	12:00 AM	Heavy Snow		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/1/2000	2:00 AM	Heavy Snow		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/10/2000	10:00 PM	Winter Storm		0	0	0.00K	0.00K

WINTER WEATHER								
Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
DES MOINES (ZONE)	12/13/2000	8:00 AM	Heavy Snow		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/15/2000	1:00 PM	Ice Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/16/2000	2:00 PM	Extreme Cold/wind Chill		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/18/2000	4:00 AM	Heavy Snow		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/20/2000	7:00 AM	Heavy Snow		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/21/2000	4:00 AM	Extreme Cold/wind Chill		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/23/2000	10:00 PM	Extreme Cold/wind Chill		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/28/2000	10:00 AM	Heavy Snow		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/13/2001	7:00 PM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/26/2001	2:00 AM	Heavy Snow		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/28/2001	10:00 AM	Ice Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	2/8/2001	11:00 PM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	3/15/2001	12:00 AM	Heavy Snow		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/30/2002	3:00 AM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	3/1/2002	3:00 PM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	2/14/2003	4:00 PM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	3/4/2003	1:00 PM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/4/2005	11:00 PM	Ice Storm		0	0	10.00K	0.00K
DES MOINES (ZONE)	5/3/2005	1:00 AM	Frost/freeze		0	0	0.00K	825.00K
DES MOINES (ZONE)	12/8/2005	3:00 AM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/20/2006	1:00 PM	Winter Weather		0	0	3.00K	0.00K
DES MOINES (ZONE)	2/15/2006	8:30 PM	Winter Weather		0	0	1.00K	0.00K
DES MOINES (ZONE)	2/16/2006	8:48 AM	Ice Storm		0	0	5.00K	0.00K
DES MOINES (ZONE)	3/21/2006	2:00 AM	Winter Weather		0	0	2.00K	0.00K
DES MOINES (ZONE)	11/30/2006	10:15 PM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/1/2006	12:00 AM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/12/2007	7:15 AM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/20/2007	8:19 PM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	2/2/2007	4:00 AM	Extreme Cold/wind Chill		0	0	0.00K	0.00K
DES MOINES (ZONE)	2/6/2007	5:15 AM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	2/12/2007	10:45 PM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	2/16/2007	3:45 PM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	2/24/2007	8:25 AM	Ice Storm		0	0	434.00K	0.00K
DES MOINES (ZONE)	4/3/2007	12:00 AM	Frost/freeze		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/1/2007	6:39 AM	Ice Storm		0	0	0.00K	0.00K

WINTER WEATHER								
Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
DES MOINES (ZONE)	12/6/2007	3:00 PM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/10/2007	10:30 PM	Ice Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/15/2007	5:45 AM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/22/2007	5:50 PM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/28/2007	5:18 AM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/31/2007	8:40 AM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/29/2008	12:10 PM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/31/2008	1:15 PM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	2/3/2008	2:45 PM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	2/5/2008	8:20 PM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	2/25/2008	5:55 PM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	2/28/2008	3:30 PM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	4/29/2008	2:00 AM	Frost/freeze		0	0	0.00K	0.00K
DES MOINES (ZONE)	11/29/2008	11:15 PM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/3/2008	11:58 AM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/14/2008	6:00 PM	Sleet		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/16/2008	9:15 AM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/18/2008	6:20 PM	Ice Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/14/2009	11:00 PM	Extreme Cold/wind Chill		0	0	0.00K	0.00K
DES MOINES (ZONE)	2/20/2009	11:25 PM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/7/2009	10:35 PM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/9/2009	7:00 AM	Blizzard		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/25/2009	8:00 AM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/6/2010	4:45 PM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/20/2010	5:25 AM	Ice Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/25/2010	5:30 AM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	2/7/2010	11:00 PM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	2/21/2010	11:50 AM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	3/20/2010	3:00 AM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/12/2010	12:15 AM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/24/2010	10:15 AM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/10/2011	9:18 PM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/17/2011	3:05 AM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	2/1/2011	7:55 AM	Blizzard		0	0	0.00K	0.00K
DES MOINES (ZONE)	2/24/2011	7:50 PM	Winter Weather		0	0	0.00K	0.00K

WINTER WEATHER								
Location or County	**Date**	**Time**	**Type**	**Mag**	**Dth**	**Inj**	**PrD**	**CrD**
DES MOINES (ZONE)	2/27/2011	6:40 PM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/12/2012	1:15 AM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	3/4/2012	1:00 PM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	4/11/2012	3:00 AM	Frost/freeze		0	0	0.00K	0.00K
DES MOINES (ZONE)	4/12/2012	3:00 AM	Frost/freeze		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/20/2012	10:00 AM	Blizzard		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/27/2013	7:00 AM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	2/21/2013	1:45 PM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	2/26/2013	5:55 AM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	3/24/2013	12:00 AM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	3/24/2013	12:00 AM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/13/2013	3:15 PM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/19/2013	6:00 PM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	12/21/2013	3:15 PM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/4/2014	6:00 PM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	1/5/2014	6:00 PM	Extreme Cold/wind Chill		0	0	0.00K	0.00K
DES MOINES (ZONE)	2/1/2014	12:00 AM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	2/4/2014	1:00 PM	Winter Storm		0	0	0.00K	0.00K
DES MOINES (ZONE)	2/17/2014	6:00 AM	Winter Weather		0	0	0.00K	0.00K
DES MOINES (ZONE)	3/1/2014	7:00 PM	Winter Weather		0	0	0.00K	0.00K

DNR RECORDED GRASS & WILDLAND FIRE EVENTS		
Date	**# Acres**	**Notes**
1/4/11	7	DNR controlled burn of native grasses
4/6/11	52	DNR controlled burn of tall grass prairie and brome grass
1/11/12	6	DNR controlled burn of brome grass, tall grasses, and mixed prairie
1/2/13	2	Permitted burn that got away from occupants.
4/2/13	35	*No notes*
9/4/13	0.5	Grass fire next to roadway caused by discarded smoking material. Burned highway right-of-way.

BURLINGTON FIRE DEPARTMENT RECORDED GRASS & WILDLAND FIRE EVENTS		
Date	**# Acres**	**Notes**
3/16/11	1	
3/28/11	1	
11/17/11	2	
11/18/11	20	
12/01/11	<1	
3/10/12	8	
3/11/12	5	
3/20/12	1	
4/1/12	18	
4/5/12	<1	
7/3/12	<1	
10/13/12	1	
3/17/13	<1	
3/23/13	<1	
4/2/13	250	
4/4/13	5	
4/4/13	5	
4/7/13	20	
3/29/14	<1	
4/9/14	1	

Appendix D. Des Moines County | Hazardous Materials Events

Iowa Department of Natural Resources Hazardous Substance Incident Tracking Database[11] has been set up to allow the public to view reported spill data in their communities, allow the department to track incidents, and allow parties responsible for an incident to submit requested and required information.

The events are hyperlinked to the DNR website and provide more detailed descriptions of individual events (applies to digital copies of this Plan only). The additional online information can be accessed by clicking the links in the "Spill Number" column.

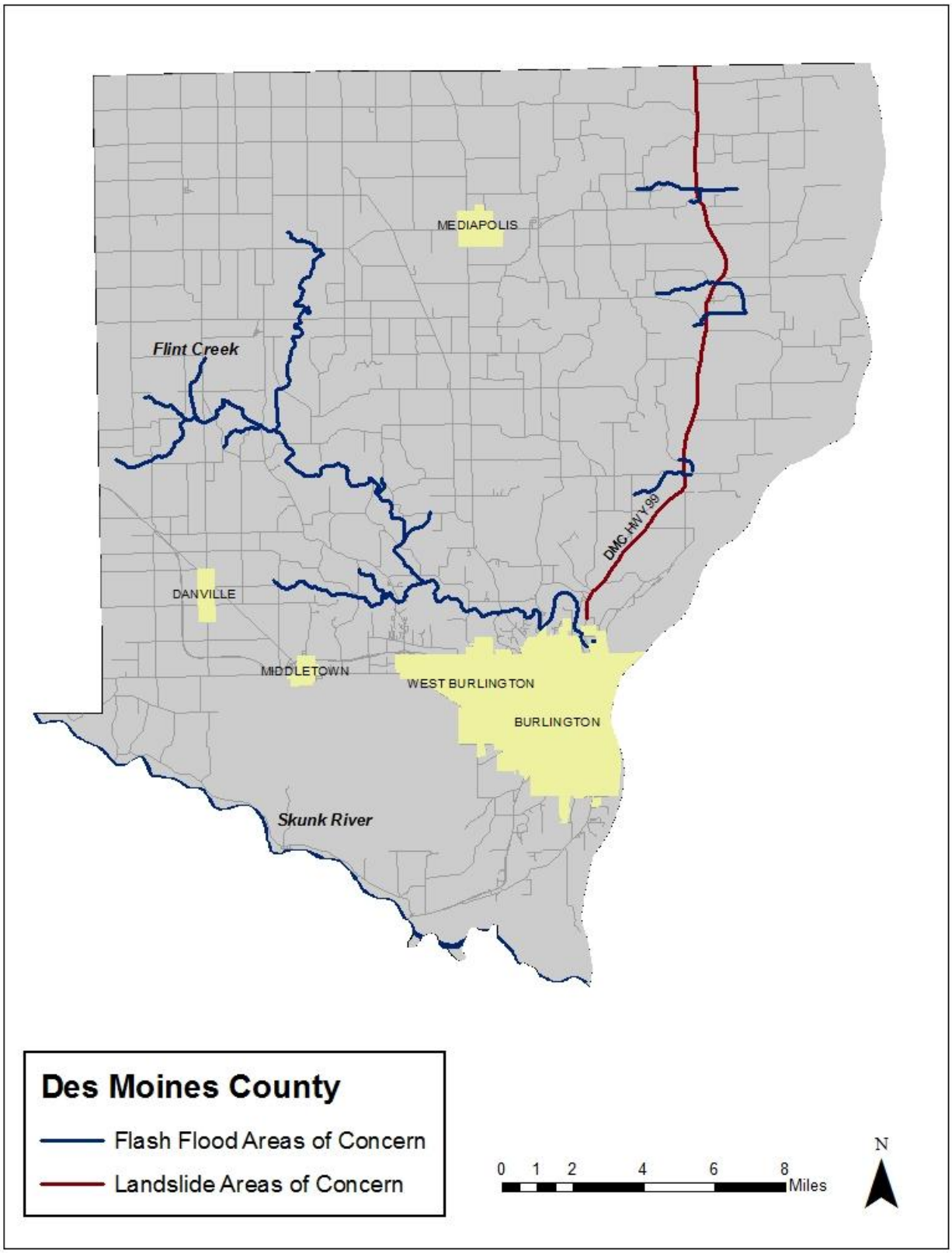
SPILL NUMBER	REPORTED DATE	CITY
110414-RDS-1400	11/4/2014	Middletown
092514-WCG-1701	9/25/2014	Burlington
091514-PFB-1215	9/15/2014	Burlington
082114-AJP-1130	8/21/2014	Mediapolis
071914-JJS-1732	7/19/2014	County
071614-PFB-0845	7/16/2014	County
070114-DLP-1745	7/1/2014	Burlington
061114-DJA-1859	6/11/2014	Burlington
032714-RAR-0838	3/27/2014	Burlington
102113-DJA-2255	10/21/2013	Mediapolis
102113-DJA-1055	10/21/2013	Mediapolis
091913-MRH-1010	9/19/2013	Burlington
090813-B1L-1050	9/8/2013	Burlington
060613-PFB-0946	6/6/2013	Burlington
053113-B1L-0010	5/31/2013	Burlington
041613-AJP-1825	4/16/2013	Burlington
022613-B1L-1436	2/26/2013	Danville
121312-PFB-1430	12/13/2012	Burlington
101112-AHB-1411	10/11/2012	Fort Madison
100312-JFP-1530	10/3/2012	Burlington
022012-JJS-2346	2/20/2012	Middletown
011112-BCN-1245	1/11/2012	County
100311-RAR-1712	10/3/2011	Burlington
080711-MRH-1933	8/7/2011	Burlington
072211-KRL-0325	7/22/2011	Burlington
061011-DJA-1425	6/10/2011	Burlington
052411-AHB-1021	5/24/2011	Middletown
120910-RLT-0950	12/9/2010	Burlington
112610-JJS-1150	11/26/2010	Burlington
110410-RLT-1538	11/4/2010	Burlington
061610-MRH-1105	6/16/2010	Burlington
051710-DJA-0637	5/17/2010	Burlington
012210-JTS-0746	1/22/2010	Mediapolis
011210-KAL-1144	1/12/2010	Burlington
100709-BCN-1550	10/7/2009	Burlington
083109-TJJ-1743	8/31/2009	Burlington

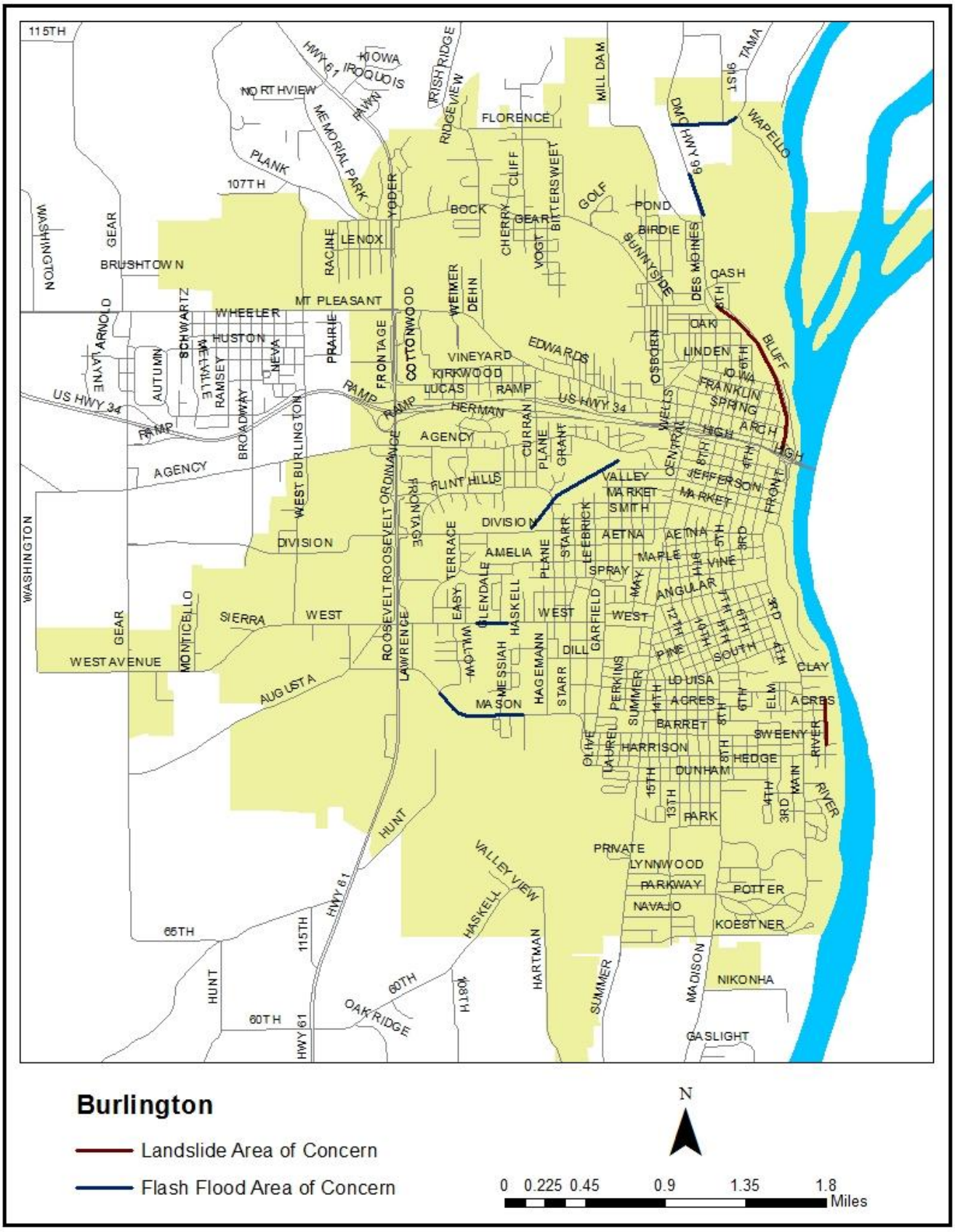
[11] https://programs.iowadnr.gov/hazardousspills/GeneralInformation.aspx?SpillID=18876

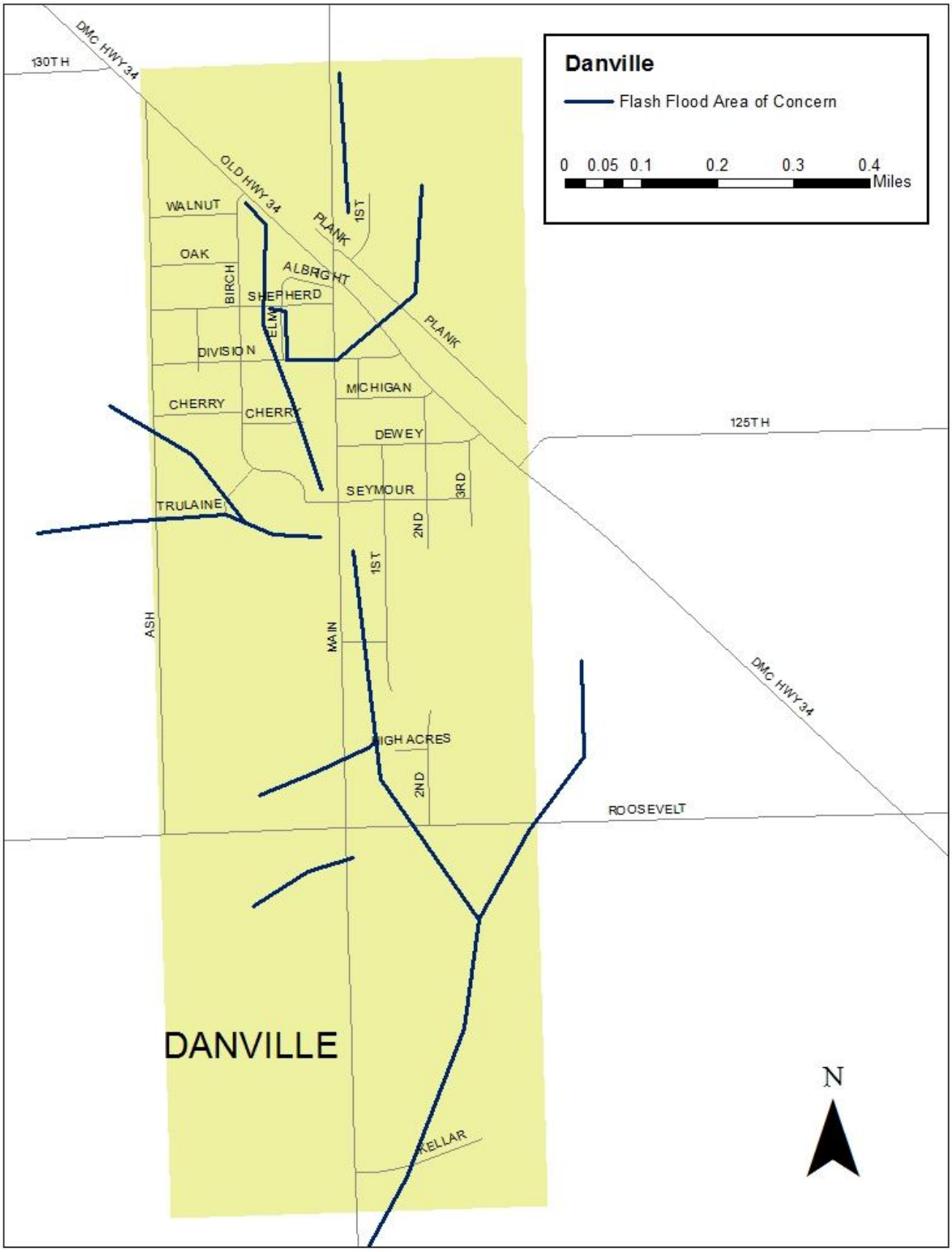
SPILL NUMBER	REPORTED DATE	CITY
071609-AHB-1044	7/16/2009	West Burlington
070209-AHB-1602	7/2/2009	Burlington
042509-PFB-0830	4/25/2009	Burlington
042409-AHB-1127	4/24/2009	Burlington
032709-AHB-1621	3/27/2009	Burlington
030309-AHB-0822	3/3/2009	Mediapolis
012109-LLB-0815	1/21/2009	Burlington
012009-AHB-0848	1/20/2009	New London
012009-ERB-0038	1/20/2009	New London
012009-ERB-0037	1/20/2009	Danville
011909-KAL-1341	1/19/2009	Danville
011909-KAL-1340	1/19/2009	Danville
101208-JJS-0800	10/12/2008	Burlington
100708-PFB-1600	10/7/2008	West Burlington
080408-RLT-1308	8/4/2008	Des Moines
052908-RLT-1034	5/29/2008	Burlington
050908-AHB-0805	5/9/2008	Mediapolis
050108-KAL-1056	5/1/2008	West Burlington
110807-KRL-2038	11/8/2007	Mediapolis
103107-PFB-1014	10/31/2007	West Burlington
102407-AHB-1559	10/24/2007	Burlington
090106-JJS-0713	9/1/2006	Burlington
081106-AHB-0755	8/11/2006	West Burlington
072706-AHB-1221	7/27/2006	Sperry
061206-AHB-1404	6/12/2006	Middletown
050206-JTS-1701	5/2/2006	West Burlington
040506-MRH-0950	4/5/2006	Middletown
020706-KAL-1400	2/7/2006	County
122005-AHB-0841	12/20/2005	Danville
121605-RLT-1057	12/16/2005	Middletown
113005-RLT-1538	11/30/2005	Mediapolis
101005-RDS-1445	10/10/2005	West Burlington
041105-KRL-0856	4/11/2005	West Burlington
040805-RLT-1551	4/8/2005	Burlington
040605-JTS-0955	4/6/2005	West Burlington
033105-RLT-1044	3/31/2005	Burlington
031405-AHB-1500	3/14/2005	Middletown
011205-RAR-0825	1/12/2005	West Burlington
112904-PFB-1525	11/29/2004	Burlington
111204-KAL-0929	11/12/2004	Middletown
062304-RDS-1724	6/23/2004	Burlington
022404-JTS-1100	2/24/2004	Middletown
110403-TJJ-2258	11/4/2003	Mediapolis
082503-JJS-1400	8/25/2003	Oakville
060903-KAL-1414	6/9/2003	Burlington
050203-KAL-0900	5/2/2003	County
041903-JJS-0431	4/19/2003	West Burlington
113002-DLP-1439	11/30/2002	Burlington
092002-MRH-1200	9/20/2002	Burlington
082102-DLP-1530	8/21/2002	Burlington
060402-KAL-2129	6/4/2002	Burlington

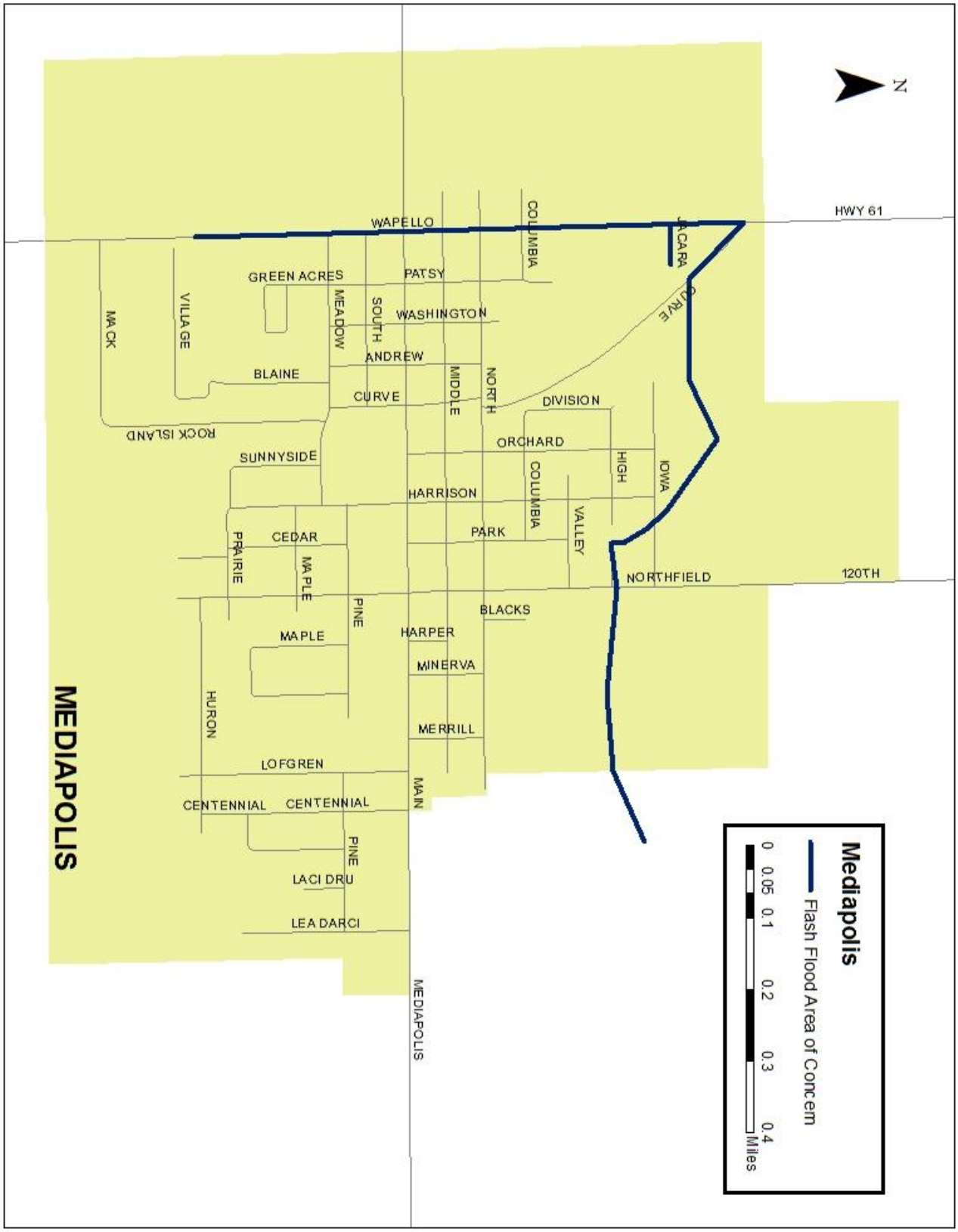
SPILL NUMBER	REPORTED DATE	CITY
052402-CWO-0742	5/24/2002	Burlington
052202-CWO-2123	5/22/2002	Sperry
022502-DLP-0828	2/25/2002	Burlington
120601-SD1-1230	12/6/2001	Mediapolis
120101-DLP-0956	12/1/2001	Burlington
100101-DLP-0940	10/1/2001	Sperry
090701-PFB-0800	9/7/2001	Burlington
090701-CWO-0333	9/7/2001	Middletown
082701-DLP-2238	8/27/2001	Middletown
071101-DLP-0725	7/11/2001	Sperry
062701-TJJ-1350	6/27/2001	Burlington
061101-CWO-2311	6/11/2001	Burlington
052301-CWO-0017	5/23/2001	Middletown
040601-CWO-1225	4/6/2001	Mediapolis
032301-MRH-1000	3/23/2001	Burlington
022301-CWO-1855	2/23/2001	Mediapolis
011201-CWO-1916	1/12/2001	Burlington
120800-TJJ-0840	12/8/2000	West Burlington
101200-KAL-2203	10/12/2000	West Burlington
100300-ALG-0938	10/3/2000	Mediapolis
072200-DLP-1037	7/22/2000	West Burlington
062100-KAL-1450	6/21/2000	West Burlington
061200-DLP-1734	6/12/2000	Mediapolis
042600-KAL-1625	4/26/2000	Mediapolis
041000-DLP-2118	4/10/2000	Middletown
011400-DLP-1415	1/14/2000	Burlington
101998-RK-0823	10/19/1998	Middletown
101298-TJ-1405	10/12/1998	Burlington
091698-RK-1540	9/16/1998	Middletown
082898-RK-1754	8/28/1998	Burlington
081498-RK-0226	8/14/1998	Middletown
080198-KL-1751	8/1/1998	Middletown
062598-KL-1520	6/25/1998	Middletown
042298-RK-1200	4/22/1998	Mediapolis
033098-KL-1615	3/30/1998	Burlington
021398-SD-1358	2/13/1998	Sperry
123197-AG-1235	12/31/1997	Burlington
112097-KL-1327	11/20/1997	Yarmouth
110897-RK-2303	11/8/1997	Middletown
101597-KL-1820	10/15/1997	Burlington
100897-SD-1814	10/8/1997	West Burlington
091897-SD-0814	9/18/1997	Middletown
090597-RK-1515	9/5/1997	Middletown
082297-KL-0850	8/22/1997	Middletown
080697-RK-1445	8/6/1997	Middletown
071897-KL-1950	7/18/1997	West Burlington
071497-SD-0533	7/14/1997	Burlington
063097-KL-0419	6/30/1997	Burlington
060397-JLB-1315	6/3/1997	Burlington
051297-KL-1616	5/12/1997	Middletown
050997-JLB-0830	5/9/1997	West Burlington

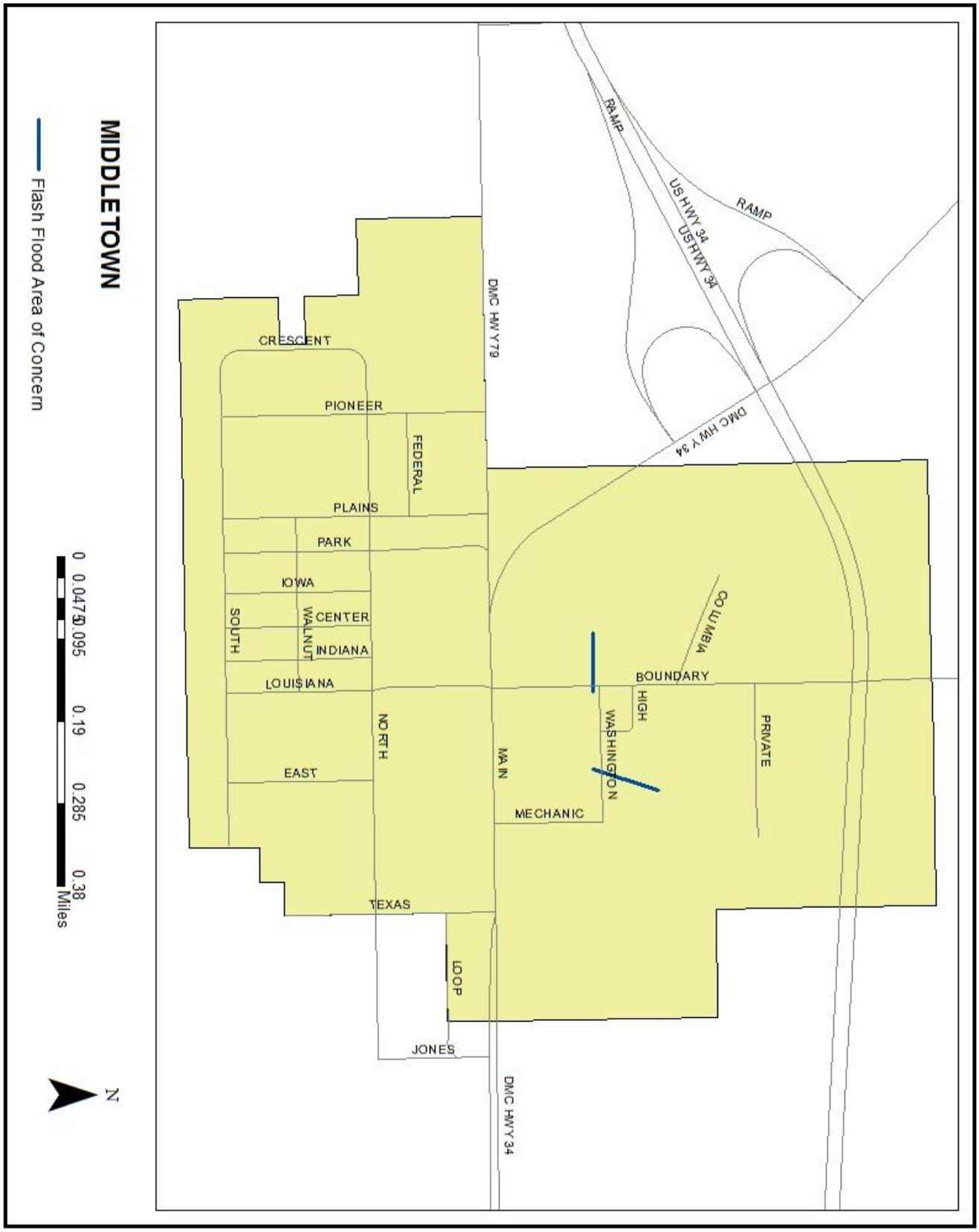
SPILL NUMBER	REPORTED DATE	CITY
050297-RK-1657	5/2/1997	Burlington
040397-SM-1347	4/3/1997	Middletown
032797-SM-0826	3/27/1997	Middletown
031597-KL-0750	3/15/1997	Burlington
021997-SM-1720	2/19/1997	Middletown
021297-PB-1500	2/12/1997	Middletown
101596-RK-1500	10/15/1996	Middletown
092996-KL-1735	9/29/1996	Middletown
082796-RK-1618	8/27/1996	Mediapolis
080296-RK-1210	8/2/1996	Burlington
072596-PB-1513	7/25/1996	Middletown
071796-KL-1605	7/17/1996	Burlington
070296-SM-1054	7/2/1996	Burlington
063096-SM-0036	6/30/1996	Sperry
040896-RK-1955	4/8/1996	Burlington
031996-RK-1620	3/19/1996	West Burlington
012296-AG-1022	1/22/1996	Middletown
010396-KL-1109	1/3/1996	Burlington
121395-RK-0730	12/13/1995	Burlington
100395-SM-0948	10/3/1995	Danville
092895-RK-1440	9/28/1995	Burlington
091895-KL-1325	9/18/1995	Burlington
082895-RK-1534	8/28/1995	Yarmouth
081195-JLB-1455	8/11/1995	West Burlington
062095-AG-1600	6/20/1995	Burlington
061295-PB-1430	6/12/1995	Burlington
061095-SM-1459	6/10/1995	Burlington
060795-RK-0910	6/7/1995	Burlington
043052-RK-1058	4/30/1995	Burlington
041795-SM-1505	4/17/1995	Burlington
031695-AG-1205	3/16/1995	Burlington

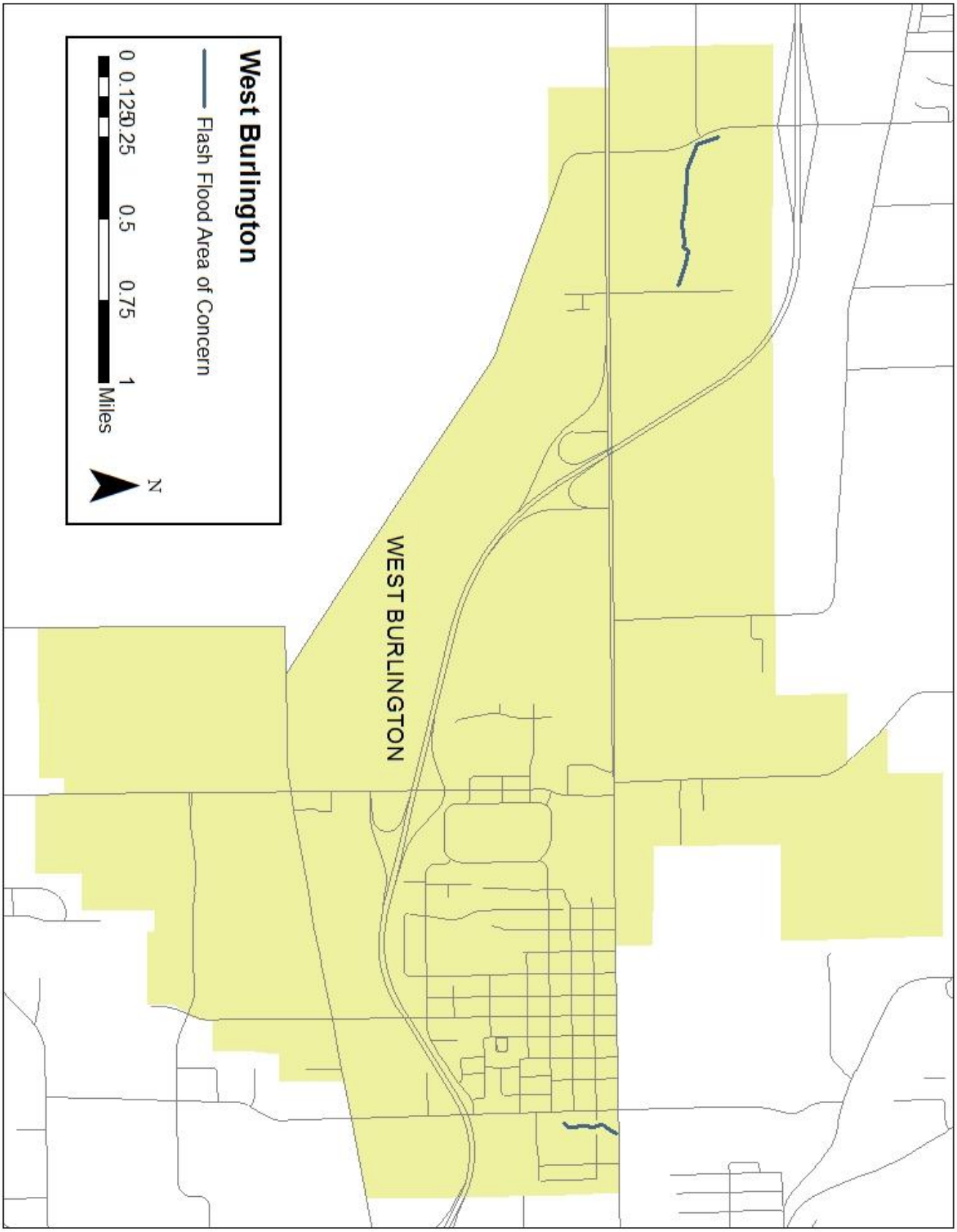

MEDIAPOLIS
Flint Creek
DMC HWY 99
DANVILLE
MIDDLETOWN
WEST BURLINGTON
BURLINGTON
Skunk River
Des Moines County
Flash Flood Areas of Concern
Landslide Areas of Concern
0 1 2 4 6 8
Miles
N

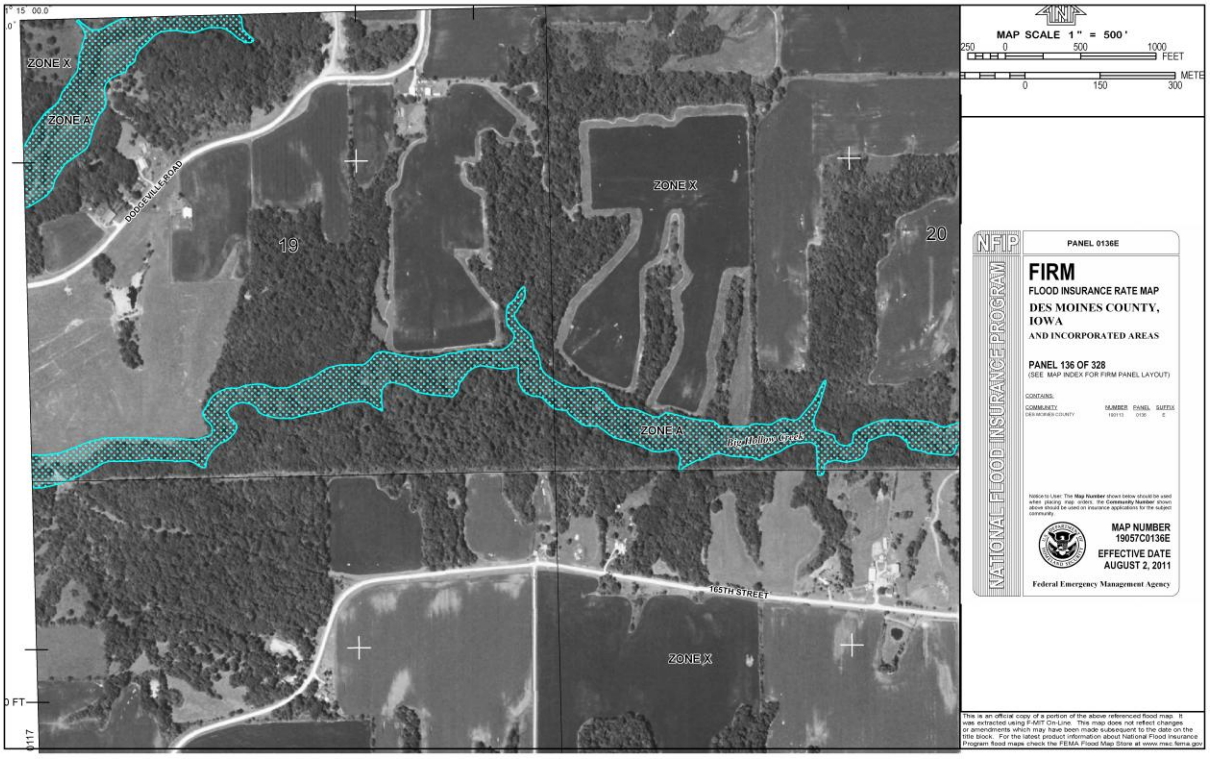

Burlington
Landslide Area of Concern
Flash Flood Area of Concern
N
0 0.225 0.45 0.9 1.35 1.8
Miles
115TH
NORTHVIEW
HWY 61
IROQUOIS
KIOWA
IRISH RIDGE
RIDGE VIEW
MILL DAM
TAMA
9TH
HWY 99
WAPELLO
PLANK
107TH
MEMORIAL PARK
YODER
FLORENCE
CLIFF
BITTERSWEET
GOLF
POND
BIRDIE
SUNNYSIDE
DES MOINES
OASH
6TH
BLUFF
BOCK
CHERRY
GEAR
VOGT
LENOX
RACINE
WASHINGTON
BRUSHTOWN
MT PLEASANT
WHEELER
WEIMER
DEHN
COTTONWOOD
OAK
LINDEN
OSBORN
EDWARDS
VINEYARD
KIRKWOOD
LUCAS
RAMP
HERMAN
US HWY 34
IOWA
FRANKLIN
SPRING
ARCH
HIGH
WELLS
CENTRAL
8TH
6TH
JEFFERSON
MARKET
FRONT
VALLEY
MARKET
SMITH
AETNA
MAPLE
VINE
5TH
3RD
ANGULAR
SPRAY
MAY
AMELIA
PLANE
STARR
LEEBRICK
GRANT
CURRAN
AGENCY
FLINT HILLS
DIVISION
TERRACE
EASY
GLENDALE
HASKELL
WEST
GARFIELD
DILL
HAGEMANN
MESSIAH
MASON
PERKINS
SUMMER
LOUISA
AGNES
BARRET
HARRISON
DUNHAM
HEDGE
SWEENY
ACRES
ELM
CLAY
PINE
SOUTH
14TH
12TH
11TH
10TH
9TH
8TH
7TH
6TH
4TH
3RD
RIVER
MAIN
15TH
13TH
PARK
PRIVATE
LYNNWOOD
PARKWAY
POTTER
NAVAJO
KOESTNER
VALLEY VIEW
HUNT
HWY 61
115TH
65TH
HASKELL
HARTMAN
SUMMER
MADISON
NIKONHA
GASLIGHT
60TH
OAK RIDGE
HUNT
HWY 61
60TH
WEST BURLINGTON
BROADWAY
RAMSEY
NEVA
PRAIRIE
FRONTAGE
ROOSEVELT
LAWRENCE
WASHINGTON
GEAR
MONTICELLO
SIERRA
WEST
WEST AVENUE
AUGUSTA
AUTUMN
SCHWARTZ
HUSTON
MCKILLE
ARNOLD
LANE

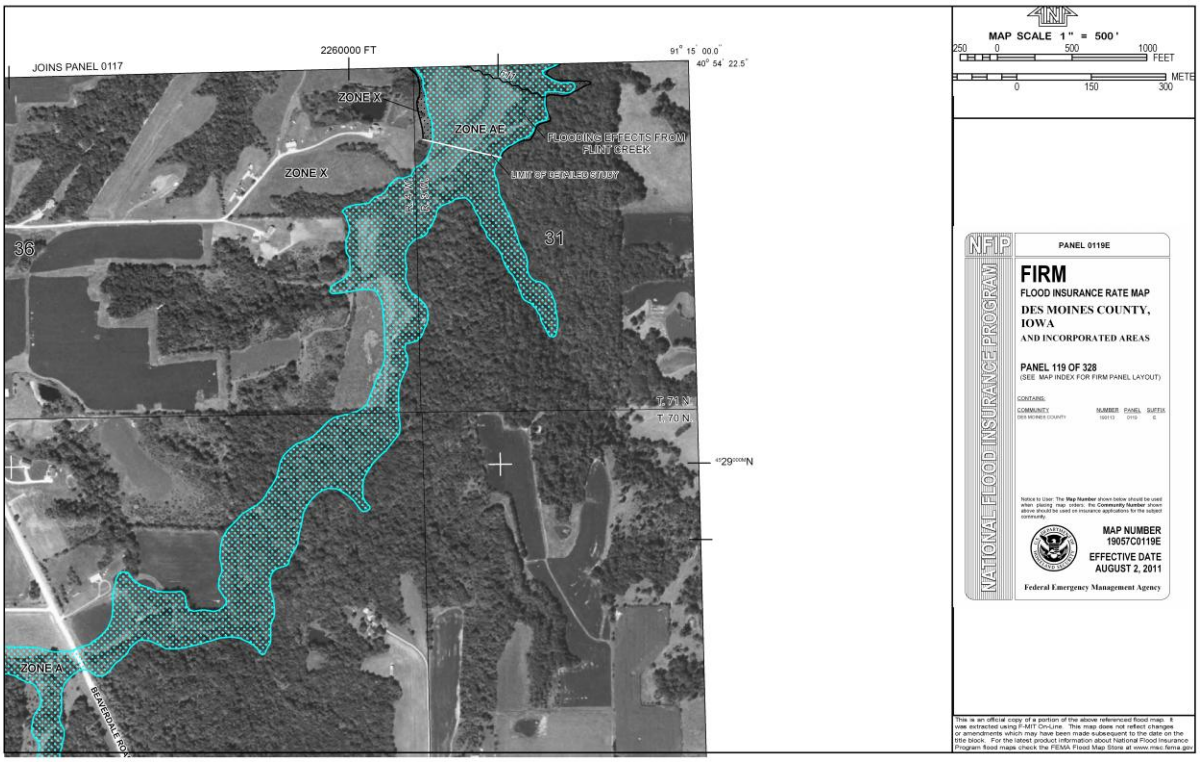

Danville
Flash Flood Area of Concern
0 0.05 0.1 0.2 0.3 0.4
Miles
DMC HWY 34
130TH
OLD HWY 34
PLANK
1ST
WALNUT
OAK
BIRCH
ALBRIGHT
SHEPHERD
ELM
DIVISION
MICHIGAN
CHERRY
DEWEY
125TH
SEYMOUR
3RD
2ND
TRULAINE
ASH
MAIN
HIGH ACRES
ROOSEVELT
DANVILLE
N

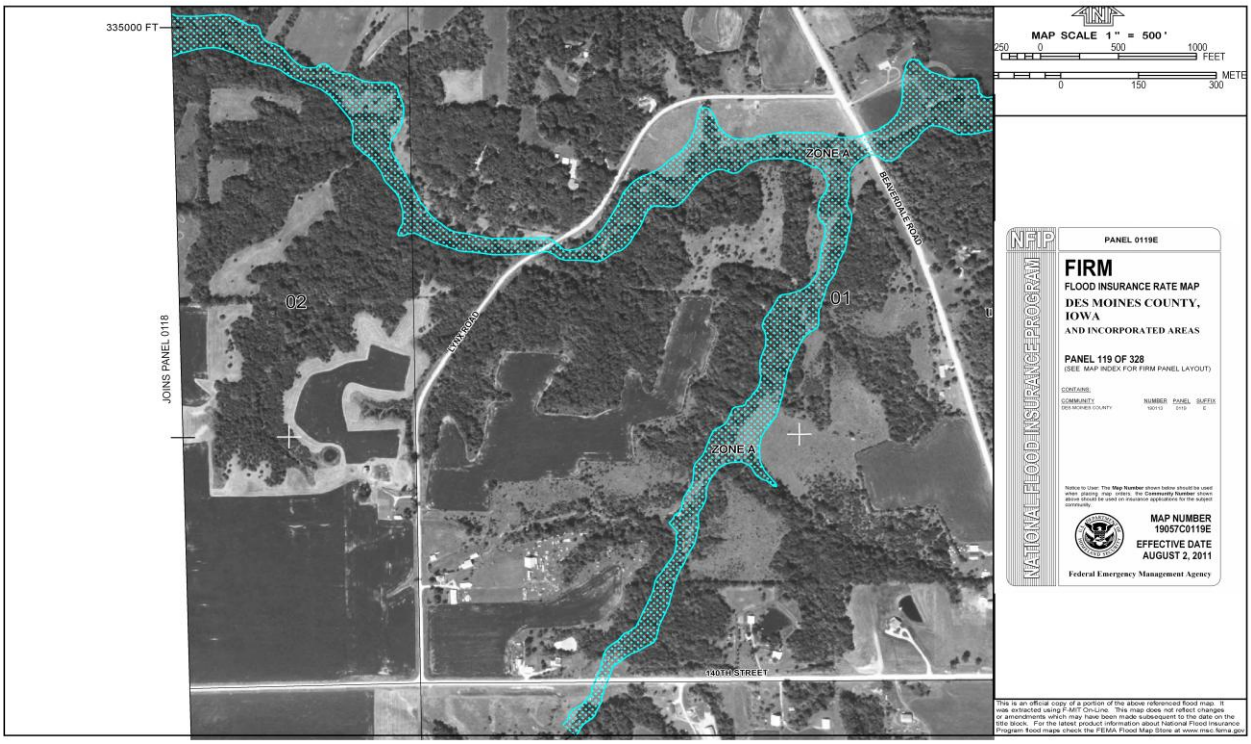

N
HWY 61
WAPELLO
COLUMBIA
ACARA
DRIVE
GREEN ACRES
PATSY
MEADOW
SOUTH
WASHINGTON
ANDREW
MACK
VILLAGE
BLAINE
CURVE
MIDDLE
NORTH
DIVISION
ROCK ISLAND
ORCHARD
SUNNYSIDE
HIGH
IOWA
HARRISON
COLUMBIA
VALLEY
PARK
CEDAR
PRAIRIE
MAPLE
NORTHFIELD
120TH
PINE
BLACKS
MAPLE
HARPER
MINERVA
HURON
MERRILL
LOFGREN
MAIN
CENTENNIAL
CENTENNIAL
PINE
LACI DRU
LEA DARCI
MEDIAPOLIS
MEDIAPOLIS
Mediapolis
Flash Flood Area of Concern
0 0.05 0.1 0.2 0.3 0.4
Miles


MIDDLETOWN
Flash Flood Area of Concern
0 0.0475 0.095 0.19 0.285 0.38
Miles
N
RAMP
US HWY 34
USHWY 34
RAMP
DMC HWY 79
DMC HWY 34
CRESCENT
PIONEER
FEDERAL
PLAINS
PARK
IOWA
SOUTH
WALNUT
CENTER
INDIANA
LOUISIANA
NORTH
EAST
TEXAS
LOOP
JONES
DMC HWY 34
COLUMBIA
BOUNDARY
HIGH
WASHINGTON
MAIN
MECHANIC
PRIVATE


West Burlington
Flash Flood Area of Concern
0 0.125 0.25 0.5 0.75 1
Miles
N
WEST BURLINGTON


ZONE X
ZONE A
ROCKVILLE ROAD
19
ZONE X
20
ZONE A
Big Hollow Creek
165TH STREET
ZONE X
MAP SCALE 1" = 500'
250 0 500 1000 FEET
0 150 300 METE
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0136E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 136 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
DES MOINES COUNTY 190113 0136 E
MAP NUMBER
19057C0136E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency


JOINS PANEL 0117
2260000 FT
91° 15' 00.0"
40° 54' 22.5"
ZONE X
ZONE AE
FLOODING EFFECTS FROM FLINT CREEK
ZONE X
LIMIT OF DETAILED STUDY
36
31
T. 71 N.
T. 70 N.
ZONE A
MAP SCALE 1" = 500'
250 0 500 1000 FEET
0 150 300 METE
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0119E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 119 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
DES MOINES COUNTY 190113 0119 E
MAP NUMBER
19057C0119E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency


335000 FT
MAP SCALE 1 " = 500 '
250 0 500 1000 FEET
0 150 300 METE
ZONE A
BENEDICT AVE ROAD
02
01
JOINS PANEL 0118
ZONE A
140TH STREET
PANEL 0119E
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 119 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY
DES MOINES COUNTY
NUMBER PANEL SUFFIX
190112 0119 E
MAP NUMBER
19057C0119E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
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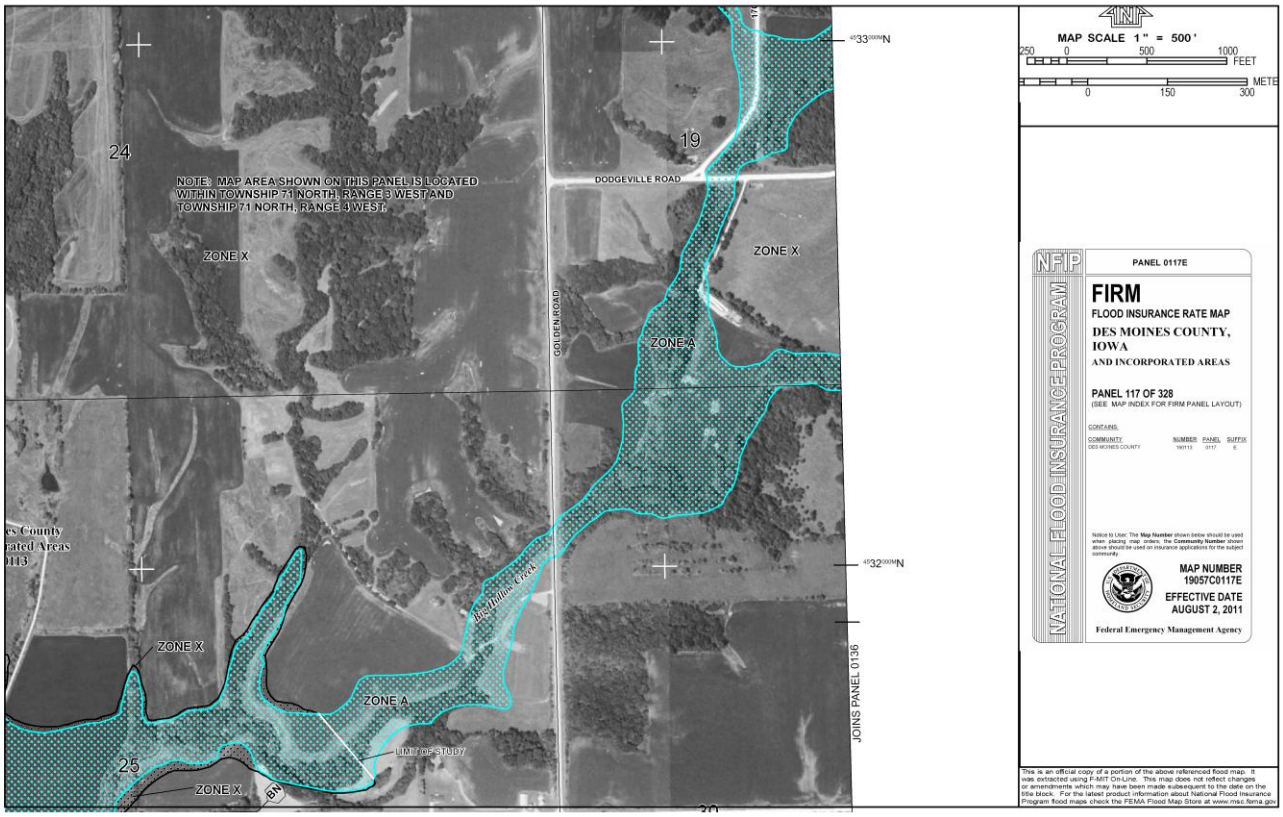
MAP SCALE 1 " = 500 '
250 0 500 1000 FEET
0 150 300 METE
24
19
NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 71 NORTH, RANGE 3 WEST AND TOWNSHIP 71 NORTH, RANGE 4 WEST.
DODGEVILLE ROAD
ZONE X
ZONE X
GOLDEN ROAD
ZONE A
45°33'00"N
45°32'00"N
Big Hollow Creek
ZONE X
ZONE A
LIMIT OF STUDY
25
ZONE X
JOINS PANEL 0136
PANEL 0117E
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 117 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY
DES MOINES COUNTY
NUMBER PANEL SUFFIX
190113 0117 E
MAP NUMBER
19057C0117E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
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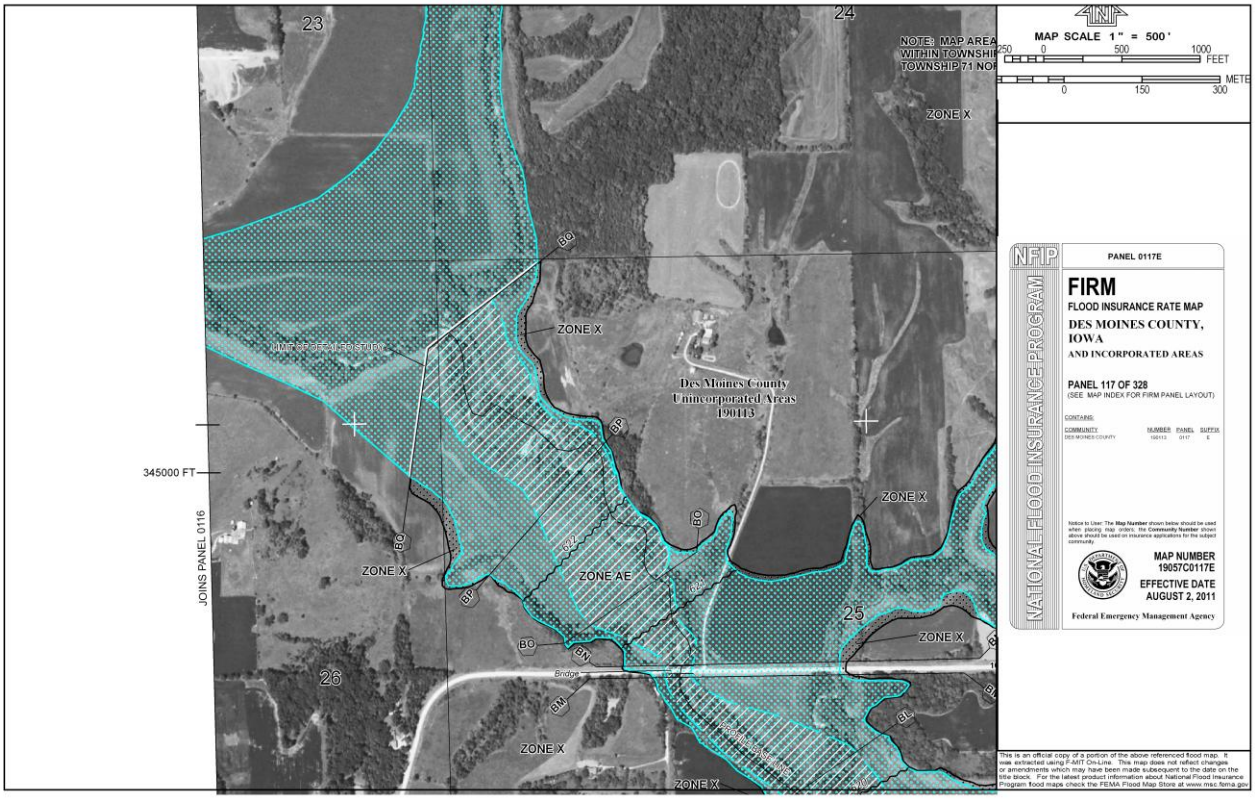
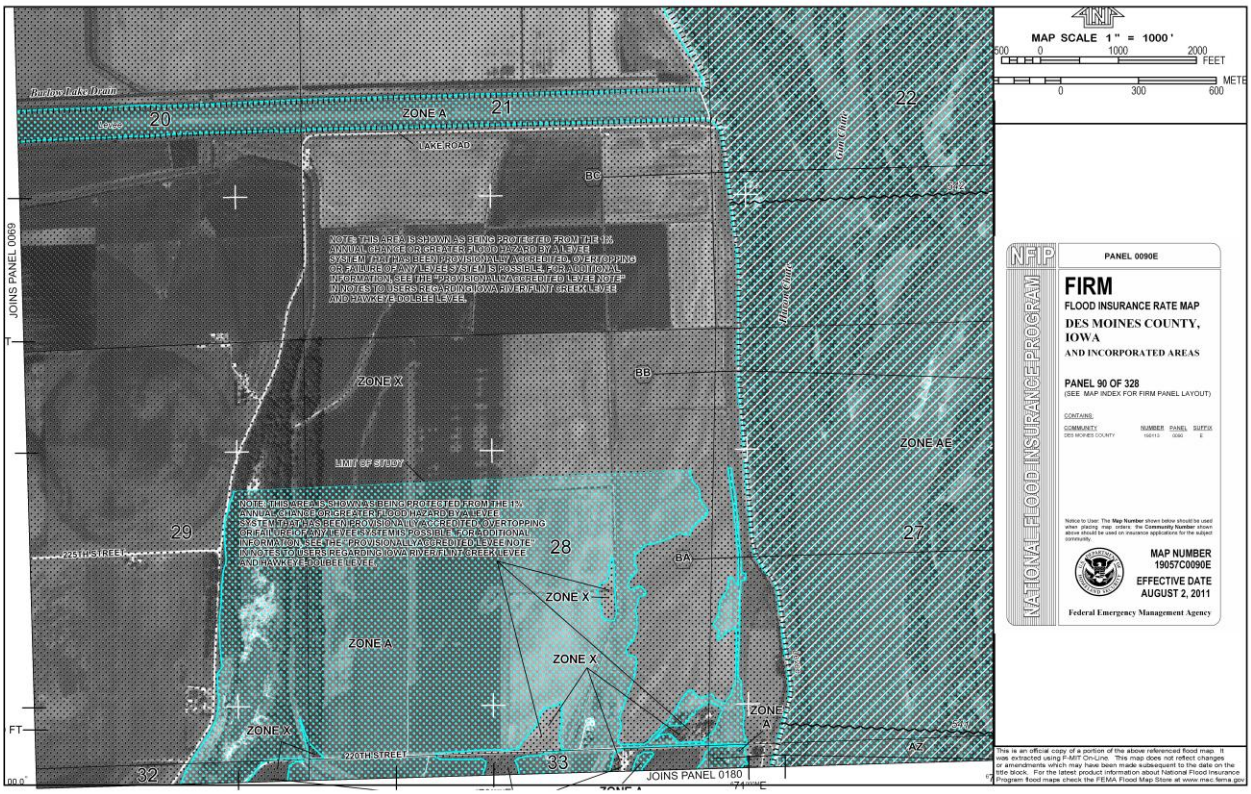
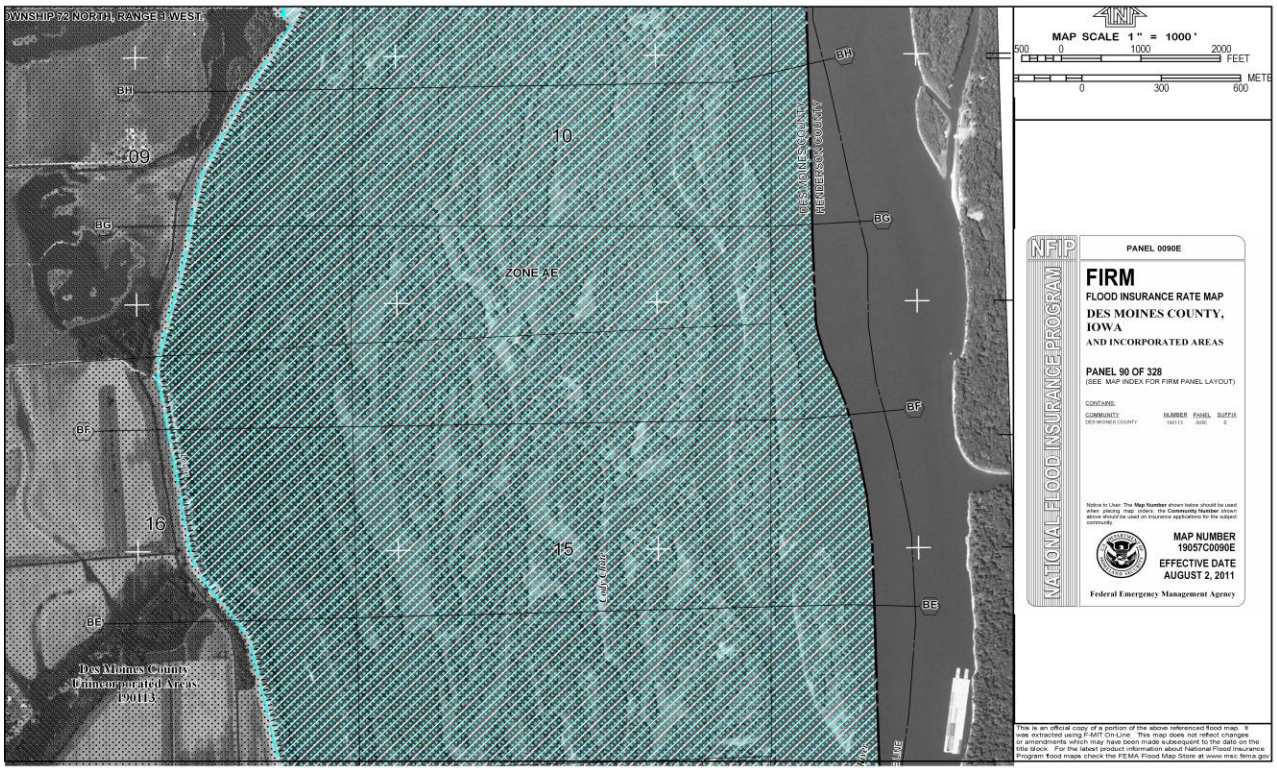
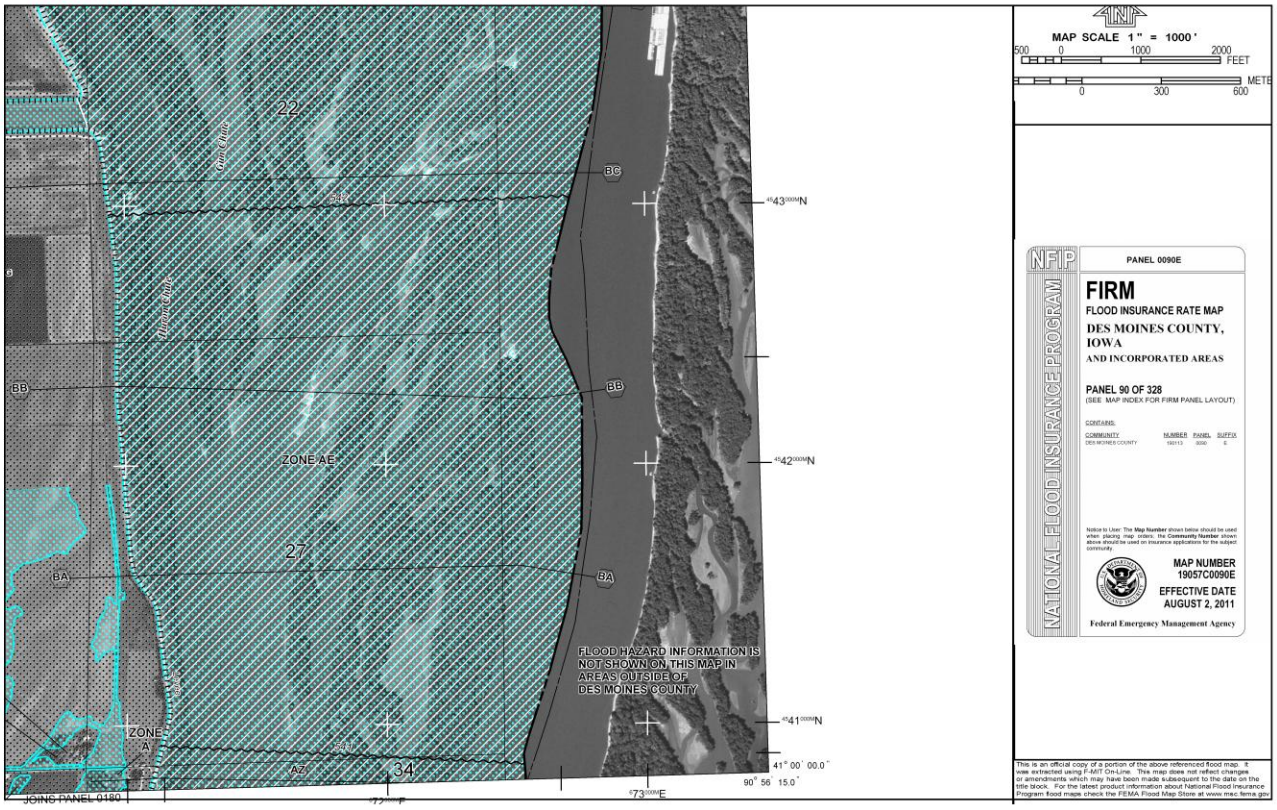
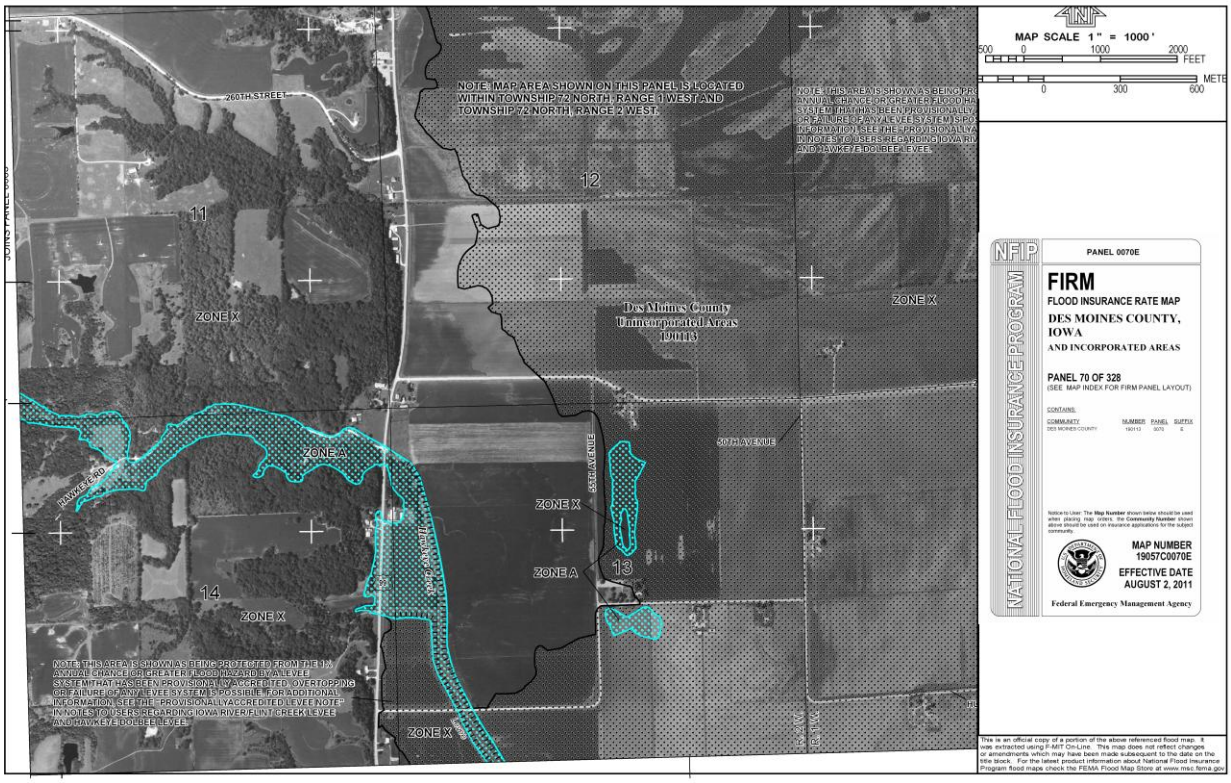

MAP SCALE 1" = 500'
NOTE: MAP AREA WITHIN TOWNSHIP 71 NOR
ZONE X
ZONE AE
Des Moines County Unincorporated Areas 190113
345000 FT
JOINS PANEL 0116
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0117E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 117 OF 328
MAP NUMBER 19057C0117E
EFFECTIVE DATE AUGUST 2, 2011
Federal Emergency Management Agency


MAP SCALE 1" = 1000'
Pontiac Lake Basin
ZONE A
LAKE ROAD
JOINS PANEL 0069
NOTE: THIS AREA IS SHOWN AS BEING PROTECTED FROM THE 1% ANNUAL CHANCE OR GREATER FLOOD HAZARD BY A LEVEE SYSTEM BUT HAS BEEN PROVISIONALLY ACCREDITED. OVERTOPPING OR FAILURE OF ANY LEVEE SYSTEM IS POSSIBLE. FOR ADDITIONAL INFORMATION, SEE THE "PROVISIONALLY ACCREDITED LEVEE NOTE" IN NOTE TO USERS REGARDING IOWA RIVER, PLANT CREEK LEVEE AND HAWKEYE-TOLBEE LEVEE.
ZONE X
LIMIT OF STUDY
ZONE AE
ZONE A
JOINS PANEL 0180
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0090E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 90 OF 328
MAP NUMBER 19057C0090E
EFFECTIVE DATE AUGUST 2, 2011
Federal Emergency Management Agency


MAP SCALE 1 " = 1000 '
500 0 1000 2000 FEET
0 300 600
PANEL 0090E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 90 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
DES MOINES COUNTY 190113 0090 E
MAP NUMBER
19057C0090E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
NATIONAL FLOOD INSURANCE PROGRAM
ZONE AE
Des Moines County, Unincorporated Areas, 190113
HENDERSON COUNTY
Cedar Creek
BH
BG
BF
BE
09
10
15
16


MAP SCALE 1 " = 1000 '
500 0 1000 2000 FEET
0 300 600
PANEL 0090E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 90 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
MAP NUMBER
19057C0090E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
NATIONAL FLOOD INSURANCE PROGRAM
ZONE AE
ZONE A
FLOOD HAZARD INFORMATION IS NOT SHOWN ON THIS MAP IN AREAS OUTSIDE OF DES MOINES COUNTY
JOINS PANEL 0180
Cedar Creek
BB
BC
BA
22
27
34
41° 00' 00.0"
90° 56' 15.0"


MAP SCALE 1 " = 1000 '
500 0 1000 2000 FEET
METE
0 300 600
NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 72 NORTH, RANGE 1 WEST AND TOWNSHIP 72 NORTH, RANGE 2 WEST.
260TH STREET
11
12
13
14
ZONE X
ZONE A
Des Moines County
Unincorporated Areas
190118
305TH AVENUE
307TH AVENUE
HAWKEYE RD
JOINS PANEL 0068
NOTE: THIS AREA IS SHOWN AS BEING PROTECTED FROM THE 1% ANNUAL CHANCE (OR GREATER) FLOOD HAZARD BY A LEVEE SYSTEM THAT HAS BEEN PROVISIONALLY ACCREDITED. OVERTOPPING OR FAILURE OF ANY LEVEE SYSTEM IS POSSIBLE. FOR ADDITIONAL INFORMATION, SEE THE "PROVISIONALLY ACCREDITED LEVEE NOTE" IN NOTES TO USERS REGARDING IOWA RIVER, FLINT CREEK LEVEE AND HAWKEYE-DOLBEE LEVEE.
NFIP
PANEL 0070E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 70 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
DES MOINES COUNTY 190113 0070 E
NATIONAL FLOOD INSURANCE PROGRAM
MAP NUMBER
19057C0070E
EFFECTIVE DATE
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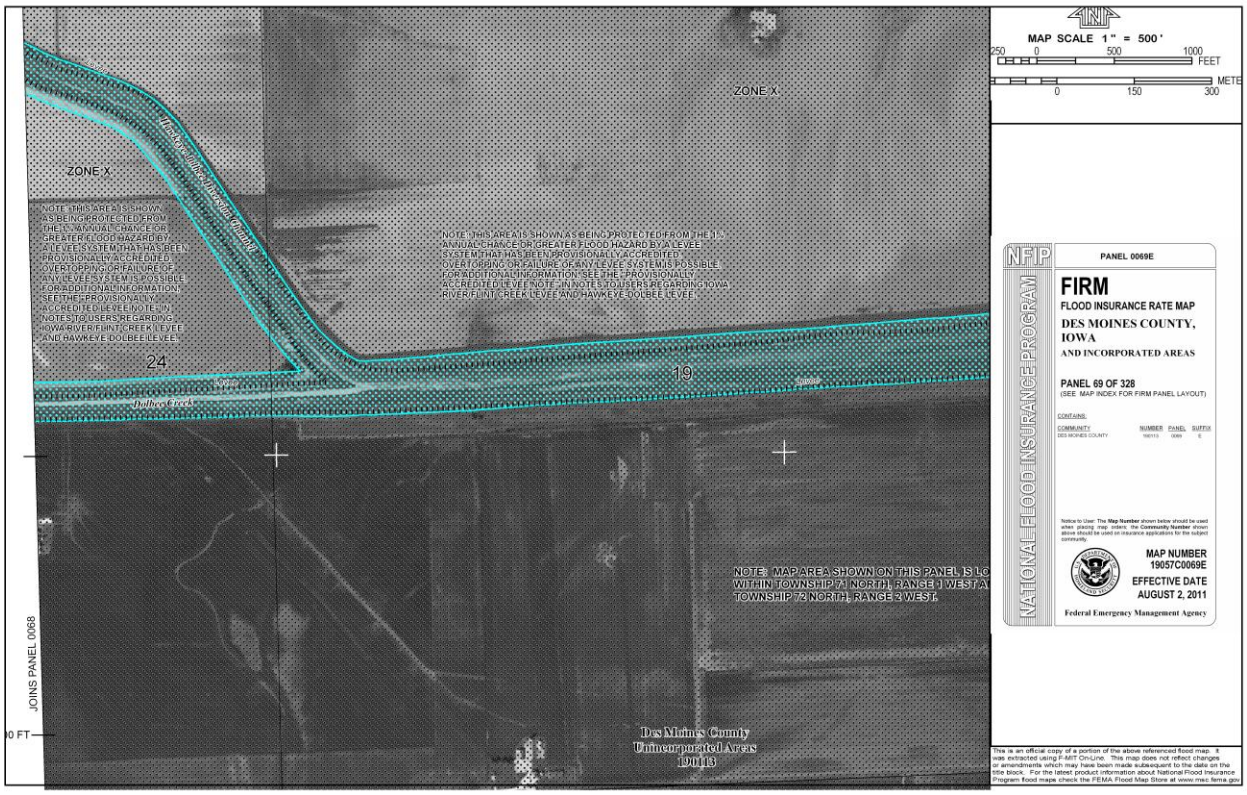
MAP SCALE 1 " = 500 '
250 0 500 1000 FEET
METE
0 150 300
ZONE X
ZONE A
NOTE: THIS AREA IS SHOWN AS BEING PROTECTED FROM THE 1% ANNUAL CHANCE OR GREATER FLOOD HAZARD BY A LEVEE SYSTEM THAT HAS BEEN PROVISIONALLY ACCREDITED. OVERTOPPING OR FAILURE OF ANY LEVEE SYSTEM IS POSSIBLE. FOR ADDITIONAL INFORMATION, SEE THE "PROVISIONALLY ACCREDITED LEVEE NOTE" IN NOTES TO USERS REGARDING IOWA RIVER, FLINT CREEK LEVEE AND HAWKEYE-DOLBEE LEVEE.
24
19
Dolbee Creek
NOTE: MAP AREA SHOWN ON THIS PANEL IS LO
WITHIN TOWNSHIP 71 NORTH, RANGE 1 WEST A
TOWNSHIP 72 NORTH, RANGE 2 WEST.
JOINS PANEL 0068
Des Moines County
Unincorporated Areas
190118
NFIP
PANEL 0069E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 69 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
DES MOINES COUNTY 190113 0069 E
NATIONAL FLOOD INSURANCE PROGRAM
MAP NUMBER
19057C0069E
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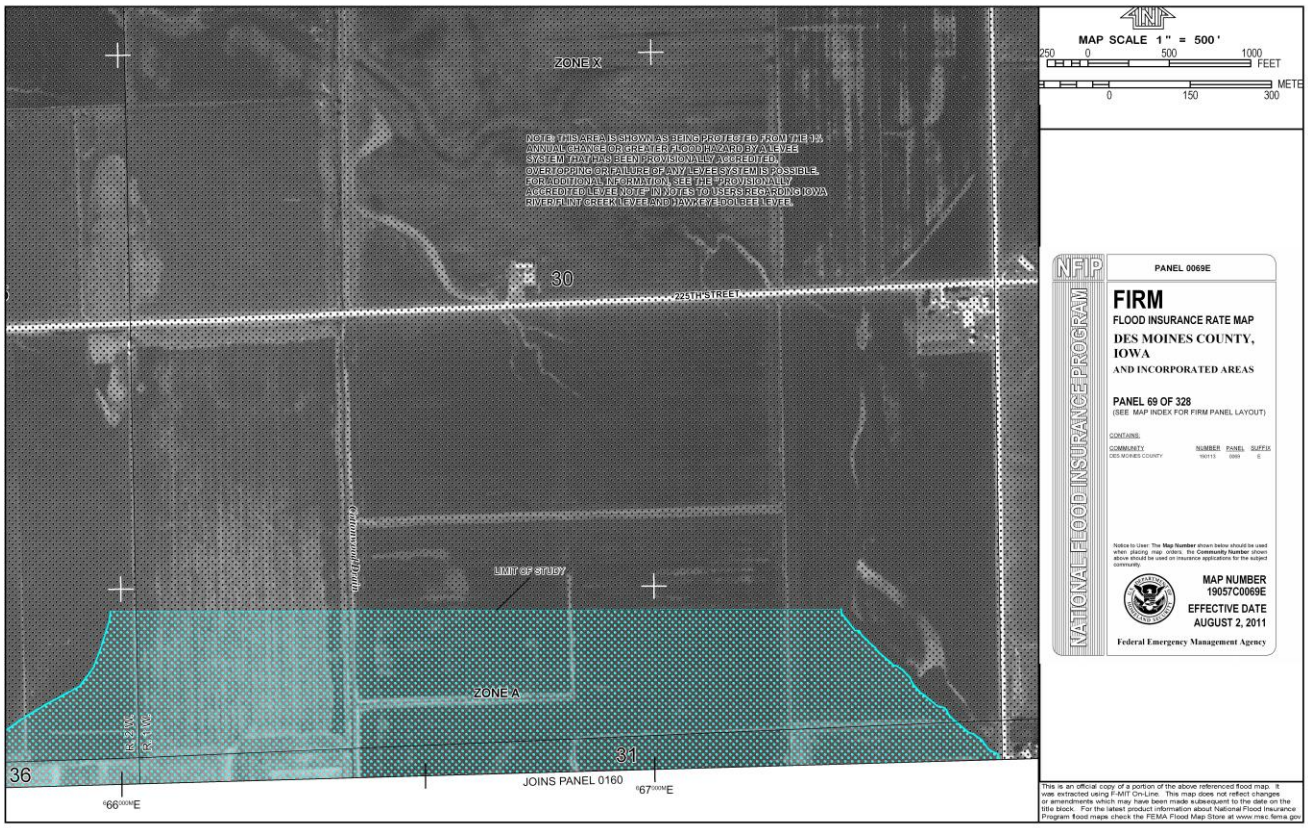
ZONE X
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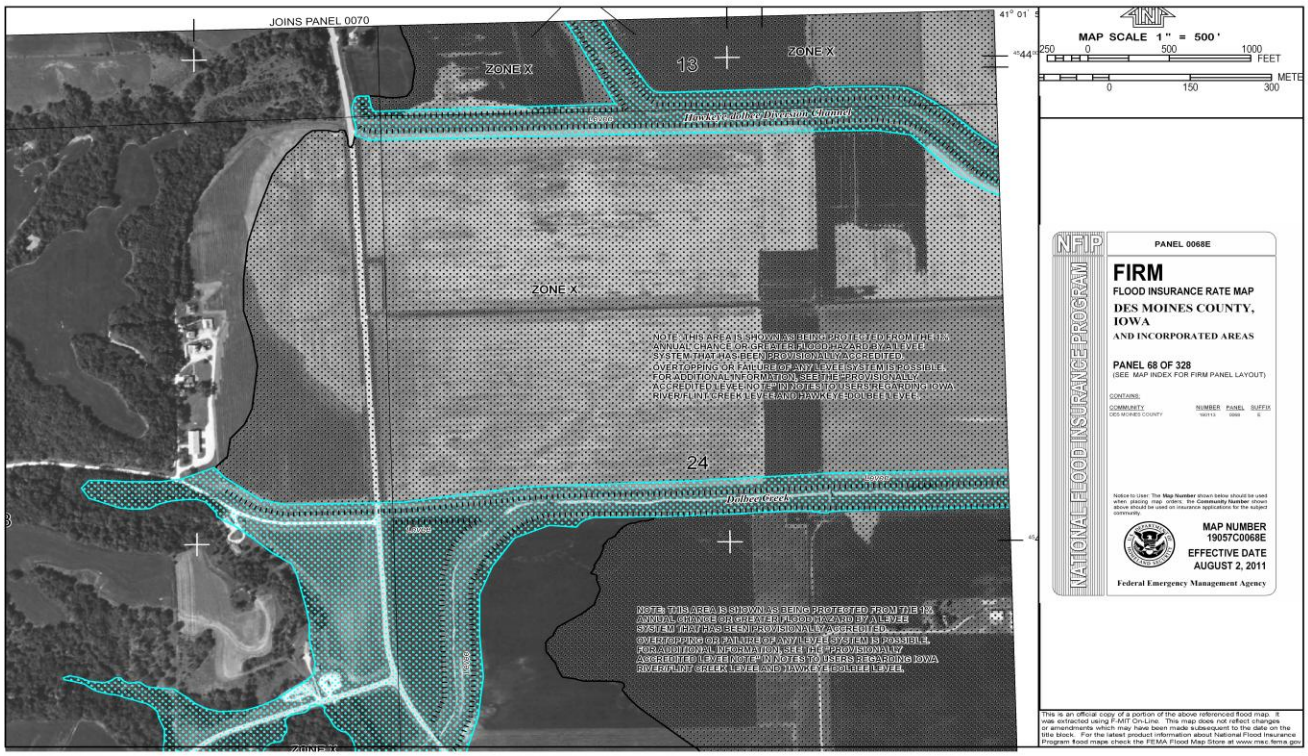
30
225TH STREET
LIMIT OF STUDY
ZONE A
31
36
JOINS PANEL 0160
MAP SCALE 1" = 500'
PANEL 0069E
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 69 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY
NUMBER
PANEL
SUFFIX
DES MOINES COUNTY
MAP NUMBER
19057C0069E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency


JOINS PANEL 0070
ZONE X
13
ZONE X
Hawkeye-Dolbee Diversion Channel
ZONE X
NOTE: THIS AREA IS SHOWN AS BEING PROTECTED FROM THE 1% ANNUAL CHANCE OR GREATER FLOOD HAZARD BY A LEVEE SYSTEM THAT HAS BEEN PROVISIONALLY ACCREDITED. OVERTOPPING OR FAILURE OF ANY LEVEE SYSTEM IS POSSIBLE. FOR ADDITIONAL INFORMATION, SEE THE "PROVISIONALLY ACCREDITED LEVEE" NOTE IN NOTES TO USERS REGARDING IOWA RIVER/FLINT CREEK LEVEE AND HAWKEYE-DOLBEE LEVEE.
24
Dolbee Creek
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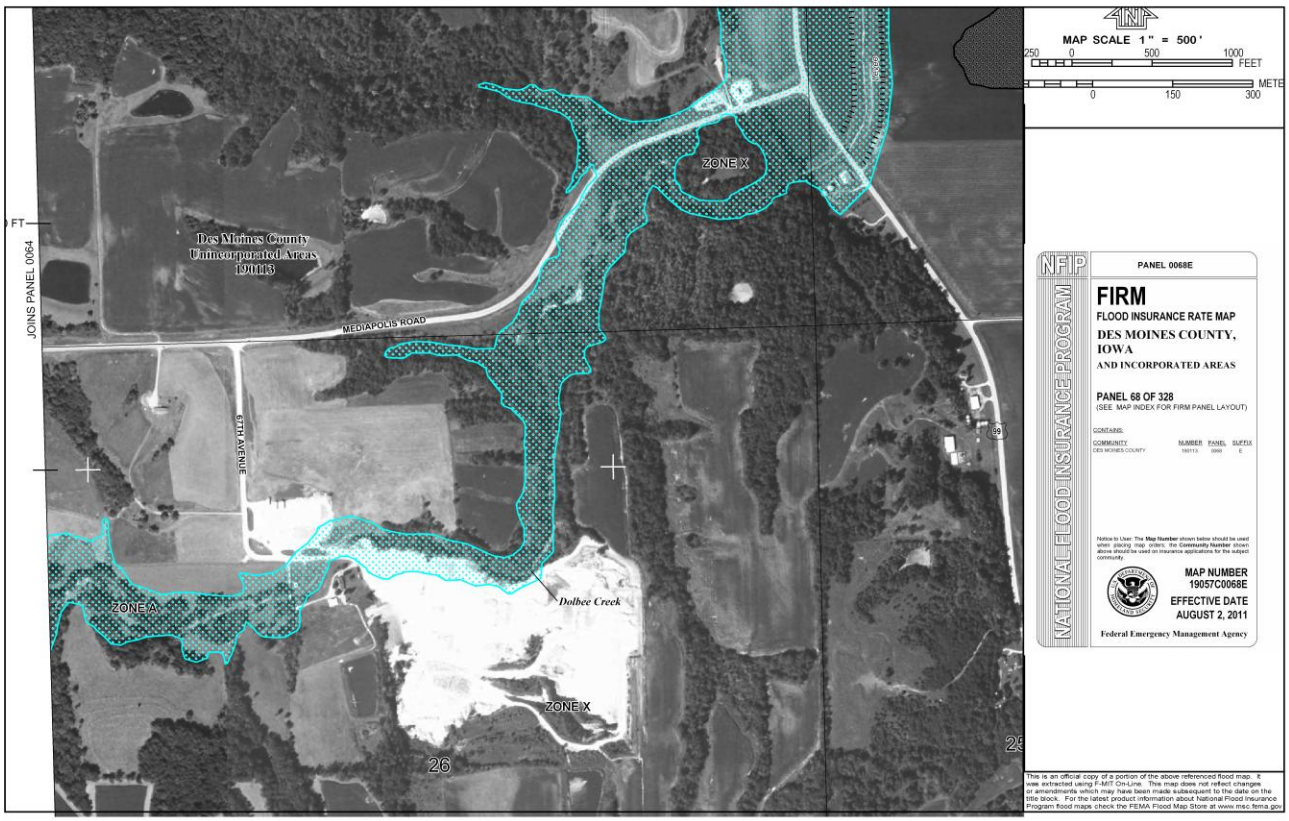
MAP SCALE 1" = 500'
PANEL 0068E
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 68 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY
NUMBER
PANEL
SUFFIX
DES MOINES COUNTY
MAP NUMBER
19057C0068E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency


MAP SCALE 1" = 500'
250 0 500 1000 FEET
0 150 300 METE
ZONE X
Des Moines County
Unincorporated Areas
190113
MEDIAPOLIS ROAD
67TH AVENUE
JOINS PANEL 0064
FT
ZONE A
Dolbee Creek
ZONE X
26
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0068E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 68 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
DES MOINES COUNTY 190113 0068 E
MAP NUMBER
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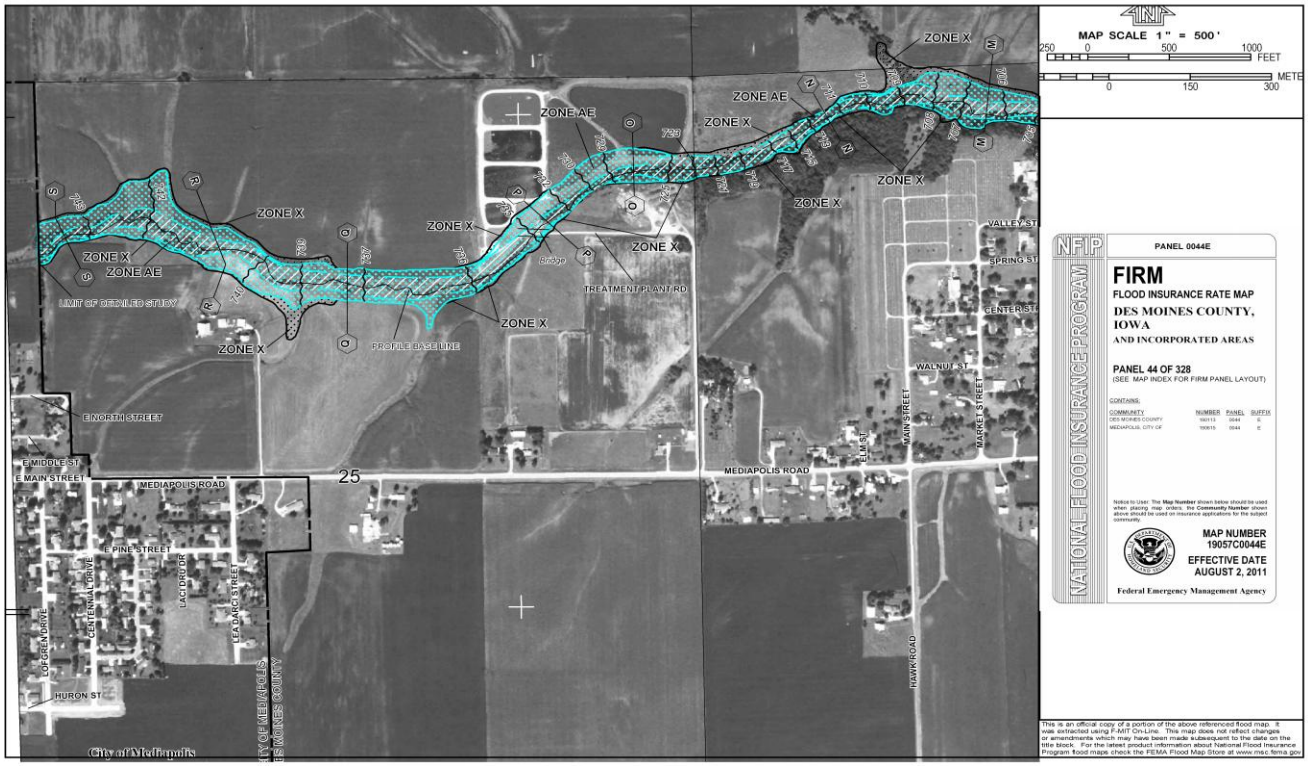
MAP SCALE 1" = 500'
250 0 500 1000 FEET
0 150 300 METE
ZONE X
ZONE AE
ZONE X
ZONE X
ZONE X
ZONE X
ZONE AE
LIMIT OF DETAILED STUDY
ZONE X
ZONE X
ZONE X
PROFILE BASELINE
TREATMENT PLANT RD
Bridge
ZONE X
ZONE X
VALLEY ST
SPRING ST
CENTER ST
WALNUT ST
MAIN STREET
MARKET STREET
ELM ST
E NORTH STREET
E MIDDLE ST
E MAIN STREET
MEDIAPOLIS ROAD
25
MEDIAPOLIS ROAD
E PINE STREET
LACI DRY DR
LEA DARCI STREET
CENTENNIAL DRIVE
LOFGREN DRIVE
HURON ST
HARK ROAD
City of Mediapolis
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0044E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 44 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
DES MOINES COUNTY 190113 0044 E
MEDIAPOLIS, CITY OF 190515 0044 E
MAP NUMBER
19057C0044E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
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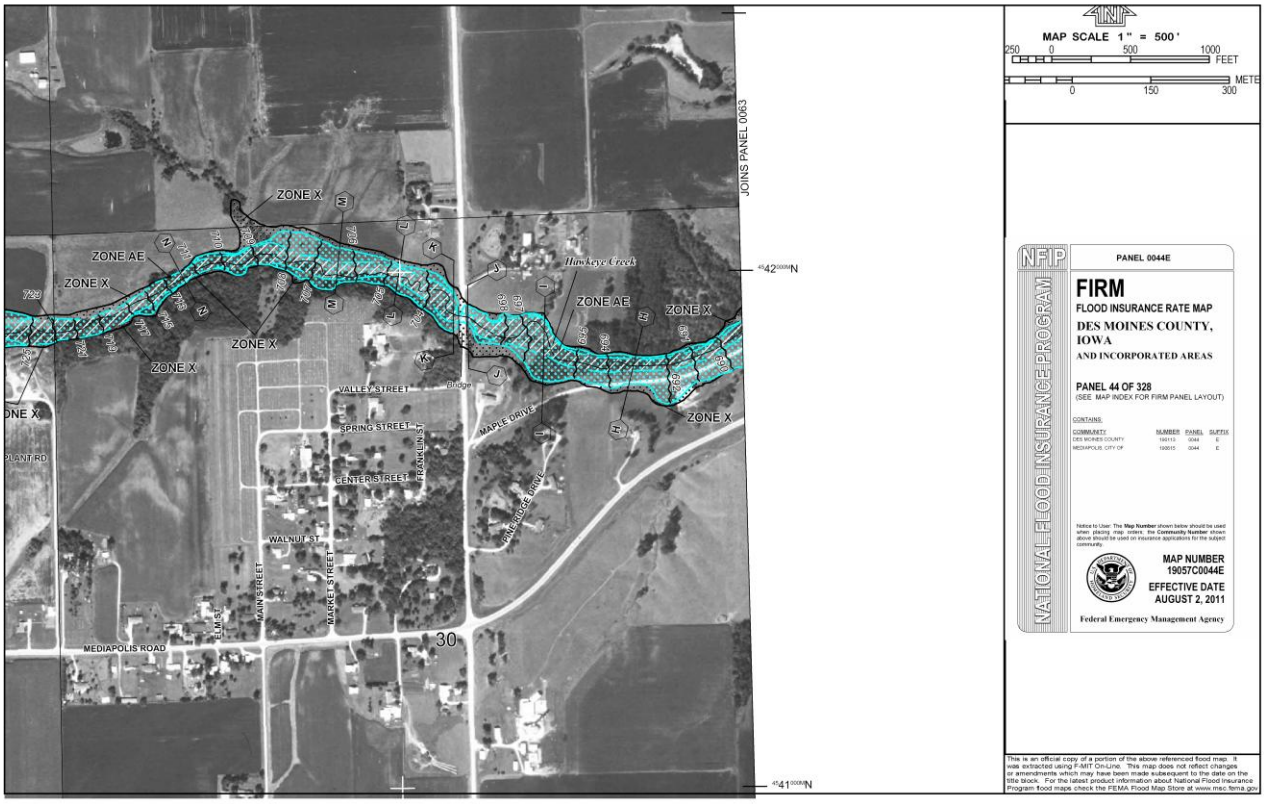
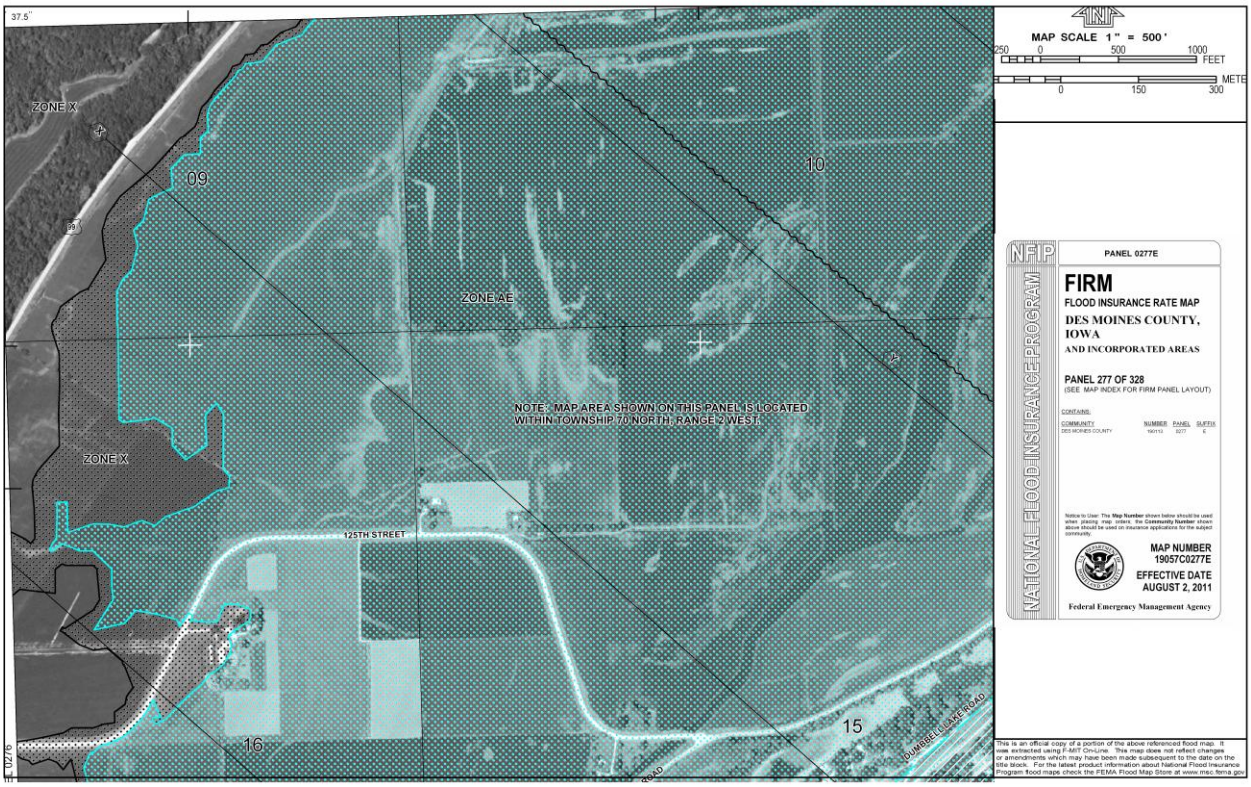
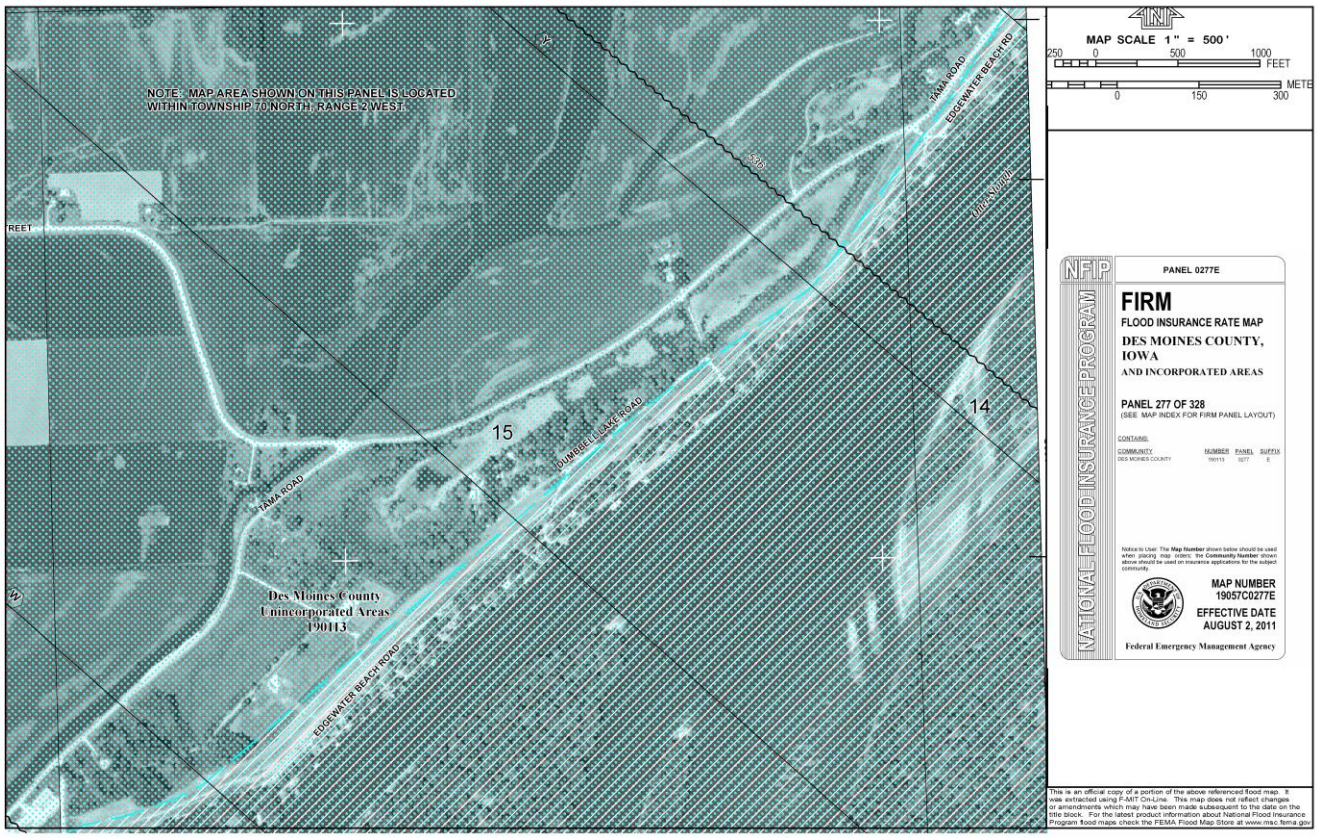

MAP SCALE 1" = 500'
250 0 500 1000 FEET
0 150 300 METE
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0044E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 44 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
DES MOINES COUNTY 190113 0044 E
MEDIAPOLIS, CITY OF 190015 0044 E
MAP NUMBER
19057C0044E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
JOINS PANEL 0063
ZONE X
ZONE AE
Hawkeye Creek
VALLEY STREET
SPRING STREET
MAPLE DRIVE
CENTER STREET
FRANKLIN ST
WALNUT ST
MAIN STREET
MARKET STREET
ELM ST
MEDIAPOLIS ROAD
PLANT RD
30
42°00'00"N
41°00'00"N


MAP SCALE 1" = 500'
250 0 500 1000 FEET
0 150 300 METE
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0277E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 277 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
DES MOINES COUNTY 190152 0277 E
MAP NUMBER
19057C0277E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
ZONE X
ZONE AE
09
10
15
16
NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 70 NORTH, RANGE 2 WEST.
125TH STREET
DUMBELL LAKE ROAD


NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 70 NORTH, RANGE 2 WEST.
MAP SCALE 1" = 500'
250 0 500 1000 FEET
0 150 300 METE
15
14
TAMA ROAD
DOUMBEER LAKE ROAD
EDGEWATER BEACH ROAD
Des Moines County
Unincorporated Areas
190113
NFIP
PANEL 0277E
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 277 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
DES MOINES COUNTY 190113 0277 E
MAP NUMBER
19057C0277E
EFFECTIVE DATE
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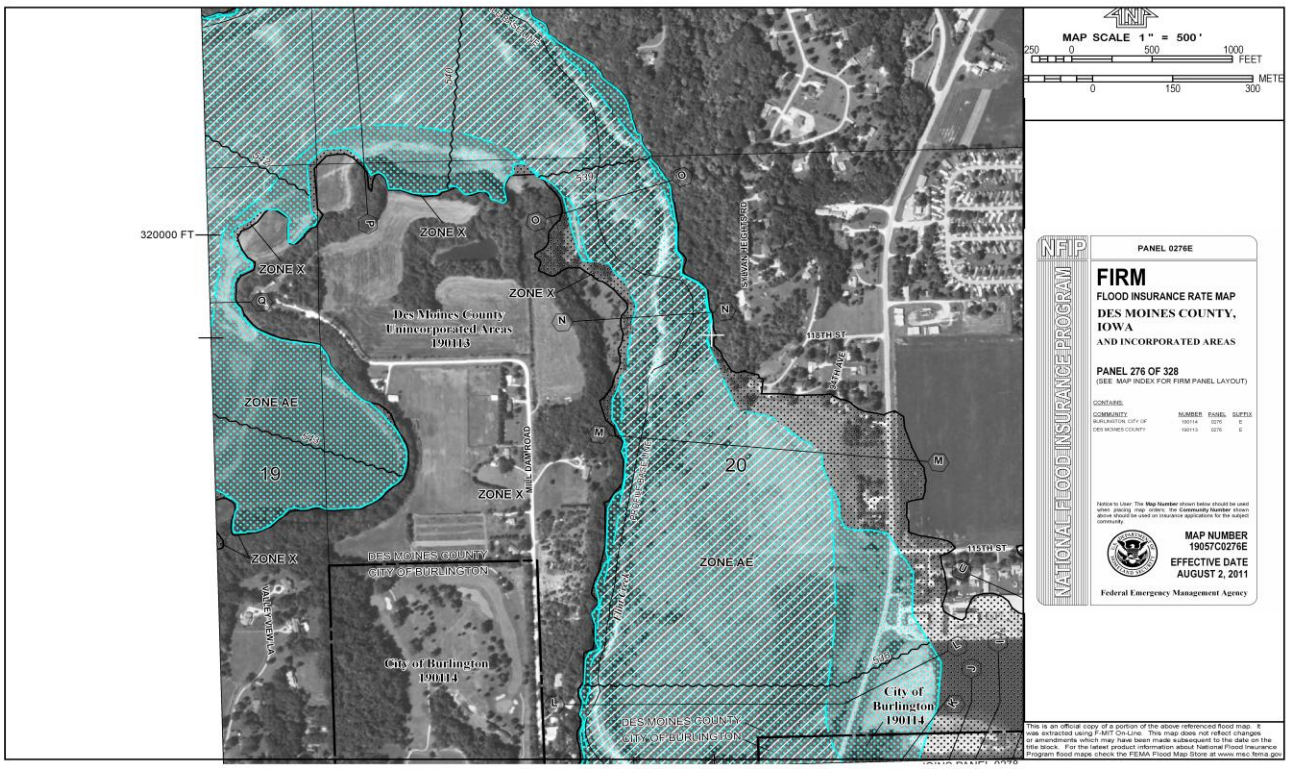
MAP SCALE 1" = 500'
250 0 500 1000 FEET
0 150 300 METE
320000 FT
ZONE X
ZONE AE
Des Moines County
Unincorporated Areas
190113
19
20
MILL DAM ROAD
DES MOINES COUNTY
CITY OF BURLINGTON
City of Burlington
190114
NFIP
PANEL 0276E
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 276 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
BURLINGTON, CITY OF 190114 0276 E
DES MOINES COUNTY 190113 0276 E
MAP NUMBER
19057C0276E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
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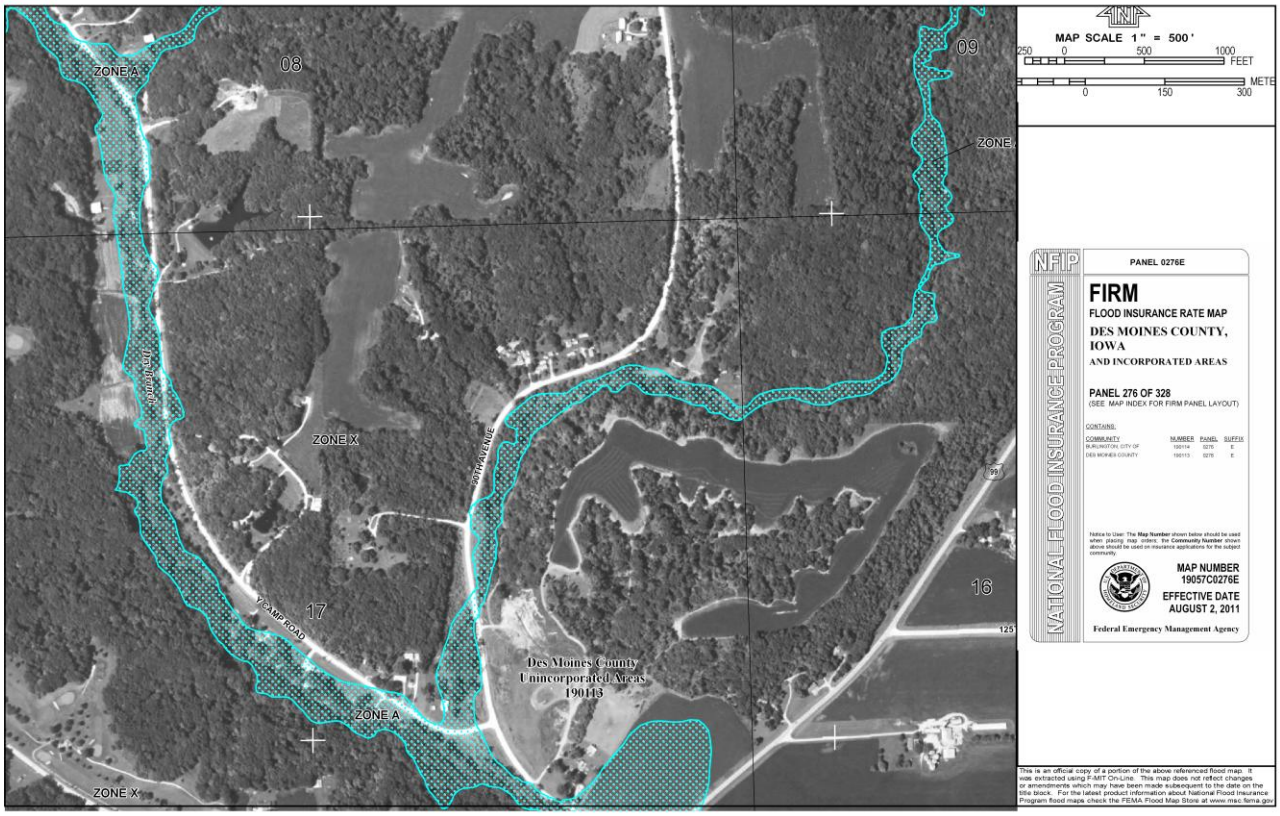
MAP SCALE 1" = 500'
250 0 500 1000 FEET
0 150 300 METERS
PANEL 0276E
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 276 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
BURLINGTON, CITY OF 190114 0276 E
DES MOINES COUNTY 190113 0276 E
Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.
MAP NUMBER
19057C0276E
EFFECTIVE DATE
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Federal Emergency Management Agency
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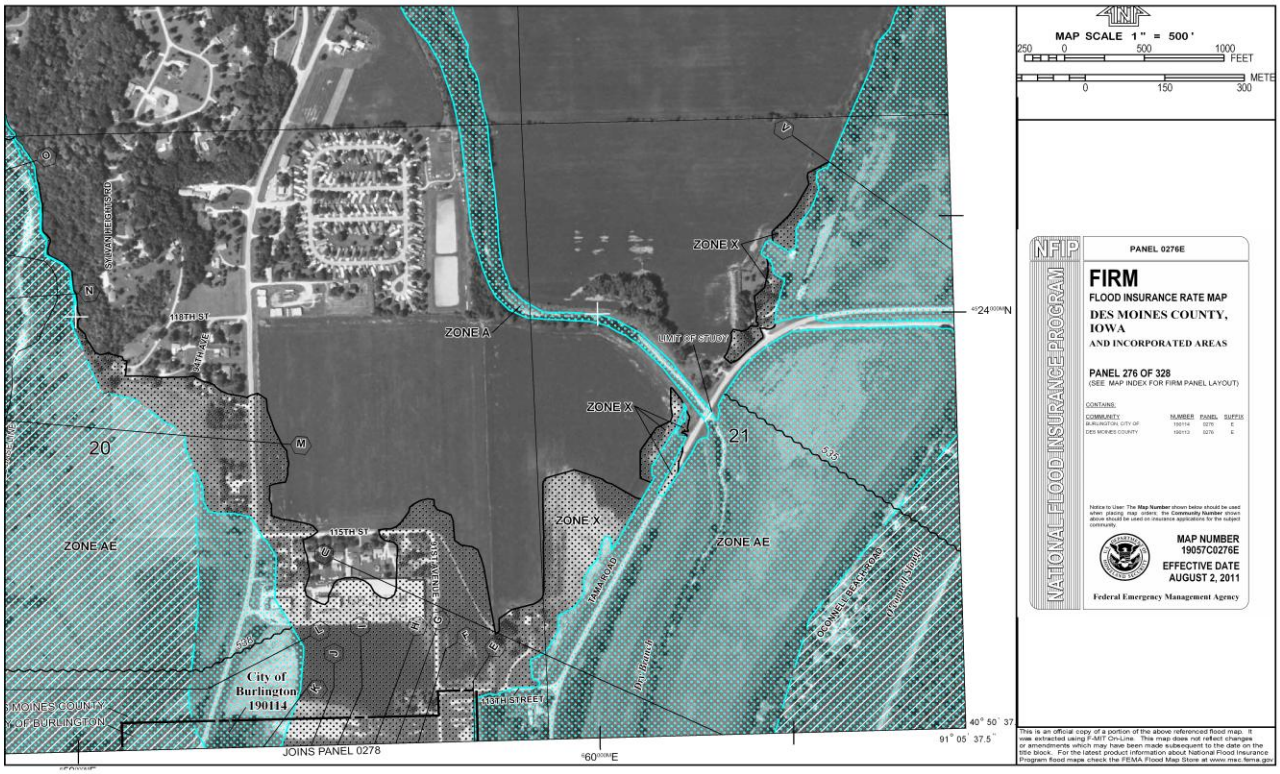
ZONE A
ZONE X
08
09
16
17
Des Moines County
Unincorporated Areas
190113
Y-34 MAP ROAD
JOHN AVENUE
ZONE A
ZONE X


MAP SCALE 1" = 500'
250 0 500 1000 FEET
0 150 300 METERS
PANEL 0276E
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 276 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
BURLINGTON, CITY OF 190114 0276 E
DES MOINES COUNTY 190113 0276 E
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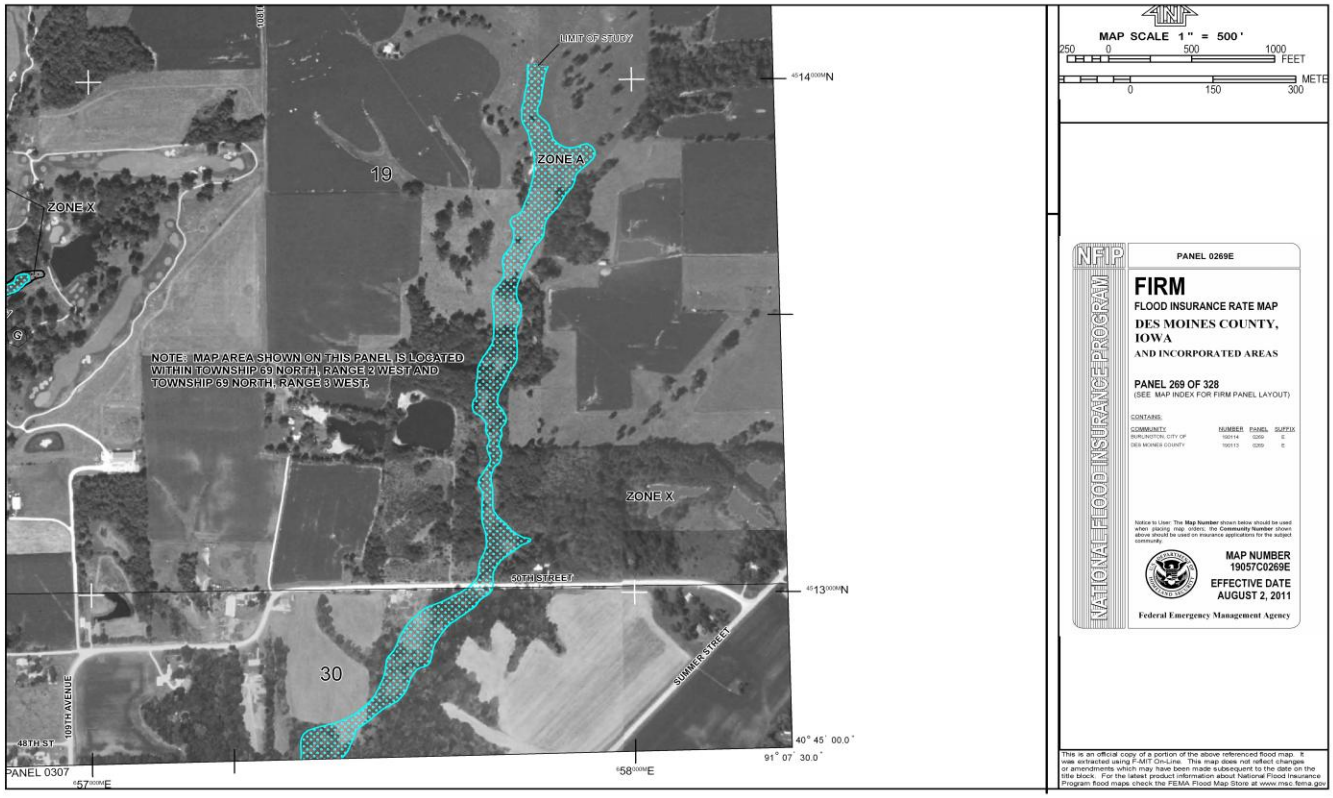
ZONE X
ZONE A
LIMIT OF STUDY
ZONE X
ZONE AE
ZONE X
ZONE AE
20
21
118TH ST
115TH ST
113TH STREET
SUGAR BOTTOM RD
JOINS PANEL 0278
City of Burlington
190114
40° 50' 37.5"
91° 05' 37.5"


ZONE X
North Branch Spring Creek
OAK HILL'S DRIVE
CLUBHOUSE DRIVE
24
FAIRWAY DRIVE
285000 FT
ZONE X
ZONE X
ZONE X
ZONE X
PROFILE BASE LINE
25
ZONE X
ZONE AE
109TH AVENUE
48TH ST
MAP SCALE 1" = 500'
250 0 500 1000 FEET
0 150 300 METE
NFIP
PANEL 0269E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 269 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
BURLINGTON, CITY OF 190114 0269 E
DES MOINES COUNTY 190113 0269 E
NATIONAL FLOOD INSURANCE PROGRAM
MAP NUMBER
19057C0269E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov


LIMIT OF STUDY
ZONE A
19
ZONE X
NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 69 NORTH, RANGE 2 WEST AND TOWNSHIP 69 NORTH, RANGE 3 WEST.
ZONE X
50TH STREET
30
SUMMER STREET
109TH AVENUE
48TH ST
PANEL 0307
MAP SCALE 1" = 500'
250 0 500 1000 FEET
0 150 300 METE
NFIP
PANEL 0269E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 269 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
BURLINGTON, CITY OF 190114 0269 E
DES MOINES COUNTY 190113 0269 E
NATIONAL FLOOD INSURANCE PROGRAM
MAP NUMBER
19057C0269E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
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MAP SCALE 1" = 500'
250 0 500 1000 FEET
0 150 300 METE
City of Burlington
190114
CITY OF BURLINGTON
DES MOINES COUNTY
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
ZONE A
ZONE AE
ZONE X
ST VAUGHAN DRIVE
65TH STREET
15TH STREET
NORTH RIVER DR
RASCHEL STREET
COCHRAN DRIVE
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0269E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 269 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
BURLINGTON, CITY OF 190114 0269 E
DES MOINES COUNTY 190113 0269 E
MAP NUMBER
19057C0269E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
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MAP SCALE 1" = 500'
250 0 500 1000 FEET
0 150 300 METE
CITY OF WEST BURLINGTON
CITY OF BURLINGTON
City of Burlington
190114
LIMIT OF STUDY
CITY OF BURLINGTON
DES MOINES COUNTY
WEST AVENUE ROAD
PINEHURST DR
CANTERBURY DRIVE
MONTICELLO DRIVE
STONEBRIAR
INDIAN HILLS ROAD
Des Moines County
Unincorporated Areas
190113
ZONE A
S GEAR AVENUE
AUGUS
10
11
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0266E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 266 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
BURLINGTON, CITY OF 190114 0266 E
DES MOINES COUNTY 190113 0266 E
WEST BURLINGTON, CITY OF 190952 0266 E
MAP NUMBER
19057C0266E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
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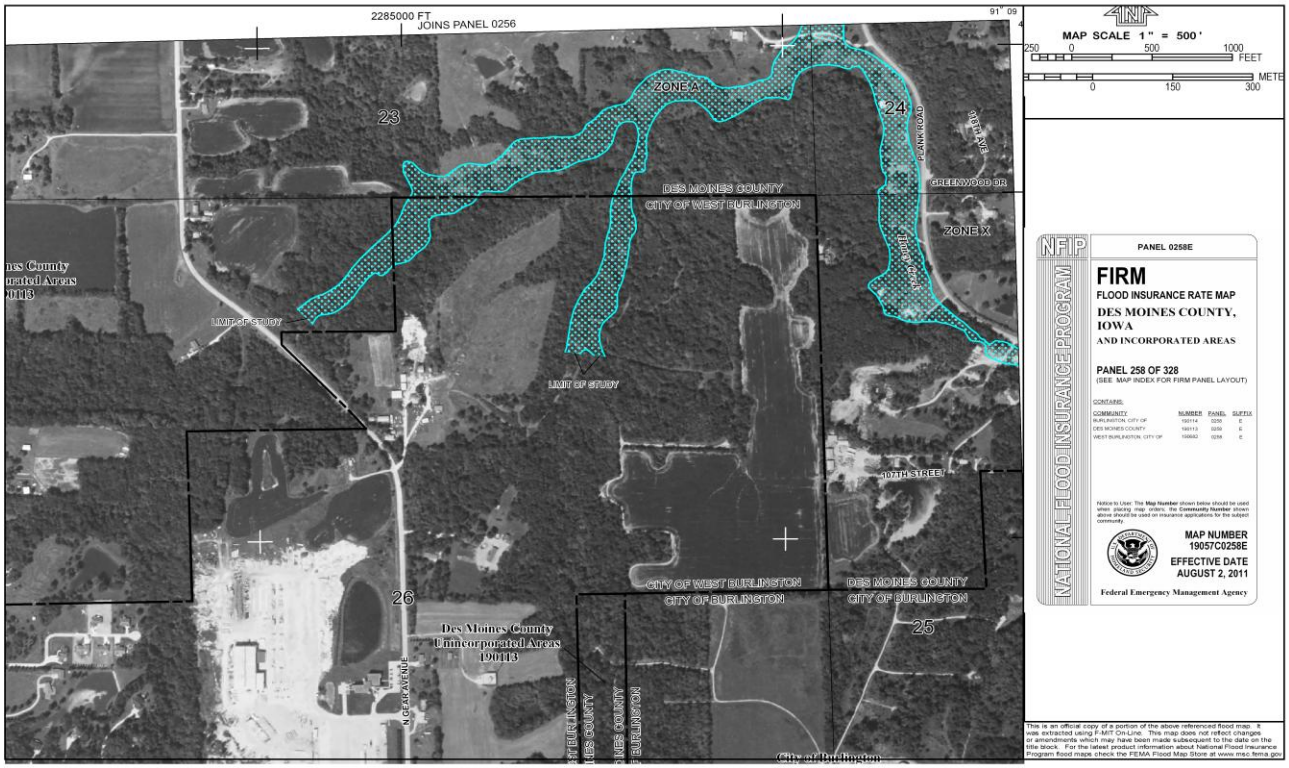
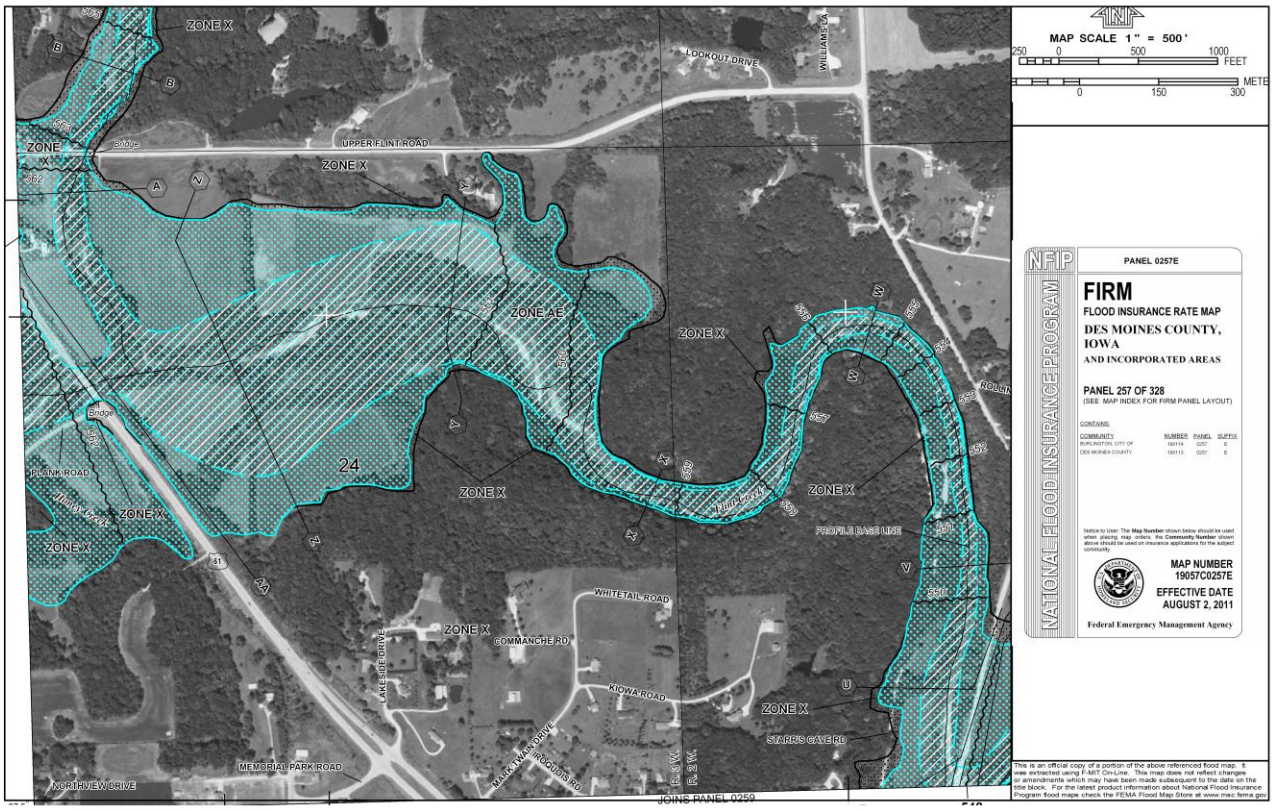
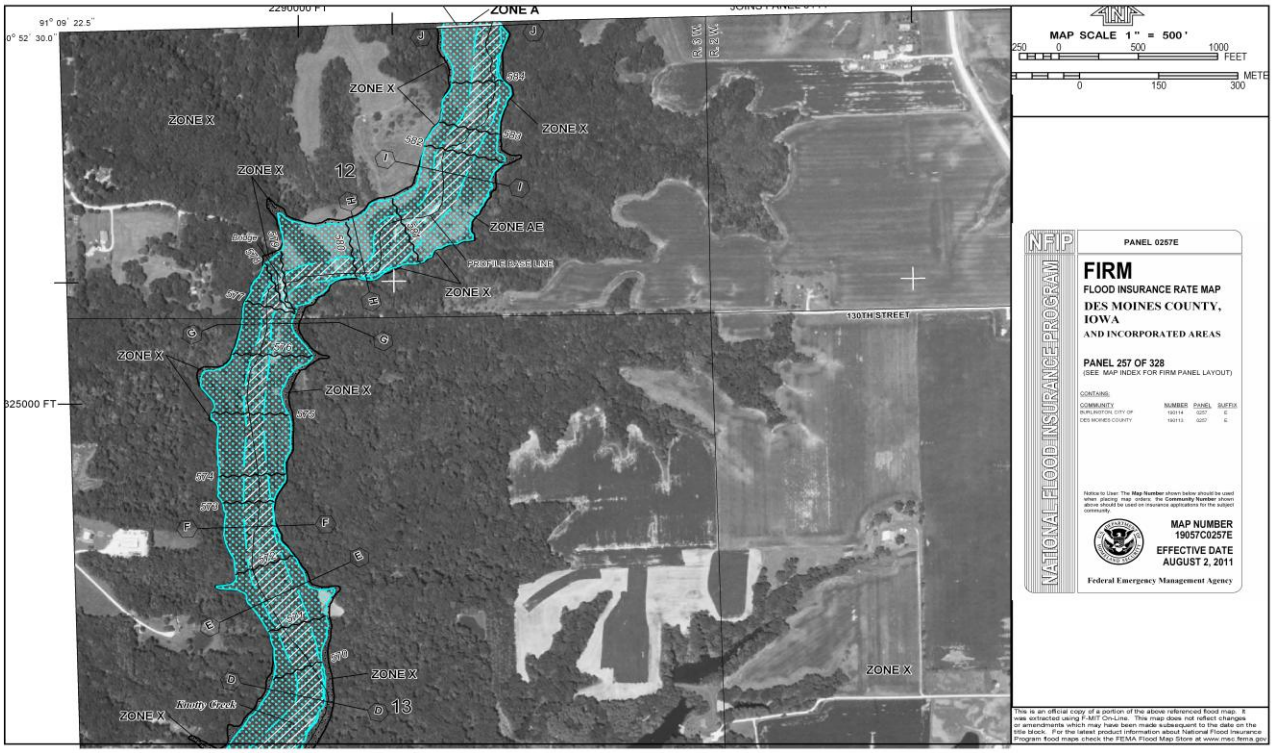
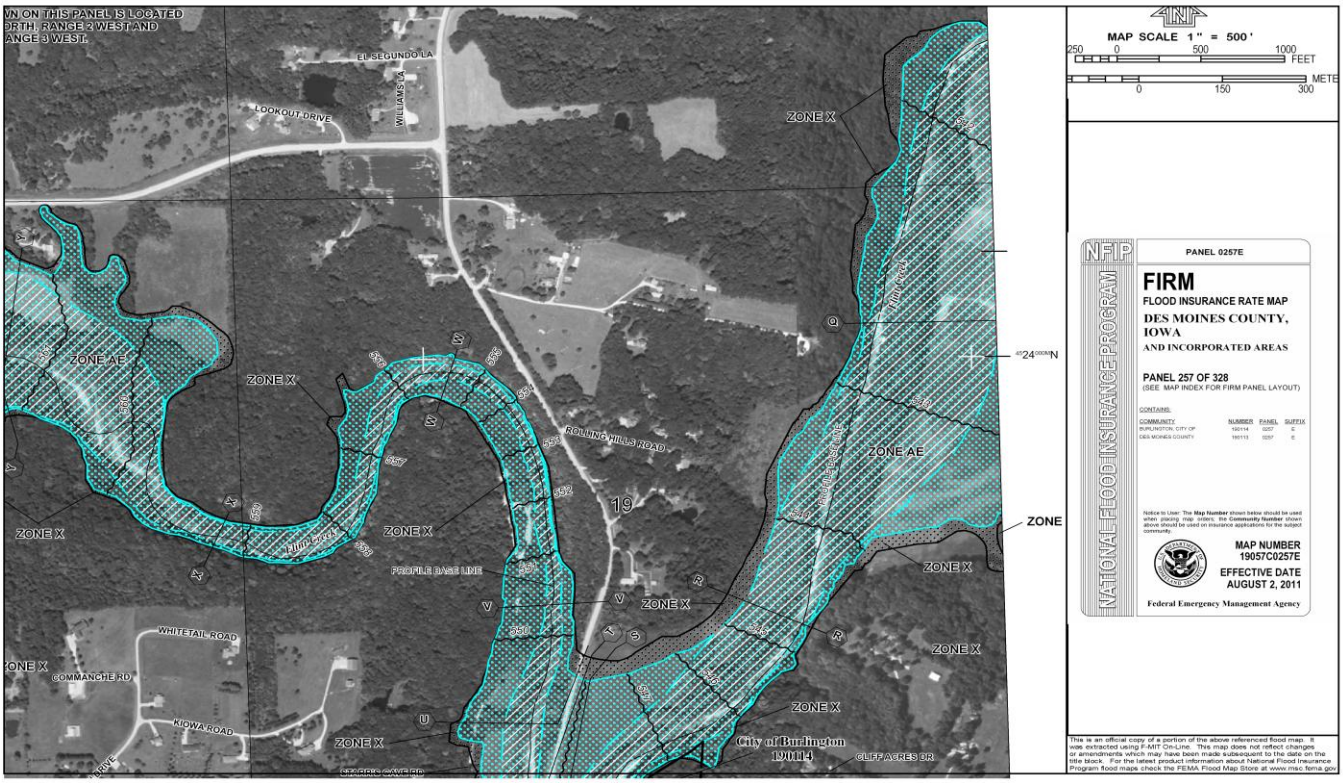
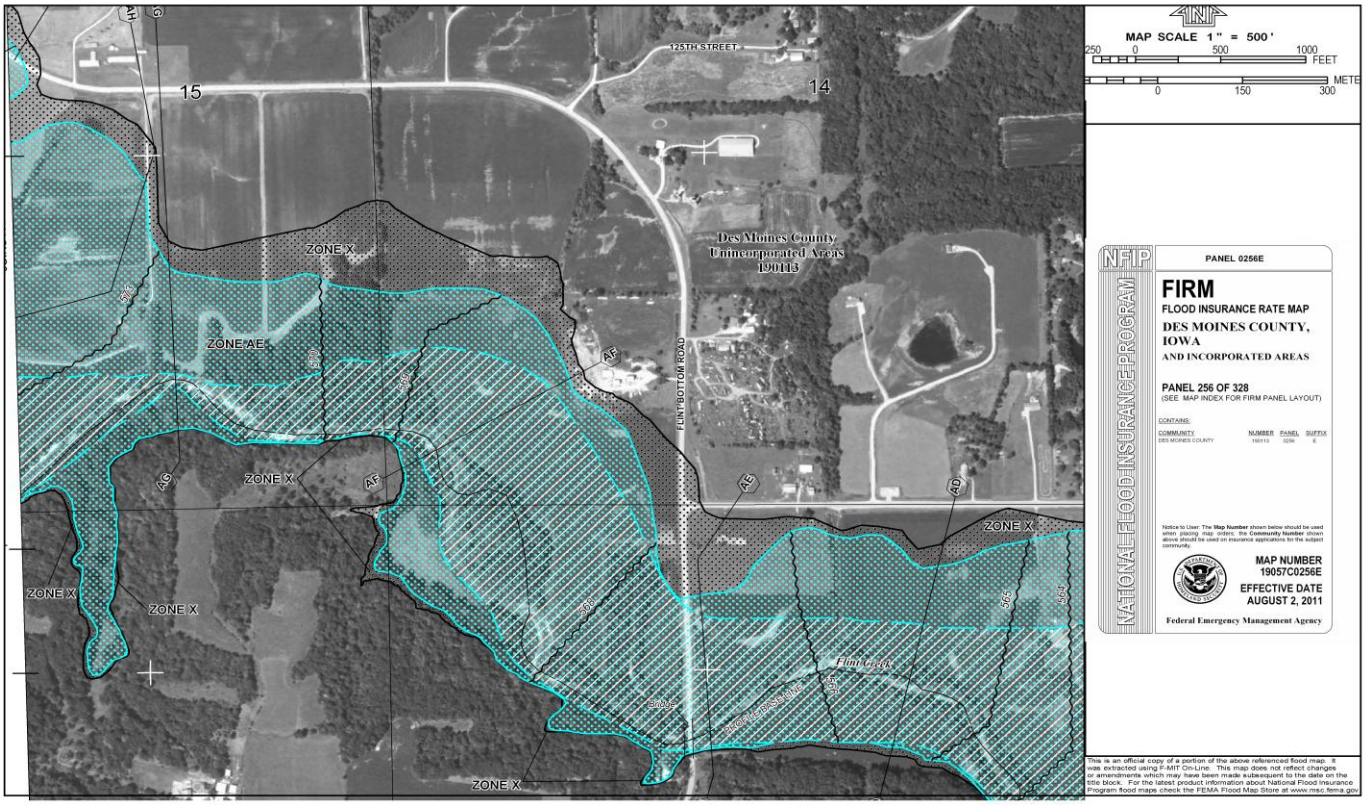
2290000 FT
JOINS PANEL 0257
MAP SCALE 1" = 500'
NORTHVIEW DRIVE
MARK TWAIN DRIVE
LITTLE FAWN RD
IROQUOIS RD
RED FOX RD
FAWN ROAD
STARRS CAVE ROAD
ZONE AE
ZONE X
GREENWOOD DR
DES MOINES COUNTY
CITY OF BURLINGTON
Des Moines County
Unincorporated Areas
190113
MEMORIAL PARK ROAD
TIMBERRIDGE DRIVE
WOODLAWN DRIVE
OAKDALE DRIVE
DREBENSTEDT CREEK
OAKLAND DELLS DR
DIAMOND RIDGE DR
HILLCREST DRIVE
EDGEWOOD PLACE
SUNNY
ZONE A
107TH STREET
LIMIT OF STUDY
PLANK ROAD
NORTHERN DRIVE
RACINE AVENUE
ISABEL AVENUE
MELVIN AVENUE
GRAILES STREET
LENOX AVENUE
24
25
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0259E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 259 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
MAP NUMBER
19057C0259E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency

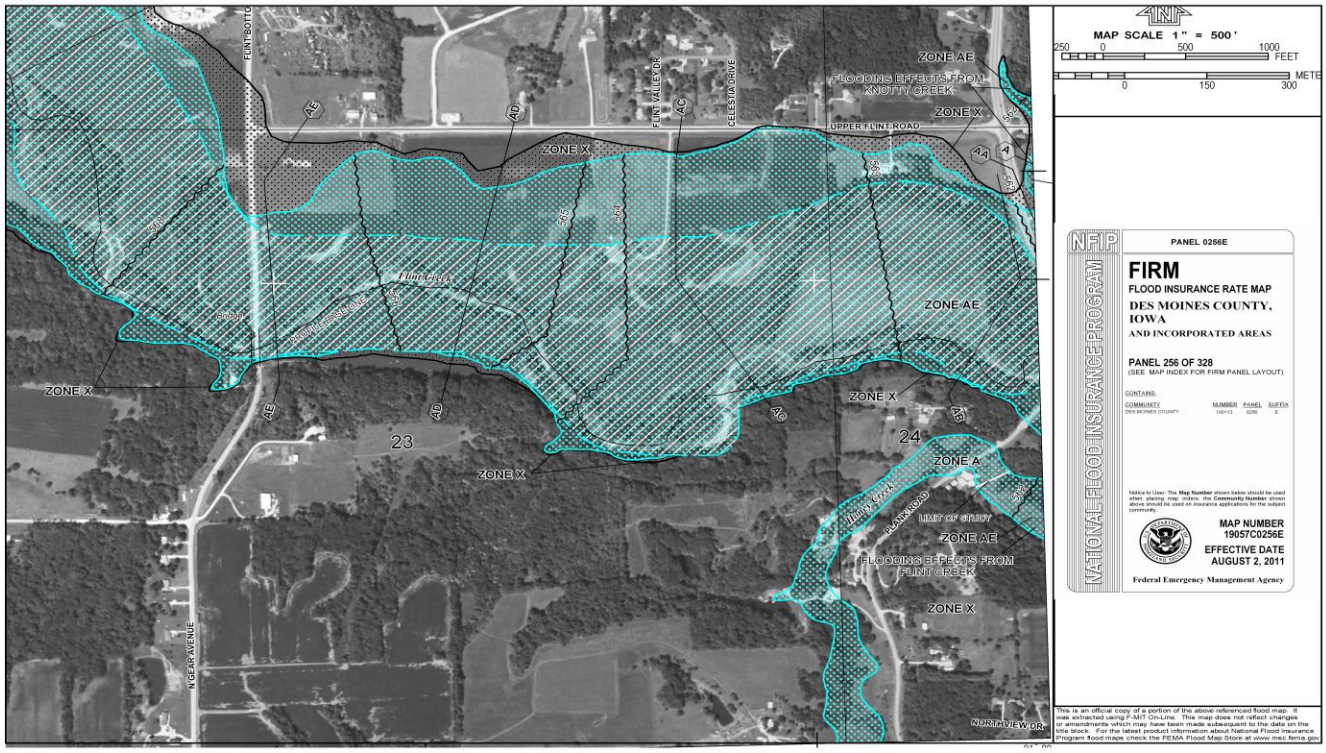

2285000 FT
JOINS PANEL 0256
MAP SCALE 1" = 500'
ZONE A
ZONE X
23
24
26
25
DES MOINES COUNTY
CITY OF WEST BURLINGTON
CITY OF BURLINGTON
Des Moines County
Unincorporated Areas
190113
LIMIT OF STUDY
GREENWOOD DR
107TH STREET
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0258E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 258 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
MAP NUMBER
19057C0258E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency


ZONE X
ZONE AE
LOOKOUT DRIVE
WILLIAMS LA
UPPER FLINT ROAD
FLINT CREEK
PLANK ROAD
Muddy Creek
PROFILE BASE LINE
WHITETAIL ROAD
COMMANCHE RD
KIOWA ROAD
LAKESIDE DRIVE
MARTIN DRIVE
STARR'S CAVE RD
MEMORIAL PARK ROAD
NORTHVIEW DRIVE
JOINS PANEL 0259
MAP SCALE 1" = 500'
FEET
METE
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0257E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 257 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY
NUMBER
PANEL
SUFFIX
BURLINGTON, CITY OF
190114
0257
E
DES MOINES COUNTY
190113
0257
E
MAP NUMBER
19057C0257E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency


ZONE A
ZONE X
ZONE AE
PROFILE BASE LINE
130TH STREET
Muddy Creek
MAP SCALE 1" = 500'
FEET
METE
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0257E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 257 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY
NUMBER
PANEL
SUFFIX
BURLINGTON, CITY OF
190114
0257
E
DES MOINES COUNTY
190113
0257
E
MAP NUMBER
19057C0257E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency


MAP SCALE 1" = 500'
250 0 500 1000 FEET
0 150 300 METE
PANEL 0257E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 257 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
BURLINGTON, CITY OF 190144 0257 E
DES MOINES COUNTY 190113 0257 E
MAP NUMBER
19057C0257E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
NATIONAL FLOOD INSURANCE PROGRAM
ZONE X
ZONE AE
ZONE
LOOKOUT DRIVE
EL SEGUNDO LA
WILLIAMS LA
ROLLING HILLS ROAD
PROFILE BASE LINE
WHITE TAIL ROAD
COMMANCHE RD
KIOWA ROAD
CLIFF ACRES DR
City of Burlington
190144
19
Flint Creek
4°24'00"N


MAP SCALE 1" = 500'
250 0 500 1000 FEET
0 150 300 METE
PANEL 0256E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 256 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
DES MOINES COUNTY 190113 0256 E
MAP NUMBER
19057C0256E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
NATIONAL FLOOD INSURANCE PROGRAM
ZONE X
ZONE AE
ZONE AF
ZONE AG
ZONE AH
ZONE AD
ZONE AE
125TH STREET
FLINT BOTTOM ROAD
Des Moines County
Unincorporated Areas
190113
15
14
Flint Creek


MAP SCALE 1" = 500'
250 0 500 1000 FEET
0 150 300 METERS
ZONE AE
FLOODING EFFECTS FROM KNOTTY CREEK
ZONE X
UPPER FLINT ROAD
FLINT VALLEY DR
CELESTIA DRIVE
FLINT BOTTOM
Flint Creek
ZONE AE
ZONE X
ZONE A
23
24
N GEAR AVENUE
BLACKROAD
LIMIT OF STUDY
FLOODING EFFECTS FROM FLINT CREEK
NORTHVIEW DR
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0256E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 256 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
DES MOINES COUNTY 190113 0256 E
MAP NUMBER
19057C0256E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
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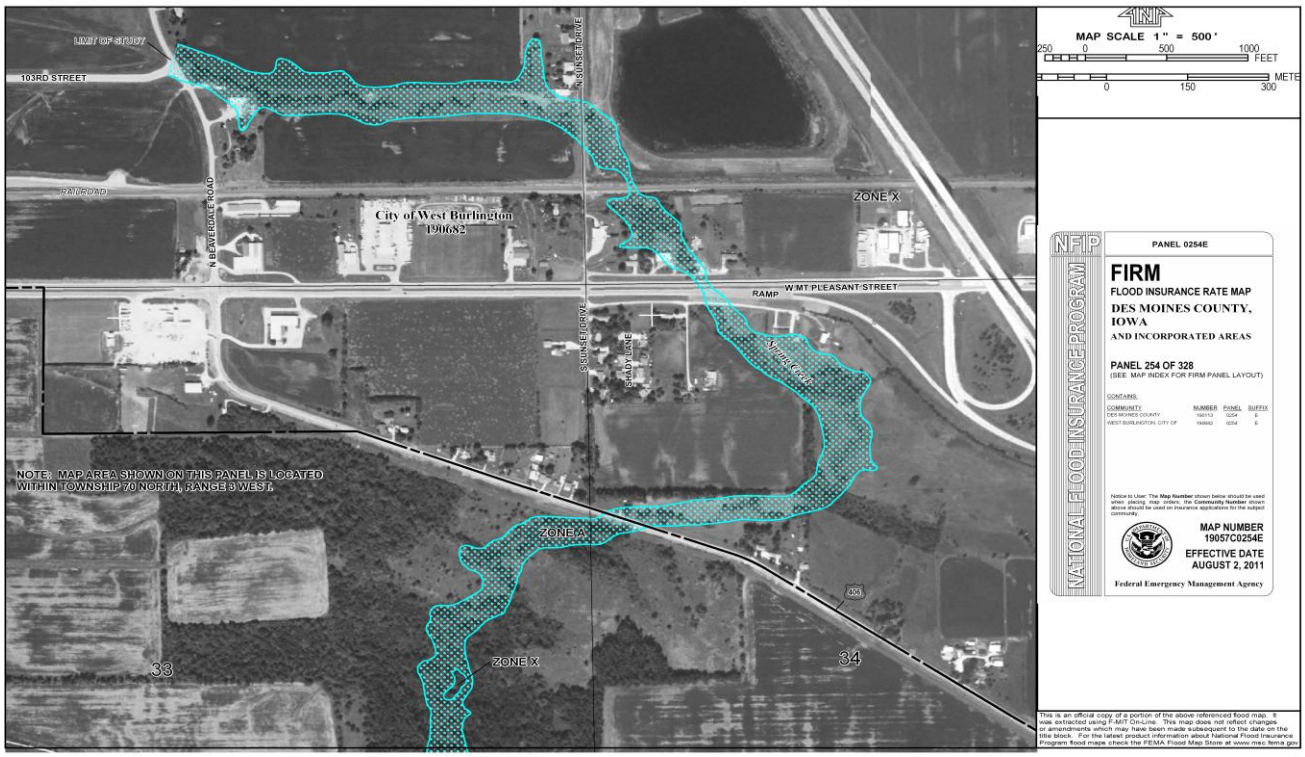
MAP SCALE 1" = 500'
250 0 500 1000 FEET
0 150 300 METERS
LIMIT OF STUDY
103RD STREET
RAILROAD
N BEAVERDALE ROAD
City of West Burlington
190682
ZONE X
W MT PLEASANT STREET
RAMP
SUNSET DRIVE
SHADY LANE
NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 70 NORTH, RANGE 3 WEST.
ZONE A
ZONE X
33
34
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0254E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 254 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
DES MOINES COUNTY 190113 0254 E
WEST BURLINGTON, CITY OF 190682 0254 E
MAP NUMBER
19057C0254E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
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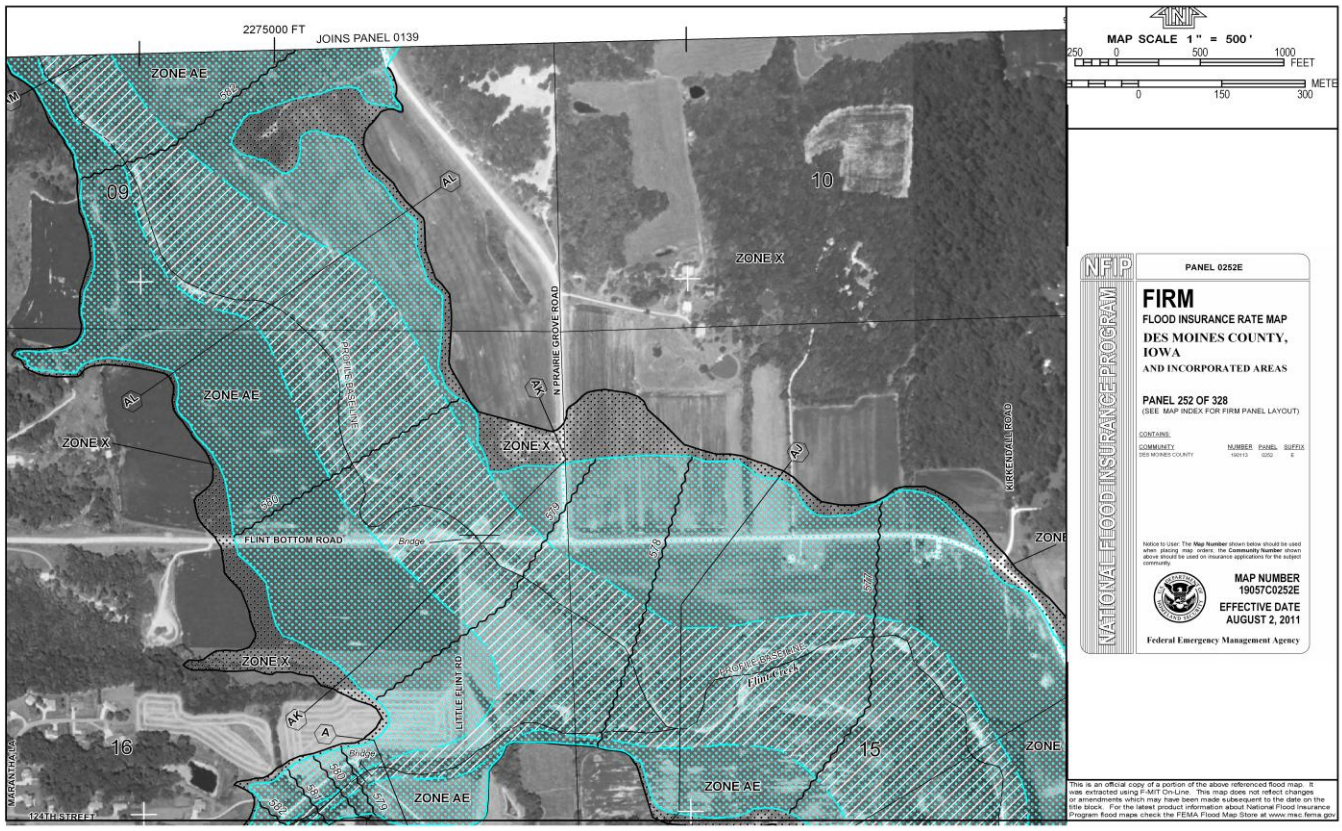
2275000 FT
JOINS PANEL 0139
ZONE AE
ZONE X
09
10
16
15
FLINT BOTTOM ROAD
N PRAIRIE GROVE ROAD
KIRKENDALL ROAD
LITTLE FLINT RD
Flint Creek
PROFILE BASELINE
Bridge
MARANTHA
124TH STREET
MAP SCALE 1 " = 500 '
250 0 500 1000 FEET
0 150 300 METE
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0252E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 252 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
DES MOINES COUNTY 190113 0252 E
Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.
MAP NUMBER
19057C0252E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
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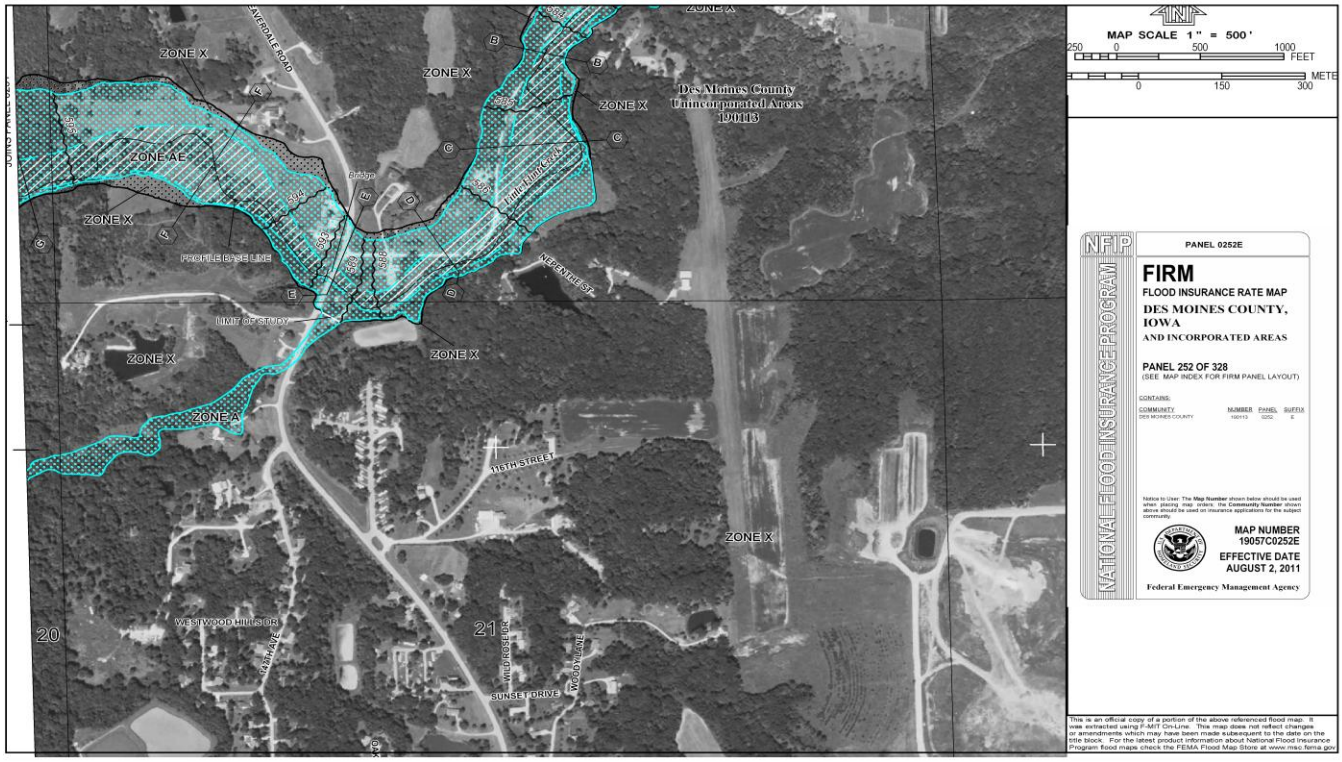
ZONE X
ZONE AE
ZONE A
Des Moines County
Unincorporated Areas
190113
Bridge
PROFILE BASELINE
LIMIT OF STUDY
FLINT HILL CT
KEEPATHE ST
75TH STREET
WESTWOOD HILLS DR
SUNSET DRIVE
20
21
MAP SCALE 1 " = 500 '
250 0 500 1000 FEET
0 150 300 METE
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0252E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 252 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
DES MOINES COUNTY 190113 0252 E
Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.
MAP NUMBER
19057C0252E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
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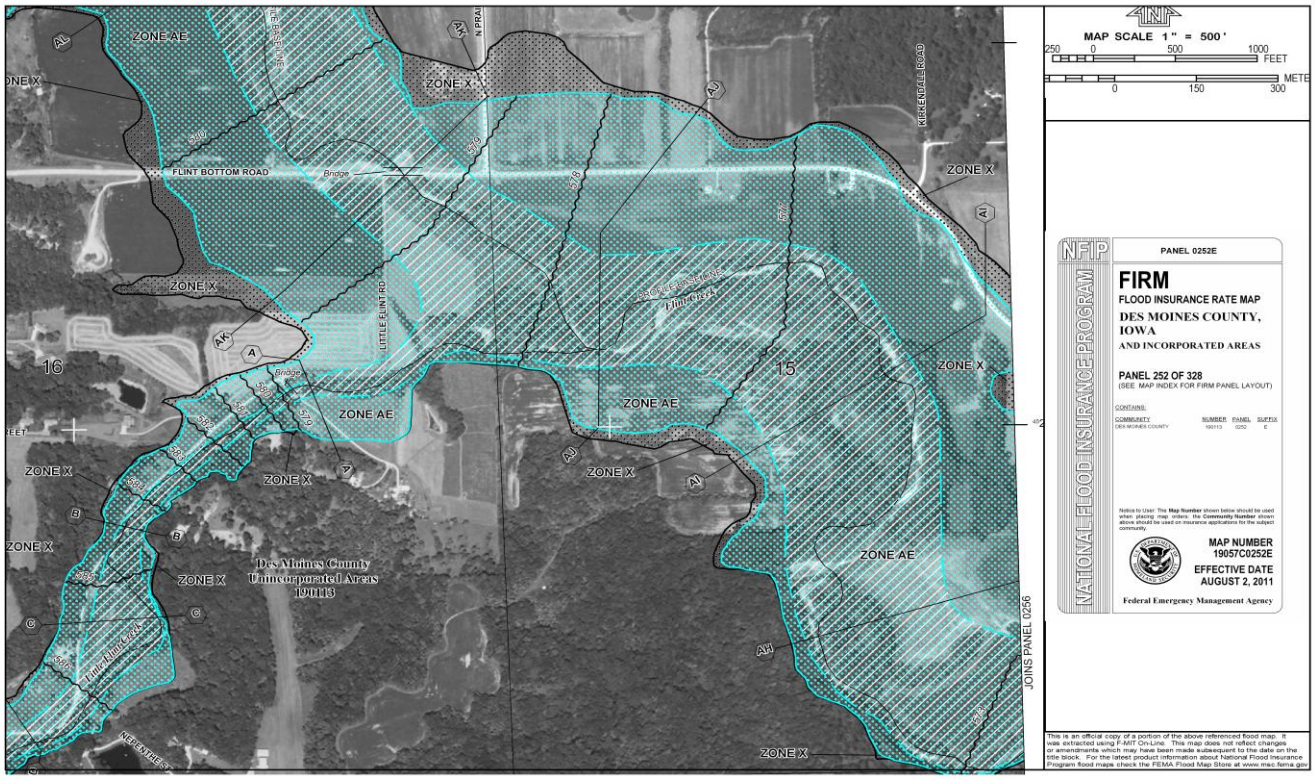
ZONE AE
ZONE X
FLINT BOTTOM ROAD
Bridge
LITTLE FLINT RD
KIRKENDALL ROAD
Flint Creek
16
15
Des Moines County
Unincorporated Areas
190113
Flint Creek
JOINS PANEL 0256
MAP SCALE 1" = 500'
250 0 500 1000 FEET
0 150 300 METE
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0252E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 252 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
DES MOINES COUNTY 190113 0252 E
MAP NUMBER
19057C0252E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency


JOINS PANEL 0232
ZONE A
ZONE X
24
19
BOUNDARY AVENUE
Des Moines County
Unincorporated Areas
190113
173RD AVENUE
LIMIT OF STUDY
25
30
DES MOINES COUNTY
CITY OF MIDDLETOWN
BOUNDARY ST
COLUMBIA ST
MAP SCALE 1" = 500'
250 0 500 1000 FEET
0 150 300 METE
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0234E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 234 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
DES MOINES COUNTY 190113 0234 E
MIDDLETOWN, CITY OF 190178 0234 E
MAP NUMBER
19057C0234E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency


City of Danville
190115
ZONE X
Long Creek
Des Moines County
Unincorporated Areas
190113
190TH AVENUE
JOINS PANEL 0227
320000 FT
E ROOSEVELT RD
ZONE A
ZONE X
E BELL RD
E KELLAR DR
22
FLOODING EFFECTS FROM
LONG CREEK
ZONE X
MAP SCALE 1 " = 500 '
250 0 500 1000 FEET
METE
0 150 300
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0231E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY,
IOWA
AND INCORPORATED AREAS
PANEL 231 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
DANVILLE, CITY OF 190115 0231 E
DES MOINES COUNTY 190113 0231 E
Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.
MAP NUMBER
19057C0231E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
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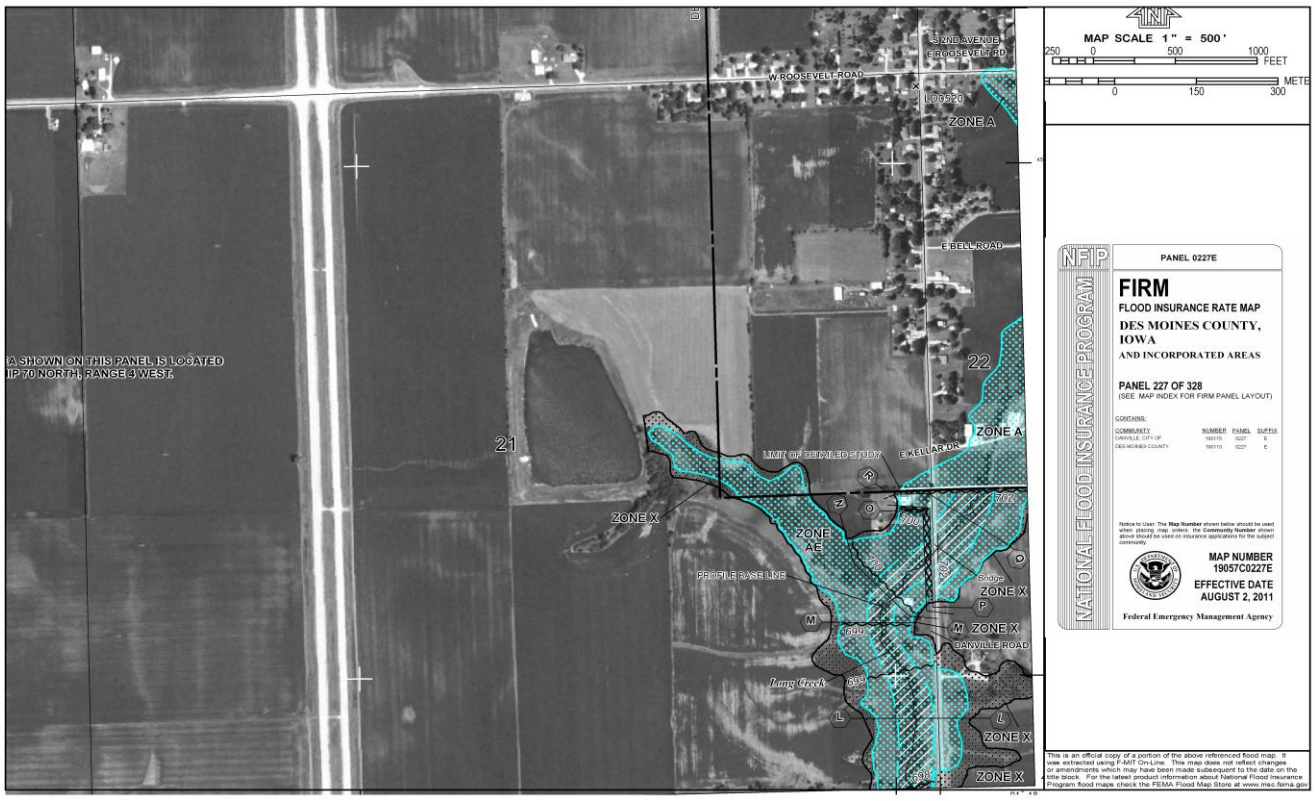
W ROOSEVELT ROAD
320TH AVENUE
E ROOSEVELT RD
ZONE A
E BELL ROAD
22
21
A SHOWN ON THIS PANEL, IS LOCATED
IP 70 NORTH, RANGE 4 WEST.
LIMIT OF DETAILED STUDY
E KELLAR DR
ZONE X
ZONE AE
PROFILE BASE LINE
ZONE X
ZONE X
DANVILLE ROAD
Long Creek
ZONE X
ZONE X
MAP SCALE 1 " = 500 '
250 0 500 1000 FEET
METE
0 150 300
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0227E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY,
IOWA
AND INCORPORATED AREAS
PANEL 227 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
DANVILLE, CITY OF 190115 0227 E
DES MOINES COUNTY 190113 0227 E
Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.
MAP NUMBER
19057C0227E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
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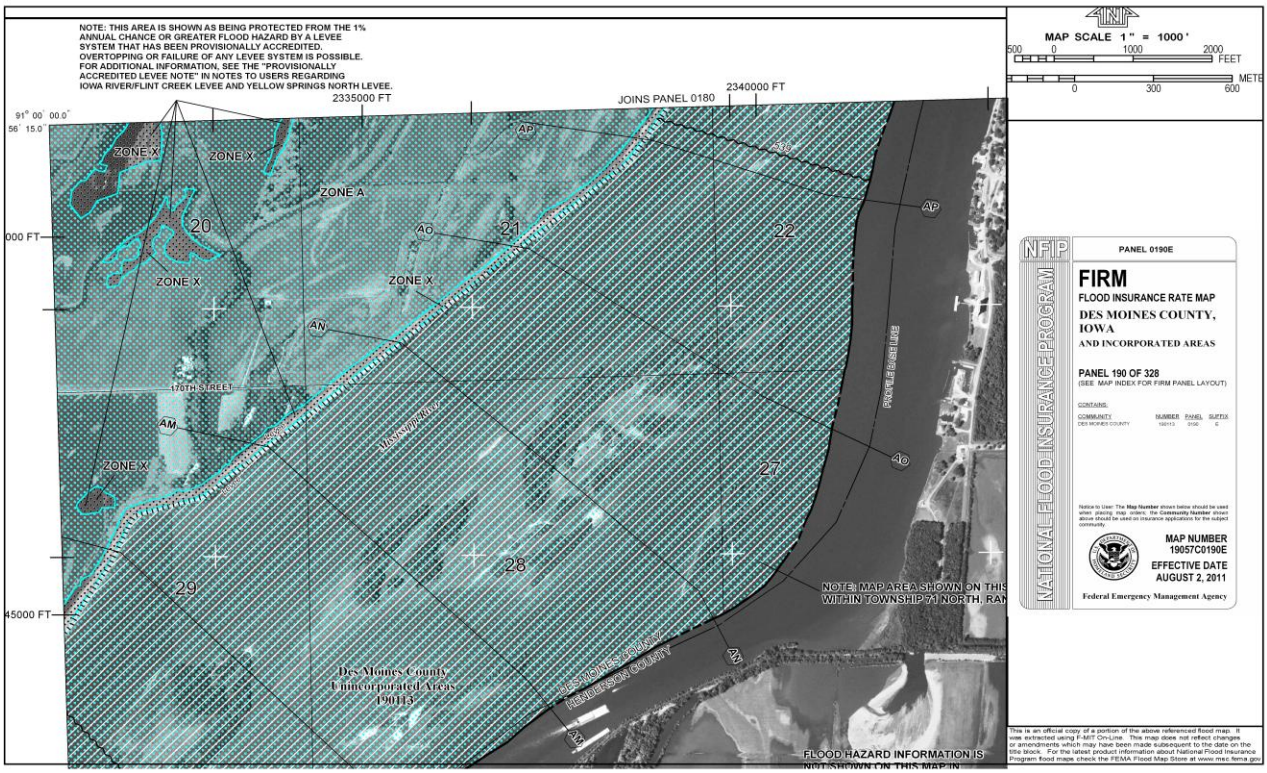
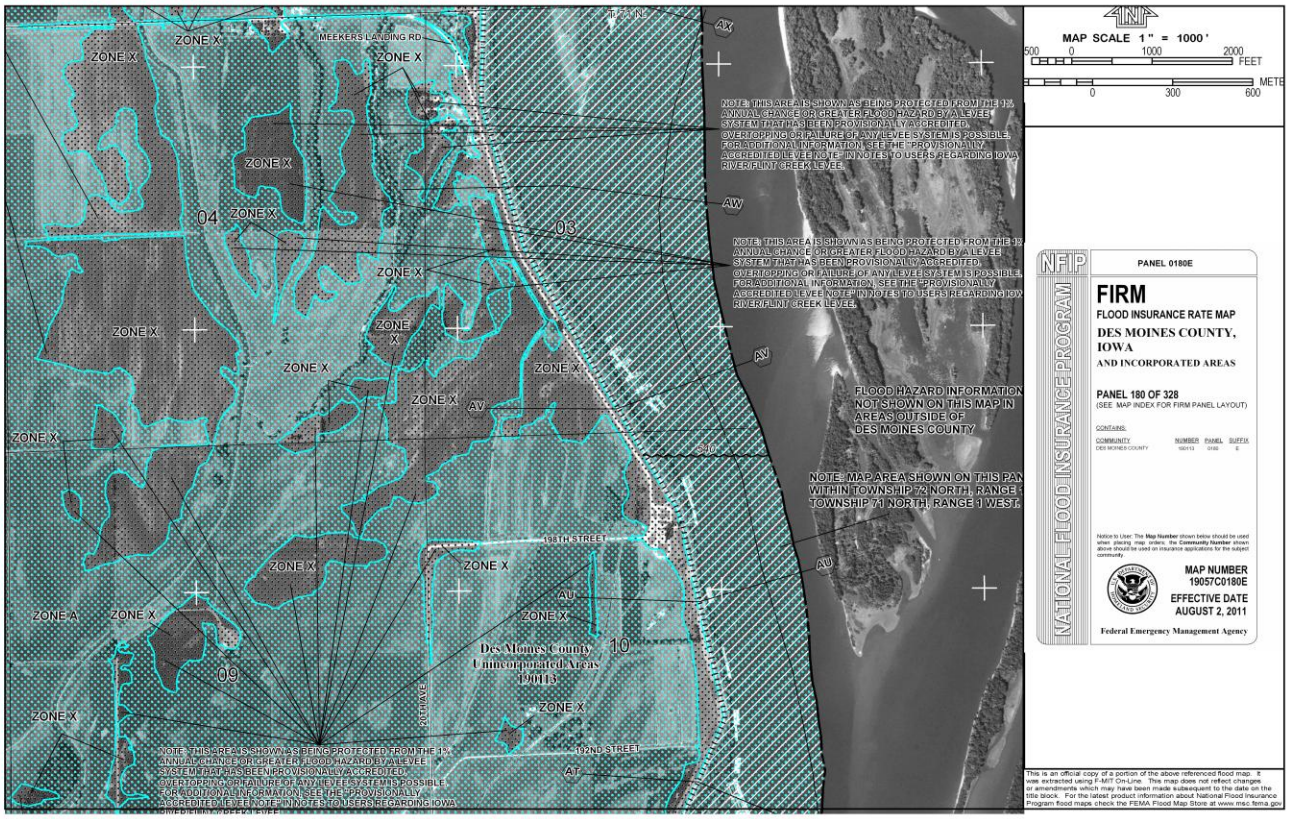
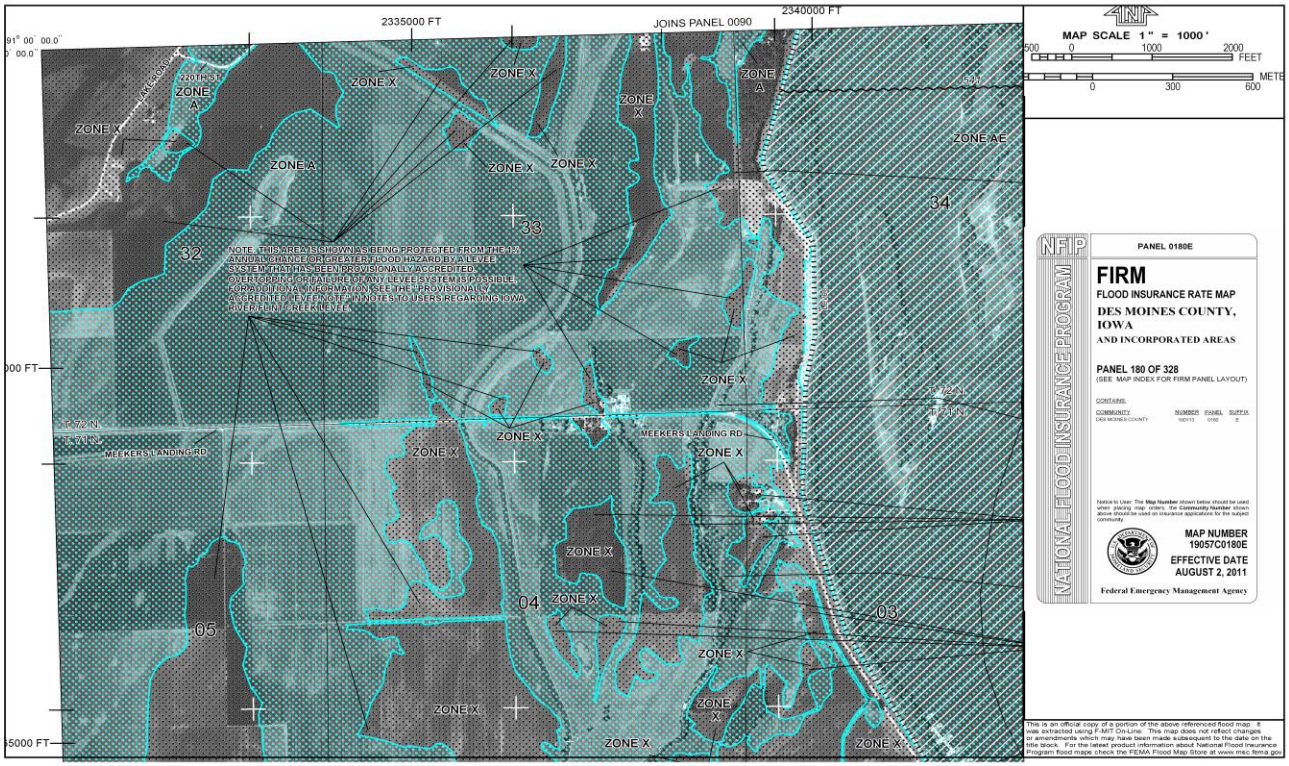

NOTE: THIS AREA IS SHOWN AS BEING PROTECTED FROM THE 1% ANNUAL CHANCE OR GREATER FLOOD HAZARD BY A LEVEE SYSTEM THAT HAS BEEN PROVISIONALLY ACCREDITED. OVERTOPPING OR FAILURE OF ANY LEVEE SYSTEM IS POSSIBLE. FOR ADDITIONAL INFORMATION, SEE THE "PROVISIONALLY ACCREDITED LEVEE NOTE" IN NOTES TO USERS REGARDING IOWA RIVER/FLINT CREEK LEVEE AND YELLOW SPRINGS NORTH LEVEE.
MAP SCALE 1 " = 1000 '
PANEL 0190E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 190 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
MAP NUMBER 19057C0190E
EFFECTIVE DATE AUGUST 2, 2011
Federal Emergency Management Agency
NATIONAL FLOOD INSURANCE PROGRAM
JOINS PANEL 0180
ZONE X
ZONE A
Des Moines County Unincorporated Areas 190113
170TH STREET
MEEKERS LANDING RD
FLOOD HAZARD INFORMATION IS NOT SHOWN ON THIS MAP IN


MAP SCALE 1 " = 1000 '
PANEL 0180E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 180 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
MAP NUMBER 19057C0180E
EFFECTIVE DATE AUGUST 2, 2011
Federal Emergency Management Agency
NATIONAL FLOOD INSURANCE PROGRAM
ZONE X
ZONE A
MEEKERS LANDING RD
193RD STREET
192ND STREET
Des Moines County Unincorporated Areas 190113
FLOOD HAZARD INFORMATION NOT SHOWN ON THIS MAP IN AREAS OUTSIDE OF DES MOINES COUNTY


2335000 FT
JOINS PANEL 0090
2340000 FT
MAP SCALE 1 " = 1000 '
500 0 1000 2000 FEET
0 300 600 METE
ZONE X
ZONE A
ZONE AE
NOTE: THIS AREA IS SHOWN AS BEING PROTECTED FROM THE 1% ANNUAL CHANCE OR GREATER FLOOD HAZARD BY A LEVEE SYSTEM THAT HAS BEEN PROVISIONALLY ACCREDITED. OVERTOPPING OR FAILURE OF ANY LEVEE SYSTEM IS POSSIBLE. FOR ADDITIONAL INFORMATION, SEE THE "PROVISIONALLY ACCREDITED LEVEE" NOTE IN "NOTES TO USERS" REGARDING IOWA RIVER/FLINT CREEK LEVEE.
MEEKERS LANDING RD
220TH ST
PANEL 0180E
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 180 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
DES MOINES COUNTY 190113 0180 E
Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.
MAP NUMBER
19057C0180E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
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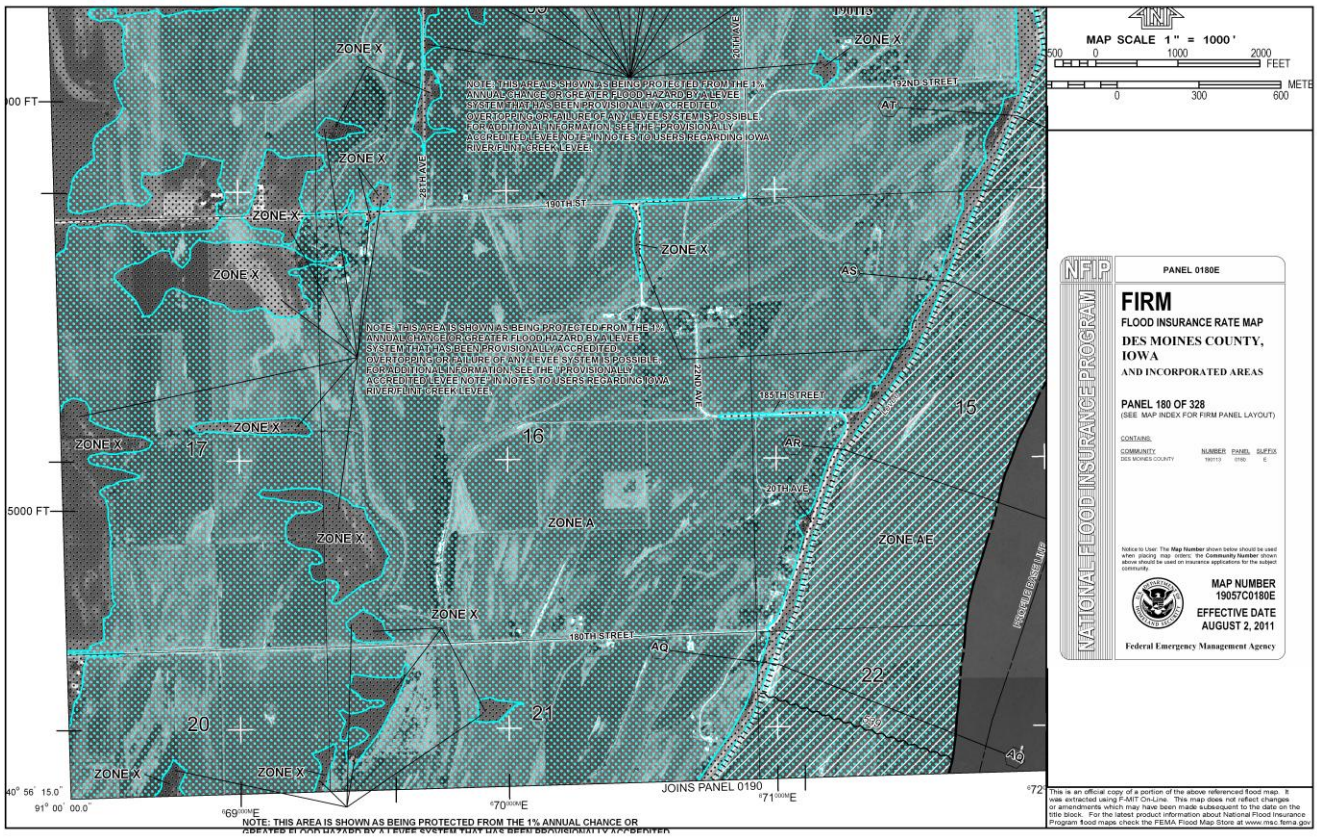
MAP SCALE 1 " = 1000 '
500 0 1000 2000 FEET
0 300 600 METE
ZONE X
ZONE A
ZONE AE
NOTE: THIS AREA IS SHOWN AS BEING PROTECTED FROM THE 1% ANNUAL CHANCE OR GREATER FLOOD HAZARD BY A LEVEE SYSTEM THAT HAS BEEN PROVISIONALLY ACCREDITED. OVERTOPPING OR FAILURE OF ANY LEVEE SYSTEM IS POSSIBLE. FOR ADDITIONAL INFORMATION, SEE THE "PROVISIONALLY ACCREDITED LEVEE" NOTE IN "NOTES TO USERS" REGARDING IOWA RIVER/FLINT CREEK LEVEE.
190TH ST
192ND STREET
185TH STREET
180TH STREET
20TH AVE
PANEL 0180E
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 180 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
DES MOINES COUNTY 190113 0180 E
Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.
MAP NUMBER
19057C0180E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
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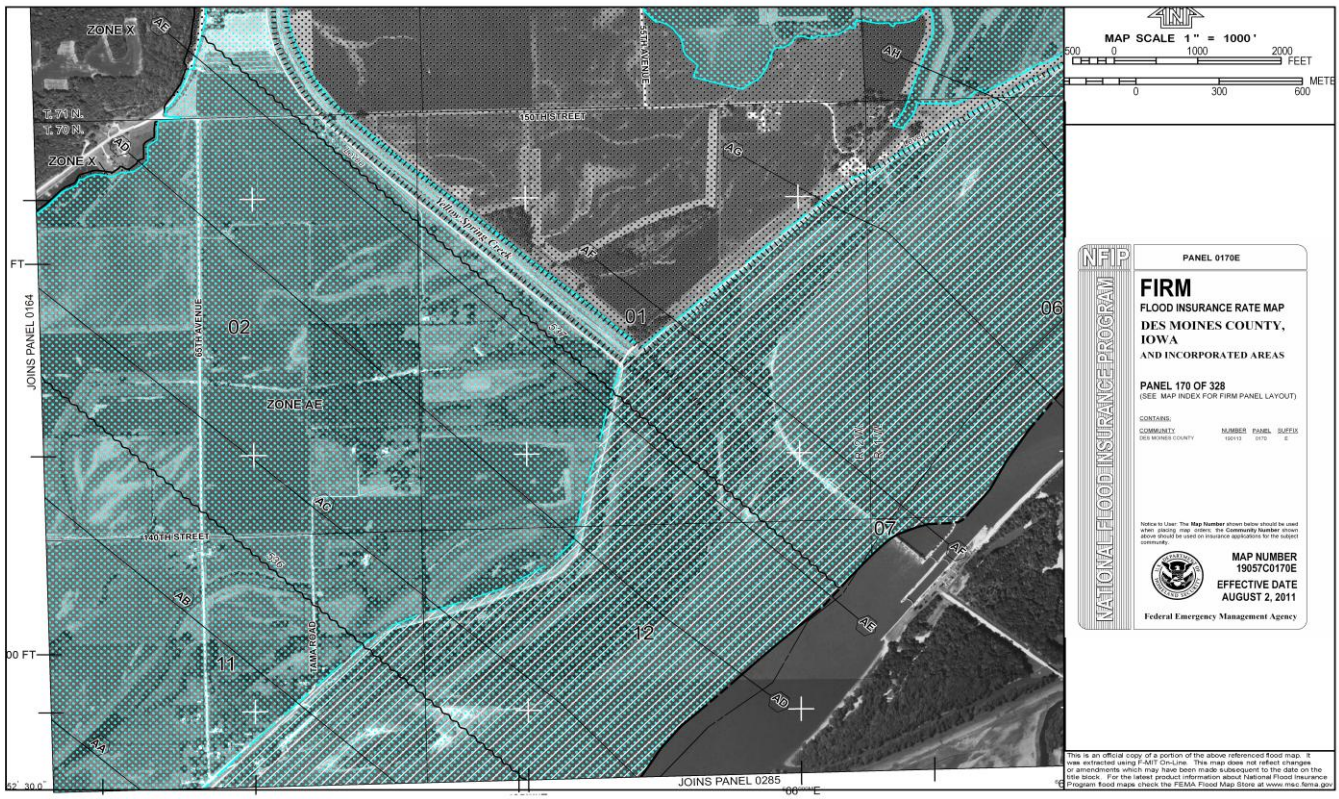
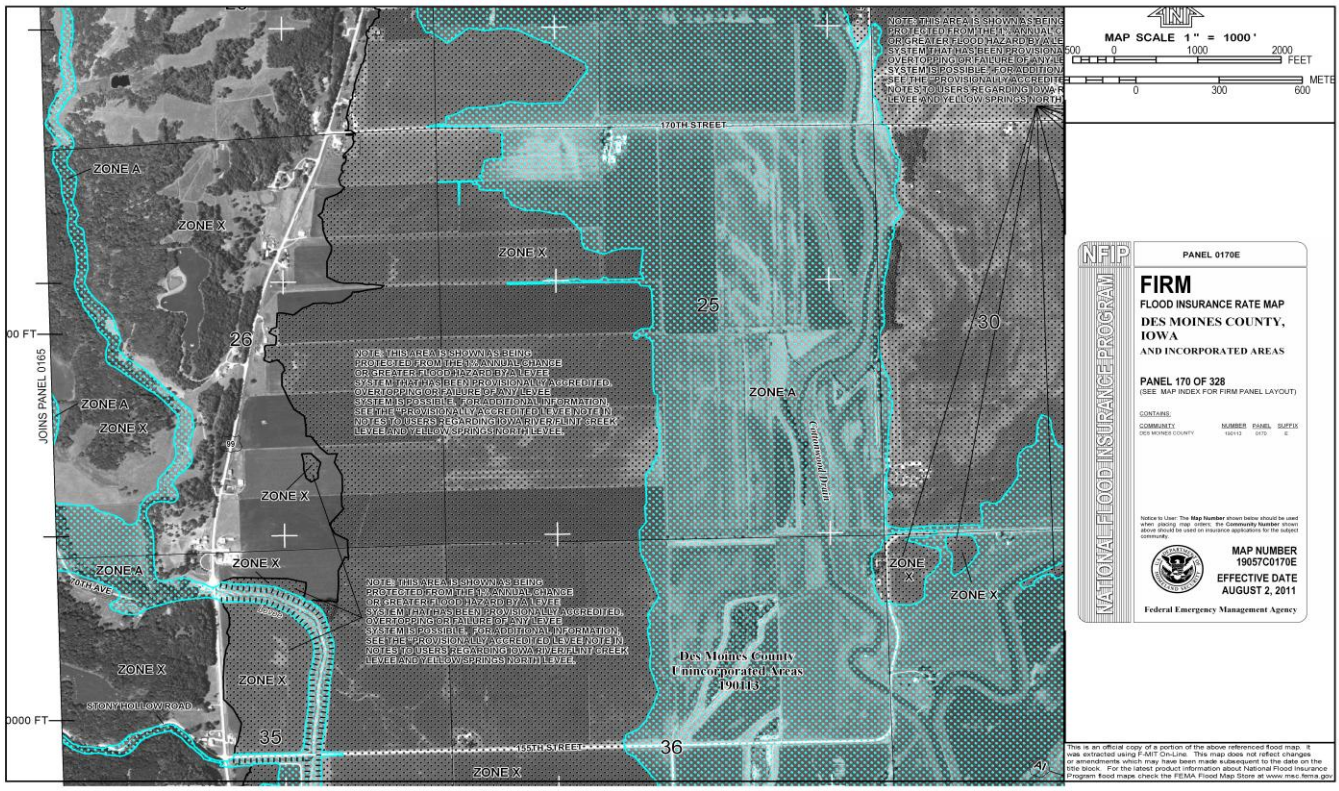
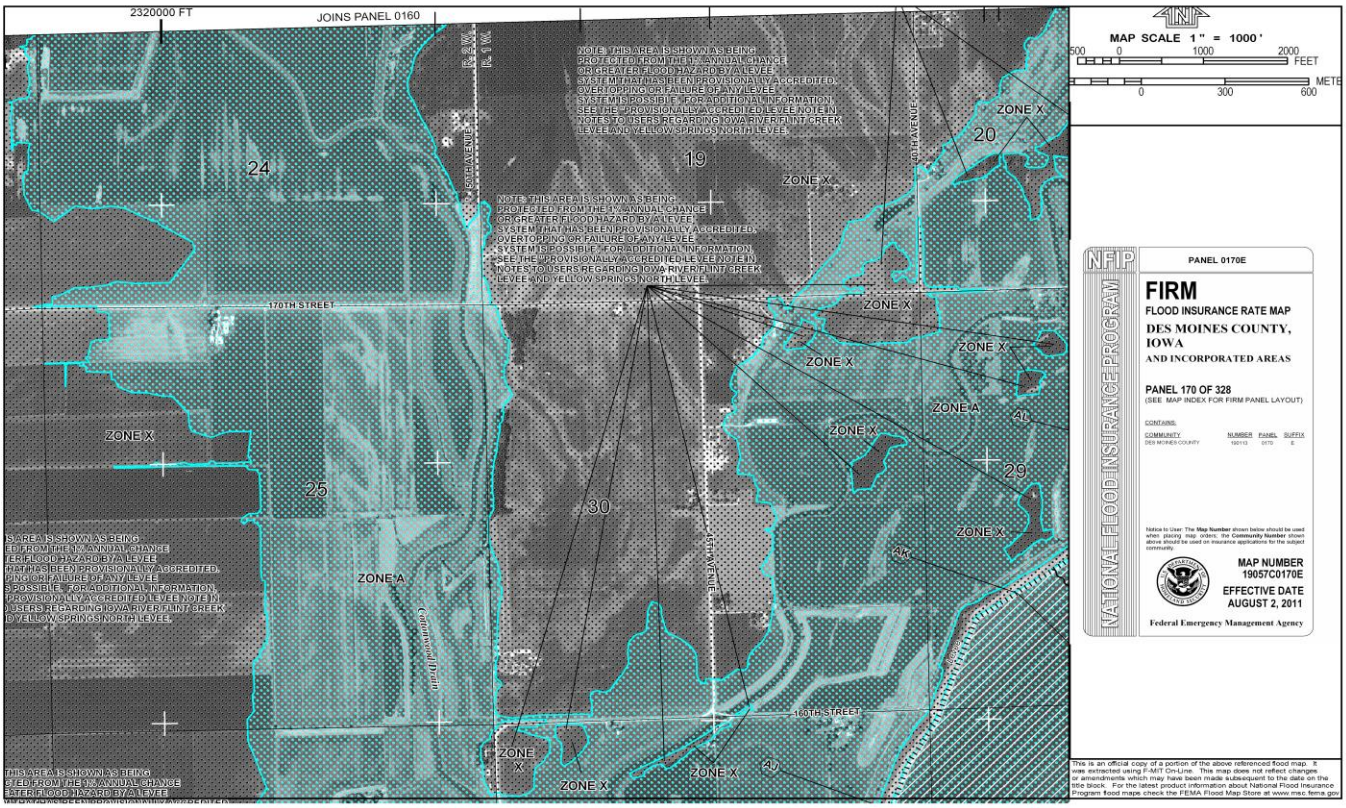
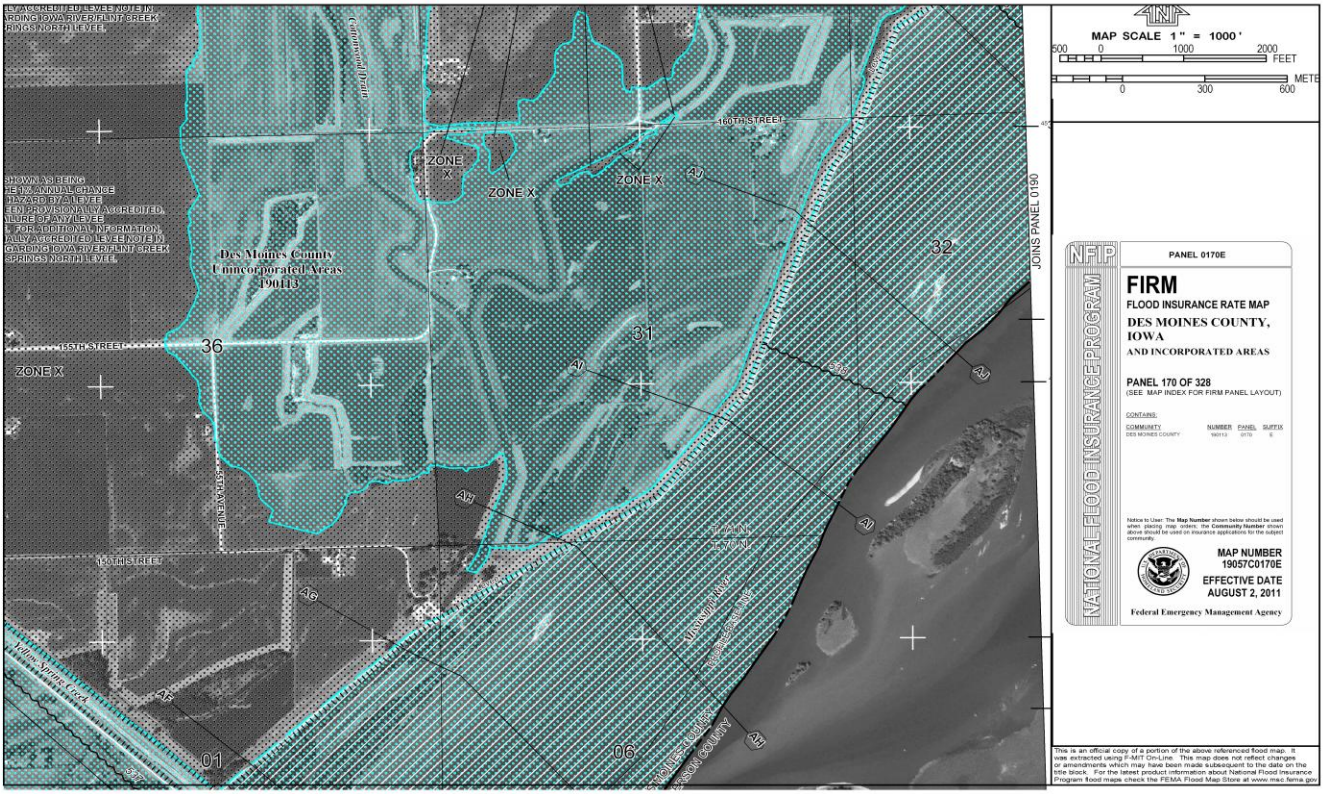
JOINS PANEL 0190
NOTE: THIS AREA IS SHOWN AS BEING PROTECTED FROM THE 1% ANNUAL CHANCE OR


MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
0 300 600 METERS
PANEL 0170E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 170 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
DES MOINES COUNTY 190113 0170 E
MAP NUMBER
19057C0170E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
NATIONAL FLOOD INSURANCE PROGRAM
ZONE X
ZONE AE
150TH STREET
140TH STREET
65TH AVENUE
JOINS PANEL 0164
JOINS PANEL 0285
01
02
06
07
11
12


MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
0 300 600 METERS
PANEL 0170E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 170 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
DES MOINES COUNTY 190113 0170 E
MAP NUMBER
19057C0170E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
NATIONAL FLOOD INSURANCE PROGRAM
ZONE A
ZONE X
ZONE AE
170TH STREET
155TH STREET
STONY HOLLOW ROAD
JOINS PANEL 0165
25
26
30
35
36
Des Moines County
Unincorporated Areas
190113


2320000 FT
JOINS PANEL 0160
MAP SCALE 1 " = 1000 '
500 0 1000 2000 FEET
0 300 600 METE
NOTE: THIS AREA IS SHOWN AS BEING PROTECTED FROM THE 1% ANNUAL CHANCE OR GREATER FLOOD HAZARD BY A LEVEE SYSTEM THAT HAS BEEN PROVISIONALLY ACCREDITED. OVERTOPPING OR FAILURE OF ANY LEVEE SYSTEM IS POSSIBLE. FOR ADDITIONAL INFORMATION, SEE THE "PROVISIONALLY ACCREDITED LEVEE NOTE IN NOTES TO USERS REGARDING IOWA RIVER/FLINT CREEK LEVEE AND YELLOW SPRINGS NORTH LEVEE.
ZONE X
ZONE A
ZONE AE
170TH STREET
160TH STREET
45TH AVENUE
60TH AVENUE
20
19
24
25
30
29
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0170E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 170 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
DES MOINES COUNTY 190113 0170 E
MAP NUMBER
19057C0170E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov


MAP SCALE 1 " = 1000 '
500 0 1000 2000 FEET
0 300 600 METE
JOINS PANEL 0190
160TH STREET
155TH STREET
45TH AVENUE
ZONE X
ZONE A
Des Moines County
Unincorporated Areas
190113
36
31
32
01
06
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0170E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 170 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
MAP NUMBER
19057C0170E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
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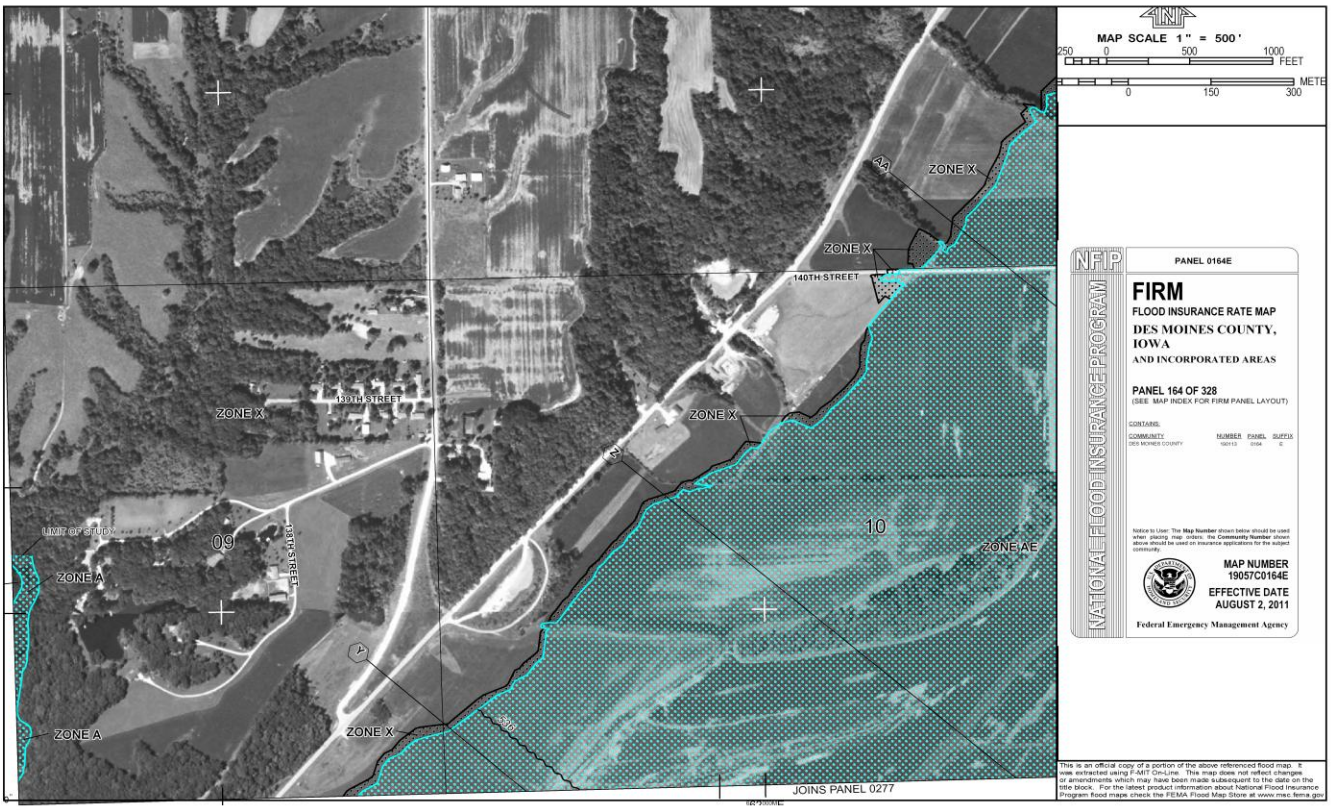
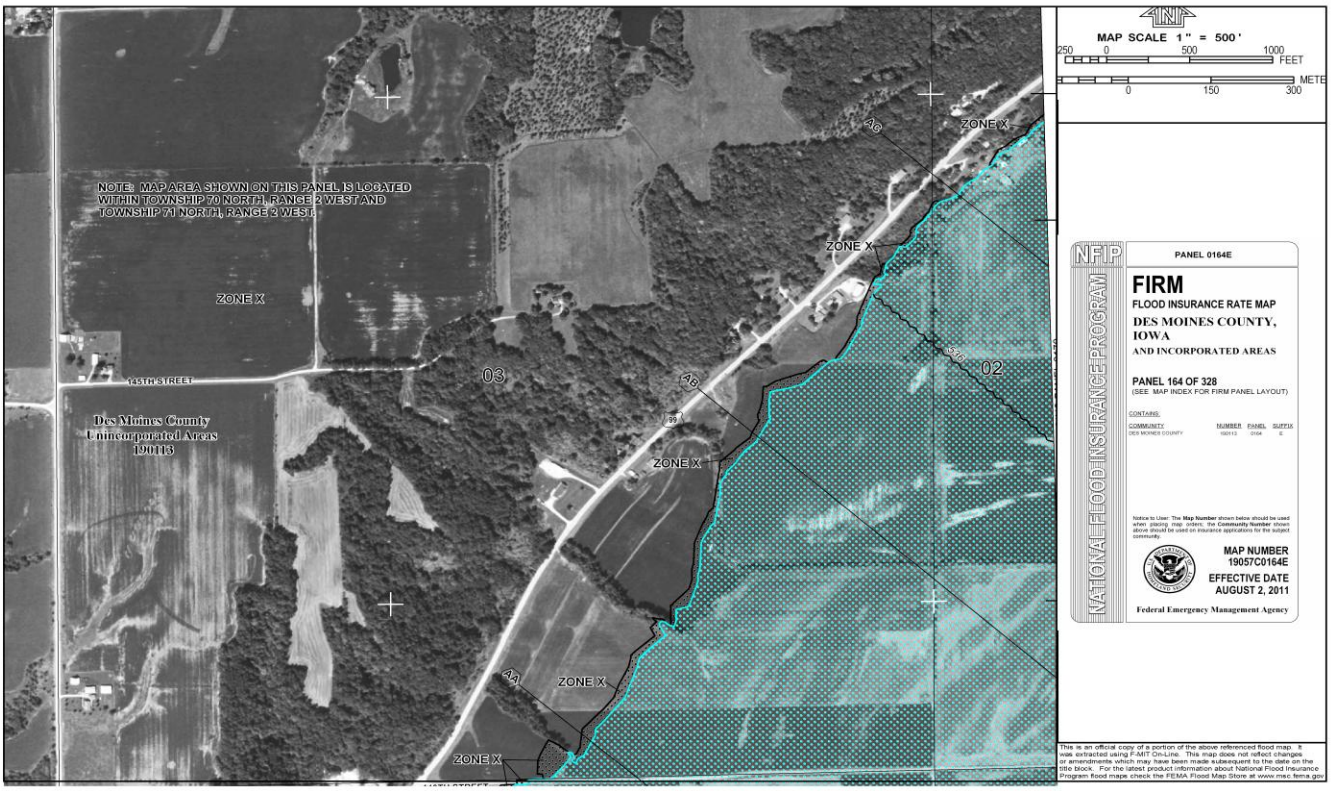

MAP SCALE 1" = 500'
250 0 500 1000 FEET
0 150 300 METE
ZONE X
140TH STREET
ZONE X
130TH STREET
ZONE X
LIMIT OF STUDY
09
138TH STREET
ZONE A
10
ZONE AE
ZONE A
ZONE X
JOINS PANEL 0277
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0164E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 164 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
DES MOINES COUNTY 190113 0164 E
Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.
MAP NUMBER
19057C0164E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov


MAP SCALE 1" = 500'
250 0 500 1000 FEET
0 150 300 METE
NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 70 NORTH, RANGE 2 WEST AND TOWNSHIP 71 NORTH, RANGE 2 WEST
ZONE X
ZONE X
135TH STREET
03
02
Des Moines County
Unincorporated Areas
190113
ZONE X
ZONE X
ZONE X
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0164E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 164 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
DES MOINES COUNTY 190113 0164 E
Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.
MAP NUMBER
19057C0164E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
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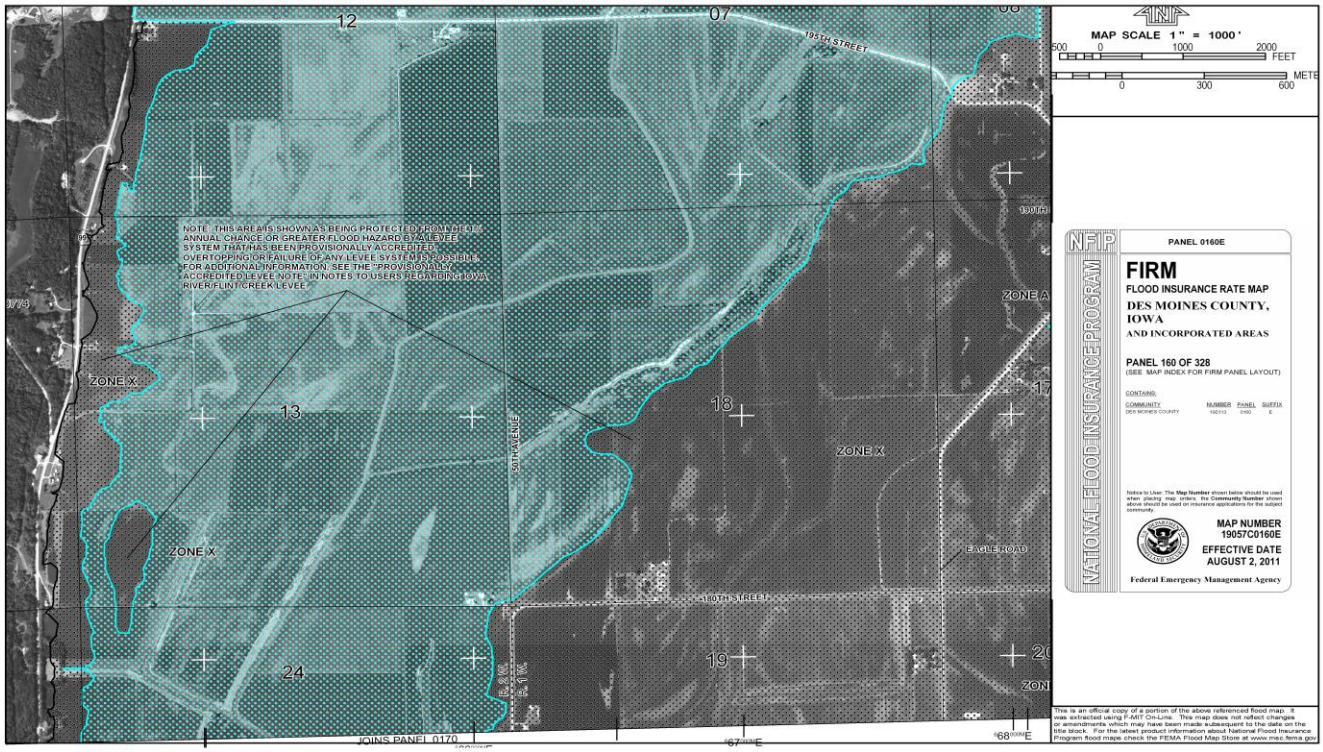
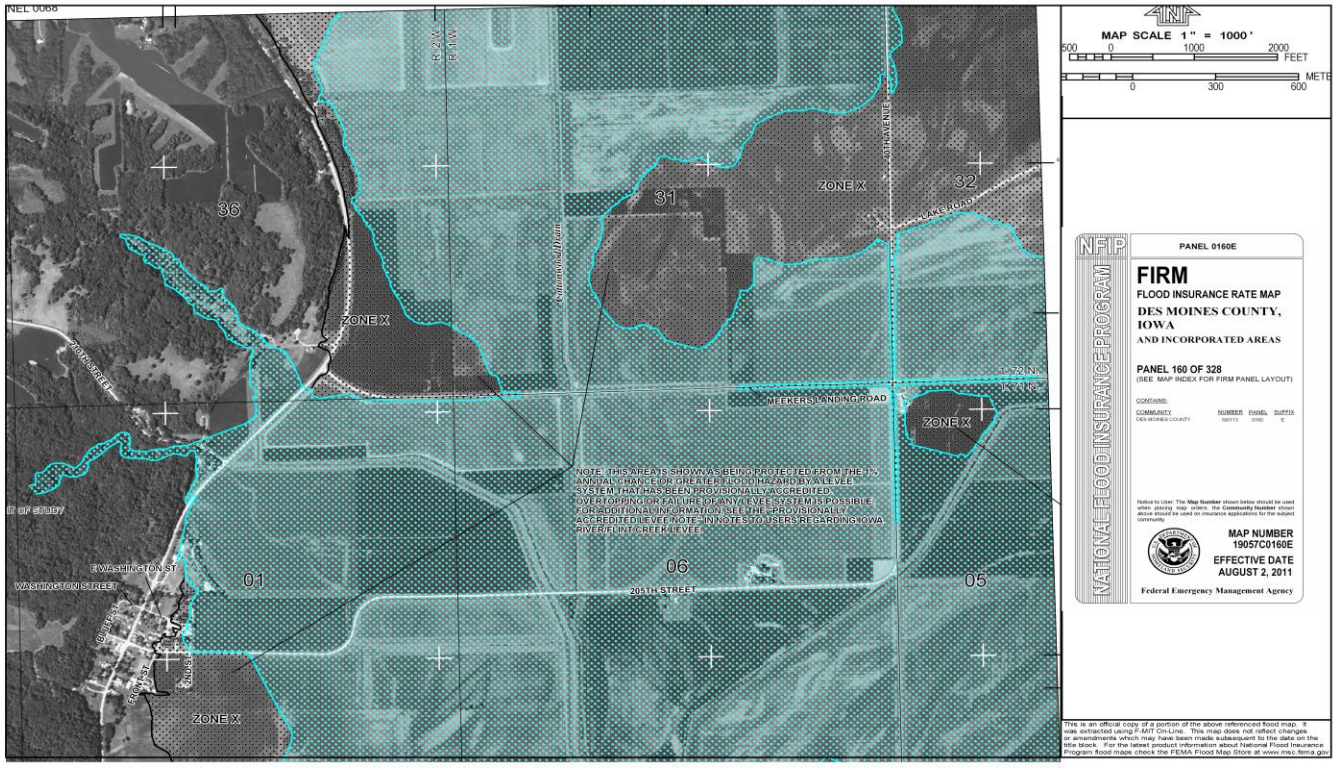
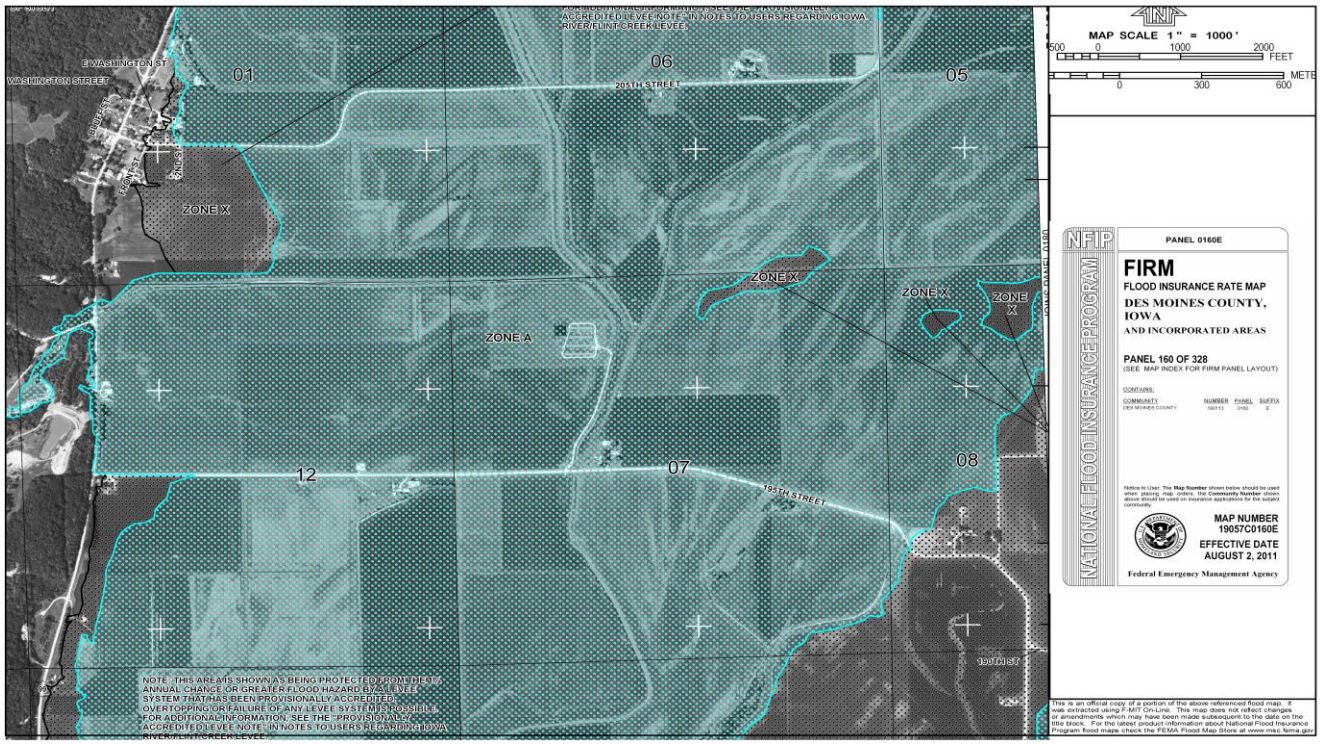

MAP SCALE 1 " = 1000 '
500 0 1000 2000 FEET
0 300 600 METE
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0160E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 160 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
DES MOINES COUNTY 190113 0160 E
MAP NUMBER
19057C0160E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
NOTE: THIS AREA IS SHOWN AS BEING PROTECTED FROM THE 1% ANNUAL CHANCE OR GREATER FLOOD HAZARD BY A LEVEE SYSTEM THAT HAS BEEN PROVISIONALLY ACCREDITED. OVERTOPPING OR FAILURE OF ANY LEVEE SYSTEM IS POSSIBLE. FOR ADDITIONAL INFORMATION, SEE THE "PROVISIONALLY ACCREDITED LEVEE" NOTE IN NOTES TO USERS REGARDING IOWA RIVER/FLINT CREEK LEVEE.
ZONE X
ZONE A
195TH STREET
190TH
180TH STREET
EAGLE ROAD
SOUTH AVENUE
JOINS PANEL 0170
12
07
13
18
24
19
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov


MAP SCALE 1 " = 1000 '
500 0 1000 2000 FEET
0 300 600 METE
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0160E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 160 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
DES MOINES COUNTY 190113 0160 E
MAP NUMBER
19057C0160E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
NOTE: THIS AREA IS SHOWN AS BEING PROTECTED FROM THE 1% ANNUAL CHANCE OR GREATER FLOOD HAZARD BY A LEVEE SYSTEM THAT HAS BEEN PROVISIONALLY ACCREDITED. OVERTOPPING OR FAILURE OF ANY LEVEE SYSTEM IS POSSIBLE. FOR ADDITIONAL INFORMATION, SEE THE "PROVISIONALLY ACCREDITED LEVEE" NOTE IN NOTES TO USERS REGARDING IOWA RIVER/FLINT CREEK LEVEE.
ZONE X
MEEKERS LANDING ROAD
LAKE ROAD
205TH STREET
WASHINGTON STREET
E WASHINGTON ST
36
31
32
01
06
05
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov


MAP SCALE 1 " = 1000 '
500 0 1000 2000 FEET
0 300 600
PANEL 0160E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 160 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
DES MOINES COUNTY 190113 0160 E
MAP NUMBER
19057C0160E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
NATIONAL FLOOD INSURANCE PROGRAM
ZONE X
ZONE A
01
06
05
12
07
08
201TH STREET
197TH STREET
E WASHINGTON ST
WASHINGTON STREET
NOTE: THIS AREA IS SHOWN AS BEING PROTECTED FROM MEDIUM ACCREDITED LEVEE NOTE: IN NOTES TO USERS REGARDING IOWA RIVER/FLINT CREEK LEVEE.
NOTE: THIS AREA IS SHOWN AS BEING PROTECTED FROM MEDIUM 1 ANNUAL CHANCE OR GREATER FLOOD HAZARD BY A LEVEE SYSTEM THAT HAS BEEN PROVISIONALLY ACCREDITED. OVERTOPPING OR FAILURE OF ANY LEVEE SYSTEM IS POSSIBLE. FOR ADDITIONAL INFORMATION, SEE THE "PROVISIONALLY ACCREDITED LEVEE NOTE" IN NOTES TO USERS REGARDING IOWA RIVER/FLINT CREEK LEVEE.
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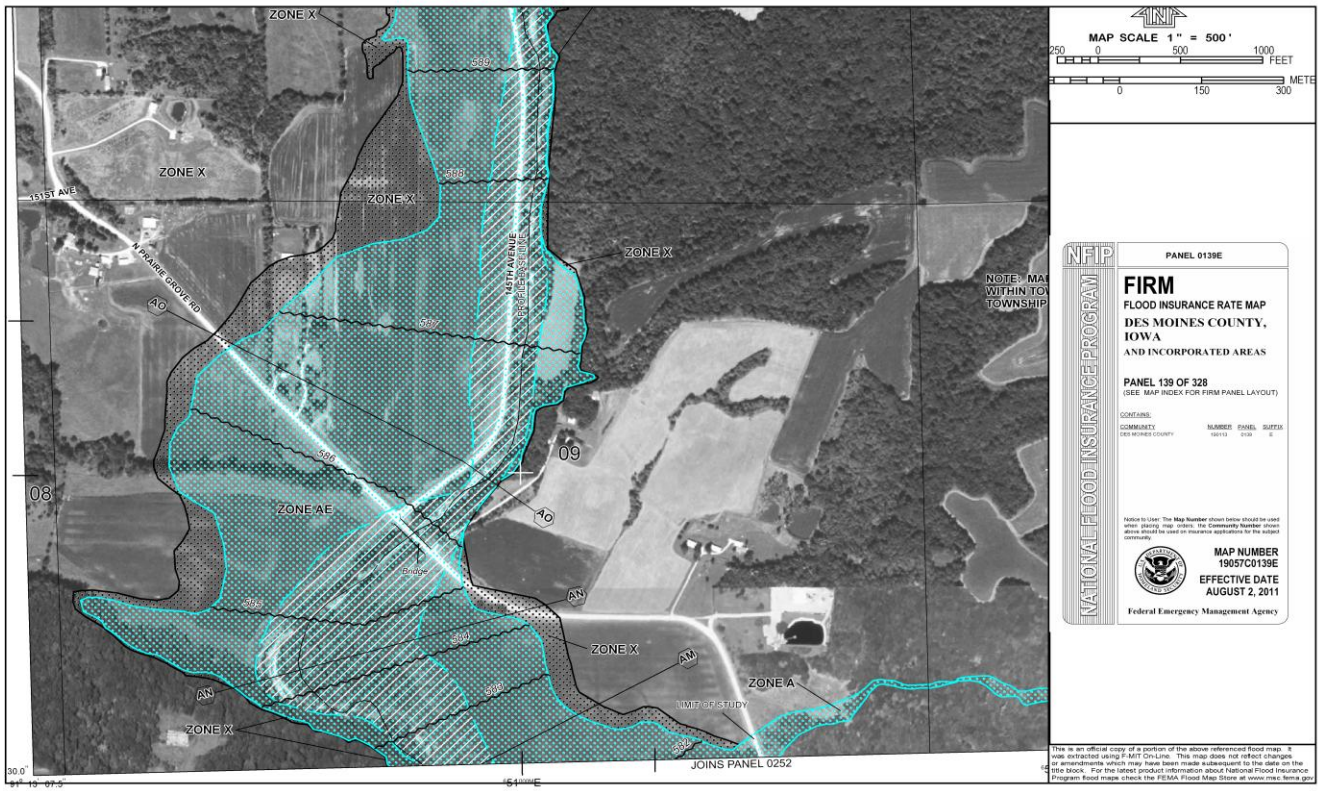
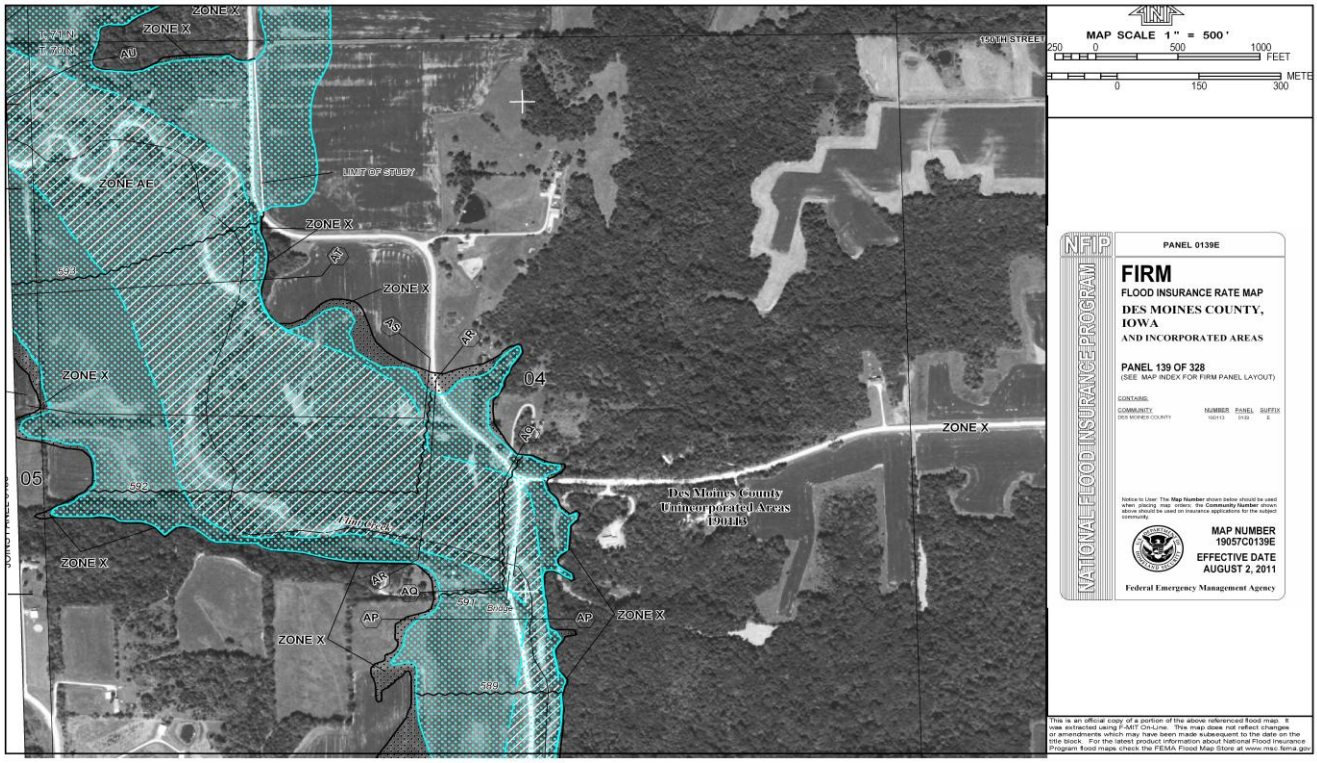
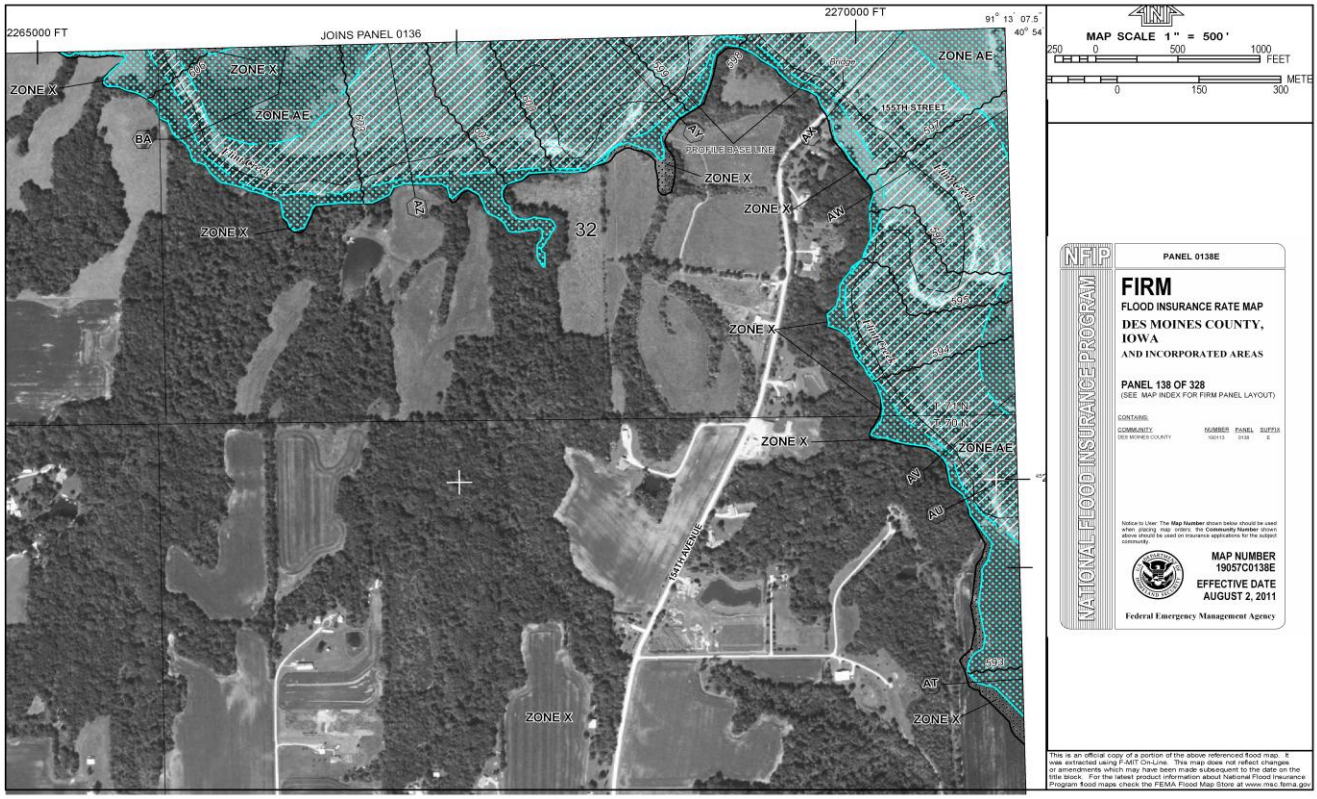
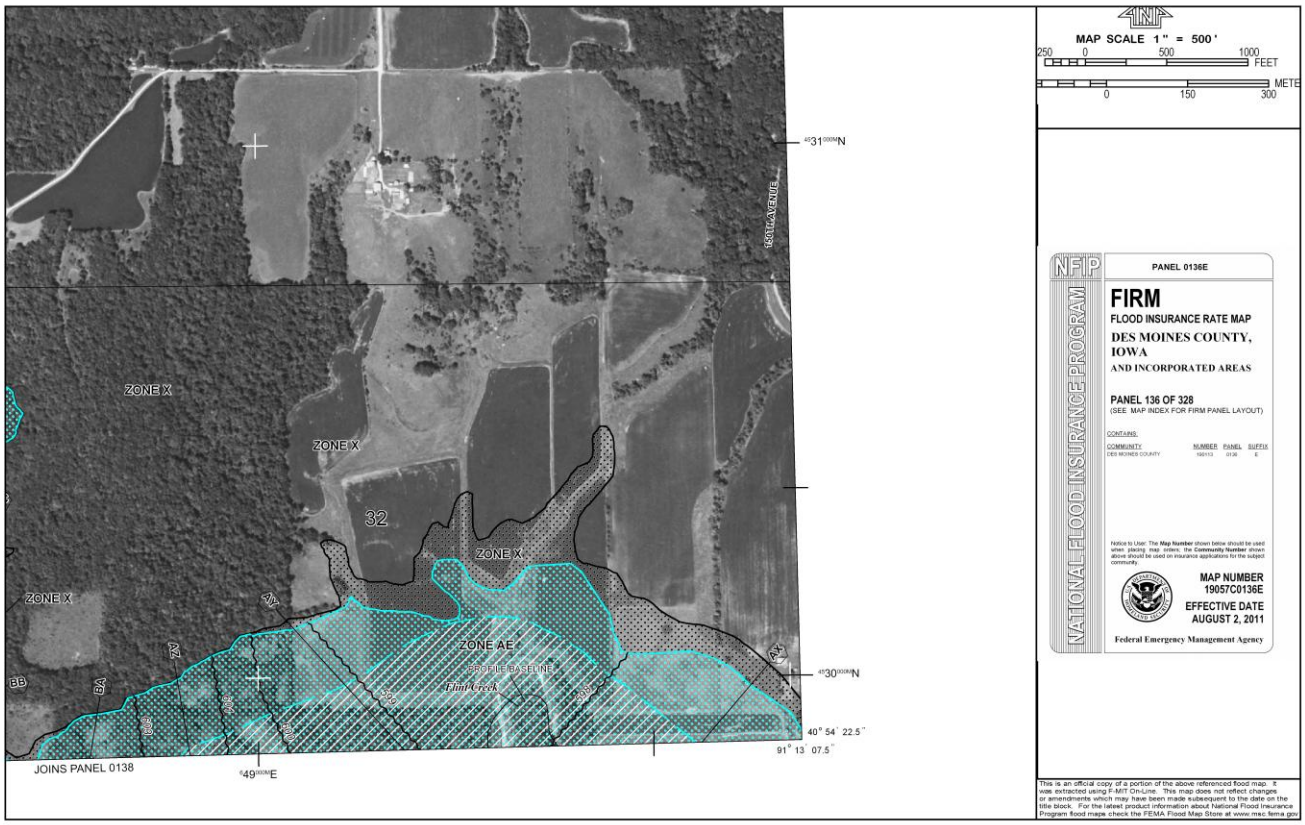
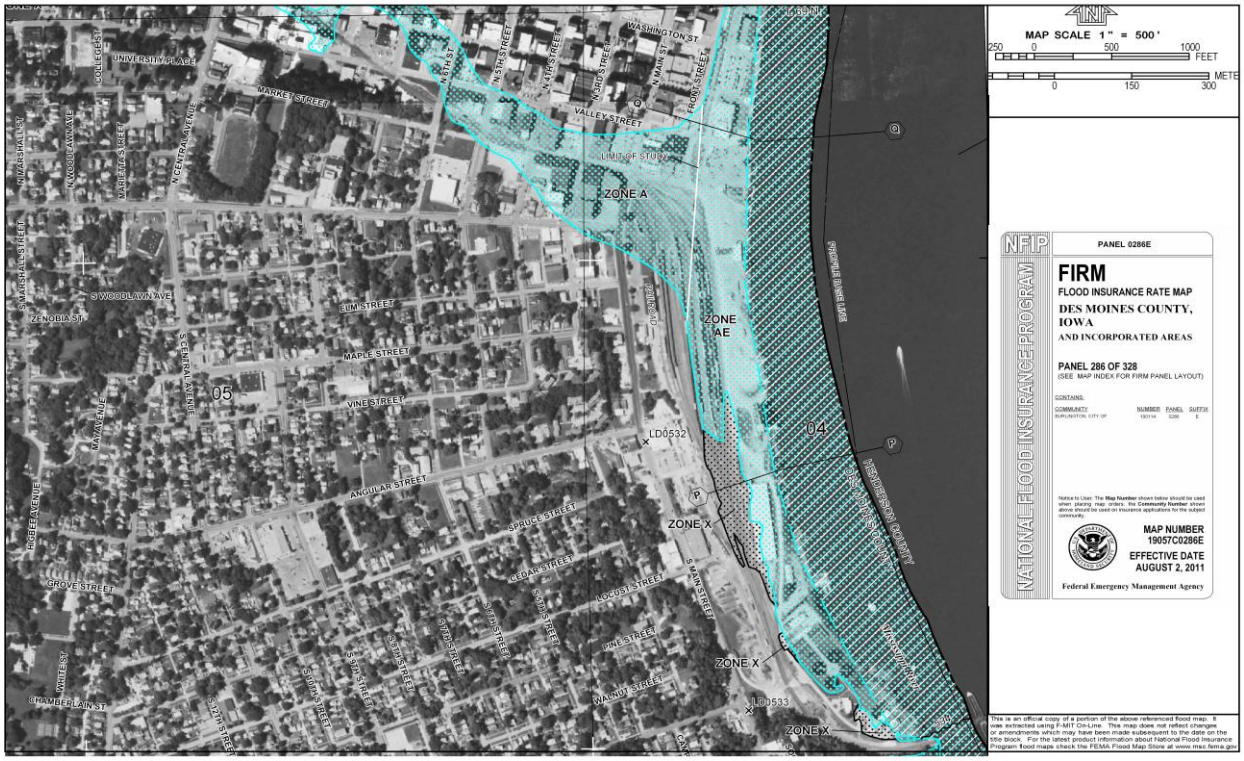

MAP SCALE 1 " = 500 '
250 0 500 1000 FEET
0 150 300
PANEL 0139E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 139 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
DES MOINES COUNTY 190113 0139 E
MAP NUMBER
19057C0139E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
NATIONAL FLOOD INSURANCE PROGRAM
ZONE X
ZONE AE
ZONE A
08
09
151ST AVE
N PRAIRIE GROVE RD
147TH AVENUE
AO
AN
AM
Bridge
LIMIT OF STUDY
JOINS PANEL 0252
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov


ZONE X
ZONE AE
LIMIT OF STUDY
155TH STREET
Des Moines County
Unincorporated Areas
190115
Middle Creek
04
05
MAP SCALE 1" = 500'
PANEL 0139E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 139 OF 328
MAP NUMBER
19057C0139E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
NATIONAL FLOOD INSURANCE PROGRAM


2265000 FT
2270000 FT
JOINS PANEL 0136
ZONE X
ZONE AE
155TH STREET
PROFILE BASE LINE
Middle Creek
32
MAP SCALE 1" = 500'
PANEL 0138E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 138 OF 328
MAP NUMBER
19057C0138E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
NATIONAL FLOOD INSURANCE PROGRAM


MAP SCALE 1" = 500'
250 0 500 1000 FEET
0 150 300 METE
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0136E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 136 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
DES MOINES COUNTY 190113 0136 E
MAP NUMBER
19057C0136E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
ZONE X
ZONE AE
ZONE X
ZONE X
ZONE X
ZONE AE
ZONE X
ZONE X
ZONE X
ZONE X
31
32
Flint Creek
JOINS PANEL 0138


MAP SCALE 1" = 500'
250 0 500 1000 FEET
0 150 300 METE
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0136E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 136 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
DES MOINES COUNTY 190113 0136 E
MAP NUMBER
19057C0136E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
ZONE X
ZONE X
ZONE X
ZONE X
ZONE AE
32
PROFILE BASELINE
Flint Creek
40° 54' 22.5"
91° 13' 07.5"
JOINS PANEL 0138


MAP SCALE 1" = 500'
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0286E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 286 OF 328
MAP NUMBER 19057C0286E
EFFECTIVE DATE AUGUST 2, 2011
Federal Emergency Management Agency
ZONE A
ZONE AE
ZONE X
LIMIT OF STUDY
MISSISSIPPI RIVER
MAIN STREET
MAPLE STREET
VINE STREET
ANGULAR STREET
SPRUCE STREET
CEDAR STREET
LOCUST STREET
WALNUT STREET
WASHINGTON ST.
MARKET STREET
VALLEY STREET
LD0532
LD0533


MAP SCALE 1" = 500'
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0278E
FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 278 OF 328
MAP NUMBER 19057C0278E
EFFECTIVE DATE AUGUST 2, 2011
Federal Emergency Management Agency
NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 70 NORTH, RANGE 2 WEST.
ZONE A
ZONE AE
ZONE X
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
JOINS PANEL 0286
WHITAKER ST
MT PLEASANT STREET
LUCAS AVENUE
ARCH STREET
PLANK STREET
CHURCH ST
EMERGENCY ST
PEASLEY STREET
WASHINGTON STREET
IOWA STREET
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HIGH STREET
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COLUMBIA STREET
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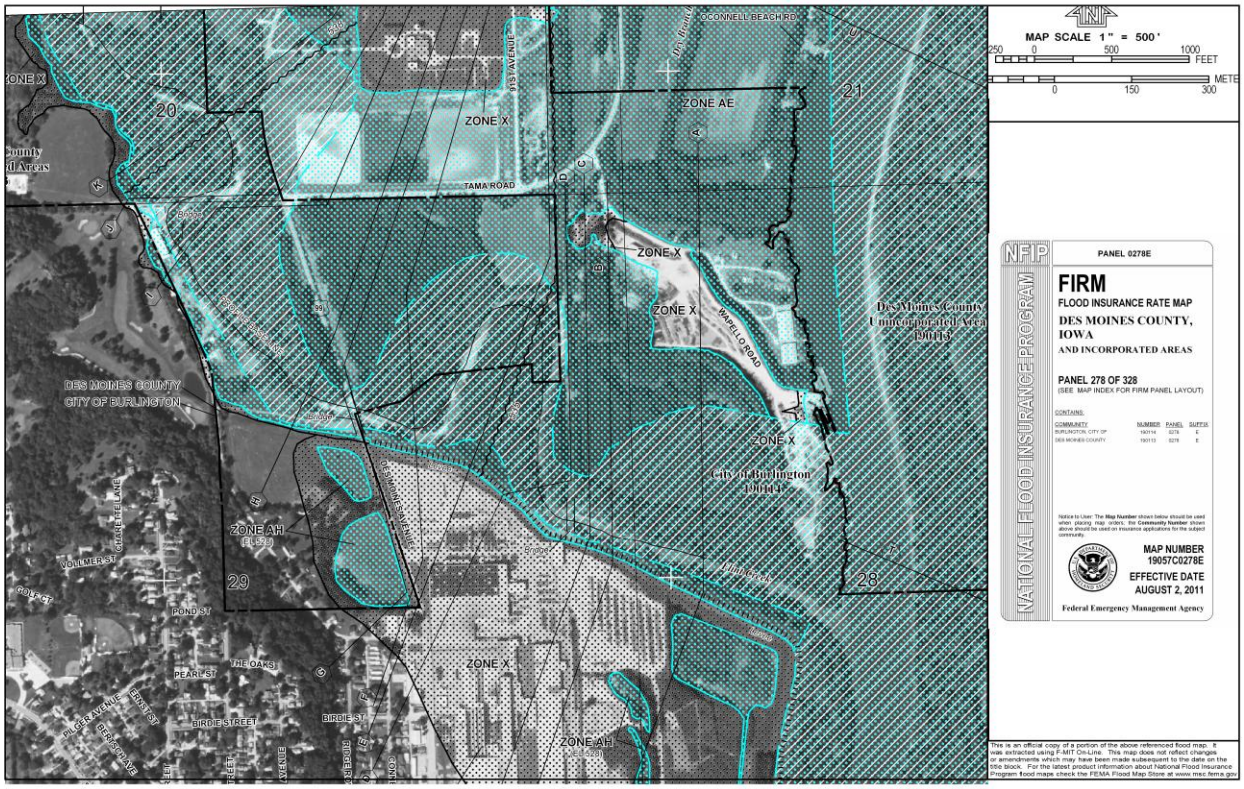
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FIRM
FLOOD INSURANCE RATE MAP
DES MOINES COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 278 OF 328
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
BURLINGTON, CITY OF 190114 0278 E
DES MOINES COUNTY 190113 0278 E
NATIONAL FLOOD INSURANCE PROGRAM
MAP NUMBER
19057C0278E
EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
ZONE X
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DES MOINES COUNTY
CITY OF BURLINGTON
Des Moines County
Unincorporated Area
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TAMA ROAD
WAPELLO ROAD
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POND ST
PEARL ST
THE OAKS
BIRDIE STREET
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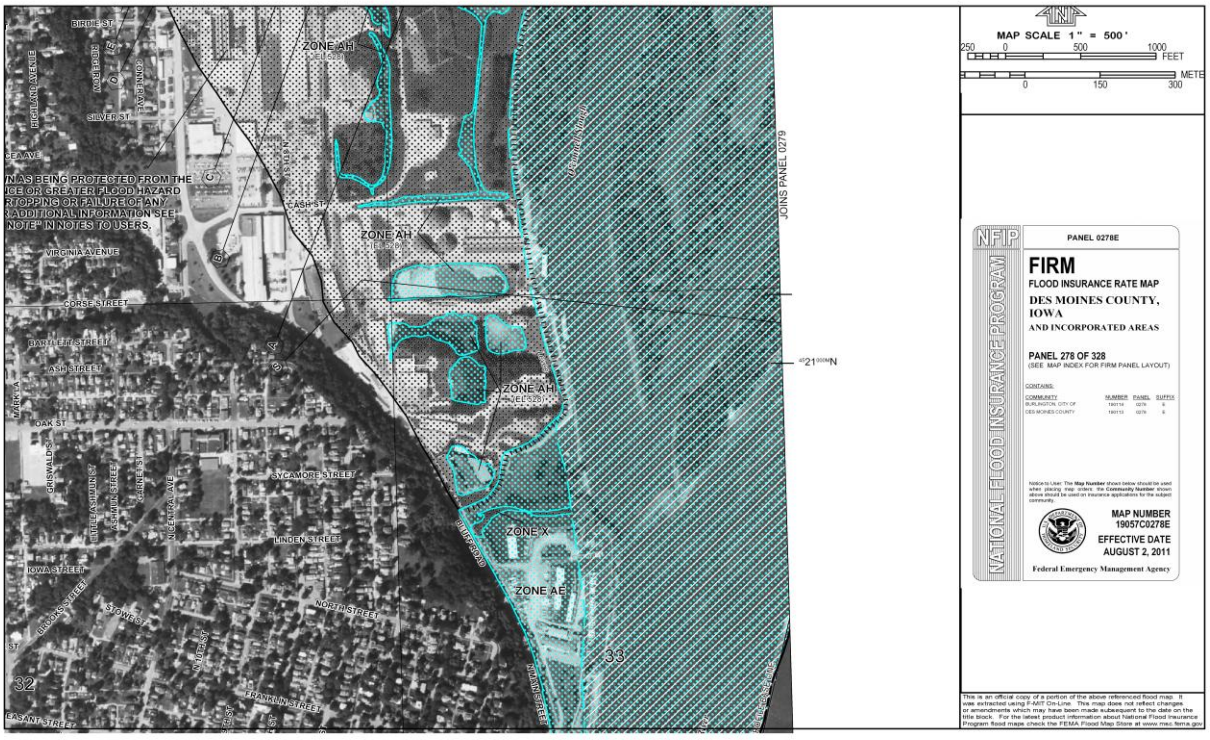
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DES MOINES COUNTY, IOWA
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EFFECTIVE DATE
AUGUST 2, 2011
Federal Emergency Management Agency
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JOINS PANEL 0279
BIRDIE ST
SILVER ST
VIRGINIA AVENUE
CORSE STREET
ASH STREET
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IOWA STREET
NORTH STREET
FRANKLIN STREET
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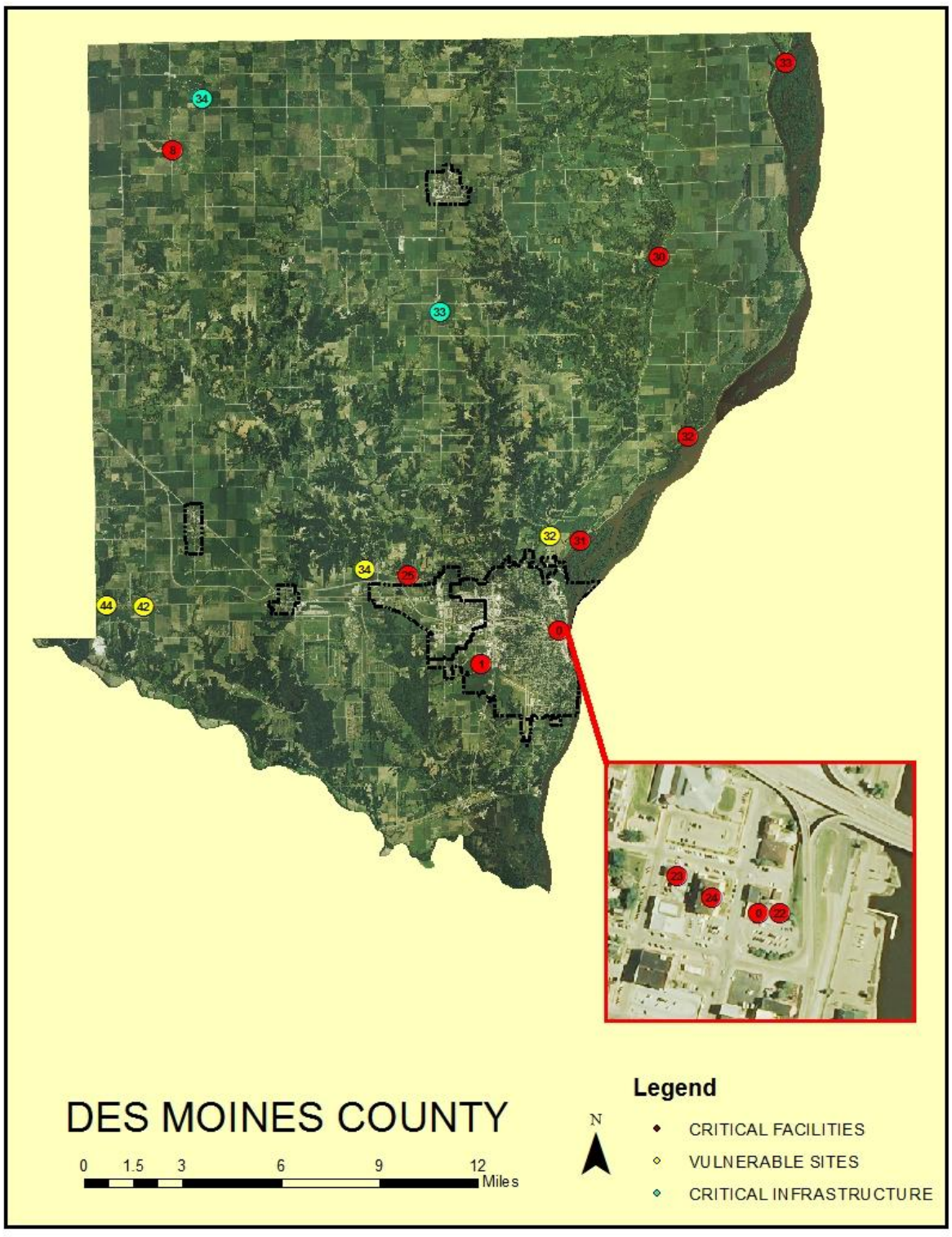
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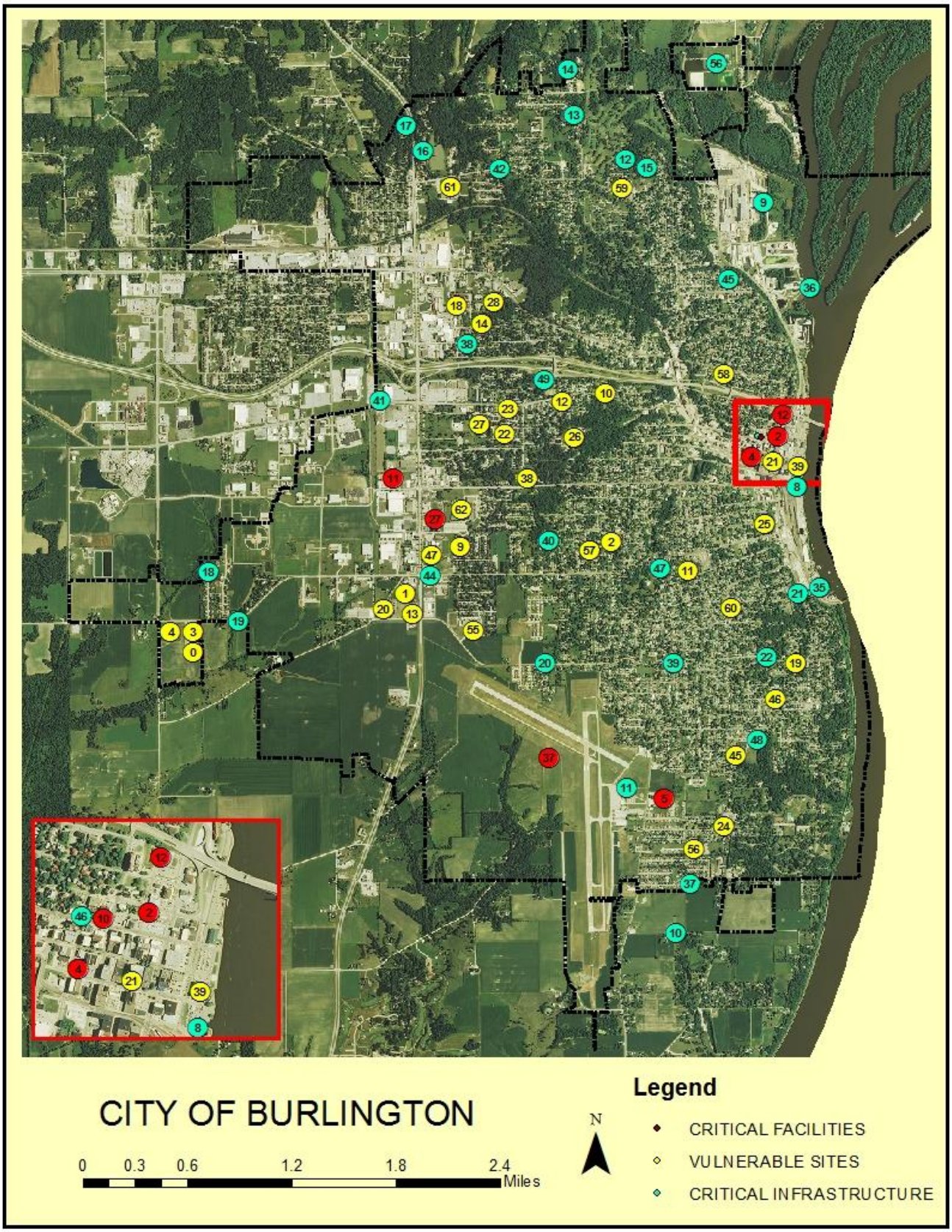
VULNERABLE SITES
CRITICAL INFRASTRUCTURE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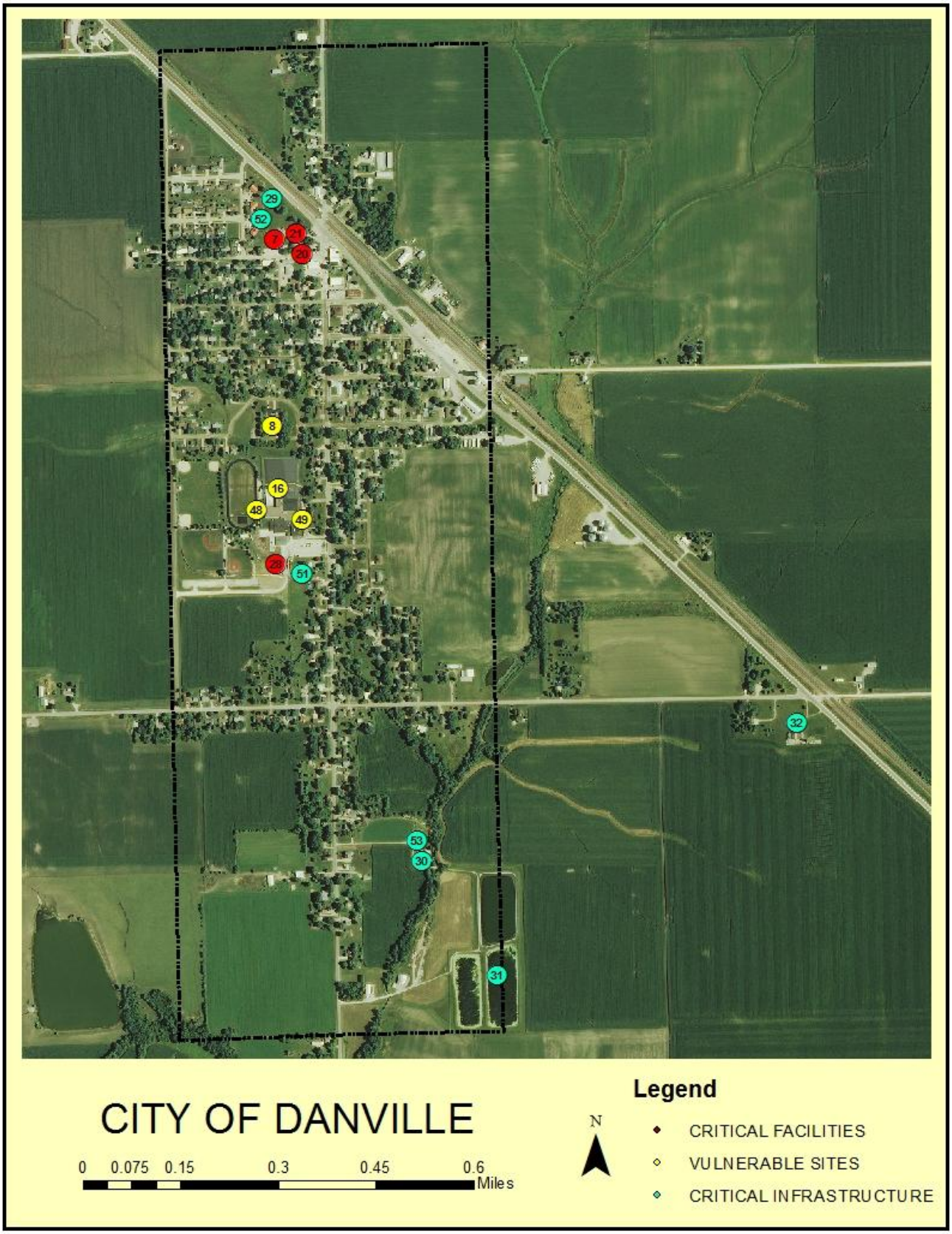
VULNERABLE SITES
CRITICAL INFRASTRUCTURE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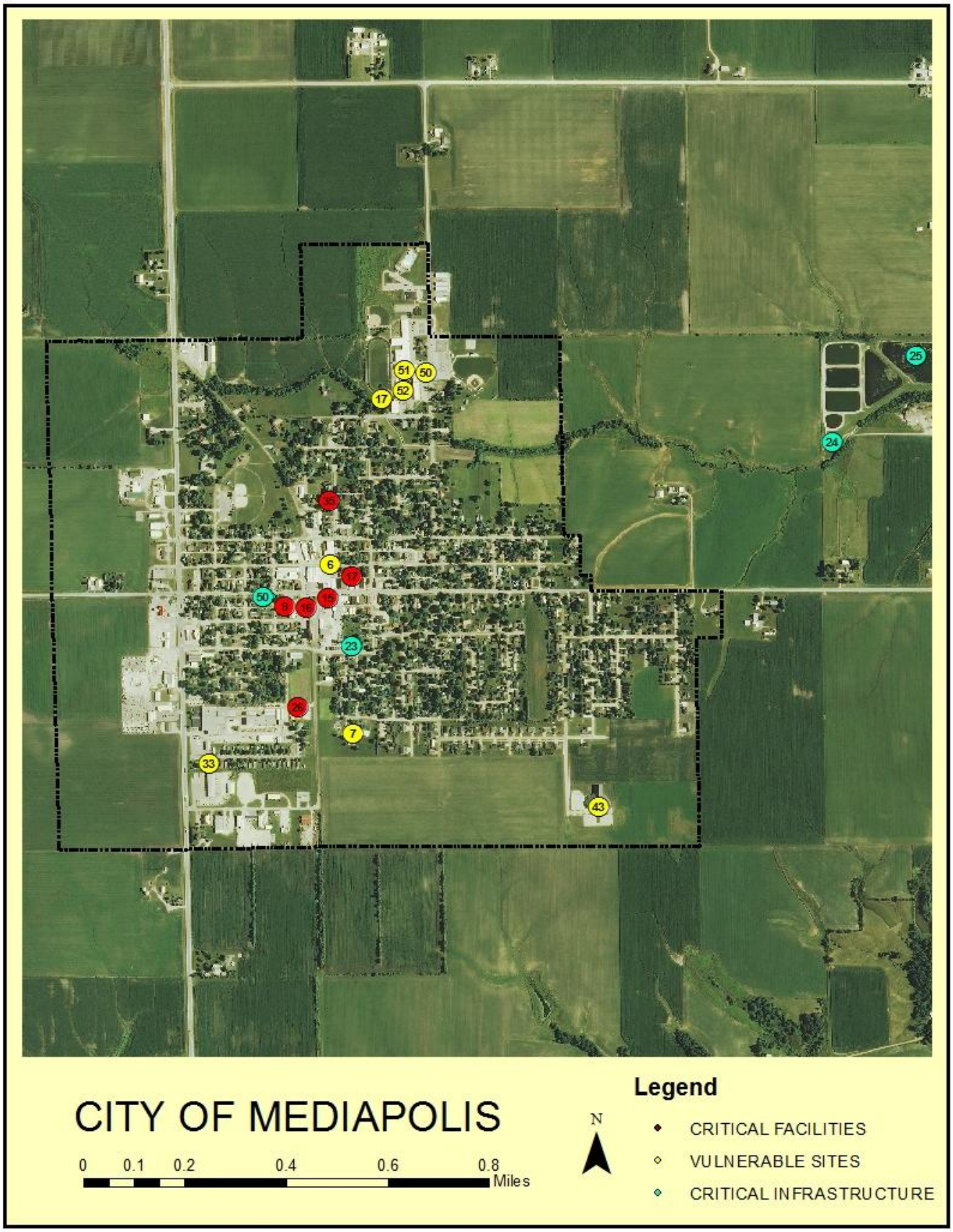
VULNERABLE SITES
CRITICAL INFRASTRUCTURE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VULNERABLE SITES
CRITICAL INFRASTRUCTURE


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CITY OF MIDDLETOWN
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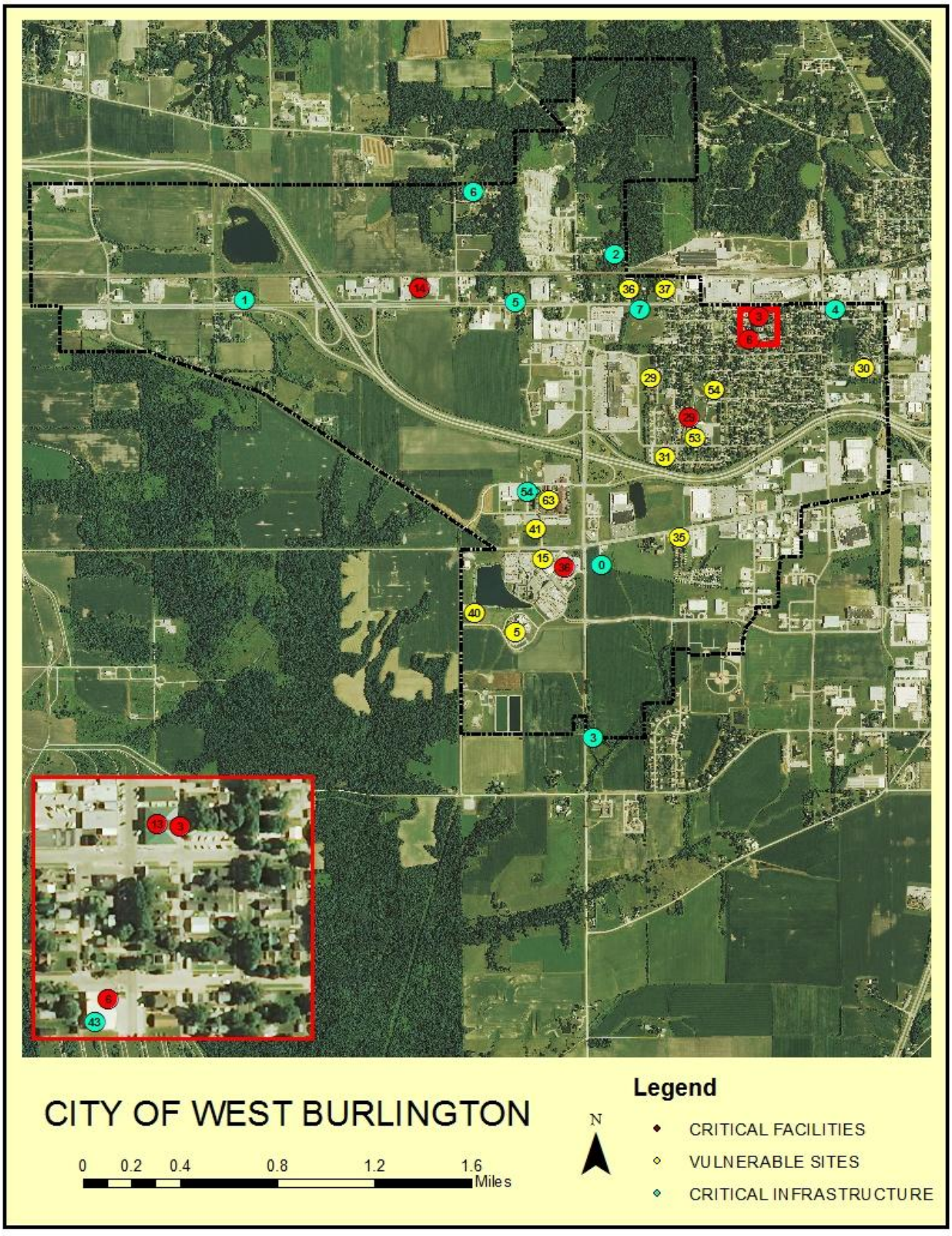
CRITICAL FACILITIES
VULNERABLE SITES
CRITICAL INFRASTRUCTURE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Legend
CRITICAL FACILITIES
VULNERABLE SITES
CRITICAL INFRASTRUCTURE

CRITICAL INFRASTRUCTURE KEY		
ID #	**Name**	**Location**
0	West Burlington Water Tower	West Burlington
1	West Mt. Pleasant Lift Station	West Burlington
2	Brushtown Lift Station	West Burlington
3	South Gear Lift Station	West Burlington
4	Meadow St. Lift Station	West Burlington
5	Mt. Pleasant East Lift Station	West Burlington
6	Emerald Lift Station	West Burlington
7	Mt. Pleasant West of Gear Lift Station	West Burlington
8	Market Street Lift Station	Burlington
9	Silver Street Lift Station	Burlington
10	14th Street Lift Station	Burlington
11	Summer Street Lift Station	Burlington
12	Golf Lane Lift Station	Burlington
13	Bittersweet Lift Station	Burlington
14	Crystal Drive Lift Station	Burlington
15	Volmer Lift Station	Burlington
16	Yoder Lift Station	Burlington
17	Surrey Road Lift Station	Burlington
18	Canterbury Lane Lift Station	Burlington
19	West Avenue Lift Station	Burlington
20	Haskell & Mason Lift Station	Burlington
21	South Street Lift Station	Burlington
22	6th & Acres Lift Station	Burlington
23	Mediapolis Water Tower	Mediapolis
24	Mediapolis Lift Station	Mediapolis
25	Mediapolis Lagoons	Mediapolis
26	Middletown Water Tower	Middletown
27	Middletown Lift Station	Middletown
28	Middletown Lagoons	Middletown
29	Danville Water Tower	Danville
30	Danville Lift Station	Danville
31	Danville Lagoons	Danville
32	Danville Pumping Station	Danville
33	Rathbun Rural Water Tower Sperry	Sperry
34	Rathbun Rural Water Tower Yarmouth	Yarmouth
35	Burlington Wastewater Treatment	Burlington
36	Burlington Waterworks Intake Pipe	Burlington
37	14th & Koester Water Tank	Burlington
38	Kirkwood & Melrose Water Tank	Burlington
39	15th & Acres Water Tank	Burlington
40	Williams & Ironwood Water Tank	Burlington
41	Agency Water Tank	Mediapolis
42	Dehn & Sunnyside Siren	Burlington

CRITICAL INFRASTRUCTURE KEY		
ID #	**Name**	**Location**
43	Broadway & Glasgow Siren	West Burlington
44	West & Lawrence Siren	Burlington
45	Ash & Des Moines Siren	Burlington
46	4th & Washington Siren	Burlington
47	White & Grove Siren	Burlington
48	Whitewood & Madison Siren	Burlington
49	Agency & Curran Siren	Burlington
50	Mediapolis Siren	Mediapolis
51	Danville Central Siren	Danville
52	Danville North Siren	Danville
53	Danville South Siren	Danville
54	Southeastern Community College Siren	West Burlington
55	Middletown Siren	Middletown
56	Burlington Waterworks	Burlington

VULNERABLE SITES KEY

ID #	Name	Address	Location
0	Blair House	1212 Indian Hills	Burlington
1	Bickford Assisted Living	3301 Sterling Drive	Burlington
2	Kings Daughters Retirement Home	628 Leebrick St.	Burlington
3	Rose Bush Gardens	4925 West Avenue Road	Burlington
4	Sunnybrook Assisted Living	5175 West Avenue Road	Burlington
5	Klein Center	1307 S. Gear Avenue	West Burlington
6	Mediapolis Care Facility	142 N. Orchard St.	Mediapolis
7	Prairie Ridge Care & Rehabilitation	608 Prairie St.	Mediapolis
8	Danville Care Center	401 Birch St.	Danville
9	ABC Kidz Care	812 Terrace Dr.	Burlington
10	Brockett Day Care	1422 E. Agency St.	Burlington
11	Great River Child Care	639 S. Central Ave.	Burlington
12	Noah's Ark Preschool & Daycare	1809 E. Agency	Burlington
13	Next Step Christian Daycare & Preschool	1015 S. Roosevelt	Burlington
14	Little Angels Childcare	2610 Vineyard St.	Burlington
15	Kidzone	1701 W. Agency St.	West Burlington
16	Danville CSD Preschool	419 Main St.	Danville
17	Mediapolis CSD Preschool	725 Northfield	Mediapolis
18	Autumn Heights Apartments	2830 Winegard Drive	Burlington
19	Bel Aire Apartments	Bel Aire Court	Burlington
20	Black Hawk Village Apartments	3420 Mason Road	Burlington
21	The Burlington Apartments	206 N. 3rd St.	Burlington
22	Greenway of Burlington	2312 Valley St.	Burlington
23	Carrington Pointe Apartments	2301 E. Agency	Burlington
24	Friedenheim Community	2603 Madison Avenue	Burlington
25	Steamboat Landing Apartments	420 4th St.	Burlington
26	Mid-Town Gardens	61 Midtown Lane	Burlington
27	Newbury Village	2645 Newbury Circle	Burlington
28	Robinson Heights Apartments	2501 Mt. Pleasant St.	Burlington
29	Westland Apartments	507 Vernon St.	West Burlington
30	Pine Ridge Apartments	701 E. Pennington St.	West Burlington
31	Burlington River Apartments	611 Van Weiss Blvd.	West Burlington
32	Green Acres Mobile Home Park	11912 Hwy 99	Des Moines County
33	Mediapolis Village Court	506 Wapello St.	Mediapolis
34	Timberline Estates	14876 Washington St.	Des Moines County
35	Western Pines Mobile Home Park	503 W. Agency Road	West Burlington
36	La Veine Trailer Park	890 W. Mt. Pleasant St.	West Burlington
37	Valley View Trailer Park, LLC.	602 W. Mt. Pleasant St.	West Burlington
38	Conger Trailer Park	2424 Division St.	Burlington
39	Memorial Auditorium	200 N. Front St.	Burlington
40	Great River Hospice	1306 Washington Road	West Burlington
41	Southeastern Community College Health Center	1500 W. Agency Road	West Burlington
42	Harmony Bible Church	21589 Highway 79	Danville

VULNERABLE SITES KEY CONTINUED

ID #	Name	Address	Location
43	Apostolic Church	700 Lofgren Dr.	Mediapolis
44	Lake Geode State Park	3333 Racine Avenue	Danville
45	Burlington Alternative High School	2312 Madison Avenue	Burlington
46	Great River Christian School	426 Harrison Avenue	Burlington
47	Notre Dame Schools	700 S. Roosevelt Avenue	Burlington
48	Danville Junior-Senior High School	419 Main St.	Danville
49	Danville Elementary School	419 Main St.	Danville
50	Mediapolis High School	725 Northfield	Mediapolis
51	Mediapolis Middle School	725 Northfield	Mediapolis
52	Mediapolis Elementary School	725 Northfield	Mediapolis
53	West Burlington Junior-Senior High School	408 W. Van Weiss Blvd.	West Burlington
54	West Burlington Elementary School	545 Ramsey St.	West Burlington
55	Edward Stone Middle School	3000 Mason Road	Burlington
56	Black Hawk Elementary School	2804 S. 14th St.	Burlington
57	Corse Elementary School	711 S. Leebrick St.	Burlington
58	North Hill Elementary	825 N. 8th St	Burlington
59	Sunnyside Elementary School	2040 Sunnyside Ave.	Burlington
60	Grimes Elementary School	800 South St.	Burlington
61	Aldo Leopold Middle School	3075 Sunnyside Ave.	Burlington
62	Burlington High School	421 Terrace Dr.	Burlington
63	Southeastern Community College	1500 W. Agency Road	West Burlington

CRITICAL FACILITIES KEY			
ID #	**Name**	**Address**	**Location**
0	Des Moines County Sheriff's Department	512 N. Main St.	Burlington
1	Des Moines County Correctional Staffing	3630 Bauer Dr.	Burlington
2	Burlington Police Department	424 N. 3rd St.	Burlington
3	West Burlington Police Department	122 Broadway St	West Burlington
4	Burlington Fire Department Central Station	418 Valley St.	Burlington
5	Burlington Fire Department Airport Station	2223 Summer St.	Burlington
6	West Burlington Fire Department	301 Broadway St.	West Burlington
7	Danville Fire & EMS	203 N. Elm	Danville
8	Yarmouth Fire Station	20454 Eastern Ave.	Yarmouth
9	Mediapolis Fire Department & Ambulance Service	412 Main St.	Mediapolis
10	Burlington City Hall	400 Washington St.	Burlington
11	Burlington Public Works/Burlington Urban Service Bus Garage	3510 Division St.	Burlington
12	Burlington Public Library	210 Court St.	Burlington
13	West Burlington City Hall	122 Broadway St.	West Burlington
14	West Burlington Public Works	2000 W. Mt. Pleasant St.	West Burlington
15	Mediapolis City Hall	510 Main St.	Mediapolis
16	Mediapolis Public Works	106 S. Curve	Mediapolis
17	Mediapolis Public Library	128 N. Orchard	Mediapolis
18	Middletown City Hall	120 Mechanic St.	Middletown
19	Middletown Public Works	120 Mechanic St.	Middletown
20	Danville City Hall	105 W. Sheperd St.	Danville
21	Danville Public Works	105 W. Sheperd St.	Danville
22	Des Moines County Emergency Management	512 N. Main St	Burlington
23	Des Moines County Health Department	522 N. 3rd St.	Burlington
24	Des Moines County Courthouse	513 N. Main St	Burlington
25	Des Moines County Roads Department	13522 Washington Road	West Burlington
26	Mediapolis CSD Bus Garage	430 Blaine St.	Mediapolis
27	Burlington CSD Bus Garage	421 Terrace Drive	Burlington
28	Danville CSD Bus Garage	419 Main St.	Danville
29	West Burlington ISD Bus Garage	211 Ramsey St.	West Burlington
30	Two Rivers Levee & Drainage District Office	5601 205th St	Mediapolis
31	Tama Road Pumping Station	Tama Road	Des Moines County
32	150th Ave. Pumping Station	150th Avenue	Des Moines County
33	Pumping Station #4	Pumping Station Road	Des Moines County
34	Iowa Army Ammunition Plant	17571 DMC Highway 79	Middletown
35	Mediapolis Clinic	401 N. Orchard	Mediapolis
36	Great River Medical Center	1401 W. Agency Road	West Burlington
37	Southeast Iowa Regional Airport	2515 Summer St.	Burlington

Public Notice: Des Moines County Multi-Jurisdictional Hazard Mitigation Plan Update Meeting

The Des Moines County Multi-Jurisdictional Hazard Mitigation Plan Committee will be meeting Wednesday, January 28th at 5:30 PM to discuss updating the Des Moines County Multi-Jurisdictional Hazard Mitigation Plan. The meeting with be held at Southeast Iowa Regional Planning Commission (SEIRPC) Offices located at 211 N Gear Avenue in West Burlington. If you have any questions please contact Zach James, SEIRPC Planning Director at 319-753-4313 or zjames@seirpc.com.

Public Notice: Des Moines County Multi-Jurisdictional Hazard Mitigation Plan Update Meeting

The Des Moines County Multi-Jurisdictional Hazard Mitigation Plan Committee will be meeting Wednesday, March 25th at 5:30 PM to discuss updating the Des Moines County Multi-Jurisdictional Hazard Mitigation Plan. The meeting with be held at Southeast Iowa Regional Planning Commission (SEIRPC) Offices located at 211 N Gear Avenue in West Burlington. If you have any questions please contact Zach James, SEIRPC Planning Director at 319-753-4313 or zjames@seirpc.com.

Public Notice: Des Moines County Multi-Jurisdictional Hazard Mitigation Plan Update Meeting

The Des Moines County Multi-Jurisdictional Hazard Mitigation Plan Committee will be meeting Wednesday, April 22nd at 5:30 PM to discuss updating the Des Moines County Multi-Jurisdictional Hazard Mitigation Plan. The meeting with be held at Southeast Iowa Regional Planning Commission (SEIRPC) Offices located at 211 N Gear Avenue in West Burlington. If you have any questions please contact Zach James, SEIRPC Planning Director at 319-753-4313 or zjames@seirpc.com.

Public Notice: Des Moines County Multi-Jurisdictional Hazard Mitigation Plan Update Meeting

The Des Moines County Multi-Jurisdictional Hazard Mitigation Plan Committee will be meeting Wednesday, May 27th at 5:30 PM to discuss updating the Des Moines County Multi-Jurisdictional Hazard Mitigation Plan. The meeting with be held at Southeast Iowa Regional Planning Commission (SEIRPC) Offices located at 211 N Gear Avenue in West Burlington. If you have any questions please contact Zach James, SEIRPC Planning Director at 319-753-4313 or zjames@seirpc.com.

Public Notice: Des Moines County Multi-Jurisdictional Hazard Mitigation Plan Update Meeting

The Des Moines County Multi-Jurisdictional Hazard Mitigation Plan Committee will be meeting Wednesday, June 24th at 5:30 PM to discuss updating the Des Moines County Multi-Jurisdictional Hazard Mitigation Plan. The meeting with be held at Southeast Iowa Regional Planning Commission (SEIRPC) Offices located at 211 N Gear Avenue in West Burlington. If you have any questions please contact Zach James, SEIRPC Planning Director at 319-753-4313 or zjames@seirpc.com.

Public Notice

The Draft Des Moines County Multi-Jurisdictional Hazard Mitigation Plan is now available for public comment. The plan assists the county and communities within the county identify hazard risks and appropriate mitigation measure that ultimately reduce loss of life and property damages. Having the plan in place makes the county and participating entities eligible for federal Hazard Mitigation Program funding. The draft Hazard Mitigation Plan may be found on the Planning Commission's website at www.seirpc.com or may be obtained by contacting SEIRPC directly. Comments will be taken until Friday, August 28th, 2015. If you have any questions please contact Zach James, SEIRPC Planning Director by phone at 319-753-4313, by email at zjames@seirpc.com, or by fax at 319-754-4763.

Add Press Release for public meeting
Add Public Hearing Notice for Approval

Appendix I. Des Moines County | Agenda, Minutes & Sign In Sheets

The table below identifies meeting participants by meeting date, time, and location. This pages following include agenda, minutes, and sign in sheets for all public meetings held for this plan update.

Meeting Time and Location	Name	Title	Organization	Representing	Service Provided
January 28, 2015 5:30-7:15 PM SEIRPC offices West Burlington	Julie Tribbey	City Clerk	City of Mediapolis	City of Mediapolis	Planning
	Ray Wilson	Emergency Representative	City of Mediapolis	City of Mediapolis	Planning
	Gina Hardin	Coordinator	Des Moines County Emergency Management	Des Moines County	Planning
	Alex Buhmeyer	Operations Supervisor	Des Moines County Conservation	Des Moines County	Planning
	Tom Broeker	County Supervisor	Des Moines County Board of Supervisors	Des Moines County	Planning
	Allen Schillie	Public Works Director	City of Danville	City of Danville	Planning
	Charlie Nichols	City Planner	City of Burlington	City of Burlington	Planning
	Byron Whittlesey	Director of Physical Plant	Southeastern Iowa Community College	Southeastern Iowa Community College	Planning
	Patrick Coen	Superintendent	Burlington CSD	Burlington CSD	Planning
	Gary DeLacy	Superintendent	Danville CSD	Danville CSD	Planning
	David Schmitt	Superintendent	West Burlington ISD	West Burlington ISD	Planning
	Grey Ray	Superintendent	Mediapolis CSD	Mediapolis CSD	Planning
	Bill Maupin	Principal	Notre Dame Schools	Notre Dame Schools	Planning
	Allen Buren	Emergency Manager	Iowa Army Ammunition Plant	Iowa Army Ammunition Plant	Planning
	Vicki Stoller	Administrator	Two Rivers Levee & Drainage District	Two Rivers Levee & Drainage District	Planning

Meeting Time and Location	Name	Title	Organization	Representing	Service Provided
March 25, 2015 5:30-7:25 PM SEIRPC offices West Burlington	Julie Tribbey	City Clerk	City of Mediapolis	City of Mediapolis	Planning
	Ray Wilson	Emergency Representative	City of Mediapolis	City of Mediapolis	Planning
	Allen Schillie	Public Works Director	City of Danville	City of Danville	Planning
	Dan Gifford	City Administrator	City of West Burlington	City of West Burlington	Planning
	Brian Carter	County Engineer	Des Moines County Roads	Des Moines County	Planning
	Alex Buhmeyer	Operations Supervisor	Des Moines County Conservation	Des Moines County	Planning
	Gina Hardin	Coordinator	Des Moines County	Des Moines County	Planning
	Dan Schmitt	Superintendent	West Burlington ISD	West Burlington ISD	Planning
	Patrick Coen	Superintendent	Burlington CSD	Burlington CSD	Planning
	Gary DeLacy	Superintendent	Danville CSD	Danville CSD	Planning
	Grey Ray	Superintendent	Mediapolis CSD	Mediapolis CSD	Planning
March 25, 2015 5:30-7:25 PM SEIRPC offices West Burlington	Ron Glasgow	Notre Dame Foundation Member	Notre Dame Foundation	Notre Dame Schools	Planning
	Allen Buren	Emergency Manager	Iowa Army Ammunition Plant	Iowa Army Ammunition Plant	Planning
	Vicki Stoller	Administrator	Two Rivers Levee & Drainage District	Two Rivers Levee & Drainage District	Planning
April 22, 2015 5:30-7:15 PM SEIRPC offices West Burlington	Bill Maupin	Principal	Notre Dame Schools	Notre Dame Schools	Planning
	Dan Schmitt	Superintendent	West Burlington ISD	West Burlington ISD	Planning
	Gary DeLacy	Superintendent	Danville CSD	Danville CSD	Planning
	Byron Whittlesey	Director of Physical Plant	Southeastern Iowa Community College	Southeastern Iowa Community College	Planning
	Tom Broeker	County Supervisor	Des Moines County Board of Supervisors	Des Moines County	Planning
	Brian Carter	County Engineer	Des Moines County Roads	Des Moines County	Planning
	Allen Schillie	Public Works Director	City of Danville	City of Danville	Planning
	Julie Tribbey	City Clerk	City of Mediapolis	City of Mediapolis	Planning
	Charlie Nichols	City Planner	City of Burlington	City of Burlington	Planning
	Allen Buren	Emergency Manager	Iowa Army Ammunition Plant	Iowa Army Ammunition Plant	Planning
	Vicki Stoller	Administrator	Two Rivers Levee & Drainage District	Two Rivers Levee & Drainage District	Planning

Meeting Time and Location	Name	Title	Organization	Representing	Service Provided
May 27th,, 2015 5:30-7:15 PM SEIRPC offices West Burlington	Tom Broeker	County Supervisor	Des Moines County Board of Supervisors	Des Moines County	Planning
	Ray Wilson	Emergency Representative	City of Mediapolis	City of Mediapolis	Planning
	Julie Tribbey	City Clerk	City of Mediapolis	City of Mediapolis	Planning
	Allen Schillie	Public Works Director	City of Danville	City of Danville	Planning
	Steve Hoambrecker	Public Works Director	City of Burlington	City of Burlington	Planning
	Alex Buhmeyer	Operations Supervisor	Des Moines County Conservation	Des Moines County	Planning
	Byron Whittlesey	Director of Physical Plant	Southeastern Iowa Community College	Southeastern Iowa Community College	Planning
	Patrick Coen	Superintendent	Burlington CSD	Burlington CSD	Planning
	Vicki Stoller	Administrator	Two Rivers Levee & Drainage District	Two Rivers Levee & Drainage District	Planning
June 24, 2015 5:30-7:30 PM SEIRPC offices West Burlington	Byron Whittlesey	Director of Physical Plant	Southeastern Iowa Community College	Southeastern Iowa Community College	Planning
	Vicki Stoller	Administrator	Two Rivers Levee & Drainage District	Two Rivers Levee & Drainage District	Planning
	Alex Buhmeyer	Operations Supervisor	Des Moines County Conservation	Des Moines County	Planning
	Ray Raker	Maintenance Supervisor	Danville CSD	Danville CSD	Planning
	Allen Buren	Emergency Manager	Iowa Army Ammunition Plant	Iowa Army Ammunition Plant	Planning
	Allen Schillie	Public Works Director	City of Danville	City of Danville	Planning
	Jerry Strause	City Council Member	City of Danville	City of Danville	Planning
	Ray Wilson	Emergency Representative	City of Mediapolis	City of Mediapolis	Planning
	Julie Tribbey	City Clerk	City of Mediapolis	City of Mediapolis	Planning
	Bruce Snodgrass	Principal	West Burlington Jr.-Sr. High	West Burlington ISD	Planning
	Dale Culler	City Clerk	City of Middletown	City of Middletown	Planning
	Steve Hoambrecker	Public Works Director	City of Burlington	City of Burlington	Planning
	Brian Carter	County Engineer	Des Moines County Roads	Des Moines County	Planning
	Tom Broeker	County Supervisor	Des Moines County Board of Supervisors	Des Moines County	Planning

INDIVIDUAL COMMITTEE MEMBER MEETINGS					
April 9, 2015 10:00 –11:00 AM West Burlington	Randy Fry	Public Works Director	City of West Burlington	City of West Burlington	Planning
	Dan Gifford	City Administrator	City of West Burlington	City of West Burlington	Planning
	Hans Trousil	Mayor	City of West Burlington	City of West Burlington	Planning
April 10, 2015 2:00 – 3:30 PM Two Rivers Levee and Drainage Association Office, Kingston, IA	Vicki Stoller	Administrator	Two Rivers Levee & Drainage District	Two Rivers Levee & Drainage District	Planning
April 16, 2015 12:00 PM – 1:30 PM Mediapolis	Greg Kuenzler	Public Works Director	City of Mediapolis	City of Mediapolis	Planning
	Julie Tribbey	City Clerk	City of Mediapolis	City of Mediapolis	Planning
May 4, 2015 11:00 AM- 12:30 PM Danville	Allen Schillie	Public Works Director	City of Danville	City of Danville	Planning
	Sue Rogers	City Clerk	City of Danville	City of Danville	Planning
May 11, 2015 10:00 – 11:00 AM SEIRPC offices, West Burlington	Chris Lee	Director	Des Moines County Conservation	Des Moines County	Planning
May 13, 2015 10:00 AM – 12:00 PM Burlington	Steve Hoambrecker	Public Works Director	City of Burlington	City of Burlington	Planning
	Matt Trexel	Fire Chief	City of Burlington	City of Burlington	Planning
	Charlie Nichols	City Planner	City of Burlington	City of Burlington	Planning
	Chris Clements	Street & Sewer Maintenance	City of Burlington	City of Burlington	Planning
	Brayden Hill	Property Maintenance Manager	City of Burlington	City of Burlington	Planning
May 13, 2015 1:30 – 2:30 PM Des Moines County Roads offices, West Burlington	Brian Carter	County Engineer	Des Moines County Roads	Des Moines County	Planning
May 15, 2015 1:30 – 2:30 PM Middletown	Allen Schillie	Water and Sewer Supervisor	City of Danville	City of Danville	Planning
	Dale Culler	City Clerk	City of Danville	City of Danville	Planning
May 26, 2015 1:00 – 2:00 PM Hoth Law Offices, Burlington	Andrew Hoth	Board Chairman	North Bottoms Levee District	North Bottoms Levee District	Planning

January 28th, 2015 Meeting Agenda

5:30 PM @ SEIRPC Offices
211 N Gear Avenue, Suite 100
West Burlington, IA 52655

1. Welcome/Introductions (10 minutes.)
2. What is hazard mitigation, the purpose of mitigation planning and the status of the Des Moines County Multi-Jurisdictional PDM update. (10 minutes)
3. Review of Des Moines County Multi-Jurisdictional Plan update planning process/timeline. (10 minutes)
4. Review and discussion of county demographic data and historical hazards. (20 minutes)
5. Review previous plan goals and discussion of goals for plan update. (20 minutes)
6. Questions, meeting recap, preview next meeting, and future meeting dates.(10 minutes)
7. Adjourn

Des Moines County Multi Jurisdictional Pre-Disaster Hazard Mitigation Plan Meeting Sign-In Sheet

DATE/TIME: January 28th, 2015 @5:30 PM LOCATION: SEIRPC Offices/West Burlington, IA

Name	Title	Organization	E-mail	Community	Check if fire, police, or elected official being compensated for participation
Byron Whitlesey	Director of Physical Plant	Southeastern Community College	bwhitlesey@scciowa.edu	West Burlington/Des Moines	☐
Tom Broeker	Des Moines County Supervisor	Des Moines County	broeker-t@dmcounty.com	D.M. County	☐
Gary Delacy	Superintendent	Danville	gary.delacy@danvillecsd.org	Danville	☐
David Schmitt	Supt	WBISD	david.schmitt@wbschools.us	WB	☐
Vicki Stoller	ADM.	Two Rivers Levee/Drainage	rivers@mepoteleo.net		☐
Alex Buhmeyer	Operations Supervisor	Des Moines County Conservation	buhmeyera@DMCounty.com	D.M. county	☐
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Des Moines County Multi Jurisdictional Pre-Disaster Hazard Mitigation Plan Meeting Sign-In Sheet

DATE/TIME: January 28th, 2015 @5:30 PM LOCATION: SEIRPC Offices/West Burlington, IA

Name	Title	Organization	E-mail	Community	Check if fire, police, or elected official being compensated for participation
Bill Maupin	Principal	Notre Dame	bill.maupin@bnotredame.org		☐
Julie Tribbey	City Clerk	City of Mediapolis	mepocity@mepotelco.net		☑
Allen Buren	Emergency Mgr	Iowa Army Ammo Plt	allen.j.buren.civ@mail.mil		☐
Greg Ray	Superintendent	Mediapolis CSD	RAYG@MEPOEDU.ORG		☐
Gina Hardin	Coordinator	Des Moines Co. Emer. mgmt	hardingedmcounty.com		☑
Ray Wilson	Mediapolis EM	City of Mediapolis	RAYWILSN@MEPOTELC.NET		☐
Allen Schillie	Public Works Dir.	City of Danville	danvcty1@danvilletelco.net		☐
Charlie Nichols	City Manner	City of Burlington	nicholsc@burlingtoniowa.org		☐
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Des Moines County Multi Jurisdictional Pre-Disaster Hazard Mitigation Plan Meeting Sign-In Sheet

DATE/TIME: January 28th, 2015 @5:30 PM LOCATION: Southeast Iowa Regional Planning Commission

Name	Title	Organization	E-mail	Community	Check if fire, police, or elected official being compensated for participation
Patrick M. Coen	Superintendent Burlington CSD	Burlington CSD	patrick.coen@bcsds.org	Burlington	☐
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Des Moines County Multi-Jurisdictional Pre-Disaster Hazard Mitigation Plan Update Meeting Minutes:

January 28th, 2015 @ 5:30pm

Location:

Southeast Iowa Regional Planning Commission
211 N. Gear Avenue
West Burlington, IA 52655

Participants:

Bill Maupin, Principal, Notre Dame Schools
Julie Tribbey, City Clerk, City of Mediapolis
Allen Buren, Emergency Manager, Iowa Army Ammunition Plant
Greg Ray, Superintendent, Mediapolis CSD
Gina Hardin, Coordinator, Des Moines County Emergency Management
Ray Wilson, Mediapolis EM, City of Mediapolis
Allen Schillie, Public Works, City of Danville
Charlie Nichols, City Planner, City of Burlington
Byron Whittlesey, Director of Physical Plant, Southeastern Iowa Community College
Tom Broeker, County Supervisor, Des Moines County
Gary DeLacy, Superintendent, Danville CSD
David Schmitt, Superintendent, West Burlington ISD
Vicki Stacler, ADM, Two Rivers Levee & Drainage
Alex Buhmeyer, Operations Supervisor, Des Moines County Conservation
Patrick Coen, Superintendent, Burlington CSD

CALL TO ORDER

- The meeting was called to order by Zach James at 5:30 pm.

AGENDA

- James explained the meeting agenda and points to accomplish. He stated that the meeting discussion could deviate from the agenda structure if anyone has particular questions related to hazard mitigation.

WELCOME/INTRODUCTIONS

- Zach James (SEIRPC Planning Director) welcomed workshop participants (committee members). Participants stated their names, their organizations and roles, and any previous hazard mitigation experience.

WHAT IS HAZARD MITIGATION AND THE MITIGATION PLAN?

- James provided an overview of hazard mitigation concepts, explaining the differences in common disaster terms. He provided a definition of hazard mitigation, explaining that, while disasters are certain to occur, mitigation can lessen the impact those disasters have on property and lives. James also discussed the past history of hazard mitigation planning in Des Moines County.
- James explained the purpose of the Des Moines County PDM plan, stating that planning is necessary in order to best mitigate and respond to hazards. The purpose of the plan, he stated, is to:
    - Outline a strategy for the implementation of hazard mitigation project in Des Moines County;
    - Understand they types of hazards that could potential impact the county, as well as the County's vulnerability to each hazard type; and
    - To comply with federal and state plan requirements and become eligible for FEMA funding for mitigation projects.

ROLE OF THE STEERING COMMITTEE

- James explained the role of the steering committee members was to help provide input based on their previous experience in hazard mitigation and familiarity with their respective communities.

PLAN UPDATE STEPS AND TIMELINE

- James provided a plan completion progress update. A basic data review of information relevant to the plan for Des Moines County has been completed. Updating community and hazard profiles, assessing risk, and ranking and scoring of hazards will be the next step. The identifying/prioritizing mitigation alternatives will be last steps in order to finish a plan draft and make it available for public review and adoption by participating jurisdictions.
- James explained that decisions are made through committee, and that all meeting participants are considered members of the planning committee.
- James explained that the plan costs are paid according to the following breakdown: 75% federal, 10% state, and 15% local. James explained that the local cost share could be covered with "in-kind" volunteer hours, and that hours from police, fire, and elected officials being compensated for their participation are not eligible. Sign-in sheets were passed around and participants were asked to check the box as appropriate depending on their local match eligibility.

DATA REVIEW

- James provided examples and data on Des Moines county demographics, economic data, historical weather data, and hazard data to illustrate how different hazards can adversely affect different populations.

GOALS ACTIVITY

- Short-term and long terms goals from the previous Des Moines County hazard mitigation plan were reviewed. James explained that the goals were developed for an earlier Des Moines County PDM. James also provided an example of the state goals from the 2013 state hazard mitigation plan. Workshop participants were asked if they thought the goals should be revised in any way. Many participants expressed a preference for a revision for the county goals to be more similar to the state goals in number and intent.
- The relevance of a creating a "long-term" plan and long term goals for a document that is revised every five years was discussed by committee members.
- The importance of using consistent language to be uniformly understood by multiple agencies was also mentioned.
- There was also discussion amongst the committee about preference for language of goals to be pro-active and broad enough to encompass a multitude of issues.

NEXT MEETING AND FUTURE MEETING DATES

- James provided a preview for the next meeting which would include discussion of critical facilities, community capabilities, identifying hazards, and an overview of the Hazard Risk Assessment. He further stated that SEIRPC staff would continue work on the draft mitigation plan document.
- James then stated that all meetings would be held on the 4th Wednesday of the month at 5:30PM at SEIRPC offices. The next meeting will be held February 25th, 2015.

ADJOURNMENT

- The meeting was officially adjourned at 7:15pm.

March 25th, 2015 Meeting Agenda

5:30 PM @ SEIRPC Offices
211 N Gear Avenue, Suite 100
West Burlington, IA 52655

1. Welcome/Introductions (5 minutes)
2. Previous Meeting Review /Goals Discussion (10 minutes)
3. Critical facilities, critical infrastructure, vulnerable sites description, review, discussion, and identification (30 minutes)
4. Communities capabilities description, review, and discussion (30 minutes)
5. Discuss Hazard Analysis and Risk Assessment (10 minutes)
6. Hazards description and identification (30 minutes)
7. Questions, preview next meeting, and future meeting dates (5 minutes)
8. Adjourn

Des Moines County Multi Jurisdictional Pre-Disaster Hazard Mitigation Plan Meeting Sign-In Sheet

DATE/TIME: February 25th, 2015 @5:30 PM LOCATION: SEIRPC Offices/West Burlington, IA

Name	Title	Organization	E-mail	Community	Check if fire, police, or elected official being compensated for participation
Ron Glasgow	~~ND~~ Foremember	ND Foundation	Ron.Glasgow@bnicmedia.com		☐
Gary Delacy	Danville Superintendent	Danville	gary.delacy@danville.csd.org	Danville	☐
Greg Ray	Mediapolis Superintendent	Mediapolis CSD	RAYG@MEPOEDU.ORG	Mediapolis	☐
Dan Gifford	City Admin.	City of WB	Siffordc@westburlington.org	W.B	☐
Brian Carter	Des Moines County Eng.	DMC	dmcsecrd@mchsi.com	DMC	☐
Vicki Stoller	Administrative Iowa Rivers L+DD	Iowa Rivers Revc	rivers@mepotelco.net		☐
Alex Buhmeyer	Operations Supervisor	Des Moines County Conservation	buhmeyer a @ dmcounty.com	DMC	☐
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Des Moines County Multi Jurisdictional Pre-Disaster Hazard Mitigation Plan Meeting Sign-In Sheet

DATE/TIME: February 25th, 2015 @5:30 PM LOCATION: SEIRPC Offices/West Burlington, IA

Name	Title	Organization	E-mail	Community	Check if fire, police, or elected official being compensated for participation
Dave Schmitt	Superintendent	WBISD	david.schmitt@wbschools.org		☐
Patrick Coen	Supt.	Burlington CSD	Patrick.coen@bcsds.org		☐
Jessie Tribbey	City Clerk	City of Mediapolis	mepocity@mepotelco.net		☐
ALLEN BUREN	PROVOST MARSHAL	IOWA ARMY AMMUNITION PLANT	allen.j.buren.civ@mail.mil		☐
Gina Hardin	Coordinator	Des Moines Co. Emer. mgmt	hardinge@dmcounty.com		☒
RAY WILSON	CITY REP	CITY OF MEDIAPOLIS	RAYWILSN@MEPOTELCO.NET		☐
Allen Schillie	Public Works Directo	city of Danville	danvcty1@danvilletelco.net		☐
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Des Moines County Multi-Jurisdictional Pre-Disaster Hazard Mitigation Plan Update Meeting Minutes:

March 25th, 2015 @ 5:30pm

Location:

Southeast Iowa Regional Planning Commission
211 N. Gear Avenue
West Burlington, IA 52655

Participants: 13
Dan Schmitt, Superintendent, West Burlington ISD
Patrick Coen, Superintendent, Burlington CSD
Julie Tribbey, City Clerk, City of Mediapolis
Allen Buren, Provst Marshal, Iowa Army Ammunition Plant
Ray Wilson, City Representative, City of Mediapolis
Allen Schille, Public Works Director, City of Danville
Ron Glasgow, Notre Dame Foundation Member, Notre Dame Foundation
Gary DeLacy, Superintendent, Danville CSD
Greg Ray, Superintendent, Mediapolis CSD
Dan Giffordd, City Administrator, City of West Burlington
Brian Carter, County Engineer, Des Moines County
Vicki Stoller, Administrator, Two Rivers Levee District
Alex Buhmeyer, Operations Supervisor, Des Moines County Conservation

Staff: 3
Gina Hardin, Coordinator, Des Moines County Emergency Management
Zach James, Planning Director, SEIRPC
Emery Ellingson, Planner, SEIRPC

CALL TO ORDER

- The meeting was called to order by Zach James at 5:30 pm.

AGENDA

- James explained the meeting agenda and points to accomplish. He stated that the meeting discussion could deviate from the agenda structure if anyone had particular questions related to hazard mitigation.

WELCOME/INTRODUCTIONS

- Zach James (SEIRPC Planning Director) welcomed workshop participants (committee members). Participants stated their names, their organizations and roles, and any previous hazard mitigation experience.
- An attendance sheet was circulated for committee members to sign

PREVIOUS MEETING REVIEW/GOALS DISCUSSION

- James provided an overview of the goal discussion held in the last meeting, during which the committee reviewed the goals of the plans of Des Moines County and the State of Iowa
- James then introduced four draft goals which had been created based on previous input by the committee.

CRITICAL FACILITIES, CRITICAL INFRASTRUCTURE, VULNERABLE SITES DESCRIPTION, REVIEW, DISCUSSION, AND IDENTIFICATION

- James explained the importance of including critical and vulnerable sites in the plan and discussed the distinction between critical facilities, critical infrastructure, and vulnerable sites.
- A previously compiled list was shown to the committee for review in order to verify site and infrastructure locations as well as discuss sites and infrastructure not listed. During the discussion, the following sites and infrastructure were discussed and/or suggested for inclusion in the plan.

    - **CRITICAL FACILITIES**
        - West Burlington ISD
        - Burlington Notre Dame Schools, 700 Roosevelt, additional address
        - Yarmouth Fire Department
        - Middletown Community Building & Public Works
        - Flood fighting location:
          5601 205th St
          Kingston, IA 52637
        - Iowa Army Ammunition Plant
        - Danville Fire Department & EMS, 203 N. Elm
        - Danville Community Building & Public Works, 104 W. Shepard
        - Bus fleet garages and storage locations (all school districts)
        - School safe rooms (Burlington High School, Danville Preschool)
        - Iowa Army Ammunition Plant
        - Mediapolis Water Tower, Pump House, 600 Meadow
        - Mediapolis Public Works Shop/Office, 106 S. Curve St.
        - West Burlington Public Works Buildings, 2000 W. Mount Pleasant St.
        - Public Works departments (countywide)
        - County Secondary Roads

- Maintenance facilities and garages (school districts, public works, conservation, etc.)
- Southeast Iowa Community College

- **CRITICAL INFRASTRUCTURE**
  - County Highway 79/Old Hwy. 34/
  - County Highway 99
  - Mediapolis City Lagoon & Pump Houses, 11002 Mediapolis Road
  - Listing of energy provider, infrastructure, and substations
  - Railroad lines (countywide)
  - Pumping stations (all communities, esp. Middletown, Danville, W. Burlington)
  - Water towers (all communities)
  - Cell towers (countywide)
  - Rathburn Rural Water
  - Sperry Water Tower
  - IAAAP Wastewater
  - Wastewater treatment facility (Mediapolis, Danville, West Burlington, IAAP)
  - Pipeline pumping stations (countywide, esp. Middletown)
  - Electric substations (countywide)
  - Mississippi River Lock & Dam #18
  - Emergency services communication radio (countywide)

- **VULNERABLE SITES**
  - Westland Mall
  - Hospice Center
  - Harmony Bible Church, west of Middletown
  - Apostolic Church, Mediapolis
  - Geode State Park
  - Big Hollow Recreation Area
  - Southeast Iowa Community College
  - Discussed double listing for community preschools. For example, Mediapolis CSD has a daycare at separate facility than school building while Danville CSD has daycare within its safe room.
  - Discussed how to include schools with multiple facilities at one location. For example, Danville CSD, among others, has multiple buildings at one address.
  - Discussed including factory sites such as Case, KPI, FE, and others. Committee liked idea of including factories but also questioned at which point would one draw the line for including commercial and industrial sites.

ADJOURNMENT

- The meeting was officially adjourned at 7:25 pm.

April 22nd, 2015 Meeting Agenda

5:30 PM @ SEIRPC Offices
211 N Gear Avenue, Suite 100
West Burlington, IA 52655

1. Welcome/Introductions (5 minutes)
2. Previous Meeting Review (10 minutes)
3. Hazard Analysis Risk Assessment Overview (10 minutes)
4. Hazard Analysis Risk Assessment Scoring Methodology (30 minutes)
5. Hazard Analysis and Risk Assessment Scoring Process(60 minutes)
6. Questions, preview next meeting, and future meeting dates (5 minutes)
7. Adjourn

Des Moines County Multi Jurisdictional Pre-Disaster Hazard Mitigation Plan Meeting Sign-In Sheet

DATE/TIME: April 22nd, 2015 @5:30 PM LOCATION: SEIRPC Offices/West Burlington, IA

Name	Title	Organization	E-mail	Community	Check if fire, police, or elected official being compensated for participation
Byron Whitlesey	Director of Physical Plant	Southeastern Community College	bwhitlesey@towa.edu	West Burlington	☐
Julie Tribbey	City Clerk	City of Mediapolis	mepocity@mepotelco.net	Mediapolis	☐
Allen Buren	Provost Marshal	IAARP	allen.j.buren@mail.mil	Missletown	☐
Allen Schillie	Public Works Director	city of Danville	danvcity1@danvilletelco.net	Danville	☐
Charlie Nichols	City planner	City of Burlington	nicholsc@burlingtoniowa.org	Burlington	☐
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Des Moines County Multi Jurisdictional Pre-Disaster Hazard Mitigation Plan Meeting Sign-In Sheet

DATE/TIME: April 22nd, 2015 @5:30 PM LOCATION: SEIRPC Offices/West Burlington, IA

Name	Title	Organization	E-mail	Community	Check if fire, police, or elected official being compensated for participation
Bill Maupin	Principal	Notre Dame	bill.maupin@notredame.org	Burlington	☐
David Schmitt	Supt	WBISD	david.schmitt@wbschools.us	WB	☐
Gary Delacy	Supt	Danville	gary.delacy@danville.ssd.org	Danville	☐
Tom Brocker	~~DMCo BOS~~ Supervisor	DMCo BOS	brockert@dmcounty.com	Des Moines County	☐
Vicki Stoller	ADM.	Two Rivers Ld DD	rivers@mepotelco.net		☐
Brian Carter	DMC County Engineer	Des Moines Co.	dmcsecr@mchsi.com	DMC	☐
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Des Moines County Multi-Jurisdictional Pre-Disaster Hazard Mitigation Plan Update Meeting Minutes:

April 22nd, 2015 @ 5:30pm

Location:

Southeast Iowa Regional Planning Commission
211 N. Gear Avenue
West Burlington, IA 52655

Participants: 11
Bill Maupin, Principal, Notre Dames Schools
Dan Schmitt, Superintendent, West Burlington ISD
Gary DeLacey, Superintendent, Danville CSD
Tom Brocker, Board of Supervisors, Des Moines County
Vicki Stoller, Administrator, Two Rivers Levee & Drainage District
Brian Carter, County Engineer, Des Moines County
Byron Whittlesey, Director of Physical Plant, Southeastern Community College
Julie Tribbey, City Clerk, City of Mediapolis
Allen Buren, Provost Marshall, Iowa Army Ammunition Plant
Allen Schille, Public Works Director, City of Danville
Charlie Nichols, City Planner, City of Burlington

Staff: 2
Zach James, Planning Director, SEIRPC
Emery Ellingson, Planner, SEIRPC

CALL TO ORDER

- The meeting was called to order by Zach James at 5:30 pm.

AGENDA

- James explained the meeting agenda and points to accomplish. He stated that the meeting discussion could deviate from the agenda structure if anyone had particular questions related to hazard mitigation. In addition, he explained the structure of the hazard analysis and scoring process.

WELCOME/INTRODUCTIONS

- Zach James (SEIRPC Planning Director) welcomed workshop participants (committee members). Participants stated their names, their organizations and roles, and any previous hazard mitigation experience.

- An attendance sheet was circulated for committee members to sign

PREVIOUS MEETING REVIEW/GOALS DISCUSSION

- James provided an overview of the last meeting, during which the committee reviewed and discussed the classification and location of critical facilities, critical infrastructure, and vulnerable sites within the county.
- There was also a review of the hazards selected for scoring by the committee during the previous meeting

HAZARD ANALYSIS RISK ASSESSMENT

- The committee reviewed the previously selected hazards and James explained the purpose and importance of prioritizing hazards and its role in emergency management strategies. James also provided explanation regarding the steps involved in identifying and scoring the hazards.

HAZARD ANALYSIS RISK ASSESSMENT SCORING METHODOLOGY

- James provided explanation of the community capabilities portion of the plan detailing entity structure, policies, programs, staff, and resources.
- Information packets with a list of questions and tables were distributed in paper form to committee members. Two forms, one specific to school districts and another to all other organization, were distributed. James also informed the committee that the digital copies of the forms would also be available. Following a brief overview of the information packet, James asked committee members to complete the forms and return them prior to the next meeting.

HAZARD ANALYSIS RISK ASSESSMENT SCORING METHODOLOGY

- James provided an example of a completed hazard analysis risk assessment from a previous plan from a different county to provide an example for the committee.
- James outlined the scoring process and explained each of the four categories (Probability, Duration, Magnitude/Severity, and Warning Time), as well as the possible scores for each hazard (Negligible, Limited, Critical, and Catastrophic). In addition, it was explained that the weighting formula for each category was based on the scoring methodology utilized by the State of Iowa for the statewide plan.
- Several members of the committee had questions concerning the scoring process, in particular with hazards that had been combined, such as animal/plant/crop disease. There was further discussion regarding how to determine scores. James explained that scoring was a group process but that each participant would provide individual scores to help create a composite score for each hazard.

HAZARD ANALYSIS AND RISK ASSESSMENT SCORING PROCESS

- The committee proceeded to work through each of the hazards, discussing the hazard and then proceeding to score each one. For each hazard, James provided a hazard definition, as well as examples and data to assist the committee with the scoring process.
- Once all the scores were compiled and processed, the committee moved to discuss the overall rankings of all the scores. The committee felt that the composite scores did not quite represent their opinion and chose to swap the hazard ranking for tornado and drought, as they felt tornadoes were more a hazard than drought.
- The committee also discussed using a four tier system to rank the hazards, and to include grass/wildfire in the third tier. James explained that the ranking and classification of hazards could be continued at the following meeting in May

QUESTIONS, PREVIEW NEXT MEETING, AND FUTURE MEETING DATES

- James introduced the topic of the next meeting, being mitigation strategies. James also provided a progress report on the actual draft document, and explained that SEIRPC would continue to meet with the individual communities to discuss specific hazards as well as to complete the community capability worksheets.
- The next meeting was set for Wednesday, May 27th, 2015

ADJOURNMENT

- The meeting was officially adjourned at 7:15 PM

May 27th, 2015 Meeting Agenda

5:30 PM @ SEIRPC Offices
211 N Gear Avenue, Suite 100
West Burlington, IA 52655

1. Welcome/Introductions (5 minutes)
2. Previous Meeting Review and Discussion (HARA Scores) (10 minutes)
3. Overview of Mitigation Strategies (10 minutes)
4. Review and activity for status and relevance of Mitigation Strategies from previous plan (45 minutes)
5. Discussion and activity for identification of new Mitigation Strategies (45 minutes)
6. Questions, preview next meeting, and future meeting dates (5 minutes)
7. Adjourn

Des Moines County Multi Jurisdictional Pre-Disaster Hazard Mitigation Plan Meeting Sign-In Sheet

DATE/TIME: May 27th, 2015 @5:30 PM LOCATION: SEIRPC Offices/West Burlington, IA

Name	Title	Organization	E-mail	Community	Check if fire, police, or elected official being compensated for participation
Byron Whittlesey	Director of Physical Plant	SCC	bwhittlesey@scciowa.edu	West Burlington	☐
Tom Broeker	DMCo Board of Supervisors	DMCo	broekert@dmcounty.com	Des Moines County	☐
Vicki Stoller	ADMINISTRATOR	Two Rivers Levee + Drainage	rivers@mepotelco.net	Des Moines/Louisa Co.	☐
Alex Buhmeyer	Operations Supervisor	DMC Conservation	buhmeyera@dmcounty.com	Des Moines County	☐
Allen Schillie	Public Works Director	city of Danville	danvcity1@danvilletelco.net	Danville	☐
RAY WILSON	EMERGENCY REP FOR MEDIAPOLIS	CITY OF MEDIAPOLIS	RAYWILSN@MEPOTELCO.NET	MEDIAPOLIS	☐
Steve Hoambrecker	Public Works Director	City of Burlington	hoambreckers@burlingtoniowa.org	Burlington	☐
Gina Harding	Coordinator	Des Moines Co Emergency Mgmt	harding@dmcounty.com	Des Moines Co	☑
Julie Tribbey	City Clerk	City of Mediapolis	mepocity@mepotelco.net	City of Mediapolis	☐
Patrick M. Coen	Superintendent Burlington CSD	Burlington CSD	patrick.coen@bcsds.org	Burlington	☑
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Des Moines County Multi-Jurisdictional Pre-Disaster Hazard Mitigation Plan Update Meeting Minutes:

May 27th, 2015 @ 5:30pm

Location:

Southeast Iowa Regional Planning Commission
211 N. Gear Avenue
West Burlington, IA 52655

Participants: 9
Tom Brocker, Board of Supervisors, Des Moines County
Vicki Stoller, Administrator, Two Rivers Levee & Drainage District
Byron Whittlesey, Director of Physical Plant, Southeastern Community College
Julie Tribbey, City Clerk, City of Mediapolis
Allen Schille, Public Works Director, City of Danville
Alex Buhmeyer, Operations Supervisor, Des Moines County
Ray Wilson, Emergency Representative, City of Mediapolis
Steve Hoambrecker, Public Works Director, City of Burlington
Patrick Coen, Superintendent, Burlington CSD

Staff: 3
Zach James, Planning Director, SEIRPC
Emery Ellingson, Regional Planner, SEIRPC
Gina Hardin, Coordinator, Des Moines County Emergency Management

CALL TO ORDER

- The meeting was called to order by Zach James at 5:30 pm.

AGENDA

- James explained the meeting agenda and points to accomplish. He stated that the meeting discussion could deviate from the agenda structure if anyone had particular questions related to hazard mitigation. In addition, he explained the structure of the hazard analysis and scoring process.

WELCOME/INTRODUCTIONS

- Zach James (SEIRPC Planning Director) welcomed workshop participants (committee members). An attendance sheet was circulated for committee members to sign

PREVIOUS MEETING REVIEW/GOALS DISCUSSION

- James provided an overview of the last meeting, during which the committee reviewed and discussed the Hazard Analysis and Risk Assessment (HARA) completed at the previous meeting.
- There was also a review of the hazards selected for scoring by the committee during the previous meeting

OVERVIEW OF MITIGATION STRATEGIES

- James introduced the concept of mitigation strategies and explained how the strategies are used to improve hazard mitigation efforts in individual communities as well as greater Des Moines County. James also highlighted several projects which were developed from the previous plan.

REVIEW AND ACTIVITY FOR STATUS AND RELEVANCE OF MITIGATION STRATEGIES FROM PREVIOUS PLAN

James provided explanation of the review process of the goals included in the previously adopted plan.

- Worksheets specific to each community containing a list of previously adopted mitigation strategies listed by hazard were distributed to the committee members. Committee members then completed the forms to the best of their ability and knowledge regarding their community or organization's efforts to complete the mitigation strategies.

DISCUSSION & ACTIVITY FOR IDENTIFCATION OF NEW MITIGATION STRATEGIES

- James introduced the concept of selecting new mitigation strategies for inclusion in the next plan. He explained the process of how these were to be selected by the committee based on which strategies would most benefit or most directly apply to specific communities of Des Moines County.
- A worksheet containing potential mitigation goals was distributed to the committee. Committee members could indicate a preference for each measure to be adopted by their respective community or organization. In addition, the worksheet contained a space for committee members to write in their own suggested measures. A secondary list containing additional potential mitigation goals was also distributed to help the committee select future mitigation goals.
- Based on the results and pending discussion at future meetings, selected goals from the previous plan and selected future goals will be combined and included in the final draft document of the plan update.

QUESTIONS, PREVIEW NEXT MEETING, AND FUTURE MEETING DATES

- James explained that during the next meeting, the draft document will be finalized and that the committee will have a chance to see the entire working document. In addition, the community capability section and Hazard Analysis Risk Assessment sections will be finalized.. James also provided a progress report on the actual draft document, and explained that SEIRPC would be meeting with the Des Moines County Emergency Management to review the plan.
- James also indicated that following the final committee meeting in June, there would be public meetings prior to the final plan adoption.
- The next meeting was set for Wednesday, June 24th, 2015

ADJOURNMENT

- The meeting was officially adjourned at 7:20 PM

June 24th, 2015 Meeting Agenda

5:30 PM @ SEIRPC Offices
211 N Gear Avenue, Suite 100
West Burlington, IA 52655

1. Welcome/Introductions (5 minutes)
2. Review of Draft Hazard Mitigation Plan Document (90 minutes)
   - Introduction (Purpose, Goals, Organization)
   - Planning Process (Adoption, Planning Process)
   - Community Profiles (Demographics, Critical Facilities, Vulnerable Sites, Critical Infrastructure)
   - Risk Assessment (Identified Hazards, Hazard Ranking)
   - Mitigation Strategies (Current and Future)
3. Questions and public input meeting dates (15 minutes)
4. Adjourn

Des Moines County Multi Jurisdictional Pre-Disaster Hazard Mitigation Plan Meeting Sign-In Sheet

DATE/TIME: June 24th, 2015 @5:30 PM LOCATION: SEIRPC Offices/West Burlington, IA

Name	Title	Organization	E-mail	Community	Check if fire, police, or elected official being compensated for participation
Byron Whitlesey	Director of Physical Plant	SCC	bwhitlesey@scciowa.edu	West Burlington	☐
Vicki Stoller	Administrator	Two Rivers L+DD	rivers@mepotelco.net	Mediapolis	☐
Alex Buhmeyer	Operations Supervisor	DMC Conservation	buhmeyera@dmcounty.com	DMC	☐
Ray Raker	Maint. Director	Danville School	ray.raker@danvillecsd.org	DMC	☐
Allen Buren	Emergency Manager	IRAAP	allen.j.buren.civemail.mil		☐
Allen Schille	Public Works Direct	city of Danville	danvcity1@danvilletelco.net	Danville	☐
Gina Hardin	Coordinator	Des Moines Co. Emer. mgmt	harding@dmcounty.com	DMC	☒
Terry Strause	City Council Danville	Danville City	jerryandsue@danvilletelco.net	Danville	☐
RAY WILSON	CITY OF MEDIAPOLIS REP	CITY OF MEDIAPOLIS	RAYWILSN@MEPOTELCO.NET	MEDIAPOLIS	☐
Julie Tribbey	City Clerk	City of Mediapolis	mepocity@mepotelco.net	Mediapolis	☐
[signature]	Principal West Burlington	West Burlington Independent School	bruce.snodgrass@wbschools.us	West Burlington	☐
Dale Culler	City Clerk	Middletown	middletowncityhall@mchsi.com	Middletown	☐

Des Moines County Multi Jurisdictional Pre-Disaster Hazard Mitigation Plan Meeting Sign-In Sheet

DATE/TIME: June 24th, 2015 @5:30 PM LOCATION: SEIRPC Offices/West Burlington, IA

Name	Title	Organization	E-mail	Community	Check if fire, police, or elected official being compensated for participation
Steve Hoambrecker	Public Works Director	City of Burlington	hoambreckers@burlingtoniowa.org	Burlington	☐
Brian Carter	County Engineer	DMC			☐
Tom Broeker	County Supervisor	DMCo			☐
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Des Moines County Multi-Jurisdictional Pre-Disaster Hazard Mitigation Plan Update Meeting Minutes:

June 24th, 2015 @ 5:30pm

Location:

Southeast Iowa Regional Planning Commission
211 N. Gear Avenue
West Burlington, IA 52655

Participants: 14
Tom Broecker, Board of Supervisors, Des Moines County
Vicki Stoller, Administrator, Two Rivers Levee & Drainage District
Byron Whittlesey, Director of Physical Plant, Southeastern Community College
Julie Tribbey, City Clerk, City of Mediapolis
Allen Schille, Public Works Director, City of Danville
Alex Buhmeyer, Operations Supervisor, Des Moines County
Ray Wilson, Emergency Representative, City of Mediapolis
Steve Hoambrecker, Public Works Director, City of Burlington
Ray Raker, Maintenance Director, Danville CSD
Allen Buren, Emergency Manager, IAAAP
Jerry Strause, Councilmember, City of Danville
Bruce Snodgrass, Principal, West Burlington ISD
Dale Culler, City Clerk, City of Middletown
Brian Carter, County Engineer, Des Moines County

Staff: 3
Zach James, Planning Director, SEIRPC
Emery Ellingson, Planner, SEIRPC
Gina Hardin, Emergency Management Coordinator, Des Moines County

CALL TO ORDER

- The meeting was called to order by Zach James at 5:30 pm.

AGENDA

- James explained the meeting agenda and points to accomplish. He stated that the meeting discussion could deviate from the agenda structure if anyone had particular questions related to the comprehensive review of the document draft.

WELCOME/INTRODUCTIONS

- Zach James (SEIRPC Planning Director) welcomed workshop participants (committee members). An attendance sheet was circulated for committee members to sign

PREVIOUS MEETING REVIEW/GOALS DISCUSSION

- James provided an overview of the last meeting, during which the committee reviewed and discussed the selection of future mitigation strategies for inclusion in the plan update.

REVIEW OF DRAFT HAZARD MITIGATION PLAN DOCUMENT

- James presented an outline of the draft document and explained the different sections and how each meeting and corresponding activities had contributed to the formation of the current document draft.

SECTION I: INTRODUCTION REVIEW

- The committee revisited and reviewed the four goals it had selected for inclusion into the plan.

SECTION II: PREREQUISITES

- James provided an overview for how the plan will be submitted once completed and how it will be potentially approved by resolution by the participating organizations. In addition, James also explained how prior to plan adoption, public hearing notices would be required.

SECTION III: PLANNING PROCESS

- The committee reviewed the planning process as it has occurred up to this meeting. James provided a table showing all the committee meeting times as well as explained how SEIRPC also met with individual communities and organizations to help develop the plan document draft.

SECTION IV: COMMUNITY PROFILES

- As a committee, the group reviewed the comprehensive list of critical facilities, vulnerable locations, and critical infrastructure that will be included in the plan. Several sites which merited inclusion were identified by the committee.

SECTION V: RISK ASSESSMENT

- The group reviewed the section concerning hazard profiles and hazard scoring. James explained how the previous activities and worksheets completed by the committee had contributed to the ranking of these hazards.

SECTION VI: MITIGATION STRATEGIES

- James explained how previously completed worksheets from the committee members had been compiled and summarized into a list of current mitigation strategies as well as potential future mitigation strategies. The committee reviewed both the current and future strategies within the draft document. During review, the group identified several future strategies which could be combined, modified, deleted, or expanded. Based on this response, several items will be changed in the draft document.

QUESTIONS, PREVIEW NEXT MEETING, AND FUTURE MEETING DATES

- James explained that once the draft document was finalized, it will be sent to committee members for a review as well as posted online. In addition, James also explained that the plan would also go through a public input process prior to submission. The group discussed potential meeting locations and times, but did not come to a consensus regarding a specific date or location.
- James also indicated that following committee review and public input, the plan would be submitted for official review, and pending approval, would potentially be ready for adoption by all participating entities.

ADJOURNMENT

- The meeting was officially adjourned at 7:30 PM

April 9th , 2015 Meeting Agenda

10:00 AM @ West Burlington City Hall
122 Broadway St.
West Burlington, IA 52655

1. Welcome/Introductions (10 minutes.)
2. Critical & Vulnerable Site Review, Flash Flood, and Landslides (10 minutes)
3. Current & Future Mitigation Strategies(10 minutes)
4. Community Capability Sheets. (20 minutes)
5. Community Specific Hazard Mitigation General Discussion (20 minutes)
6. Adjourn

Des Moines County Hazard Mitigation Workshop Sign-In Sheet

DATE/TIME: 4/9/2015, 10:00 AM – 10:45 AM LOCATION: City Hall, West Burlington, IA

Name	Title	Organization	E-mail	Community	Check if fire, police, or elected official being compensated for participation
Hans Trousil	Mayor	City of West Burlington		West Burlington	☐
Dan Gifford	City Administrator	City of West Burlington	giffordd@westburlington.org	West Burlington	☐
Randy Frye	Public Works Director	City of West Burlington		West Burlington	☐
Zach James	Planning Director	Southeast Iowa Regional Planning Commission (SEIRPC)	zjames@seirpc.com	Southeast Iowa Regional Planning Commission (SEIRPC)	☐
Emery Ellingson	Regional Planner	Southeast Iowa Regional Planning Commission (SEIRPC	eellingson@seirpc.com	Southeast Iowa Regional Planning Commission (SEIRPC)	☐
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Des Moines County Multi-Jurisdictional Pre-Disaster Hazard Mitigation Community Meeting Minutes:

April 9th, 2015 @ 10:00 AM

Location:
West Burlington City Hall
122 Broadway St.
West Burlington, IA 52655

Participants: (3)
Hans Trousil, Mayor
Dan Gifford, City Administrator
Randy Fry, Public Works Director

Staff (2)
Zach James, Planning Director, SEIRPC
Emery Ellingson, Regional Planner, SEIRPC

CALL TO ORDER

- The meeting was called to order by Zach James at 10:00 AM.

AGENDA

- James explained the meeting agenda and points to accomplish. He stated that the meeting discussion could deviate from the agenda structure if anyone has particular questions related to hazard mitigation.

WELCOME/INTRODUCTIONS

- Zach James (SEIRPC Planning Director) welcomed meeting participants. Participants stated their names, their organizations and roles, and any previous hazard mitigation experience.

SITE REVIEW, FLASH FLOOD, AND LANDSLIDES

- The representatives from the City of West Burlington reviewed the list of critical sites, critical infrastructure, and vulnerable sites compiled by SEIRPC. Several additional sites were added to the respective lists. In addition, several sites were identified as potentially hazardous sites for flash flood and landslide events.

CURRENT & FUTURE MITIGATION STRATEGIES

- The City of West Burlington representatives reviewed the current mitigation strategies and updated the current status of the different strategies. Selected potential future goals were also discussed as well as suggested.

COMMUNITY CAPABILITY SHEETS

- The City of West Burlington representatives completed worksheets to provide information and better describe the ability of their community to respond to disasters and emergency situations.

GENERAL DISCUSSION

- Discussion included questions about the Des Moines County Hazard Mitigation plan as well as additional discussion concerning hazards and concerns specific to West Burlington. For example, the potential dangers of hazardous materials transport through the community on both US Highway 34 and the rail network were identified as a concern for the community. The potential for a transportation incident was a primary concern given the close proximity of residential areas to both transportation routes.

ADJOURNMENT

- The meeting was officially adjourned at 12:30 PM.

April 10th , 2015 Meeting Agenda

2:00 PM @ Two Rivers Levee & Drainage District
5601 205th St.
Kingston, IA 52637

1. Welcome/Introductions (10 minutes.)
2. Critical & Vulnerable Site Review, Flash Flood, and Landslides (10 minutes)
3. Current & Future Mitigation Strategies(10 minutes)
4. Community Capability Sheets. (20 minutes)
5. Community Specific Hazard Mitigation General Discussion (20 minutes)
6. Adjourn

Des Moines County Hazard Mitigation Workshop Sign-In Sheet

DATE/TIME: 4/10/2015, 2:00 PM – 3:30 PM **LOCATION: Two Rivers Levee & Drainage District, Kingston, IA**

Name	Title	Organization	E-mail	Community	Check if fire, police, or elected official being compensated for participation
Vicki Stoller	Administrator	Two Rivers Levee & Drainage District		Two Rivers Levee & Drainage District	☐
Zach James	Planning Director	Southeast Iowa Regional Planning Commission (SEIRPC)	zjames@seirpc.com	Southeast Iowa Regional Planning Commission (SEIRPC)	☐
Emery Ellingson	Regional Planner	Southeast Iowa Regional Planning Commission (SEIRPC	eellingson@seirpc.com	Southeast Iowa Regional Planning Commission (SEIRPC)	☐
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Des Moines County Multi-Jurisdictional Pre-Disaster Hazard Mitigation Community Meeting Minutes:

April 10th, 2015 @ 2:00 PM

Location:
Two Rivers Levee & Drainage District
5601 205th St.
Kingston, IA 52637

Participants: (1)
Vicki Stoeller, Administrator

Staff (2)
Zach James, Planning Director, SEIRPC
Emery Ellingson, Regional Planner, SEIRPC

CALL TO ORDER

- The meeting was called to order by Zach James at 2:00 PM.

AGENDA

- James explained the meeting agenda and points to accomplish. He stated that the meeting discussion could deviate from the agenda structure if anyone has particular questions related to hazard mitigation.

WELCOME/INTRODUCTIONS

- Zach James (SEIRPC Planning Director) welcomed meeting participants. Participants stated their names, their organizations and roles, and any previous hazard mitigation experience.

SITE REVIEW, FLASH FLOOD, AND LANDSLIDES

- The representative from Two Rivers reviewed the list of critical sites, critical infrastructure, and vulnerable sites compiled by SEIRPC. Several additional sites were added to the respective lists. In addition, several sites were identified as potentially hazardous sites for flash flood and landslide events.

CURRENT & FUTURE MITIGATION STRATEGIES

- The Two Rivers representative reviewed the current mitigation strategies and updated the current status of the different strategies. Selected potential future goals were also discussed as well as suggested.

COMMUNITY CAPABILITY SHEETS

- The Two Rivers representative completed worksheets to provide information and better describe the ability of their community to respond to disasters and emergency situations.

GENERAL DISCUSSION

- Discussion included questions about the Des Moines County Hazard Mitigation plan as well as additional discussion concerning hazards and concerns specific to Two Rivers. For example, obtaining back up generators for pump stations throughout the levee district was identified as a significant need of the organization.

ADJOURNMENT

- The meeting was officially adjourned at 3:30 PM.

April 16th , 2015 Meeting Agenda

2:00 PM @ Mediapolis City Hall
510 Main St.
Mediapolis, IA 52637

1. Welcome/Introductions (10 minutes.)
2. Critical & Vulnerable Site Review, Flash Flood, and Landslides (10 minutes)
3. Current & Future Mitigation Strategies(10 minutes)
4. Community Capability Sheets. (20 minutes)
5. Community Specific Hazard Mitigation General Discussion (20 minutes)
6. Adjourn

Des Moines County Hazard Mitigation Workshop Sign-In Sheet

DATE/TIME: 4/16/2015, 12:00 PM – 1:30 PM LOCATION: City Hall, Mediapolis, IA

Name	Title	Organization	E-mail	Community	Check if fire, police, or elected official being compensated for participation
Julie Tribbey	City Clerk	City of Mediapolis	mepocity@mepotelco.net	Mediapolis	☐
Greg Kuenzler	Public Works Director	City of Mediapolis	mepocity@mepotelco.net	Mediapolis	☐
Zach James	Planning Director	Southeast Iowa Regional Planning Commission (SEIRPC)	zjames@seirpc.com	Southeast Iowa Regional Planning Commission (SEIRPC)	☐
Emery Ellingson	Regional Planner	Southeast Iowa Regional Planning Commission (SEIRPC	eellingson@seirpc.com	Southeast Iowa Regional Planning Commission (SEIRPC)	☐
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Des Moines County Multi-Jurisdictional Pre-Disaster Hazard Mitigation Community Meeting Minutes:

April 16th, 2015 @ 12:00 PM

Location:
Mediapolis City Hall
510 Main St.
Mediapolis, IA 52637

Participants: (2)
Julie Tribbey, City Clerk
Greg Kuenzler, Public Works Director

Staff (2)
Zach James, Planning Director, SEIRPC
Emery Ellingson, Regional Planner, SEIRPC

CALL TO ORDER

- The meeting was called to order by Zach James at 12:00 PM.

AGENDA

- James explained the meeting agenda and points to accomplish. He stated that the meeting discussion could deviate from the agenda structure if anyone has particular questions related to hazard mitigation.

WELCOME/INTRODUCTIONS

- Zach James (SEIRPC Planning Director) welcomed meeting participants. Participants stated their names, their organizations and roles, and any previous hazard mitigation experience.

SITE REVIEW, FLASH FLOOD, AND LANDSLIDES

- The representatives from the City of Mediapolis reviewed the list of critical sites, critical infrastructure, and vulnerable sites compiled by SEIRPC. Several additional sites were added to the respective lists. In addition, several sites were identified as potentially hazardous sites for flash flood and landslide events.

CURRENT & FUTURE MITIGATION STRATEGIES

- The City of Mediapolis representatives reviewed the current mitigation strategies and updated the current status of the different strategies. Selected potential future goals were also discussed as well as suggested.

COMMUNITY CAPABILITY SHEETS

- The City of Mediapolis representatives completed worksheets to provide information and better describe the ability of their community to respond to disasters and emergency situations.

GENERAL DISCUSSION

- Discussion included questions about the Des Moines County Hazard Mitigation plan as well as additional discussion concerning hazards and concerns specific to Mediapolis. For example, flash flooding along US Highway 61 on the east side of the city was identified as a specific hazard. In addition, possible bridge and culvert replacement was also discussed. Potential creation of wetlands was also identified as a possible project for the community as well.

ADJOURNMENT

- The meeting was officially adjourned at 12:30 PM.

May 4th, 2015 Meeting Agenda

11:00 AM @ Danville City Hall
105 W. Sheperd St.
Danville, IA 52623

1. Welcome/Introductions (10 minutes.)
2. Critical & Vulnerable Site Review, Flash Flood, and Landslides (10 minutes)
3. Current & Future Mitigation Strategies(10 minutes)
4. Community Capability Sheets. (20 minutes)
5. Community Specific Hazard Mitigation General Discussion (20 minutes)
6. Adjourn

Des Moines County Hazard Mitigation Workshop Sign-In Sheet

DATE/TIME: 5/4/2015, 11:00AM – 12:30PM LOCATION: City Hall, Danville, IA

Name	Title	Organization	E-mail	Community	Check if fire, police, or elected official being compensated for participation
Sue Rogers	City Clerk	City of Danville	danvcty3@danvilletelco.net	Danville	☐
Alan Schille	Public Works Director	City of Danville	danvcty3@danvilletelco.net	Danville	☐
Zach James	Planning Director	Southeast Iowa Regional Planning Commission (SEIRPC)	zjames@seirpc.com	Southeast Iowa Regional Planning Commission (SEIRPC)	☐
Emery Ellingson	Regional Planner	Southeast Iowa Regional Planning Commission (SEIRPC	eellingson@seirpc.com	Southeast Iowa Regional Planning Commission (SEIRPC)	☐
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Des Moines County Multi-Jurisdictional Pre-Disaster Hazard Mitigation Community Meeting Minutes:

May 4th, 2015 @ 11:00 AM

Location:
Danville City Hall
105 W. Sheperd St.
PO Box 265
Danville, IA 52623

Participants: (2)
Sue Rogers, City Clerk
Allen Schillie, Public Works Director

Staff (2)
Zach James, Planning Director, SEIRPC
Emery Ellingson, Regional Planner, SEIRPC

CALL TO ORDER

- The meeting was called to order by Zach James at 11:00 AM.

AGENDA

- James explained the meeting agenda and points to accomplish. He stated that the meeting discussion could deviate from the agenda structure if anyone has particular questions related to hazard mitigation.

WELCOME/INTRODUCTIONS

- Zach James (SEIRPC Planning Director) welcomed meeting participants. Participants stated their names, their organizations and roles, and any previous hazard mitigation experience.

SITE REVIEW, FLASH FLOOD, AND LANDSLIDES

- The representatives from the City of Danville reviewed the list of critical sites, critical infrastructure, and vulnerable sites compiled by SEIRPC. Several additional sites were added to the respective lists. In addition, several sites were identified as potentially hazardous sites for flash flood and landslide events.

CURRENT & FUTURE MITIGATION STRATEGIES

- The City of Danville representatives reviewed the current mitigation strategies and updated the current status of the different strategies. Selected potential future goals were also discussed as well as suggested.

COMMUNITY CAPABILITY SHEETS

- The City of Danville representatives completed worksheets to provide information and better describe the ability of their community to respond to disasters and emergency situations.

GENERAL DISCUSSION

- Discussion included questions about the Des Moines County Hazard Mitigation plan as well as additional discussion concerning hazards and concerns specific to Danville. For example, obtaining backup generators for lift station pumps was identified as a potential goal. In addition, mitigating flash flooding within the community was also identified as a high potential hazard within the community.

ADJOURNMENT

- The meeting was officially adjourned at 12:30 PM.

May 11th, 2015 Meeting Agenda

10:00 AM @ SEIRPC Offices
211 N. Gear Avenue
West Burlington, IA 52655

1. Welcome/Introductions (10 minutes.)
2. Critical & Vulnerable Site Review, Flash Flood, and Landslides (10 minutes)
3. Current & Future Mitigation Strategies(10 minutes)
4. Community Capability Sheets. (20 minutes)
5. Community Specific Hazard Mitigation General Discussion (20 minutes)
6. Adjourn

Des Moines County Hazard Mitigation Workshop Sign-In Sheet

DATE/TIME: 5/11/2015, 10:00 AM – 11:00 AM LOCATION: SEIRPC Offices, West Burlington, IA

Name	Title	Organization	E-mail	Community	Check if fire, police, or elected official being compensated for participation
Chris Lee	County Conservation Director	Des Moines County Conservation	leec@dmcounty.com	Des Moines County	☐
Zach James	Planning Director	Southeast Iowa Regional Planning Commission (SEIRPC)	zjames@seirpc.com	Southeast Iowa Regional Planning Commission (SEIRPC)	☐
Emery Ellingson	Regional Planner	Southeast Iowa Regional Planning Commission (SEIRPC	eellingson@seirpc.com	Southeast Iowa Regional Planning Commission (SEIRPC)	☐
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Des Moines County Multi-Jurisdictional Pre-Disaster Hazard Mitigation Community Meeting Minutes:

May 11th, 2015 @ 10:00 AM

Location:
Southeast Iowa Regional Planning Commission
211 N. Gear Ave.
West Burlington, IA 52655

Participants: (1)
Chris Lee, Director, Des Moines County Conservation Department

Staff (2)
Zach James, Planning Director, SEIRPC
Emery Ellingson, Regional Planner, SEIRPC

CALL TO ORDER

- The meeting was called to order by Zach James at 10:00 AM.

AGENDA

- James explained the meeting agenda and points to accomplish. He stated that the meeting discussion could deviate from the agenda structure if anyone has particular questions related to hazard mitigation.

WELCOME/INTRODUCTIONS

- Zach James (SEIRPC Planning Director) welcomed meeting participants. Participants stated their names, their organizations and roles, and any previous hazard mitigation experience.

SITE REVIEW, FLASH FLOOD, AND LANDSLIDES

- The representative from Des Moines County Conservation reviewed the list of critical sites, critical infrastructure, and vulnerable sites compiled by SEIRPC. Several additional sites were added to the respective lists. In addition, several sites were identified as potentially hazardous sites for flash flood and landslide events.

CURRENT & FUTURE MITIGATION STRATEGIES

- The Des Moines County Conservation representative reviewed the current mitigation strategies and updated the current status of the different strategies. Selected potential future goals were also discussed as well as suggested.

COMMUNITY CAPABILITY SHEETS

- The Des Moines County Conservation representative completed worksheets to provide information and better describe the ability of their community to respond to disasters and emergency situations.

GENERAL DISCUSSION

- Discussion included questions about the Des Moines County Hazard Mitigation plan as well as additional discussion concerning hazards and concerns specific to Des Moines County Conservation Department. For example, constructing storm safe rooms at the county's camping facilities was identified as a necessary future improvement.

ADJOURNMENT

- The meeting was officially adjourned at 2:00 PM.

May 13th, 2015 Meeting Agenda

10:00 AM @ City of Burlington Public Works Department
3510 Division Street
Burlington, IA 52601

1. Welcome/Introductions (10 minutes.)
2. Critical & Vulnerable Site Review, Flash Flood, and Landslides (10 minutes)
3. Current & Future Mitigation Strategies(10 minutes)
4. Community Capability Sheets. (20 minutes)
5. Community Specific Hazard Mitigation General Discussion (20 minutes)
6. Adjourn

Des Moines County Hazard Mitigation Workshop Sign-In Sheet

DATE/TIME: 5/13/2015, 10:00 AM – 12:00 PM LOCATION: City of Burlington Public Works

Name	Title	Organization	E-mail	Community	Check if fire, police, or elected official being compensated for participation
Steve Hoambrecker	Public Works Director	City of Burlington	hoambreckers@burlingtoniowa.org	Burlington	☐
Breyden Hill	Property Maintenance Manager	City of Burlington	hillb@burlingtoniowa.org	Burlington	☐
Chris Clements	Street & Sewer Maintenance	City of Burlington	clementsc@burlingtoniowa.org	Burlington	☐
Charlie Nichols	City Planner	City of Burlington	nicholsc@burlingtoniowa.org	Burlington	☐
Matt Trexel	Fire Chief	City of Burlington	trexelm@burlingtoniowa.org	Burlington	
Zach James	Planning Director	Southeast Iowa Regional Planning Commission (SEIRPC)	zjames@seirpc.com	Southeast Iowa Regional Planning Commission (SEIRPC)	☐
Emery Ellingson	Regional Planner	Southeast Iowa Regional Planning Commission (SEIRPC	eellingson@seirpc.com	Southeast Iowa Regional Planning Commission (SEIRPC)	☐
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Des Moines County Multi-Jurisdictional Pre-Disaster Hazard Mitigation Community Meeting Minutes:

May 13th, 2015 @ 10:00 AM

Location:

Burlington Public Works Department
3510 Division St.
Burlington, IA 52601

Participants: (5)
Steve Hoambrecker, Public Works Director
Charlie Nichols, City Planner
Breydn Hill, Maintenance Director
Chris Clements, Sewer & Street Maintenance
Matt Trexel, Fire Chief

Staff (2)
Zach James, Planning Director, SEIRPC
Emery Ellingson, Regional Planner, SEIRPC

CALL TO ORDER

- The meeting was called to order by Zach James at 5:30 pm.

AGENDA

- James explained the meeting agenda and points to accomplish. He stated that the meeting discussion could deviate from the agenda structure if anyone has particular questions related to hazard mitigation.

WELCOME/INTRODUCTIONS

- Zach James (SEIRPC Planning Director) welcomed workshop participants (committee members). Participants stated their names, their organizations and roles, and any previous hazard mitigation experience.

SITE REVIEW, FLASH FLOOD, AND LANDSLIDES

- The representatives from the City of Burlington reviewed the list of critical sites, critical infrastructure, and vulnerable sites compiled by SEIRPC. Several additional sites were added to the respective lists. In addition, several sites were identified as potentially hazardous sites for flash flood and landslide events.

CURRENT & FUTURE MITIGATION STRATEGIES

- The City of Burlington representatives reviewed the current mitigation strategies and updated the current status of the different strategies. Selected potential future goals were also discussed as well as suggested.

COMMUNITY CAPABILITY SHEETS

- The City of Burlington representatives completed worksheets to provide information and better describe the ability of their community to respond to disasters and emergency situations.

GENERAL DISCUSSION

- Discussion included questions about the Des Moines County Hazard Mitigation plan as well as additional discussion concerning hazards and concerns specific to Burlington. For example, obtaining backup generators for warning sirens as well as potentially replacing a few sirens was a topic. In addition, river flooding and the best practices to limit and mitigate damages from flooding were also discussed.

ADJOURNMENT

- The meeting was officially adjourned at 12:00 PM.

May 13th, 2015 Meeting Agenda

1:30 PM @ Des Moines County Roads Department
13522 Washington Road
West Burlington, IA 52655

1. Welcome/Introductions (10 minutes.)
2. Critical & Vulnerable Site Review, Flash Flood, and Landslides (10 minutes)
3. Current & Future Mitigation Strategies(10 minutes)
4. Community Capability Sheets. (20 minutes)
5. Community Specific Hazard Mitigation General Discussion (20 minutes)
6. Adjourn

Des Moines County Hazard Mitigation Workshop Sign-In Sheet

DATE/TIME: 5/13/2015, 1:30 PM – 2:30 PM LOCATION: Des Moines County Roads Department

Name	Title	Organization	E-mail	Community	Check if fire, police, or elected official being compensated for participation
Brian Carter	County Engineer	Des Moines County Roads	dmcsecrd@mchsi.com	Des Moines County	☐
Zach James	Planning Director	Southeast Iowa Regional Planning Commission (SEIRPC)	zjames@seirpc.com	Southeast Iowa Regional Planning Commission (SEIRPC)	☐
Emery Ellingson	Regional Planner	Southeast Iowa Regional Planning Commission (SEIRPC	eellingson@seirpc.com	Southeast Iowa Regional Planning Commission (SEIRPC)	☐
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Des Moines County Multi-Jurisdictional Pre-Disaster Hazard Mitigation Community Meeting Minutes:

May 13th, 2015 @ 1:30 PM

Location:
Des Moines County Roads Department
13522 Washington Road
West Burlington, IA 52655

Participants: (1)
Brian Carter, County Engineer, Des Moines County

Staff (2)
Zach James, Planning Director, SEIRPC
Emery Ellingson, Regional Planner, SEIRPC

CALL TO ORDER

- The meeting was called to order by Zach James at 1:30 PM.

AGENDA

- James explained the meeting agenda and points to accomplish. He stated that the meeting discussion could deviate from the agenda structure if anyone has particular questions related to hazard mitigation.

WELCOME/INTRODUCTIONS

- Zach James (SEIRPC Planning Director) welcomed meeting participants. Participants stated their names, their organizations and roles, and any previous hazard mitigation experience.

SITE REVIEW, FLASH FLOOD, AND LANDSLIDES

- The representative from Des Moines County Roads reviewed the list of critical sites, critical infrastructure, and vulnerable sites compiled by SEIRPC. Several additional sites were added to the respective lists. In addition, several sites were identified as potentially hazardous sites for flash flood and landslide events.

CURRENT & FUTURE MITIGATION STRATEGIES

- The Des Moines County Roads representative reviewed the current mitigation strategies and updated the current status of the different strategies. Selected potential future goals were also discussed as well as suggested.

COMMUNITY CAPABILITY SHEETS

- The Des Moines County Roads representative completed worksheets to provide information and better describe the ability of their community to respond to disasters and emergency situations.

GENERAL DISCUSSION

- Discussion included questions about the Des Moines County Hazard Mitigation plan as well as additional discussion concerning hazards and concerns specific to Des Moines County Conservation Department. For example, obtaining portable generators to power garage openers for the county's vehicle storage facilities was identified as a potential improvement to help the county respond to emergency situations.

ADJOURNMENT

- The meeting was officially adjourned at 2:30 PM.

May 15th, 2015 Meeting Agenda

1:30 PM @ Middletown City Hall
120 Mechanic St.
Middletown, IA 52638

1. Welcome/Introductions (10 minutes.)
2. Critical & Vulnerable Site Review, Flash Flood, and Landslides (10 minutes)
3. Current & Future Mitigation Strategies(10 minutes)
4. Community Capability Sheets. (20 minutes)
5. Community Specific Hazard Mitigation General Discussion (20 minutes)
6. Adjourn

Des Moines County Hazard Mitigation Workshop Sign-In Sheet

DATE/TIME: 5/15/2015, 1:30 PM – 2:30 PM LOCATION: City Hall, Middletown, IA

Name	Title	Organization	E-mail	Community	Check if fire, police, or elected official being compensated for participation
Dick Cullen	City Clerk	City of Middletown	middletowncityhall@mchsi.com	Middletown	☐
Alan Schille	Water and Sewer Supervisor	City of Middletown	middletownpublicworks@gmail.com	Middletown	☐
Zach James	Planning Director	Southeast Iowa Regional Planning Commission (SEIRPC)	zjames@seirpc.com	Southeast Iowa Regional Planning Commission (SEIRPC)	☐
					☐
					☐
					☐
					☐

Des Moines County Multi-Jurisdictional Pre-Disaster Hazard Mitigation Community Meeting Minutes:

May 15th, 2015 @ 1:30 PM

Location:
Middletown City Hall
120 Mechanic St.
Middletown, IA 52638

Participants: (2)
Allen Schillie, Water & Sewer Supervisor
Dale Culler, City Clerk

Staff (2)
Zach James, Planning Director, SEIRPC
Emery Ellingson, Regional Planner, SEIRPC

CALL TO ORDER

- The meeting was called to order by Zach James at 1:30 PM.

AGENDA

- James explained the meeting agenda and points to accomplish. He stated that the meeting discussion could deviate from the agenda structure if anyone has particular questions related to hazard mitigation.

WELCOME/INTRODUCTIONS

- Zach James (SEIRPC Planning Director) welcomed meeting participants. Participants stated their names, their organizations and roles, and any previous hazard mitigation experience.

SITE REVIEW, FLASH FLOOD, AND LANDSLIDES

- The representatives from the City of Middletown reviewed the list of critical sites, critical infrastructure, and vulnerable sites compiled by SEIRPC. Several additional sites were added to the respective lists. In addition, several sites were identified as potentially hazardous sites for flash flood and landslide events.

CURRENT & FUTURE MITIGATION STRATEGIES

- The City of Middletown representatives reviewed the current mitigation strategies and updated the current status of the different strategies. Selected potential future goals were also discussed as well as suggested.

COMMUNITY CAPABILITY SHEETS

- The City of Middletown representatives completed worksheets to provide information and better describe the ability of their community to respond to disasters and emergency situations.

GENERAL DISCUSSION

- Discussion included questions about the Des Moines County Hazard Mitigation plan as well as additional discussion concerning hazards and concerns specific to Middletown. For example, developing a secondary water acquisition system was discussed as a possible need as currently its water supply comes from the Burlington Waterworks..

ADJOURNMENT

- The meeting was officially adjourned at 2:30 PM.

May 26th, 2015 Meeting Agenda North Bottom Levee District

1:00 PM @ Steven S. Hoth Law Office
200 Jefferson St.
Burlington, IA 52601

1. Welcome/Introductions (10 minutes.)
2. Critical & Vulnerable Site Review, Flash Flood, and Landslides (10 minutes)
3. Current & Future Mitigation Strategies(10 minutes)
4. Community Capability Sheets. (20 minutes)
5. Community Specific Hazard Mitigation General Discussion (20 minutes)
6. Adjourn

Des Moines County Hazard Mitigation Workshop Sign-In Sheet

DATE/TIME: 5/26/2015 LOCATION: Hoth Law Offices, Burlington, IA

Name	Title	Organization	E-mail	Community	Check if fire, police, or elected official being compensated for participation
Andrew Hoth	Board Chairman	North Bottom Levee District		Two Rivers Levee & Drainage District	☐
Zach James	Planning Director	Southeast Iowa Regional Planning Commission (SEIRPC)	zjames@seirpc.com	Southeast Iowa Regional Planning Commission (SEIRPC)	☐
Emery Ellingson	Regional Planner	Southeast Iowa Regional Planning Commission (SEIRPC	eellingson@seirpc.com	Southeast Iowa Regional Planning Commission (SEIRPC)	☐
					☐
					☐

Des Moines County Multi-Jurisdictional Pre-Disaster Hazard Mitigation Community Meeting Minutes:

May 26th, 2015 @ 1:00 PM

Location:
Steven S. Hoth Law Offices
200 Jefferson St.
Burlington, IA 52601

Participants: (1)
Andrew Hoth, North Bottoms Levee District Board Chairman

Staff (2)
Zach James, Planning Director, SEIRPC
Emery Ellingson, Regional Planner, SEIRPC

CALL TO ORDER

- The meeting was called to order by Zach James at 1:00 PM.

AGENDA

- James explained the meeting agenda and points to accomplish. He stated that the meeting discussion could deviate from the agenda structure if anyone has particular questions related to hazard mitigation.

WELCOME/INTRODUCTIONS

- Zach James (SEIRPC Planning Director) welcomed meeting participants. Participants stated their names, their organizations and roles, and any previous hazard mitigation experience.

SITE REVIEW, FLASH FLOOD, AND LANDSLIDES

- The representative from North Bottom Levee District reviewed the list of critical sites, critical infrastructure, and vulnerable sites compiled by SEIRPC. Several additional sites were added to the respective lists. In addition, several sites were identified as potentially hazardous sites for flash flood and landslide events.

CURRENT & FUTURE MITIGATION STRATEGIES

- The North Bottom Levee District representative reviewed the current mitigation strategies and updated the current status of the different strategies. Selected potential future goals were also discussed as well as suggested.

COMMUNITY CAPABILITY SHEETS

- The North Bottom Levee District representative completed worksheets to provide information and better describe the ability of their community to respond to disasters and emergency situations.

GENERAL DISCUSSION

- Discussion included questions about the Des Moines County Hazard Mitigation plan as well as additional discussion concerning hazards and concerns specific to North Bottom Levee District. For example, elevating Des Moines County Highway 99, which cuts through the levee district, was identified as a potential improvement that would help the North Bottom Levee District better perform its duties.

ADJOURNMENT

- The meeting was officially adjourned at 2:00 PM.

August 19th, 2015 Meeting Agenda

5:30 PM @ Burlington Public Library Meeting Room B
210 Court Street
Burlington, IA 52601

1. Welcome/Introductions (5 minutes)
2. What is Hazard Mitigation? (10 minutes)
3. What is the Mitigation Plan? (10 minutes)
4. Plan Process and Development (10 minutes)
5. Review of Draft Hazard Mitigation Plan (20 minutes)
6. Review of mitigation strategies (20 Minutes)
7. Questions, comments, and input (5 minutes)
8. Adjourn

Des Moines County Multi Jurisdictional Pre-Disaster Hazard Mitigation Plan Meeting Sign-In Sheet

DATE/TIME: August 19th, 2015 @5:30 PM LOCATION: Burlington, IA Public Library

Name	Title	Organization	E-mail	Community	Check if fire, police, or elected official being compensated for participation
Gina Hardin	Coordinator	Des Moines Co Emer. Mgmt	harding@dmcounty.com	County	☒
Jim Fenneau	City Manager	City of Burlington	fenneauj@burlingtoniowa.org	Burlington	☐
Matt Trexel	Fire Chief	Burlington Fire Dept.	trexelm@burlingtoniowa.org	Burlington	☐
RAY WILSON	CITY EM REP	CITY OF MEDIAPOLIS	RAYWILSN@MEPOTELCO.NET	MEDIAPOLIS	☐
Johnny Platt	Director	DESCOM Des Moines Co. 911	PLATTJ@DESCOM.ORG	County	☐
Grant Hollyer	PD	BPD	hillyerg@burlington	Burlington	☐
Michael Bloomme	PD	BPD	bloommem burlingtonia	Burlington	☐
Zach Ahrens	PD	BPD	ahrensz@burlington.org	Burlington	☐
					☐
					☐
					☐
					☐

Des Moines County Multi-Jurisdictional Pre-Disaster Hazard Mitigation Plan
Public Input Meeting Minutes

August 19th, 2015 @ 5:30pm

Location:

Burlington Public Library
210 Court St.
Burlington, IA 52601

Participants: 7
Ray Wilson, Emergency Representative, City of Mediapolis
Jim Ferneau, City Manager, City of Burlington
Matt Trexel, Fire Chief, City of Burlington
Johnny Platt, Director, Des Moines County 911
Grant Hillyer, Police Officer, City of Burlington
Michael Bloomer, Police Officer, City of Burlington
Zach Ahrens, Police Officer, City of Burlington

Staff: 3
Zach James, Planning Director, SEIRPC
Emery Ellingson, Planner, SEIRPC
Gina Hardin, Emergency Management Coordinator, Des Moines County

CALL TO ORDER

- The meeting was called to order by Zach James at 5:30 pm.

AGENDA

- James explained the meeting agenda and points to accomplish. He stated that the meeting discussion could deviate from the agenda structure if anyone had particular questions related to the comprehensive review of the document draft.

WELCOME/INTRODUCTIONS

- Zach James (SEIRPC Planning Director) welcomed public input participants (committee members). An attendance sheet was circulated for the public to sign.

PREVIOUS MEETING REVIEW/GOALS DISCUSSION

- James provided a comprehensive introduction to the document and explained to the public participants both the content and the purpose of the document.

REVIEW OF DRAFT HAZARD MITIGATION PLAN DOCUMENT

- Copies of the document and its appendices were provided to the public for review. James provided further explanation regarding the content of each section of the document as well as the processes utilized to create it.
- During this time, the public engaged in review and discussion about the document, especially in relation to federal funding and declared disasters.

QUESTIONS, CONCERNS, AND INPUT

- During this time, several corrections and alterations to the current document were suggested by members of the public. These changes were noted and made to the document following the meeting.

QUESTIONS, PREVIEW NEXT MEETING, AND FUTURE OF THE PLAN

- James explained that the next step, following the finalizing of all changes and alterations would be submittal to the state and FEMA for official review. James also indicated that, pending approval, the plan would then need to approved by resolution by the administrative body for all the organizations listed in the plan.

ADJOURNMENT

- The meeting was officially adjourned at 7:30 PM

Worksheet # 1: Progress Report

Progress Report Period: _____ (Date) to _____ (Date)

Project Title: _____ Project ID#: _____

Responsible Agency: _____

Address: _____

City/County: _____

Contact Person: _____ Title: _____

Phone #(s): _____ e-mail address: _____

List Supporting Agencies and Contacts: _____

_____

Total Project Cost: $_____ Anticipated Cost Overrun/Under run: _____

Date of Project Approval: _____ Start date of the project: _____

Anticipated completion date: _____

Description of the Project (include a description of each phase, if applicable, and the time frame for completing each phase).

Milestones	Complete	Projected Date of Completion

_____
_____

Plan Goal(s)/Objective(s) Addressed:

Goal: _____

Objective: _____

Indicator of Success (e.g., losses avoided as a result of the acquisition program):
In most cases, you will list losses avoided as the indicator. In cases where it is difficult to quantify the benefits in dollar amounts, you will use other indicators, such as the number of people who now know about mitigation or who are taking mitigation actions to reduce their vulnerability to hazards.

_____
_____
_____

Status *(Please checks pertinent information and provide explanations for items with an asterisk. For completed or canceled projects, see Worksheet #2 — to complete a project evaluation):*

Project Status	Project Cost Status
(1) ☐ Project on schedule	(1) ☐ Cost unchanged
(2) ☐ Project completed	(2) ☐ Cost overrun* *explain: _____ _____
(3) ☐ Project delayed* *explain: _____ _____	(3) ☐ Cost under run* *explain: _____ _____
(4) ☐ Project canceled	

Summary of progress on project for this report:

A. What was accomplished during this reporting period?

B. What obstacles, problems, or delays did you encounter, if any?

C. How was each problem resolved?

_____
_____

Next Steps: What is/are the next step(s) to be accomplished over the next reporting period?

Worksheet #2: Evaluating Your Planning Team

When gearing up for the plan evaluation, the planning team should reassess its composition and ask the following questions:

	YES	NO
Have there been local staffing changes that would warrant inviting different members to the planning team? Comments/Proposed Action:		
Are there organizations that have been invaluable to the planning process or to project implementation that should be represented on the planning team? Comments/Proposed Action:		
Are there any representatives of essential organizations who have not fully participated in the planning and implementation of actions? If so, can someone else from this organization commit to the planning team? Comments/Proposed Action:		
Are there procedures (e.g., signing of MOAs, commenting on submitted progress reports, distributing meeting minutes, etc.) that can be done more efficiently? Comments/Proposed Action:		
Are there ways to gain more diverse and widespread cooperation? Comments/Proposed Action:		
Are there different or additional resources (financial, technical, and human) that are now available for mitigation planning? Comments/Proposed Action:		

If the planning team determines the answer to any of these questions is "yes," some changes may be necessary.

Worksheet #3: Evaluate Your Project Results

Project Name and Number: Project Budget: Project Description: Associated Goal and Objective (s): Indicator of Success (e.g., losses avoided):	*Insert location map* *include before and after photos if appropriate*

Was the action implemented?

IF YES ↓

What were the results of the implemented action?

IF NO ↓

Why not?

Was there political support for the action?	YES	NO
Were enough funds available?	YES	NO
Were workloads equitably or realistically distributed?	YES	NO
Was new information discovered about the risks or community that made implementation difficult or no longer sensible?	YES	NO
Was the estimated time of implementation reasonable?	YES	NO
Were sufficient resources (for example staff and technical assistance) available?	YES	NO

Were the outcomes as expected? **YES** **NO** Additional comments or other outcomes:
If No, please explain:

Did the results achieve the goal and objective (s)? **YES** **NO**
Explain how:

↓

Was the action cost-effective? YES NO
Explain how or how not:

What were the losses avoided after having completed the project?

If it was a structural project, how did it change the hazard profile?

Date _____

Prepared by: _____

Worksheet #4: Revisit Your Risk Assessment

Risk Assessment Steps	Questions	YES	NO	COMMENTS
Identify hazards	Are there new hazards that can affect your community?			
Profile hazard events	Are new historical records available?			
	Are additional maps or new hazard studies available?			
	Have chances of future events (along with their magnitude, extent, etc.) changed?			
	Have recent and future development in the community been checked for their effect on hazard areas?			
Inventory assets	Have inventories of existing structures in hazard areas been updated?			
	Are future developments foreseen and accounted for in the inventories?			
	Are there any new special high-risk populations?			
Estimate losses	Have loss estimates been updated to account for recent changes?			

If you answered "Yes" to any of the above questions, review your data and update your risk assessment information accordingly

Worksheet #5: Revise the Plan

Prepare to update the plan.

When preparing to update the plan:	Check the box when addressed ✓
1. Gather information, including project evaluation worksheets, progress reports, studies, related plans, etc. Comments:	☐
2. Reconvene the planning team, making changes to the team composition as necessary (see results from *Worksheet #2*). **Comments:**	☐

Consider the results of the evaluation and new strategies for the future.

When examining the community consider:	Check the box when addressed ✓
1. The results of the planning and outreach efforts. Comments:	☐
2. The results of the mitigation efforts. Comments:	☐
3. Shifts in development trends. **Comments:**	☐
4. Areas affected by recent disasters. **Comments:**	☐
5. The recent magnitude, location, and type of the most recent hazard or disaster. **Comments:**	☐
6. New studies or technologies. **Comments:**	☐
7. Changes in local, state, or federal laws, policies, plans, priorities, or funding. **Comments:**	☐

8. Changes in the socioeconomic fabric of the community. ☐

Comments:

9. Other changing conditions. ☐

Comments:

Incorporate your findings into the plan.

When examining the plan:	**Check the box when addressed ✓**
1. Revisit the risk assessment.	☐
Comments:	
2. Update your goals and strategies.	☐
Comments:	
3. Recalculate benefit-cost analyses of projects to prioritize action items.	☐
Comments:	

Use the following criteria to evaluate the plan:

Criteria	**YES**	**NO**	**Solution**
Are the goals still applicable?			
Have any changes in the state or community made the goals obsolete or irrelevant?			
Do existing actions need to be reprioritized for implementation?			
Do the plan's priorities correspond with state priorities?			
Can actions be implemented with available resources?			

Comments:

Appendix K. Des Moines County | Resolutions of Adoption

RESOLUTION NO. _____

A RESOLUTION OF DES MOINES COUNTY, IOWA ADOPTING THE DES MOINES COUNTY MULTI-JURISDICTIONAL PRE-DISASTER MITIGATION PLAN UPDATE, 2015

WHEREAS Des Moines County, Iowa recognizes the threat that natural and man-made hazards pose to people and property within Des Moines County; and

WHEREAS Des Moines County, Iowa has prepared a multi-hazard mitigation plan, hereby known as *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015* in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015* identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in all of Des Moines County from the impacts of future hazards and disasters; and

WHEREAS adoption by the County Board of Supervisors of Des Moines County, Iowa demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015,*

NOW THEREFORE, BE IT RESOLVED THAT the Board of Supervisors of Des Moines County, Iowa adopts the *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015*.

ADOPTED this 1st day of Sept, 2015.

By: Robert W. Beck
Robert Beck, County Supervisor
By: _____
Thomas Broeker, County Supervisor
By: Jim Cary
Jim Cary, County Supervisor

ATTEST:

By: Carol S. Copeland
Carol S. Copeland, County Clerk

APPROVED
SEP 01 2015
BOARD OF SUPERVISORS

A RESOLUTION OF SOUTHEASTERN COMMUNITY COLLEGE ADOPTING THE DES MOINES COUNTY MULTI-JURISDICTIONAL PRE-DISASTER MITIGATION PLAN UPDATE, 2015

WHEREAS Southeastern Community College recognizes the threat that natural and man-made hazards pose to people and property within Southeastern Community College; and

WHEREAS Des Moines County, Iowa, has prepared a multi-hazard mitigation plan, hereby known as *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015,* in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015,* identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in all of Des Moines County, including Southeastern Community College, from the impacts of future hazards and disasters; and

WHEREAS adoption by the Board of Trustees of Southeastern Community College demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015,*

NOW THEREFORE, BE IT RESOLVED THAT the Board of Trustees of Southeastern Community College adopts the *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015.*

ADOPTED this 14th day of December, 2015.

By: _____

By: Moudy Nabulsi Title: Chair, Board of Trustees

ATTEST:

By: _____

By: Sherry Zeller Title: Secretary, Board of Trustees

Resolution 2015-36

A RESOLUTION OF DANVILLE, IOWA ADOPTING THE DES MOINES COUNTY MULTI-JURISDICTIONAL PRE-DISASTER MITIGATION PLAN UPDATE, 2015

WHEREAS Danville, Iowa recognizes the threat that natural and man-made hazards pose to people and property within the City of Danville; and

WHEREAS Des Moines County, Iowa has prepared a multi-hazard mitigation plan, hereby known as *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015* in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015* identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in all of Des Moines County, including the City of Danville, from the impacts of future hazards and disasters; and

WHEREAS adoption by the City Council of the City of Danville, Iowa demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015*,

NOW THEREFORE, BE IT RESOLVED THAT the City Council of the City of Danville, Iowa adopts the *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015*.

Passed and approved this 7th day of December, 2015.

Trent A. Henkelvig, Mayor

ATTESTED BY:

Susan K. Rogers, City Clerk

Roll Call Vote:

Worthy – aye
Lippert – aye
Strause – aye
Fraise – aye
Cole – absent

RESOLUTION NO. _____

A RESOLUTION OF TWO RIVERS LEVEE AND DRAINAGE DISTRICT ADOPTING THE DES MOINES COUNTY MULTI-JURISDICTIONAL PRE-DISASTER MITIGATION PLAN UPDATE, 2015.

WHEREAS Two Rivers Levee and Drainage District recognizes the threat that natural and man-made hazards pose to people and property within the Two Rivers Levee and Drainage District; and

WHEREAS Des Moines County, Iowa has prepared a multi-hazard mitigation plan, hereby known as Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2-5 in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in all of Des Moines County, including the Two Rivers Levee and Drainage District, from the impacts of future hazards and disaster; and

WHEREAS adoption by the Board of the Two Rivers Levee and Drainage District demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015.

NOW THEREFORE, BE IT RESOLVED THAT the Board of Two Rivers Levee and Drainage District adopts the Des Moines County Multi-Jurisdictional Pre Disaster Mitigation Plan Update, 2015.

ADOPTED THIS 8 day of December, 2015.

By: Kirk Sigle

By: Kirk Sigle (Print) Title: Chair (Print)

ATTEST:

By: Vicki A. Stoller

By: VICKI A. STOLLER (Print) Title: ADMINISTRATOR (Print)

RESOLUTION NO. _____

A RESOLUTION OF IOWA ARMY AMMUNITION PLANT ADOPTING THE DES MOINES COUNTY MULTI-JURISDICTIONAL PRE-DISASTER MITIGATION PLAN UPDATE, 2015

WHEREAS IOWA ARMY AMMUNITION PLANT recognizes the threat that natural and man-made hazards pose to people and property within the IOWA ARMY AMMUNITION PLANT; and

WHEREAS Des Moines County, Iowa has prepared a multi-hazard mitigation plan, hereby known as *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015* in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015* identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in all of Des Moines County, including the IOWA ARMY AMMUNITION PLANT, from the impacts of future hazards and disasters; and

WHEREAS adoption by IOWA ARMY AMMUNITION PLANT demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015*,

NOW THEREFORE, BE IT RESOLVED THAT IOWA ARMY AMMUNITION PLANT adopts the *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015*.

ADOPTED this 2ND day of DEC., 2015.

By: _____

By: ALLEN BUREN Title: EMERGENCY MANAGER
(Print) (Print)

ATTEST:

By: _____

By: _____ Title: _____
(Print) (Print)

RESOLUTION NO. _____

A RESOLUTION OF DANVILLE COMMUNITY SCHOOL DISTRICT ADOPTING THE DES MOINES COUNTY MULTI-JURISDICTIONAL PRE-DISASTER MITIGATION PLAN UPDATE, 2015

WHEREAS Danville Community School District recognizes the threat that natural and man-made hazards pose to people and property within the Danville Community School District; and

WHEREAS Des Moines County, Iowa has prepared a multi-hazard mitigation plan, hereby known as *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015* in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015* identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in all of Des Moines County, including the Danville Community School District, from the impacts of future hazards and disasters; and

WHEREAS adoption by the School Board of the Danville Community School District demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015*,

NOW THEREFORE, BE IT RESOLVED THAT the School Board of the Danville Community School District adopts the *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015*.

ADOPTED this 14 day of December, 2015.

By: Sandra L. Dockendorff
By: Sandra L. Dockendorff Title: President
(Print) (Print)

ATTEST:

By: Christa Seibert
By: Christa Seibert Title: Business Manager
(Print) (Print)

10.02

RESOLUTION NO. 10.02

A RESOLUTION OF MEDIAPOLIS COMMUNITY SCHOOL DISTRICT ADOPTING THE DES MOINES COUNTY MULTI-JURISDICTIONAL PRE-DISASTER MITIGATION PLAN UPDATE, 2015

WHEREAS Mediapolis Community School District, Iowa recognizes the threat that natural and man-made hazards pose to people and property within the Mediapolis Community School District; and

WHEREAS Des Moines County, Iowa has prepared a multi-hazard mitigation plan, hereby known as *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015* in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015* identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in all of Des Moines County, including the Mediapolis Community School District, from the impacts of future hazards and disasters; and

WHEREAS adoption by the School Board of the Mediapolis Community School District, Iowa demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015*,

NOW THEREFORE, BE IT RESOLVED THAT the Board of Education of the Mediapolis Community School District adopts the *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015*.

ADOPTED this 14th day of December, 2015.

By: _____, Board of Education President
(Print): BJ Coates, Board of Education President

ATTEST:

By: Dawn Kelly, Board Secretary
(Print): Dawn R Kelly

RESOLUTION 39-2015

A RESOLUTION OF MEDIAPOLIS, IOWA ADOPTING THE DES MOINES COUNTY MULTI-JURISDICTIONAL PRE-DISASTER MITIGATION PLAN UPDATE, 2015

WHEREAS, Mediapolis, Iowa recognizes the threat that natural and man-made hazards pose to people and property within the City of Mediapolis; and

WHEREAS, Des Moines County, Iowa has prepared a multi-hazard mitigation plan, hereby known as *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015* in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015* identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in all of Des Moines County, including the City of Mediapolis, from the impacts of future hazards and disasters; and

WHEREAS, adoption by the City Council of the City of Mediapolis, Iowa demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015.*

NOW, THEREFORE, BE IT RESOLVED THAT the City Council of the City of Mediapolis, Iowa adopts the *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015.*

PASSED, APPROVED AND ADOPTED THIS 21st day of December, 2015.

Larry Flaherty, Mayor

ATTEST:

Julia Tribbey, City Clerk

RESOLUTION NO. _____

A RESOLUTION OF WEST BURLINGTON INDEPENDENT SCHOOL DISTRICT ADOPTING THE DES MOINES COUNTY MULTI-JURISDICTIONAL PRE-DISASTER MITIGATION PLAN UPDATE, 2015

WHEREAS West Burlington Independent School District recognizes the threat that natural and man-made hazards pose to people and property within the West Burlington Independent School District; and

WHEREAS Des Moines County, Iowa has prepared a multi-hazard mitigation plan, hereby known as *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015* in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015* identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in all of Des Moines County, including the West Burlington Independent School District, from the impacts of future hazards and disasters; and

WHEREAS adoption by the School Board of the West Burlington Independent School District demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015*,

NOW THEREFORE, BE IT RESOLVED THAT the School Board of the West Burlington Independent School District adopts the *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015*.

ADOPTED this 21 day of Dec., 2015.

By: _____
Dan Hockett, School Board President

ATTEST:

By: _____

RESOLUTION NO. _____

A RESOLUTION OF BURLINGTON COMMUNITY SCHOOL DISTRICT, IOWA ADOPTING THE DES MOINES COUNTY MULTI-JURISDICTIONAL PRE-DISASTER MITIGATION PLAN UPDATE, 2015

WHEREAS Burlington Community School District, Iowa recognizes the threat that natural and man-made hazards pose to people and property within the Burlington Community School District; and

WHEREAS Des Moines County, Iowa has prepared a multi-hazard mitigation plan, hereby known as *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015* in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015* identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in all of Des Moines County, including the Burlington Community School District, from the impacts of future hazards and disasters; and

WHEREAS adoption by the School Board of the Burlington Community School District, Iowa demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015*,

NOW THEREFORE, BE IT RESOLVED THAT the Board of Directors of the Burlington Community School District, Iowa adopts the *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015*.

ADOPTED this 14th day of December, 2015.

By: Marlis Robberts

By: Marlis Robberts Title: Board President
(Print) (Print)

ATTEST:

By: Gregory A. Reynolds

By: Gregory A. Reynolds Title: Board Secretary
(Print) (Print)

RESOLUTION 2015 – 64

ADOPTING THE DES MOINES COUNTY MULTI-JURISDICTIONAL PRE-DISASTER MITIGATION PLAN UPDATE, 2015

WHEREAS, As the governing body of the incorporated areas of the City of West Burlington, the City Council recognizes the threat that natural and man-made hazards pose to people and property within the City of West Burlington; and

WHEREAS, Des Moines County, Iowa has prepared a multi-hazard mitigation plan, hereby known as Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015 in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in all of Des Moines County, including the City of West Burlington, from the impacts of future hazards and disasters; and

WHEREAS, adoption by the City Council of the City of West Burlington, Iowa demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015,

NOW THEREFORE, BE IT RESOLVED that the City Council of the City of West Burlington, Iowa adopts the Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015.

Council Member Lees moved the foregoing Resolution be adopted. Council Member Steward seconded the motion to adopt.

Members of the City Council of the City of West Burlington, Iowa, voted as follows to adopt the Resolution:

AYES: Steward, Lees, Ervine, Raleigh

NAYS: None

WHEREUPON, the Mayor declared this Resolution duly adopted. Passed and approved this 16th day of December, 2015.

Hans K. Trousil, Mayor

ATTEST:

Kelly D. Fry, City Clerk

RESOLUTION NO. _____

A RESOLUTION OF BURLINGTON NOTRE DAME SCHOOLS ADOPTING THE DES MOINES COUNTY MULTI-JURISDICTIONAL PRE-DISASTER MITIGATION PLAN UPDATE, 2015

WHEREAS Burlington Notre Dame Schools recognizes the threat that natural and man-made hazards pose to people and property within the Burlington Notre Dame Schools; and

WHEREAS Des Moines County, Iowa has prepared a multi-hazard mitigation plan, hereby known as *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015* in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015* identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in all of Des Moines County, including the Burlington Notre Dame Schools, from the impacts of future hazards and disasters; and

WHEREAS adoption by the School Board of the Burlington Notre Dame Schools demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015*,

NOW THEREFORE, BE IT RESOLVED THAT the School Board of the Burlington Notre Dame Schools adopts the *Des Moines County Multi-Jurisdictional Pre-Disaster Mitigation Plan Update, 2015*.

ADOPTED this 25 day of January 2016.

By: Deb Trine

By: Deb Trine (Print) Title: Business Manager (Print)

ATTEST:

By: [signature]

By: Bill Maupin (Print) Title: Principal (Print)