Jurisdiction: **Dallas County, IA**	**Title of Plan:** Dallas County, Iowa Multi-jurisdictional Hazard Mitigation Plan	**Date of Plan:** November 2012
Local Point of Contact: Mr. Barry Halling **Title:** Emergency Management Coordinator **Agency:** Dallas County Emergency Management	**Address:** 121 N. 9th Street Adel, IA 50003	
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Funding Source: HMGP 1880		
State Reviewer:	**Title:**	**Date:**
FEMA Reviewer: Lynnis Jameson Michelle Wolfe	**Title:** Plan Reviewer Plan Reviewer	**Date:** 12/13/2012 12/14/2012
Date Received in FEMA Region VII	11/20/2012	
Plan Not Approved		
Plan Approvable Pending Adoption	12/14/2012	
Plan Approved		

Jurisdiction:	NFIP Status*	
	Y	**NP**
1. Dallas County	Y	
2. City of Adel	Y	
3. City of Bouton		NP
4. City of Dallas Center	Y	
5. City of Dawson	Y	
6. City of DeSoto	Y	
7. City of Dexter		S
8. City of Granger	Y	
9. City of Linden		NP
10. City of Minburn		NP
11. City of Perry	Y	
12. City of Redfield	Y	
13. City of Van Meter	Y	
14. City of Waukee	Y	
15. City of Woodward		NP
16. Adel-DeSoto-Minburn Schools		N/A
17. Dallas Center-Grimes Schools		N/A
18. Perry Schools		N/A
19. Van Meter Schools		N/A
20. Waukee Schools		N/A
21. West Central Valley Schools		N/A
22. Woodward-Granger Schools		N/A

*** Notes: Y = Participating NP = Not Participating in NFIP S- Sanctioned R-Rescinded**

SECTION 1: REGULATION CHECKLIST

1. REGULATION CHECKLIST **Regulation** (44 CFR 201.6 Local Mitigation Plans)	**Location in Plan** (section and/or page number)	**Met**	**Not Met**
ELEMENT A. PLANNING PROCESS			
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))	Executive Summary p. ii to iii, Chapter 1 p. 1.3-1.8 & Appendix B meeting minutes	✓	
A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))	Chapter 1, p. 1.11-1.12	✓	
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))	Chapter 1, p. 1.8-1.11	✓	
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))	Chapter 1, p. 1.11-1.12; Chapter 3 (information from existing plans, studies, reports, and technical information cited throughout); Appendix A - References	✓	
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))	Chapter 5, p.5.3-5.4	✓	
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))	Chapter 5, p.5.1-5.3	✓	
ELEMENT A: REQUIRED REVISIONS			

1. REGULATION CHECKLIST (continued) **Regulation** (44 CFR 201.6 Local Mitigation Plans)	Location in Plan (section and/or page number)	Met	Not Met
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT			
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))	Chapter 3, Section 3.1 Hazard Identification (p.3.2-3.9); Section 3.4 Hazard Profiles & Vulnerability, Description Sections (p. 3.40-3.209)	✓	
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))	Chapter 3, Section 3.4 Hazard Profiles, Previous Occurrences Sections (p. 3.40-3.209)	✓	
B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))	Chapter 3, Section 3.4 Hazard Profiles, Geographic Location/Extent, Previous Occurrences, Vulnerability Overview, Potential Losses to Existing Development, future Development (p. 3.40-3.209) and Section 3.5 Hazard Analysis Summaries p. 3.210	✓	
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))	Chapter 3, Section 3.4.12 (p. 3.155)	✓	
ELEMENT B: REQUIRED REVISIONS			
ELEMENT C. MITIGATION STRATEGY			
C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))	Chapter 2, Section 2.2 (p. 2.10-2.51).	✓	
C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))	Chapter 2, Section 2.2 each jurisdiction's capability table (p.2.10-2.51); Chapter 3, Section 3.4 (p. 3.154); Chapter 4 (4.6-4.12)	✓	
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))	Chapter 4 (p. 4.1-4.2)	✓	
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))	Chapter 4 (p. 4.6-4.102); Appendix C	✓	

1. REGULATION CHECKLIST (continued) **Regulation** (44 CFR 201.6 Local Mitigation Plans)	**Location in Plan** (section and/or page number)	**Met**	**Not Met**
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))	Chapter 4 (p. 4.4-4.5) and (p. 4.6-4.102)	✓	
C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))	Chapter 5 (p. 5.3)	✓	
ELEMENT C: REQUIRED REVISIONS			
ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION (applicable to plan updates only)			
D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))	Only for City of Perry. Chapter 3, Section 3.3 Future Land Use & Development (p. 3.30-3.33)	✓	
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))	Only for City of Perry. Chapter 4 (p.4.58- 4.71)	✓	
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))	Only for City of Perry. Chapter 4 (p.4.58- 4.71)	✓	
ELEMENT D: REQUIRED REVISIONS			
ELEMENT E. PLAN ADOPTION			
E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))			✓
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))			✓

ELEMENT E: REQUIRED REVISIONS

Written proof that all jurisdictions' governing bodies have formally adopted the plan (usually a resolution) must be submitted to FEMA. *See Local Multi-Hazard mitigation Planning Guidance (July 2008) pages 17-18.*

Note: If the plan is not adopted by a participating jurisdiction, that jurisdiction would not be eligible for project grants under the following hazard mitigation assistance programs: HMGP, PDM, FMA, and SRL.

PENDING APA

SECTION 2: PLAN ASSESSMENT

A. Plan Strengths and Opportunities for Improvement

This section provides a discussion of the strengths of the plan document and identifies areas where these could be improved beyond minimum requirements.

Element A: Planning Process

Plan Strengths

- The inclusion of a widely-distributed community survey with sample public comments from the survey, as well as a comparison of the ranking results from the public versus the planning committee was well done. The detailed documentation of the process in Appendix B is helpful in illuminating the plan conclusions as well as giving any of the public who read the plan a sensation of participation.
- The plan is well organized as a Multi-Jurisdictional plan. It is not repetitive, yet highlights the differences among jurisdictions.
- The Capabilities Table in Section 2 Community Profiles for both cities and school districts is extensive and helpful.

Element B: Hazard Identification and Risk Assessment

Plan Strengths

- The Future Land Use and Development maps and discussions in Section 3 use comprehensive plan material well and clarify the relationship between development and hazards.
- The level of analysis for individual hazards is directly tied to the mitigation strategy by a sound decision-making process.
    - There is a good section on Upstream Dams Outside the Planning Area.
    - The probability calculations for extreme heat events are detailed.
    - The analysis of the potential damage from hail is sensible and weighs factors carefully.
    - The entire River Flooding section provides a model for developing realistic estimates of risk.
    - The Tornado Potential Loss Scenarios in the Tornado risk assessment section provide multiple scenarios for various population densities.

Opportunities for Improvement

- Adding the potential areas for future development found in Section 3.3 as one of the overlays for the Floodplain/Critical Facilities maps would make them even more helpful in future plan updates.
- Hazard Score Element Definitions use the same methodology as the State uses. The categories overlap in some cases, i.e. Magnitude: Limited - 10% to 25%; Critical – 25% to 50%. It would be helpful to eliminate the overlap in future plan updates.
- In future plan updates of Earthquake hazards, a justification as to why a magnitude 6.7 (p. 3.78) earthquake was selected for calculating damage dollar losses would be helpful. I.e. is this the most likely scenario, even if an earthquake occurs only every few millennia, or is a lower level of magnitude more likely?
- Future updates regarding Flash Flooding would benefit from maps of areas that regularly have flash floods, such as parts of Dallas Center and the unincorporated County, and a discussion of why they are particularly vulnerable.

Element C: Mitigation Strategy

Plan Strengths

- The Capabilities Table in Section 2 Community Profiles for both cities and school districts is extensive and helpful.

- There was a good approach and explanation in the plan as to how goal setting was done. The goals appear to be well-tailored to the area.
- The plan contains a good discussion of cost-benefit process.
- Mitigation Action Implementation sheets are well done. The level of detail could help make implementation more likely.

B. Resources for Implementing Your Approved Plan

A variety of mitigation resources are available to communities. The Iowa Homeland Security & Emergency Management website: http://www.iowahomelandsecurity.org/disasters/hazard_mitigation.html provides planning and project related information as well as details on how major FEMA mitigation programs are implemented in the State.

HSEMD's training website provides information on upcoming training opportunities within the State: http://homelandsecurity.iowa.gov/training/.

Various funding programs are available from several state and federal agencies to assist local jurisdictions in accomplishing their mitigation activities and goals. A detailed listing of programs, information on each program, and contact information is also available from the 2010 State Hazard Mitigation Plan.

Review of the FEMA HMA guidance (FY11 is the most current) is also encouraged as guidance provides information about application and eligibility requirements. This guidance is available from http://www.iowahomelandsecurity.org/grants/HMA.html or through FEMA's grant applicant resources page at http://www.fema.gov/government/grant/hma/grant_resources.shtm.

- The FEMA Hazard mitigation planning site http://www.fema.gov/plan/mitplanning/index.shtm contains the official guidance to meet the requirements of the Stafford Act, as well as other resources and procedures for developing and updating hazard mitigation plans.
- FEMA offers a Mitigation Best Practices Portfolio where communities can learn from others' successes, share their own successes, use the FEMA library, find detailed information and maps on hazards, read case studies, and find other resources for becoming a more resilient community: http://www.fema.gov/plan/prevent/bestpractices/index.shtm

The Department of Homeland Security's Federal Emergency Management Agency (FEMA) recently launched the new FEMA.gov. Please be informed that many of the most popular Hazard Mitigation Assistance web links have changed:

- Where can I get information on Hazard Mitigation Assistance? https://www.fema.gov/hazard-mitigation-assistance
- Hazard Mitigation Grant Program: https://www.fema.gov/hazard-mitigation-grant-program
- Pre-Disaster Mitigation Program: https://www.fema.gov/pre-disaster-mitigation-grant-program
- Flood Mitigation Assistance Program: https://www.fema.gov/flood-mitigation-assistance-program
- **Fiscal Year 2011 Unified Guidance (with updated links)**: http://www.fema.gov/library/viewRecord.do?id=4225
  The Hazard Mitigation Assistance Unified Guidance dated June 1, 2010 applies to HMGP for disasters declared on or after June 1, 2010.
- Grant Applicant Resources : https://www.fema.gov/site-page/grant-applicant-resources
- Application Process: https://www.fema.gov/site-page/application-development-and-process
- Environmental and Historic Preservation (EHP) At-A-Glance: http://www.fema.gov/library/viewRecord.do?id=5904 This document provides information on

how to incorporate environmental and historic preservation considerations into your Hazard Mitigation Assistance application and project.

- Version 4.8 of the Benefit Cost Analysis Software is now available. The updated toolkit and updated training materials are available on the Benefit Cost Analysis website at http://www.fema.gov/benefit-cost-analysis.

If you need additional information contact the Hazard Mitigation Assistance Helpline at (866) 222-3580 or email hmagrantshelpline@fema.dhs.gov. Please allow up to 5 business days for a response.

Dallas County, Iowa

Multi-Jurisdictional Hazard Mitigation Plan

October 2012

Developed by Dallas County with professional assistance from
AMEC Environment & Infrastructure, Inc.
Homeland Security and Emergency Management

Dallas County Hazard Mitigation Planning Committee

Name		Agency/Organization
Jim	McNeill	City of Adel
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Camilla	McCain	City of Bouton
Betty	Tingwald	City of Bouton
Cindy	Riesselman	City of Dallas Center
Clarence	Norman	City of Dawson
Billy	Samuel	City of Dawson
Nick	Eikstein	City of DeSoto
Marcia	Thomas	City of DeSoto
Dan	VanLagen	City of DeSoto
Tawnee	Eckhart	City of Dexter
Mike	Grief	City of Granger
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Brian	Eiterman	City of Perry
Chris	Hinds	City of Perry
Mary	Murphy	City of Perry
Lori	Riley	City of Perry
Steve	Tibble	City of Perry
Eric	Vaughn	City of Perry
Josh	Wuebker	City of Perry
Tyler	Clausen	City of Redfield
Terry	Dunielson	City of Redfield
John	Hoy	City of Redfield
Deb	Light	City of Redfield
Allan	Adams	City of Van Meter
Jake	Anderson	City of Van Meter
Adam	Coyle	City of Van Meter
Gary	Herrick	City of Van Meter
Bob	Lacy	City of Van Meter
David	Herman	City of Van Meter
Clint	Robinson	City of Waukee
Valerie	Purvis	City of Woodward
Jim	George	Dallas County

Name		Agency/Organization
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Lynn	Royer	Dallas County
Tom	Tierney	Dallas County
Barry	Halling	Dallas County Emergency Management
Greg	Dufoe	Adel-DeSoto-Minburn Schools
Scott	Grimes	Dallas Center-Grimes Schools
Kathy	Moline	Dallas Center-Grimes Schools
Lynn	Ubben	Perry Schools
Kevin	McLaughlin	Perry Schools & Perry Fire
Kelly	Bell	Van Meter School
John C.	Carver	Van Meter School
Deron	Durflinger	Van Meter Schools
Keith	Elmquist	Waukee Schools
Eric	Rose	Waukee Schools
Dave	Wilkerson	Waukee Schools
David	Arnold	West Centeral Valley Schools
Brad	Anderson	Woodward Granger Schools
Peggy	Reelitz	Polk County
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EXECUTIVE SUMMARY

The purpose of hazard mitigation is to reduce or eliminate long-term risk to people and property from hazards. Dallas County and participating jurisdictions developed this multi-jurisdictional local hazard mitigation plan to reduce future losses to the County and its communities resulting from natural hazards. The plan was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 and to achieve eligibility for the Federal Emergency Management Agency (FEMA) Hazard Mitigation Assistance Grant Programs.

The Dallas County Multi-Hazard Mitigation Plan is a multi-jurisdictional plan that covers the following 22 jurisdictions that participated in the planning process:

- Dallas County
- City of Adel
- City of Bouton
- City of Dallas Center
- City of Dawson
- City of DeSoto
- City of Dexter
- City of Granger
- City of Linden
- City of Minburn
- City of Perry
- City of Redfield
- City of Van Meter
- City of Waukee
- City of Woodward
- Adel-DeSoto-Minburn Schools
- Dallas Center-Grimes Schools
- Perry Schools
- Van Meter Schools
- Waukee Schools
- West Central Valley Schools
- Woodward-Granger Schools

For the City of Perry, this plan serves as the plan update to their Local Hazard Mitigation Plan that was developed and approved by FEMA in 2005. For all other jurisdictions, this is an initial Local Hazard Mitigation Plan. The County's planning process followed a methodology prescribed by FEMA, which began with the formation of a Hazard Mitigation Planning Committee (HMPC) comprised of key stakeholders from Dallas County and participating jurisdictions. The HMPC conducted a risk assessment that identified and profiled hazards that pose a risk to Dallas County, assessed the County's vulnerability to these hazards, and

examined the capabilities in place to mitigate them. The County is vulnerable to several hazards that are identified, profiled, and analyzed in this plan. Riverine and flash flooding, winter storms, tornadoes and windstorms are among the hazards that can have a significant impact on the County.

Based upon the risk assessment, the HMPC identified goals for reducing risk from hazards. Goals Developed by the Hazard Mitigation Planning Committee are listed below:

- Protect critical facilities and infrastructure from natural hazards;
- Create a disaster resistant community by improving public understanding of natural hazards and risk by providing public awareness, preparedness, and mitigation information through various channels of communication;
- Improve capabilities to mitigate natural hazards by incorporating mitigation strategies in plans, policies, and programs;
- Prevent or reduce the impact of natural hazards for the residents, businesses, and municipalities of Dallas County;
- Strengthen communication among agencies and between agencies and the public.

To meet the identified goals, the plan recommends the mitigation actions detailed in Chapter 4. The HMPC developed an implementation plan for each action, which identifies priority level, background information, ideas for implementation, responsible agency, timeline, cost estimate, potential funding sources, and more. These additional details are also provided in Chapter 4.

PREREQUISITES

44 CFR requirement 201.6(c)(5): The local hazard mitigation plan shall include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan. For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.

Note to Reviewers*: When this plan has been reviewed and approved pending adoption by FEMA Region VII the adoption resolutions will be signed by the participating jurisdictions and added to Appendix D. A model resolution is provided.*

The following jurisdictions participated in the development of this plan and have adopted the multi-jurisdictional plan. Resolutions of Adoptions are included in Appendix D.

- Dallas County
- City of Adel
- City of Bouton
- City of Dallas Center
- City of Dawson
- City of DeSoto
- City of Dexter
- City of Granger
- City of Linden
- City of Minburn
- City of Perry
- City of Redfield
- City of Van meter
- City of Waukee
- City of Woodward
- Adel-DeSoto-Minburn Schools
- Dallas Center-Grimes Schools
- Perry Schools
- Van Meter Schools
- Waukee Schools
- West Central Valley Schools
- Woodward-Granger Schools

Model Resolution

Resolution # _____

Adopting the Dallas County Multi-Jurisdictional Local Hazard Mitigation Plan

Whereas, the (Name of Government/District/Organization seeking FEMA approval of hazard mitigation plan) recognizes the threat that natural hazards pose to people and property within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

Whereas, the U.S Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards;

Whereas, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments; and

Whereas, an adopted Local Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, the (Name of Government/District/Organization) fully participated in the hazard mitigation planning process to prepare this Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, the Iowa Homeland Security and Emergency Management Division and the Federal Emergency Management Agency Region VII officials have reviewed the "Dallas County Multi-Jurisdictional Local Hazard Mitigation Plan," and approved it contingent upon this official adoption of the participating governing body; and

Whereas, the (Name of Government/District/Organization) desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the Dallas County Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption by the governing body for the (Name of Government/District/Organization) demonstrates the jurisdictions' commitment to fulfilling the mitigation goals outlined in this Multi-Jurisdictional Local Hazard Mitigation Plan

Whereas, adoption of this legitimizes the plan and authorizes responsible agencies to carry out their responsibilities under the plan;

Now, therefore, be it resolved, that the (Name of Government/District/Organization) adopts the "Dallas County Multi-Jurisdictional Local Hazard Mitigation Plan" as an official plan; and

Be it further resolved, the (Name of Government/District/Organization) will submit this Adoption Resolution to the Iowa Homeland Security and Emergency Management Division and Federal Emergency Management Agency Region VII officials to enable the plan's final approval.

Date: _____

Certifying Official: _____

1 INTRODUCTION AND PLANNING PROCESS

1.1 Purpose

Dallas County and the participating cities and school districts prepared this Multi-jurisdictional Hazard Mitigation Plan to guide hazard mitigation planning to better protect the people and property of the County from the effects of natural hazard events. For the City of Perry, this plan serves as the plan update to their Local Hazard Mitigation Plan that was developed and approved by FEMA in 2005. For all other jurisdictions, this is an initial Local Hazard Mitigation Plan. This plan demonstrates the communities' commitments to reducing risks from hazards and serves as a tool to help decision makers direct mitigation activities and resources. This plan was also developed to make Dallas County and the participating jurisdictions eligible for certain federal grant programs; specifically, the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Assistance (HMA) grants such as the Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, and Flood Mitigation Assistance Program.

1.2 Background and Scope

Each year in the United States, natural disasters take the lives of hundreds of people and injure thousands more. Nationwide, taxpayers pay billions of dollars annually to help communities, organizations, businesses, and individuals recover from disasters. These monies only partially reflect the true cost of disasters, because additional expenses to insurance companies and nongovernmental organizations are not reimbursed by tax dollars. Many natural disasters are predictable, and much of the damage caused by these events can be alleviated or even eliminated.

Hazard mitigation is defined by FEMA as "any sustained action taken to reduce or eliminate long-term risk to human life and property from a hazard event." The results of a three-year, congressionally mandated independent study to assess future savings from mitigation activities provides evidence that mitigation activities are highly cost-effective. On average, each dollar spent on mitigation saves society an average of $4 in avoided future losses in addition to saving lives and preventing injuries (National Institute of Building Science Multi-Hazard Mitigation Council 2005).

Hazard mitigation planning is the process through which hazards that threaten communities are identified, likely impacts of those hazards are determined, mitigation goals are set, and appropriate strategies to lessen impacts are determined, prioritized, and implemented. This plan documents the hazard mitigation planning process undertaken by the Hazard Mitigation Planning Committee. It identifies relevant hazards and vulnerabilities in the planning area and sets forth a mitigation strategy to decrease vulnerability and increase resiliency and sustainability in Dallas County.

The Dallas County Multi-jurisdictional Hazard Mitigation Plan is a multi-jurisdictional plan that geographically covers the participating jurisdictions within Dallas County's boundaries (hereinafter referred to as the planning area). The following jurisdictions officially participated in the planning process:

- Dallas County
- City of Adel
- City of Bouton
- City of Dallas Center
- City of Dawson
- City of DeSoto
- City of Dexter
- City of Granger
- City of Linden
- City of Minburn
- City of Perry
- City of Redfield
- City of Van meter
- City of Waukee
- City of Woodward
- Adel-DeSoto-Minburn Schools
- Dallas Center-Grimes Schools
- Perry Schools
- Van Meter Schools
- Waukee Schools
- West Central Valley Schools
- Woodward-Granger Schools

The cities of Clive, Grimes, Urbandale, and West Des Moines are dual county cities with portions of their cities in both Dallas County and Polk County. Since these cities are registered as Polk county cities FEMA, the Iowa Homeland Security and Emergency Management Division, and Polk County have all determined that these cities will continue to be included in the Polk County Hazard Mitigation Plan update, scheduled for completion in 2014. Although these jurisdictions are not officially participating in the Dallas County Plan, the portions of these jurisdictions that are in Dallas County are included in the risk assessment, where data is available.

This plan was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 (Public Law 106-390) and the implementing regulations set forth by the Interim Final Rule published in the *Federal Register* on February 26, 2002, (44 CFR §201.6) and finalized on October 31, 2007. (Hereafter, these requirements and regulations will be referred to collectively as the Disaster Mitigation Act.) While the act emphasized the need for mitigation plans and more coordinated mitigation planning and implementation efforts, the regulations established the requirements that local hazard mitigation plans must meet in order for a local jurisdiction to

be eligible for certain federal disaster assistance and hazard mitigation funding under the Robert T. Stafford Disaster Relief and Emergency Act (Public Law 93-288).

Information in this plan will be used to help guide and coordinate mitigation activities and decisions for local land use policy in the future. Proactive mitigation planning will help reduce the cost of disaster response and recovery to communities and their residents by protecting critical community facilities, reducing liability exposure, and minimizing overall community impacts and disruptions. The Dallas County planning area has been affected by hazards in the past and the participating jurisdictions are therefore committed to reducing future impacts from hazard events and becoming eligible for mitigation-related federal funding.

1.3 Plan Organization

The Dallas County Multi-jurisdictional Hazard Mitigation Plan is organized as follows:

- Executive Summary
- Prerequisites
- Chapter 1: Introduction and Planning Process
- Chapter 2: Planning Area Profile and Capabilities
- Chapter 3: Risk Assessment
- Chapter 4: Mitigation Strategy
- Chapter 5: Plan Implementation and Maintenance
- Appendices

1.4 Planning Process

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

In February 2011, Dallas County contracted with AMEC Environment & Infrastructure, Inc. (AMEC) to facilitate the development of a multi-jurisdictional, local hazard mitigation plan. AMEC's role was to:

- Assist in establishing the Hazard Mitigation Planning Committee (HMPC) as defined by the Disaster Mitigation Act (DMA),
- Ensure the developed plan meets the DMA requirements as established by federal regulations and following FEMA's planning guidance,
- Facilitate the entire planning process,
- Identify the data requirements that HMPC participants could provide and conduct the research and documentation necessary to augment that data,
- Assist in facilitating the public input process,
- Produce the draft and final plan documents, and
- Coordinate the Iowa Emergency Management and Homeland Security Department's and FEMA plan reviews.

1.4.1 Multi-Jurisdictional Participation

44 CFR Requirement §201.6(a)(3): Multi-jurisdictional plans may be accepted, as appropriate, as long as each jurisdiction has participated in the process and has officially adopted the plan.

Dallas County Emergency Management invited the incorporated cities, the school districts, various county and city departments, fire department personnel, library representatives, and state and federal agencies to participate in the Dallas County Multi-jurisdictional Hazard Mitigation Planning process. The jurisdictions that elected to participate in this plan are listed above in section 1.2. The Disaster Mitigation Act requires that each jurisdiction participate in the planning process and officially adopt the multi-jurisdictional hazard mitigation plan. Each jurisdiction that chose to participate in the planning process and development of the plan was required to meet plan participation requirements defined at the beginning of the process, which included the following:

- Designate a representative to serve on the HMPC;
- Participate in at least one of three HMPC meetings by either direct representation or authorized representation;
- Provide information to support the plan development by completing and returning the AMEC Data Collection Guide;
- Identify mitigation actions for the plan (at least one);
- Review and comment on plan drafts;
- Inform the public, local officials, and other interested parties about the planning process and provide an opportunity for them to comment on the plan;
- Formally adopt the mitigation plan.

All of the jurisdictions listed as official participants in this plan met all of these participation requirements. Table 1.1 shows the representation of each participating jurisdiction at the planning meetings, provision of Data Collection Guides, and development of mitigation actions. Sign-in sheets are included in Appendix B: Planning Process Documentation.

Table 1.1. Jurisdictional Participation in Planning Process

Jurisdiction	Informational Meeting	HMPC Kick-off Meeting	HMPC Meeting #2	HMPC Meeting #3	Data Collection Guide	Action(s)
Dallas County	x	x	x	x	x	X
Cities						
Adel	X	X	X	X	X	X
Bouton			X	X	X	X
Dallas Center			X	X	X	X
Dawson		X	X	X	X	X
DeSoto		X	X		X	X
Dexter				X	X	X

Jurisdiction	Informational Meeting	HMPC Kick-off Meeting	HMPC Meeting #2	HMPC Meeting #3	Data Collection Guide	Action(s)
Granger	X	X	X	X	X	X
Linden				X	X	X
Minburn			X	X	X	X
Perry		X	X	X	X	X
Redfield	X	X	X	X	X	X
Van Meter	X	X	X	X	X	X
Waukee	X		X	X	X	X
Woodward			X	X	X	X
School Districts						
Adel-DeSoto-Minburn Schools	X	X	X	X	X	X
Dallas Center-Grimes Schools		X	X	X	X	X
Perry Schools	X	X	X	X	X	X
Van Meter Schools	X	X	X	X	X	X
Waukee Schools	X	X	X	X	X	X
West Central Valley Schools			X	X	X	X
Woodward- Granger Schools				X	X	X

1.4.2 The Planning Steps

AMEC and Dallas County worked together to establish the framework and process for this planning effort using FEMA's *Local Multi-Hazard Mitigation Planning Guidance* (2008) and the State and Local Mitigation Planning How-To Guides (2001), which include *Multi-Jurisdictional Mitigation Planning* (2006). The plan is structured around a four-phase process:

1) Organize resources
2) Assess risks
3) Develop the mitigation plan
4) Implement the plan and monitor progress

Into this process, AMEC integrated a detailed 12-step planning process modified from FEMA's Community Rating System (CRS) and Flood Mitigation Assistance programs. Thus, the 12-step process used for this plan meets the funding eligibility requirements of the Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, Community Rating System, and Flood Mitigation Assistance Program. Table 1.2 shows how the 12-step process followed fits into FEMA's four-phase DMA process as well as the 10-step CRS process.

Table 1.2. Mitigation Planning Process Used to Develop the Dallas County Multijurisdictional Local Hazard Mitigation Plan

DMA Requirements	12-step Planning Process	CRS Process
1) Organize Resources		
201.6(c)(1)	1) Organize Resources	1) Organize
201.6(b)(1)	2) Plan for Public Involvement	2) Involve the Public
201.6(b)(2) and (3)	3) Coordinate with other departments and agencies and incorporate existing information.	3) Coordinate
2) Assess Risks		
201.6(c)(2)(i), (iii)	4) Identify the hazards	4) Assess the hazard
201.6(c)(2)(i), (iii)	5) Profile the Hazards	
201.6(c)(2)(ii), (iii)	6) Identify Assets	5) Assess the problem
201.6(c)(2)(ii), (iii)	7) Estimate Losses	
3) Develop the Mitigation Plan		
201.6(c)(3)(i)	8) Identify Goals	6) Set Goals
201.6(c)(3)(ii)	9) Develop Potential Mitigation Actions	7) Review Possible Activities
201.6(c)(3)(iii)	10) Draft the Mitigation Plan	8) Draft an Action Plan
4) Implement the Plan and Monitor Progress		
201.6(c)(5)	11) Adopt the Plan	9) Adopt the Plan
201.6(c)(4)	12) Implement and Maintain the Plan	10) Implement, Evaluate, and Revise the Plan

Phase I Organize Resources

Step 1: Organize the Planning Team

The planning process resulting in the preparation of this plan document officially began with an informational meeting in Adel, Iowa on March 9, 2012. Dallas County Emergency Management e-mailed invitations to participants from several jurisdictions in the County as well as other County Departments. The purpose of this meeting was to organize the planning team and provide overview information about the planning process to be followed.

A Hazard Mitigation Planning Committee (HMPC) was created that includes representatives from each participating jurisdiction, departments of the County,and other local, state, and federal organizations responsible for making decisions in the plan and agreeing upon the final contents. In addition to the participating jurisdictions, the agencies and organizations that participated in the planning meetings included the following:

- Iowa Homeland Security and Emergency Management Division
- Iowa Department of Natural Resources Geological and Water Survey
- Iowa Department of Natural Resources Forestry
- National Weather Service

After the informational meeting, a formal Kick-off meeting was held on April 19, 2012 followed by two additional planning meetings held on June 21, 2012 and August 23, 2012. A complete list of all representatives of the agencies and organizations that participated on the Dallas County HMPC is provided in Appendix B.

The HMPC contributed to this planning process by:

- providing facilities for meetings,
- attending and participating in meetings,
- collecting data,
- managing administrative details,
- making decisions on plan process and content,
- submitting mitigation action implementation worksheets,
- reviewing drafts, and
- coordinating and assisting with public involvement and plan adoptions.

The HMPC communicated during the planning process with a combination of face-to-face meetings, phone interviews, and email correspondence. The meeting schedule and topics are listed in Table 1.3. The meeting minutes for each of the meetings are included in Appendix B.

Table 1.3. Schedule of HMPC Meetings

Meeting	Topic	Date
Informational Meeting	General overview of planning process/requirements and schedule.	3/9/2012
Kick-Off Meeting	Kickoff meeting: introduction to DMA, the planning process, hazard identification and public input strategy. Distribution of data collection guide to jurisdictions. Preliminary hazard ranking results.	4/19/2012
Planning Meeting #2	Review of draft Risk Assessment, Development of plan goals.	6/21/2012
Planning Meeting #3	Mitigation action identification and prioritization. Determine process to monitor, evaluate, and update plan.	8/23/2012

During the kickoff meeting, AMEC presented information on the scope and purpose of the plan, participation requirements of HMPC members, and the proposed project work plan and schedule. Plans for public involvement (Step 2) and coordination with other agencies and departments (Step 3) were discussed. AMEC also introduced hazard identification requirements and data needs. The HMPC discussed potential hazards as well as past events and impacts and refined the identified hazards to be relevant to Dallas County. The hazard ranking methodology utilized by Iowa Homeland Security and Emergency Management Division in the State Hazard Mitigation Plan was introduced and the HMPC made preliminary determinations of probability, magnitude, warning time, and duration for each hazard identified.

Participants were given the AMEC Data Collection Guide to facilitate the collection of information needed to support the plan, such as data on historic hazard events, values at risk, and current capabilities. Each participating jurisdiction completed and returned the worksheets

in the Data Collection Guide to AMEC. AMEC integrated this information into the plan, supporting the development of Chapters 2 and 3.

Figure 3.1. Hazard Mitigation Planning Committee Kick-Off Meeting

Step 2: Plan for Public Involvement

44 CFR Requirement 201.6(b): An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include: (1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval.

At the kickoff meeting, the HMPC discussed options for soliciting public input on the mitigation plan. To provide an opportunity for the public to comment during the drafting stage, the committee determined that the most effective method would be dissemination of a survey.

A survey was developed specific to the Dallas County Mitigation Plan that provided a brief plan summary as well as a questionnaire to capture public and stakeholder input. The complete survey is provided in Appendix B. A press release was issued announcing the availability of the survy at the twelve public libraries in the County as well as online at SurveyMonkey.com. In addition, committee members distributed the survey to members of the public and key stakeholders in their own jurisdiction. A few of the efforts made to disseminate the survey are described below. Additional details such as the Press Resease that was issued are included in Appendix B.

- Dallas County Emergency Management distributed SurveyMonkey link to planning partners via email:
- Dallas County Emergency Management distributed the survey as well as several FEMA publications at the Sheriff's booth at the Dallas County Fair in July 2012;
- Dallas County included a write-up about the planning process as well as a link to the survey on their County Website;

- Dallas County Public Health Dept. distributed SurveyMonkey link to distribution list via email
- The City of Adel included the survey as well as the SurveyMonkey link via the City Newsletter;
- The City of Minburn included a write-up about the planning process as well as a link to the survey on their City Website;The City of De Soto posted the survey at City Hall, the Library, U.S. Post Office, and Casey's General Store. The survey was also forwarded to the Mayor and City Council Members. The City of Van Meter printed the survey in their utility billing newsletter which was sent to approximately 400 residential and commercial accounts in Van Meter. The City also posted the survey on the City's website and on the City's Facebook and Twitter Pages.

Figure 3.2. Screen Shot of the Minburn Website, July 19, 2012

The survey asked the public and stakeholders to indicate the level of risk significance in Dallas County that they perceive for each hazard. They were asked to rate the impacts of each hazard profiled in this plan as negligible, limited, moderate, critical, or catastrophic. Sixty surveys were completed resulting in the ranking order provided in Table 1.4 from greatest perceived risks to least perceived risk. To provide a comparison, the hazard ranking level determined by the Hazard Mitigation Planning Committee is provided in the far right column.

Table 1.4. Public Perception of Hazard Impacts (High to Low)

Public Ranking (High to Low)	Public Rating Average	HMPC Ranking (High to Low)
Tornado	4.25	Tornado
Severe Winter Storm	3.71	River Flooding
River Flooding	3.46	Severe Winter Storm
Windstorm	3.45	Flash Flood
Drought	3.4	Windstorm
Flash Flood	3.32	Grass or Wildland Fire
Thunderstorms and Lightning	3.2	Hailstorm
Extreme Heat	3.03	Thunderstorms and Lightning
Hailstorm	3.03	Dam Failure
Animal/Crop/Plant Disease	2.85	Animal/Crop/Plant Disease
Grass or Wildland Fire	2.8	Levee Failure
Dam Failure	2.24	Drought
Levee Failure	2.14	Landslide
Expansive Soils	1.98	Expansive Soils
Earthquake	1.76	Extreme Heat
Sinkholes	1.73	Earthquake
Landslide	1.53	Sinkholes

Source: SurveyMonkey Results, HMPC

In the survey, the public was also asked to review 11 types of mitigation actions considered by the Iowa Homeland Security and Emergency Management Division for FEMA funding. The Dallas County HMPC also considered these types of projects in the Dallas County Multi-jurisdictional Hazard Mitigation Plan. The survey asked the public to place a check next to the mitigation project types that they felt could benefit their community. Table 1.5 provides the compiled results of this question.

Table 1.5. Public's Opinion of Beneficial Mitigation Project Types

Project Type	Percent
Minor Localized Flood Reduction Projects (stormwater management/ localized flood control)	75.0%
New Tornado Safe Room Construction	62.5%
Structural Retrofitting of Existing Buildings (adding a tornado saferoom)	57.1%
Flood-prone Property Acquisition & Structure Demolition/Relocation	41.1%
Electrical Utilities Infrastructure Retrofit	37.5%
Soil Erosion Stabilization	37.5%
Flood-prone Structure Elevation	26.8%
Dry Floodproofing of Historical Residential Structures	25.0%
Non-structural Retrofitting of Existing Buidings and Facilities from Wind Damage	21.4%
Wildfire Mitigation	19.6%
Dry Floodproofing of Non-residential Structures	18.2%

Source: SurveyMonkey Results

The public was also asked to comment on any other issues that the Dallas County Hazard Mitigaiton Planning committee should consider in developing a strategy to reduce future losses caused by natural hazard events. Some of the comments provide by the public are included below:

- “Generator & Siren updates for all small cities”
- “andating all tornado alarms to be able to be turned on remotely such as thru dispatch (county)”
- “Roadway infrastructure improvements needed.”
- “Flooding, I feel is the largest risk for Adel and we seriously need to reconsider where our soccer fields for our children are located and where homes/families are at risk for flooding. I think we should expect a flood.”
- “Evans Park needs a water holding pond!!”
- “Help individuals be prepared by offering instructional meetings. Sometimes no matter how much you do, individuals will be left to deal with some issues on their own. Education is so important.”
- “More emergency electrical generation, especially at the McCreary Center and Public Safety Building in Perry.”

The public was also given an opportunity to provide input on a draft of the complete plan prior to its submittal to the State and FEMA.

The jurisdictions announced the availability of the final draft plan and the two-week final public comment period in the *Dallas County News* and the *Perry Chief*. These newspapers have combined circulation that covers the County. A copy of the press release is provided in Appendix B. The final public comment period was from October 22 to November 2, 2012.

The HMPC invited other targeted stakeholders to comment on the draft plan via an e-mail letter, which is described in greater detail in Step 3: Coordinate with Other Departments and Agencies. Minor comments were received and incorporated.

Step 3: Coordinate with Other Departments and Agencies

44 CFR Requirement 201.6(b): An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include: (2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process. (3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

There are numerous organizations whose goals and interests interface with hazard mitigation in Dallas County. Coordination with these organizations and other community planning efforts is vital to the success of this plan. Dallas County invited neighboring communities, other local, state, and federal departments and agencies to the planning meetings to learn about the hazard mitigation planning initiative. In addition, the HMPC developed a list of additional stakeholders involved in hazard mitigation activities, to invite by e-mail letter to review and comment on the draft of the Dallas County Multi-jurisdictional Hazard Mitigation Plan prior to submittal to the State and FEMA. Those agencies invited to meetings and/or comment on the plan draft included emergency management officials of adjacent counties, members of academic organizations, the Dallas County Economic Development Alliance, Iowa State University, and various state and federal agencies. Appendix B includes a complete list of those organizations

invited to participate in the planning meetings as well as a copy of the e-mail letter that was sent and the address list. The agencies and organizations other than the participating jurisdictions that attended in the planning meetings included the following:

- Iowa Homeland Security and Emergency Management Division
- Iowa Department of Natural Resources Geological and Water Survey
- Iowa Department of Natural Resources Forestry
- National Weather Service

In addition, input was solicited from many other agencies and organizations that provided information but were not able to attend planning meetings.As part of the coordination with other agencies, the HMPC collected and reviewed existing technical data, reports, and plans. These included:

- Reports from the National Flood Insurance Program's Community Information System;
- Effective Digital Flood Insurance Rate Maps for all of Dallas County;
- Preliminary Digital Flood Insurance Rate Maps for Clive, Grimes, Urbandale, and West Des Moines (provided by Iowa Department of Natural Resources);
- Iowa Department of Natural Resources, Dam Safety Program Inventory of Dams for Dallas County;
- Available Dam Safety Inspection Reports from the Iowa Department of Natural Resources Dam Safety Program for High and Significant Hazard Dams;
- Wildland and Grass Fire Reports from the Iowa Department of Natural Resources, Wildland Fire Program;
- Information from the National Inventory of Dams;
- Dallas County Flood Insurance Study, 2007;
- City of Perry Hazard Mitigation Plan, 2005;
- Various the local plans such as Comprehensive Plans, Economic Development Plans, Emergency Operations Plans, Capital Improvement Plans, etc. For a complete list of local plans that were reviewed and incorporated, see Chapter 2;
- Iowa Flood Center (University of Iowa) Watershed Project Description (includes the Middle/South Raccoon River Watershed); and
- Iowa State Hazard Mitigation Plan, 2010.

This information was used in the development of the hazard identification, vulnerability assessment, and capability assessment and in the formation of goals, objectives, and mitigation actions. These sources, as well as additional sources of information are documented throughout the plan and in Appendix A, References.

Phase 2 Assess Risk

Step 4: Identify the Hazards

AMEC assisted the HMPC in a process to identify the natural hazards that have impacted or could impact communities in Dallas County. At the kickoff meeting, the HMPC examined the

history of disaster declarations in Dallas County, the list of hazards considered in the Iowa State Hazard Mitigation Plan, and the hazards identified in the City of Perry's 2005 Local Hazard Mitigation Plan. The committee then worked through this list of all potential hazards that could affect the planning area. They discussed past hazard events, types of damage, and where additional information might be found. The committee identified 17 natural hazards that have the potential to impact the planning area. Additional information on the hazard identification process and which hazards were identified for each jurisdiction is provided in Section 3.1.

Step 5: Profile the Hazards

During the kick-off meeting, the HMPC refined the list of hazards to make the analysis relevant to Dallas County, discussed past events and impacts and came to consensus on the preliminary probability, magnitude, warning time, and duration levels to contribute to the hazard ranking methodology utilized by the State. In addition, each jurisdiction completed a Data Collection Guide, including information on previous hazard events in their community. Utilizing the information from the Data Collection Guides as well as additional existing plans, studies, reports, and technical information as well as information available through internet research and GIS analysis, a profile was developed for each hazard identified. More information on the methodology and resources used to identify and profile the hazards can be found in Sections Section 3.4.

Step 6: Identify Assets

Assets for each jurisdiction were identified through a combination of several resources. The Dallas County Assessor's Office, GIS Department provided GIS parcel data including structure and value information for each parcel in the County. Population data was obtained from the U.S. Census Bureau. To develop a list of critical and essential facilities that should be considered in the risk assessment, each community provided a list of those facilities that they consider critical or essential. These lists were compared with the list of essential facilities included in available datasets within HAZUS MH 2.1 to develop a comprehensive list of critical/essential facilities. At Meeting #2, these lists were provided to each jurisdiction for correction and validation. Once the critical/essential facility lists were validated, those without latitude/longitude points were geo-located to create a shape-file of these facilities to be used in additional risk analysis. Methodologies and results of the analyses are provided in Chapter 3.

Additional assets such as historic, cultural, and economic assets as well as specific vulnerable populations and structures were obtained from a variety of sources as described in Chapter 3.

The HMPC also analyzed development trends from data available from the U.S. Census Bureau as well as information obtained from each jurisdiction such as Comprehensive Plans and Future Development Plans. For each hazard, there is a discussion regarding future development and how it may impact vulnerability to that specific hazard.

Step 7: Estimate Losses

After profiling the hazards that could affect Dallas County and identifying assets, the HMPC collected information to describe the likely impacts of future hazard events on the participating jurisdictions.

Existing mitigation capabilities were also considered in developing loss estimates. This assessment consisted of identifying the existing mitigation capabilities of participating jurisdictions. This involved collecting information about existing government programs, policies, regulations, ordinances, and plans that mitigate or could be used to mitigate risk from hazards. Participating jurisdictions collected information on their regulatory, personnel, fiscal, and technical capabilities, as well as previous and ongoing mitigation initiatives. This information is included in Chapter 2 Planning Area Profile and Capabilities.

Specific capabilities such as participation in the National Flood Insurance Program as well as designation as Fire Wise Communities or Storm Ready Communities and placement of storm sirens are incorporated in the vulnerability analysis discussions, where applicable.

Taking into consideration the vulnerability and capability assessments, and where sufficient information was available, a variety of methods was used to estimate losses for each profiled hazard. For geographic hazards such as riverine flooding, specific assets at risk and loss estimates were determined through GIS analysis. For the earthquake hazard, FEMA's loss estimation computer software, HAZUS-MH was utilized to estimate losses in the planning area. For other hazards such as weather-related hazards, loss estimates were developed based on statistical analysis of historic events. For hazards such as dam failure and levee failure, GIS data was not available to identify specific geographic boundaries at risk. For these hazards, the risk assessment provides descriptions of the types of improvements located in approximated risk areas as well as aerial photographs depticting development downstream of high hazard dams and development behind levee protected areas. The methodologies for each loss estimate are described in detail in Chapter 3.

Results of the preliminary risk assessment were presented at Meeting #2 and the Draft Risk Assessment (Chapter 3) was provided to the HMPC for review and comment. Several comments, corrections, and suggestions were provided to AMEC and incorporated into the risk assessment as appropriate.

Phase 3 Develop the Mitigation Plan

Step 8: Set Goals

AMEC facilitated a brainstorming and discussion session with the HMPC during their second meeting to identify goals for the overall Multi-jurisdictional Hazard Mitigation Plan. To focus the committee on the issues brought out by the risk assessment, key issues were summarized and presented via a PowerPoint Presentation for each hazard profiled. Then the HMPC discussed the definition and purpose of goal statements and reviewed examples of goals from other local plans. Then, as a group, through a group voting exercise, the HMPC achieved consensus on the final goals for the Multi-jurisdictional Hazard Mitigation Plan, which are described in Chapter 4.

Step 7: Review Possible Activities

At the final meeting the HMPC reviewed the Iowa Emergency Management and Homeland Security Division's Hazard Mitigation Assistance funding priorities as well as a handout describing the six types of mitigation projects generally recognized by FEMA. The group discussed the types of mitigation actions/projects that could be done by the jurisdictions in Dallas County. Consideration was given to the identified key issues that were developed from

the risk assessment and the anticipated success for each project type. Committee members discussed issues such as availability of funds, actions that should receive priority, feasibility of actual implementation utilizing the STAPLEE methodology as a guide. Projects relating to emergency response were discussed, but participants were encouraged to focus on long-term mitigation solutions since response-related mitigation actions occur on a routine basis as requirements of other plans. Complex projects that would necessitate use of large numbers of county resources were also discussed. This opportunity to discuss a broad range of mitigation alternatives allowed the jurisdictions wishing to complete projects to understand the overall priorities of the committee and to allow for discussion of the types of project most beneficial to each jurisdiction. Projects were discussed within the context of the priorities and likelihood of success/failure for each was determined. As part of this discussion, consideration was given to the potential cost of each project in relation to the anticipated future cost savings. Following the project/action discussion, action forms were distributed to all committee members along with a modified form of the STAPLEE process to evaluate each action. These completed worksheets were returned to AMEC. Each participating jurisdiction prioritized the projects they submitted by indicating high, moderate, or low local priority. For a comprehensive of mitigation alternatives discussed, see Appendix C.

Step 8: Draft the Plan

A complete draft of the plan was made available online and in hard copy for review and comment by the public and other agencies and interested stakeholders. This review period was from October 22 to November 2, 2012. Methods for inviting interested parties and the public to review and comment on the plan were discussed in Steps 2 and 3, and materials are provided in Appendix B. Comments were integrated into a final draft for submittal to the Iowa Homeland Security and Emergency Management Division and FEMA Region VII.

Phase 4 Implement the Plan and Monitor Progress

Step9: Adopt the Plan

To secure buy-in and officially implement the plan, the governing bodies of each participating jurisdiction adopted the plan. Scanned copies of resolutions of adoption are included in Appendix D of this plan.

Step 10: Implement, Evaluate, and Revise the Plan

The HMPC developed and agreed upon an overall strategy for plan implementation and for monitoring and maintaining the plan over time during Meeting #3. This strategy is described in Chapter 5, Plan Maintenance Process.

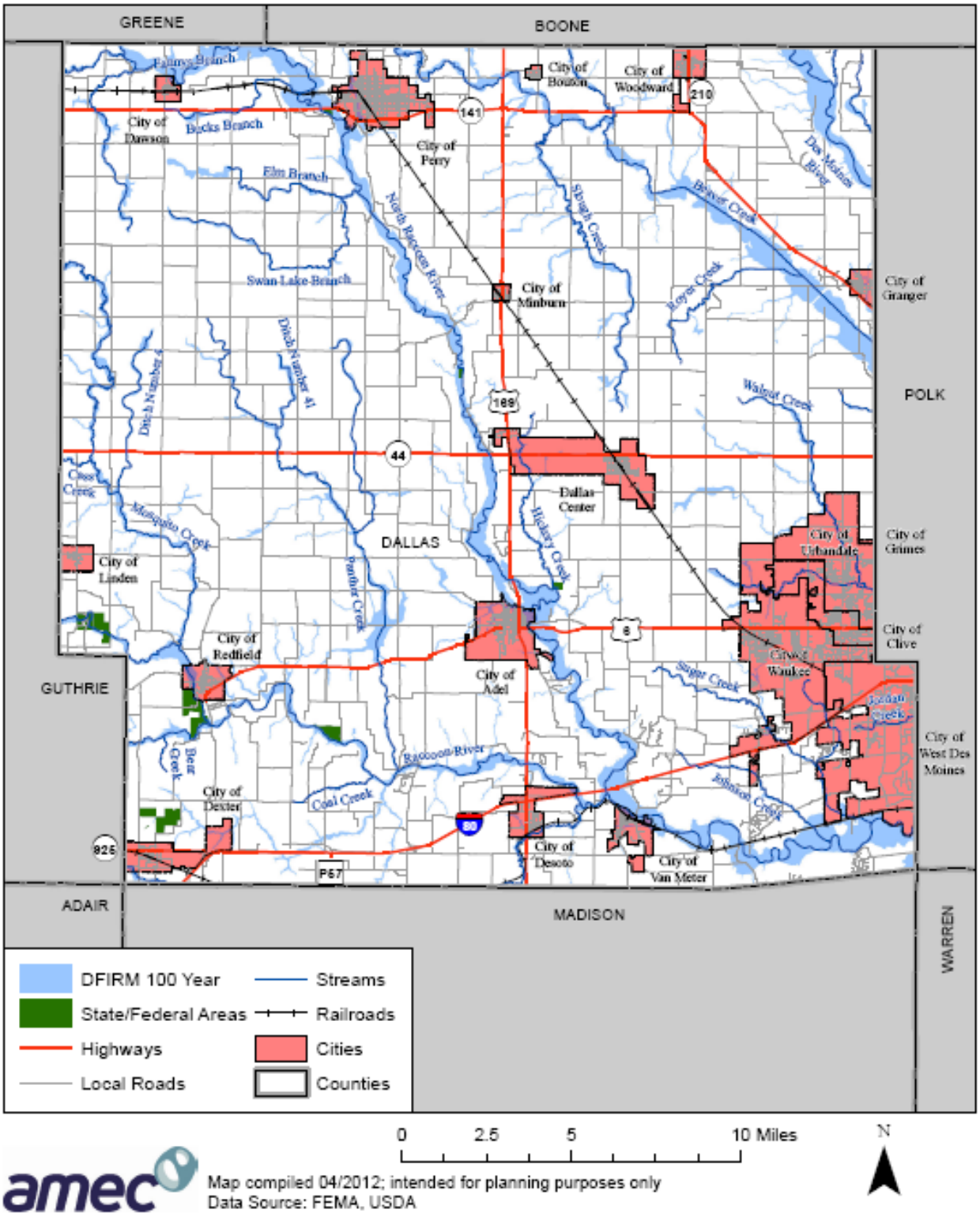
2 PLANNING AREA PROFILE AND CAPABILITIES

This chapter provides a general profile of Dallas County followed by individual sections for each participating jurisdiction. The sections for each jurisdiction provide an overview profile as well as details on existing capabilities, plans, and programs that enhance their ability to implement mitigation strategies.

2.1 Dallas County Planning Area Profile

Figure 2.1 provides a map of the Dallas County planning area. The source of the data for the corporate boundaries is from the effective Digital Flood Insurance Rate map. Since Dallas County and many of the incorporated areas have seen extensive growth, annexations have, and will likely, continue to occur. Annexations that have occurred subsequent to the DFIRM development have included mostly undeveloped land. To access maps and other data regarding current corporate boundaries, please visit the Dallas County GIS Department's website at: http://www.co.dallas.ia.us/index.aspx?page=849.

Figure 2.1. Dallas County Planning Area



2.1.1 Geography and Topography

Dallas County is located in southwestern Iowa. The principal city is the City of Perry, and the City of Adel is the County seat. Dallas County comprises approximately 597 square miles and is served by U.S. Highway 6 and 169; Iowa Highways 44, 141, 144, and 210; and Interstate Highway 80. The Chicago Northwestern and Iowa Interstate Railroads operate lines in the County.

All of 14 and portions of 4 incorporated cities are within Dallas County Boundaries as follows:

- Adel
- Bouton
- Clive
- Dallas Center
- Dawson
- DeSoto
- Dexter
- Granger
- Grimes
- Linden
- Minburn
- Perry
- Redfield
- Urbandale
- Van Meter
- Waukee
- West Des Moines
- Woodward

The majority of land area and populations for the jurisdictions of Clive, Grimes, Urbandale, and West Des Moines are in Polk County. According to Iowa Homeland Security & Emergency Management and Polk County Emergency Management, these jurisdictions will participate in the Polk County Hazard Mitigation Plan Update. Although these jurisdictions are not officially participating in the Dallas County Plan, the portions of these jurisdictions that are in on the Dallas County side are included in the risk assessment, where data is available. See Chapter 3 for additional information.

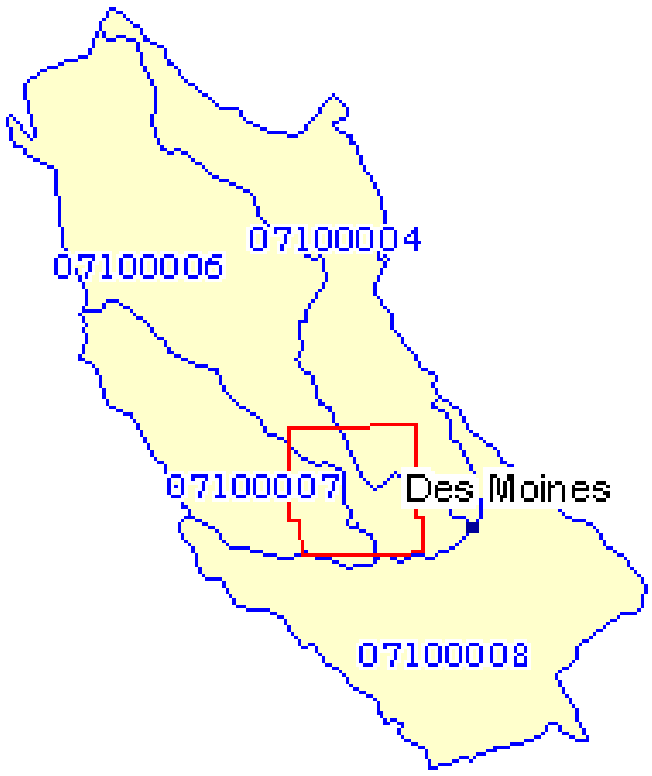
In addition, the Cities of Granger and Woodward have small portions of their city limits in adjacent counties. Since the majority of these cities are in Dallas County, these cities are official participants of the Dallas County plan. Therefore, where data is available, these cities are profiled and discussed in terms of their entire city limits, including the portions in adjacent counties. The City of Granger's city limits include a small portion of adjacent Polk County and the City of Woodward's city limits include a portion of adjacent Boone County. Additional details of the portions of these cities in adjacent counties are discussed in the Profiles of these jurisdictions in Sections 2.2.8 and 2.2.15 respectively.

The general surface of Dallas County is undulating Iowa prairie. The majority of land is characterized as fairly level, with some rolling hills. Along the rivers and running streams, there are bluffs, especially in the southwest near the South Raccoon River. From the divide between the South Raccoon River and the North Raccoon River, the general surface gradually rises. With the exception of part of the southwest corner, the general surface of the County inclines from the northwest to the southeast, and is crossed by numerous streams which are bordered by belts of timber

As depicted in Figure 2.2 Dallas County crosses four watersheds as follows:

- Middle Des Moines Watershed (07100004)—this watershed crosses the northeast corner of Dallas County.
- North Raccoon Watershed (07100006)—this watershed crosses from the northwest to southeast.
- South Raccoon Watershed (07100007)—this watershed crosses over the western edge and southwestern corner.
- Lake Red Rock Watershed (07100008)—there is a very small portion of this watershed along the southern boundary of Dallas County.

Figure 2.2. Dallas County, Iowa Watersheds (Dallas County is red square)



Source: Environmental Protection Agency, http://cfpub.epa.gov/surf/county.cfm?fips_code=19049

2.1.2 Climate

The climate of Dallas County is characterized by extreme temperatures and moderate precipitation. In January, the coldest month, the average daily minimum temperature is 7.5 degrees Fahrenheit. In July, the hottest month, average daily maximum temperature is 85.3 degrees Fahrenheit. The total annual precipitation in Dallas County is 31.36 inches. Seventy-four percent of Dallas County's annual precipitation falls in the form of rain between April and September. The average seasonal snowfall is 27.8 inches (Dallas County Flood Insurance Study, 2007).

2.1.3 Population/Demographics

According to the 2010 U.S. Census, the population of Dallas County was 66,135, up 62 percent from the 2000 population of 40,750. This population increase ranked Dallas County as Iowa's fastest growing county in this past decade. The greatest growth has occurred in the more urban areas of the County, including the western suburbs of the Des Moines metropolitan area. Table 2.1 provides the populations for each city and the unincorporated county for 2000 and 2010 with the number and percent change. Please note that Clive, Granger, Grimes, Urbandale, and West Des Moines, and Woodward are bi-county cities with portions of their city limits in adjacent counties. The population statistics below were determined for the portions of those cities that are in Dallas County. This was accomplished by overlaying the census block shapefile over the shapefile of the incorporated areas. The unincorporated areas population was determined by subtracting the populations of the incorporated areas from the overall county population.

Table 2.1. Dallas County Population 2000-2010 by City

Jurisdiction	2010 Population	2000 Population	2000-2010 # Change	2000-2010 % Change
Adel	3,682	3,435	247	7.2%
Bouton	129	136	-7	-5.1%
Clive*	4,721	2,394	2,327	97.2%
Dallas Center	1,623	1,595	28	1.8%
Dawson	131	155	-24	-15.5%
De Soto	1,050	1,009	41	4.1%
Dexter	611	689	-78	-11.3%
Granger**	1,032 (1,244)	583 (583)	449 (661)	77.0% (113.4%)
Grimes *	1	1	0	0.0%
Linden	199	226	-27	-11.9%
Minburn	365	391	-26	-6.6%
Perry	7,702	7,633	69	0.9%
Redfield	835	833	2	0.2%
Urbandale *	6,339	327	6,012	1838.5%
Van Meter	1,016	866	150	17.3%
Waukee	13,790	5,126	8,664	169.0%
West Des Moines *	11,510	4,653	6,857	147.4%
Woodward **	1,018 (1,024)	1,203 (1,200)	-185 (-176)	-15.4% (-14.7%)
Unincorporated	10,381	9,495	886	9.3%
Total	66,135	40,750	25,385	62.3%

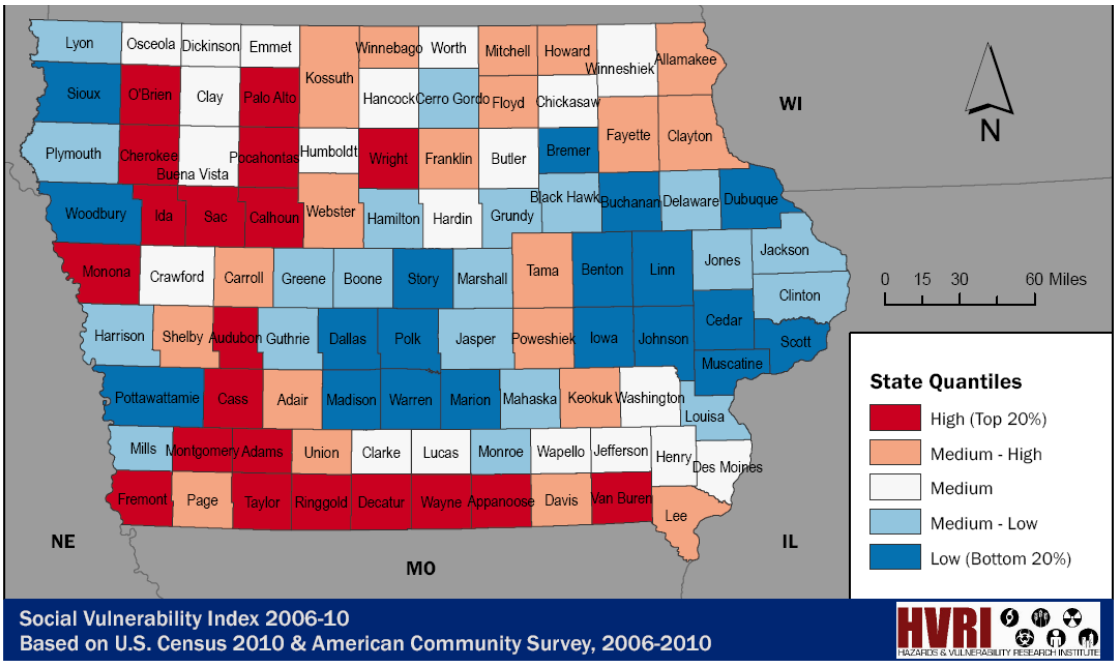
Source: U.S. Bureau of the Census, Decennial Census; * Clive, Grimes, Urbandale, and West Des Moines population figures are only for the portions of those cities that are within Dallas County: **population data and change for Granger and Woodward includes entire city limits including portions in adjacent counties is provided in parentheses.

According to the 2010 census, 8.5 percent of the population is under age 5. 28.9 percent of the population is under age 18 and 9.8 percent of the population is over age 65. Females make up 51 percent of the population.

The Hazards and Vulnerability Research Institute at the University of South Carolina developed the Social Vulnerability Index (SoVI ®) to evaluate and rank the ability to respond to, cope with, recover from, and adapt to disasters. The index synthesizes 30 socioeconomic variables, which the research literature suggests contribute to reduction in a community's ability to prepare for, respond to, and recover from hazards. SoVI ® data sources include primarily those from the United States Census Bureau.

Dallas County has a low Social Vulnerability Index of -5.9 and ranks 1.75 percent in National Percentile Rankings. The low index indicates that Dallas County is more able to cope and recover from disasters than counties with a higher index.

Figure 2.3. County Comparison Within the State for Social Vulnerability Index, 2006-2010



Source: Hazards and Vulnerability Research Institute, http://webra.cas.sc.edu/hvri/products/sovi2010_img/PDF/Iowa_0610.pdf

Table 2.2 provides additional demographic and economic indicators for Dallas County:

Table 2.2. Poverty, Education, and Language Demographics, Dallas County, Iowa

Jurisdiction	Est. # Below Poverty Level	Est. % Below Poverty Level	Est. % Over age 25 w/ High School Diploma or Higher	Est. % Over age 25 w/ Bachelor's Degree or Higher	Est. % of Population that Speaks English less than "very well"
Iowa	338263	11.6	89.9	24.5	2.9
Dallas County	4131	6.7	92.7	40.2	4.3
Adel	330	9.3	93.1	29.2	0.4
Bouton	8	9.3	90	5.7	0
Clive*	918	6.1	95.4	54.4	6.1
Dallas Center	58	3	93	24	0.6
Dawson	2	1.5	95.5	0	0
DeSoto	91	9.8	89.7	17.9	0
Dexter	52	8.7	90.7	18.5	0
Granger*	127	12.3	90.6	21.4	1.7
Grimes*	312	4.1	96.9	36.4	1.9
Linden	8	2.4	87.3	19.9	2.5
Minburn	2	0.7	87.9	13.1	0
Perry	1200	15.8	73.7	9.8	21.6
Redfield	104	11.1	92.3	15.6	0
Urbandale*	1355	3.6	96.9	47.4	4.3
Van Meter	41	3.4	96	30.7	0.4
Waukee	340	2.8	94.8	50.8	1.9
West Des Moines*	3321	6.1	95.2	49.5	4.7
Woodward*	31	2.7	92.2	16.9	0

Source: U.S. Census 2010 American Community Survey 5-year estimates; *includes portions in adjacent counties.

2.1.4 History

The tract of land now known as Dallas County was included in the territory which the Sac and Fox Indians ceded to the United States Government in the treaty of October 11, 1842. Dallas County was named for Hon. George M. Dallas of Pennsylvania, then Vice President of the United States of America under James K. Polk. Dallas County is one of the five counties that make up the Des Moines–West Des Moines Metropolitan Statistical Area.

The first settlers arrived in Dallas County in 1845. During 1847 and 1848, there was an increase of settlers. At that time, Fort Des Moines was the nearest trading point where mail matter, clothing, groceries and the necessary supplies could be purchased. During the winter of 1847-1848, the first Dallas County school house was built. It was privately built by W.W. Miller at his own expense, but was free for all who desired to send their children (The History of Dallas County, Iowa, Des Moines Union Historical Company, 1879).

2.1.5 Economy/Industry

Table 2.3. Labor Force Summary as of December 2011

Region	Available Labor Force	Number Employed	Number Unemployed	Unemployment Rate
United States	153,406,000	139,864,000	13,542,000	8.60%
Iowa	1,657,000	1,572,000	95,000	5.70%
DM-WDM MSA*	313,300	296,700	16,500	5.30%
Dallas County	34,400	32,900	1,500	4.20%

Source: Dallas County Economic Development Alliance, http://www.dallascounty-ia.org/demographics/workforce.aspx: *DM-WDM MSA = Des Moines-West Des Moines Metropolitan Statistical Area

Table 2.4. Leading Dallas County Employers

Company	Product/Service	Community	Employees
Wells Fargo Home Mortgage	Mortgage Services	West Des Moines	3,177
Wells Fargo Card Services	Financial Services	West Des Moines	1,278
Farm Bureau Insurance	Insurance/Financial Services	West Des Moines	1,160
Hy-Vee	Full Service Grocer	West Des Moines	759
Iowa Foundation for Medical Care	Health Care Improvement	West Des Moines	779
GuideOne Insurance	Insurance Services	West Des Moines	523
ITA Group	Performance Improvement	West Des Moines	450
ADP	Data Processing	West Des Moines	520
Iowa Student Loan	Student Loan Provider	West Des Moines	400
Aviva USA	Insurance Services	West Des Moines	
Wells Fargo Financial	Financial Services	Urbandale	530
Citi Card Services	Financial Services	Urbandale	
Allied Insurance	Insurance Services	Urbandale	300
Compressor Controls	Turbomachinery	Urbandale	300
Rain and Hail Insurance	Insurance Services	Urbandale	300
Quebecor World	Book Binding	Waukee	150
Gilcrest Jewett	Lumber & Building Material	Waukee	145

Company	Product/Service	Community	Employees
Briggs Medical Services	Healthcare Products		
Tyson Fresh Foods, Inc.	Pork Processing	Perry	1200
Percival Scientific	Environmental Chambers	Perry	80
Osmundson Manufacturing	Farm Tillage Equipment	Perry	75
United Brick & Tile Company	Clay Brick Production	Adel	170
Stine Seed Company	Seed	Adel	225
Evo Medical Solutions	Neutralizers, Therapy Devices	Adel	82
Iowa Spring	Coil and Spring Manufacturing	Adel	90
Monarch Manufacturing	Egress Window Systems	Waukee	95
Barr Nunn	Trucking Services	Granger	77
Hy-Line International	Research	Dallas Center	147
Pioneer Hi-Bred International	Bio-Science/Research	Dallas Center	40

Source: Dallas County Economic Development Alliance, http://www.dallascounty-ia.org/demographics/leading-employers.aspx

2.1.6 Agriculture

According to the 2007 Census of Agriculture, there are 912 farms in the County that cover 297,090 acres of land, which accounts for 78 percent of the surface land in the County. In 2007, Dallas County produced 58,775 hogs and pigs and 14,936 head of cattle and had a total livestock value of $3,600,000. In the same year, Dallas County farmers harvested 22.4 million bushels of corn and 4.9 million bushels of soybeans. Production of all crops in Dallas County contributed $156.90 million or 3.5 percent of the County's total economic output.

2.2 City/County Jurisdictional Profiles and Mitigation Capabilities

This section includes individual profiles for each participating jurisdiction as well as a discussion and table indicating specific capabilities of each jurisdiction that relate to their ability to implement mitigation opportunities.

2.2.1 Unincorporated Dallas County

The jurisdiction of Dallas County includes all unincorporated areas within the County boundaries. The Dallas County government structure is a County Board of Supervisors with three members. The Dallas County government includes the following departments and offices:

- Assessor
- Community Services
- Conservation
- Dallas County Extension
- Dallas County Fair
- Economic Development
- Emergency Management
- Emergency Medical Services
- Empowerment
- Environmental health
- Facilities Management
- Human Resources
- Information Services Department
- Mental health/Developmental Disabilities
- Operations Administration
- Planning and Development
- Public Health and Home Health
- Road Department
- Veterans Affairs

Mitigation Capabilities

Chapter 29C of the Code of Iowa creates the State Emergency Management Division and the local Emergency Management Commissions. The Dallas County Emergency Management Commission is made up of the mayors of all of the jurisdictions in Dallas County, one member of the Dallas County Board of Supervisors, and the Sheriff. The Commission appoints an Emergency Management Coordinator to manage the agency and assist the Commission. Committees and activities of the Dallas County Emergency Management Commission are as follows:

- County 911 Committee

- County Fire Association
- County EMS Committee
- County Safety Committee
- County Wellness Committee
- Courthouse Security Committee
- Updates County Emergency Plans
- Manages County Emergency Operations Center
- Coordinates HazMat Responses
- Helps Coordinate Emergency Responses
- Assists Cities, Schools, and the private sector with Emergency Planning

Additional capabilities are discussed below as well as in Table 2.5 that follows:

- There are no outdoor warning sirens in unincorporated portions of the County. All outdoor warning sirens are within city limits of the municipalities in the County.
- The County utilizes CodeRed for Emergency Communications in the County. However, historically, this has not been utilized for weather-related hazards. Emergency situations that have been identified that would utilize the CodeRed system include evacuation notices, bio-terrorism alerts, boil water notices, and missing child reports.
- The unincorporated county does not have any designated public tornado shelters/saferooms.

Table 2.5. Dallas County Mitigation Capabilities

Capabilities	Comments
Planning Capabilities	
Comprehensive Plan	Yes
Builder's Plan	No
Capital Improvement Plan	Yes-June 2004
Local Emergency Plan	N/A
County Emergency Plan	Yes
Local Recovery Plan	N/A
County Recovery Plan	Yes-2010
Local Mitigation Plan	N/A
County Mitigation Plan	In Process
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	N/A
Economic Development Plan	Yes-Dallas County Development Alliance
Transportation Plan	No
Land-use Plan	Yes-Chapter 45
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	No
Firewise or other fire mitigation plan	No
School Mitigation Plan	N/A
Critical Facilities Plan (Mitigation/Response/Recovery)	No
Policies/Ordinance	
Zoning Ordinance	Yes
Building Code	Not Reported
Floodplain Ordinance	Yes
Subdivision Ordinance	Yes
Tree Trimming Ordinance	No
Nuisance Ordinance	Yes

Capabilities	Comments
Storm Water Ordinance	No
Drainage Ordinance	No
Site Plan Review Requirements	No
Historic Preservation Ordinance	Commission
Landscape Ordinance	No
Iowa Wetlands and Riparian Areas Conservation Plan	Yes
Debris Management Plan	No
Program	
Zoning/Land Use Restrictions	Yes
Codes Building Site/Design	Yes
National Flood Insurance Program (NFIP) Participant - Nondelegated	No
NFIP Participant - Delegated	Yes
NFIP Community Rating System (CRS) Participating Community	No
Hazard Awareness Program	No
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	Not Reported
Economic Development Program	No
Land Use Program	Yes
Public Education/Awareness	No
Property Acquisition	No
Planning/Zoning Boards	Yes
Stream Maintenance Program	No
Tree Trimming Program	No
Engineering Studies for Streams (Local/County/Regional)	No
Mutual Aid Agreements	Not Reported
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	No
Hazard Analysis/Risk Assessment (County)	Yes-County EOP-Outdated
Flood Insurance Maps	Yes-2007
FEMA Flood Insurance Study (Detailed)	Yes-2007
Evacuation Route Map	No
Critical Facilities Inventory	No
Vulnerable Population Inventory	No
Land Use Map	Yes
Staff/Department	
Building Code Official	Yes
Building Inspector	Yes
Mapping Specialist (GIS)	Yes
Engineer	Yes
Development Planner	No
Public Works Official	Yes
Emergency Management Coordinator	Yes
NFIP Floodplain Administrator	Yes
Bomb and/or Arson Squad	No
Emergency Response Team	No
Hazardous Materials Expert	No
Local Emergency Planning Committee	No
County Emergency Management Commission	Yes
Sanitation Department	Yes
Transportation Department	Yes
Economic Development Department	No
Housing Department	No
Planning Consultant	No
Regional Planning Agencies	No
Historic Preservation	Yes-County Commission
Non-Governmental Organizations (NGOs)	
American Red Cross	No
Salvation Army	No

Capabilities	Comments
Veterans Groups	Yes-County Veterans Affairs Office
Environmental Organization	No
Homeowner Associations	N/A
Neighborhood Associations	N/A
Chamber of Commerce	Yes
Community Organizations (Lions, Kiwanis, etc.	Yes
Local Funding Availability	
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	Yes
Authority to levy taxes for a specific purpose	Yes
Fees for water, sewer, gas, or electric services	No
Impact fees for new development	No
Ability to incur dept through general obligation bonds	Yes
Ability to incur debt through special tax bonds	Yes
Ability to incur debt through private activities	No
Ability to withhold spending in hazard prone areas	Unknown

Source: Data Collection Guide

2.2.2 City of Adel

Adel, Iowa is the County Seat of Dallas County. It is located along the North Raccoon River about 13 miles west of the I-80, I-35 intersection and was incorporated in 1847. According to the 2010 Census, the population of Adel was 3,682. This is up 7 percent from the 2000 Census. The City of Adel is governed by a Mayor and 5-member City Council and has the following City Departments:

- Building and Code Compliance
- Library
- Parks and Recreation
- Public Safety
- Public Works

Mitigation Capabilities

Specific capabilities are discussed below as well as in Table 2.6 that follows:

- The Fire Department provides ongoing fire safety education in the schools.
- In 2008, the City addressed repetitive flooding to the water treatment plant by constructing a levee and spillway system to divert floodwaters back to the river.
- The City has four outdoor warning sirens that are activated by the Dallas County Communications Center, Adel Fire Department, or Adel Police Department.
- The City also utilizes Code Red warning system, purchased through the E-911 Committee. Code Red is available through the Dallas county Communications Center.
- The City has one public tornado shelter located at the Adel Methodist Church at 115 S. 10th Street. However, it has not been constructed in accordance with FEMA standards.

Table 2.6. Adel Mitigation Capabilities

Capabilities	Comments
Planning Capabilities	
Comprehensive Plan	Yes-Feb. 2009
Builder's Plan	Yes--in City Code
Capital Improvement Plan	Yes-annually updated
Local Emergency Plan	March 2012
County Emergency Plan	N/A
Local Recovery Plan	No
County Recovery Plan	N/A
Local Mitigation Plan	In Process
County Mitigation Plan	In Process
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	N/A
Economic Development Plan	Yes-2011 Urban Revitalization Plan
Transportation Plan	Yes-Feb. 2009 in Comp. Plan
Land-use Plan	Yes-Feb. 2009 in Comp. Plan
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	No
Firewise or other fire mitigation plan	No
School Mitigation Plan	N/A
Critical Facilities Plan (Mitigation/Response/Recovery)	Yes-March 2012 City EOP

Capabilities	Comments
Policies/Ordinance	
Zoning Ordinance	Yes--in City Code
Building Code	Yes--in City Code; 2006 ICC
Floodplain Ordinance	Yes--in City Code
Subdivision Ordinance	Yes--in City Code
Tree Trimming Ordinance	Yes--in City Code
Nuisance Ordinance	Yes--in City Code
Storm Water Ordinance	Yes--in City Code
Drainage Ordinance	No
Site Plan Review Requirements	Yes
Historic Preservation Ordinance	No
Landscape Ordinance	No
Iowa Wetlands and Riparian Areas Conservation Plan	No
Debris Management Plan	No
Program	
Zoning/Land Use Restrictions	Yes--in City Code
Codes Building Site/Design	No
National Flood Insurance Program (NFIP) Participant - Nondelegated	N/A
NFIP Participant - Delegated	Yes
NFIP Community Rating System (CRS) Participating Community	No
Hazard Awareness Program	No
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	Rating 7
Economic Development Program	No
Land Use Program	Yes--In Comp Plan
Public Education/Awareness	No
Property Acquisition	No
Planning/Zoning Boards	Yes
Stream Maintenance Program	No
Tree Trimming Program	No
Engineering Studies for Streams (Local/County/Regional)	No
Mutual Aid Agreements	Yes--Dallas Co. Fire Depts.
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	No
Hazard Analysis/Risk Assessment (County)	N/A
Flood Insurance Maps	Yes-2007
FEMA Flood Insurance Study (Detailed)	Yes-2007
Evacuation Route Map	No
Critical Facilities Inventory	No
Vulnerable Population Inventory	No
Land Use Map	Yes--In Comp Plan
Staff/Department	
Building Code Official	Yes
Building Inspector	Yes
Mapping Specialist (GIS)	No
Engineer	No--Private Firm when needed
Development Planner	No
Public Works Official	Yes
Emergency Management Coordinator	Yes--Police Chief is designated
NFIP Floodplain Administrator	Yes
Bomb and/or Arson Squad	No
Emergency Response Team	Yes
Hazardous Materials Expert	No
Local Emergency Planning Committee	Yes
County Emergency Management Commission	Yes-Dallas County
Sanitation Department	No
Transportation Department	No
Economic Development Department	No

Capabilities	Comments
Housing Department	No
Planning Consultant	No
Regional Planning Agencies	No
Historic Preservation	Yes
Non-Governmental Organizations (NGOs)	
American Red Cross	No-closest is Des Moines
Salvation Army	No-closest is Des Moines
Veterans Groups	Yes-American Legion
Environmental Organization	No
Homeowner Associations	Yes
Neighborhood Associations	No
Chamber of Commerce	Yes
Community Organizations (Lions, Kiwanis, etc.	Yes
Local Funding Availability	
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	Yes
Authority to levy taxes for a specific purpose	Yes
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	Yes
Ability to incur dept through general obligation bonds	Yes
Ability to incur debt through special tax bonds	Yes
Ability to incur debt through private activities	No
Ability to withhold spending in hazard prone areas	Unknown

Source: Data Collection Guide

2.2.3 Bouton

The City of Bouton is a small city in north-central Dallas County. It is governed by a Mayor and 5-member Council. It had a 2010 population of 129, down 5percent from the 2000 population of 136.

Mitigation Capabilities

Specific capabilities are discussed below as well as in Table 2.7 that follows:

- The City provides ongoing education on fire safety and water use.
- The City has two outdoor warning sirens that are activated by the fire department.
- There are no designated tornado shelters/saferoom within city limits.

Table 2.7. Bouton Capabilities

Capabilities	Comments
Planning Capabilities	
Comprehensive Plan	Not Reported
Builder's Plan	Not Reported
Capital Improvement Plan	Not Reported
Local Emergency Plan	Not Reported
County Emergency Plan	N/A
Local Recovery Plan	Not Reported
County Recovery Plan	N/A
Local Mitigation Plan	In Process
County Mitigation Plan	In Process
Local Mitigation Plan (PDM)	Not Reported
County Mitigation Plan (PDM)	N/A
Economic Development Plan	

Capabilities	Comments
Transportation Plan	Not Reported
Land-use Plan	Not Reported
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	Not Reported
Firewise or other fire mitigation plan	Not Reported
School Mitigation Plan	N/A
Critical Facilities Plan (Mitigation/Response/Recovery)	Not Reported
Policies/Ordinance	
Zoning Ordinance	Not Reported
Building Code	Not Reported
Floodplain Ordinance	Not Reported
Subdivision Ordinance	Not Reported
Tree Trimming Ordinance	Not Reported
Nuisance Ordinance	Not Reported
Storm Water Ordinance	Not Reported
Drainage Ordinance	Not Reported
Site Plan Review Requirements	Not Reported
Historic Preservation Ordinance	Not Reported
Landscape Ordinance	Not Reported
Iowa Wetlands and Riparian Areas Conservation Plan	Not Reported
Debris Management Plan	Not Reported
Program	
Zoning/Land Use Restrictions	Not Reported
Codes Building Site/Design	Not Reported
National Flood Insurance Program (NFIP) Participant - Nondelegated	Not Reported
NFIP Participant - Delegated	No-No Special Flood Hazard Area
NFIP Community Rating System (CRS) Participating Community	No
Hazard Awareness Program	Not Reported
National Weather Service (NWS) Storm Ready	Not Reported
Building Code Effectiveness Grading (BCEGs)	Not Reported
ISO Fire Rating	Not Reported
Economic Development Program	Not Reported
Land Use Program	Not Reported
Public Education/Awareness	Not Reported
Property Acquisition	Not Reported
Planning/Zoning Boards	Not Reported
Stream Maintenance Program	Not Reported
Tree Trimming Program	Not Reported
Engineering Studies for Streams (Local/County/Regional)	No
Mutual Aid Agreements	Not Reported
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	Yes-Sept. 2011
Hazard Analysis/Risk Assessment (County)	N/A
Flood Insurance Maps	Yes-2007, No Special Flood Hazard Area
FEMA Flood Insurance Study (Detailed)	Yes-2007, No Special Flood Hazard Area
Evacuation Route Map	Yes-Sept. 2011
Critical Facilities Inventory	Yes-Sept. 2011
Vulnerable Population Inventory	Yes-Sept. 2011
Land Use Map	Yes-Sept. 2011
Staff/Department	
Building Code Official	Not Reported
Building Inspector	Not Reported
Mapping Specialist (GIS)	Not Reported
Engineer	Not Reported
Development Planner	Not Reported
Public Works Official	Not Reported
Emergency Management Coordinator	Not Reported
NFIP Floodplain Administrator	Not Reported
Bomb and/or Arson Squad	Not Reported

Capabilities	Comments
Emergency Response Team	Not Reported
Hazardous Materials Expert	Not Reported
Local Emergency Planning Committee	Not Reported
County Emergency Management Commission	Not Reported
Sanitation Department	Not Reported
Transportation Department	Not Reported
Economic Development Department	Not Reported
Housing Department	Not Reported
Planning Consultant	Not Reported
Regional Planning Agencies	Not Reported
Historic Preservation	Not Reported
Non-Governmental Organizations (NGOs)	
American Red Cross	Not Reported
Salvation Army	Not Reported
Veterans Groups	Not Reported
Environmental Organization	Not Reported
Homeowner Associations	Not Reported
Neighborhood Associations	Not Reported
Chamber of Commerce	Not Reported
Community Organizations (Lions, Kiwanis, etc.	Not Reported
Local Funding Availability	
Ability to apply for Community Development Block Grants	Not Reported
Ability to fund projects through Capital Improvements funding	Not Reported
Authority to levy taxes for a specific purpose	Not Reported
Fees for water, sewer, gas, or electric services	Not Reported
Impact fees for new development	Not Reported
Ability to incur dept through general obligation bonds	Not Reported
Ability to incur debt through special tax bonds	Not Reported
Ability to incur debt through private activities	Not Reported
Ability to withhold spending in hazard prone areas	Not Reported

Source: Data Collection Guide

2.2.4 Dallas Center

The City of Dallas Center is located in east-central Dallas County approximately 20 miles west of Des Moines. In 2010, the City had a population of 1,623 up nearly 2 percent from the 2000 Census. The City is governed by a Mayor and 5-member Council as well as the following City Departments:

- Administration Department (includes City Clerk/Treasurer, Deputy Clerk, and City Attorney)
- Fire & Rescue Department
- Library Department
- Planning and Zoning Department
- Police Department
- Public Works Department

Mitigation Capabilities

Specific capabilities are discussed below as well as in Table 2.8 that follows:

- The City has two outdoor warning sirens that are activated by the County Dispatch and the local Fire Department.

- The City utilizes Code Red and Nixil warning systems to notify members of the community of emergency events.
- The City does not have designated public tornado shelters/saferooms.

Table 2.8. Dallas Center Capabilities

Capabilities	Comments
Planning Capabilities	
Comprehensive Plan	Yes
Builder's Plan	No
Capital Improvement Plan	Yes
Local Emergency Plan	Yes
County Emergency Plan	N/A
Local Recovery Plan	Yes
County Recovery Plan	N/A
Local Mitigation Plan	In Process
County Mitigation Plan	In Process
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	N/A
Economic Development Plan	No
Transportation Plan	No
Land-use Plan	Yes
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	No
Firewise or other fire mitigation plan	No
School Mitigation Plan	N/A
Critical Facilities Plan (Mitigation/Response/Recovery)	No
Policies/Ordinance	
Zoning Ordinance	Yes
Building Code	Yes
Floodplain Ordinance	Yes
Subdivision Ordinance	No
Tree Trimming Ordinance	No
Nuisance Ordinance	Yes
Storm Water Ordinance	Yes
Drainage Ordinance	Yes
Site Plan Review Requirements	Yes
Historic Preservation Ordinance	No
Landscape Ordinance	No
Iowa Wetlands and Riparian Areas Conservation Plan	No
Debris Management Plan	No
Program	
Zoning/Land Use Restrictions	Yes
Codes Building Site/Design	Yes
National Flood Insurance Program (NFIP) Participant - Nondelegated	No
NFIP Participant - Delegated	Yes
NFIP Community Rating System (CRS) Participating Community	No
Hazard Awareness Program	No
National Weather Service (NWS) Storm Ready	Yes
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	Not Reported
Economic Development Program	Yes
Land Use Program	Yes
Public Education/Awareness	No
Property Acquisition	No
Planning/Zoning Boards	Yes
Stream Maintenance Program	No
Tree Trimming Program	No
Engineering Studies for Streams (Local/County/Regional)	No

Capabilities	Comments
Mutual Aid Agreements	Yes
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	Yes
Hazard Analysis/Risk Assessment (County)	N/A
Flood Insurance Maps	Yes-2007
FEMA Flood Insurance Study (Detailed)	Yes-2007
Evacuation Route Map	Yes
Critical Facilities Inventory	Yes
Vulnerable Population Inventory	No
Land Use Map	Yes
Staff/Department	
Building Code Official	Yes
Building Inspector	Yes
Mapping Specialist (GIS)	No
Engineer	Yes
Development Planner	No
Public Works Official	Yes
Emergency Management Coordinator	No
NFIP Floodplain Administrator	No
Bomb and/or Arson Squad	No
Emergency Response Team	Yes
Hazardous Materials Expert	No
Local Emergency Planning Committee	Yes
County Emergency Management Commission	Yes
Sanitation Department	No
Transportation Department	No
Economic Development Department	No
Housing Department	No
Planning Consultant	No
Regional Planning Agencies	No
Historic Preservation	No
Non-Governmental Organizations (NGOs)	
American Red Cross	No
Salvation Army	No
Veterans Groups	Yes
Environmental Organization	No
Homeowner Associations	Yes
Neighborhood Associations	No
Chamber of Commerce	No
Community Organizations (Lions, Kiwanis, etc.	Yes
Local Funding Availability	
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	Yes
Authority to levy taxes for a specific purpose	Yes
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	Yes
Ability to incur dept through general obligation bonds	Yes
Ability to incur debt through special tax bonds	Yes
Ability to incur debt through private activities	Yes
Ability to withhold spending in hazard prone areas	Yes

Source: Data Collection Guide

2.2.5 Dawson

The City of Dawson is a small city in northwest Dallas County. It is governed by a Mayor and 5-member Council. It had a 2010 population of 131, down 15 percent from the 2000 population.

Mitigation Capabilities

Specific capabilities are discussed below as well as in Table 2.9 that follows:

- The City has two outdoor warning sirens that are activated either electronically or manually.
- The Perry Police Department assists the City of Dawson in warning citizens of emergencies.
- There are no designated tornado shelters/saferooms within city limits.

Table 2.9. Dawson Capabilities

Capability	Comments
Planning Capabilities	
Comprehensive Plan	No
Builder's Plan	No
Capital Improvement Plan	No
Local Emergency Plan	No
County Emergency Plan	N/A
Local Recovery Plan	No
County Recovery Plan	N/A
Local Mitigation Plan	In Process
County Mitigation Plan	In Process
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	N/A
Economic Development Plan	No
Transportation Plan	No
Land-use Plan	No
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	No
Firewise or other fire mitigation plan	No
School Mitigation Plan	N/A
Critical Facilities Plan (Mitigation/Response/Recovery)	No
Policies/Ordinance	
Zoning Ordinance	Yes
Building Code	No
Floodplain Ordinance	Yes
Subdivision Ordinance	No
Tree Trimming Ordinance	Yes
Nuisance Ordinance	Yes
Storm Water Ordinance	No
Drainage Ordinance	No
Site Plan Review Requirements	No
Historic Preservation Ordinance	No
Landscape Ordinance	No
Iowa Wetlands and Riparian Areas Conservation Plan	No
Debris Management Plan	No
Program	
Zoning/Land Use Restrictions	Yes
Codes Building Site/Design	No
National Flood Insurance Program (NFIP) Participant - Nondelegated	No
NFIP Participant - Delegated	Yes
NFIP Community Rating System (CRS) Participating Community	No

Capability	Comments
Hazard Awareness Program	No
National Weather Service (NWS) Storm Ready	Yes
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	Rating 8
Economic Development Program	No
Land Use Program	No
Public Education/Awareness	No
Property Acquisition	No
Planning/Zoning Boards	No
Stream Maintenance Program	No
Tree Trimming Program	No
Engineering Studies for Streams (Local/County/Regional)	No
Mutual Aid Agreements	Yes
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	No
Hazard Analysis/Risk Assessment (County)	N/A
Flood Insurance Maps	Yes-2007
FEMA Flood Insurance Study (Detailed)	Yes-2007
Evacuation Route Map	No
Critical Facilities Inventory	No
Vulnerable Population Inventory	No
Land Use Map	No
Staff/Department	
Building Code Official	No
Building Inspector	Yes-through Perry, IA
Mapping Specialist (GIS)	Yes-through Jefferson, IA
Engineer	Yes-through Dallas Co.
Development Planner	No
Public Works Official	No
Emergency Management Coordinator	No
NFIP Floodplain Administrator	Yes
Bomb and/or Arson Squad	No
Emergency Response Team	No
Hazardous Materials Expert	No
Local Emergency Planning Committee	No
County Emergency Management Commission	Yes
Sanitation Department	Yes-private business provides
Transportation Department	No
Economic Development Department	No
Housing Department	No
Planning Consultant	No
Regional Planning Agencies	No
Historic Preservation	No
Non-Governmental Organizations (NGOs)	
American Red Cross	No
Salvation Army	No
Veterans Groups	No
Environmental Organization	No
Homeowner Associations	No
Neighborhood Associations	No
Chamber of Commerce	No
Community Organizations (Lions, Kiwanis, etc.	No
Local Funding Availability	
Ability to apply for Community Development Block Grants	No
Ability to fund projects through Capital Improvements funding	No
Authority to levy taxes for a specific purpose	Yes
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	No
Ability to incur dept through general obligation bonds	Yes

Capability	Comments
Ability to incur debt through special tax bonds	Yes
Ability to incur debt through private activities	Yes
Ability to withhold spending in hazard prone areas	No

Source: Data Collection Guide

2.2.6 DeSoto

The City of De Soto is located in south-central Dallas County. In 2010, the City had a population of 1,050 up 4 percent from the 2000 Census. The City is governed by a Mayor and 5-member Council as well as the following City Departments:

- City Hall (City Clerk/Treasurer)
- Library
- Public Works
- Police
- Fire & Rescue

Mitigation Capabilities

Specific mitigation capabilities are discussed below as well as in Table 2.10 that follows:

- The City has 2 outdoor warning sirens. One of which was replaced in 2012. The sirens are active by the local Fire & Rescue Department and the Dallas County Sheriff's Department.
- The United Methodist Church at 421 Dallas Street serves as a local tornado shelter. However, it is not constructed in accordance with FEMA saferoom standards.

Table 2.10. DeSoto Capabilities

Capability	Comments
Planning Capabilities	
Comprehensive Plan	Yes-2009
Builder's Plan	Yes-site plans/ordinances
Capital Improvement Plan	No
Local Emergency Plan	2009 and ongoing
County Emergency Plan	N/A
Local Recovery Plan	No
County Recovery Plan	N/A
Local Mitigation Plan	In Process
County Mitigation Plan	In Process
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	N/A
Economic Development Plan	No
Transportation Plan	No
Land-use Plan	Yes-zoning map
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	Yes-2011 Source water protection AWWA awarded
Firewise or other fire mitigation plan	No
School Mitigation Plan	No
Critical Facilities Plan (Mitigation/Response/Recovery)	No
Policies/Ordinance	
Zoning Ordinance	Yes

Capability	Comments
Building Code	Yes
Floodplain Ordinance	Yes-2009 Chapter 160
Subdivision Ordinance	Yes-2009 Chapter 170
Tree Trimming Ordinance	Yes-2009 Chapter 151
Nuisance Ordinance	Yes-2009 Chapters 50-57
Storm Water Ordinance	No
Drainage Ordinance	No
Site Plan Review Requirements	Yes-2009 Chapter 156
Historic Preservation Ordinance	No
Landscape Ordinance	Yes-2009
Iowa Wetlands and Riparian Areas Conservation Plan	No
Debris Management Plan	No
Program	
Zoning/Land Use Restrictions	No
Codes Building Site/Design	No
National Flood Insurance Program (NFIP) Participant - Nondelegated	No
NFIP Participant - Delegated	Yes
NFIP Community Rating System (CRS) Participating Community	No
Hazard Awareness Program	No
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	Rating 7
Economic Development Program	No
Land Use Program	No
Public Education/Awareness	Yes-Library summer reading program
Property Acquisition	No
Planning/Zoning Boards	Yes
Stream Maintenance Program	No
Tree Trimming Program	No-handled by private utility (Mid-American Energy)
Engineering Studies for Streams (Local/County/Regional)	Unknown
Mutual Aid Agreements	Yes-Van Meter & Ade.
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	Yes-Water Treatment Department, continuing asset management project
Hazard Analysis/Risk Assessment (County)	N/A
Flood Insurance Maps	Yes-2007
FEMA Flood Insurance Study (Detailed)	Yes-2007
Evacuation Route Map	No
Critical Facilities Inventory	Yes-Asset Management Plan
Vulnerable Population Inventory	No
Land Use Map	Yes
Staff/Department	
Building Code Official	Yes
Building Inspector	Yes
Mapping Specialist (GIS)	Yes-Public Works Dept.
Engineer	Yes-private company
Development Planner	No
Public Works Official	Yes
Emergency Management Coordinator	No
NFIP Floodplain Administrator	Yes
Bomb and/or Arson Squad	No
Emergency Response Team	Yes, Fire & Rescue Dept.
Hazardous Materials Expert	Yes, Fire & Rescue Dept.
Local Emergency Planning Committee	No
County Emergency Management Commission	Yes
Sanitation Department	Yes-Waste Management
Transportation Department	No
Economic Development Department	No
Housing Department	No

Capability	Comments
Planning Consultant	No
Regional Planning Agencies	No
Historic Preservation	No
Non-Governmental Organizations (NGOs)	
American Red Cross	No
Salvation Army	No
Veterans Groups	No
Environmental Organization	No
Homeowner Associations	No
Neighborhood Associations	No
Chamber of Commerce	No
Community Organizations (Lions, Kiwanis, etc.	Not Reported
Local Funding Availability	
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	Yes
Authority to levy taxes for a specific purpose	Yes
Fees for water, sewer, gas, or electric services	Yes, Water, Sewer, Waste
Impact fees for new development	Yes
Ability to incur dept through general obligation bonds	Not Reported
Ability to incur debt through special tax bonds	Not Reported
Ability to incur debt through private activities	Not Reported
Ability to withhold spending in hazard prone areas	Not Reported

Source: Data Collection Guide

2.2.7 Dexter

The City of Dexter is located in the southwest corner of Dallas County. The 2010 population was 611 which is dwon 11 percent from the 2000 population. The City is governed by a Mayor and 5-member City Council .

Mitigation Capabilities

Specific mitigation capabilities are discussed below as well as in Table 2.11 that follows:

- The City has one outdoor warning siren that is activated by the Volunteer Fire Department.

Table 2.11. Dexter Capabilities

Capabilities	Comments
Planning Capabilities	
Comprehensive Plan	Yes-2002-2022
Builder's Plan	No
Capital Improvement Plan	In Process-2013
Local Emergency Plan	Yes
County Emergency Plan	N/A
Local Recovery Plan	No
County Recovery Plan	No
Local Mitigation Plan	In Porcess
County Mitigation Plan	In Process
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	No
Economic Development Plan	In Porcess
Transportation Plan	No
Land-use Plan	No
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	Entering into 28E Agreement

Capabilities	Comments
Firewise or other fire mitigation plan	No
School Mitigation Plan	N/A
Critical Facilities Plan (Mitigation/Response/Recovery)	Yes-Response Plan for Retirment Apts.
Policies/Ordinance	
Zoning Ordinance	Yes
Building Code	Yes
Floodplain Ordinance	No
Subdivision Ordinance	Yes
Tree Trimming Ordinance	Yes
Nuisance Ordinance	Yes
Storm Water Ordinance	Yes
Drainage Ordinance	Yes
Site Plan Review Requirements	Yes
Historic Preservation Ordinance	No
Landscape Ordinance	Yes
Iowa Wetlands and Riparian Areas Conservation Plan	No
Debris Management Plan	No
Program	
Zoning/Land Use Restrictions	Yes
Codes Building Site/Design	Yes
National Flood Insurance Program (NFIP) Participant - Nondelegated	No
NFIP Participant - Delegated	No
NFIP Community Rating System (CRS) Participating Community	No
Hazard Awareness Program	No
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	7/9 in 2005
Economic Development Program	In Process
Land Use Program	No
Public Education/Awareness	No
Property Acquisition	No
Planning/Zoning Boards	Yes
Stream Maintenance Program	No
Tree Trimming Program	No
Engineering Studies for Streams (Local/County/Regional)	No
Mutual Aid Agreements	Tes
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	No
Hazard Analysis/Risk Assessment (County)	No
Flood Insurance Maps	Yes
FEMA Flood Insurance Study (Detailed)	No
Evacuation Route Map	No
Critical Facilities Inventory	No
Vulnerable Population Inventory	No
Land Use Map	No
Staff/Department	
Building Code Official	Yes
Building Inspector	Yes
Mapping Specialist (GIS)	No
Engineer	Yes-contracted
Development Planner	Yes-contracted
Public Works Official	Yes
Emergency Management Coordinator	No
NFIP Floodplain Administrator	No
Bomb and/or Arson Squad	No
Emergency Response Team	Yes-Vol. Fire Dept.
Hazardous Materials Expert	No
Local Emergency Planning Committee	No
County Emergency Management Commission	Yes
Sanitation Department	Yes-contracted

Capabilities	Comments
Transportation Department	No
Economic Development Department	Yes-contracted
Housing Department	no
Planning Consultant	Yes-contracted
Regional Planning Agencies	Yes-contracted
Historic Preservation	Museum Board
Non-Governmental Organizations (NGOs)	
American Red Cross	No
Salvation Army	No
Veterans Groups	American Legion
Environmental Organization	No
Homeowner Associations	No
Neighborhood Associations	No
Chamber of Commerce	No
Community Organizations (Lions, Kiwanis, etc.	Lion's Club
Local Funding Availability	
Ability to apply for Community Development Block Grants	No
Ability to fund projects through Capital Improvements funding	Yes
Authority to levy taxes for a specific purpose	Unknown
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	No
Ability to incur dept through general obligation bonds	Yes
Ability to incur debt through special tax bonds	Yes
Ability to incur debt through private activities	No
Ability to withhold spending in hazard prone areas	No

Source: Data Collection Guide

2.2.8 Granger

The City of Granger is located in northeast Dallas County on the county line between Dallas County and Polk County. The 2010 population of the Dallas County portion of the City was 1,032 which is up 77 percent from the 2000 population. The portion of the City that is in Polk County is a residential area that had s a 2010 population of approximately 212 for a total City of Granger population of 1,244. The City is governed by a Mayor and 5-member City Council and has the following departments:

- Administration (includes Mayor, City Council, and City Clerk)
- Public Safety
- Public Works
- Library
- Parks & Recreation

Mitigation Capabilities

Specific mitigation capabilities are discussed below as well as in Table 2.12 that follows:

- The Fire Department does fire safety classes annually in the schools.
- The City has one outdoor warning siren that is activated by Polk County Dispatch.

Table 2.12. Granger Capabilities

Capability	Comments
Planning Capabilities	
Comprehensive Plan	In Process
Builder's Plan	In Process
Capital Improvement Plan	Yes
Local Emergency Plan	Yes
County Emergency Plan	N/A
Local Recovery Plan	In Process
County Recovery Plan	N/A
Local Mitigation Plan	In Process
County Mitigation Plan	In Process
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	N/A
Economic Development Plan	In Process
Transportation Plan	No
Land-use Plan	In Process
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	Yes
Firewise or other fire mitigation plan	No
School Mitigation Plan	N/A
Critical Facilities Plan (Mitigation/Response/Recovery)	No
Policies/Ordinance	
Zoning Ordinance	Yes-Chapter 165, 166, & 167
Building Code	Yes-Chapter 155
Floodplain Ordinance	Yes-Chapter 160
Subdivision Ordinance	Yes-Chapter 170
Tree Trimming Ordinance	Yes-Chapter 151
Nuisance Ordinance	Yes-Chapters 50, 51, 55, & 56
Storm Water Ordinance	Yes-Chapter 97
Drainage Ordinance	Yes-Chapter 97
Site Plan Review Requirements	Yes-Chapter 158
Historic Preservation Ordinance	No
Landscape Ordinance	Yes-Chapters 151 & 152
Iowa Wetlands and Riparian Areas Conservation Plan	Unknown
Debris Management Plan	No
Program	
Zoning/Land Use Restrictions	Yes
Codes Building Site/Design	Yes
National Flood Insurance Program (NFIP) Participant - Nondelegated	No
NFIP Participant - Delegated	Yes, Case # 08-07-0907P
NFIP Community Rating System (CRS) Participating Community	No
Hazard Awareness Program	Yes-IAMU Hazard Comm. For utilities
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	Unknown
ISO Fire Rating	Rating 7 City-9 Rural
Economic Development Program	Yes-local committee and Dallas Co.
Land Use Program	Yes
Public Education/Awareness	Yes-Fire Safety
Property Acquisition	No

Capability	Comments
Planning/Zoning Boards	Yes
Stream Maintenance Program	Yes
Tree Trimming Program	Yes-Ordinance 151
Engineering Studies for Streams (Local/County/Regional)	Yes-Oxley Creek by Veenstra & Kimm
Mutual Aid Agreements	Yes
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	In Process
Hazard Analysis/Risk Assessment (County)	N/A
Flood Insurance Maps	Yes-2007
FEMA Flood Insurance Study (Detailed)	Yes-2007
Evacuation Route Map	Unknown
Critical Facilities Inventory	Yes-2007
Vulnerable Population Inventory	No
Land Use Map	Yes
Staff/Department	
Building Code Official	Yes
Building Inspector	Yes-Contracted Services
Mapping Specialist (GIS)	Yes-Contracted Services
Engineer	Yes-Contracted Services
Development Planner	Yes-Contracted Services
Public Works Official	Yes
Emergency Management Coordinator	Yes
NFIP Floodplain Administrator	Yes-Contracted Services
Bomb and/or Arson Squad	No
Emergency Response Team	Yes-Fire & EMS volunteers
Hazardous Materials Expert	No-utilize Des Moines Haz-Mat
Local Emergency Planning Committee	Yes-City Council
County Emergency Management Commission	Yes
Sanitation Department	Yes-Contracted Services
Transportation Department	No-utilize IDOT
Economic Development Department	Yes-Committee
Housing Department	No
Planning Consultant	Contracted Services
Regional Planning Agencies	No
Historic Preservation	No
Non-Governmental Organizations (NGOs)	
American Red Cross	No
Salvation Army	No
Veterans Groups	Yes-American Legion
Environmental Organization	No
Homeowner Associations	No
Neighborhood Associations	No
Chamber of Commerce	No
Community Organizations (Lions, Kiwanis, etc.	No
Local Funding Availability	
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	Yes
Authority to levy taxes for a specific purpose	Yes
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	Yes
Ability to incur dept through general obligation bonds	Yes
Ability to incur debt through special tax bonds	Yes
Ability to incur debt through private activities	No
Ability to withhold spending in hazard prone areas	Unknown

Source: Data Collection Guide

2.2.9 Linden

The City of Linden is a small city in western Dallas County along the border of Guthrie County. It is governed by a Mayor and 5-member Council. It had a 2010 population of 199, down 12 percent from the 2000 population.

Mitigation Capabilities

Specific capabilities are discussed below as well as in Table 2.13 that follows:

- The City has one, older model outdoor warning siren.

Table 2.13. Linden Capabilities

Capability	Comments
Planning Capabilities	
Comprehensive Plan	No
Builder's Plan	No
Capital Improvement Plan	No
Local Emergency Plan	No
County Emergency Plan	N/A
Local Recovery Plan	No
County Recovery Plan	N/A
Local Mitigation Plan	In Process
County Mitigation Plan	In Process
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	N/A
Economic Development Plan	No
Transportation Plan	No
Land-use Plan	No
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	No
Firewise or other fire mitigation plan	No
School Mitigation Plan	N/A
Critical Facilities Plan (Mitigation/Response/Recovery)	No
Policies/Ordinance	
Zoning Ordinance	Yes-for sewer project
Building Code	Yes
Floodplain Ordinance	No-No Special Flood Hazard Area
Subdivision Ordinance	No
Tree Trimming Ordinance	No-private utility does this
Nuisance Ordinance	Yes
Storm Water Ordinance	Yes
Drainage Ordinance	Yes
Site Plan Review Requirements	No
Historic Preservation Ordinance	No
Landscape Ordinance	No
Iowa Wetlands and Riparian Areas Conservation Plan	No
Debris Management Plan	No
Program	
Zoning/Land Use Restrictions	Not Reported
Codes Building Site/Design	Not Reported
National Flood Insurance Program (NFIP) Participant - Nondelegated	No
NFIP Participant - Delegated	No-No Special Flood Hazard Area
NFIP Community Rating System (CRS) Participating Community	No
Hazard Awareness Program	No
National Weather Service (NWS) Storm Ready	No

Capability	Comments
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	Not Reported
Economic Development Program	No
Land Use Program	No
Public Education/Awareness	No
Property Acquisition	No
Planning/Zoning Boards	No
Stream Maintenance Program	No
Tree Trimming Program	No
Engineering Studies for Streams (Local/County/Regional)	No
Mutual Aid Agreements	Not Reported
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	No
Hazard Analysis/Risk Assessment (County)	N/A
Flood Insurance Maps	Yes-2007, No Special Flood Hazard Area
FEMA Flood Insurance Study (Detailed)	Yes-2007, No Special Flood Hazard Area
Evacuation Route Map	No
Critical Facilities Inventory	No
Vulnerable Population Inventory	No
Land Use Map	No
Staff/Department	
Building Code Official	Yes, 3 volunteers on Building Board
Building Inspector	No
Mapping Specialist (GIS)	No
Engineer	No
Development Planner	No
Public Works Official	No
Emergency Management Coordinator	No
NFIP Floodplain Administrator	No
Bomb and/or Arson Squad	No
Emergency Response Team	No
Hazardous Materials Expert	No
Local Emergency Planning Committee	No
County Emergency Management Commission	No
Sanitation Department	No
Transportation Department	No
Economic Development Department	No
Housing Department	No
Planning Consultant	No
Regional Planning Agencies	No
Historic Preservation	No
Non-Governmental Organizations (NGOs)	
American Red Cross	No
Salvation Army	No
Veterans Groups	No
Environmental Organization	No
Homeowner Associations	No
Neighborhood Associations	No
Chamber of Commerce	No
Community Organizations (Lions, Kiwanis, etc.	Yes-Lions Club meets twice/yr.
Local Funding Availability	
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	Unknown
Authority to levy taxes for a specific purpose	Unknown
Fees for water, sewer, gas, or electric services	Yes-sewer
Impact fees for new development	Unknown
Ability to incur dept through general obligation bonds	Yes
Ability to incur debt through special tax bonds	Yes
Ability to incur debt through private activities	Unknown

Capability	Comments
Ability to withhold spending in hazard prone areas	No

Source: Data Collection Guide

2.2.10 Minburn

The City of Minburn is a small city in north-central Dallas County. It had a 2010 population of 365, down 7 percent from the 2000 population. It is governed by a Mayor and 5-member Council.

Mitigation Capabilities

Specific capabilities are discussed below as well as in Table 2.14 that follows:

- The City has been awarded a USDA grant for sewer improvements which were in progress at the time this plan was developed.
- The City has been awarded a CDBG grant for a new water treatment facility.
- The City has two outdoor warning sirens that are activated by the Sheriff's Department.

Table 2.14. Minburn Capabilities

Capability	Comments
Planning Capabilities	
Comprehensive Plan	In Process
Builder's Plan	No
Capital Improvement Plan	No
Local Emergency Plan	No
County Emergency Plan	N/A
Local Recovery Plan	No
County Recovery Plan	N/A
Local Mitigation Plan	In Process
County Mitigation Plan	In Process
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	N/A
Economic Development Plan	No
Transportation Plan	No
Land-use Plan	No
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	No
Firewise or other fire mitigation plan	No
School Mitigation Plan	N/A
Critical Facilities Plan (Mitigation/Response/Recovery)	No
Policies/Ordinance	
Zoning Ordinance	In Process
Building Code	Yes-County
Floodplain Ordinance	No-No Special Flood Hazard Area
Subdivision Ordinance	No
Tree Trimming Ordinance	No
Nuisance Ordinance	No
Storm Water Ordinance	No
Drainage Ordinance	No
Site Plan Review Requirements	No
Historic Preservation Ordinance	No
Landscape Ordinance	No

Capability	Comments
Iowa Wetlands and Riparian Areas Conservation Plan	No
Debris Management Plan	No
Program	
Zoning/Land Use Restrictions	No
Codes Building Site/Design	Building Permits turned in to County
National Flood Insurance Program (NFIP) Participant - Nondelegated	No
NFIP Participant - Delegated	No-No Special Flood Hazard Area
NFIP Community Rating System (CRS) Participating Community	No
Hazard Awareness Program	No
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	Not Reported
Economic Development Program	No
Land Use Program	No
Public Education/Awareness	No
Property Acquisition	No
Planning/Zoning Boards	No
Stream Maintenance Program	No
Tree Trimming Program	No
Engineering Studies for Streams (Local/County/Regional)	No
Mutual Aid Agreements	Dallas Center & County
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	No
Hazard Analysis/Risk Assessment (County)	N/A
Flood Insurance Maps	Yes-2007, No Special Flood Hazard Area
FEMA Flood Insurance Study (Detailed)	Yes-2007, No Special Flood Hazard Area
Evacuation Route Map	No
Critical Facilities Inventory	No
Vulnerable Population Inventory	No
Land Use Map	No
Staff/Department	
Building Code Official	No-utilize County
Building Inspector	No-utilize County
Mapping Specialist (GIS)	No-utilize County
Engineer	No-utilize County
Development Planner	No-utilize County
Public Works Official	Yes
Emergency Management Coordinator	No
NFIP Floodplain Administrator	No
Bomb and/or Arson Squad	No
Emergency Response Team	No
Hazardous Materials Expert	No
Local Emergency Planning Committee	No
County Emergency Management Commission	Yes
Sanitation Department	No
Transportation Department	No
Economic Development Department	No
Housing Department	No
Planning Consultant	No
Regional Planning Agencies	No
Historic Preservation	No
Non-Governmental Organizations (NGOs)	
American Red Cross	No
Salvation Army	No
Veterans Groups	Yes-American Veterans, American Legion and American Auxiliary
Environmental Organization	No
Homeowner Associations	No
Neighborhood Associations	No

Capability	Comments
Chamber of Commerce	No
Community Organizations (Lions, Kiwanis, etc.	No
Local Funding Availability	
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	Yes
Authority to levy taxes for a specific purpose	Yes
Fees for water, sewer, gas, or electric services	Yes-Water & Sewer
Impact fees for new development	Unknown
Ability to incur dept through general obligation bonds	Yes
Ability to incur debt through special tax bonds	Yes
Ability to incur debt through private activities	No
Ability to withhold spending in hazard prone areas	N/A

Source: Data Collection Guide

2.2.11 Perry

The City of Perry is located in the north-central portion of the County. The 2010 population of 7,702 is up one percent from the 2000 Census. The City is governed by a Mayor and 5-member City Council and has a City Administrator as well as the following City departments:

- Cemetery
- Compliance
- Garbage & Recycling
- Library
- Parks & Recreation
- Perry Water Works
- Perry Municipal Airport
- Planning & zoning
- Public Safety

In addition to the City departments above, the City also has the following Boards and Commissions:

- Airport Commission
- Historic Preservation
- Library Board
- Parks & Recreation
- Planning & Zoning
- Tree board
- Zoning Board of Adjustment

Mitigation Capabilities

Specific capabilities are discussed below as well as in Table 2.15 that follows:

- Monthly Fire Safety Program
- Provision of smoke detectors
- 911 Server Room
- Backup for GIS Server
- The City has six outdoor warning sirens that are activated by the Perry Police Department Dispatch
- The City utilizes Code Red warning system to alert residents of emergencies.

Table 2.15. Perry Capabilities

Capability	Comments
Planning Capabilities	
Comprehensive Plan	Yes-2007
Builder's Plan	No
Capital Improvement Plan	No
Local Emergency Plan	Yes-June 2012
County Emergency Plan	N/A
Local Recovery Plan	No
County Recovery Plan	N/A
Local Mitigation Plan	Yes-Oct. 2005; Update in Process
County Mitigation Plan	In Process
Local Mitigation Plan (PDM)	Yes-Oct. 2005; Update in Process
County Mitigation Plan (PDM)	N/A
Economic Development Plan	Yes-2007 (part of Comp Plan)
Transportation Plan	Yes-June 2012 (part of EOP)
Land-use Plan	Yes-2007 (part of Comp Plan)
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	No
Firewise or other fire mitigation plan	No
School Mitigation Plan	N/A
Critical Facilities Plan (Mitigation/Response/Recovery)	Yes-June 2012 (part of EOP)
Policies/Ordinance	
Zoning Ordinance	Yes-Chapter 165
Building Code	Yes-1994 UBC
Floodplain Ordinance	Yes-Jan. 2000-Chapter 160
Subdivision Ordinance	Yes-Chapter 166
Tree Trimming Ordinance	Yes-Chapter 151
Nuisance Ordinance	Yes-Chapter 50
Storm Water Ordinance	Yes-Chapter 100
Drainage Ordinance	Yes-Suburban Development Standards
Site Plan Review Requirements	Yes-Building Inspector
Historic Preservation Ordinance	Yes-Chapter 129
Landscape Ordinance	Yes-Perry Tree board/Alliant Energy
Iowa Wetlands and Riparian Areas Conservation Plan	No
Debris Management Plan	Yes-6/2012 (part of EOP)
Program	
Zoning/Land Use Restrictions	Yes-Building Inspector
Codes Building Site/Design	Yes-Building Inspector
National Flood Insurance Program (NFIP) Participant - Nondelegated	No
NFIP Participant - Delegated	Yes
NFIP Community Rating System (CRS) Participating Community	No
Hazard Awareness Program	No
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	Not Reported
Economic Development Program	Yes-Perry Economic Dev. Program and Greater Dallas Co. Alliance
Land Use Program	Yes-Perry Tree Board
Public Education/Awareness	Yes-Perry Living Mag, PSA, City Hall and Chamber
Property Acquisition	Yes-Neighbor Stabilization Program
Planning/Zoning Boards	Yes-Perry Zoning Board
Stream Maintenance Program	No
Tree Trimming Program	Yes-Perry Tree Board/Alliant Energy
Engineering Studies for Streams (Local/County/Regional)	No
Mutual Aid Agreements	Yes

Capability	Comments
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	Yes-2007 Comprehensive Plan
Hazard Analysis/Risk Assessment (County)	N/A
Flood Insurance Maps	Yes-2007
FEMA Flood Insurance Study (Detailed)	Yes-2007
Evacuation Route Map	No
Critical Facilities Inventory	Yes-2007 Comprehensive Plan
Vulnerable Population Inventory	No
Land Use Map	Yes-2007 Comprehensive Plan
Staff/Department	
Building Code Official	Yes
Building Inspector	Yes
Mapping Specialist (GIS)	Contracted Services
Engineer	Contracted Services
Development Planner	Contracted Services
Public Works Official	Yes
Emergency Management Coordinator	No-utilize County
NFIP Floodplain Administrator	Yes
Bomb and/or Arson Squad	No-utilize County
Emergency Response Team	No-utilize County
Hazardous Materials Expert	No-utilize County
Local Emergency Planning Committee	Yes-NIMS Committee
County Emergency Management Commission	Yes
Sanitation Department	Yes
Transportation Department	No
Economic Development Department	Yes-Dallas Co. Alliance, Perry Industry
Housing Department	Yes-Region XII Council of Governments
Planning Consultant	Yes-Region XII Council of Governments
Regional Planning Agencies	Yes-Region XII Council of Governments
Historic Preservation	Yes
Non-Governmental Organizations (NGOs)	
American Red Cross	No
Salvation Army	No
Veterans Groups	Yes-American Legion Post
Environmental Organization	Yes-American Legion Post
Homeowner Associations	No
Neighborhood Associations	Yes-Parkview Place & Highview
Chamber of Commerce	Yes-Perry Chamber of Commerce
Community Organizations (Lions, Kiwanis, etc.	Yes-Lions, Kiwanis, Knights of Columbus, Rotary, Crime Stoppers, Optimist Club, Nudgers, Masons, Elks, Perry Citizens Against Crime
Local Funding Availability	
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	Yes
Authority to levy taxes for a specific purpose	Yes
Fees for water, sewer, gas, or electric services	Yes-Water & Sewer
Impact fees for new development	Yes
Ability to incur dept through general obligation bonds	Yes
Ability to incur debt through special tax bonds	Yes-Tax Increment Finance
Ability to incur debt through private activities	Yes-Perry Economic Development
Ability to withhold spending in hazard prone areas	No

Source: Data Collection Guide

2.2.12 Redfield

The City of Redfield is located in southwest Dallas County. In 2010, the City had a population of 835, up 0.2 percent from the 2000 census. The City is governed by a Mayor and 5-member Council.

Mitigation Capabilities

Specific mitigation capabilities are discussed below as well as in Table 2.16 that follows:

- The City has one outdoor warning sirens that is activated by the County
- The City also utilizes Red Alert to warn citizens of emergencies.

Table 2.16. Redfield Capabilities

Capability	Comments
Planning Capabilities	
Comprehensive Plan	Yes-2000
Builder's Plan	No
Capital Improvement Plan	No
Local Emergency Plan	No
County Emergency Plan	N/A
Local Recovery Plan	No
County Recovery Plan	N/A
Local Mitigation Plan	In Process
County Mitigation Plan	In Process
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	N/A
Economic Development Plan	No
Transportation Plan	No
Land-use Plan	No
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	No
Firewise or other fire mitigation plan	No
School Mitigation Plan	N/A
Critical Facilities Plan (Mitigation/Response/Recovery)	No
Policies/Ordinance	
Zoning Ordinance	Yes
Building Code	No
Floodplain Ordinance	Yes-2007
Subdivision Ordinance	Unknown
Tree Trimming Ordinance	Yes
Nuisance Ordinance	Yes
Storm Water Ordinance	No
Drainage Ordinance	Yes
Site Plan Review Requirements	Unknown
Historic Preservation Ordinance	No
Landscape Ordinance	No
Iowa Wetlands and Riparian Areas Conservation Plan	No
Debris Management Plan	No
Program	
Zoning/Land Use Restrictions	No
Codes Building Site/Design	No
National Flood Insurance Program (NFIP) Participant - Nondelegated	No
NFIP Participant - Delegated	Yes
NFIP Community Rating System (CRS) Participating Community	No

Capability	Comments
Hazard Awareness Program	No
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	Rating 7
Economic Development Program	No
Land Use Program	No
Public Education/Awareness	No
Property Acquisition	No
Planning/Zoning Boards	Yes
Stream Maintenance Program	No
Tree Trimming Program	Yes
Engineering Studies for Streams (Local/County/Regional)	No
Mutual Aid Agreements	Yes
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	No
Hazard Analysis/Risk Assessment (County)	N/A
Flood Insurance Maps	Yes-2007
FEMA Flood Insurance Study (Detailed)	Yes-2007
Evacuation Route Map	No
Critical Facilities Inventory	No
Vulnerable Population Inventory	No
Land Use Map	Yes-Zoning Map
Staff/Department	
Building Code Official	No
Building Inspector	No
Mapping Specialist (GIS)	No-utilize Dallas Co.
Engineer	No
Development Planner	No
Public Works Official	Yes
Emergency Management Coordinator	No
NFIP Floodplain Administrator	Yes
Bomb and/or Arson Squad	No
Emergency Response Team	No
Hazardous Materials Expert	No
Local Emergency Planning Committee	No
County Emergency Management Commission	Yes
Sanitation Department	No
Transportation Department	No
Economic Development Department	No
Housing Department	No
Planning Consultant	No
Regional Planning Agencies	No
Historic Preservation	No
Non-Governmental Organizations (NGOs)	
American Red Cross	No
Salvation Army	No
Veterans Groups	Yes-American Legion
Environmental Organization	No
Homeowner Associations	No
Neighborhood Associations	Yes-Raccoon St. Neighborhood Watch
Chamber of Commerce	No
Community Organizations (Lions, Kiwanis, etc.	Yes-Lions, Red Development
Local Funding Availability	
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	Yes
Authority to levy taxes for a specific purpose	Yes
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	Unknown
Ability to incur dept through general obligation bonds	Yes

Capability	Comments
Ability to incur debt through special tax bonds	Yes
Ability to incur debt through private activities	No
Ability to withhold spending in hazard prone areas	Yes

Source: Data Collection Guide

2.2.13 Van Meter

The City of Van Meter is located in southern Dallas County near the Dallas/Madison County border. The 2010 population was 1,016 which is up 17 percent from the 2000 population. The City is governed by a Mayor and 5-member City Council and has the following departments:

- Administration
- Public Works
- Police
- Fire & Rescue
- Library
- Parks & Recreation

In addition, the City has the following boards and commissions:

- Residential Housing and Development
- Planning & Zoning Commission
- Board of Adjustment
- Economic Development

Mitigation Capabilities

Specific mitigation capabilities are discussed below as well as in Table 2.17 that follows:

- The City has one outdoor warning siren that is activated remotely by Dallas County Dispatch.

Table 2.17. Van Meter Capabilities

Capability	Comments
Planning Capabilities	
Comprehensive Plan	Yes-June 2011
Builder's Plan	No
Capital Improvement Plan	No
Local Emergency Plan	In Process
County Emergency Plan	N/A
Local Recovery Plan	No
County Recovery Plan	N/A
Local Mitigation Plan	In Process
County Mitigation Plan	In Process
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	N/A
Economic Development Plan	No
Transportation Plan	No
Land-use Plan	Yes-June 2003, Amended June 2009

Capability	Comments
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	No
Firewise or other fire mitigation plan	No
School Mitigation Plan	N/A
Critical Facilities Plan (Mitigation/Response/Recovery)	No
Policies/Ordinance	
Zoning Ordinance	Yes
Building Code	Yes-2006
Floodplain Ordinance	Yes-2007
Subdivision Ordinance	Yes
Tree Trimming Ordinance	Yes
Nuisance Ordinance	Yes
Storm Water Ordinance	No
Drainage Ordinance	No
Site Plan Review Requirements	Yes
Historic Preservation Ordinance	No
Landscape Ordinance	Yes
Iowa Wetlands and Riparian Areas Conservation Plan	No
Debris Management Plan	No
Program	
Zoning/Land Use Restrictions	Yes
Codes Building Site/Design	Yes
National Flood Insurance Program (NFIP) Participant - Nondelegated	No
NFIP Participant - Delegated	Yes
NFIP Community Rating System (CRS) Participating Community	No
Hazard Awareness Program	Yes
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	Rating 7
Economic Development Program	No
Land Use Program	Yes-zoning
Public Education/Awareness	No
Property Acquisition	No
Planning/Zoning Boards	Yes
Stream Maintenance Program	Yes
Tree Trimming Program	Yes-as needed
Engineering Studies for Streams (Local/County/Regional)	Unknown
Mutual Aid Agreements	Yes
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	No
Hazard Analysis/Risk Assessment (County)	N/A
Flood Insurance Maps	Yes-2007
FEMA Flood Insurance Study (Detailed)	Yes-2007
Evacuation Route Map	No
Critical Facilities Inventory	No
Vulnerable Population Inventory	No
Land Use Map	Yes
Staff/Department	
Building Code Official	Contracted Services
Building Inspector	Contracted Services
Mapping Specialist (GIS)	No
Engineer	Contracted Services
Development Planner	No
Public Works Official	Yes
Emergency Management Coordinator	No
NFIP Floodplain Administrator	Yes
Bomb and/or Arson Squad	No
Emergency Response Team	No
Hazardous Materials Expert	No

Capability	Comments
Local Emergency Planning Committee	No
County Emergency Management Commission	Yes
Sanitation Department	Contracted Services
Transportation Department	No
Economic Development Department	No
Housing Department	No
Planning Consultant	No
Regional Planning Agencies	No
Historic Preservation	No
Non-Governmental Organizations (NGOs)	
American Red Cross	No
Salvation Army	No
Veterans Groups	Yes
Environmental Organization	No
Homeowner Associations	No
Neighborhood Associations	No
Chamber of Commerce	No
Community Organizations (Lions, Kiwanis, etc.	No
Local Funding Availability	
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	Yes
Authority to levy taxes for a specific purpose	Yes
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	Yes
Ability to incur dept through general obligation bonds	Yes
Ability to incur debt through special tax bonds	No
Ability to incur debt through private activities	Yes
Ability to withhold spending in hazard prone areas	Yes

Source: Data Collection Guide

2.2.14 Waukee

With a 2010 population of 13,790, the City of Waukee is now the largest city in Dallas County. Since 2000, this city, which is part of the Des Moines Metropolitan area, has increased in population by 169 percent. Waukee is located in southeast Dallas County near the county line between Dallas County and Polk County. The City is governed by a Mayor and 5-member City Council and has the following departments:

- Administration
- Fire
- Police
- Library
- Finance and Human Resources
- Development Services
- Parks & Recreation
- Public Works
- Streets
- Utilities
- Storm Water

The City also has the following Boards and Committees:

- Board of Adjustment
- Board of Appeals
- Library board of Trustees
- Park Board
- Planning & Zoning Commission
- Utilities Committee

Mitigation Capabilities

Specific mitigation capabilities are discussed below as well as in Table 2.18 that follows:

- The Fire Department does fire safety classes annually in the schools and day cares.
- The City has seven outdoor warning sirens that are activated by the Police Department by radio frequency in duty police cars, or base station at the public safety building.
- The City also has the ability to utilize the Dallas County Sheriff's Reverse 911 warning system.

Table 2.18. Waukee Capabilities

Capability	Comments
Planning Capabilities	
Comprehensive Plan	Yes-March 2008
Builder's Plan	No
Capital Improvement Plan	Yes-March 2012
Local Emergency Plan	Yes-Updated April 2012
County Emergency Plan	N/A
Local Recovery Plan	No
County Recovery Plan	N/A
Local Mitigation Plan	In Process
County Mitigation Plan	In Process
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	N/A
Economic Development Plan	No
Transportation Plan	Yes-Oct. 2004
Land-use Plan	Yes-March 2008
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	No
Firewise or other fire mitigation plan	No
School Mitigation Plan	N/A
Critical Facilities Plan (Mitigation/Response/Recovery)	No
Policies/Ordinance	
Zoning Ordinance	Yes
Building Code	Yes-2003
Floodplain Ordinance	Yes
Subdivision Ordinance	Yes
Tree Trimming Ordinance	Yes
Nuisance Ordinance	Yes
Storm Water Ordinance	Yes
Drainage Ordinance	Yes
Site Plan Review Requirements	Yes
Historic Preservation Ordinance	No
Landscape Ordinance	Yes

Capability	Comments
Iowa Wetlands and Riparian Areas Conservation Plan	No
Debris Management Plan	No
Program	
Zoning/Land Use Restrictions	Yes
Codes Building Site/Design	Yes
National Flood Insurance Program (NFIP) Participant - Nondelegated	No
NFIP Participant - Delegated	Yes
NFIP Community Rating System (CRS) Participating Community	No
Hazard Awareness Program	Unknown
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	Rating 5
Economic Development Program	Yes
Land Use Program	Yes
Public Education/Awareness	Yes
Property Acquisition	No
Planning/Zoning Boards	Yes
Stream Maintenance Program	No
Tree Trimming Program	Yes-annual trimming
Engineering Studies for Streams (Local/County/Regional)	No
Mutual Aid Agreements	Yes
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	No
Hazard Analysis/Risk Assessment (County)	N/A
Flood Insurance Maps	Yes-2007
FEMA Flood Insurance Study (Detailed)	Yes-2007
Evacuation Route Map	No
Critical Facilities Inventory	Yes-2007
Vulnerable Population Inventory	No
Land Use Map	Yes
Staff/Department	
Building Code Official	No
Building Inspector	Yes-2
Mapping Specialist (GIS)	No
Engineer	Yes-2 Engineering Techs.
Development Planner	Yes
Public Works Official	Yes
Emergency Management Coordinator	No
NFIP Floodplain Administrator	Yes
Bomb and/or Arson Squad	Yes- Bomb-Contracted Services; Arson-In-house
Emergency Response Team	Yes
Hazardous Materials Expert	Contracted Services
Local Emergency Planning Committee	Yes
County Emergency Management Commission	Yes
Sanitation Department	Contracted Services
Transportation Department	No
Economic Development Department	No
Housing Department	No
Planning Consultant	No
Regional Planning Agencies	No
Historic Preservation	No
Non-Governmental Organizations (NGOs)	
American Red Cross	Yes
Salvation Army	Yes
Veterans Groups	Yes
Environmental Organization	No
Homeowner Associations	Yes
Neighborhood Associations	No

Capability	Comments
Chamber of Commerce	Yes
Community Organizations (Lions, Kiwanis, etc.	Yes
Local Funding Availability	
Ability to apply for Community Development Block Grants	No
Ability to fund projects through Capital Improvements funding	Yes
Authority to levy taxes for a specific purpose	Yes
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	No
Ability to incur dept through general obligation bonds	Yes
Ability to incur debt through special tax bonds	Yes
Ability to incur debt through private activities	Unknown
Ability to withhold spending in hazard prone areas	Unknown

Source: Data Collection Guide

2.2.15 Woodward

The City of Woodward is located in northeast Dallas County on the county line between Dallas County and Boone County. The 2010 population of the Dallas County portion of the city was 1,018 which is down 15 percent from the 2000 population. The portion of Woodward city limits that are in Boone County contains primarily the State Hospital, "Woodward Academy". In 2011, the enrollment of Woodward Academy was 255 students. The City is governed by a Mayor and 5-member City Council and has the following departments:

- City Hall (includes City Clerk and Chief Finance Officer)
- Public Works
- Water/Wastewater
- Police
- Library

The City also has the following Advisory Committees:

- Parks & Recreation Committee
- Planning & Zoning Commission
- Finance
- Water & Sewer
- Streets & Alleys

Mitigation Capabilities

Specific mitigation capabilities are discussed below as well as in Table 2.19 that follows:

- The Fire Department does fire safety classes annually in the schools.
- The Water Department disseminates information annually about water quality.
- The City has undertaken storm sewer projects to upgrade and improve the storm drain system throughout the community since 2000 and ongoing.
- The City has two outdoor warning sirens. One is in town and one is at the State Hospital in city limits on the Boone County side of the county line. The one in town is activated

manually or by phone by the Woodward Fire Department. The one at the State Hospital is managed by the State Hospital.

- The City utilizes Code Red and Nixle web systems as community emergency notification systems.

Table 2.19. Woodward Capabilities

Capability	Comments
Planning Capabilities	
Comprehensive Plan	Yes
Builder's Plan	No
Capital Improvement Plan	Yes
Local Emergency Plan	Yes
County Emergency Plan	N/A
Local Recovery Plan	Yes
County Recovery Plan	N/A
Local Mitigation Plan	In Process
County Mitigation Plan	In Process
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	N/A
Economic Development Plan	Yes
Transportation Plan	No
Land-use Plan	No
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	No
Firewise or other fire mitigation plan	No
School Mitigation Plan	N/A
Critical Facilities Plan (Mitigation/Response/Recovery)	Yes
Policies/Ordinance	
Zoning Ordinance	Yes
Building Code	Yes-International Building Code
Floodplain Ordinance	No-No Special Flood Hazard Area
Subdivision Ordinance	Yes
Tree Trimming Ordinance	Yes
Nuisance Ordinance	Yes
Storm Water Ordinance	Yes
Drainage Ordinance	Yes
Site Plan Review Requirements	Yes
Historic Preservation Ordinance	No
Landscape Ordinance	Yes
Iowa Wetlands and Riparian Areas Conservation Plan	No
Debris Management Plan	Yes
Program	
Zoning/Land Use Restrictions	Yes
Codes Building Site/Design	Yes
National Flood Insurance Program (NFIP) Participant - Nondelegated	No
NFIP Participant - Delegated	No-No Special Flood Hazard Area
NFIP Community Rating System (CRS) Participating Community	No
Hazard Awareness Program	Yes
National Weather Service (NWS) Storm Ready	Yes
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	Not Reported
Economic Development Program	Yes
Land Use Program	Yes
Public Education/Awareness	Yes
Property Acquisition	No
Planning/Zoning Boards	Yes
Stream Maintenance Program	N/A

Capability	Comments
Tree Trimming Program	Yes
Engineering Studies for Streams (Local/County/Regional)	N/A
Mutual Aid Agreements	Yes
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	Yes
Hazard Analysis/Risk Assessment (County)	N/A
Flood Insurance Maps	Yes-2007, No Special Flood Hazard Area
FEMA Flood Insurance Study (Detailed)	Yes-2007, No Special Flood Hazard Area
Evacuation Route Map	Yes
Critical Facilities Inventory	Yes
Vulnerable Population Inventory	No
Land Use Map	Yes
Staff/Department	
Building Code Official	Yes
Building Inspector	Yes
Mapping Specialist (GIS)	No
Engineer	Contracted Services
Development Planner	No
Public Works Official	Yes
Emergency Management Coordinator	Yes
NFIP Floodplain Administrator	No
Bomb and/or Arson Squad	No
Emergency Response Team	Yes
Hazardous Materials Expert	No
Local Emergency Planning Committee	Yes
County Emergency Management Commission	Yes
Sanitation Department	Yes
Transportation Department	No
Economic Development Department	Yes-Woodward Economic Development Alliance (WEDA)
Housing Department	No
Planning Consultant	No
Regional Planning Agencies	No
Historic Preservation	No
Non-Governmental Organizations (NGOs)	
American Red Cross	No
Salvation Army	No
Veterans Groups	Yes-American Legion Post 210
Environmental Organization	No
Homeowner Associations	No
Neighborhood Associations	No
Chamber of Commerce	No
Community Organizations (Lions, Kiwanis, etc.	Yes-Lions, Masons, Boy Scouts, Envision Woodward Bicycling Groups
Local Funding Availability	
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	Yes
Authority to levy taxes for a specific purpose	Yes
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	Yes
Ability to incur dept through general obligation bonds	Yes
Ability to incur debt through special tax bonds	Yes
Ability to incur debt through private activities	No
Ability to withhold spending in hazard prone areas	No

Source: Data Collection Guide

2.3 School District Profiles and Mitigation Capabilities

This section includes general profile information of the seven school districts that have school buildings in Dallas County and are participating in development of this plan as well as a summary of mitigation capabilities. The seven school districts are as follows:

- Adel DeSoto Minburn Schools
- Dallas Center-Grimes Schools
- Perry Schools
- Van Meter Schools
- Waukee Schools
- West Central Valley Schools
- Wood-Granger Schools

The map in Figure 2.4 provides the boundaries of the school districts in Dallas County and Table 2.20 that follows provides location and enrollment information for each school in each of the seven participating school districts.

Figure 2.4. Dallas County School District Boundaries

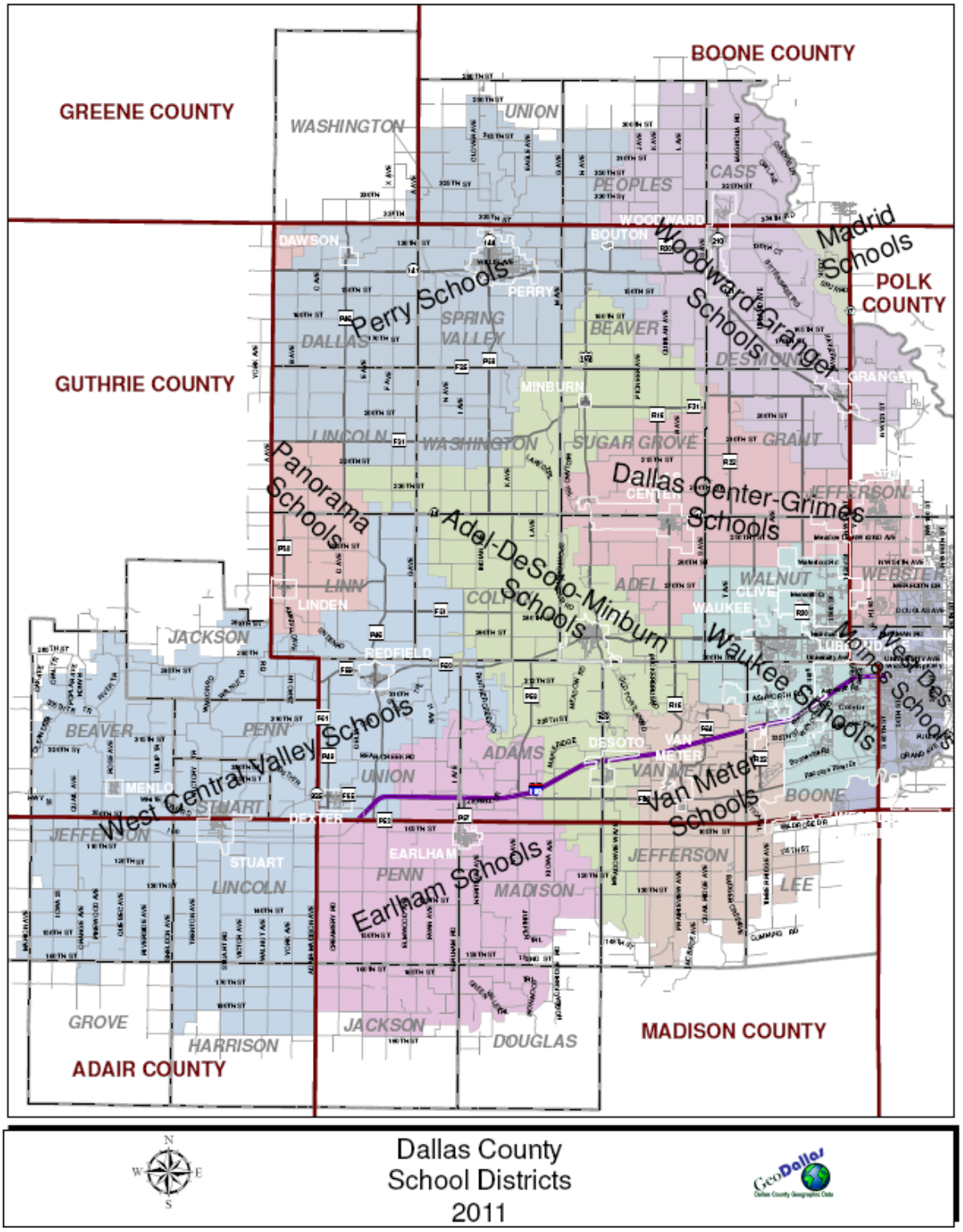


Table 2.20. Dallas County School Building Locations and Enrollment Data, 2011

District Name	Building Name	Street Address	City	Building Enrollment
Adel DeSoto Minburn	Adel Elementary School	1608 Grove St.	Adel	385
Adel DeSoto Minburn	ADM Middle School	801 Nile Kinnick Dr. S.	Adel	342
Adel DeSoto Minburn	ADM Senior High School	801 Nile Kinnick Dr S	Adel	469
Adel DeSoto Minburn	DeSoto Intermediate School	317 Spruce St	DeSoto	335
Dallas Center-Grimes	Dallas Center Elementary	1205 13th St	Dallas Center	338
Dallas Center-Grimes	Dallas Center-Grimes High School	2555 W 1st St	Grimes	598
Dallas Center-Grimes	Dallas Center-Grimes Middle School	1400 Vine Street	Dallas Center	533
Dallas Center-Grimes	North Ridge Elementary	400 NW 27th St	Grimes	269
Perry	Perry Elementary	1600 8th Street	Perry	790
Perry	Perry High School	1200 18th Street	Perry	553
Perry	Perry Middle School	1200 18th Street	Perry	425
Van Meter	Van Meter Elementary School	520 1st Ave	Van Meter	262
Van Meter	Van Meter Jr-Sr High School	520 1st Ave	Van Meter	359
Waukee	Brookview Elementary	8000 E.P. True Pkwy	W. Des Moines	613
Waukee	Eason Elementary	605 SE Boone Dr	Waukee	594
Waukee	Maple Grove Elementary	1455 98th St.	W. Des Moines	685
Waukee	Prairieview School	655 SE University Ave	Waukee	431
Waukee	Shuler Elementary	16400 Douglas Pkwy	Clive	603
Waukee	Walnut Hills Elementary	4240 NW 156th St	Urbandale	546
Waukee	Waukee Elementary School	850 6th St	Waukee	700
Waukee	Waukee Middle School	905 South Warrior Lane	Waukee	806
Waukee	Waukee Senior High School	555 SE University	Waukee	1,147
Waukee	Waukee South MS	2350 SE LA Grant Pkwy	Waukee	811
West Central Valley	Dexter Elementary School	803 Washington St	Dexter	158
West Central Valley	West Central Valley Middle School	1375 High St.	Redfield	199
Woodward-Granger	Woodward-Granger Elementary School	2200 State St	Granger	424
Woodward-Granger	Woodward-Granger Grandwood	1251 334th St	Woodward	34
Woodward-Granger	Woodward-Granger High School	306 W 3rd St	Woodward	201
Woodward-Granger	Woodward-Granger Middle School	306 W 3rd St	Woodward	166

Source: Iowa Department of Education, http://educateiowa.gov/index.php?option=com_content&view=article&id=346&Itemid=4439

Potential capabilities to implement mitigation programs and projects can vary among school districts. To determine mitigation capabilities, each participating school district completed a Data Collection Guide to report planning, personnel, fiscal, and other capabilities related to implementation of mitigation programs and projects. Table 2.21 provides a summary of the reported capabilities for each participating school district.

Table 2.21. Summary of Mitigation Capabilities for Participating School Districts

Capability	Adel-DeSoto-Minburn Schools	Dallas Center-Grimes Schools	Perry Schools	Van Meter Schools	Waukee Schools	Woodward-Granger Schools	West Central Valley Schools
Planning Elements							
Master Plan	Yes-2010	No	Yes-March 2008	Not Reported	N/A	N/A	No
Capital Improvement Plan	Yes-2012	Yes-July 2011	Yes	Yes-Spring 2012	Yes-May 2012	N/A	No
School Emergency Plan	Yes-2011-2012	Yes-July 2011	Yes-2008	Yes-Spring 2012	Yes-April 2010	Yes-August 2011	Yes-annually
Weapons Policy	Yes-2012	Yes-May 2012	Yes-2009	Not Reported	Yes	Yes-August 2011	No
Personnel Resources							
Full-time building official (i.e. principal)	Yes	Yes	Yes	Yes-Spring 2012	Yes	Yes-August 2011	Yes
Emergency Manager	No	Yes-Administrative Office, Associate Superintendent	Director of Bldgs. And Grounds is member of Fire Dept and an EMT	Not Reported	No	No	Yes-Superintendent
Grant Writer	No	No	No	Not Reported	No	No	No
Public Information Officer	No	No	Yes-Superintendent	Not Reported	Yes-District Administration	Yes-Superintendent	Yes-Superintendent
Financial Resources							
Capital Improvements project funding	Yes	No	Yes	Yes	Yes	Yes	Yes
Local funds	Yes	Yes	Yes	Yes	Yes	Yes	Yes
General obligation bonds	Yes	No	Yes	Yes	Yes	Yes	No
Special tax bonds	Yes	No	Yes	Yes	Yes	Yes	Yes
Private activities/donations	Yes	No	Yes	Yes	Yes	Yes	Yes
State and federal funds	Yes	No	Yes	Yes	Yes	Yes	Yes
Other							
Public Education Programs	None Reported	Integrated in curriculum	Annual Fire Safety in Elementary, Emergency Planning Meetings through Area Education Agency and Iowa Association of School Boards, Social Network Awareness Training; Special speakers from Department of Natural Resources.	Not Reported	Not Reported	Annual Safety Day at elementary	Fire Safety at elementary
Privately or self-insured?	Private	Private	Private	Private	Private	Private	Private

Capability	Adel-DeSoto-Minburn Schools	Dallas Center-Grimes Schools	Perry Schools	Van Meter Schools	Waukee Schools	Woodward-Granger Schools	West Central Valley Schools
Fire evacuation training	Yes-4 times/year	Yes-4 time/year	Yes-4 times/year	Each Semester	Yes	Yes-4 times/year	Yes-4 times/year
Tornado sheltering Exercises	Yes-4 times/year	Yes-4 times/year	Yes-4 times/year	Each Semester	Yes	Yes-4 times/year	Yes-4 times/year
Public Address/Emergency Alert System	Public Address System	Public Address System	Public Address and "School Messenger" text system	Public Address, Fire/burglar alarm	Public Address, Fire alarm	Public Address	Public Address, security alerts and fire alerts. Some have phone lines with alert messaging capability
NOAA Weather Radios	Yes	Most buildings	Yes	Real time weather Radar	Yes	Yes	No
Lock-down security training	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mitigation Programs	None Reported	None Reported	Bus Evacuation-bi-annually, New Fire Alarm System at Perry Elementary, New ADA/public safety signage throughout district	Not Reported	Not Reported	New construction has standards for thicker concrete for safety	No
Tornado Shelter/Saferoom	No	No	No	Yes-not reviewed for FEMA standards	Yes-not reviewed for FEMA standards	No	Yes-current HMA Grant for saferoom in Stuart High School; Stuart Elementary saferoom to be completed in 2013
Campus Police	School Resource Officer through partnership with Adel Police Dept.	No	School Resource Office through partnership with Perry Police Dept.	Not Reported	No	No-but officers are designated and on-call	No

Source: Data Collection Guides: Dates indicate when last updated.

3 RISK ASSESSMENT

44 CFR Requirement §201.6(c)(2): [The plan shall include] A risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.

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

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

Step 1—Identify Hazards
Step 2—Profile Hazard Events
Step 3—Inventory Assets
Step 4—Estimate Losses

This chapter is divided into five main parts:

- **Section 3.1 Hazard Identification** identifies the hazards that threaten the planning area and the methodology utilized to score or rank the hazards;
- **Section 3.2 Assets at Risk** provides the planning area's total exposure to natural hazards, considering critical facilities and other community assets at risk;
- **Section 3.3 Future Land Use and Development** discusses areas of planned future development
- **Section 3.4 Hazard Profiles and Vulnerability** For each hazard, this section is divided into two parts: 1) Hazard Profile discusses the threat to the planning area, the geographic location/extent at risk, previous occurrences of hazard events, and probability of future occurrence; and 2) Vulnerability Assessment further defines and quantifies populations, buildings, critical facilities, and other community assets at risk to natural hazards;
- **Section 3.5 Hazard Analysis Summary** provides a tabular summary of the hazard ranking for each jurisdiction in the planning area.

3.1 Hazard Identification

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

3.1.1 Review of Existing Mitigation Plans

The City of Perry, Iowa previously developed a single-jurisdiction Hazard Mitigation Plan dated 2005. The City of Perry has now made the decision to participate in the multi-jurisdictional county-wide plan. Although the City's previous plan expired prior to development of this multi-jurisdictional plan, it has been consulted in development of the risk assessment and information included and updated where appropriate. The hazards included in the 2005 Perry Hazard Mitigation Plan are listed in Table 3.1

Table 3.1. Hazards included in 2005 Perry, Iowa Hazard Mitigation Plan

- Aircraft Crash
- Communications Failure
- Drought/Extreme Heat
- Disease/Epidemic
- Earthquake
- Hazardous Materials
- Fire
- Flooding
- Pipeline Incident
- Power Failure
- School Violence
- Structural Failure
- Terrorism
- Thunderstorms
- Tornadoes
- Water Supply Contamination
- Winter Storms
- Workplace Violence

To facilitate consistency within planning efforts in the State, and to enable comprehensive statewide analysis, of local plans the Hazard Mitigation Planning Committee (HMPC) considered each of the 23 hazards included in the 2010 State of Iowa Hazard Mitigation plan. The HMPC reviewed data and discussed the impacts of each of these hazards. Table 3.2 below provides the full list of hazards in the State Hazard Mitigation Plan.

Table 3.2. Hazards Included in 2010 Iowa State Hazard Mitigation Plan

- Animal/Crop/Plant Disease
- Dam Failure
- Drought
- Earthquake
- Expansive Soils
- Extreme Heat
- Flash Flood
- Grass or Wildland Fire
- Hailstorm
- Hazardous Materials
- Human Disease
- Infrastructure Failure
- Landslide
- Levee Failure
- Radiological
- River Flooding
- Severe Winter Storm
- Sinkholes
- Terrorism
- Thunderstorms and Lightning
- Tornado
- Transportation Incident
- Windstorm

3.1.2 Review Disaster Declaration History

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

FEMA also issues emergency declarations, which are more limited in scope and do not include the long-term federal recovery programs of major disaster declarations. Determinations for declaration type are based on scale and type of damages and institutions or industrial sectors affected.

Table 3.3 lists federal disaster declarations that included Dallas County from 1965 to 2011.

Table 3.3. FEMA Disaster Declarations that included Dallas County, Iowa, 1965-2011

Disaster Number	Description	Declaration Date (Incident Period)	IA/PA
DR-1930	Severe Storms, Flooding, & Tornadoes	7-29-2010 (6-1-2010 to 8-31-3010)	PA
DR-1880	Severe Winter Storms	3-2-2010 (1-19-2010 to 1-26-2010)	PA
DR-1763	Severe Storms, Tornadoes, & Flooding	5-27-2008 (5-25-2008 to 8-13-2008)	PA & IA
DR-1705	Severe Storms, Flooding, & Tornadoes	5-25-2007 (5-5-2007 to 5-7-2007)	IA
DR-1518	Severe Storms, Tornadoes, & Flooding	5-25-2004 (5-19-2004 to 6-24-2004)	IA
DR-1230	Severe Weather, Tornadoes, & Flooding	7-2-1998 (6-13-1998 to 7-15-1998)	IA & PA
DR-996	Flooding, Severe Storms	7-9-1993 (4-13-1993 to 10-1-1993)	IA & PA
DR-928	Ice Storm	12-26-1991 (10-31-1991 to 11-29-1991)	PA
DR-868	Flooding, Severe Storm	5-26-1990 (5-18-1990 to 7-6-1990)	IA & PA
DR-590	High winds & Tornadoes	7-1-1979 (7-1-1979 to 7-1-1979)	IA & PA
DR-259	Flooding	4-25-1969 (4-25-1969 to 4-25-1969)	IA & PA
DR-193	Flooding	4-22-1965 (4-22-1965 to 4-22-1965)	IA & PA

Source: Federal Emergency Management Agency, www.fema.gov/; Note: Incident dates are in parentheses; PA= Public Assistance, IA= Individual Assistance

3.1.3 Research Additional Sources

Additional data on the past impacts of hazards in the planning area was collected from the following sources:

- Iowa Hazard Mitigation Plan (November 2010);
- City of Perry Hazard Mitigation Plan (2005);
- Information on past extreme weather and climate events from the National Oceanic and Atmospheric Administration's (NOAA) National Climatic Data Center;
- Iowa Department of Natural Resources;
- Dallas County Health Department;
- Disaster declaration history from the Federal Emergency Management Agency (FEMA);
- The National Drought Mitigation Center Drought Reporter;
- US Department of Agriculture's (USDA) Risk Management Agency Crop Insurance Statistics;
- Information provided by local jurisdictions; and
- Various articles and publications available on the internet (sources are indicated where data is cited).

3.1.4 Hazards Identified

The HMPC decided to include all natural hazards from the 2010 State of Iowa Hazard Mitigation Plan, which is inclusive of the natural hazards included in the 2005 Perry Hazard Mitigation Plan. The five man-made and technological hazards (Hazardous Materials, Infrastructure Failure, Radiological, Terrorism, and Transportation Incident) as well as the Human Disease Hazard were eliminated from further analysis for two reasons. First, evaluation of these hazards is not necessary for plans to meet the requirements of the Disaster Mitigation Act of 2000. Secondly, these hazards are profiled and planned for in other plans such as the Local Emergency Operations Plans and plans maintained by the Dallas County Health Department.

Through this hazard identification review process, 17 natural hazards that have the potential to significantly affect the planning area were chosen for further analysis in the risk assessment. These hazards are named and organized in the plan to be consistent with the 2010 Iowa Hazard Mitigation Plan are listed in Table 3.4.

Table 3.4. Hazards Identified for Dallas County Multi-jurisdictional Hazard Mitigation Plan

- Animal/Crop/Plant Disease
- Dam Failure
- Drought
- Earthquake
- Expansive Soils
- Extreme Heat
- Flash Flood
- Grass or Wildland Fire
- Hailstorm
- Landslide
- Levee Failure
- River Flooding
- Severe Winter Storm
- Sinkholes
- Thunderstorms and Lightning
- Tornado
- Windstorm
-

Although 17 natural hazards that have the potential to significantly affect the planning area were selected for additional analysis, not all hazards impact every jurisdiction. Table 3.5 provides a summary of the jurisdictions impacted by each hazard.

Table 3.5. Hazards Identified for Each Participating Jurisdiction

Jurisdiction	Animal/Crop/Plant	Dam Failure	Drought	Earthquake	Expansive Soils	Extreme Heat	Flash Flood	Grass or Wildland Fire	Hailstorm	Landslide	Levee Failure	River Flooding	Severe Winter Storm	Sinkholes	T-storms & Lightning	Tornado	Windstorm
Dallas County	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Cities																	
Adel	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Bouton	x	-	x	x	x	x	x	x	x	x	-	-	x	x	x	x	x
Clive*	x	x	x	x	x	x	x	x	x	x	-	-	x	x	x	x	x
Dallas Center	x	-	x	x	x	x	x	x	x	x	-	x	x	x	x	x	x
Dawson	x	-	x	x	x	x	x	x	x	x	-	x	x	x	x	x	x
DeSoto	x	x	x	x	x	x	x	x	x	x	-	x	x	x	x	x	x
Dexter	x	-	x	x	x	x	x	x	x	x	-	-	x	x	x	x	x
Granger	x	-	x	x	x	x	x	x	x	x	-	x	x	x	x	x	x
Grimes*	x	-	x	x	x	x	x	x	x	x	-	-	x	x	x	x	x
Linden	x	-	x	x	x	x	x	x	x	x	-	-	x	x	x	x	x
Minburn	x	-	x	x	x	x	x	x	x	x	-	-	x	x	x	x	x
Perry	x	-	x	x	x	x	x	x	x	x	-	x	x	x	x	x	x
Redfield	x	-	x	x	x	x	x	x	x	x	-	x	x	x	x	x	x
Urbandale*	x	-	x	x	x	x	x	x	x	x	-	-	x	x	x	x	x
Van Meter	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Waukee	x	-	x	x	x	x	x	x	x	x	-	x	x	x	x	x	x
West Des Moines	x	x	x	x	x	x	x	x	x	x	-	-	x	x	x	x	x
Woodward	x	-	x	x	x	x	x	x	x	x	-	-	x	x	x	x	x
School Districts																	
Adel-DeSoto-Minburn Schools	x	-	x	x	x	x	x	x	x	x	-	-	x	x	x	x	x
Dallas Center-Grimes Schools	x	-	x	x	x	x	x	x	x	x	-	-	x	x	x	x	x
Perry Schools	x	-	x	x	x	x	x	x	x	x	-	-	x	x	x	x	x
Van Meter Schools	x	-	x	x	x	x	x	x	x	x	-	-	x	x	x	x	x
Waukee Schools	x	-	x	x	x	x	x	x	x	x	-	-	x	x	x	x	x
West Central Valley Schools	x	-	x	x	x	x	x	x	x	x	-	-	x	x	x	x	x
Woodward- Granger Schools	x	-	x	x	x	x	x	x	x	x	-	x	x	x	x	x	x

Note: dash (-) indicates hazard is not applicable; * These jurisdictions are included in the risk assessment although they are not officially participating jurisdictions in the Dallas County Plan. Portions of these jurisdictions are in both Dallas and Polk Counties. According to Iowa Homeland Security & Emergency management and Polk County Emergency management, these jurisdictions will participate in the Polk County Hazard Mitigation Plan.

Multi-Jurisdictional Risk Assessment

For this multi-jurisdictional plan, the risks are assessed for each jurisdiction where they deviate from the risks facing the entire planning area. The planning area is fairly uniform in terms of climate and topography as well as building construction characteristics. Accordingly, the geographic areas of occurrence for weather-related hazards do not vary greatly across the planning area for most hazards. The more urbanized areas within the planning area have more assets that are vulnerable to the weather-related hazards and varied development trends impact the future vulnerability. Similarly, more rural areas have more assets (crops/livestock) that are vulnerable to animal/plant/ crop disease. These differences are discussed in greater detail in the vulnerability sections of each hazard.

The hazards that have the potential to vary across the planning area in terms of geographic areas at risk include dam failure, flash flood, grass or wildland fire, landslide, levee failure, river flood, sinkholes, expansive soils, and earthquake..

The majority of land area and populations for the jurisdictions of Clive, Grimes, Urbandale, and West Des Moines are in Polk County. According to Iowa Homeland Security & Emergency Management and Polk County Emergency Management, these jurisdictions will continue to participate in the Polk County Hazard Mitigation Plan Update. Although these jurisdictions are not officially participating in the Dallas County Plan, the portions of these jurisdictions that are in on the Dallas County side are included in the risk assessment, where data is available.

3.1.5 Hazard Scoring Methodology

To maintain reporting format consistent with the 2010 Iowa State Hazard Mitigation Plan, the Dallas County HMPC used the same methodology to score and prioritize the hazards. This prioritization was based on a hazard scoring system that considers four elements of risk: probability, magnitude/severity, warning time, and duration. Table 3.6 provides definitions for each of the four elements along with associated rating levels.

Table 3.6. Hazard Score Element Definitions and Rating Scales

Element/Score	Definitions
Probability: 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	
1—Unlikely	Less than 10% probability in any given year (up to 1 in 10 chance of occurring), history of events is less than 10% likely or the event is unlikely but there is a possibility of its occurrence.
2—Occasional	Between 10% and 20% probability in any given year (up to 1 in 5 chance of occurring), history of events is greater than 10% but less than 20% or the event could possibly occur.
3—Likely	Between 20% and 33% probability in any given year (up to 1 in 3 chance of occurring), history of events is greater than 20% but less than 33% or the event is likely to occur.
4—Highly Likely	More than 33% probability in any given year (event has up to a 1 in 1 chance of occurring), history of events is greater than 33% likely or the event is highly likely to occur.
Magnitude / Severity: Assessment of severity in terms of injuries and fatalities, personal property, and infrastructure and the degree and extent with which the hazard affects the jurisdiction.	
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	25% 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.
Warning Time: Rating of the potential amount of warning time that is available before the hazard occurs. This should be taken as an average warning time.	
1	More than 24 hours warning time
2	12 to 24 hours warning time
3	6 to 12 hours warning time
4	Minimal or no warning time (up to 6 hours warning)
Duration: A measure of the duration of time that the hazard will affect the jurisdiction.	
1	Less than 6 hours
2	Less than 1 day
3	Less than 1 week
4	More than one week

Using the rating scales described in the table above, the formula used to determine each hazard's score, including weighting factors, is provided below:

(Probability x .45) + (Magnitude/Severity x .30) + (Warning Time x .15) + (Duration x .10) = SCORE

Based on the hazard's overall weighted score, the hazards are categorized as follows: High (3.0-4.0), Moderate (2.0-2.9), and Low (1.1-1.9)

These terms relate to the level of planning analysis to be given to the particular hazard in the risk assessment process and are not meant to suggest that a hazard would have only limited impact. In order to focus on the most critical hazards, those assigned a level of high or moderate were given more extensive attention in the remainder of the risk assessment (e.g., quantitative analysis or loss estimation), while those with a low planning significance were addressed in more general or qualitative ways.

The Hazard Mitigation Planning Committee determined overview hazard ranking scores for the planning area as a whole. The results of this overview are provided below in Table 3.7. Additionally, the hazard ranking overview is provided at the beginning of each hazard profile and vulnerability section. A detailed hazard summary by jurisdiction is provided at the conclusion of each hazard profile and vulnerability section to provide a summary of how the hazard varies by jurisdiction.

Table 3.7. Dallas County Planning Area Hazard Ranking Results

Hazard Type	Probability	Magnitude	Warning Time	Duration	Weighted Score	Level
Tornado	4	4	4	1	3.7	High
River Flooding	4	3	1	4	3.25	High
Severe Winter Storm	4	2	3	4	3.25	High
Flash Flood	4	2	3	1	2.95	Moderate
Windstorm	4	2	2	1	2.8	Moderate
Grass or Wildland Fire	3	2	4	1	2.65	Moderate
Hailstorm	4	1	3	1	2.65	Moderate
Thunderstorms and Lightning	4	1	2	2	2.6	Moderate
Dam Failure	1	3	4	4	2.35	Moderate
Animal/Crop/Plant Disease	1	3	4	4	2.35	Moderate
Levee Failure	1	2	4	4	2.05	Moderate
Drought	2	2	1	4	2.05	Moderate
Landslide	2	2	2	1	1.9	Low
Expansive Soils	3	1	1	1	1.9	Low
Extreme Heat	2	1	1	4	1.75	Low
Earthquake	1	1	4	1	1.45	Low
Sinkholes	1	1	2	1	1.15	Low

3.2 Assets at Risk

This section assesses the population, structures, critical facilities and infrastructure, and other important assets in the planning area that may be at risk to natural hazards.

3.2.1 Total Exposure of Population and Structures

Table 3.8 shows the total population, building count, estimated value of buildings, estimated value of contents and estimated total exposure to parcels by jurisdiction. Please note that for Clive, Granger, Grimes, Urbandale, West Des Moines, and Woodward, this exposure data is only for those portions of those cities on the Dallas County side of the county line. Grimes, for example has a very small section of city limits that falls on the Dallas County side. Since Clive, Grimes, Urbandale, and West Des Moines will continue to be included in the Polk County Hazard Mitigation Plan update; only the exposure on the Dallas County side of the county line is discussed. The majority of both Granger and Woodward are in Dallas County. Therefore, these jurisdictions are official participants of this plan. Therefore, the total 2010 population, including the portion in adjacent counties is provided in parenthesis.

Population data is based on the 2010 data from the U.S. Census Bureau. Building counts and Building Exposure values are based on parcel data provided by the Dallas County Assessor's Office. Contents Exposure Values were calculated by factoring a multiplier to the Building Exposure Values based on usage type. The contents multipliers were derived from the HAZUS MH 2.1 and are defined below the table. Land values have been purposely excluded because land remains following disasters, and subsequent market devaluations are frequently short term and difficult to quantify. Additionally, state and federal disaster assistance programs generally do not address loss of land or its associated value (other than crop insurance).

Table 3.8. Maximum Population and Building Exposure by Jurisdiction

Jurisdiction	Population (2010)	Building Count	Building Exposure ($)	Content Exposure ($)	Total Exposure ($)
Adel	3,682	1,556	$170,500,200	$106,424,020	$276,924,220
Bouton	129	78	$3,320,100	$1,903,065	$5,223,165
Clive*	4,721	1,769	$416,450,670	$221,196,875	$637,647,545
Dallas Center	1,623	806	$94,660,470	$64,860,275	$159,520,745
Dawson	131	87	$4,580,910	$3,184,335	$7,765,245
DeSoto	1,050	372	$36,827,430	$22,817,645	$59,645,075
Dexter	611	382	$24,720,700	$15,479,075	$40,199,775
Granger**	1,032(1,244)	434	$52,117,190	$33,584,855	$85,702,045
Grimes*	1	1	$18,930	$18,930	$37,860
Linden	199	131	$4,811,390	$2,828,435	$7,639,825
Minburn	365	232	$16,914,130	$10,082,990	$26,997,120
Perry	7,702	3,009	$215,604,100	$145,629,800	$361,233,900
Redfield	835	462	$25,521,340	$15,942,690	$41,464,030
Urbandale*	6,339	2,466	$623,804,800	$318,975,490	$942,780,290
Van Meter	1,016	523	$42,813,770	$23,557,930	$66,371,700
Waukee	13,790	4,589	$856,715,950	$512,631,890	$1,369,347,840
West Des Moines*	11,510	3,334	$1,418,557,790	$1,141,172,890	$2,559,730,680
Woodward**	1,018(1,024)	518	$44,077,980	$28,481,180	$72,559,160
Unincorporated	10,381	4,733	$836,982,580	$531,989,375	$1,368,971,955
Total	66,135	25,482	$4,889,000,430	$3,200,761,745	$8,089,762,175

Sources: Population, 2010 U.S. Census; Building Count and Building Exposure, Dallas County Assessor's Office, 2012; Contents Exposure derived by applying multiplier to Building Exposure based on HAZUS MH 2.1 standard contents multipliers per usage type as follows: Residential (50%), Commercial (100%), Industrial (150%), Agricultural (100%); * Data is for only the portions of these jurisdictions that are in Dallas County.**Population for entire city limits, including portions of adjacent counties provided in parentheses.

Table 3.9 provides the building value exposures for the county and each city in the planning area broken down by usage type.

Table 3.9. Building Values/Exposure by Usage Type

Jurisdiction	Residential	Commercial	Industrial	Agriculture	Total
Adel	$32,702,120	$33,068,710	$4,549,760	$179,610	$170,500,200
Bouton	$2,834,070	$296,920	$-	$189,110	$3,320,100
Clive	$390,507,590	$25,765,920	$-	$177,160	$416,450,670
Dallas Center	$62,166,570	$26,817,500	$2,566,180	$3,110,220	$94,660,470
Dawson	$2,793,150	$1,621,270	$-	$166,490	$4,580,910
Desoto	$28,061,810	$8,505,780	$42,240	$217,600	$36,827,430
Dexter	$18,916,930	$4,702,790	$433,680	$667,300	$24,720,700
Granger	$37,064,670	$15,052,000	$-	$520	$52,117,190
Grimes	$-	$-	$-	$18,930	$18,930
Linden	$3,965,910	$699,580	$-	$145,900	$4,811,390
Minburn	$13,662,280	$3,217,050	$-	$34,800	$16,914,130
Perry	$147,168,080	$60,576,900	$7,219,480	$639,640	$215,604,100
Redfield	$20,005,620	$4,667,400	$848,320	$-	$25,521,340
Urbandale	$609,658,620	$12,132,260	$-	$2,013,920	$623,804,800
Van Meter	$38,606,850	$4,018,860	$95,170	$92,890	$42,813,770
Waukee	$694,790,040	$153,479,380	$6,621,920	$1,824,610	$856,715,950
West Des Moines	$554,769,800	$860,425,690	$-	$3,362,300	$1,418,557,790
Woodward	$31,193,600	$12,649,190	$-	$235,190	$44,077,980
Unincorporated	$623,940,120	$44,953,610	$13,953,710	$154,135,140	$836,982,580
Total	$3,412,807,830	$1,272,650,810	$36,330,460	$167,211,330	$4,889,000,430

Source: Dallas County Assessor's Office, 2012

Table 3.10 provides the building count total for the county and each city in the planning area broken out by building usage types (residential, commercial, industrial, and agricultural). This data is from the parcel data provided by the Dallas County Assessor's Office.

Table 3.10. Building Counts by Usage Type

Jurisdiction	Residential	Commercial	Industrial	Agricultural	Total
Adel	1,200	324	29	3	1,556
Bouton	64	14	0	0	78
Clive*	1,696	72	0	1	1,769
Dallas Center	585	205	9	7	806
Dawson	64	21	0	2	87
DeSoto	290	79	2	1	372
Dexter	265	102	6	9	382
Granger	336	98	0	0	434
Grimes*	0	0	0	1	1
Linden	89	40	0	2	131
Minburn	153	78	0	1	232
Perry	2,304	605	96	4	3,009
Redfield	347	95	20	0	462
Urbandale*	2,446	8	0	12	2,466
Van Meter	443	77	2	1	523
Waukee	4,181	385	10	13	4,589
West Des Moines*	3,025	296	0	13	3,334
Woodward	400	115	0	3	518
Unincorporated	3,129	381	64	1,159	4,733
Total	21,017	2,995	238	1,232	25,482

Source: Dallas County Assessor's Office, 2012; * Data is for only the portions of these jurisdictions that are in Dallas County.

3.2.2 Critical Facilities and Infrastructure

A critical facility may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. Table 3.11 is a summary of the inventory of 270 critical and essential facilities and infrastructure in the planning area. This list was compiled by conducting a query in the HAZUS MH 2.1 software for critical and essential facilities in Dallas County and adding critical and essential facilities that were reported by each jurisdiction on their Data Collection Guide. This combined list was sorted by jurisdiction and provided to planning committee members for correction and validation. The validated facilities from HAZUS were already available in a GIS format. The additional facilities were geo-referenced according to their address to enable GIS analysis of all facilities reported as critical and essential. The full list of critical and essential facilities is provided in Appendix E. The list of facilties is "For Official Use Only". To obtain access, contact the Dallas County Emergency Manager.

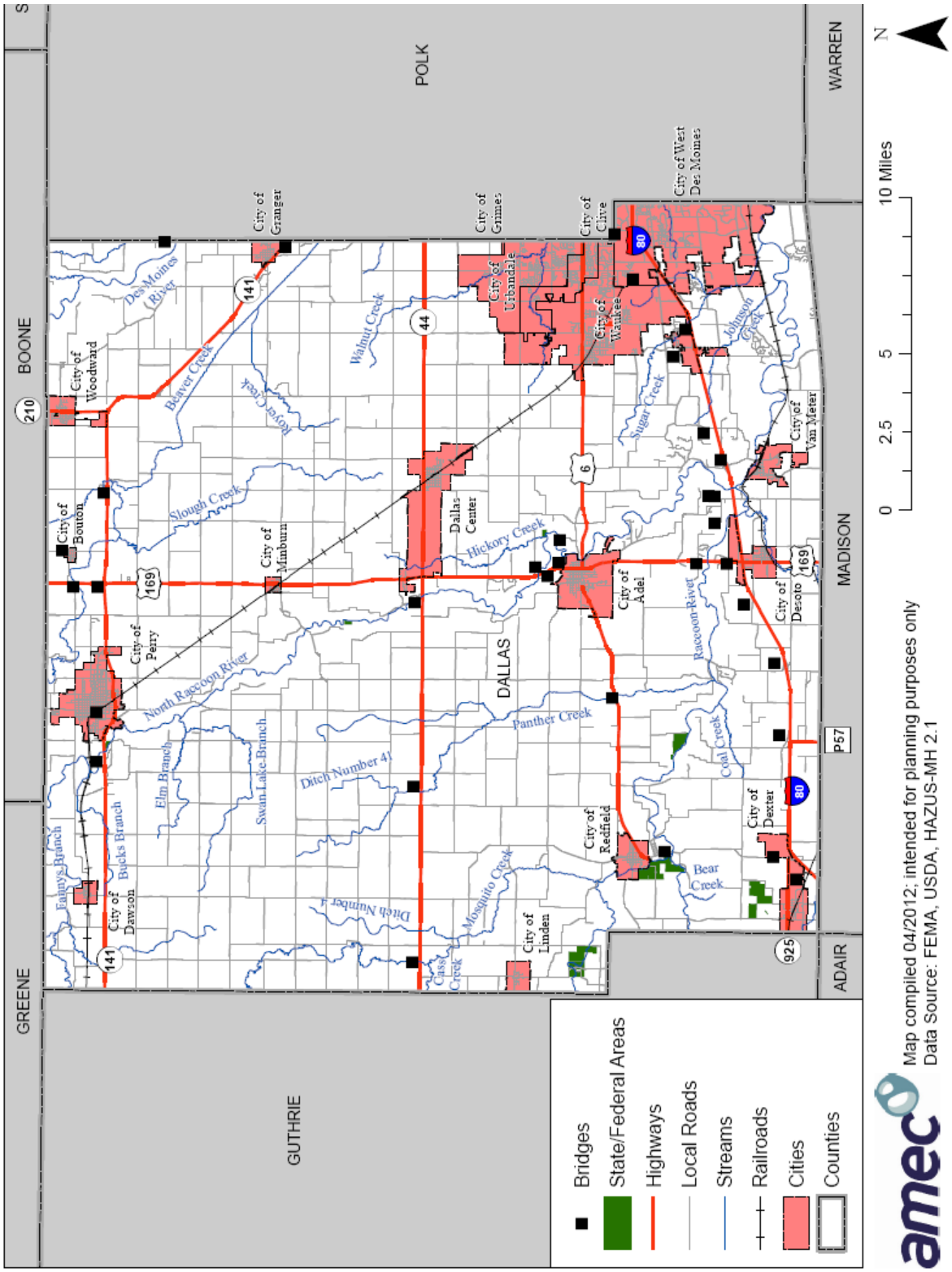
Table 3.11. Inventory of Critical/Essential Facilities and Infrastructure by Jurisdiction

Jurisdiction	Airports	Bus Facility	Childcare	City Facility	Communications Facility	Communicy Center	County Facility	Elder Care Fac.	Electric Power Fac.	Fire Station	Combination Fire, Police, City	Haz-Mat	Sheriff's Office/Jail	Major Employer	Medical Care Facility	Nat. Guard Armory	Natural Gas Facility	Police Facility	Public School Fac.	Private School	Senior Housing	Shelter	Wastewater Facility	Water Facility	Other	Total
Dallas County	-	-	-	-	-	-	7	1	-		-	-	1	-	1	-	1	-	-	-	-	-	-	-	-	11
Adel	-	1	1	2	1	-	-	1	1		1	3	-	2	1	-	-	1	-	-	-	-	1	3	-	19
Bouton	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Dallas Center	-	-	1	2	-	-	-	1	-	1	-	-	-	2	1	-	-	1	-	-	-	1	1	3	3	17
Dawson	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
DeSoto	-	-	1	2	1	-	-	-	-	1	-	-	-	15	-	-	-	1	-	-	-	-	2	3	1	27
Dexter	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	2
Granger	-	-	1	1	1	-	-	1	1		1	-	-	3	-	-	-	2	-	1	-	-	1	3	1	17
Linden	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	2	-	4
Minburn	-	-	-	2	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	7
Perry	1	-	-	2	4	-	-	2	1	1	-	-	-	4	2	1	-	1	-	2	-	-	2	1	-	24
Redfield	-	-	-	-	-	1	-	-	-		1	4	-	-	1	-	1	-	-	-	-	-	1	1	-	10
Van Meter	-	-	1	2	-	-	-	-	-	1	-	-	-	2	-	-	-	-	-	-	1	-	3	2	1	13
Waukee	-	-	4	2	-	-	-	2	-	1	-	-	-	7	-	-	2	1	-	-	-	-	13	2	2	36
Woodward	-	-	1	2	-	-	-	-	1	1	-	-	-	4	-	1	1	1	-	-	2	-	2	1	4	21
Adel-DeSoto-Minburn Schools	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	6	-	-	-	-	-	-	6
Dallas Center-Grimes Schools	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	13	-	-	-	-	-	-	13
Perry Schools	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	6	-	-	-	-	-	-	6
Van Meter Schools	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	2
Waukee Schools	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	14	-	-	-	-	-	-	14
West Central Valley Schools	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	2
Woodward- Granger Schools	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	14	-	-	-	-	-	-	14
Total	**1**	**1**	**10**	**17**	**8**	**2**	**7**	**8**	**4**	**11**	**3**	**7**	**1**	**39**	**6**	**2**	**5**	**8**	**57**	**3**	**3**	**1**	**29**	**22**	**13**	**268**

Source: HAZUS MH 2.1; Hazard mitigation Planning Committee; * Data is for only the portions of these jurisdictions that are in Dallas County

Figure 3.1 shows the locations of all bridges in the planning area. There were no bridges indicated as “scour critical” bridges in the planning area.

Figure 3.1. Dallas County Bridges



The maps in Figure 3.34 through Figure 3.51 in the River Flooding profile section provide locations of the available critical facilities located within the county and each incorporated city

3.2.3 Other Assets

Assessing the vulnerability of the planning area to disaster also involves inventorying the natural, historic, cultural, and economic assets of the area. This is important for the following reasons:

- The plan participants may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- If these resources are impacted by a disaster, knowing about them ahead of time allows for more prudent care in the immediate aftermath, when the potential for additional impacts is higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, such as wetlands and riparian habitat, which help absorb and attenuate floodwaters.
- Losses to economic assets (e.g., major employers or primary economic sectors) could have severe impacts on a community and its ability to recover from disaster.

In the planning area, specific assets include the following:

Threatened and Endangered Species: Table 3.12 includes Federally Threatened, Endangered, Proposed and Candidate Species in Dallas County, Iowa.

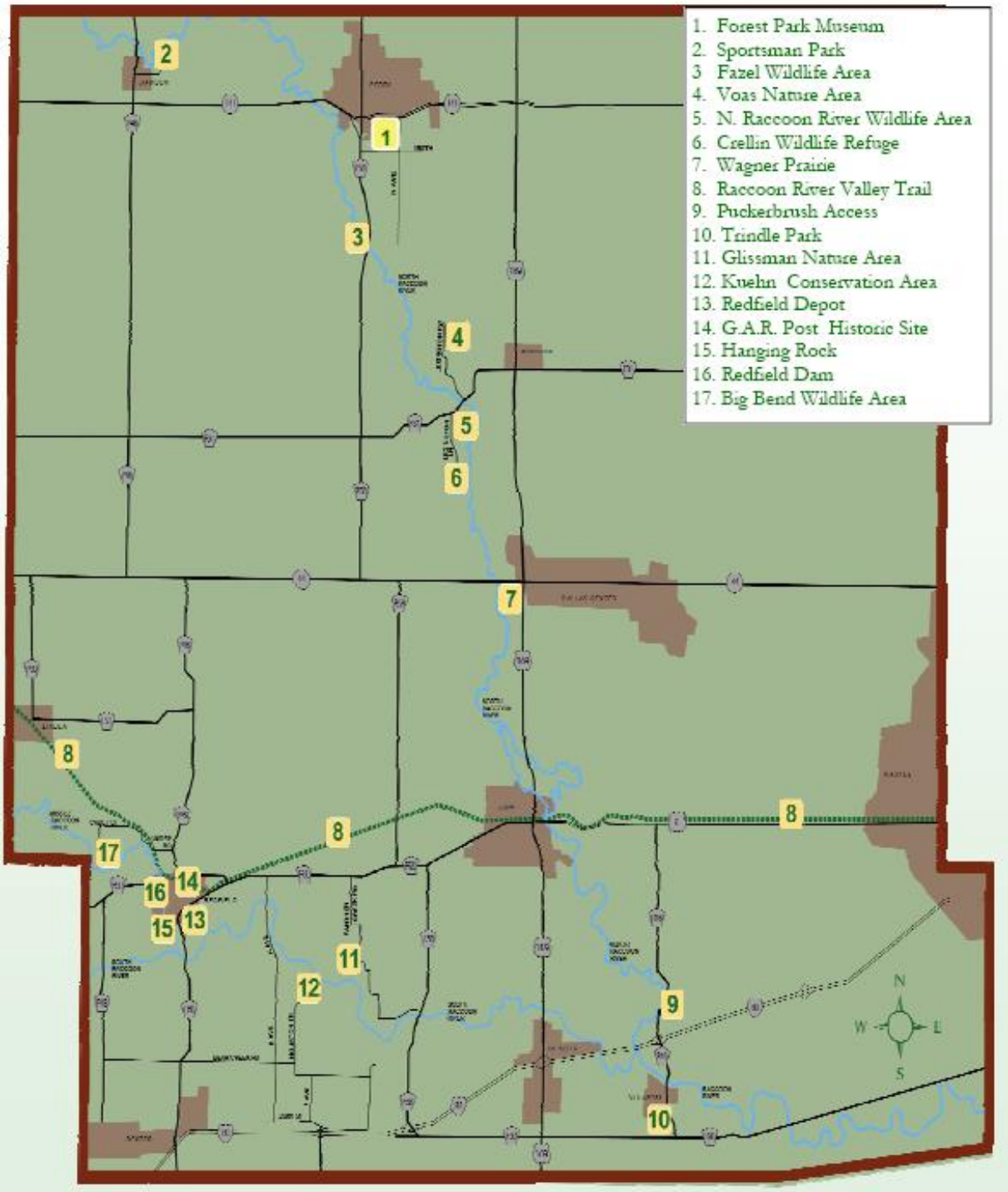
Table 3.12. Threatened and Endangered Species in Dallas County

Common Name	Scientific Name	Status
Indiana bat	Myotis sodalis	Endangered
Topeka shiner	Notropis topeka	Endangered and Critical Habitat
Prairie bush clover	Lespedeza leptostachya	Threatened
Western prairie fringed orchid	Platanthera praeclara	Threatened

Source: U.S. Fish and Wildlife Service, http://www.fws.gov/midwest/endangered/lists/iowa_cty.html, 2012

Dallas County has several conservation and recreational areas. In 1962, the people of Dallas County voted to authorize a Conservation Board with the purpose to acquire and develop museums, county parks, preserves, forests, wildlife, and other conservation resources; and to provide environmental programming to cultivate citizenship and a conservation ethic. The map in Figure 3.2 shows the locations of the conservation, parks, and recreation areas

Figure 3.2. Dallas County Conservation Parks & Recreations Map



Source: Dallas County Conservation Department, http://www.co.dallas.ia.us/index.aspx?page=231

Historic Resources: These properties are identified in Table 3.13.

Table 3.13. Dallas County, Iowa Properties on the National Register of Historic Places

City	Resource	Address	Year Listed	Resource
Adel	Adel Bridge	River St.	2002	STRUCTURE
Adel	Adel Public Square Historic District	4 blocks in Adel downtown Public Square	2009	DISTRICT
Perry	Beaver Creek Bridge	M Ave. over Beaver Cr.	1998	STRUCTURE
Perry	Bruce's Snowball Market #1 Addition	921 Railroad St.	2000	BUILDING
Adel	Dallas County Courthouse	Town Sq.	1979	STRUCTURE
Dexter	Dexter Community House	707 Dallas St.	1975	BUILDING
Perry	Downtown Perry Historic District	Bet. 3rd St., Lucinda St., 1st Ave. and Railroad St.	2000	DISTRICT
Van Meter	Feller, Robert William Andrew, Farmstead	2965 340th Tr.	1999	DISTRICT
Perry	Jones Business College	1305 Otley Ave.	2000	BUILDING
Woodward	McColl, Anthony M., House	502 S. Main St.	1987	BUILDING
Perry	Perry Carnegie Library Building	1123 Willis Ave.	1996	BUILDING
Yale	Prairie Center Methodist Episcopal Church and Pleasant Hill Cemetery	Beaumont Ave. and 200th St.	2004	BUILDING
Perry	Saint Patrick's Catholic Church and Rectory	1312 Third St	2011	BUILDING
DeSoto	Wilson, John, House	SW of DeSoto	1979	BUILDING

Source: National Park Service, National Register of Historic Places, http://nrhp.focus.nps.gov/natreg/docs/Download.html#simplified

Economic Resources: Major employers in the planning area include the following:

Table 3.14. Major Employers in Dallas County

Company	Product/Service	Community	Employees
Wells Fargo Home Mortgage	Mortgage Services	West Des Moines	3,177
Wells Fargo Card Services	Financial Services	West Des Moines	1,278
Farm Bureau Insurance	Insurance/Financial Services	West Des Moines	1,160
Hy-Vee	Full Service Grocer	West Des Moines	759
Iowa Foundation for Medical Care	Health Care Improvement	West Des Moines	779
GuideOne Insurance	Insurance Services	West Des Moines	523
ITA Group	Performance Improvement	West Des Moines	450
ADP	Data Processing	West Des Moines	520
Iowa Student Loan	Student Loan Provider	West Des Moines	400
Aviva USA	Insurance Services	West Des Moines	
Wells Fargo Financial	Financial Services	Urbandale	530
Citi Card Services	Financial Services	Urbandale	
Allied Insurance	Insurance Services	Urbandale	300
Compressor Controls	Turbomachinery	Urbandale	300
Rain and Hail Insurance	Insurance Services	Urbandale	300
Quebecor World	Book Binding	Waukee	150
Gilcrest Jewett	Lumber & Building Material	Waukee	145
Briggs Medical Services	Healthcare Products	Not Reported	
Tyson Fresh Foods, Inc.	Pork Processing	Perry	1200
Percival Scientific	Environmental Chambers	Perry	80
Osmundson Manufacturing	Farm Tillage Equipment	Perry	75
United Brick & Tile Company	Clay Brick Production	Adel	170
Stine Seed Company	Seed	Adel	225
Evo Medical Solutions	Neutralizers, Therapy Devices	Adel	82
Iowa Spring	Coil and Spring Manufacturing	Adel	90
Monarch Manufacturing	Egress Window Systems	Waukee	95
Barr Nunn	Trucking Services	Granger	77
Hy-Line International	Research	Dallas Center	147
Pioneer Hi-Bred International	Bio-Science/Research	Dallas Center	40

Dallas County Economic Development Alliance, http://www.dallascounty-ia.org/demographics/leading-employers.aspx

Agriculture also plays an important role in the Dallas County economy. Table 3.15 provides a summary of the agriculture-related jobs in Dallas County.

Table 3.15. Agriculture-Related Jobs in Dallas County

	Jobs
Crop and livestock production	1,442
Ag processing	2,052
Ag support	260
Total ag contribution	3,755

Source: Iowa State University Extension, 2009

3.3 Future Land Use and Development

According to U.S. Census Bureau population statistics between April 2010 and July 2011, Dallas County is the fastest growing county in Iowa and the seventh-fastest growing county in the nation. The County experienced a 5 percent increase during this one-year period. One of the factors contributing to its rapid population growth is the western growth of the Des Moines metropolitan area. The growth is also attributed to a relatively stable economy with job growth and a reputation as one of the best places for business and careers, as well as the many cultural, recreational, and other amenities that enhance the quality of life.

Table 3.16 provides the population growth statistics for all cities in Dallas County as well as the unincorporated portions of the county. Please note that portions of Clive, Granger, Grimes, Urbandale, West Des Moines, and Woodward have portions of their city limits within adjacent counties. The population statistics below are only for the portions of those cities that are in Dallas County.

Table 3.16. Dallas County Population Growth, 2000-2010

Jurisdiction	2010 Population	2000 Population	2000-2010 # Change	200-2010 % Change
Adel	3,682	3,435	247	7.2%
Bouton	129	136	-7	-5.1%
Clive*	4,721	2,394	2,327	97.2%
Dallas Center	1,623	1,595	28	1.8%
Dawson	131	155	-24	-15.5%
De Soto	1,050	1,009	41	4.1%
Dexter	611	689	-78	-11.3%
Granger**	1,032 (1,244)	583 (583)	449 (661)	77.0% (113.4%)
Grimes *	1	1	0	0.0%
Linden	199	226	-27	-11.9%
Minburn	365	391	-26	-6.6%
Perry	7,702	7,633	69	0.9%
Redfield	835	833	2	0.2%
Urbandale *	6,339	327	6,012	1838.5%
Van Meter	1,016	866	150	17.3%
Waukee	13,790	5,126	8,664	169.0%
West Des Moines *	11,510	4,653	6,857	147.4%
Woodward **	1,018 (1,024)	1,203 (1,200)	-185 (-176)	-15.4% (-14.7%)
Unincorporated	10,381	9,495	886	9.3%
Total	66,135	40,750	25,385	62.3%

Source: U.S. Bureau of the Census, Decennial Census; * Clive, Grimes, Urbandale, and West Des Moines population figures are only for the portions of those cities that are within Dallas County: **population data and change for entire city limits including portions in adjacent counties is provided in parentheses.

Along with population growth comes an increase in the number of housing untis. Table 3.17 provides the change in numbers of housing untis in the planning area from 2000 to 2010. Xx that follows provides the number of building permits issued by jurisdiction from 2000 to 2009.

Table 3.17. Change in Housing Units, 2000-2010

Jurisdiction	2010 Housing Units	2000 Housing Units	# Change	% Change
Dallas County, Iowa	27,260	16,529	10,731	39%
Adel city, Iowa	1,579	1,419	160	10%
Bouton city, Iowa	63	61	2	3%
Clive city, Iowa	6,077	4,902	1,175	19%
Dallas Center city, Iowa	669	616	53	8%
Dawson city, Iowa	63	67	-4	-6%
De Soto city, Iowa	417	401	16	4%
Dexter city, Iowa	284	270	14	5%
Granger city, Iowa	490	265	225	46%
Grimes city, Iowa	3,272	1,958	1,314	40%
Linden city, Iowa	92	101	-9	-10%
Minburn city, Iowa	163	165	-2	-1%
Perry city, Iowa	3,180	2,994	186	6%
Redfield city, Iowa	381	369	12	3%
Urbandale city, Iowa	16,319	11,869	4,450	27%
Van Meter city, Iowa	415	342	73	18%
Waukee city, Iowa	5,378	2,087	3,291	61%
West Des Moines city, Iowa	26,219	20,815	5,404	21%
Woodward city, Iowa	503	528	-25	-5%
Dallas County, Iowa	27,260	16,529	10,731	39%

Source: U.S. Bureau of the Census, Decennial Census; *Includes portions of theses cities in adjacent counties

Table 3.18. Building Permits Issued, 2000-2009

Jurisdiction	Total	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000
Adel	153	3	6	7	14	25	21	17	25	20	15
Bouton	1	0	0	1	0	0	0	0	0	0	0
Clive*	1016	55	36	209	114	98	104	95	98	106	101
Dallas Center	45	3	5	11	9	7	0	0	7	3	0
Dawson	0	0	0	0	0	0	0	0	0	0	0
De Soto	21	0	0	1	0	2	0	3	3	10	2
Dexter	17	1	0	6	2	0	2	3	0	0	3
Granger*	198	13	8	14	20	60	57	25	1	0	0
Grimes*	1526	152	161	247	355	210	92	90	107	42	70
Minburn	4	0	0	1	1	0	1	1	0	0	0
Perry	219	3	5	54	8	39	0	26	0	67	17
Redfield	21	0	0	1	2	1	1	3	4	6	3
Urbandale*	3754	116	104	233	384	545	733	835	471	0	333
Van Meter	55	9	7	8	12	0	4	4	4	6	1
Waukee	3194	228	117	285	484	729	314	331	279	288	139
West Des Moines*	5278	408	816	353	402	381	431	439	1043	530	475
Woodward*	25	0	0	2	15	1	1	0	3	1	2

Source: U.S. Bureau of the Census, Manufacturing, Mining and Construction Division; Building Permits - Diskette "Permit Authorized Construction in Permit-Issuing Places by State and County" (Reported Only Units); *Includes portions of theses cities in adjacent counties

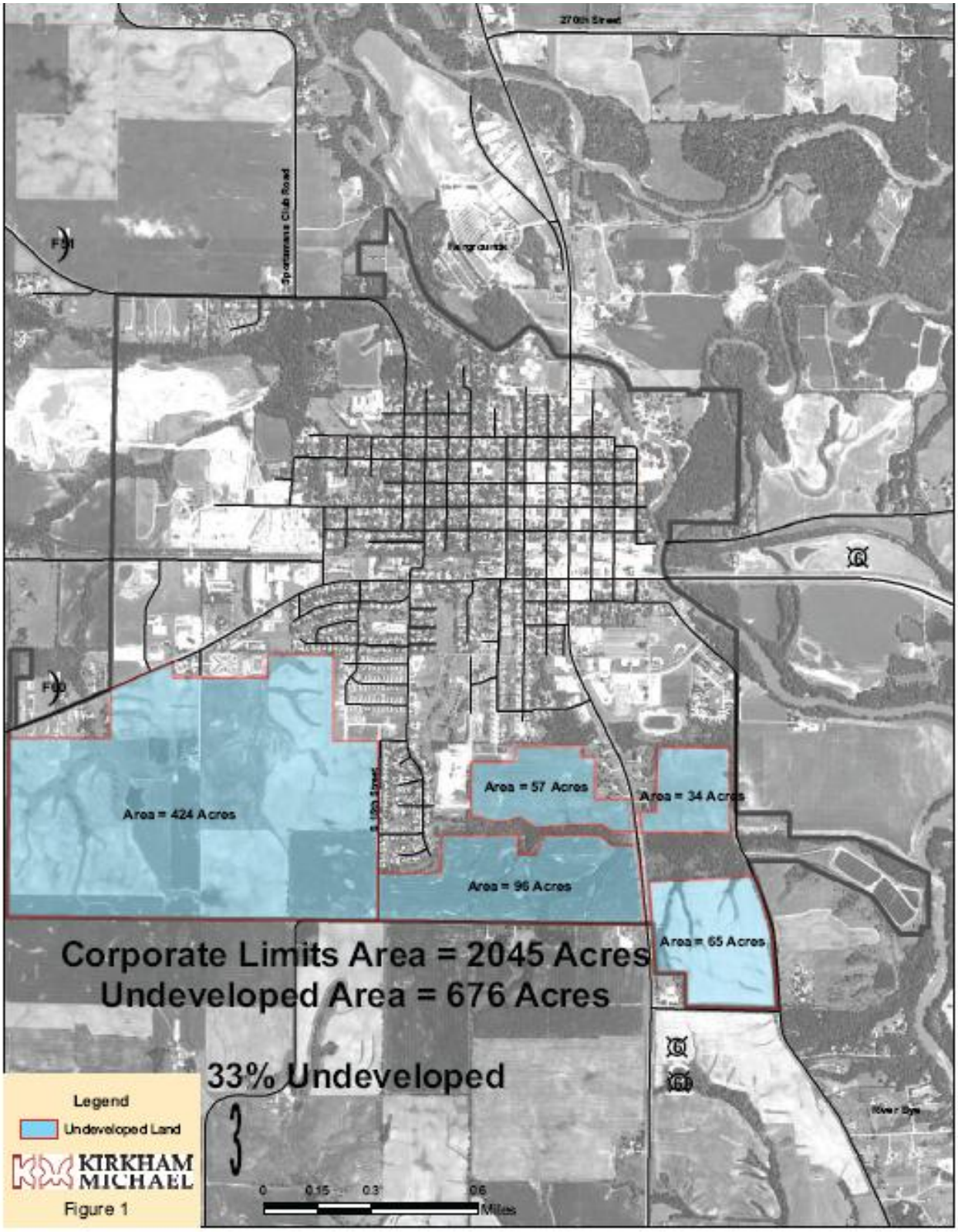
The following section provides narrative descriptions of future land use and development provided by each of the participating jurisdictions. Where available, maps are provided to show potential growth areas.

Adel

The City of Adel's existing city limits encompass approximately 2,045 acres. Of this, approximately 676 acres are undeveloped or underdeveloped, within the southwest, south, and southeast neighborhoods as shown in Figure 3.3. Each of these areas is expected to be used primarily for residential neighborhoods, including parks and open space, and including commercial or retail uses along applicable sections of Highway 169 and other major roads or streets. The city limits also include approximately 20 acres of developable industrial area at their western edge.

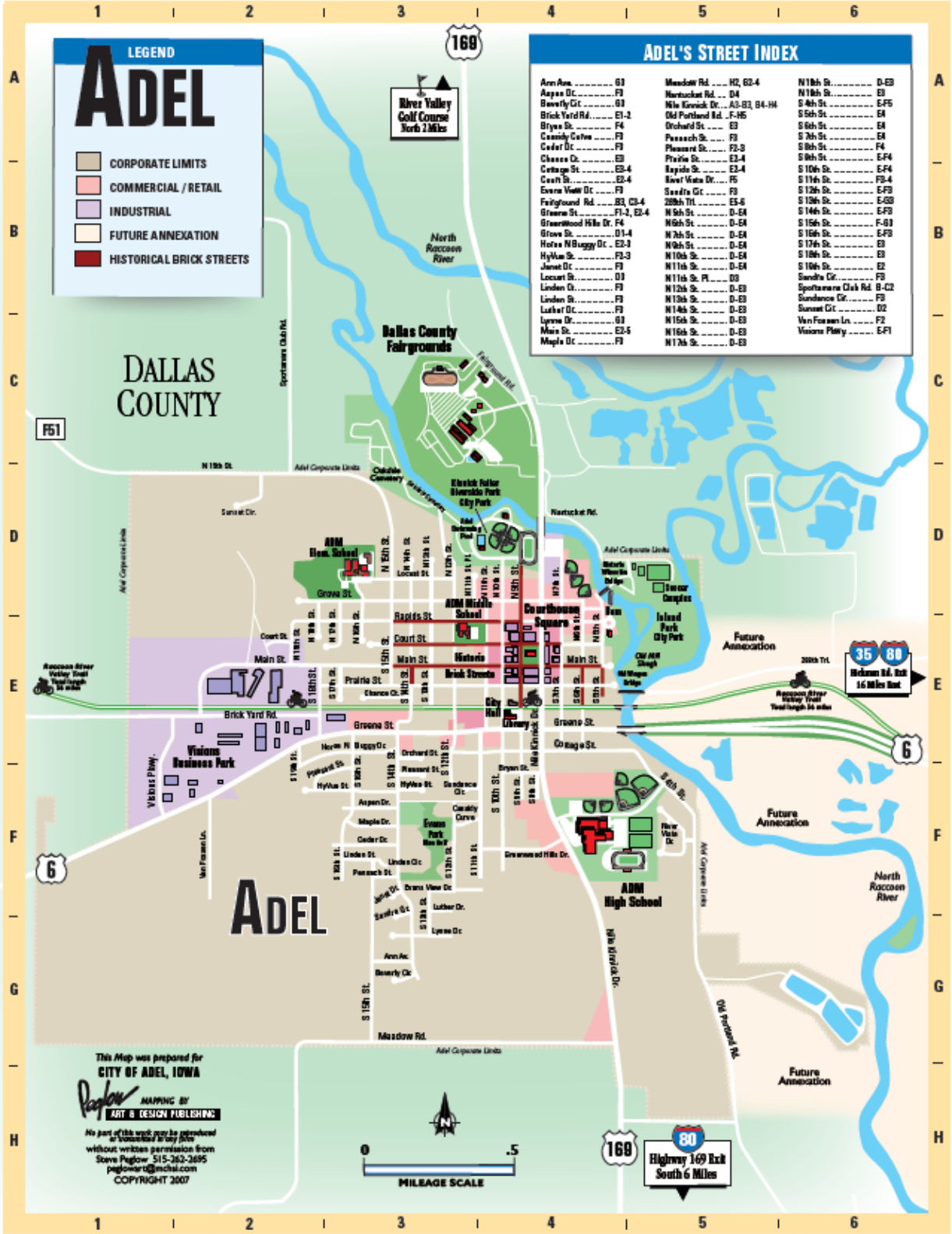
Figure 3.4 that follows shows current land use and future annexation areas.

Figure 3.3. City of Adel Undeveloped Land



Source: City of Adel Comprehensive Plan, 2009

Figure 3.4. Adel Current Land Use/Potential Annexation



Source: City of Adel, http://www.adeliowa.org/map.page

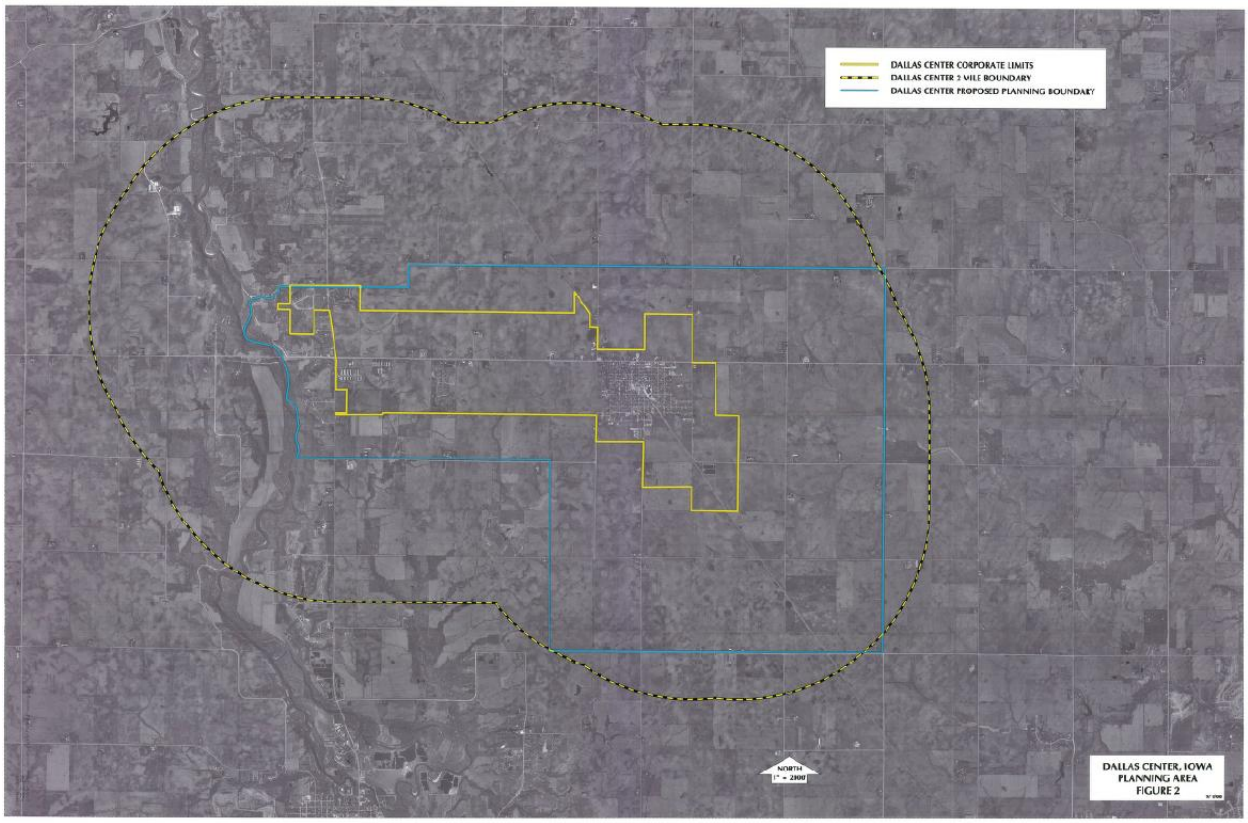
Bouton

No future development reported.

Dallas Center

The City of Dallas Center's location approximately 20 miles west of the Des Moines metropolitan area will be a major factor on future urban growth. According to the 2008 Dallas Center Comprehensive Plan, it is anticipated that the City of Dallas Center will continue to experience modest growth, reaching a population of 2,050 at a 10percent growth rate by the year 2025. In its Comprehensive Plan, the City of Dallas Center identified the greatest potential for future growth to occur easterly and southeasterly of the City of Dallas Center toward the Des Moines metropolitan area. It is anticipated that limited growth will occur southwesterly and northerly of the City of Dallas Center. The future development planning area developed by the City is shown by the blue line in Figure 3.5

Figure 3.5. Proposed Planning Boundary



Source: Dallas Center Comprehensive Plan, 2008

Dawson

The City of Dawson does not have any planned future development. From 2000 to 2010, the City of Dawson population decreased by 15 percent.

DeSoto

According to the 2009 Comprehensive Plan for the City of DeSoto, of the 973 acres within the City of DeSoto, 471 (48.4 percent) acres are agriculture and 165 (17 percent) acres are vacant land. This 65.4 percent is sufficient to meet the growth projections for DeSoto. Agriculture and vacant land in DeSoto are the most feasible areas for infill. Any additional land would come primarily from the 17,684 acres of unincorporated land with a two-mile area surrounding city limits. 0 shows the low and high estimated acreage needed for future growth for each usage type from 2005-2025.

Table 3.19. DeSoto Low and High Estimated Acreage Needed for Future Growth, 2005-2025

	Low		High	
	Acres	%	Acres	%
Residential	265	27.2	365	37.5
Single Family	214	22.0	289	29.7
Multi-Family	23	2.4	39	4.0
Mobile Home	18	1.8	18	1.8
Planned Urban Development	10	1.0	20	2.1
Commercial	57	5.9	79	8.1
Community & Hwy Service	26	2.7	34	3.5
Neighborhood Commercial	27	2.8	38	3.9
Office Commercial	4	0.4	7	0.7
Industrial	42	4.3	72	7.4
Light Industrial	9	0.9	16	1.6
Limited Industrial	33	3.4	56	5.8
Public/Government	21	2.2	31	3.2
Vacant	75	7.7	16	1.6
Agricultural	412	42.3	299	30.7
Other	101	10.4	110	11.3
TOTAL	973	100	973	100

Source: City of DeSoto Comprehensive Plan, 2009; "Other" includes: parks/open space, floodway, and misc.

Residential Priorities

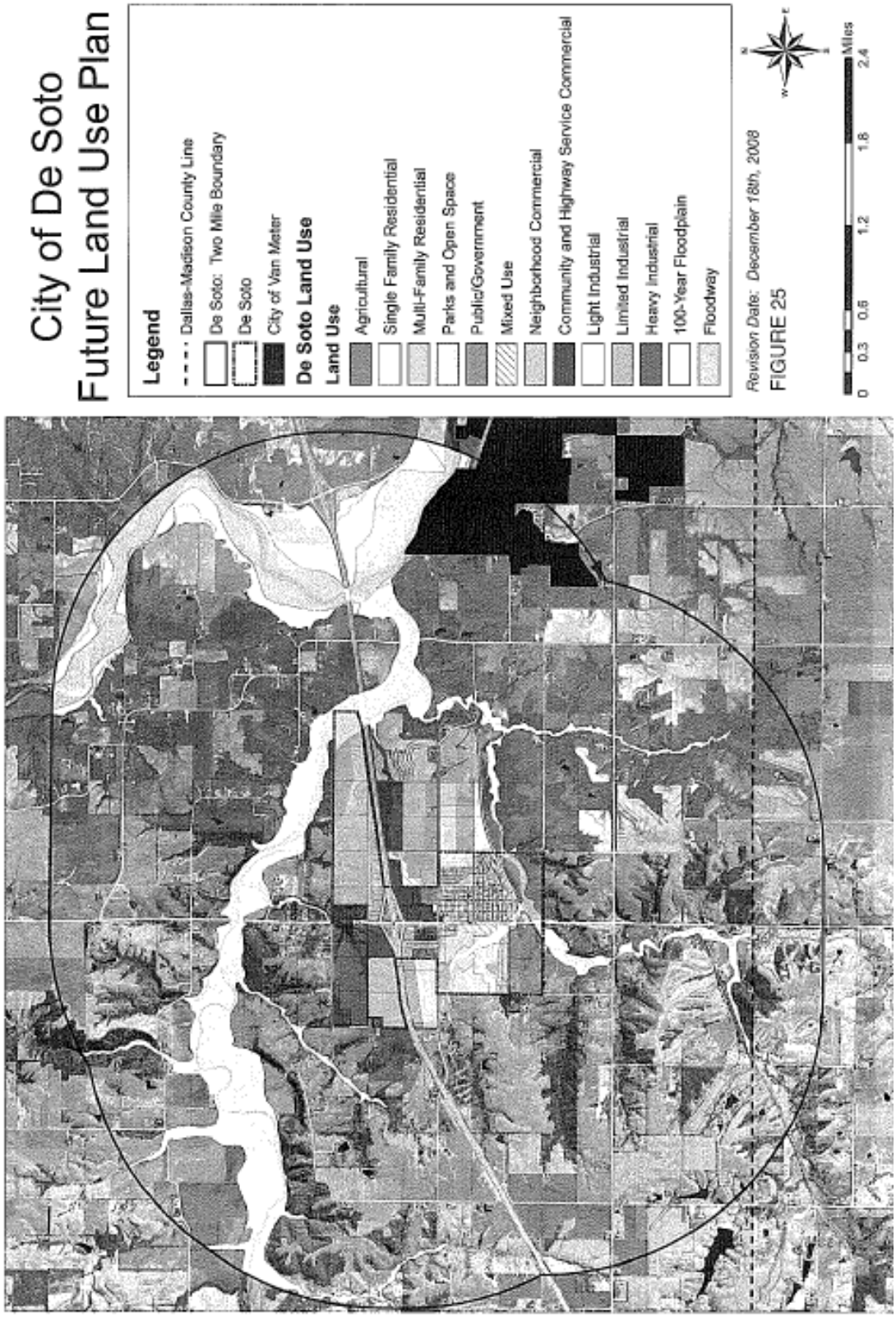
Future residential intensification is targeted toward the Oak Hill Plantation. This area provides space for 192 single-family residential lots (89 acres), 11 acres of multi-family or Planned Urban Development, 12 acres of commercial/mixed use, and 37 acres of parks/open space. Another potential area for residential growth is the agricultural land south of Oak Hill Plantation within the city limits.

Commercial Priorities

Future commercial intensification is targeted along the U.S. Highway 169 corridor south of Interstate 80. Other areas that could be developed for commercial use include the land on the northwest quadrant of Interstate 80 and U.S. Highway 169 and the area north of Adel-DeSoto-Minburn School, east of Ashland Crossing Plat 1, and south of Interstate 80.

Figure 3.6 that follows provides the future land use map for the City of DeSoto.

Figure 3.6. City of DeSoto Future Land Use



Source: City of DeSoto Comprehensive Plan, 2009

Dexter

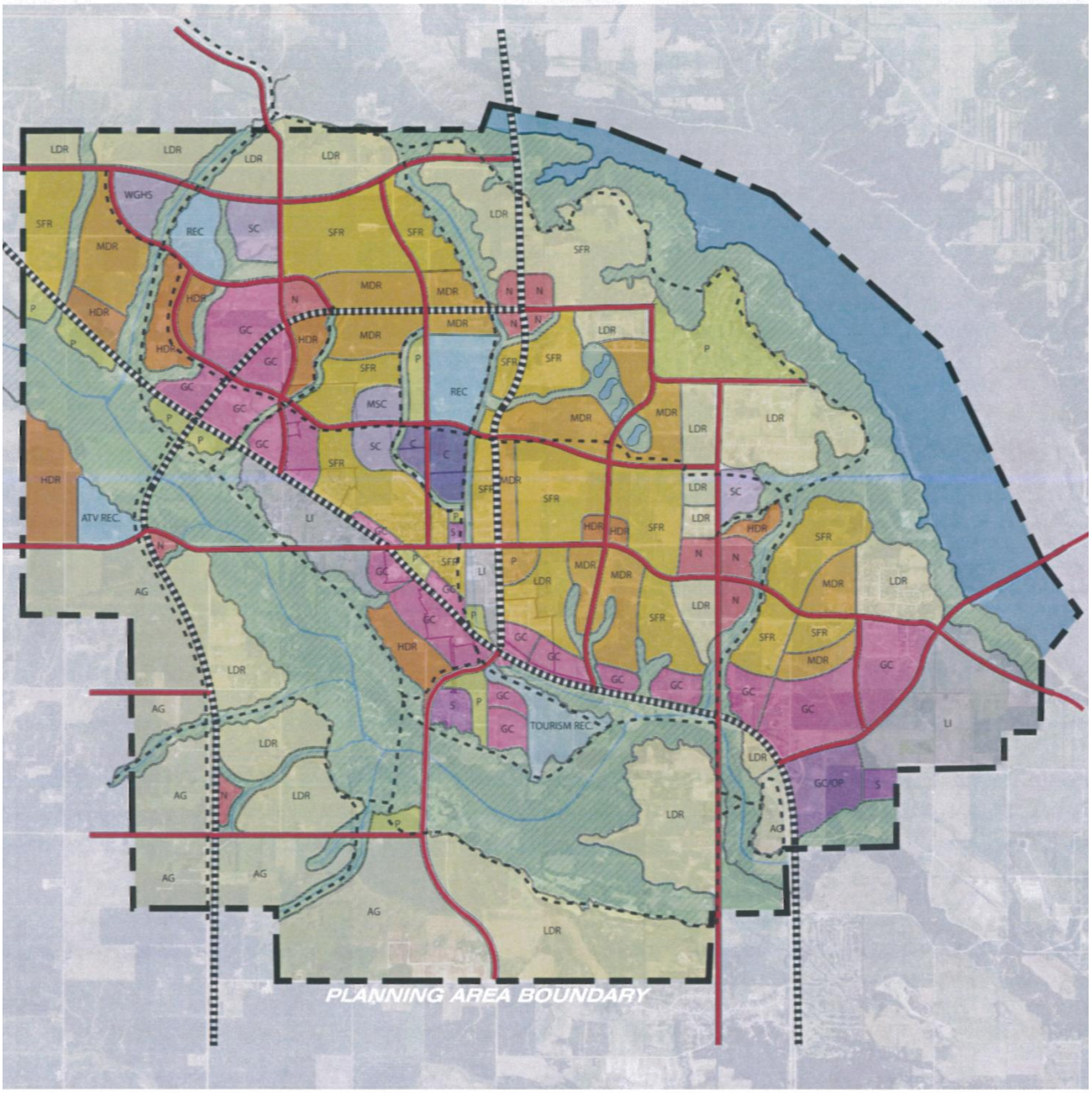
The City of Dexter has a comprehensive plan dated 2002, including future land use plans to 2022. The following is an excerpt from that plan summarizing the future land use plan:

> Ideally, all development will occur in the interior portions of the city. However, since it is detrimental to not allow any rural development, local incentives are necessary to attract residents and newcomers to build inside Dexter. Overall, it is recommended that land should be developed at a rate of 1.5 to 2.5 units per acre in single-family zones and 3.0 to 6.0 units per acre in multi-family zones.
>
> *A vision for future land use is emerging, especially to the east of the current development.* A proposal to the city is, when the need arises and the opportunity is made, the city should *study* the development of a mixed-use area along highway 925. The area should include up to 50 single-family homes over five years and up to 30 units of multi-family housing, especially along the east edge of the residential corridor. Combined with the development of an industrial area, the proposal includes developing a road along the west end of the industrial area. The road would access single-family uses on the west and mixed-use residential and commercial to the east and provide direct access to more of the industrial area. The proposal will meet long-term needs for housing, industry, and highway-oriented retail.
>
> *Annexing land will not necessary impact the rate of and location of growth.* In the same light, the future land use plan cannot be implemented by simply annexing land. The community must provide infrastructure where housing and industrial development can occur inexpensively and efficiently. Cooperation with Dallas County, active subdivision regulation, and continued reference to land use plans and goals are necessary to ensure that development is occurring as desired.

Granger

The City is currently in the process of developing a Comprehensive Plan. A new Wastewater Treatment Plan is planned for construction on Xavier Avenue. The map in Figure 3.7 provides existing land use from the Comprehensive Plan under development.

Figure 3.7. Granger Existing Land Use



LEGEND

PLANNING LIMITS	LOW DENSITY RESIDENTIAL (LDR)	NEIGHBORHOOD COMMERCIAL (N)	OFFICE PARK (OP)	AGRICULTURE (AG)	ATV REC
ARTERIAL STREETS	SINGLE FAMILY RESIDENTIAL (SFR)	GENERAL COMMERCIAL (GC)	SEWER (S)	PARKS (P)	TOURISM REC
MAJOR ROADWAYS	MEDIUM DENSITY RESIDENTIAL (MDR)	LIGHT INDUSTRIAL (LI)	SCHOOL (SC)	GREENWAY/PRESERVE/OS	WATER
TRAIL	HIGH DENSITY RESIDENTIAL (HDR)	AGRICULTURE (AG)	CIVIC (C)	REC	WOODED AREA

Source: City of Granger-Comprehensive Plan under development.

Linden

A new sewer system is planned for construction.

Minburn

No future development areas indicated.

Perry

Commercial Development

Land along Iowa Highway 141 has been identified for potential future commercial development. The land immediately east of the HyVee/Pamida area would be best suited for commercial development as it already generates a significant amount of vehicular traffic. Also, the abandoned railroad located near the property is planned to be developed into a pedestrian trail, so the land would also be accessible to future trail users.

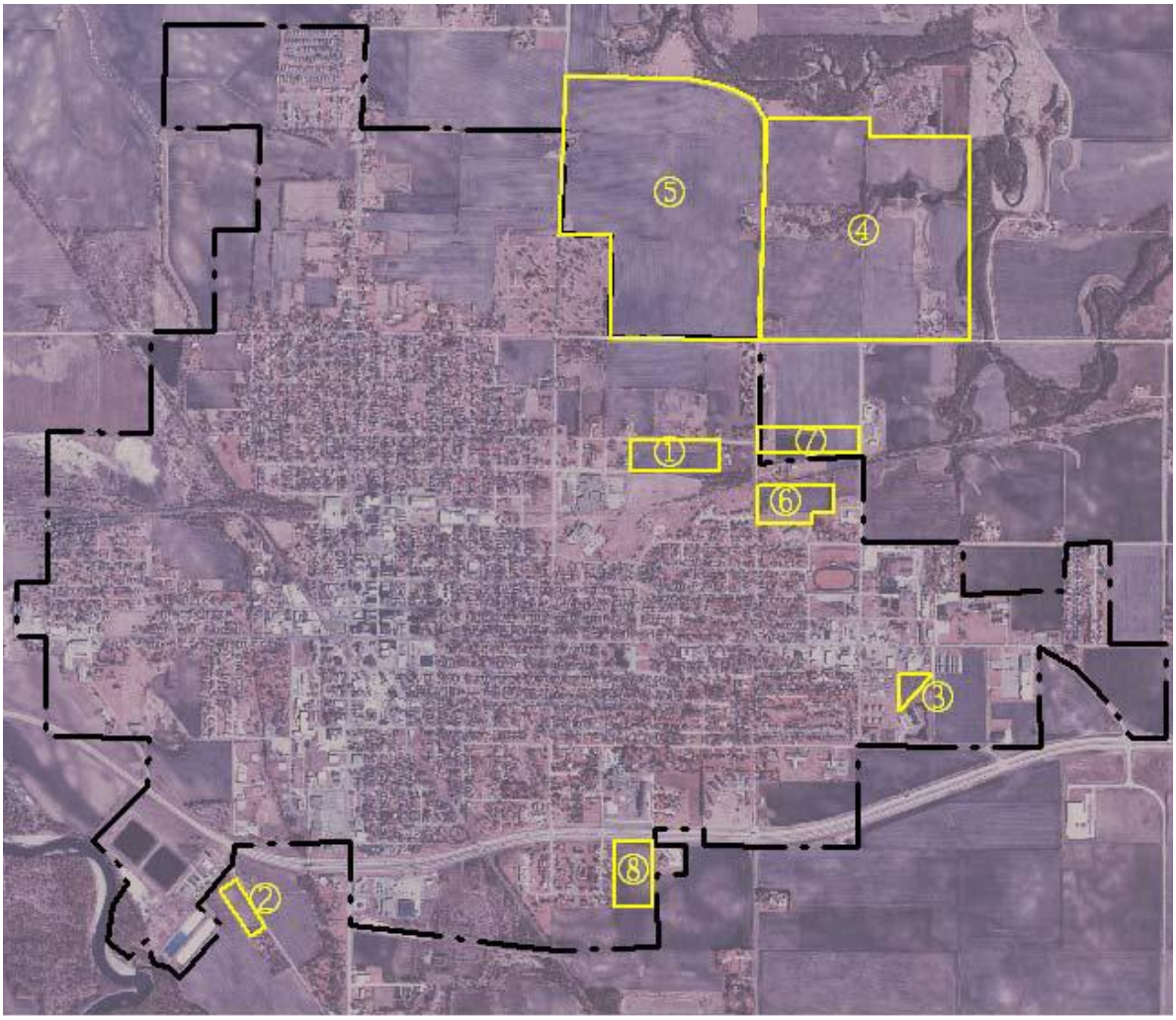
Another area for commercial development is located along both sides of Highway 141 on the east side of Perry. It is envisioned that Perry will most likely grow eastward, so this location would be ideal for future commercial development. As the area to the north fills in with residential development, there will be even more vehicular traffic at the intersections located along Highway 141, making it best suited for commercial use.

Another smaller area for commercial use is located on the west side of Perry, west of Pattee Park.

Residential Development

The 2005 City of Perry Comprehensive plan provides the map in Figure 3.8 showing the locations of planned residential developments in Perry.

Figure 3.8. City of Perry Planned Developments



Source: City of Perry Comprehensive Plan, 2005

The section that follows provides brief descriptions of each of the planned development areas.

1. Sun Am Development – 37 Single family homes

2. Beatty Development on Ivy Place – Seven one-acre lots for single family homes This development is outside of the city limits and would need to connect to the City's wastewater system.

3. Kading Development – 21 duplexes off 22nd Street- Construction started in 2005

4. Green Development – 175 acres for 80+ single family homes incorporating green space, natural areas, and recreational trails

5. Buchan Development – 200 acres for 100+ single family homes off of 16th Street. This may end up being a long range project. Infrastructure is near the area, but a lift station would need to be installed.

6. Homes on Hiawatha Development – 11 single-family homes and 13 duplexes off 16th Street on Hiawatha Street

7. Miller Development off North Street when completed – 40 single-family homes

8. Hunter Farms Development – Potential for approximately 100 housing units east of 10th Street and south of Highway 141 There is infrastructure near this site that could serve the area.

Industrial Development

According to the City's Comprehensive Plan future industrial use is likely to occur in the industrial site located on the far southeast corner of Perry. Percival Scientific is currently the only business in operation at the site, but there is room for additional industries. The use at this location would most likely be light industrial due to the available utilities. Additional industrial use may be suited for the western edge of Perry between Iowa Highway 141 and Willis Avenue. This would also likely be light industrial in nature, but could be heavy, which would be compatible with other uses in the area, such as Tyson Foods.

Conservation/Recreational

According to the City's Comprehensive Plan, areas surrounding waterways in and around Perry, especially within the 100-year floodplain should remain as they are and future development should be limited. These areas are mostly used as open space or agriculture and should remain that way to limit the affect on the streams and river. One area that the City plans to develop for recreational use is the abandoned railroad roundhouse area on the west edge of town. The area will be used for camping, hiking and picnicking and should not impede on the natural flow of the Raccoon River. Any development in the area will not impede the natural flow of floodwaters, should the area be flooded.

Another area planned for recreational use is the property north of the High School. The school plans to develop a sports complex in this area including a new high school baseball field. It

should also be noted that the City plans to develop trails within the abandoned railroad right-of-way, beginning out by the roundhouse area and heading southeast to Waukee as discussed earlier in this plan. There are also long range plans to extend the trail system eastwards along abandoned railroad right-of-way from the Wiese Park area. This project may be out of this document's 20-year planning period.

Other parks and recreational development will be smaller in nature and will likely be incorporated in new developments as neighborhood parks as new areas of town develop.

Redfield

A new water treatment facility is planned to be located at the City Shop location.

Van Meter

In the 2001 Comprehensive Plan, Van Meter identified three priority growth areas for its orderly and planned future development. The areas are all inside the Van Meter School District boundaries on the western edge conform to the City's current annexation boundary with the City of DeSoto and on the southern end conform to the Madison County line.

Priority Area 1

Priority area 1 includes approximately 6,300 acres. Generally, Area 1 is bounded by the Madison County line on the south, extends ½ mile west of Portland Road and includes all of Section 15 and 16 which extend north of Interstate 80.

Priority Area 2

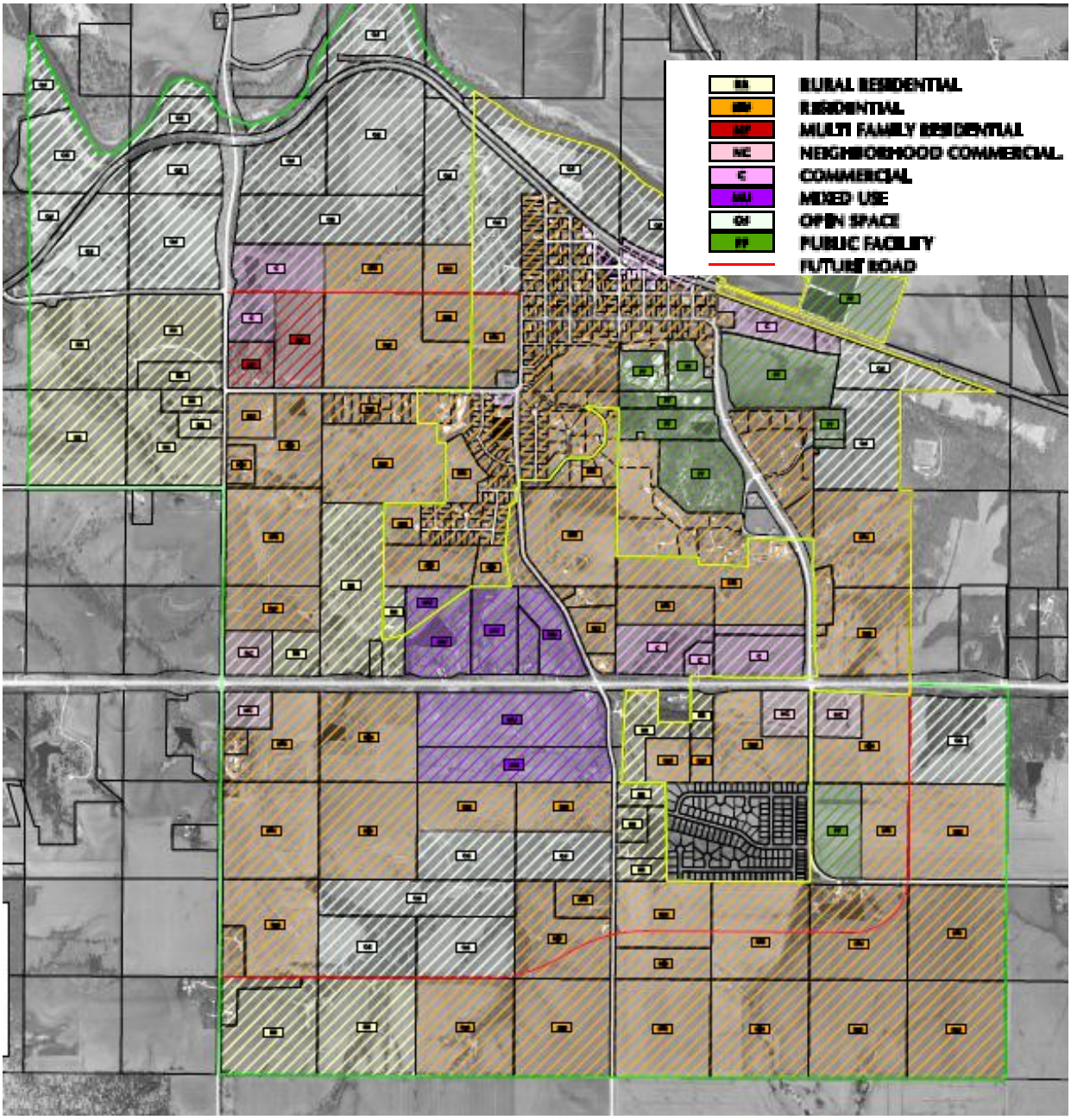
Priority area 2 is to the east of area 1 and encompasses approximately 4,800 acres. The Madison County line is the border to the south. The southeast corner of this area is bordered by Tabor Road.

Priority Area 3

Priority area 3 includes approximately 4,224 acres and extends from Tabor Road to include unincorporated Boonville and Napa Valley.

The City of Van Meter Future Land Use Map is provided in Figure 3.9

Figure 3.9. City of Van Meter Future Land Use Map



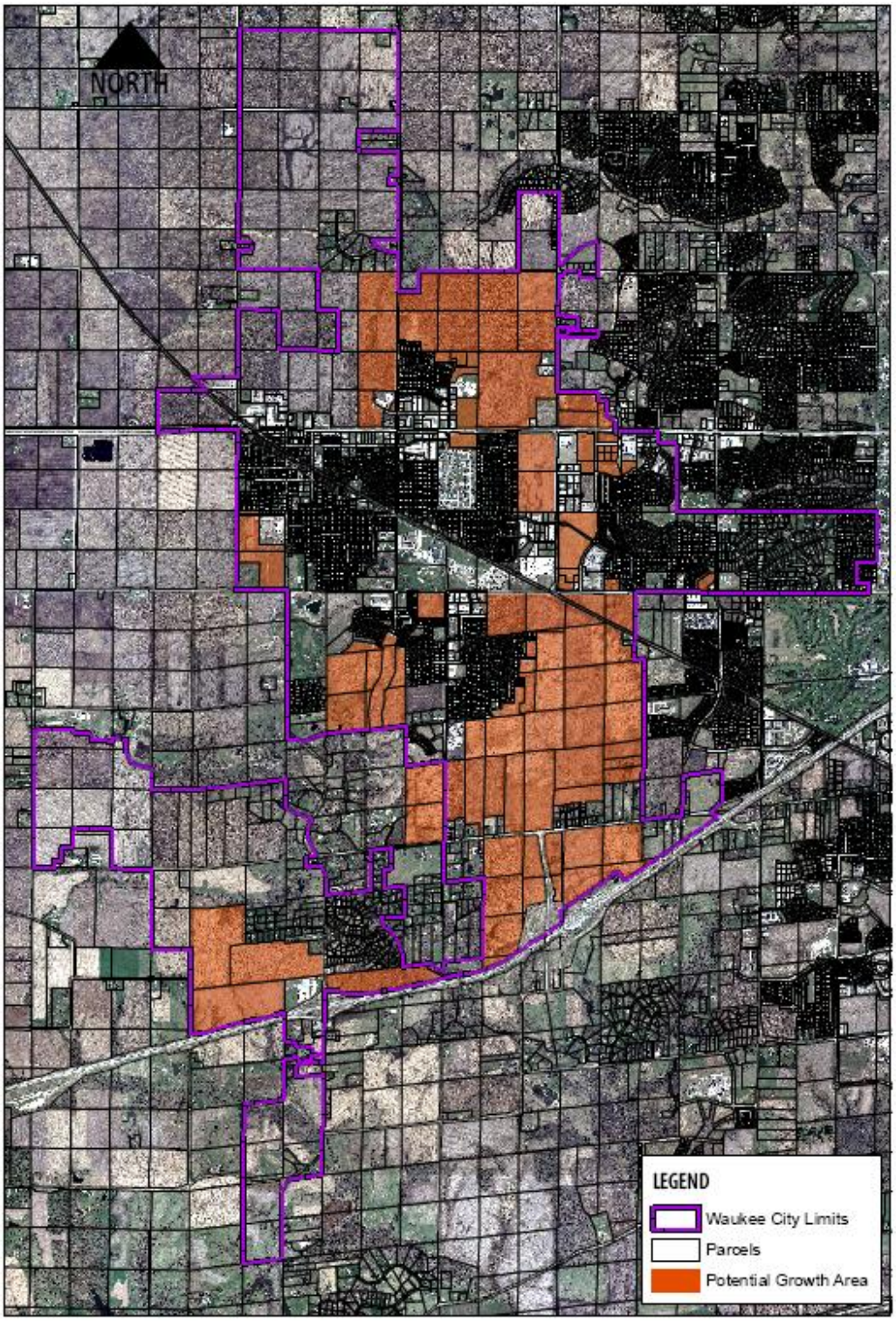
Source: City of Van Meter

Waukee

The City of Waukee has experienced growth primarily adjacent to established urban areas where existing roadway infrastructure and utility services have been available to be extended. At this time the City expects growth to continue in areas where new roadway and utility infrastructure is planned. In general, Waukee is fortunate enough that the majority of property within the City is not prone to flooding or a history of other natural disasters. In the few select areas where flood plains do exist, the City has identified those areas through the development

review process and kept them from being built upon. Figure 3.10 identifies the City's anticipated growth areas over the next 5 – 10 years.

Figure 3.10. City of Waukee: Potential/Planned Growth Areas 5-10 Years



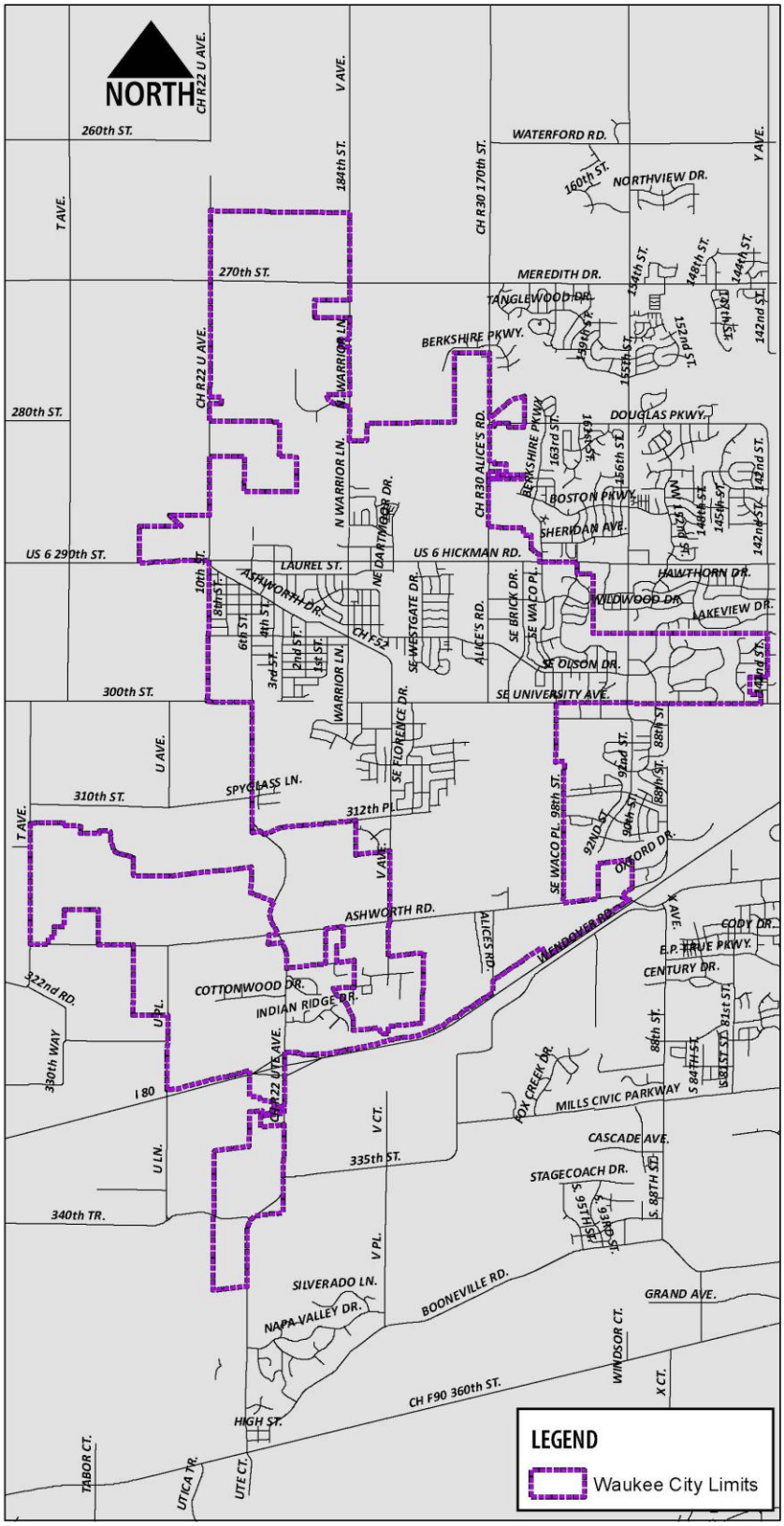
Source: City of Waukee

The City anticipates several new infrastructure projects in the next 5 years. No new City facilities are planned at this time to be constructed in the next 5 years. New infrastructure projects are identified as follows:

- *Alice's Road Extension: University Avenue to I-80*. This project is intended to provide access to approximately 1,300 acres of property intended to be developed into a mix of residential, commercial, retail, office, and related uses.
- *Fox Creek / Alice's Road Corridor Sewer*. This project will provide sanitary sewer service to approximately 600 acres along the Alice's Road Corridor.
- *University Avenue Intersection Reconfiguration*. The intersection of University Avenue and Alice's Road will be reconfigured to adjust the geometry of the intersection to accommodate the planned size and connection of the existing Alice's Road north and south of University Avenue.
- *Alice's Road / 105th Street & I-80 Interchange*. The proposed interchange is a planned infrastructure project between the cities of Waukee and West Des Moines to provide direct access to land to be developed. In Waukee's case, this project will also provide a more direct route for many existing residents to the interstate system.
- *NE Alice's Road Widening*. A portion of Alice's Road north of Hickman Road is planned to be widened to accommodate a new retail development in the northwest corner of the Alice's Road/ Hickman Road intersection. A portion of Alice's Road south of Hickman Road near the intersection will also be widened to match up the planned widening of the roadway north of Hickman Road.
- *SE Alice's Road Widening: University Avenue to Hickman Road*. This portion of Alice's Road is planned to be widened to better accommodate existing development along Alice's Road as well as facilitate better integrate the design of this Alice's Road segment with the other planned extensions and widenings explained elsewhere.
- *Little Walnut Creek Sewer and Lift Station*. The proposed regional lift station Phase One will provide sanitary sewer service to 173 acres with Phase Two providing sewer service to 575 acres in the Little Walnut Creek basin.
-

Figure 3.11 is a map identifying the location of each planned Infrastructure Project.

Figure 3.11. City of Waukee: New Facilities/Infrastructure, 5 Years



Source: City of Waukee

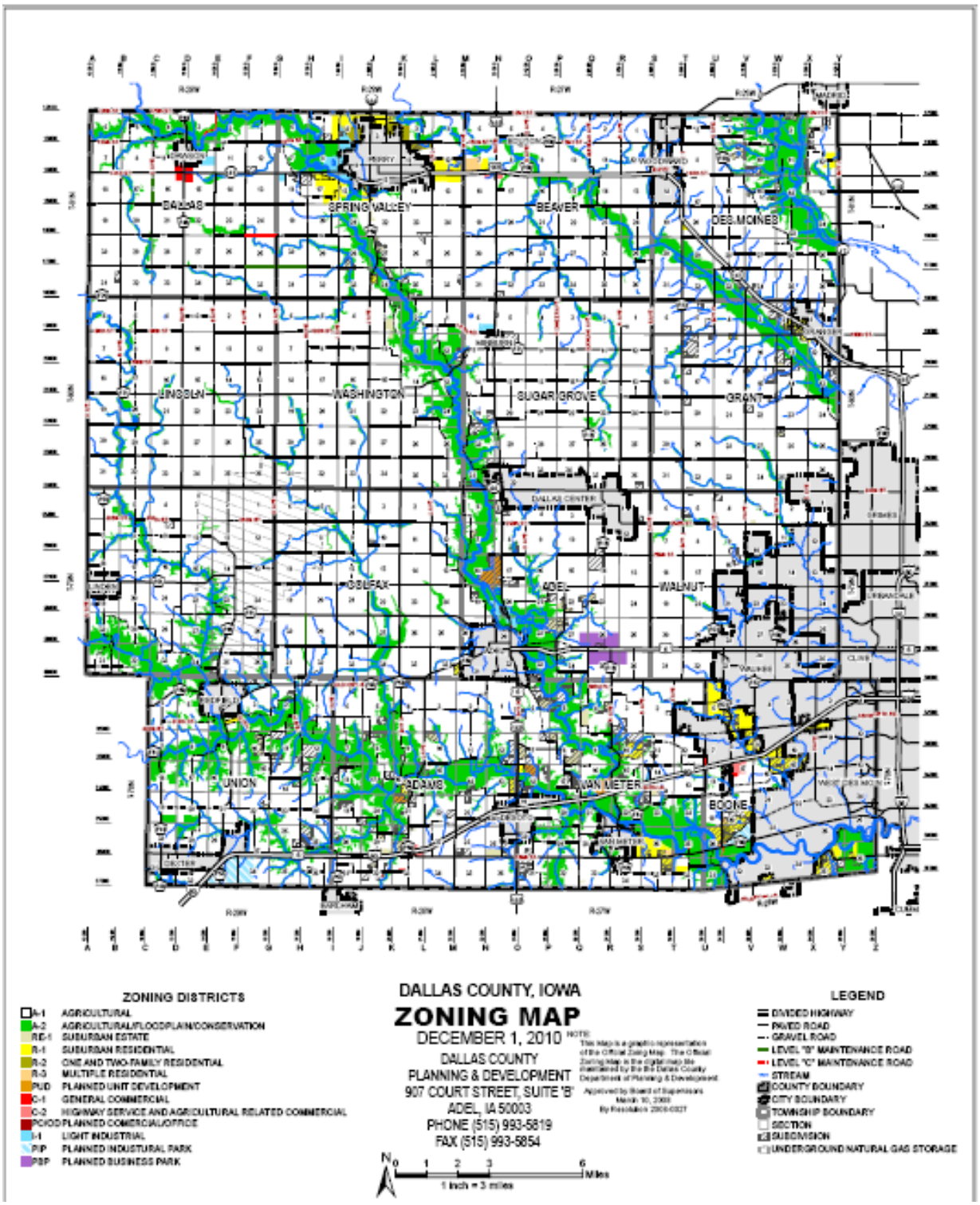
Woodward

No future development areas indicated.

Unincorporated Dallas County

Figure 3.12 is the Dallas County Zoning Map showing some of the planned growth areas.

Figure 3.12. Dallas County Zoning Map



Source: Dallas County Planning & Development, http://www.co.dallas.ia.us/Modules/ShowDocument.aspx?documentid=4539

3.4 Hazard Profiles and Vulnerability

Hazard Profiles

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

Each hazard identified in Section 3.1.4 is profiled individually in this section. The level of information presented in the profiles varies by hazard based on the information available. With each update of this plan, new information will be incorporated to provide for better evaluation and prioritization of the hazards that affect the planning area. Detailed profiles for each of the identified hazards include information categorized as follows:

Hazard Description

This section consists of a general description of the hazard and the types of impacts it may have on a community. It also includes the ratings assigned to the hazard relative to typical warning times and duration of hazard events as described in Table 3.6.

Geographic Location/Extent

This section describes the geographic location of the hazard in the planning area. Where available, maps are utilized to indicate the specific locations of the planning area that are vulnerable to the subject hazard. This section also provides information as to the extent of the hazard (i.e. the size or degree of impacts). Extent is addressed in more detailed/quantified terms (where available) in the Vulnerability Section for each hazard.

Previous Occurrences

This section includes information on historic incidents and their impacts.

Probability of Future Occurrence

The frequency of past events is used to gauge the likelihood of future occurrences. Where possible, the probability or chance of occurrence was calculated based on historical data. Probability was determined by dividing the number of events observed by the number of years and multiplying by 100. This gives the percent chance of the event happening in any given year. An example would be three droughts occurring over a 30-year period, which suggests a 10percent chance of a drought occurring in any given year. For each hazard, the probability is assigned a rating as defined in Table 3.6.

Vulnerability Assessments

Requirement §201.6(c)(2)(ii) :[The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.

Requirement §201.6(c)(2)(ii)(A) :The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.

Requirement §201.6(c)(2)(ii)(B) :[The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate.

Requirement §201.6(c)(2)(ii)(C): [The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

Requirement §201.6(c)(2)(ii): (As of October 1, 2008) [The risk assessment] must also address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged floods.

Following the hazard profile for each hazard is the vulnerability assessment. The vulnerability assessment further defines and quantifies populations, buildings, critical facilities, and other community assets at risk to natural hazards. The vulnerability assessment for this plan followed the methodology described in the FEMA publication *Understanding Your Risks—Identifying Hazards and Estimating Losses* (2002). The vulnerability assessments were conducted based on the best available data and the significance of the hazard. Data to support the vulnerability assessments was collected from the following sources:

- Statewide GIS data sets compiled by state and federal agencies;
- FEMA's HAZUS-MH loss estimation software;
- Written descriptions of assets and risks provided by participating jurisdictions;
- Existing plans and reports;
- Personal interviews with planning committee members and other stakeholders; and
- Other sources as cited.

Detailed profiles for each of the identified hazards include information categorized as follows:

Vulnerability Overview

This section consists of a general overview narrative of the planning area's vulnerability to the hazard. Within this section, the magnitude/severity of the hazard is discussed. The magnitude of the impact of a hazard event (past and perceived) is related directly to the vulnerability of the people, property, and the environment it affects. This is a function of when the event occurs, the location affected the resilience of the community, and the effectiveness of the emergency response and disaster recovery efforts.

For each hazard, the magnitude/severity is assigned a rating as defined in Table 3.6.

Potential Losses to Existing Development

This section provides the potential losses to existing development. Where data is available, this section provides estimated financial losses as well as the methodology used.

Future Development

This section provides information on how vulnerability to this hazard will be impacted by planned future development as well as information for jurisdictions to consider in planning future development.

Hazard Summary by Jurisdiction

For hazards that vary by jurisdiction, this section will provide an overview of how the hazard varies, followed by a table indicating the probability, magnitude, warning time, and duration rankings for each jurisdiction with the resulting hazard score and level.

3.4.1 Animal/Crop/Plant Disease

Hazard Score Calculation					
Probability	Magnitude/Severity	Warning Time	Duration	Weighted Score	Level
1	3	4	4	2.35	Moderate

3.4.1.1 Profile

Hazard Description

Agricultural infestation is the naturally occurring infection of vegetation, crops or livestock with insects, vermin, or diseases that render the crops or livestock unfit for consumption or use. Because of Iowa's overall substantial agricultural industry and related facilities and locations, the potential for infestation of crops or livestock poses a significant risk to the economy of the State. Iowa cropland is vulnerable to disease and other agricultural pests. Iowa farmers harvested an estimated 13.8 billion acres of corn, 8.6 billion acres of soybeans, and 1.1 billion acres of hay and grass silage, according to USDA figures in 2007. Iowa's total agricultural output reached $20.4 billion in 2007, with crops contributing $10.3 billion and livestock sales contributing $10.1 billion to that total (USDA National Agricultural Statistics Service, 2007 Census of Agriculture). Iowa was ranked #1 in both corn and soybean production in the U.S.

Dallas County planning area has 78 percent of the land in the County as cropland, pastures, and trees. Agricultural infestation of crops or livestock in the planning area would severely affect the economy.

Some level of agricultural infestation is normal in Iowa. The concern is when the level of an infestation escalates suddenly, or a new infestation appears, overwhelming normal control efforts. The levels and types of agricultural infestation appear to vary by many factors, including cycles of heavy rains and drought.

Animal Disease

Agricultural incidents are naturally occurring infection of livestock with insects, vermin, or diseases that render the livestock unfit for consumption or use. In 2007, the state of Iowa ranked number one in the U.S. for livestock inventory of poultry egg layers with 53,793,712 and for hogs and pigs inventory of 19,295,092, and an inventory of 11,404,869 for pullets for laying flock replacement. Iowa is also ranked #9 in the U.S. for 4,002,111 turkeys and ranked #7 for 3,982,344 cattle and calves. With this substantial agricultural industry and related facilities throughout the State, the potential for infestation of livestock poses a significant risk to the Iowa economy.

The Iowa Department of Agriculture and Land Stewardship (IDALS) monitors and reports on the following animal reportable diseases in Iowa:

- Avian Influenza,
- Bovine Spongiform Encephalopathy (BSE) Disease,
- Chronic Wasting Disease,

- Exotic Newcastle Disease,
- Foot and Mouth Disease,
- Johne's Disease,
- Pseudo rabies,
- Scrapie, and
- West Nile Virus.
-

Producers are required by state law to report any of the reportable animal diseases to the IDALS's Bureau of Animal Industry. The IDALS's Bureau of The Center for Agriculture Security is the lead coordinating bureau for any emergency response for an agriculture incident.

Avian influenza continues to be of concern in Iowa as the State is number one in poultry egg layers (over 53 million), 10th nationally in turkey production (over 9 million) and 5th in turkey processing in 2011 which is even higher inventories than in 2007. Source: IDALS 2012 Newsletter.

Bovine Spongiform Encephalopathy (BSE) "mad cow" disease, is a chronic, degenerative disease affecting the central nervous system of cattle. Cases have been found world-wide since 1986, but in Canada and the U.S. only a single cow was reported with BSE in 2003.

Chronic Wasting Disease (CWD) is a fatal, neurological disease of farmed and wild deer and elk. The disease has been identified in wild and captive mule deer, white-tailed deer and North American elk, and in captive black-tailed deer. CWD belongs to the family of diseases known as transmissible spongiform encephalopathies (TSEs). Recently from 1996 to June 2002, it was diagnosed in farmed elk herds in Colorado, Kansas, Montana, Iowa, Oklahoma, South Dakota, and the Canadian Provinces of Alberta and Saskatchewan. Then from 2000 to June 2002, CWD has also been found in wild deer in northwestern Iowa, southern New Mexico, southwestern South Dakota, south central Wisconsin, northwestern Colorado, and the Canadian Province of Saskatchewan. To date, it has not been found in Iowa. Source: http://www.iowaagriculture.gov/animalIndustry/cwdFacts.asp.

Exotic Newcastle disease (END) is a contagious and fatal viral disease affecting all species of birds. There was an epidemic of END in California in 2003 that is resulting in the death of millions of chickens and other birds, and costing millions of dollars. END is probably one of the most infectious diseases of poultry in the world. END is so virulent that many birds die without showing any clinical signs.

Johne's (yo-knees) disease is a contagious, chronic and eventually fatal infection that affects the small intestine of ruminants, including cattle, sheep and goats. Johne's, also called Para tuberculosis, is a slow progressive wasting disease with an incubation period of usually 2 or more years. Johne's is a reportable disease, but not a quarantineable disease.

Pseudo rabies is a viral disease most prevalent in swine, often causing newborn piglets to die. Older pigs can survive infection, becoming carriers of the pseudo rabies virus for life. Other animals infected from swine die from pseudo rabies, which is also known as Aujeszky's disease and "mad itch." Infected cattle and sheep can first show signs of pseudo rabies by scratching and biting themselves. In dogs and cats, pseudo rabies can cause sudden death. The virus

does not cause illness in humans. Due to an extensive eradication program, Iowa & the rest of United States are free of pseudo rabies.

Scrapie is a fatal, degenerative disease affecting the central nervous system of sheep and goats that is very similar to BSE (mad cow disease), although it does not cause disease in humans, and has been present in the U.S. for over 50 years. Infected flocks that contain a high percentage of susceptible animals can experience significant production losses. In these flocks over a period of several years, the number of infected animals increases and the age at onset of clinical signs decreases making these flocks economically unviable. Animals sold from infected flocks spread scrapie to other flocks. The presence of scrapie in the U.S. also prevents the export of breeding stock, semen, and embryos to many other countries. Currently there is a national program underway to eradicate scrapie in the U.S.

Disease outbreaks can also occur in wild animal populations. The IDALS's Bureau of Animal Industry also monitors wild animal species and game throughout the state as well as diseases that may impact them.

Crop Pests/Diseases

A plant disease outbreak or a pest infestation could negatively impact crop production and agriculturally dependent businesses. An extreme outbreak or infestation could potentially result in billions of dollars in production losses. The cascading net negative economic effects could result in wide-spread business failures, reduction of tax revenues, harm to other state economies, and diminished capability for this country to compete in the global market.

Many factors influence disease development in plants, including hybrid/variety genetics, plant growth stage at the time of infection, weather (e.g., temperature, rain, wind, hail, etc.), single versus mixed infections, and genetics of the pathogen populations. The two elements of coordination and communication are essential when plant diseases or pest infestations occur. The United States Department of Agriculture/ Animal Plant Health Inspection Service, local producers, local government, assessment teams, and state government entities must work together to effectively diagnose the various plant hazards to determine if immediate crop quarantine and destruction is required.

Iowa State University, College of Agriculture and Life Sciences, has The Plant and Insect Diagnostic Clinic http://www.ipm.iastate.edu/ipm/info /insects that provides diagnosis of plant problems (plant diseases, insect damage, and assessment of herbicide damage) and the identification of insects and weeds from the field, garden, and home. According to the Plant and Insect Diagnostic Clinic, the following are common known crop pests/diseases in Iowa:

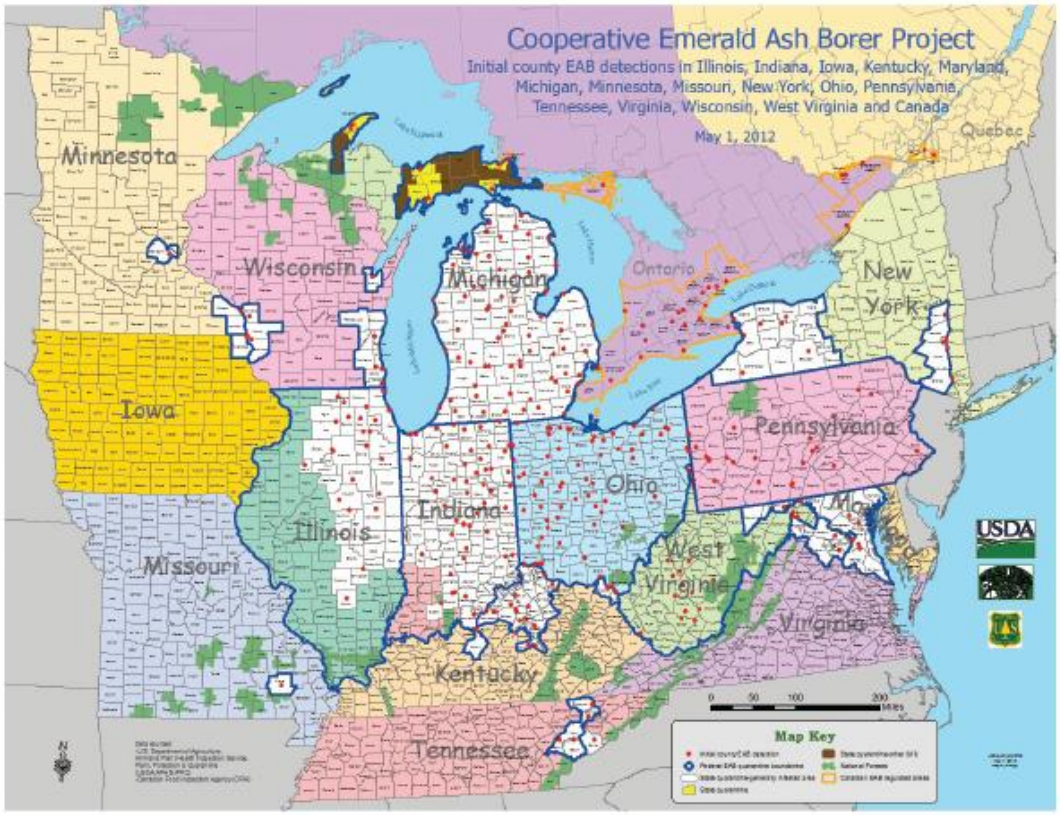
- **Pests –** rootworm, tomato fruitworm, two spotted spider mite
- **Corn Diseases** – Corn Smut, gray Leaf Spot, Stewart's Wilt, Diplodia Ear Rot, and Stalk Rot
- **Soybean Diseases** – Soybean Rust and Soybean Cyst Nematode.

Emerald Ash Borer

The Hazard Mitigation Planning Team is also aware of the emerald ash borer pest that threatens Iowa's forests. This pest is a slender, emerald green beetle that is ½ inch long, and

responsible for the destruction of approximately 20 million ash trees in Ohio, Michigan, Indiana, Illinois, and Ontario, Canada. Figure 3.13 shows the initial counties in the U.S. and Canada in which the Emerald Ash Borer was detected.

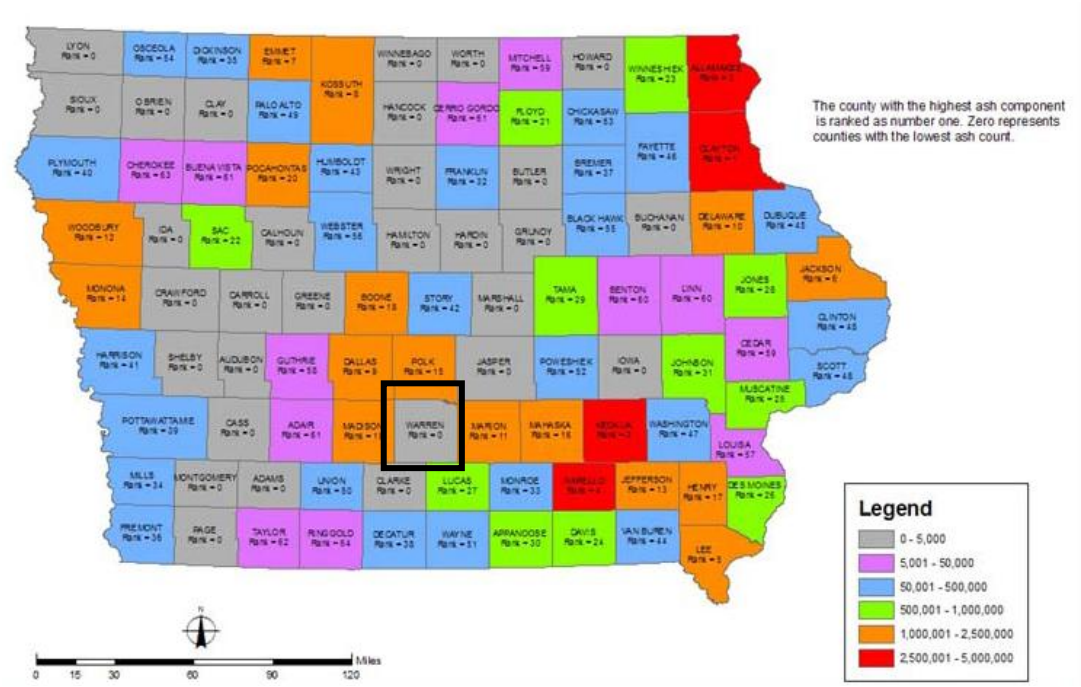
Figure 3.13. USDA Initial County Emerald Ash Borer Detection Map, May 1, 2012.



Source: http://www.aphis.usda.gov/plant_health/plant_pest_info/emerald_ash_b/index.shtml

In early May 2010 the pest was found in one tree on an island in the Mississippi River in Allamakee County (northeast corner of Iowa). It is estimated by the Iowa Department of Natural Resources – Forestry Bureau that approximately 15-20 percent of public trees in Iowa cities are green ash. In some communities, ash comprises more than 60 percent of the public trees. Statewide, there are over 50 million ash trees (green, white and black) in bottomland and upland forests (2005 USDA Forest Service, Forest Inventory Data) and another 30 million urban ash trees (Iowa Department of Natural Resources – Forestry Bureau). In Figure 3.14 below, Dallas County is ranked 9th in the State with 1 million to 2.5 million ash trees in the County according to data from the U.S. Forest Service. Also, a cooperative state and federal effort has developed the "Iowa Emerald Ash Borer Readiness Plan" http://www.extension.iastate.edu/pme/EAB%20other%20forms/IA%20EAB%20Readiness%20Plan%2010MAY2010.pdf to help stop this pest by education, monitoring, surveillance, containment, and communication.

Figure 3.14. Distribution of Ash Trees in Iowa



Source: Iowa State University Extension Office
http://www.extension.iastate.edu/pme/EAB%20other%20forms/Iowa%20Ash%20Tree%20Distribution%202006%20map.jpg
Note: Dallas County is outlined in black.

Wildlife

Iowa farmers also lose a significant amount of crops each year as a result of wildlife foraging. This can be particularly problematic in areas where natural habitat has been diminished or in years where weather patterns such as early/late frost deep snow, or drought has caused the wild food sources to be limited.

Warning Time Score: 4—less than 6 hours

Duration Score: 4—more than 1 week

Geographic Location/Extent

All of Dallas County is subject to animal/livestock incidents and agricultural infestations. There are 912 farms in the County that cover 297,090 acres of land, which accounts for 78 percent of the surface land in the County.

Animal Location/Extent

Table 3.20 provides the inventory number of hogs and pigs and cattle in Dallas County compared to the State according to Iowa State University, University Extension information. In 2007, Dallas County produced 58,775 hogs and pigs and 14,936 head of cattle and had a total livestock value of $3,600,000.

Table 3.20. Livestock Value in Dallas County and Iowa

Livestock			
		Dallas County	Iowa
Hogs and Pigs	Inventory	58,775	19,295,092
	Sold	116,183	47,279,443
Cattle	Inventory	14,936	3,982,344
	Sold	15,861	3,635,880
Total livestock value in millions		$3.60	$5,754.1
Livestock value as percent of total economic output		0.1%	2.1%

Source: Iowa State University, University Extension, 2007

Crop Location/Extent

Table 3.21 provides the crops harvested in Dallas County compared to the State according to Iowa State University, University Extension information. In 2007, Dallas County farmers harvested 22.4 million bushels of corn and 4.9 million bushels of soybeans. Production of all crops in Dallas County contributed $156.90 million or 3.5 percent of the County's total economic output.

Table 3.21. Crop Value in Dallas County and Iowa

Crops and Cropland ($ in Millions)				
	Dallas County		Iowa	
	Corn	Soybeans	Corn	Soybeans
Acres harvested	137,918	96,888	13,842,282	8,612,810
Bushels harvested (millions)	22.4	4.9	2,292.2	430.7
Output of all crops (millions)	$156.90		$10,359.3	
Market value of all crops	3.5 %		3.9%	

Source: Iowa State University, University Extension, 2007

Also according to the Iowa Department of Agriculture and Land Stewardship, Pesticide Bureau, there are 17 registered farms in Dallas County on the sensitive crop location report for pesticide applicators to avoid. The crops include organic fruits and vegetables, honey, and vineyards. Source: http://www.iowaagriculture.gov/pesticides.asp

Previous Occurrences

There have been a total of 77 sheep flocks in Iowa that have been found to be infected with Scrapie since the accelerated national Scrapie Eradication Program started in November 2001. In fiscal year 2005, Iowa had a high of 15 newly infected flocks. The number of new infected flocks has been decreasing since that time. Iowa's last infected flock was found in June 2010.

According to the Iowa Department of Public Health, Center for Acute Disease Epidemiology, there was 1 reported case of Rabies in Dallas County in 2011 from a skunk and no cases in 2010. The only neighboring county with rabies was Polk County was 2 confirmed cases in bats in 2011 and 1 case from a bat 2010.
According to the U.S. Department of Agriculture's Risk Management Agency, during the 11-year period from 2001-2011, combined crop insurance payments for damages resulting from insects, Asian Soybean Rust, and wildlife totaled $68,146. The Iowa Statewide average for farm acres

with insurance is 85 percent (USDA Risk Management Agency, 2011 Iowa Crop Insurance) Profile http://www.rma.usda.gov/pubs/2012/stateprofiles/iowa11.pdf). Table 3.22 provides a summary of insured crop losses as a result of crop infestations.

Table 3.22. Crop Insurance Payments for Crop Pests/Diseases 2001-2011

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid ($)
2008	SOYBEANS	Asian Soybean Rust	2,750
2001	CORN	Insects	4,603
2002	CORN	Insects	2,096
2010	CORN	Insects	12,831
2002	SOYBEANS	Insects	4,597
2003	SOYBEANS	Insects	6,513
2006	CORN	Wildlife	123
2007	CORN	Wildlife	1,169
2009	CORN	Wildlife	9,409
2011	CORN	Wildlife	12,391
2007	SOYBEANS	Wildlife	7,881
2011	SOYBEANS	Wildlife	3,783
Total			**$68,146**

Source: USDA Risk Management Agency Crop Insurance Payment FOIA Request; USDA Risk Management Agency Iowa Crop Insurance Profile, http://www.rma.usda.gov/pubs/2012/stateprofiles/iowa11.pdf

Probability of Future Occurrence

The planning area experiences agricultural losses every year as a result of naturally-occurring diseases that impact animals/livestock. From the list of nine reportable diseases that IDALS monitors and reports on, only rabies was reported in 2011 in Dallas County. There are three reportable diseases: Avian influenza, Exotic Newcastle Disease, and Scrapie that could become a problem in Iowa at any time. The IDALS is constantly monitoring livestock and extensive eradication programs in the U.S. have already wiped out several of these reportable diseases.

Probability Score: 1—Unlikely

3.4.1.2 Vulnerability

Overview

A widespread infestation of animals/livestock and crops could impact the economic base of the County. According to the Iowa State University, University Extension, 2007, the total economic output of livestock and crops in Dallas County is 3.6 percent.

Magnitude Score: 3—Critical

Potential Losses to Existing Development

Buildings, infrastructure, and critical facilities are not vulnerable to this hazard. Its impacts are primarily economic and environmental, rather than structural affects.

Rough estimates of potential direct losses fall in a range of 1-75 percent of livestock receipts. Based on a worst case scenario where 75 percent of livestock is lost in a given year due to agricultural infestations, the total direct costs could approach $2.7 million.

Table 3.23 provides the annual crop losses for insurable crops. The insurable loss is adjusted to estimate losses to all insurable crops by considering that 85 percent of insurable crops in the State were insured (2011 Iowa Crop Insurance Profile from USDA's Risk Management Agency).

Table 3.23. Estimated Insurable Crop Losses Resulting From Infestation

Crop Value* (in 1,000s)	Crop Insurance Paid-11 yrs	Adjusted 11-year Losses	Annual Estimated Losses
$156,900	68,146	$80,171	$7,288

Source: Crop value is from Iowa State University, University Extension, 2007; Crop Insurance Paid is from the USDA's Risk Management Agency for 2001-2011.
Note: This includes insurable crops that are insured

Rough estimates of potential direct losses from a maximum threat event fall in a range of 1-50 percent of annual crop receipts. Based on a worst case scenario where 50 percent of crop production is lost in a given year due to agricultural infestations, the total direct costs could approach $78,450,000.

Future Development

Future development is not expected to significantly impact the planning area's vulnerability to this hazard. However, if crop production and numbers of animals/livestock increases, the amount vulnerable to infestation also increases. Regarding the Emerald Ash Borer, the Iowa Department of Natural Resources recommends that other native tree species be planted in lieu of Ash trees to avoid increasing vulnerability to infestation of the Emerald Ash Borer.

The U.S. Forest Service estimates that Dallas County has 1 to 2.5 million ash trees in the County. Removal of debris if an infestation would occur would be challenging and costly. If only 10 percent of the Ash trees were impacted in Dallas County, that would translate to 200,000 trees. It is estimated that is costs $682 to replace each Ash tree. In Dallas County, this translates to over $136 million.

Animal/Crop/Plant Disease Hazard Summary by Jurisdiction

The magnitude determinations discussed in the vulnerability overview sections were factored into the following hazard summary table to show how this hazard varies by jurisdiction. It has been determined that the magnitude of animal/crop/plant disease would be less than 10 percent of property damage in the cities and for the school districts, thus their magnitude has been

lowered to a Level 1. The majority damages for animal/crop/plant disease would be in the unincorporated County where the animals and crops are located.

Jurisdiction	Probability	Magnitude	Warning Time	Duration	Score	Level
Dallas County	1	3	4	4	2.35	Moderate
Cities						
Adel	1	1	4	4	1.75	Low
Bouton	1	1	4	4	1.75	Low
Clive*	1	1	4	4	1.75	Low
Dallas Center	1	1	4	4	1.75	Low
Dawson	1	1	4	4	1.75	Low
DeSoto	1	1	4	4	1.75	Low
Dexter	1	1	4	4	1.75	Low
Granger	1	1	4	4	1.75	Low
Grimes*	1	1	4	4	1.75	Low
Linden	1	1	4	4	1.75	Low
Minburn	1	1	4	4	1.75	Low
Perry	1	1	4	4	1.75	Low
Redfield	1	1	4	4	1.75	Low
Urbandale*	1	1	4	4	1.75	Low
Van Meter	1	1	4	4	1.75	Low
Waukee	1	1	4	4	1.75	Low
West Des Moines*	1	1	4	4	1.75	Low
Woodward	1	1	4	4	1.75	Low
School Districts						
Adel-DeSoto-Minburn Schools	1	1	4	4	1.75	Low
Dallas Center-Grimes Schools	1	1	4	4	1.75	Low
Perry Schools	1	1	4	4	1.75	Low
Van Meter Schools	1	1	4	4	1.75	Low
Waukee Schools	1	1	4	4	1.75	Low
West Central Valley Schools	1	1	4	4	1.75	Low
Woodward- Granger Schools	1	1	4	4	1.75	Low

* These jurisdictions are included in the risk assessment although they are not officially participating jurisdictions in the Dallas County Plan. Portions of these jurisdictions are in both Dallas and Polk Counties. According to Iowa Homeland Security & Emergency management and Polk County Emergency management, these jurisdictions will participate in the Polk County Hazard Mitigation Plan.

3.4.2 Dam Failure

Hazard Score Calculation					
Probability	Magnitude/Severity	Warning Time	Duration	Weighted Score	Level
1	3	4	4	2.35	Moderate

3.4.2.1 Profile

Hazard Description

Many of Iowa's community settlements were founded along rivers and streams due to their reliance on water resources. Often, these streams or rivers later needed a dam for flood control or a reservoir for a constant water source. A dam is defined as a barrier constructed across a watercourse for the purpose of storage, control, or diversion of water. Dams are typically constructed of earth, rock, concrete, or mine tailings. Dam failure is the uncontrolled release of impounded water resulting in downstream flooding, affecting both life and property. Dam failure can be caused by any of the following: flooding; earthquakes; flow blockages; landslides; lack of maintenance; improper operation; poor construction; vandalism; or terrorism.

The thresholds for when a dam falls under State regulation are outlined in Iowa Administrative Code 567-71.3 and are listed below. The thresholds are primarily based on both dam height and wter storage volulmes. State regulated dams are those dams that meet the following:

In rural areas:

a. *Any dam designed to provide a sum of permanent and temporary storage exceeding 50 acre-feet at the top of dam elevation, or 25 acre-feet if the dam does not have an emergency spillway, and which has a height of 5 feet or more.*

b. *Any dam designed to provide permanent storage in excess of 18 acre-feet and which has a height of 5 feet or more.*

c. *Any dam across a stream draining more than 10 square miles.*

d. *Any dam located within 1 mile of an incorporated municipality, if the dam has a height of 10 feet or more, stores 10 acre-feet or more at the top of dam elevation, and is situated such that the discharge from the dam will flow through the incorporated area.*

In urban areas:

Any dam which exceeds the thresholds in 71.3 (1) "a", "b", or "d".

Low head dams:

Any low head dam on a stream draning 2 or more square miles in an urban area, or 10 or more square milesin a rural area.

Dams are classified by the State of Iowa into three categories based on the potential risk to people and property in the event of failure (see Table 3.24). The classification can change over time due to changes in development downstream from the dam. In addition, older dams may not have been built to the standards of their updated classification when this occurs. The Iowa Department of Natural Resources performs annual inspections on all high hazard dams in the state.

Table 3.24. Dam Hazard Classification Definitions

Hazard Class	Definition
High	A structure shall be classified as high hazard if located in an area where failure may create a serious threat of loss of human life or result in serious damage to residential, industrial, or commercial areas, important public utilities, public buildings, or major transportation facilities.
Moderate (Significant)	A structure shall be classified as moderate hazard if located in an area where failure may damage isolated homes or cabins, industrial or commercial buildings, moderately traveled roads or railroads, interrupt major utility services, but without substantial risk of loss of human life. In addition, structures where the dam and its impoundment are of 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, shall be considered moderate hazard for design and regulatory purposes unless a higher hazard class is warranted by downstream conditions.
Low	A structure shall be classified as low hazard if located in an area where damages from a failure would be limited to loss of the dam, loss of livestock, damages to farm outbuildings, agricultural lands, and lesser used roads, and where loss of human live is considered unlikely.

Source: Iowa Department of Natural Resources

Warning Time Score: 4—Minimal or no warning (up to 6 hrs. warning)

Duration Score: 4—More than one week

Geographic Location/Extent

Dams in Planning Area

There are 63 state-regulated dams inside the county boundaries of Dallas County. Of the 63 state regulated dams inside Dallas County, 6 are high hazard dams, 9 are moderate (significant), and 48 are low hazard dams.

Table 3.25 provides the names, locations, and other pertinent information for all high and moderate (significant) hazard dams in the planning area. For those shaded light-gray, the most recent inspection reports were obtained from the Iowa Department of Natural Resources. Inspection reports were not available for the un-shaded dams. The Vulnerability Analysis section provides additional information about these dams based on data that was extracted from the inspection reports.

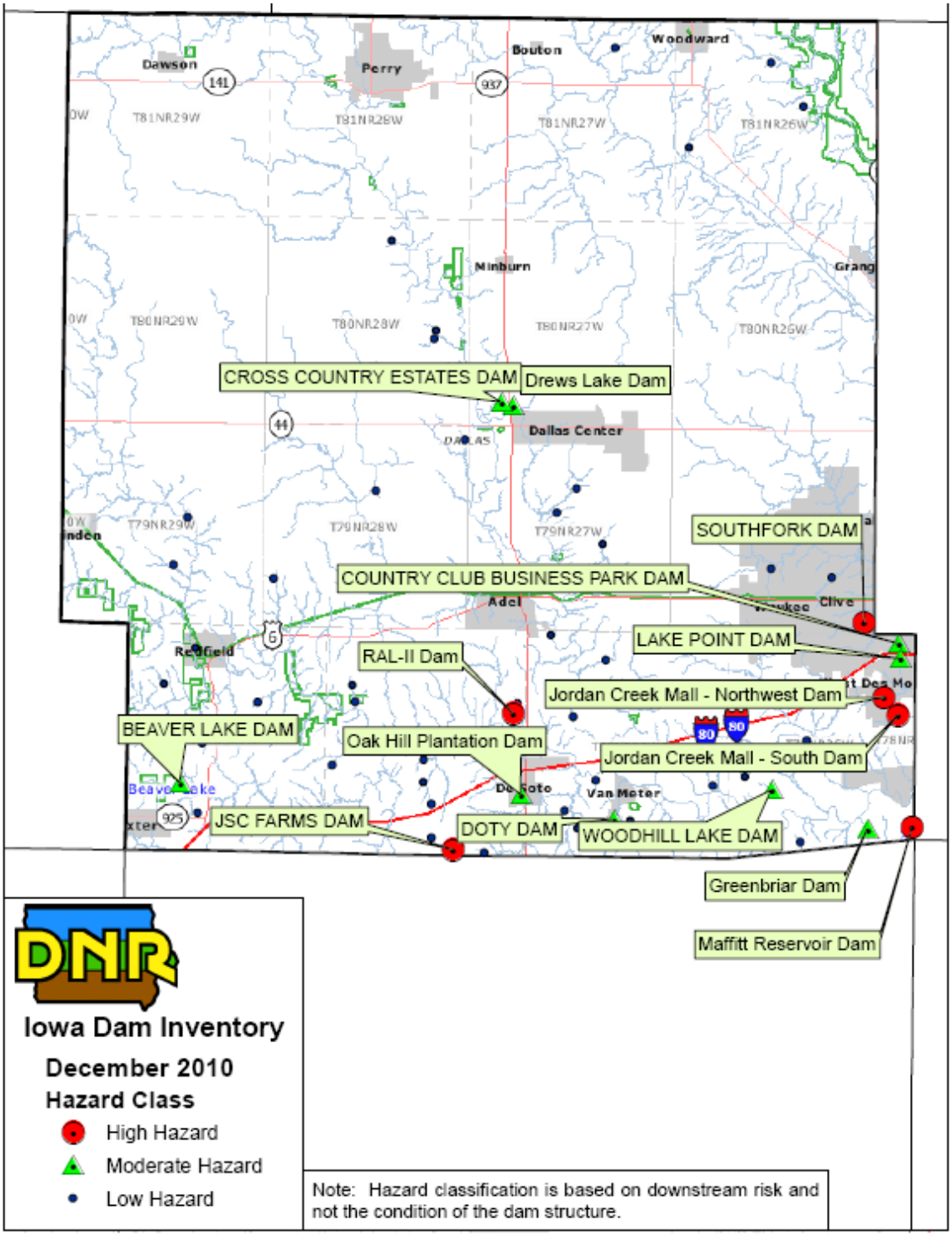
Table 3.25. High and Significant Hazard Dams in the Dallas County Planning Area

Dam Name	NID #	Hazard Class	EAP	Dam Ht. (ft)	Max Storage (acre-ft)	Normal Storage (acre-ft)	Last Inspection Date	River	Nearest Downstream City/Distance (miles)
Jordan Creek Mall - Northwest Dam	IA03530	H	N	17	46.5	18.2	07/06/2010	Tr- Jordan Creek	West Des Moines / 0
Jordan Creek Mall - South Dam	IA03529	H	N	17	37.5	5.5	07/06/2010	Tr- Jordan Creek	West Des Moines / 0
RAL-II Dam	IA03548	H	N	35	120	61	0720/2010	Tr- South Raccoon River	Van Meter / 4
JSC FARMS DAM	IA02906	H	N	49	823	480	08/25/2011	TR- BULGER CREEK	DeSoto / 6
Maffitt Reservoir Dam	IA01338	H	N	79	6700	5200	08/25/2011	TR-RACCOON RIVER	West Des Moines / 1
SOUTHFORK DAM	IA02411	H	N	38	204	67	09/29/2011	TR- WALNUT CR.	Clive / 1
CROSS COUNTRY ESTATES DAM	IA03621	S	NR	29	35	16	N/A	TR- NORTH RACCOON RIVER	Adel / 7
Drews Lake Dam	IA03545	S	NR	20	140	80	N/A	Tr- Raccoon River	Adel / 6
LAKE POINT DAM	IA02604	S	NR	20	58	21	N/A	TR-WALNUT CREEK	West Des Moines / 0
Oak Hill Plantation Dam	IA03544	S	NR	32	92	43	N/A	Tr- Bulger Creek	DeSoto / 0
WOODHILL LAKE DAM	IA02509	S	NR	32	155	97	N/A	TR- RACCON RIVER	West Des Moines / 7
Country Club Business Park Dam	IA02540	S	NR	18	109	43	04/19/2007	TR- CLIVE LAKE	West Des Moines / 0
DOTY DAM	IA00278	S	NR	30	67	27	09/02/2009	TR-SOUTH RACCOON	Van Meter / 1
Greenbriar Dam	IA00296	S	N	52	440	245	9/30/2010	TR-RACCOON RIVER	West Des Moines / 2
BEAVER LAKE DAM	IA02498	S	N	43	696	319	08/28/2011	TR-BEAR CREEK	Van Meter / 16

Source: Iowa Department of Natural Resources; H = High, S = Significant; NR= Not Required; N/A = Not Available; EAP = Emergency Action Plan

Figure 3.15 provides the locations of high, significant, and low hazard dams in the planning area. Inundation maps were requested for the six high hazard dams from the Iowa DNR. However, inundation maps are not on file for any of the high hazard dams in Dallas County.

Figure 3.15. Dam Locations in Dallas County



Source: Iowa Department of Natural Resources

Upstream Dams Outside the Planning Area

Lake Panorama in adjacent Guthrie County was identified by the HMPC and Iowa Department of Natural Resources as an upstream dam that could impact Dallas County in the event of failure. At the time of plan development, an inundation map was under development. However, it was not yet avaialbe for incorporation in the risk assessment. If this or other inundation maps become available, they will be incorporated in the update to this plan. Additional information on Lake Panorama dam is provided in Table 3.26 .

Table 3.26. Lake Panorama in Guthrie County

Dam Name	NID #	Hazard Class	EAP ?	Dam Height (ft)	Max. Storage (acre-ft)	Last Inspection	River
Lake Panorama Dam	IA00415	S	N	70	60,200	11/7/2007	Middle Raccoon River

Source: National Inventory of Dams, http://nid.usace.army.mil password required

Previous Occurrences

To determine previous occurrences of dam failure within Dallas County, the City of Perry 2005 Hazard Mitigation Plan was consulted as well as the Iowa State Hazard Mitigation Plan and the Stanford University's National Performance of Dams Program (http://npdp.stanford.edu/index.html). No record of dam failure within Dallas County boundaries was found.

Probability of Future Occurrence

There is an overall low probability of dam failures in Dallas County. There is a rigorous routine inspection and regular maintenance schedule for all state regulated dams. Recent inspection reports were requested from Iowa DNR for all high hazard dams. According to these inspection reports, all high hazard dams in the county have been inspected within the last two years and were found to be in "good condition. The findings of the inspection reports, including downstream development are discussed in greater in the vulnerability section that follows.

Probability Score: 1—Unlikely

3.4.2.2 Vulnerability

Overview

Dam failure is typically an additional or secondary impact of another disaster such as flooding or earthquake. The impacts to the planning area and its municipalities from a dam or levee failure would be similar in some cases to those associated with flood events (see the flood hazard vulnerability analysis and discussion). Based on the hazard class definitions, failure of any of the high hazard dams could result in a serious threat of loss of human life, serious damage to residential, industrial or commercial areas, important public utilities, public buildings, or major transportation facilities.

Catastrophic failure of high hazard dams has the potential to result in greater destruction due to the potential speed of onset and greater depth, extent, and velocity of flooding. Another difference is that dam failures could flood areas outside of mapped flood hazards.

For each of the high-hazard dams indicated in Table 3.25 the information provided by the Iowa Department of Natural Resources, including the most recent inspection reports have been reviewed to determine the specific jurisdictions, approximate number of people and types of property that may be vulnerable in the event of dam failure. More detailed spatial analysis was not possible since inundation maps are not available.

This analysis revealed that the following jurisdictions are vulnerable to dam failure of high hazard dams:

- Unincorporated Dallas County (portions),
- DeSoto,
- Clive,
- Van Meter, and
- West Des Moines

Additionally, the following communities are vulnerable to dam failure of significant hazard dams:

- Unincorporated Dallas County (portions),
- Adel
- DeSoto,
- Clive,
- Van Meter, and
- West Des Moines

To determine the potential magnitude of dam failure of the high and significant hazard dams, several factors were evaluated: Dam Hazard Class, Proximity to populations, and Volume of Dam. Table 3.27 summarizes the estimated potential magnitude for the high and significant hazard dams that could impact the planning area in the event of overtopping or failure. Those dams with gray shading also have an available recent inspection report completed by the Iowa Department of Natural Resources and are discussed separately in the section entitled Potential Losses to Existing Development.

Table 3.27. Potential Magnitude of Dam Failure

Dam Name	Hazard Class	Max. Storage (acre-ft)	River	Nearest Downstream City	Distance to Nearest City (miles)	Potential Magnitude
Jordan Creek Mall - Northwest Dam	H	46.5	Tr- Jordan Creek	West Des Moines	0	Critical
Jordan Creek Mall - South Dam	H	37.5	Tr- Jordan Creek	West Des Moines	0	Critical
RAL-II Dam	H	120	Tr- South Raccoon River	Van Meter	4	Critical
JSC FARMS DAM	H	823	TR- BULGER CREEK	DE SOTO	6	Critical
Maffitt Reservoir Dam	H	6700	TR-RACCOON RIVER	WEST DES MOINES	1	Critical
SOUTHFORK DAM	H	204	TR- WALNUT CR.	CLIVE	1	Critical
CROSS COUNTRY ESTATES DAM	S	35	TR- NORTH RACCOON RIVER	ADEL	7	Negligible
Drews Lake Dam	S	140	Tr- Raccoon River	Adel	6	Negligible
LAKE POINT DAM	S	58	TR-WALNUT CREEK	WEST DES MOINES	0	Limited
Oak Hill Plantation Dam	S	92	Tr- Bulger Creek	DeSoto	0	Limited
WOODHILL LAKE DAM	S	155	TR- RACCON RIVER	WEST DES MOINES	7	Negligible
Country Club Business Park Dam	S	109	TR- CLIVE LAKE	WEST DES MOINES	0	Limited
DOTY DAM	S	67	TR-SOUTH RACCOON	VAN METER	1	Negligible
Greenbriar Dam	S	440	TR-RACCOON RIVER	WEST DES MOINES	2	Limited
BEAVER LAKE DAM	S	696	TR-BEAR CREEK	VAN METER	16	Negligible

Magnitude/Severity Score: 3—Critical

Potential Losses to Existing Development

To estimate potential losses to existing development as a result of dam failure hazard information regarding potential downstream impacts in the event of failure was extracted from the hazard classification review in available inspection reports.

Table 3.28 provides the information on assets downstream of dam structures obtained from the hazard classification review comments contained in the inspection reports:

Table 3.28. Assets Downstream of Dam Structures

Dam Name	Class	River	Nearest Downstream City	Distance to Nearest City (miles)	Assets Downstream
Jordan Creek Mall - Northwest Dam	H	Tr- Jordan Creek	West Des Moines	0	Integral part of Jordan Creek Mall development; Dam serves as West Des Moines City street.
Jordan Creek Mall - South Dam	H	Tr- Jordan Creek	West Des Moines	0	Integral part of Jordan Creek Mall development; Dam serves as West Des Moines City street.
RAL-II Dam	H	Tr- South Raccoon River	Van Meter	4	One (1) house in floodplain area located below structure.
JSC FARMS DAM	H	TR-BULGER CREEK	DE SOTO	6	Potential for loss of live at one (1) residence located approximately one-fourth mile below dam; damage could also occur to the Iowa Interstate Railroad located about one-half mile downstream of the dam.
Maffitt Reservoir Dam	H	TR-RACCOON RIVER	WEST DES MOINES	1	Used for water supply; has aesthetic and recreational value; embankment top serves as a paved county road; presence of urban properties downstream; Interstate Highway downstream; loss of life would be expected from sudden failure.
SOUTHFORK DAM	H	TR-WALNUT CR.	CLIVE	1	Integral part of a residential subdivision; downstream development exists and there is potential for additional downstream development.
Greenbriar Dam	S	TR-RACCOON RIVER	WEST DES MOINES	2	Paved road on embankment top serves as access to residences on west side of lake; embankment serves as utility corridor to houses.
BEAVER LAKE DAM	S	TR-BEAR CREEK	VAN METER	16	Land use downstream is agricultural with no development that would affect the hazard classification.

Source: Iowa Department of Natural Resources

Data limitations prevent development of quantitative loss estimates since specific inundation maps are not available to determine specific structures, values, and expected water depth. If inundation maps become available prior to the next update of this plan, additional quantitative loss estimates can be developed. Figure 3.16 through Figure 3.20 provide aerial imagery of the six high hazard dams in Dallas County to provide contextual information regarding downstream development.

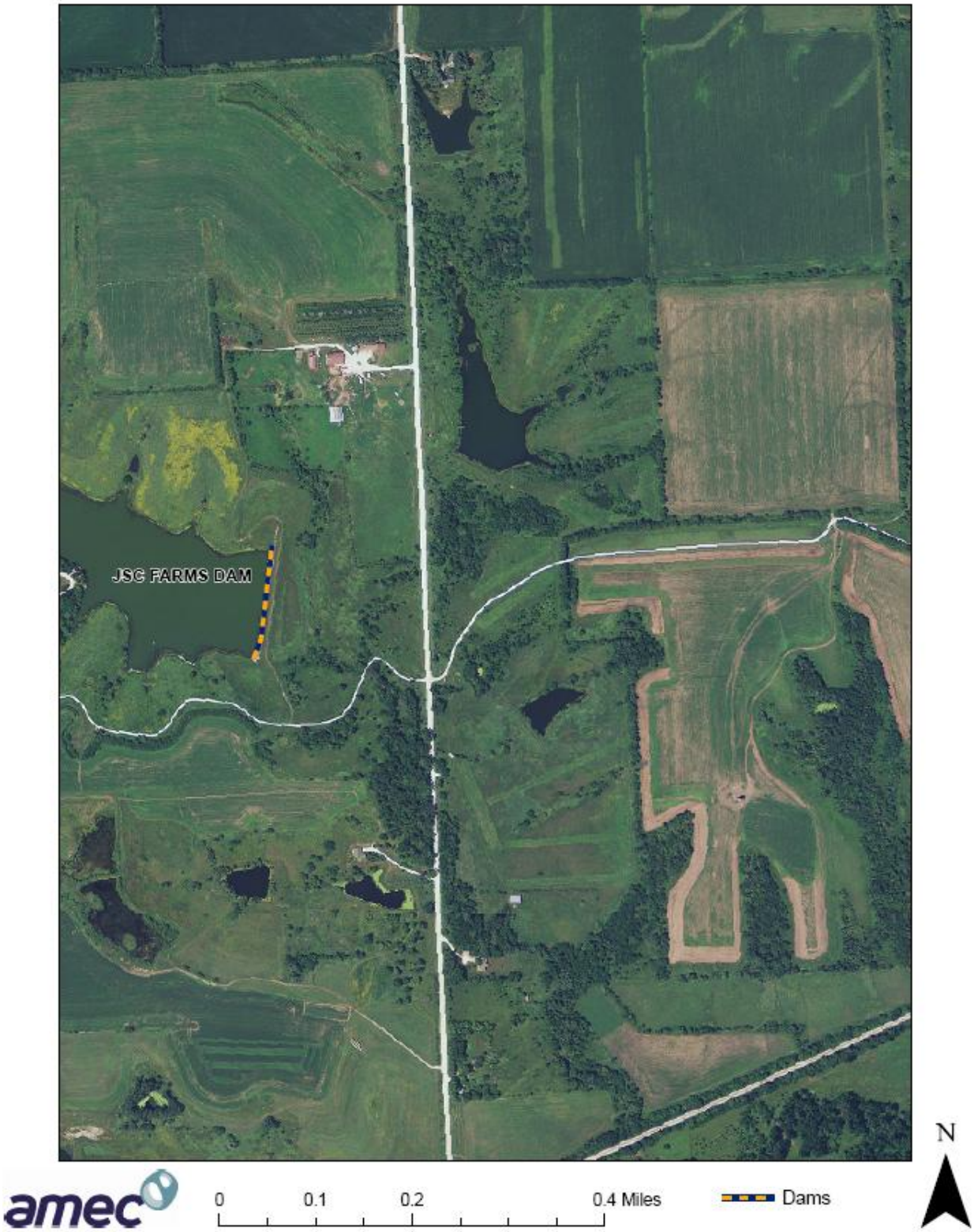
Figure 3.16. Jordan Creek Mall Dams Aerial Map (Northwest Dam and South Dam)

Source: Map complied by AMEC; Dam Locations from Iowa Department of Natural Resources; Aerial Imagery from USDA

Figure 3.17. Rall II Dam Aerial Map

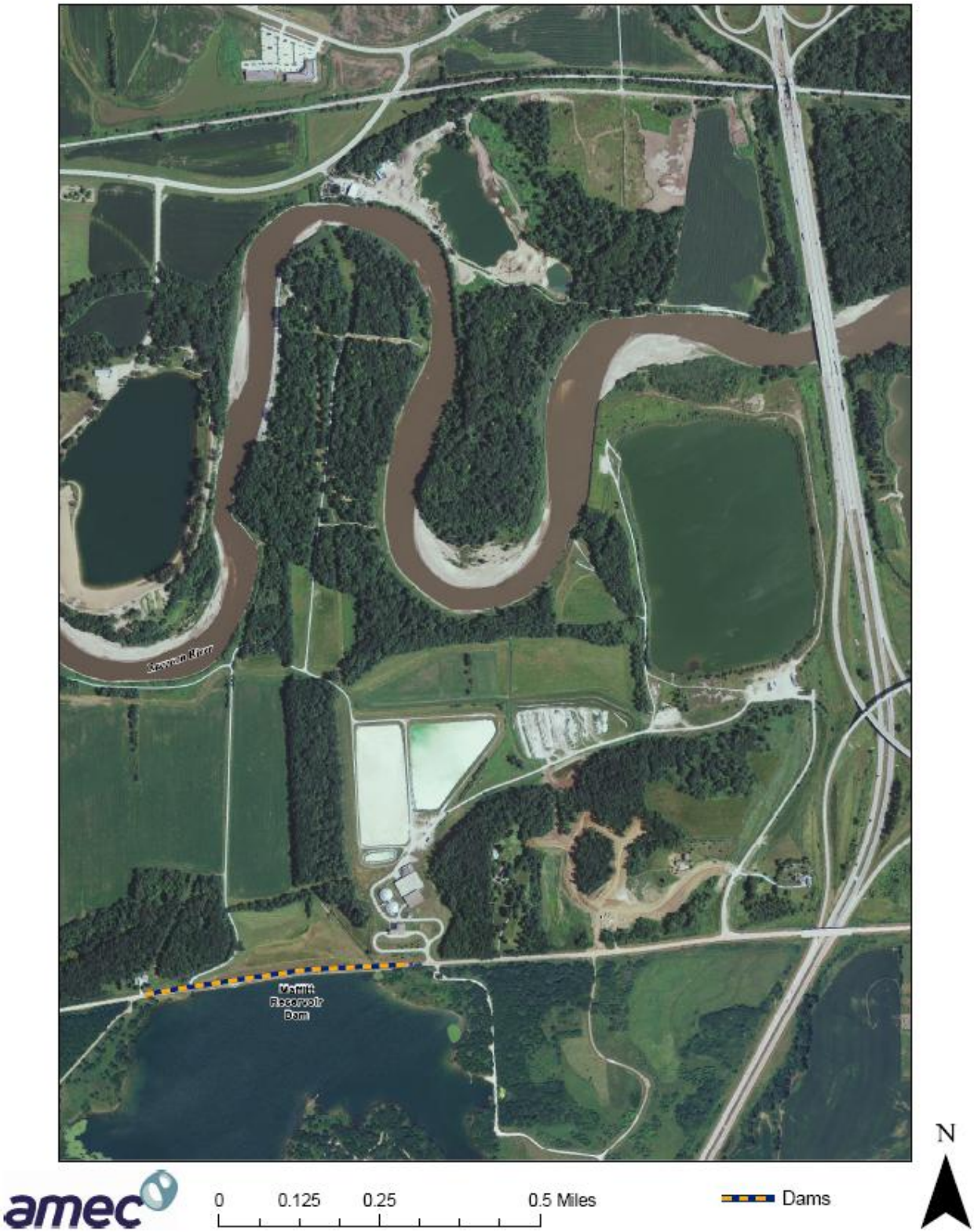
Source: Map complied by AMEC; Dam Locations from Iowa Department of Natural Resources; Aerial Imagery from USDA

Figure 3.18. JSC Farms Dam Aerial Map



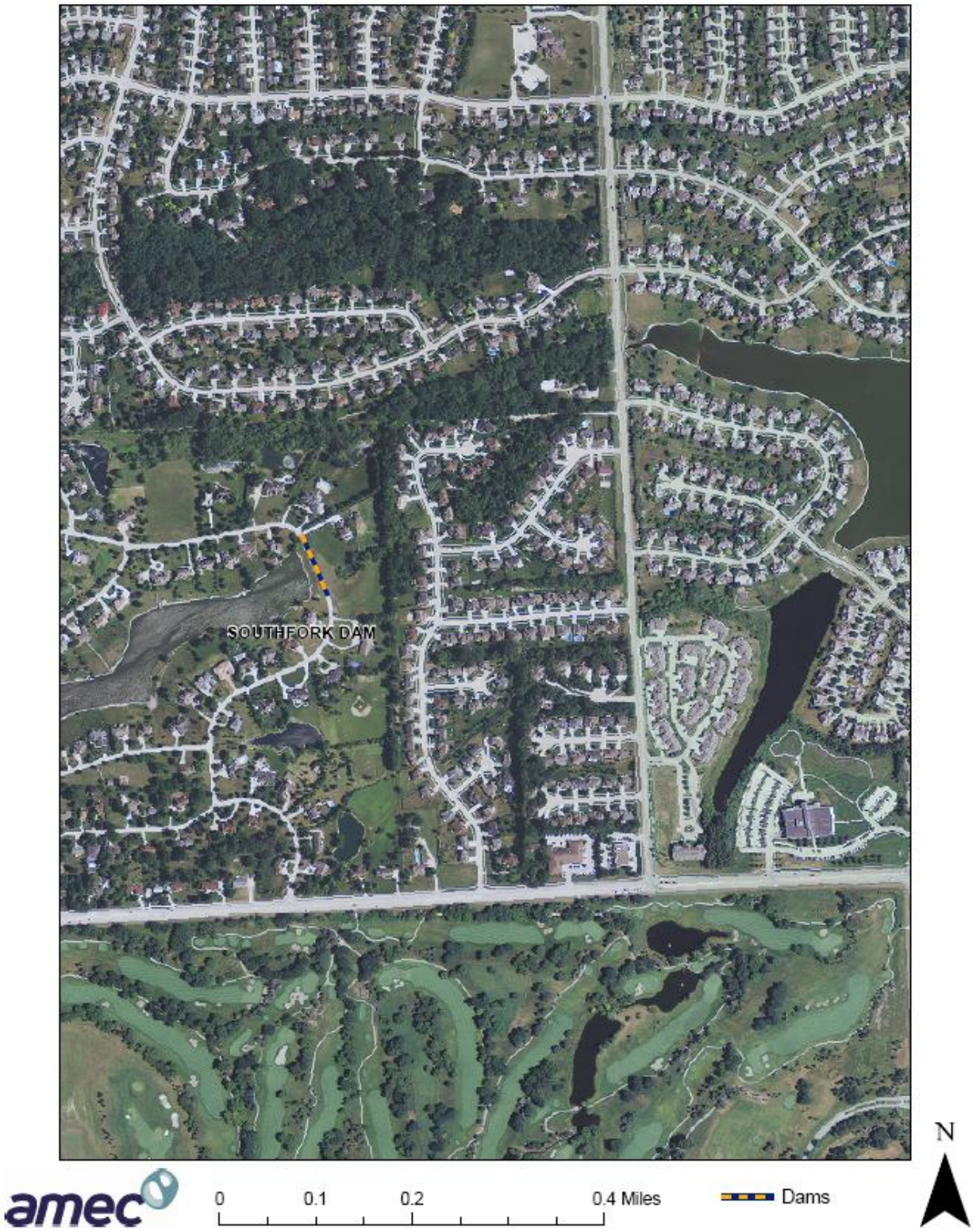
Source: Map complied by AMEC; Dam Locations from Iowa Department of Natural Resources; Aerial Imagery from USDA

Figure 3.19. Maffit Reservoir Dam Aerial Map



Source: Map complied by AMEC; Dam Locations from Iowa Department of Natural Resources; Aerial Imagery from USDA

Figure 3.20. Southfork Dam Aerial Map



Source: Map complied by AMEC; Dam Locations from Iowa Department of Natural Resources; Aerial Imagery from USDA

Future Development

Future development located downstream from dams in floodplains or inundation zones would increase vulnerability to this hazard. Of those jurisdictions vulnerable to dam inundation hazard, the following have had substantial growth in the last 10 years:

- Unincorporated Dallas County (portions)--19% growth,
- Adel—7% growth,
- Clive—97% growth,
- DeSoto—3% growth,
- West Des Moines—147% growth.

Van Meter had a 14% loss in population from 2000 to 2010.

Dam Failure Hazard Summary by Jurisdiction

The magnitude determinations discussed in the vulnerability overview sections were factored into the following hazard summary table to show how this hazard varies by jurisdiction.

Jurisdiction	Probability	Magnitude	Warning Time	Duration	Score	Level
Dallas County	1	Critical - 4	4	4	2.65	Moderate
Cities						
Adel	1	1	4	4	1.35	Low
Bouton	N/A	N/A	N/A	N/A	N/A	N/A
Clive*	1	4	4	4	2.65	Moderate
Dallas Center	N/A	N/A	N/A	N/A	N/A	N/A
Dawson	N/A	N/A	N/A	N/A	N/A	N/A
DeSoto	1	4	4	4	2.65	Moderate
Dexter	N/A	N/A	N/A	N/A	N/A	N/A
Granger	N/A	N/A	N/A	N/A	N/A	N/A
Grimes*	N/A	N/A	N/A	N/A	N/A	N/A
Linden	N/A	N/A	N/A	N/A	N/A	N/A
Minburn	N/A	N/A	N/A	N/A	N/A	N/A
Perry	N/A	N/A	N/A	N/A	N/A	N/A
Redfield	N/A	N/A	N/A	N/A	N/A	N/A
Urbandale*	N/A	N/A	N/A	N/A	N/A	N/A
Van Meter	1	4	4	4		
Waukee	N/A	N/A	N/A	N/A	N/A	N/A
West Des Moines*	1	4	4	4	2.65	Moderate
Woodward	N/A	N/A	N/A	N/A	N/A	N/A
School Districts						
Adel-DeSoto-Minburn Schools	N/A	N/A	N/A	N/A	N/A	N/A
Dallas Center-Grimes Schools	N/A	N/A	N/A	N/A	N/A	N/A
Perry Schools	N/A	N/A	N/A	N/A	N/A	N/A
Van Meter Schools	N/A	N/A	N/A	N/A	N/A	N/A
Waukee Schools	N/A	N/A	N/A	N/A	N/A	N/A
West Central Valley Schools	N/A	N/A	N/A	N/A	N/A	N/A
Woodward- Granger Schools	N/A	N/A	N/A	N/A	N/A	N/A

* These jurisdictions are included in the risk assessment although they are not officially participating jurisdictions in the Dallas County Plan. Portions of these jurisdictions are in both Dallas and Polk Counties. According to Iowa Homeland Security & Emergency management and Polk County Emergency management, these jurisdictions will participate in the Polk County Hazard Mitigation Plan.

3.4.3 Drought

Hazard Score Calculation					
Probability	Magnitude/Severity	Warning Time	Duration	Weighted Score	Level
2	2	1	4	2.05	Moderate

3.4.3.1 Profile

Hazard Description

Drought is generally defined as a condition of moisture levels significantly below normal for an extended period of time over a large area that adversely affects plants, animal life, and humans. Drought conditions can also be defined in terms of meteorological, hydrological, agricultural, and socioeconomic.

Meteorological drought is defined on the basis of the degree of dryness (in comparison to some "normal" or average amount) and the duration of the dry period. A meteorological drought must be considered as region-specific since the atmospheric conditions that result in deficiencies of precipitation are highly variable from region to region.

Hydrological drought is associated with the effects of periods of precipitation (including snowfall) shortfalls on surface or subsurface water supply (i.e., streamflow, reservoir and lake levels, ground water). The frequency and severity of hydrological drought is often defined on a watershed or river basin scale. Although all droughts originate with a deficiency of precipitation, hydrologists are more concerned with how this deficiency plays out through the hydrologic system. Hydrological droughts are usually out of phase with or lag the occurrence of meteorological and agricultural droughts. It takes longer for precipitation deficiencies to show up in components of the hydrological system such as soil moisture, streamflow, and ground water and reservoir levels. As a result, these impacts are out of phase with impacts in other economic sectors.

Agricultural drought links various characteristics of meteorological (or hydrological) drought to agricultural impacts, focusing on precipitation shortages, differences between actual and potential evaporation, soil water deficits, reduced ground water or reservoir levels, and so forth. Plant water demand depends on prevailing weather conditions, biological characteristics of the specific plant, its stage of growth, and the physical and biological properties of the soil. Deficient topsoil moisture at planting may hinder germination, leading to low plant populations per hectare and a reduction of final yield. However, if topsoil moisture is sufficient for early growth requirements, deficiencies in subsoil moisture at this early stage may not affect final yield if subsoil moisture is replenished as the growing season progresses or if rainfall meets plant water needs.

Socioeconomic drought refers to when physical water shortage begins to affect people.

The four different definitions all have significance in Iowa. A meteorological drought is the easiest to determine based on rainfall data and is an easier drought to monitor from rain gauges and reports. A hydrological drought means that stream and river levels are low, which also has an impact for surface water and ground water irrigators. In addition, in-stream discharges that

fall below a pre-required level also place the state in regulatory difficulty with U.S. Fish and Wildlife and with neighboring states over cross-border flowage rights. An agricultural drought represents difficulty for Iowa's agricultural-based economy and is also relatively easy to monitor based on crop viabilities for different regions.

The National Drought Mitigation Center (NDMC) located at the University of Nebraska in Lincoln provides drought monitoring and technical assistance to all areas of the world. NDMC's website is found at http://www.drought.unl.edu/. Specific drought impacts by county are recorded at http://droughtreporter.unl.edu/.

The impacts of drought can be categorized as economic, environmental, or social. Many economic impacts occur in agriculture and related sectors, including forestry and fisheries, because of the reliance of these sectors on surface and subsurface water supplies. In addition to obvious losses in yields in both crop and livestock production, drought is associated with increases in insect infestations, plant disease, and wind erosion. Droughts also bring increased problems with insects and disease to forests and reduce growth. The incidence of forest and range fires increases substantially during extended droughts, which in turn places both human and wildlife populations at higher levels of risk. Income loss is another indicator used in assessing the impacts of drought because so many sectors are affected.

Although environmental losses are difficult to quantify, increasing public awareness and concern for environmental quality has forced public officials to focus greater attention and resources on these effects. Environmental losses are the result of damages to plant and animal species, wildlife habitat, and air and water quality, forest and range fires, degradation of landscape quality, loss of biodiversity, and soil erosion. Some of the effects are short-term and conditions quickly return to normal following the end of the drought. Other environmental effects linger for some time or may even become permanent. Wildlife habitat, for example may be degraded through the loss of wetlands, lakes, and vegetation. However, many species will eventually recover from this temporary aberration. The degradation of landscape quality, with increased soil erosion, may lead to a more permanent loss of biological productivity of the landscape.

Social impacts mainly involve the public safety, health, conflicts between water users, reduced quality of life, and inequities in the distribution of impacts and disaster relief. Many of the impacts specified as economic and environmental has social components as well.

Although drought is not predictable, long-range outlooks may indicate an increased chance of drought, which can serve as a warning. A drought period can last for months, years, or even decades. It is rarely a direct cause of death, though the associated heat, dust, and stress can all contribute to increased mortality.

Periods of drought are normal occurrences in all parts of Iowa. Drought in Iowa is caused by severely inadequate amounts of precipitation that adversely affect farming and ranching, surface and ground water supplies, and uses of surface waters for navigation and recreation. Because of these impacts, drought can have significant economic and environmental impacts. Drought can also lead to increased probability and severity of wildfires and wind erosion.

Warning Time Score: 1—24+ Hours

Duration Score: 4—more than 1 week

Geographic Location/Extent

Dallas County is at risk of drought. According to data collected from 1981-2010 for the NOAA National Climatic Data Center, Dallas County has on average 113 days and 36 inches of rainfall per year. In average years, this represents enough rainfall to prevent drought; however, it is during successive years of below-average rainfall that droughts do impact this area.

Previous Occurrences

Drought occurs periodically in Iowa with the most severe in historical times occurring in the 1930's. Other major droughts, usually characterized by deficient rainfall combined with unusually high summer temperatures, occurred in 1886, 1893 - 1894, 1901, 1954 -1956, 1976 - 1977 and 1988 - 1989. Although droughts are not the spectacular weather events that floods, blizzards or tornadoes can be, historically they produce more economic damage to the State than all other weather events combined.

According to the National Drought Mitigation Center's Drought Impact Reporter, during the 10-year period from January 2002 thru December 2011, Dallas County had 28 reported drought impacts. The following are the categories and reported number of impacts:

- Agriculture – 12
- Business & Industry – 2
- Energy - 1
- Fire – 2
- Relief, Response & Restrictions – 3
- Society & Public Health – 2
- Water Supply & Quality – 6

Impacts of recent drought periods in Iowa that affected Dallas County are provided below. Unless otherwise indicated, these impacts are from the Drought Impact Reporter:

- October 27, 2011—Hay supplies are considered short across 22 percent of Iowa. Livestock producers moved cattle to stalk fields.
- January 1, 2011 to March 31, 2012—Drought in 2011 led ranchers to sell cattle leading to the lowest cattle inventory in the U.S. since 1952, according to the U.S. Department of Agriculture. Beef and dairy farmers owned 90.77 million head of cattle on January 1, 2012, which were 2.1 percent fewer cattle than in January 2011. Drought forced many ranchers in the South to sell their livestock because it was more economical to sell than to feed them.
- January 1, 2009 to December 31, 2009—Drought reduced the amount of cargo shipped on the Missouri River to 269,000 tons in 2009. During 2000, a non-drought year, there were 1.3 million tons shipped on the Missouri River.
- September 15, 2006 to October 20, 2006—Agriculture Secretary Mike Johanns lengthened the time allowed for emergency livestock grazing on land in the Conservation Reserve Program (CRP) in 30 states including Iowa for farmers and livestock owners who were affected by drought.

- December 4, 2005—Extreme drought and warm nights in August fostered the production of aflatoxin. Aflatoxin levels in corn are regulated by the Food and Drug Administration. The FDA limits the level of contamination at 20 parts per billion for corn sold for commercial purposes. Higher levels of contamination, as much as 300 parts per billion, are permitted for some livestock feed, and that corn has been sold strictly as livestock feed for as little as 75 cents a bushel. Therefore, farmers whose fields have high levels of contamination, experienced large losses in revenue and are filing crop insurance claims. According to a crop insurance agent for Farm Bureau in Wapello, almost every producer has had some aflatoxin in their corn in 2005. Iowa farmers have not seen so much aflatoxin since the 1988 drought. Aflatoxin is produced by the fungus Aspergillus flavus and invades stress-weakened corn in the field. Aflatoxin can interfere with the immune system or cause liver damage or cancer.
- September 6, 2006—The U.S. Department of Agriculture designated 20 Iowa counties agriculture disaster areas due to crop or livestock losses stemming from continued drought conditions. Dallas County was added as a contiguous county thus eligible for a USDA disaster loan.

According to NOAA Regional Climate Center, (http://www.hprcc.unl.edu) the NCDC monthly recorded normals in Perry, IA from 1971-2000 are below in Table 3.29.

Table 3.29. NCDC Monthly Recorded Lowest Precipitation and the Year Occurred, 1971-2000 from Perry, IA COOP Station

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Monthly Lowest
Lowest Precipitation (in.)	0.01	0.00	0.12	0.42	1.30	0.84	0.27	0.38	0.85	0.16	0.00	0.11	0.00
Year Lowest Occurred	1986	1987	1994	1989	1992	1992	1975	1971	2000	1988	1976	1979	1987

Source: http://www.hprcc.unl.edu/data/historical/index.php?state=ia&action=select_state&submit=Select+State

According to the USDA's Risk Management Agency, payments for insured crop losses in Dallas County as a result of drought conditions occurred in eight of the eleven years from 2001-2011 totaled $4,574,673. According to the 2011 Crop Insurance Profile from USDA's Risk Management Agency, 85 percent of insurable crops in Iowa were insured.

Table 3.30. Crop Insurance Claims Paid From Drought, 2001-2011

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid ($)
2001	CORN	Drought	933,899
2002	CORN	Drought	166,186
2003	CORN	Drought	162,251
2005	CORN	Drought	18,983
2006	CORN	Drought	9,939
2007	CORN	Drought	40,136
2008	CORN	Drought	54,077

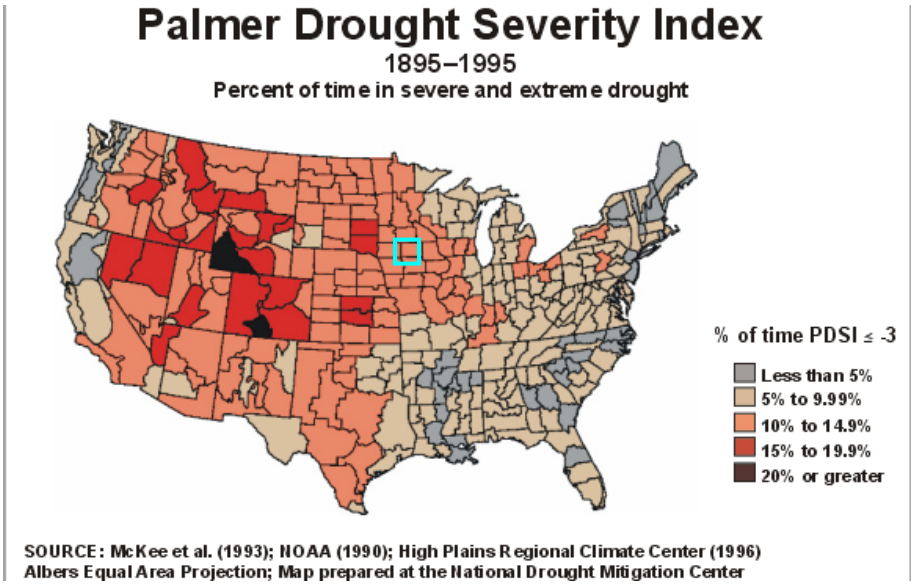
Crop Year	Crop Name	Cause of Loss Description	Insurance Paid ($)
2011	CORN	Drought	274,064
2001	HYBRID CORN SEED	Drought	6,129
2005	HYBRID CORN SEED	Drought	3,593
2001	OATS	Drought	1,482
2011	OATS	Drought	2,466
2001	SOYBEANS	Drought	637,061
2002	SOYBEANS	Drought	187,894
2003	SOYBEANS	Drought	1,877,722
2005	SOYBEANS	Drought	3,425
2006	SOYBEANS	Drought	35,941
2007	SOYBEANS	Drought	736
2008	SOYBEANS	Drought	17,966
2011	SOYBEANS	Drought	140,723
Total			$4,574,673

Source: USDA Risk Management Agency Crop Insurance Payment FOIA Request; USDA Risk Management Agency Iowa Crop Insurance Profile, http://www.rma.usda.gov/pubs/2012/stateprofiles/iowa11.pdf

Probability of Future Occurrence

Lack of precipitation for a given area is the primary contributor to drought conditions. Since precipitation levels cannot be predicted in the long term, it is difficult to determine the probability of future occurrences of drought. Figure 3.21 shows the Palmer Drought Severity Index for the U.S. from 1895-1995. Dallas County, Iowa has experienced severe and extreme drought 10-14.9percent of the time during that 100-year period.

Figure 3.21. United States Percent of Time in Drought, 1985-1995



Note: Blue rectangle is the approximate location of the Dallas County.

In the past 10 years, there have been a lot of recorded damages from drought conditions in Dallas County and the state of Iowa, but when examining a longer timeframe of 100 years, the

drought conditions occurred only 10 to 14.9 percent of the time thus rating the probability score as an occasional event. The differences can be attributed to better reporting of drought conditions.

Probability Score: 2—Occassional

3.4.3.2 Vulnerability

Overview

Negative impacts of drought are primarily economic and environmental. With Dallas County's 912 farms covering 297,090 acres of land, which equates to 78 percent of the land used for agriculture, the planning area has a high exposure to this hazard. Aside from agricultural impacts, other losses related to drought include increased costs of fire suppression and damage to roads and structural foundations due to the shrink dynamic of expansive soils during excessively dry conditions.

According to the Iowa Hazard Mitigation Plan, estimated statewide losses has drought listed as the 2th highest hazard losses with $177 million.

Magnitude Score: 2—Limited

Potential Losses to Existing Development

Areas associated with agricultural use are vulnerable to drought conditions which could result in a decrease in crop production or a decrease in available grazing area for livestock. According to the eleven year period for which data is available from USDA's Risk Management Agency, (see Table) the average amount of annual claims paid for crop damage as a result of drought in Dallas County was $489,269. According to the 2011 Iowa Crop Insurance Profile from USDA's Risk Management Agency, 85 percent of the insurable crops in Iowa are insured with USDA Crop Insurance.

Considering the value of crops from the 2007 Census of Agriculture as baseline crop exposure, the estimated annual losses from drought was determined minimal compared to the value of the insurable crops.

Table 3.31. Estimated Insurable Annual Crops Lost Resulting From Drought

11-Year Drought Indemnity Paid	Adjusted 11-Year Drought Losses (considering 85% insured)	Estimated Annualized Losses	2007 Value of Crops
$4,574,673	$5,381,965	$489,269	$156,900,000

Source: Crop value is from Iowa State University, University Extension, 2007; Crop Insurance Paid is from the USDA's Risk Management Agency for 2001-2011.
Note: This includes insurable crops that are insured

Future Development

Increases in acreage planted with crops would increase the exposure to drought-related agricultural losses. In addition, increases in population add additional strain on water supply systems to meet the growing demand for treated water.

Drought Hazard Summary by Jurisdiction

The following hazard summary table shows how this hazard varies by jurisdiction. As discussed in the drought previous occurrences and vulnerability sections, the majority of the damages from drought are impacted by crops. In the cities, the drought conditions would be the same, but the magnitude would be less with lawns and local gardens affected, and leading to expansive soil problems around foundations. The magnitude score is lower in the cities and school districts.

Jurisdiction	Probability	Magnitude	Warning Time	Duration	Score	Level
Dallas County	2	2	1	4	2.05	Moderate
Cities						
Adel	2	1	1	4	1.75	Low
Bouton	2	1	1	4	1.75	Low
Clive*	2	1	1	4	1.75	Low
Dallas Center	2	1	1	4	1.75	Low
Dawson	2	1	1	4	1.75	Low
DeSoto	2	1	1	4	1.75	Low
Dexter	2	1	1	4	1.75	Low
Granger	2	1	1	4	1.75	Low
Grimes*	2	1	1	4	1.75	Low
Linden	2	1	1	4	1.75	Low
Minburn	2	1	1	4	1.75	Low
Perry	2	1	1	4	1.75	Low
Redfield	2	1	1	4	1.75	Low
Urbandale*	2	1	1	4	1.75	Low
Van Meter	2	1	1	4	1.75	Low
Waukee	2	1	1	4	1.75	Low
West Des Moines*	2	1	1	4	1.75	Low
Woodward	2	1	1	4	1.75	Low
School Districts						
Adel-DeSoto-Minburn Schools	2	1	1	4	1.75	Low
Dallas Center-Grimes Schools	2	1	1	4	1.75	Low
Perry Schools	2	1	1	4	1.75	Low
Van Meter Schools	2	1	1	4	1.75	Low
Waukee Schools	2	1	1	4	1.75	Low
West Central Valley Schools	2	1	1	4	1.75	Low
Woodward- Granger Schools	2	1	1	4	1.75	Low

* These jurisdictions are included in the risk assessment although they are not officially participating jurisdictions in the Dallas County Plan. Portions of these jurisdictions are in both Dallas and Polk Counties. These jurisdictions participate in the Polk County Hazard Mitigation Plan.

3.4.4 Earthquake

Hazard Score Calculation					
Probability	Magnitude/Severity	Warning Time	Duration	Weighted Score	Level
1	1	4	1	1.45	Low

3.4.4.1 Profile

Hazard Description

An earthquake is a sudden motion or trembling that is caused by a release of energy accumulated within or along the edge of Earth's tectonic plates. Earthquakes occur primarily along fault zones, tears in the Earth's crust, along which stresses build until one side of the fault slips, generating compressive and shear energy that produces the damage. Heaviest damage generally occurs nearest the epicenter which is that point on the Earth's surface directly above the point of fault movement. The composition of geologic materials between these points is a major factor in transmitting the energy to buildings and other structures on the Earth's surface.

Warning Time Score: 4—less than 6 hours

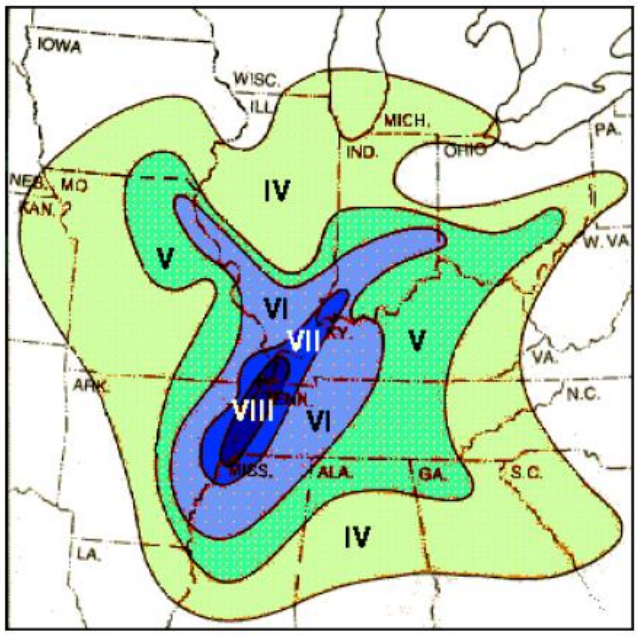
Duration Score: 1—less than 6 hours

Geographic Location/Extent

While geologists often refer to the Midwest as the "stable midcontinent," because of its lack of major crustal movements, there are two regions of active seismicity, the Nemaha Ridge and the New Madrid Fault Zone. The Nemaha Ridge in Kansas and Nebraska, associated with the Humboldt Fault, is characterized by numerous small earthquakes that release stresses before they build to dangerous levels. The area is not considered a threat to Iowa. The New Madrid Fault Zone, on the other hand, has greater destructive potential. It is located along the valley of the Mississippi River, from its confluence with the Ohio River southward, and includes portions of Illinois, Kentucky, Tennessee, Missouri, Arkansas, and Mississippi. The Earth's crust in the midcontinent is older, and therefore thicker, cooler, and more brittle than that in California for example. Consequently, earthquake shock waves travel faster and farther in the Midwest, making quakes here potentially more damaging than similar sized events in other geologic settings.

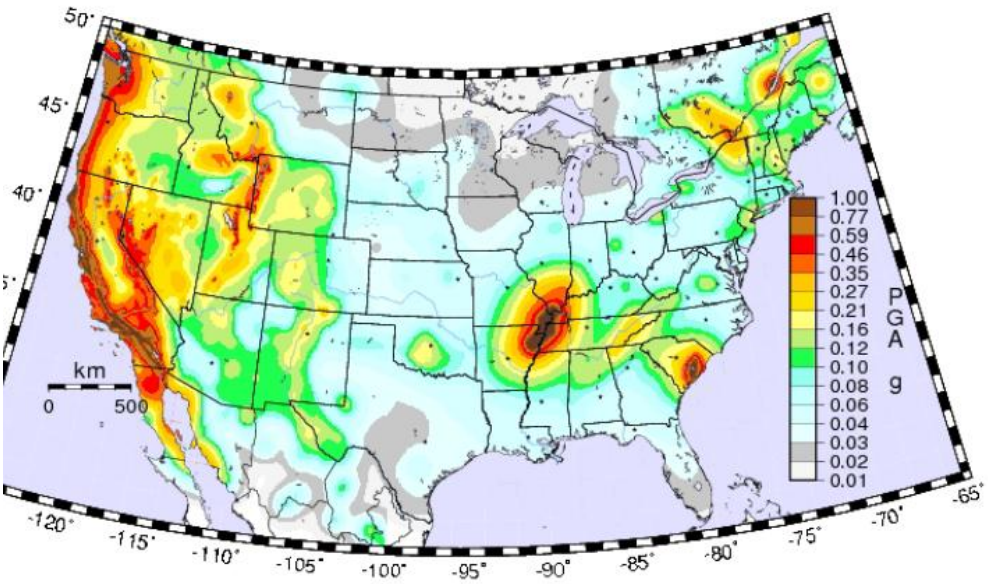
Iowa counties are located in low risk zones as a whole. The southeastern part of the state of Iowa is more at risk to earthquake effects from the New Madrid Fault Zone. 0 shows the estimated effects of a 6.5 Richter magnitude earthquake along the New Madrid Fault Zone. It suggests that Iowans in four southwest counties could experience trembling buildings, some broken dishes and cracked windows, movement and falling of small unstable objects, abrupt openings or closing doors, and liquids spilling from open containers. About 29 other counties, from Page to Polk to Muscatine, could experience vibrations similar to the passing of a heavy truck, rattling of dishes and windows, creaking of walls, and swinging of suspended objects. These effects will vary considerably with differences in local geology and construction techniques. Figure 3.23 shows the Seismic Hazard Map for the U.S. showing the peak ground acceleration of 10 percent in a 50 year timeframe.

Figure 3.22. Iowa Perspective on Midwestern Earthquakes



Source: http://www.igsb.uiowa.edu/Browse/quakes/quakes.htm

Figure 3.23. United States Seismic Hazard Map



Source: United States Geological Survey, http://earthquake.usgs.gov/hazards/products/conterminous/2008/maps/

The extent or severity of earthquakes is generally measured in two ways: 1) Magnitude Measurement utilizes the Richter Magnitude Scale and 2) Severity Measurement utilizes the Modified Mercalli Intensity Scale.

Richter Magnitude Scale

The Richter magnitude scale was developed in 1935 by Charles F. Richter of the California Institute of Technology as a mathematical device to compare the size of earthquakes. The magnitude of an earthquake is determined from the logarithm of the amplitude of waves recorded by seismographs. Adjustments are included for the variation in the distance between the various seismographs and the epicenter of the earthquakes. On the Richter Scale, magnitude is expressed in whole numbers and decimal fractions. For example, a magnitude 5.3 might be computed for a moderate earthquake, and a strong earthquake might be rated as magnitude 6.3. Because of the logarithmic basis of the scale, each whole number increase in magnitude represents a tenfold increase in measured amplitude; as an estimate of energy, each whole number step in the magnitude scale corresponds to the release of about 31 times more energy than the amount associated with the preceding whole number value.

Modified Mercalli Intensity Scale

The effect of an earthquake on the Earth's surface is called the intensity. The intensity scale consists of a series of certain key responses such as people awakening, movement of furniture, damage to chimneys, and finally - total destruction. Although numerous *intensity scales* have been developed over the last several hundred years to evaluate the effects of earthquakes, the one currently used in the United States is the Modified Mercalli (MM) Intensity Scale. It was developed in 1931 by the American seismologists Harry Wood and Frank Neumann. This scale, composed of 12 increasing levels of intensity that range from imperceptible shaking to catastrophic destruction, is designated by Roman numerals. It does not have a mathematical basis; instead it is an arbitrary ranking based on observed effects.

The Modified Mercalli Intensity value assigned to a specific site after an earthquake has a more meaningful measure of severity to the nonscientist than the magnitude because intensity refers to the effects actually experienced.

The **lower** numbers of the intensity scale generally deal with the manner in which the earthquake is felt by people. The **higher** numbers of the scale are based on observed structural damage. Structural engineers usually contribute information for assigning intensity values of VIII or above.

Previous Occurrences

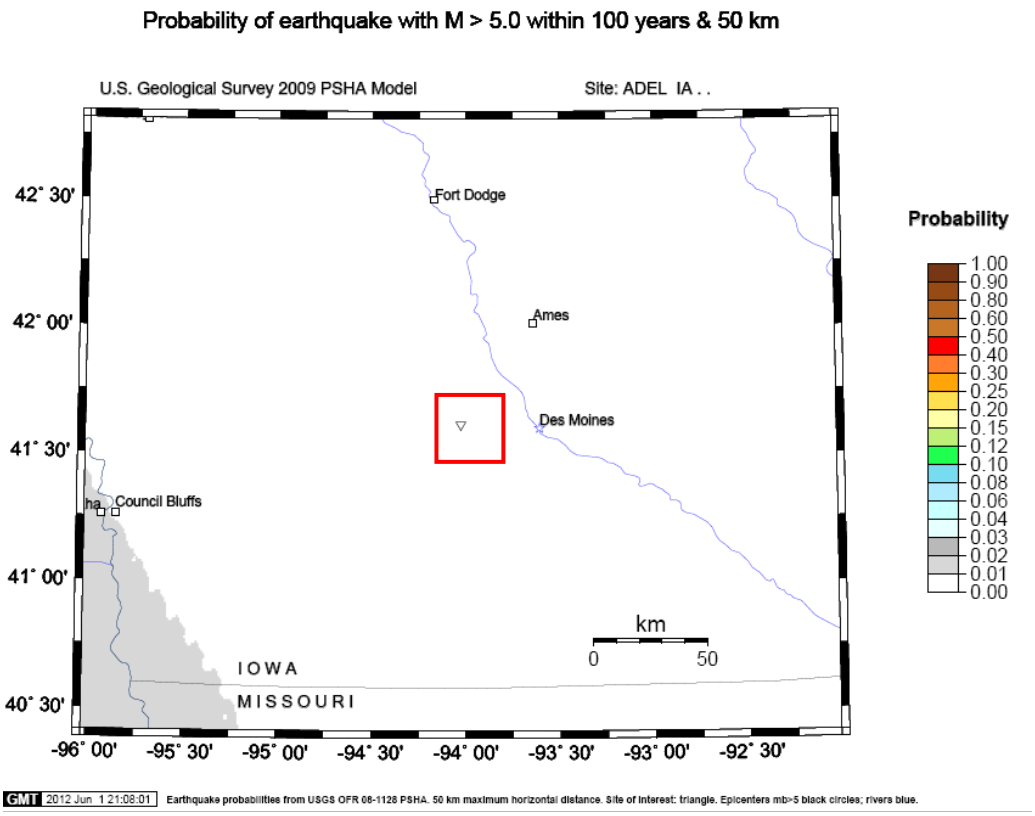
Iowa has experienced little effects from only a few earthquakes in the past 175 years. The epicenters of 13 earthquakes have been located in the State with the majority along the Mississippi River. The strongest earthquake in Iowa occurred in Davenport in 1934 and resulted in only slight damage. There have been no epicenters in Dallas County and no earthquake damages recorded in the County (Source: State of Iowa Hazard Mitigation Plan, 2010).

Probability of Future Occurrence

Figure 3.24 demonstrates the probability of an earthquake with a magnitude greater than 5.0 in the Dallas County in a 100 year time period. The red square shows the approximate Dallas County boundary. As shown in this graphic, the probability of a 5.0 Magnitude or greater earthquake in the next 100 years is 0.00 percent. The probability converts to an estimated

maximum recurrence interval of 5,000 years. The probability of a significant earthquake in any given year is unlikely.

Figure 3.24. Probability of Magnitude 5.0 or greater within 100 Years – Dallas County



Source: United States Geological Survey, https://geohazards.usgs.gov/eqprob/2009/output/5424.pdf
Note: Red square is approximate location of Dallas County, IA

Probability Score: 1—Unlikely

3.4.4.2 Vulnerability

Overview

As discussed under the probability section, the probability of a 5.0 Magnitude or greater earthquake in the next 100 years is 0.00 percent. Although a damaging event is unlikely, the potential impacts could be costly in the more urban areas of the County. Most structures in Dallas County are not built to earthquake standards, but because of the relatively low magnitude of a possible quake, property damage would likely be minor foundational damage.

Magnitude Score: 1—Negligible

Potential Losses to Existing Development

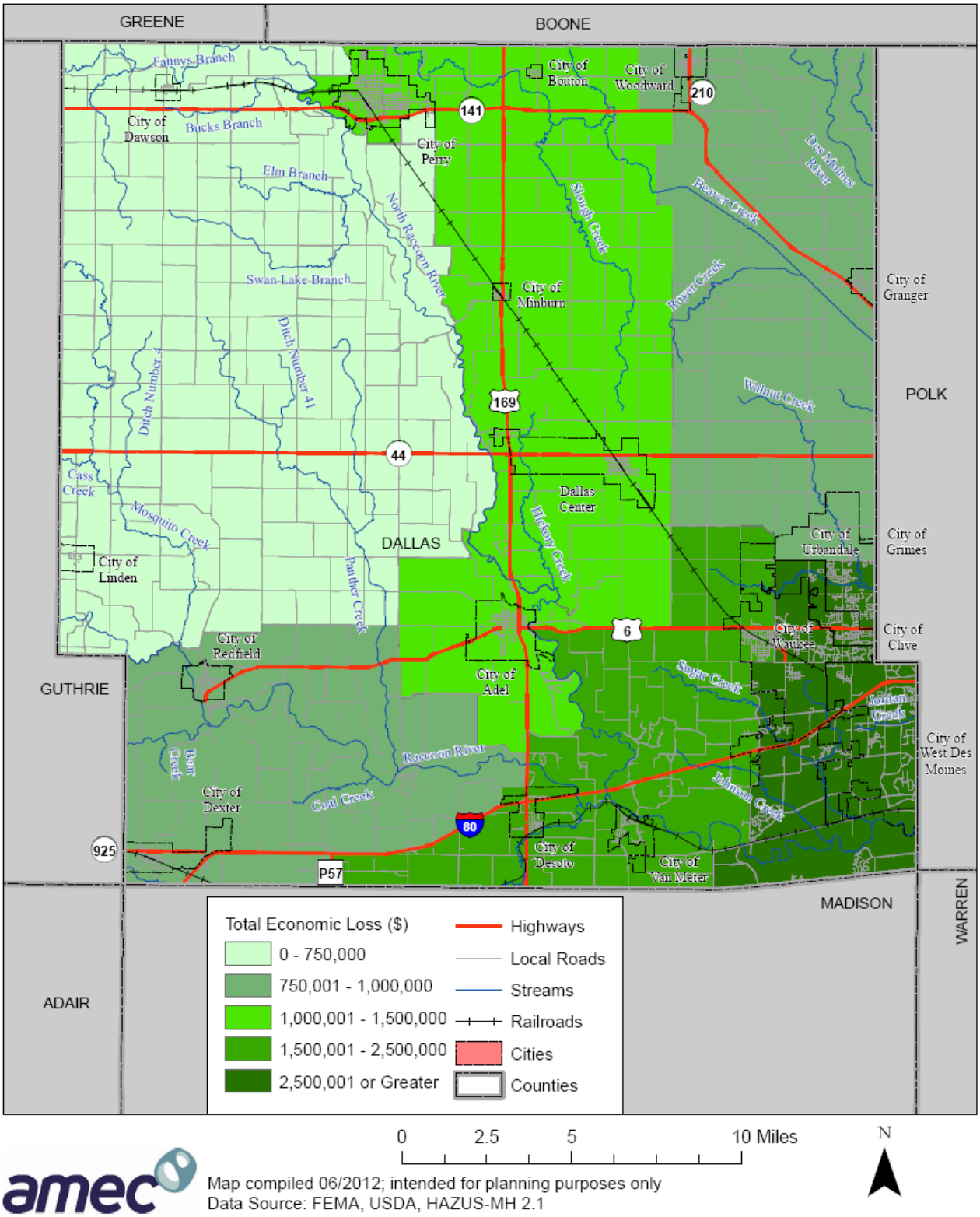
An analysis of a worst-case, probabilistic, 2,500 year, 6.7 magnitude scenario event, estimates that the total building and economic related losses would be $14,754,000. The estimated loss category amounts are shown in Table 3.32 and Figure 3.25 map showing the location of earthquake losses. The darker green shaded areas indicate a higher level of loss.

Table 3.32. Estimated Economic Losses-2,500 Year 6.7 Magnitude Earthquake Event

Dallas County	Damage Amounts
Cost Structural Damage	$3,086,000
Cost Non-Structural Damage	$5,594,000
Contents Damage	$1,291,000
Inventory Loss	$50,000
Relocation Loss	$1,997,000
Capital Related Loss	$768,000
Wages Loss	$1,007,000
Rental Income Loss	$961,000
Total Earthquake Scenario Losses	$14,754,000

Source: HAZUS-MH 2.1, February 2012.

Figure 3.25. Estimated Economic Losses-2,500 Year 6.7 Magnitude Earthquake Event



Map compiled 06/2012; intended for planning purposes only
Data Source: FEMA, USDA, HAZUS-MH 2.1

According to this analysis, Dallas County would have .003 percent in damages to the total building/contents exposure. This is using the HAZUS building exposure values which are from U.S. Census Block 2000 data.

Table 3.33. Earthquake Loss Ratio--2,500 Year 6.7 Magnitude Earthquake Event

Jurisdiction	Total Earthquake Scenario Losses ($)	Building Exposure ($)	Loss Ratio (%)
Dallas County	$14,754,000	$5,218,366,000	.003

Source: HAZUS-MH 2.1, February 2012.

Table 3.34 provides the anticipated numbers of buildings by type and damage category that would result according to the HAZUS analysis.

Table 3.34. Expected Building Damage by Building Type--2,500 Year 6.7 Magnitude Earthquake Event

County	Bldg. Type	Slight	Moderate	Extensive	Complete	Totals
Dallas	Agriculture	25	12	2	0	39
	Commercial	82	34	6	0	122
	Education	3	1	0	0	4
	Government	3	1	0	0	4
	Industrial	24	10	2	0	36
	Other Residential	9	4	1	0	14
	Religion	401	138	13	1	428
	Single Family	665	143	14	1	823
Totals		1,212	343	38	2	1,470

Source: HAZUS-MH 2.1, February 2012.

Future Development

Overall the planning area has a low vulnerability to earthquake risk. Future development is not expected to increase the risk other than contributing to the overall exposure of what could become damaged as a result of an unlikely event.

Earthquake Hazard Summary by Jurisdiction

The following hazard summary table shows how this hazard varies by jurisdiction. The cities with the largest building counts were given a higher magnitude rating since there would be more building damages.

Jurisdiction	Probability	Magnitude	Warning Time	Duration	Score	Level
Dallas County	1	1	4	1	1.45	Low
Cities						
Adel	1	1	4	1	1.45	Low
Bouton	1	1	4	1	1.45	Low
Clive*	1	2	4	1	1.75	Low
Dallas Center	1	1	4	1	1.45	Low
Dawson	1	1	4	1	1.45	Low
DeSoto	1	1	4	1	1.45	Low
Dexter	1	1	4	1	1.45	Low
Granger	1	1	4	1	1.45	Low
Grimes*	1	2	4	1	1.75	Low
Linden	1	1	4	1	1.45	Low
Minburn	1	1	4	1	1.45	Low
Perry	1	1	4	1	1.45	Low
Redfield	1	1	4	1	1.45	Low
Urbandale*	1	2	4	1	1.75	Low
Van Meter	1	1	4	1	1.45	Low
Waukee	1	2	4	1	1.75	Low
West Des Moines*	1	2	4	1	1.75	Low
Woodward	1	1	4	1	1.45	Low
School Districts						
Adel-DeSoto-Minburn Schools	1	1	4	1	1.45	Low
Dallas Center-Grimes Schools	1	1	4	1	1.45	Low
Perry Schools	1	1	4	1	1.45	Low
Van Meter Schools	1	1	4	1	1.45	Low
Waukee Schools	1	2	4	1	1.75	Low
West Central Valley Schools	1	1	4	1	1.45	Low
Woodward- Granger Schools	1	1	4	1	1.45	Low

* These jurisdictions are included in the risk assessment although they are not officially participating jurisdictions in the Dallas County Plan. Portions of these jurisdictions are in both Dallas and Polk Counties. According to Iowa Emergency Management and Homeland Security, these jurisdictions will participate in the Polk County Hazard Mitigation Plan update.

3.4.5 Expansive Soils

Hazard Score Calculation					
Probability	Magnitude/Severity	Warning Time	Duration	Weighted Score	Level
3	1	1	1	1.90	Low

3.4.5.1 Profile

Hazard Description

A relatively widespread geologic hazard for Iowa is the presence of soils that expand and shrink in relation to their water content. Expansive soils can cause physical damage to building foundations, roadways, and other components of the infrastructure when clay soils swell and shrink due to changes in moisture content. For Iowa, the vulnerability to this hazard most frequently is associated with soils shrinking during periods of drought.

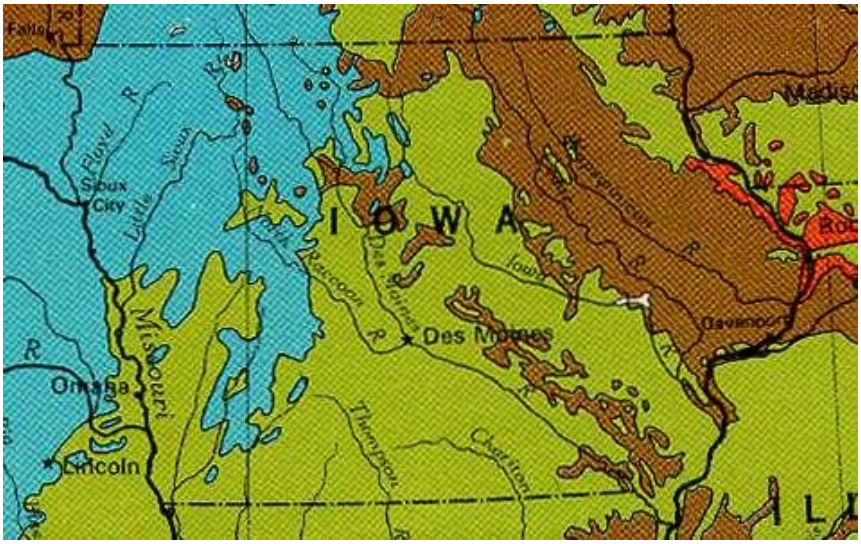
Warning Time Score: 1—24 + hours

Duration Score: 4—more than one week

Geographic Location/Extent

Figure 3.26 shows a map of the swelling potential of soils in Iowa. All of Dallas County is located in an area where part of the soil unit (generally less than 50 percent) consists of clay having slight to moderate swelling potential. This hazard affects all participating jurisdictions.

Figure 3.26. U.S. Geological Survey Swelling Clays Map of Iowa



MAP LEGEND

- Unit contains abundant clay having high swelling potential
- Part of unit (generally less than 50%) consists of clay having high swelling potential
- Unit contains abundant clay having slight to moderate swelling potential
- Part of unit (generally less than 50%) consists of clay having slight to moderate swelling potential
- Unit contains little or no swelling clay
- Data insufficient to indicate clay content of unit and/or swelling potential of clay (Shown in westernmost states only)

Previous Occurrences

Streets and parking lots throughout the County are damaged every year by the effects of expansive soils as well as underground water lines that are damaged as the soil expands and contracts at varying levels along a water line. The frequency of damage from expansive soils can be associated with the cycles of drought and heavy rainfall, which reflect changes in moisture content. There is no data regarding incidents of damages resulting from expansive soils. These damages are largely isolated incidents and affect property owners, local governments, and businesses to make any necessary repairs.

Probability of Future Occurrence

Although there will continue to be some damage to paved areas and foundations in Dallas County due to swelling soils, it is unlikely that these damages will become greater in the future unless new development occurs in areas where the hazard is more severe. Certain buildings and construction practices could be put in place to lessen these impacts. The HMPC determined that damage to assets in the planning area is likely to occur up to 1 in 3 years.

Probability Score: 3—Likely

3.4.5.2 Vulnerability

Overview

The HMPC has determined that while the entire planning area is vulnerable to some structural damage as a result of shrinking and expanding soils, there is no data available to determine damage estimates for this hazard. In most cases, individual property owners, local governments, and businesses pay for repairs to damages caused by this hazard. The HMPC felt that underground utility lines such as water and sewer pipes may be at risk to damages associated with expansive soils. However, there is no data to support damages and costs associated with this hazard at this time.

Magnitude Score: 1—Negligible

Potential Losses to Existing Development

Existing development will continue to be vulnerable to expansive soils.

Future Development

Additional future development in the planning area will also be vulnerable to this hazard.

Expansive Soils Hazard Summary by Jurisdiction

The the following hazard summary table shows how this hazard varies by jurisdiction. The cities and school districts were given a magnitude Level 2 since there are more structures and critical facilities within these jurisdictions.

Jurisdiction	Probability	Magnitude	Warning Time	Duration	Score	Level
Dallas County	3	1	1	1	1.90	Low
Cities						
Adel	3	2	1	1	2.20	Moderate
Bouton	3	2	1	1	2.20	Moderate
Clive*	3	2	1	1	2.20	Moderate
Dallas Center	3	2	1	1	2.20	Moderate
Dawson	3	2	1	1	2.20	Moderate
DeSoto	3	2	1	1	2.20	Moderate
Dexter	3	2	1	1	2.20	Moderate
Granger	3	2	1	1	2.20	Moderate
Grimes*	3	2	1	1	2.20	Moderate
Linden	3	2	1	1	2.20	Moderate
Minburn	3	2	1	1	2.20	Moderate
Perry	3	2	1	1	2.20	Moderate
Redfield	3	2	1	1	2.20	Moderate
Urbandale*	3	2	1	1	2.20	Moderate
Van Meter	3	2	1	1	2.20	Moderate
Waukee	3	2	1	1	2.20	Moderate
West Des Moines*	3	2	1	1	2.20	Moderate
Woodward	3	2	1	1	2.20	Moderate
School Districts						
Adel-DeSoto-Minburn Schools	3	2	1	1	2.20	Moderate
Dallas Center-Grimes Schools	3	2	1	1	2.20	Moderate
Perry Schools	3	2	1	1	2.20	Moderate
Van Meter Schools	3	2	1	1	2.20	Moderate
Waukee Schools	3	2	1	1	2.20	Moderate
West Central Valley Schools	3	2	1	1	2.20	Moderate
Woodward- Granger Schools	3	2	1	1	2.20	Moderate

* These jurisdictions are included in the risk assessment although they are not officially participating jurisdictions in the Dallas County Plan. Portions of these jurisdictions are in both Dallas and Polk Counties. According to Iowa Emergency Management and Homeland Security, these jurisdictions will participate in the Polk County Hazard Mitigation Plan update.

3.4.6 Extreme Heat

Hazard Score Calculation					
Probability	Magnitude/Severity	Warning Time	Duration	Weighted Score	Level
2	1	1	4	1.75	Low

3.4.6.1 Profile

Hazard Description

Extreme temperature events, both hot and cold, can have severe impacts on human health and mortality, natural ecosystems, agriculture, and other economic sectors. The remainder of this section profiles extreme heat. Extreme cold events are profiled in combination with Severe Winter Storm in Section 3.4.13 According to information provided by FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Ambient air temperature is one component of heat conditions, with relative humidity being the other. The relationship of these factors creates what is known as the apparent temperature. The Heat Index chart shown in Figure 3.27 uses both of these factors to produce a guide for the apparent temperature or relative intensity of heat conditions.

Figure 3.27. Heat Index (HI) Chart

Temperature (°F)

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

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

Caution Extreme Caution Danger Extreme Danger

Source: National Weather Service (NWS)

Note: Exposure to direct sun can increase Heat Index values by as much as 15°F. The shaded zone above 105°F corresponds to a HI that may cause increasingly severe heat disorders with continued exposure and/or physical activity.

From 1988-2011, there were 3,496 fatalities in the U.S. attributed to summer heat. This translates to an annual average of 146 deaths. According to the National Weather Service,

among natural hazards, no other natural disaster—not lightning, hurricanes, tornadoes, floods, or earthquakes—takes a greater toll. Table 3.35 below shows number of heat related fatalities per year form 1988-2011.

Table 3.35. Extreme Heat Fatalities, U.S. 1988-2011

YEAR	Heat-Related Deaths
1988	41
1989	6
1990	32
1991	36
1992	8
1993	20
1994	29
1995	1,021
1996	36
1997	81
1998	173
1999	502
2000	158
2001	166
2002	167
2003	36
2004	6
2005	158
2006	253
2007	105
2008	71
2009	45
2010	138
2011	208
Annual Average	146

Source: National Weather Service, http://www.crh.noaa.gov/mkx/?n=taw-part10-usa_fatality_stats

Those at greatest risk for heat-related illness include infants and children up to four years of age, people 65 years of age and older, people who are overweight, and people who are ill or on certain medications. However, even young and healthy individuals are susceptible if they participate in strenuous physical activities during hot weather. In agricultural areas, the exposure of farm workers, as well as livestock, to extreme temperatures is a major concern.

Table 3.36 lists typical symptoms and health impacts of exposure to extreme heat.

Table 3.36. Typical Health Impacts of Extreme Heat

Heat Index (HI)	Disorder
80-90° F (HI)	Fatigue possible with prolonged exposure and/or physical activity
90-105° F (HI)	Sunstroke, heat cramps, and heat exhaustion possible with prolonged exposure and/or physical activity
105-130° F (HI)	Heatstroke/sunstroke highly likely with continued exposure

Source: National Weather Service Heat Index Program, www.weather.gov/os/heat/index.shtml

The National Weather Service has a system in place to initiate alert procedures (advisories or warnings) when the Heat Index is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. A common guideline for issuing excessive heat alerts is when the maximum daytime Heat Index is expected to equal or exceed 105 degrees Fahrenheit (°F) and the night time minimum Heat Index is 80°F or above for two or more consecutive days. A heat advisory is issued when temperatures reach 105 degrees and a warning is issued at 115 degrees.

Warning Time Score: 1—More than 24 hours warning time

Duration Score: 4—More than one week

Geographic Location/Extent

The entire planning area is subject to extreme heat and all participating jurisdictions are affected.

Previous Occurrences

According to information obtained from the National Climatic Data Center (NCDC) and the Spatial Hazard Events and Losses Database for the United States (SHELDUS) there have been three recorded extreme heat events from 1990-2011.

- **July 15-28, 2011**-- Temperatures rose into the 90s each day through the period. Though most days did not see 100 degree heat, the dew point and overnight lows were very significant. Low temperatures during most of the nights were in the 70s, with many of the nights in the mid to upper 70s. Dew point temperatures failed to fall below 70 through most of the period, with frequent excursions in the upper 70s to low 80s. These conditions caused considerable stress on livestock.
- **July/August 2001**—The most recent heat wave to impact the area occurred in the summer of 2001. Very warm and humid conditions that began in the last part of July continued into August. Temperatures during the day warmed into the 90s, with overnight lows remaining in the 70s. Dew point temperatures held in the mid 70s to low 80s through most of the time. An elderly woman passed away in Des Moines as a result of the high temperatures.
- **July 1995—**The State of Iowa was impacted by a large heat wave that occurred in the summer of 1995. In July of that year temperatures and dew point soared to new record levels across the State. The heat wave took a dramatic toll on the State as well as three human fatalities were attributed to the event.

The HMPC also reviewed high temperature data for the National Weather Service COOP station at Perry, Iowa (Dallas County) from the Iowa Environmental Mesonet, Iowa State University Department of Agronomy (http://mesonet.agron.iastate.edu/request/coop/fe.phtml). The website contains records of high temperature by date.

Research revealed that the average monthly temperatures at the Perry, Iowa Station for June, July, and August, are 81, 85, and 83 degrees Fahrenheit, respectively. Based on these average monthly temperatures, the heat events that were 10 degrees or more above the average monthly temperature for June, July, and August, were considered. The planning committee identified 908 days out of the 22,402 days included in the period of record between January 1, 1951 and May 1, 2012 that met this definition of extreme heat. This translates to 4 percent of the days in June, July, and August with temperatures10 degrees or more above the monthly average which is an average of 14 days per year when the temperature in June, July, and August was10 degrees or more above the monthly average. Of the 22,402 days in the period of record analyzed, 40 days had temperatures above 100 degrees Fahrenheit. Years when temperatures exceeded 100 during an event were 1954, 1955, 1956, 1957, 1963, 1974, 1977, 1983, 1985, 1987, 1988, 1990, 1995, 2000, 2001, and 2003. The highest recorded temperature in Perry, Iowa (Dallas County) was 106 degrees Fahrenheit which was reached on August 16th during the 1988 event.

To further review historical occurrences of extreme heat events, the data for temperatures 10 degrees or more above normal were further analyzed to determine how many events last three days or more. Table 3.37 below provides the number of times during the 61.5 period of record for each month (June, July, and August) when the temperature was 10 degrees or more above normal for 3 or more consecutive days. Based on 44 events during June, July, and August during the 61.5 year period, this translates to a 72 percent chance likelihood o f extreme heat events occurring in the planning area.

Table 3.37. Number of Events in June, July, and August with Temperature 10 Degrees or More Above Normal Lasting for 3 or more Consecutive Days (Jan. 1, 1951 to May 1, 2012)

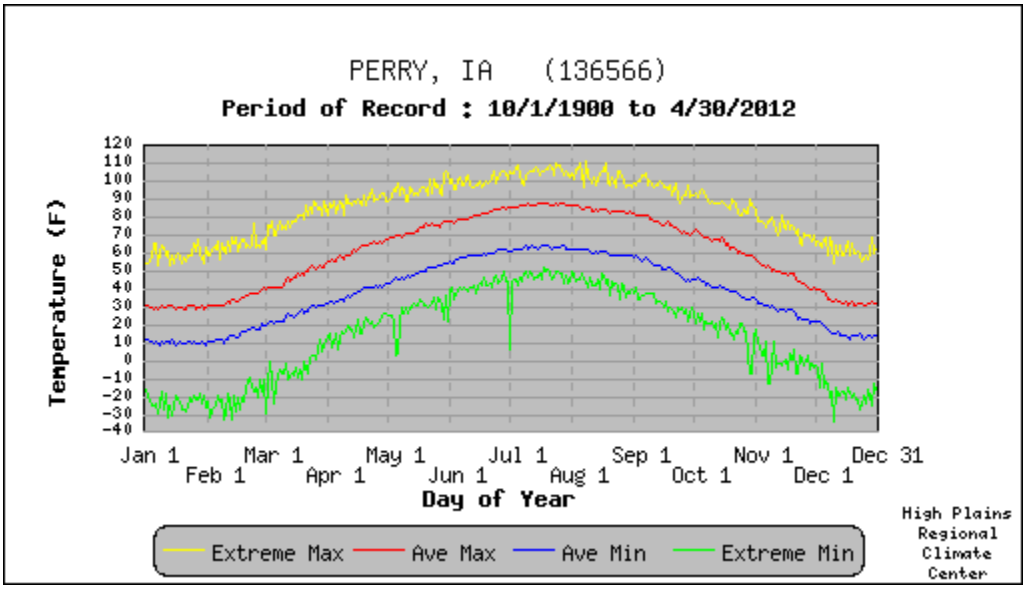
Month	# of Events
June	13
July	15
August	16
Total	44

Source: Iowa State University Department of Agronomy, http://mesonet.agron.iastate.edu/request/coop/fe.phtml

Although there have been 44 occurrences of extreme heat events in the last 61.5 years, there have been no associated reports of death in Dallas County according to the Dallas County Health Department. For the most part, the impacts have been associated with agricultural losses and economic impacts such as increased electric bills to air condition homes and businesses.

Figure 3.28 provides the daily temperature averages and extremes for the Perry, Iowa weather station for the period of record from 1900 to 2011.

Figure 3.28. Daily Temperatures Averages and Extremes, Perry, Iowa (1900 – 2011)



- Extreme Max. is the maximum of all daily maximum temperatures recorded for the day of the year.
- Ave. Max. is the average of all daily maximum temperatures recorded for the day of the year.
- Ave. Min. is the average of all daily minimum temperatures recorded for the day of the year.
- Extreme Min. is the minimum of all daily minimum temperatures recorded for the day of the year.

Source: High Plains Regional Climate Summary, http://www.hprcc.unl.edu/data/historical/index.php?state=ia&action=select_state&submit=Select+State

During the eleven-year period from 2001-2011, crop insurance claims paid as a result of losses related to extreme temperatures totaled $474,241 which translates to an annual average of $43,112. According to USDA Risk Management Agency's 2011 Iowa Crop Insurance Profile, 85percent of insurable crops in Iowa are insured. Table 3.38 summarizes the claims paid by year and type of event.

Table 3.38. Claims Paid in Dallas County for Crop Loss as a Result of Extreme Temperature Events (2001-2011)

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid
2001	CORN	Heat	209,225
2001	HYBRID CORN SEED	Heat	19,688
2001	SOYBEANS	Heat	154,397
2001	SOYBEANS	Hot Wind	1,377
2003	SOYBEANS	Heat	1,342
2006	CORN	Heat	301
2007	SOYBEANS	Heat	3,234
2008	SOYBEANS	Heat	9,091
2011	CORN	Heat	26,402

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid
2011	CORN	Hot Wind	19,728
2011	HYBRID CORN SEED	Heat	6,773
2011	SOYBEANS	Heat	22,683
Total			$474,241

Source: USDA Risk Management Agency Crop Insurance Payment FOIA Request; USDA Risk Management Agency Iowa Crop Insurance Profile, http://www.rma.usda.gov/pubs/2012/stateprofiles/iowa11.pdf

Probability of Future Occurrence

Based on historical data, there is a 72 percent chance probability of an extreme heat event occurring in the planning area in any given year. Although extreme heat events, by definition, occur almost every year, the HMPC determined that damaging events occur less often and determined that the Probability Score for this hazard should be occasional, with a 10 to 20 percent likelihood of a damaging extreme heat event in any given year.

Probability Score: 2—Occaisonal

3.4.6.2 Vulnerability

Vulnerability Overview

Those at greatest risk for heat-related illness include infants and children up to four years of age, people 65 years of age and older, people who are overweight, and people who are ill or on certain medications. To determine jurisdictions within the planning area with populations that may be more vulnerable to extreme heat, demographic data was obtained from the 2010 Census on numbers of people in each jurisdiction under age 5 and over age 65. Data was not available for the under age 4 demographic, overweight individuals and those on certain medications.

The participating jurisdictions with the highest numbers of children under 5 and adults 65 and over in descending order are: Waukee, Perry, and Adel.

Magnitude Score: 1—Negligible

Potential Losses to Existing Development

Heat-related illness or death is generally the greatest concern resulting from extreme heat events. Table 3.39 provides the demographic data obtained for populations under age 5 and 65 and over in the planning area.

Table 3.39. Dallas County Population Under Age 5 and Over Age 65, 2010 Census Data

Jurisdiction	Population under Age 5	Population 65 and over	Total under 5 and 65 and Over
Adel	266	468	734
Bouton	7	14	21
Clive*	Data Not Available for Dallas County Only		
Dallas Center	104	287	391
Dawson	11	19	30
DeSoto	102	101	203
Dexter	34	81	115
Granger	151	143	294
Grimes*	Data Not Available for Dallas County Only		
Linden	11	29	40
Minburn	25	47	72
Perry	696	1,061	1,757
Redfield	59	145	204
Urbandale*	Data Not Available for Dallas County Only		
Van Meter	73	88	161
Waukee	1,428	1,110	2,538
West Des Moines*	Data Not Available for Dallas County Only		
Woodward	65	134	199
Dallas County	5,772	2,006	7,778

*Data is not available for the Dallas County portions of these cities only.

There are nine elder care facilities, three senior housing facilities, and 10 childcare facilities that were reported by planning committee as follows:

Table 3.40. Elder Care Facilities and Senior Housing in the Planning Area

Jurisdiction	Elder Care Facilities	Senior Housing	Childcare Facilities
Adel	1	-	1
Dallas Center	1	-	1
DeSoto	-	-	1
Granger	1	-	1
Perry	2	-	-
Van Meter	-	1	1
Waukee	2	-	4
Woodward	-	2	1

Source: Data Collection Guides and Critical Facility Inventory Validation Forms

These facilities house populations vulnerable to extreme temperatures. This could be of particular concern in the event of power failure during an extreme heat event if these facilities do not have back-up power capabilities.

Although historically no heat-related deaths are known, the potential exists. Extreme heat can also cause agricultural losses. During the eleven-year period from 2001-2011, crop insurance claims paid as a result of losses related to extreme temperatures totaled $474,241. Considering that 85 percent of crops are insured in Iowa (2011 Iowa Crop Insurance Profile, USDA, RMA), the adjusted losses calculate to $557,931 for the period. This results in an average annual loss of $50,721 to insurable crops as a result of freeze and frost affecting agriculture.

Extreme heat can also cause a strain on electricity delivery infrastructure which can be overloaded during peak use of electricity to power air conditioning during extreme heat events.

Another type of infrastructure damage that can occur as a result of extreme heat is road damage. When asphalt is exposed to prolonged extreme heat, it can cause buckling of asphalt-paved roads, driveways, and parking lots.

Future Development

Population growth can result in increases in the age-groups that are most vulnerable to extreme heat. Of the three participating jurisdictions that have the highest concentrations of populations vulnerable to extreme heat, Waukee has had the most growth in the last 10 years at 149 percent. Adel grew 7 percent and Perry grew 1 percent. Population growth also increases the strain on electricity infrastructure and more homes are built and serviced with electricity to accommodate the growing population.

Extreme Heat Hazard Summary by Jurisdiction

Although the entire planning area is subject to extreme heat, the jurisdictions vary in terms of the vulnerable populations. The jurisdictions with more than 700 combined children under 5 and adults 65 and older were assigned a magnitude of 2. The remaining jurisdictions were assigned a magnitude of 1. The hazard summary table below demonstrates how this hazard varies by jurisdiction.

Jurisdiction	Probability	Magnitude	Warning Time	Duration	Score	Level
Dallas County	2	2	1	4	2.05	Moderate
Cities						
Adel	2	2	1	4	2.05	Moderate
Bouton	2	1	1	4	1.75	Low
Clive*	2	2	1	4	2.05	Moderate
Dallas Center	2	1	1	4	1.75	Low
Dawson	2	1	1	4	1.75	Low
DeSoto	2	1	1	4	1.75	Low
Dexter	2	1	1	4	1.75	Low
Granger	2	1	1	4	2.05	Moderate
Grimes*	2	2	1	4	2.05	Moderate
Linden	2	1	1	4	1.75	Low
Minburn	2	1	1	4	1.75	Low
Perry	2	2	1	4	2.05	Moderate
Redfield	2	1	1	4	1.75	Low
Urbandale*	2	2	1	4	2.05	Moderate
Van Meter	2	1	1	4	1.75	Low
Waukee	2	2	1	4	2.05	Moderate
West Des Moines*	2	2	1	4	2.05	Moderate
Woodward	2	1	1	4	1.75	Low
School Districts						
Adel-DeSoto-Minburn Schools	2	1	1	4	1.75	Low
Dallas Center-Grimes Schools	2	1	1	4	1.75	Low
Perry Schools	2	1	1	4	1.75	Low
Van Meter Schools	2	1	1	4	1.75	Low
Waukee Schools	2	1	1	4	1.75	Low
West Central Valley Schools	2	1	1	4	1.75	Low
Woodward-Granger Schools	2	1	1	4	1.75	Low

* These jurisdictions are included in the risk assessment although they are not officially participating jurisdictions in the Dallas County Plan. Portions of these jurisdictions are in both Dallas and Polk Counties. According to Iowa Emergency Management and Homeland Security, these jurisdictions will participate in the Polk County Hazard Mitigation Plan update.

3.4.7 Flash Flood

Hazard Score Calculation					
Probability	Magnitude/Severity	Warning Time	Duration	Weighted Score	Level
4	2	3	1	2.95	Moderate

3.4.7.1 Profile

Hazard 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.

Ice jam flooding is a form of flash flooding that occurs when ice breaks up in moving waterways, and then stacks on itself where channels narrow. This creates a natural dam, often causing flooding within minutes of the dam formation.

Flooding caused by dam and levee failure is discussed in Section 3.4.2 and Section 3.4.11 respectively. Riverine Flooding is discussed separately in Section 3.4.12.

Most flash flooding is caused by slow-moving thunderstorms or thunderstorms repeatedly moving over the same area. Flash flooding is an extremely dangerous form of flooding which can reach full peak in only a few minutes and allows little or no time for protective measures to be taken by those in its path. Flash flood waters move at very fast speeds and can move boulders, tear out trees, scour channels, destroy buildings, and obliterate bridges. Flash flooding often results in higher loss of life, both human and animal, than slower developing river and stream flooding.

In some cases, flooding may not be directly attributable to a river, stream, or lake overflowing its banks. Rather, it may simply be the combination of excessive rainfall or snowmelt, saturated ground, and inadequate drainage. With no place to go, the water will find the lowest elevations–areas that are often not in a floodplain. This type of flooding, often referred to as sheet flooding, is becoming increasingly prevalent as development outstrips the ability of the drainage infrastructure to properly carry and disburse the water flow

In certain areas, aging storm sewer systems are not designed to carry the capacity currently needed to handle the increased storm runoff. Typically, the result is water backing into basements, which damages mechanical systems and can create serious public health and safety concerns. This combined with rainfall trends and rainfall extremes all demonstrate the high probability, yet generally unpredictable nature of flash flooding in the planning area.

Although flash floods are somewhat unpredictable, there are factors that can point to the likelihood of flash floods occurring. Weather surveillance radar is being used to improve monitoring capabilities of intense rainfall. This, along with knowledge of the watershed

characteristics, modeling techniques, monitoring, and advanced warning systems increases the warning time for flash floods.

Warning Time Score: 1—More than 24 hours warning time

Duration Score: 1—Less than 6 hours

Geographic Location/Extent

Flash flooding occurs in those locations of the in the planning area that are low-lying and/or do not have adequate drainage to carry away the amount of water that falls during intense rainfall events. According to NCDC, the following jurisdictions have a history of flash flooding events: unincorporated county, Adel, Dallas Center, DeSoto, Granger, Perry, Van Meter Waukee, and Woodward.

Previous Occurrences

As discussed in the Description section, flash flooding is caused by intense rainfall over a brief period. Table 3.41 provides the top 30 rainfall events at the Perry Weather Station since 1951.

Table 3.41. Top 30 Rainfall Events, Perry NWS COOP Station, 1951 to May 2012

MONTH	DAY	YEAR	AMOUNT (in.)
8	6	1963	4.83
7	11	2006	4.55
6	30	1986	4.26
8	14	1981	4.23
9	8	2001	4.1
5	23	2004	4.08
6	10	1953	4.05
7	1	1973	3.96
7	2	1958	3.66
5	6	1960	3.55
4	27	2009	3.4
5	24	2007	3.39
5	18	1974	3.36
7	17	1996	3.25
9	13	1978	3.21
8	23	2002	3.2
11	4	2003	3.2
8	12	1999	3.19
7	7	1952	3.19
8	22	1954	3.15
6	18	1967	3.13
7	9	1993	3.04
9	11	2006	3.02
4	18	1978	2.92
5	25	1960	2.9

MONTH	DAY	YEAR	AMOUNT (in.)
5	9	1990	2.88
8	26	1987	2.84
4	25	2007	2.77
9	30	1961	2.77
6	14	1986	2.74

Source: Iowa State University Department of Agronomy http://mesonet.agron.iastate.edu/request/coop/fe.phtml

Information from the National Climatic Data Center was obtained from 1993 to 2011 to determine previous occurrences for flash flood in the hazard area. The following event types were considered as flash flood events: flash flood, flash flooding, heavy rain, urban flood, urban flooding, and urban/small stream flooding. Table 3.42 provides a summary of the NCDC data.

Table 3.42. NCDC Dallas County, Iowa Flash Flood Events Summary, 1993 to 2011

Type	# Events	Fatalities	Injuries	Property Damage ($)	Crop Damage ($)
Flash Flood	32	0	0	$1,910,000	$950,000
Flash Flooding	1	0	0	$500,000	$50,000
Heavy Rain	5	0	0	$20,000	$10,0001
Urban Flood	4	0	0	$570,000	$56,000
Urban Flooding	1	0	0	$50,000	$5,000
Urban/Small Stream Flooding	8	0	0	$310,000	$110,000
Total	51	0	0	$3,360,000	$1,181,000

Source: NCDC

Of the 51 flash flood events recorded in NCDC for the 19-yer period:

- 5 were county-wide
- 11 were in the unincorporated county
- 3 were in Adel
- 15 were in Dallas Center
- 1 was in DeSoto
- 3 were in Granger
- 2 were in Perry
- 1 was in Van Meter
- 2 were in Waukee
- 2 were in Woodward

Descriptions of some of the events reported in NCDC are provided below in reverse chronological order:

- **March 22, 2011**—Rainfall of 1.73 inches in an hour and 45 minutes.
- **August 10, 2010**—Water over V Ave and 156th due to Walnut Creek.
- August 9, 2010-- Highway 44 just east of X Ave had running water over the road and there was moderate street flooding in Dallas Center.

- **August 8, 2010**—A swath of 2 to 5 inch rainfall extended from west central, through central, into parts of southeast Iowa. There were numerous reports of a foot or more of flowing water over streets. Following the flash flooding, water remained standing on many roads due to the soils across the state being nearly saturated. This resulted in some road closures. Four to six inches of water over Highway 6 at Highway R22.
- **August 4, 2010**—Rainfall of 1 to 2.5 inches in under an hour produced flash flooding. The flooding took place during rush hour in the Des Moines metropolitan area. Numerous cars were stalled with many intersections under water. Rescue missions were conducted in a few locations to get people out of the fast flowing water. Manhole covers were blown off by rapidly rising water in Dallas County at Adel. Highway F31 near Beaver Creek is closed, estimated 6-8 inches of water was flowing over the road.
- **June 23, 2009—**Widespread street flooding in the town of Waukee. Water was 9 to 12 inches deep on Wildwood Ave just west of 156th St. Water depth was 6 inches or more at the intersection of 156th St. and Wildwood Ave. Sugar Creek was flooding and continued to rise rapidly in Waukee near Centennial Park.
- **April 26, 2009—**Rainfall of 3.40 inches fell in 24 hours
- **June 12, 2008**-- A 100 yard wide area of water over 4 inches deep and rising was reported on Highway 44. Water was over the road on County road F31
- **June 11, 2008**—Many of the storms produced rainfall of 1 to 2 inches per hour, with some areas reporting total rainfall of up to 4 or 5 inches. With the very wet soil conditions across the state, it only took between 1/2 and 1 inch of rain to cause flash flooding. Water was reported across roads in many places across the state. Water was reported flowing over Highway 44. Five feet of water reported over Highway 17.
- **June 8, 2008**—All creeks and streams were out of their banks with numerous county gravel roads having water flowing over them. Heavy rainfall of 3 to 6 inches occurred in a broad swath extending from west central into north central, and parts of central and northeast Iowa. This resulted in widespread flash flooding. Eventually, the rain lead to major to record flooding along many of the rivers in the state. Two and one half inches of rain was recorded in Dallas Center.
- **September 6, 2007**--In Dallas and Polk Counties, 1.5 to 3 inches of rain produced considerable street flooding in Polk County, and flash flooding in Dallas County. Water was flowing over Iowa Highway 44 just east of Dallas Center, resulting in its closure. During the late night hours, a line of thunderstorms formed along the cold front and advanced east.
- **June 22, 2007**—Rainfall of 2 to 4 inches was common in central, into north central and parts of northeast Iowa. Spotty reports of up to 6 inches in a 2 to 3 hour period were received. There were numerous reports of water flowing over highways as well as bridge and highway washouts.
- **March 14, 2007**—Very warm temperatures moved into Iowa during the previous several days. High temperatures warmed into the 50s and 60s across snow covered areas. This caused considerable snow melt, leading to flooding along area rivers. Many of the rivers remained ice covered as the water rose. Ice broke free and began flowing down the river during the night of the 13th into the day on the 14th. Flash flooding in Webster, Emmet and Dallas Counties. Flash flooding was also reported on the Raccoon River near Adel in Dallas County. This was also caused by ice jamming. Damage was relatively minor. Several roads were closed in the area, including U.S. Highway 169.

- **August 3, 2004**—Very heavy rainfall fell in areas that had received significant rainfall during the previous 48 hours. Rainfall of 2 to 4 inches in less than three hours caused flash flooding in Dallas, Warren, and Decatur Counties
- **May 24, 2004**—Numerous counties reported flash flooding as rainfall of one to 4 inches in spots resulted in flooded highways
- **May 22, 2004**—Several locations received 2 to 5 inch rainfalls in less than two hours, resulting in widespread flash flooding.
- **May 4, 2003**—The line of thunderstorms remained stationary and deposited copious amounts of rain. Much of the state was already nearly saturated from heavy rainfall during the previous week. The additional 2 to 4 inch rainfall that occurred in a three hour period produced flash flooding in several areas. Water was flowing over highways in Greene and Dallas Counties. In Polk County, in addition to the water flowing over highways, flooding was widespread in the Des Moines metro area. Many intersections were flooded by several feet of water around the metro area. There were also numerous reports of flooding in basements around the three counties.
- **August 23, 2002**—Highways were under water in Dallas and Audubon Counties. Evacuations were considered for the town of Brayton in Audubon County, and Highway 144 was impassible in Perry.
- **June 12, 2002**—The forest fires in Colorado were a contributing factor to the thunderstorm initiation. During the night of the 11th and early morning of the 12th, two mesoscale convective systems formed over the fires in Colorado. As a result of the thunderstorms, flash flooding occurred in Dallas County. Highway 44 was under several inches of water east of Dallas Center. Flood waters were over Highway 141 west of Perry as well.
- **May 29, 2002**—Thunderstorm clusters dropped 2 to 4 inches of rain in under two hours in a few locations
- **June 12, 2001**—The storms trained along the east west line for several hours. A band of very heavy rain was reported from Greene County, east into Boone, Story, Dallas, and Polk Counties. Rainfall of three to four inches was common in these areas. Numerous roads were closed due to the high water. Water was standing in fields everywhere
- **July 21, 1998**—Rainfall was very heavy with many areas receiving 2 to 3 inches in one to two hours time.
- **July 6, 1998**—Flash flooding occurred in Dallas, Polk, and Guthrie Counties. Widespread rainfall of 2 to 3 inches occurred, with some areas receiving around 5 inches. Much of the rain fell in about an hour, causing very rapid rises in streams as the ground was saturated at the time it rained
- **June 29, 1998 (DR-1230 Severe Weather, Tornadoes, & Flooding)—**At least 38 counties were declared disaster areas by the Federal Government due to the severe damage and flooding. In the Des Moines County Warning Area these included: Wright, Franklin, Butler, Bremer, Hamilton, Hardin, Grundy, Crawford, Carroll, Greene, Boone, Story, Marshall, Audubon, Guthrie, Dallas, Polk, Jasper, Cass, Adair, Madison, Warren, Marion, Adams, and Taylor. The Dallas County declaration was for both Public Assistance and Individual Assistance. Reports from some of the local extension agents say damage to the corn ranged up to 75percent destroyed in areas with the highest wind,
- **June 18, 1998**—Rainfall of three to five inches was recorded in parts of Dallas, Madison, Polk, Story, and Warren Counties. This resulted in flash flooding as all creeks and streams swelled over their banks. The situation became very serious in the larger cities. In Des

Moines, a state of emergency was declared as water of 6 feet or greater in depth choked many of the city intersections. Hundreds of cars were stalled in the streets and many basements were flooded. Between the high winds and water, electricity was knocked out to 15000 homes in Des Moines during the height of the storm. Damage estimates were in the hundreds of thousands of dollars in all of the flash flood counties, and over one million dollars in Polk County, where the Governor declared a state disaster. A disaster declaration was also made for Dallas County. Reports indicated that in the Des Moines metropolitan area, up to 10,000 homes had water in the basement. The city of Des Moines reported that infrastructure losses alone around $1 million. Crop damage estimates from this event, combined with the event of just a few days earlier, totaled around $100 million. During the early afternoon hours, the cold front over Nebraska began moving east, resulting in a change in the thunderstorm configuration

- **June 17, 1998**—Urban flooding was reported as one to two inches of rain fell in one to one and one half hours time. This caused some property damage.
- **June 15, 1998**—Thunderstorms dropping heavy rainfall developed over Dallas County. The rain area was very slow to move and as a result dropped excessive amounts of rain on already saturated soil. Two to four inches of rain fell in a little over an hour causing urban and lowland flooding. Once the rain stopped, the flooding subsided fairly quickly.
- **June 14, 1998**—Rainfall of one to two inches in less than 2 hours was common, with many areas receiving three inches or more of additional rainfall. Urban and small stream flooding was widespread with considerable ponding and lowland flooding reported. In Lake Panorama area in adjacent Guthrie County. Saturated soil around the lake began to slide into the lake by late in the afternoon. As the flood crest caused by the heavy rains moved down the Raccoon River, the town of DeSoto was left without water for a few days. The water treatment plant there is located next to the river and was engulfed by floodwaters. Some of the preliminary estimates received were: $560,000 in Guthrie County, $380,000 in Audubon County, and $400,000 in Dallas County
- **August 29, 1993**—Rainfall of 4.00 to 6.00 inches was common over Dallas and Polk Counties. Unofficial rainfall of 8.00 to 10.00 inches was reported just to the west of the Des Moines metropolitan area. Flash flooding was widespread. The heaviest damage occurred in more populated Polk County. Both Walnut Creek and Four Mile Creek approached or exceeded record levels. The soil was completely saturated before the rain occurred, thus nearly all of the rain that fell ran off. Reports indicated that the water table was so high and soil so saturated that water was already running in the Des Moines city sewer system from seepage. This combined with the excessive rainfall caused raw sewage to back up into about 1,000 homes in Des Moines. Another resident in Van Meter characterized his stool as "erupting like Mt. Vesuvius". Following the flash floods, and even already during the flash flood event, mainstem rivers began to flood seriously.

Although not specifically reported in NCDC, the City of Bouton reports a repetitive flash flood situation caused by inadequate storm drainage within the City. Water drains off of a nearby field over a city road and floods houses on the other side of the road. The city road has also been undermined by heavy flows.

Probability of Future Occurrence

The frequency of past events is used to gauge the likelihood of future occurrences. The events from NCDC that occurred on the same day were combined to determine the total number of flash flooding events in the planning area. There were 36 separate days when flash flooding was reported somewhere in the planning area during the period from 1993 to 2011 (19 years). This translates to flash flooding somewhere in the planning area approximately 1.9 times in any given year.

Probability Score: 4—Highly Likely

3.4.7.2 Vulnerability

Vulnerability Overview

Water over low-lying roads and bridges are the most frequent types of impacts associated with flash flooding that has occurred in the county. This can cause wash out of bridge abutments and erosion/scour damage on roads. There is potential for loss of life if motorists drive into moving water. However, public education campaigns have helped to educate citizens about not driving through moving water. Previous occurrences of flash flooding in the county did not report any injuries or fatalities. Building damage is generally limited to water in basements where rain is too intense for drainage systems and natural drainage to carry water away from the structure. In addition, when combined storm/sanitary sewer systems are overloaded, this can result in sewer back-up as described above in previous occurrences by one Van Meter resident and in the descriptions of the manhole covers being blown off. Generally, flash-flooding is short in duration and government services and business operations are not impacted.

Based on historical occurrences, Dallas Center seems to be particularly vulnerable to flash flooding as there were 15 events during the 19-year period. The unincorporated County had the next highest number of flash flooding events with 11 during the same 15-year period.

Additionally based on the narrative descriptions of previous events, the City of DeSoto's water treatment plant is vulnerable to flash flooding due to its location on the river.

Magnitude Score: 2--Limited

Potential Losses to Existing Development

When roads and bridges are inundated by water, damage often occurs as the water scours materials around bridge abutments and gravel roads. The water can also cause erosion undermining road beds. In some instances, steep slopes that are saturated with water may cause mud or rock slides onto roadways. These damages can cause costly repairs for state, county, and city road/bridge maintenance departments.

When sewer back-up occurs, this can result in costly clean-up for home and business owners as well as present a health hazard.

Based on loss estimates reported by NCDC, property losses averaged $176,842 over the 19-year period from 1993 to 2011 and crop losses averaged $95,263 over the same period.

According to FEMA standard values for loss of service for utilities reported in the 2009 BCA Reference Guide, the economic impact as a result of loss of potable water service is $93 per person per day of lost service. According to this estimate, the cost of the DeSoto Water Treatment Plant being shut down for 3 days would result in an economic loss of approximately $292,950 based on the 2010 population of 1,050. (1,050 people X $93 X 3 days).

Future Development

In planning future development, jurisdictions in the planning area should avoid development in low-lying areas near rivers and streams or where interior drainage systems are not adequate to provide drainage during heavy rainfall events. Future development should also take into consideration the impact of additional impervious surfaces to water run-off and drainage capabilities during heavy rainfall events.

Flash Flood Hazard Summary by Jurisdiction

For Unincorporated Dallas County, the City of Bouton, and Dallas Center, the magnitude was determined to be limited due to the large number of flash flooding events reported in NCDC and by the planning representatives for these jurisdictions. For DeSoto, the magnitude was determined to be critical due to the potential impact to the water treatment plant. For the remaining jurisdictions, the magnitude was determined to be negligible due to the small number of reported flash flooding events or no flash flooding events reported for these areas.

Jurisdiction	Probability	Magnitude	Warning Time	Duration	Score	Level
Dallas County	4	2	3	1	2.65	
Cities						
Adel	4	1	3	1	2.65	Moderate
Bouton	4	2	3	1	2.95	Moderate
Clive*	4	1	3	1	2.65	Moderate
Dallas Center	4	2	3	1	2.95	Moderate
Dawson	4	1	3	1	2.65	Moderate
DeSoto	4	3	3	1	3.25	High
Dexter	4	1	3	1	2.65	Moderate
Granger	4	1	3	1	2.65	Moderate
Grimes*	4	1	3	1	2.65	Moderate
Linden	4	1	3	1	2.65	Moderate
Minburn	4	1	3	1	2.65	Moderate
Perry	4	1	3	1	2.65	Moderate
Redfield	4	1	3	1	2.65	Moderate
Urbandale*	4	1	3	1	2.65	Moderate
Van Meter	4	1	3	1	2.65	Moderate
Waukee	4	1	3	1	2.65	Moderate
West Des Moines	4	1	3	1	2.65	Moderate
Woodward	4	1	3	1	2.65	Moderate
School Districts						
Adel-DeSoto-Minburn Schools	4	1	3	1	2.65	Moderate
Dallas Center-Grimes Schools	4	1	3	1	2.65	Moderate
Perry Schools	4	1	3	1	2.65	Moderate
Van Meter Schools	4	1	3	1	2.65	Moderate
Waukee Schools	4	1	3	1	2.65	Moderate
West Central Valley Schools	4	1	3	1	2.65	Moderate
Woodward-Granger Schools	4	1	3	1	2.65	Moderate

* These jurisdictions are included in the risk assessment although they are not officially participating jurisdictions in the Dallas County Plan. Portions of these jurisdictions are in both Dallas and Polk Counties. According to Iowa Emergency Management and Homeland Security, these jurisdictions will participate in the Polk County Hazard Mitigation Plan update.

3.4.8 Grass or Wildland Fire

Hazard Score Calculation					
Probability	Magnitude/Severity	Warning Time	Duration	Weighted Score	Level
3	2	4	1	2.65	Moderate

3.4.8.1 Profile

Hazard Description

Iowa's urban/rural interface (areas where development occurs within or immediately adjacent to wildland, near fire-prone trees, brush, and/or other vegetation), is growing as metro areas expand into natural forest, prairies and agricultural areas that are in permanent vegetative cover through the Conservation Reserve Program (CRP). The state has the largest number of CRP contracts in the nation, totaling over 1.5 million acres. Most of this land is planted in cool and warm season grass plantings, tree plantings and riparian buffer strips. There is an additional 230,000 acres are in federal ownership and conservation easements. The threat of wildland fire in the urban interface is greater now than it has been in more than a century and the problem is compounded by homeowners formerly from urban area that do not understand that all of the services generally taken for granted in the cities are not equally available.

Wildfires are frequently associated with lightning and drought conditions, as dry conditions make vegetation more flammable. As new development encroaches into the wildland/urban interface more and more structures and people are at risk. On occasion, ranchers and farmers intentionally set fire to vegetation to restore soil nutrients or alter the existing vegetation growth. Also, individuals in rural areas frequently burn trash, leaves and other vegetation debris. These fires have the potential to get out of control and turn into wildfires.

The risk of wildfires is a real threat to landowners across the state. The National Weather Service monitors the conditions supportive of wildfires in the state on a daily basis so that wildfires can be predicted, if not prevented.

The risk factors considered are:

- High temperature
- High wind speed
- Fuel moisture (greenness of vegetation)
- Low humidity
- Small cloud cover

- Warning Time Score: 4—Minimal or no warning
- Duration Score: 1—Less than 6 hours

Geographic Location/Extent

As of April 2012, Dallas County, Iowa had 9,577.88 acres active in the CRP. This translates to 2.5 percent of the total 375,040 of land acres in the county. Additionally, there is over 3,000 acres of parks, wildlife areas, and trails in the planning are that are managed by the Dallas County Conservation Board; this translates to an additional .8 percent of land in uses with vegetative cover. Considering CRP land, parks, wildlife areas and trails, the total acreage in the county is over 12,500 acres or 3.3 percent in land uses consistent with vegetative cover.

At this time, Wildland-Urban Interface areas have not been specifically identified for Dallas County. If this information becomes available prior to the next update of this plan, it will be incorporated.

Previous Occurrences

According to information obtained from the Iowa Department of Natural Resources Forestry Bureau, there were 57 reported wildland or grass fires in Dallas County from 2005-2011. In total, these 57 fires burned 769.16 acres and injured one person, a firefighter. Thirty-one of the fires began as prescribed burns, burning 549.9 acres and 26 were started either accidently or from natural phenomena, such as lightning. These 26 fires burned 219.26 acres during the 7-year reporting period. The firefighter injury occurred in 2009 when a land owner used propane torch to clean out a fence row. Wind caused the fire to get out of control. Table 3.43 provides the number of acres burned each year from 2005-2009 by cause as well as the number of injuries/fatalities each year.

Table 3.43. Acreage Burned by Grass or Wildland Fires by Cause, 2005-20011

YEAR	Lightening	Campfire	Smoking	Debris Burning	Arson	Equip Use	Railroads	Children:	Misc	Controlled Burn	Injuries:	Fatalities:
2011	0	0	0	0	0	0	0	0	0	270.5	0	0
2010	0	0	0	53.25	0	0	0	0	20	103	0	0
2009	1	0	0	18	0	0	0	0	1	117	1	0
2008	0	0	0	3	0	0	0	0	0	38.8	0	0
2007	0	0	0	0	0	0	0	0	0	20.6	0	0
2006	0	0	5	0	30	0	0	80	0	0	0	0
2005	0	0.01	8	0	0	0	0	0	0	0	0	0
Total	1	0.01	73	75.05	30	15	0	80	21	549.9	1	0

Source: Iowa Department of Natural Resources Forestry Bureau, 2012

Of the 26 accidental or naturally-caused fires during the 7-year period, the locations of three were not reported. The reported locations and number of fires are as follows:

- City of Dexter – 1
- City of Perry – 2
- Unincorporated rural Dallas Co. – 20

Probability of Future Occurrence

When analyzing just the accidental fires, there has been an average of 3.7 fires burning 31 acres per year. However, most of these fires did not result in major damages. To refine the probability determination, the planning committee determined that although wildland and grass fires occur annually in the planning area, damaging fires occur less frequently. Therefore, the planning committee determined the probability score to be likely in any given year that a damaging grass or wildland fire could occur in the planning area.

Probability Score: 3--Likely

3.4.8.2 Vulnerability

Overview

Areas that are most vulnerable to wildfire are agricultural areas where land is burned, rural areas where trash and debris are burned, and the wildland-urban interface areas.

Potential Losses to Existing Development

Wildfires can be responsible for extensive damage to crops, the environment and occasionally residential or business facilities. Homes built in rural areas are more vulnerable since they are in closer proximity to land that is burned and homeowners are more likely to burn trash and debris in rural locations. The vulnerability of structures in rural areas is exacerbated due to the lack of hydrants in these areas for firefighting and the distance required for firefighting vehicles and personnel to travel to respond. Potential losses to crops and rangeland are additional concerns.

Utilizing the data available from the Iowa Department of Natural Resources Forestry Bureau, during the 7-year period from 2005-2011, there were 26 accidental or natural-caused fires that burned 219.26 acres. If grass and wildland fires continue at a similar rate, the average annual number of fires will be 3.7 fires burning an average 31 acres per year. Economic losses were not available from historical data. As a result it is not possible to estimate future economic losses at this time.

Vulnerability Score: 2—Limited

Future Development

Future development in the wildland-urban interface would increase vulnerability to this hazard.

Wildland/Grass Fires Hazard Summary by Jurisdiction

Wildland/Grass Fires occur more frequently in the unincorporated portions of Dallas County and these areas are more vulnerable to wildland/grass fires due to more homes built in rural areas in closer proximity to land/trash/debris that is burned. Also homes in these more rural areas do not have hydrants in most cases and are farther from firehouses. Wildland/Grass fires can occur in city limits. However, the magnitude is generally lower due to proximity to firefighting services. There is less potential for wildland/grass fires impacting schools due to general locations away from Wildland Urban Interface Areas. Again, if a wildland/grass fire were to occur near school buildings, the magnitude would be lower due to close proximity to firefighting services.

Jurisdiction	Probability	Magnitude	Warning Time	Duration	Score	Level
Dallas County	3	2	4	1	2.65	Moderate
Cities						
Adel	2	1	4	1	1.9	Low
Bouton	2	1	4	1	1.9	Low
Clive*	2	1	4	1	1.9	Low
Dallas Center	2	1	4	1	1.9	Low
Dawson	2	1	4	1	1.9	Low
DeSoto	2	1	4	1	1.9	Low
Dexter	2	1	4	1	1.9	Low
Granger	2	1	4	1	1.9	Low
Grimes*	2	1	4	1	1.9	Low
Linden	2	1	4	1	1.9	Low
Minburn	2	1	4	1	1.9	Low
Perry	2	1	4	1	1.9	Low
Redfield	2	1	4	1	1.9	Low
Urbandale*	2	1	4	1	1.9	Low
Van Meter	2	1	4	1	1.9	Low
Waukee	2	1	4	1	1.9	Low
West Des Moines	2	1	4	1	1.9	Low
Woodward	2	1	4	1	1.9	Low
School Districts						
Adel-DeSoto-Minburn Schools	1	1	4	1	1.45	Low
Dallas Center-Grimes Schools	1	1	4	1	1.45	Low
Perry Schools	1	1	4	1	1.45	Low
Van Meter Schools	1	1	4	1	1.45	Low
Waukee Schools	1	1	4	1	1.45	Low
West Central Valley Schools	1	1	4	1	1.45	Low
Woodward-Granger Schools	1	1	4	1	1.45	Low

* These jurisdictions are included in the risk assessment although they are not officially participating jurisdictions in the Dallas County Plan. Portions of these jurisdictions are in both Dallas and Polk Counties. According to Iowa Emergency Management and Homeland Security, these jurisdictions will participate in the Polk County Hazard Mitigation Plan update.

3.4.9 Hailstorm

Hazard Score Calculation					
Probability	Magnitude/Severity	Warning Time	Duration	Weighted Score	Level
4	1	3	1	2.65	Moderate

3.4.9.1 Profile

Hazard Description

According to the National Oceanic and Atmospheric Administration (NOAA), hail is precipitation that is formed when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere causing them to freeze. The raindrops form into small frozen droplets and then continue to grow as they come into contact with super-cooled water which will freeze on contact with the frozen rain droplet. This frozen rain droplet can continue to grow and form hail. As long as the updraft forces can support or suspend the weight of the hailstone, hail can continue to grow.

At the time when the updraft can no longer support the hailstone, it will fall down to the earth. For example, a ¼" diameter or pea sized hail requires updrafts of 24 mph, while a 2 ¾" diameter or baseball sized hail requires an updraft of 81 mph. The largest hailstone recorded in the United States was found in Vivian, South Dakota on July 23, 2010, measuring eight inches in diameter, almost the size of a soccer ball. Soccer-ball-sized hail is the exception, but even small pea sized hail can do damage.

Hailstorms in Iowa cause damage to property, crops, and the environment and kill and injure livestock. In the United States, hail causes more than $1 billion in damage to property and crops each year. Much of the damage inflicted by hail is to crops. Even relatively small hail can shred plants to ribbons in a matter of minutes. Vehicles, roofs of buildings and homes, and landscaping are the other things most commonly damaged by hail. Hail has been known to cause injury to humans, occasionally fatal injury.

The onset of hailstorms is generally rapid. Duration is less than 6 hours and warning time is generally 6 to 12 hours.

Based on information provided by the Tornado and Storm Research Organization, Table 3.44 below describes typical damage impacts of the various sizes of hail.

Table 3.44. Tornado and Storm Research Organization Hailstorm Intensity Scale

Intensity Category	Diameter (mm)	Diameter (inches)	Size Description	Typical Damage Impacts
Hard Hail	5-9	0.2-0.4	Pea	No damage
Potentially Damaging	10-15	0.4-0.6	Mothball	Slight general damage to plants, crops
Significant	16-20	0.6-0.8	Marble, grape	Significant damage to fruit, crops, vegetation
Severe	21-30	0.8-1.2	Walnut	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored

Intensity Category	Diameter (mm)	Diameter (inches)	Size Description	Typical Damage Impacts
Severe	31-40	1.2-1.6	Pigeon's egg > squash ball	Widespread glass damage, vehicle bodywork damage
Destructive	41-50	1.6-2.0	Golf ball > Pullet's egg	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
Destructive	51-60	2.0-2.4	Hen's egg	Bodywork of grounded aircraft dented, brick walls pitted
Destructive	61-75	2.4-3.0	Tennis ball > cricket ball	Severe roof damage, risk of serious injuries
Destructive	76-90	3.0-3.5	Large orange > Soft ball	Severe damage to aircraft bodywork
Super Hailstorms	91-100	3.6-3.9	Grapefruit	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
Super Hailstorms	>100	4.0+	Melon	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

Source: Tornado and Storm Research Organization (TORRO), Department of Geography, Oxford Brookes University
Notes: In addition to hail diameter, factors including number and density of hailstones, hail fall speed and surface wind speeds affect severity.

Warning Time Score: 3—6-12 hours

Duration Score: 1—less than 6 hours

Geographic Location/Extent

The entire planning area, including all participating jurisdictions, is at risk to hailstorms.

Previous Occurrences

The NCDC reports 166 hail events in Dallas County between 1970 – December 2011. Table 3.45 shows the number of hail events by the size of the hail. Beginning January 5, 2010, the National Weather Service (NWS) will issue a Severe Thunderstorm Warning whenever a thunderstorm is forecasted to produce wind gusts to 58 miles per hour (50 knots) or greater and/or hail size one inch (quarter-size) diameter which can produce significant damage (source: http://www.nws.noaa.gov/oneinchhail/).

Table 3.45. Hail Events Summarized by Hail Size

Hail Size (inches)	Number of Events 1970 to 2011	Injuries	Property Damages*	Crop Damages*
<.75	25	0	$68,000	$110,000
.75	31	0	$1,000	$70,000
.88	22	0	$36,000	$80,000
1.00	44	0	$166,000	$129,000
1.25	3	0	$25,000	$25,000
1.50	11	0	$77,000	$60,000
1.75	25	0	$218,000	$88,000
2.20	2	0	$45,000	$13,000
2.50	1	0	$15,000	0
2.75	2	0	$40,000	$45,000
Totals	166	0	$691,000	$620,000

Source: National Climatic Data Center;
Note: Although events were recorded back to 1970, property and crop damages were not indicated until after 1995

According to the USDA Risk Management Agency, insured corn and soybean losses in Dallas County as a result of hail from 2001 to 2011 totaled $137,001.

Table 3.46. Crop Insurance Claims Paid in Dallas County as a Result of Hailstorms, 2001-2011.

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid ($)
2001	CORN	Hail	929
2003	CORN	Hail	3,939
2008	CORN	Hail	4,054
2009	CORN	Hail	14,117
2010	CORN	Hail	65,721
2001	SOYBEANS	Hail	1,486
2002	SOYBEANS	Hail	3,219
2003	SOYBEANS	Hail	19,697
2008	SOYBEANS	Hail	19,772
2010	SOYBEANS	Hail	4,067
Total			$137,001

Source: USDA Risk Management Agency Crop Insurance Payment FOIA Request; USDA Risk Management Agency Iowa Crop Insurance Profile, http://www.rma.usda.gov/pubs/2012/stateprofiles/iowa11.pdf

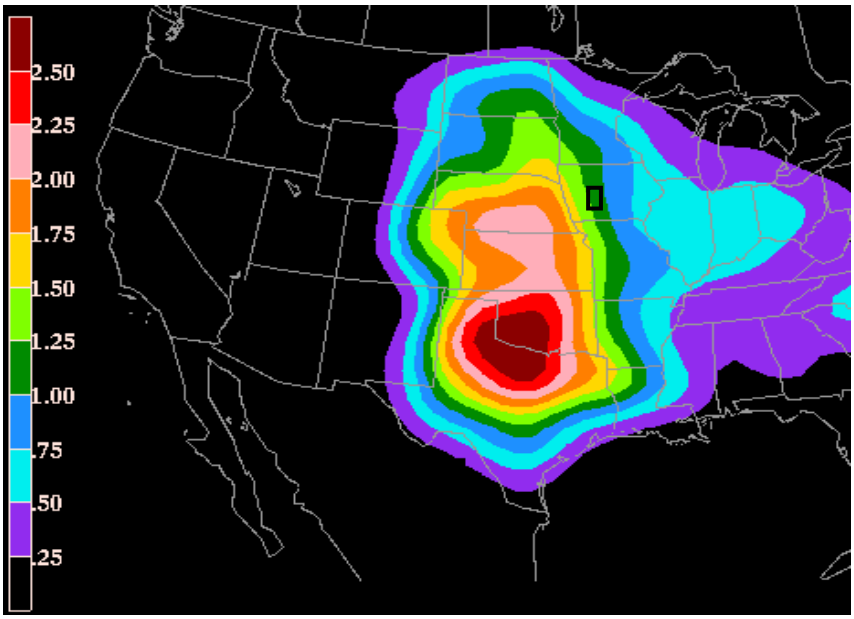
Probability of Future Occurrence

Based on this data, there have been 166 events in a 42-year period, producing an average of 2.5 hail events each year in Dallas County. When limiting the probability analysis to hail events producing hail 1.75 inches and larger, there have been 30 events in a 42-year period. Based on this history, the probability of a destructive hail event in any given year is 71 percent. Thus making the probability as “highly likely” in any given year.

Figure 3.29 is based on hailstorm data from 1980-1994. It shows the probability of hailstorm occurrence (2” diameter or larger) based on number of days per year within a 12.5 mile radius

of a given point on the map. Dallas County is located in the region to receive 1.25 hailstorms annually.

Figure 3.29. Annual Hailstorm Probability (2'' diameter or larger), United States 1980-1994



Source: NSSL, http://www.nssl.noaa.gov/users/brooks/public_html/bighail.gif
Note: Black square indicates approximate location of Dallas County

Probability Score: 4—Highly Likely

3.4.9.2 Vulnerability

Overview

In general, assets in the planning area that are vulnerable to hail damage include people, crops, vehicles, and built structures. According to the Iowa Hazard Mitigation Plan, the estimated statewide losses for the hail hazard is listed as the 5th highest hazard losses with $33 million.

Magnitude Score: 1—Negligible

Potential Losses to Existing Development

Table 3.47 provides the estimated annualized property damages resulting from hail as $40,647. There has been a minimal amount of hail damages recorded over the past 17 years. Most buildings are privately insured thus insurance would help the building owner recover from hail damage.

Table 3.47. Estimated Annualized Property Damages Resulting from Hail

Building Exposure	1995-2011 Hail Property Damages	Annualized Property Damages
$3,148,130,000	$691,000	$40,647

Source: Building Exposure, Dallas County Assessor's Office, 2012; Hail Property Damage from NCDC records

Table 3.48 provides the annual crop losses for insurable resulting from Hail. The insurable loss is adjusted to estimate losses to all insurable crops by considering that 85 percent of insurable crops in the State were insured (2011 Iowa Crop Insurance Profile from USDA's Risk Management Agency).

Table 3.48. Estimated Insurable Annualized Crop Damages Resulting from Hail

11-Year Hail Indemnity Paid	Adjusted 11-Year Hail Losses (considering 85% insured)	Adjusted Annualized Crop Losses	2007 Value of Crops
$237,001	$278,825	$25,347	$156,900,000

Source: Crop Exposure is from Iowa State University, University Extension, 2007 ; Insurance paid is from USDA's RMA; Statewide Crop insurance Coverage is from USDA's RMA Iowa Crop Insurance Profile.
Note: This includes insurable crops that are insured.

Future Development

Dallas County's current trend in increased development will likely increase vulnerability to hailstorms.

Hail Hazard Summary by Jurisdiction

The following hazard summary table shows how this hazard varies by jurisdiction. The magnitude was rated higher as a Level 2, with a Moderately High score of 2.95 for the cities and the school districts that have more built structures.

Jurisdiction	Probability	Magnitude	Warning Time	Duration	Score	Level
Dallas County	4	1	3	1	2.65	Moderate
Cities						
Adel	4	2	3	1	2.95	Moderate
Bouton	4	2	3	1	2.95	Moderate
Clive*	4	2	3	1	2.95	Moderate
Dallas Center	4	2	3	1	2.95	Moderate
Dawson	4	2	3	1	2.95	Moderate
DeSoto	4	2	3	1	2.95	Moderate
Dexter	4	2	3	1	2.95	Moderate
Granger	4	2	3	1	2.95	Moderate
Grimes*	4	2	3	1	2.95	Moderate
Linden	4	2	3	1	2.95	Moderate
Minburn	4	2	3	1	2.95	Moderate
Perry	4	2	3	1	2.95	Moderate
Redfield	4	2	3	1	2.95	Moderate
Urbandale*	4	2	3	1	2.95	Moderate
Van Meter	4	2	3	1	2.95	Moderate
Waukee	4	2	3	1	2.95	Moderate
West Des Moines*	4	2	3	1	2.95	Moderate
Woodward	4	2	3	1	2.95	Moderate
School Districts						
Adel-DeSoto-Minburn Schools	4	2	3	1	2.95	Moderate
Dallas Center-Grimes Schools	4	2	3	1	2.95	Moderate
Perry Schools	4	2	3	1	2.95	Moderate
Van Meter Schools	4	2	3	1	2.95	Moderate
Waukee Schools	4	2	3	1	2.95	Moderate
West Central Valley Schools	4	2	3	1	2.95	Moderate
Woodward- Granger Schools	4	2	3	1	2.95	Moderate

* These jurisdictions are included in the risk assessment although they are not officially participating jurisdictions in the Dallas County Plan. Portions of these jurisdictions are in both Dallas and Polk Counties. According to Iowa Emergency Management and Homeland Security, these jurisdictions will participate in the Polk County Hazard Mitigation Plan update.

3.4.10 Landslide

Hazard Score Calculation					
Probability	Magnitude/Severity	Warning Time	Duration	Weighted Score	Level
2	2	2	1	1.9	Low

3.4.10.1 Profile

Hazard Description

A landslide is the downhill movement of masses of soil and rock by gravity. The basic ingredients for landslides are gravity, susceptible soil or rock, sloping ground, and water. 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, small scale landslides have been occurring in slide-prone areas of Iowa long before human occupation. New landslides can occur because of rainstorms, fires, earthquakes, and various human activities that modify slope and drainage.

Warning Time Score: 2—12 to 24 hours warning time

Duration Score: 1—Less than 6 hours

Geographic Location/Extent

The map in Figure 3.30 depicts landslide susceptibility and incidents rates in Iowa according to the Iowa Department of Natural Resources. This shows that almost all of Dallas County has a moderate susceptibility and moderate incident rate of landslide. Additionally, the HMPC indicated that there are several areas in the southwest corner of the county where landslide onto county roads has been problematic during periods of heavy rain.

Figure 3.30. Landslide Susceptibility and Incident Rates in Iowa

Source: Iowa Department of Natural Resources

Previous Occurrences

Landslide has been a recurring issue for the Van Meter School. Mud and water from a hillside has slid around and into the Van Meter School building. A retaining wall has been constructed to help alleviate the problem.

Probability of Future Occurrence

The HMPC determined the probability of future occurrence of landslide in the planning area to be Occasional.

Probability Score: 2--Occasional

3.4.10.2 Vulnerability

Vulnerability Overview

There will continue to be intense rainfall events that cause landslides in the planning area. But, the damages are relatively minimal and not widespread.

Potential Losses to Existing Development

Various county roads and Van Meter School District have identified specific areas of development that are vulnerable to landslide.

Future Development

Future development downslope from areas prone to landslide will increase vulnerability to this hazard.

Landslide Hazard Summary by Jurisdiction

Jurisdiction	Probability	Magnitude	Warning Time	Duration	Score	Level
Dallas County	2	3	2	1	2.2	Moderate
Cities						
Adel	2	2	2	1	1.9	Low
Bouton	2	2	2	1	1.9	Low
Clive*	2	2	2	1	1.9	Low
Dallas Center	2	2	2	1	1.9	Low
Dawson	2	2	2	1	1.9	Low
DeSoto	2	2	2	1	1.9	Low
Dexter	2	2	2	1	1.9	Low
Granger	2	2	2	1	1.9	Low
Grimes*	2	2	2	1	1.9	Low
Linden	2	2	2	1	1.9	Low
Minburn	2	2	2	1	1.9	Low
Perry	2	2	2	1	1.9	Low
Redfield	2	2	2	1	1.9	Low
Urbandale*	2	2	2	1	1.9	Low
Van Meter	2	2	2	1	1.9	Low
Waukee	2	2	2	1	1.9	Low
West Des Moines8	2	2	2	1	1.9	Low
Woodward	2	2	2	1	1.9	Low
School Districts						
Adel-DeSoto-Minburn Schools	2	2	2	1	1.9	Low
Dallas Center-Grimes Schools	2	2	2	1	1.9	Low
Perry Schools	2	2	2	1	1.9	Low
Van Meter Schools	2		2	1	2.2	Moderate
Waukee Schools	2	2	2	1	1.9	Low
West Central Valley Schools	2	2	2	1	1.9	Low
Woodward-Granger Schools	2	2	2	1	1.9	Low

*These jurisdictions are included in the risk assessment although they are not officially participating jurisdictions in the Dallas County Plan. Portions of these jurisdictions are in both Dallas and Polk Counties. According to Iowa Emergency Management and Homeland Security, these jurisdictions will participate in the Polk County Hazard Mitigation Plan update.

3.4.11 Levee Failure

Hazard Score Calculation					
Probability	Magnitude/Severity	Warning Time	Duration	Weighted Score	Level
1	2	4	4	2.05	Moderate

3.4.11.1 Profile

Hazard Description

Levees are earth embankments constructed along rivers and coastlines to protect adjacent lands from flooding. Floodwalls are concrete structures, often components of levee systems, designed for urban areas where there is insufficient room for earthen levees. When levees and floodwalls and their appurtenant structures are stressed beyond their capabilities to withstand floods, levee failure can result in loss of life and injuries as well as damages to property, the environment, and the economy.

Levees range from small agricultural levees that protect farmland from high-frequency flooding to large urban areas that protect people and property from larger-less frequent flooding events such as the 100-year and 500-year flood levels. For purposes of this discussion, levee failure will refer to both overtopping and breach of a levee as defined in FEMA's Publication "So You Live Behind a Levee" (http://content.asce.org/ASCELeveeGuide.html).

> **Overtopping: When a Flood Is Too Big**
> Overtopping occurs when floodwaters exceed the height of a levee and flow over its crown. As the water passes over the top, it may erode the levee, worsening the flooding and potentially causing an opening, or breach, in the levee.
>
> **Breaching: When a Levee Gives Way**
> A levee breach occurs when part of a levee gives way, creating an opening through which floodwaters may pass. A breach may occur gradually or suddenly. The most dangerous breaches happen quickly during periods of high water. The resulting torrent can quickly swamp a large area behind the failed levee with little or no warning.
> Earthen levees can be damaged in several ways. For instance, strong river currents and waves can erode the surface. Debris and ice carried by floodwaters—and even large objects such as boats or barges—can collide with and gouge the levee. Trees growing on a levee can blow over, leaving a hole where the root wad and soil used to be. Burrowing animals can create holes that enable water to pass through a levee. If severe enough, any of these situations can lead to a zone of weakness that could cause a levee breach. In seismically active areas, earthquakes and ground shaking can cause a loss of soil strength, weakening a levee and possibly resulting in failure. Seismic activity can also cause levees to slide or slump, both of which can lead to failure.

Warning Time Score: 4—Minimal or no warning

Duration Score: 4—More than 1 week

Geographic Location/Extent

Research revealed two levees in Dallas County that have been constructed with the intent to provide some level of flood protection to the built environment.

- The Van Meter levee, constructed in 1964 along the North River, a tributary to the Raccoon River provides an undesignated level of protection to a portion of the City of Van Meter. Operation and maintenance is a cooperative effort between the City and the U.S. Army Corps of Engineers (USACE). This project was designed to provide the town and its residents protection from flash floods by increasing the capacity of North River thorugh enlargement and straightening of the chanel and constructing low earthen levee embankments along both banks where natural banks were not of sufficient height.
- The Adel Water Treatment Facility Levee was constructed by the City after the 2008 flooding to lessen the need to sandbag in areas around the water treatment plant. This system is comprised of a spillway with a levee system that re-routes the water back into the river. It provides an undesignated level of protection and is not an accredited levee system.
- There are likely many other agricultural type levees/berms in the planning area. However, this type of levee is not inventoried or regulated at this time.

Figure 3.31 and Figure 3.32 provide aerial imagery of the Van Meter Levee and Adel Water Treatment Facility Levee respectively.

Figure 3.31. Van Meter Levee

Source: Map complied by AMEC from USDA aerial imagery and drawings from the USACE April 16, 2012 Pre-inspection packet.

Figure 3.32. Adel Water Treatment Plant Levee System

Source: Map complied by AMEC from USDA aerial imagery and location description from the City of Adel.

Previous Occurrences

There are no previous recorded occurrences of failure of the Van Meter Levee. The Hazard Mitigation Planning Committee noted that the levee did not fail or overtop during the 1993 flood event.

According to the April 16, 2012 USACE Pre-Inspection packet for this levee system, subsequent to project construction there is no documentation that indicates there have been any performance issues with the project. There are not reports of overbank flooding or major damage. The historical inspection reports do not indicate any damage from significant rain events.

There are also no previous recorded occurrences of failure of the Adel Water Treatment Plant Levee.

Probability of Future Occurrence

Based on past performance, the Hazard Mitigation Planning Committee determined that the probability of future occurrence of failure of the Van Meter Levee or Adel Water Treatment Plant Levee is unlikely.

Probability Score: 1--Unlikely

3.4.11.2 Vulnerability

Vulnerability Overview

Levee failure is typically an additional or secondary impact of another disaster such as flooding or earthquake. The impacts to the City of Van Meter or the City of Adel from levee failure would be similar to those associated with flood. Since the levees are not accredited levees engineered to provide protection from the 1percent annual chance flood, associated property losses as a result of failure are included in the flood loss estimates for Van Meter and Adel provided in the River Flood Hazard Vulnerability Analysis in Section 3.4.12. The main issue is that failure of any size levee in the midst of a flood event has the potential to result in more destruction to property and infrastructure as well as an increased potential for loss of life due to the speed of onset and greater depth, extent, and velocity of flooding.

Potential Losses to Existing Development

If the Van Meter levee system were to fail, there would be damage to the buildings and infrastructure on both sides of the project. Since the specific protected area has not been designated on the Digital Flood Insurance Rate Map, it is not possible to estimate specific losses. However, the image in Figure 3.31 shows that development is present on both sides of the system and could be damaged in the event of failure or overtopping.

If the Adel Water Treatment Plant levee fails, this would result in damage to the water treatment facility and the loss of potable water in the city. The water treatment facility's replacement value is $703,950 and the contents are valued at $105,650. Additionally, due to the potential speed of onset, this could also result in loss of life.

According to FEMA standard values for loss of service for utilities reported in the 2009 BCA Reference Guide, the economic impact as a result of loss of potable water is $93 per person per day of lost service. The loss of potable water in Adel (2010 population of 3,682) as a result of failure of the levee would result in $342,426 per day in loss of use damages.

Magnitude Score: 2--Limited

Future Development

Additional development in the area protected by the Van Meter levee would increase the vulnerability to this hazard.

Levee Failure Hazard Summary by Jurisdiction

The Cities of Van Meter and Adel are the only jurisdiction that would be impacted by this hazard.

Jurisdiction	Probability	Magnitude	Warning Time	Duration	Score	Level
Dallas County	N/A	N/A	N/A	N/A	N/A	N/A
Cities						
Adel	1	2	4	4	2.05	Moderate
Bouton	N/A	N/A	N/A	N/A	N/A	N/A
Clive*	N/A	N/A	N/A	N/A	N/A	N/A
Dallas Center	N/A	N/A	N/A	N/A	N/A	N/A
Dawson	N/A	N/A	N/A	N/A	N/A	N/A
DeSoto	N/A	N/A	N/A	N/A	N/A	N/A
Dexter	N/A	N/A	N/A	N/A	N/A	N/A
Granger	N/A	N/A	N/A	N/A	N/A	N/A
Grimes*	N/A	N/A	N/A	N/A	N/A	N/A
Linden	N/A	N/A	N/A	N/A	N/A	N/A
Minburn	N/A	N/A	N/A	N/A	N/A	N/A
Perry	N/A	N/A	N/A	N/A	N/A	N/A
Redfield	N/A	N/A	N/A	N/A	N/A	N/A
Urbandale*	N/A	N/A	N/A	N/A	N/A	N/A
Van Meter	1	2	4	4	2.05	Moderate
Waukee	N/A	N/A	N/A	N/A	N/A	N/A
West Des Moines	N/A	N/A	N/A	N/A	N/A	N/A
Woodward	N/A	N/A	N/A	N/A	N/A	N/A
School Districts						
Adel-DeSoto-Minburn Schools	N/A	N/A	N/A	N/A	N/A	N/A
Dallas Center-Grimes Schools	N/A	N/A	N/A	N/A	N/A	N/A
Perry Schools	N/A	N/A	N/A	N/A	N/A	N/A
Van Meter Schools	N/A	N/A	N/A	N/A	N/A	N/A
Waukee Schools	N/A	N/A	N/A	N/A	N/A	N/A
West Central Valley Schools	N/A	N/A	N/A	N/A	N/A	N/A
Woodward-Granger Schools	N/A	N/A	N/A	N/A	N/A	N/A

* These jurisdictions are included in the risk assessment although they are not officially participating jurisdictions in the Dallas County Plan. Portions of these jurisdictions are in both Dallas and Polk Counties. According to Iowa Emergency Management and Homeland Security, these jurisdictions will participate in the Polk County Hazard Mitigation Plan update.

3.4.12 River Flooding

Hazard Score Calculation					
Probability	Magnitude/Severity	Warning Time	Duration	Weighted Score	Level
4	3	1	4	3.25	High

3.4.12.1 Profile

Hazard Description

Flooding has been a major problem for many of the communities in Dallas County. Many of the communities were settled and developed largely because of their proximity to water resources. A flood is partial or complete inundation of normally dry land areas. Heavy precipitation can cause flooding either in the region of precipitation or in areas downstream. Heavy accumulations of ice or snow can also cause flooding during the melting stage. These events are complicated by the freeze/thaw cycles characterized by moisture thawing during the day and freezing at night. There are two main types of flooding in the planning area: riverine flooding and flash flooding which includes ice jam flooding. Flash flooding is discussed separately in Section 3.4.7.

Riverine flooding is defined as the overflow of rivers, streams, drains, and lakes due to excessive rainfall, rapid snowmelt or ice melt. The areas adjacent to rivers and stream banks that carry excess floodwater during rapid runoff are called floodplains. A floodplain is defined as the lowland and relatively flat area adjoining a river or stream. The terms “base flood” and “100-year flood” refer to the area in the floodplain that is subject to a one percent or greater chance of flooding in any given year. Floodplains are a larger entity called a basin, which is defined as all the land drained by a river and its branches.

Flooding caused by dam and levee failure is discussed in Section 3.4.2 and Section 3.4.11 respectively.

Warning Time Score: 1—More than 24 hours warning time

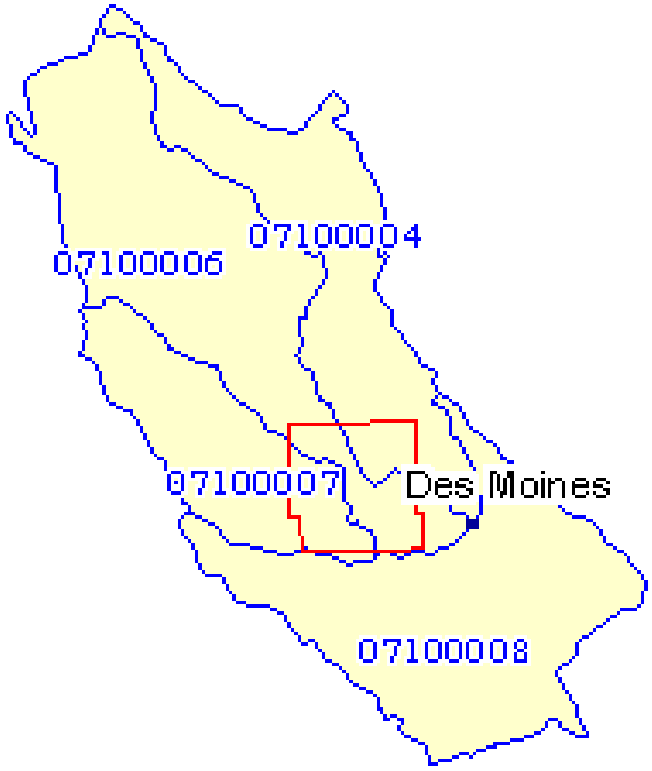
Duration Score: 4 More than 1 week

Geographic Location/Extent

Dallas County crosses four watersheds as follows:

- Middle Des Moines Watershed (07100004)—this watershed crosses the northeast corner of Dallas County.
- North Raccoon Watershed (07100006)—this watershed crosses from the northwest to southeast.
- South Raccoon Watershed (07100007)—this watershed crosses over the western edge and southwestern corner.
- Lake Red Rock Watershed (07100008)—there is a very small portion of this watershed along the southern boundary of Dallas County.

Table 3.49. Dallas County, Iowa Watersheds (Dallas County is red square)



Source: Environmental Protection Agency, http://cfpub.epa.gov/surf/county.cfm?fips_code=19049

For purposes of this hazard profile and vulnerability analysis, the geographic location/extent for river flooding will be considered as those areas at risk to the 100-year flood (also known as the 1-percent annual chance flood). The 1-percent annual chance flood has been adopted by FEMA as the base flood for floodplain management purposes.

The 1-percent annual chance flood has been determined for the planning area as depicted on the effective Digital Flood Insurance Rate Maps (DFIRM) for Adel, Bouton, Dallas Center, Dawson, DeSoto, Dexter, Granger, Linden, Minburn, Perry, Redfield, Van Meter, Waukee, Woodward, and the unincorporated portions of the County. For Clive, Grimes, Urbandale, and Wes Des Moines, the geographic location/extent utilized to determine areas at risk to the 1-percent annual chance flood have been derived from preliminary DFIRMs that were made available during the development of this mitigation plan. Large portions of these cities are located in adjacent Polk County and they will be included in the Polk County Flood Insurance Study and map update effort. *Please note that preliminary DFIRMs are utilized in this plan as the best information available and are subject to change.*

Jurisdictional Flood Hazard Maps and Descriptions

Effective DFIRMs were available for: Adel, Bouton, Dallas Center, Dawson, DeSoto, Dexter, Granger, Linden, Minburn, Perry, Redfield, Van Meter, Waukee, Woodward, and the unincorporated portions of Dallas County. For Clive, Grimes, Urbandale, and Wes Des Moines,

preliminary DFIRMs were available during the development of this mitigation plan. These cities are dual county communities geographically located in southeast Dallas County and southwest Polk County. Because the majority of their landmasses are located in Polk County, the entire communities of the Cities of Clive, Grimes, Urbandale, and West Des Moines are being mapped with the Polk county FIS and FIRMS. Although the preliminary maps are not yet effective, they were utilized in this risk assessment as the best available data. Additionally, Clive, Grimes, Urbandale, and West Des Moines are not "official" plan participants of this Dallas County Multi-jurisdictional Hazard Mitigation Plan. Iowa Homeland Security and Emergency Management and Polk County Emergency Management have indicated that they will be included in the update to the Polk County Plan. However, since portions of these cities do cross into the Dallas County planning area, an overview assessment of their risk to this hazard will be provided for those portions of the cities on the Dallas County side of the boundary.

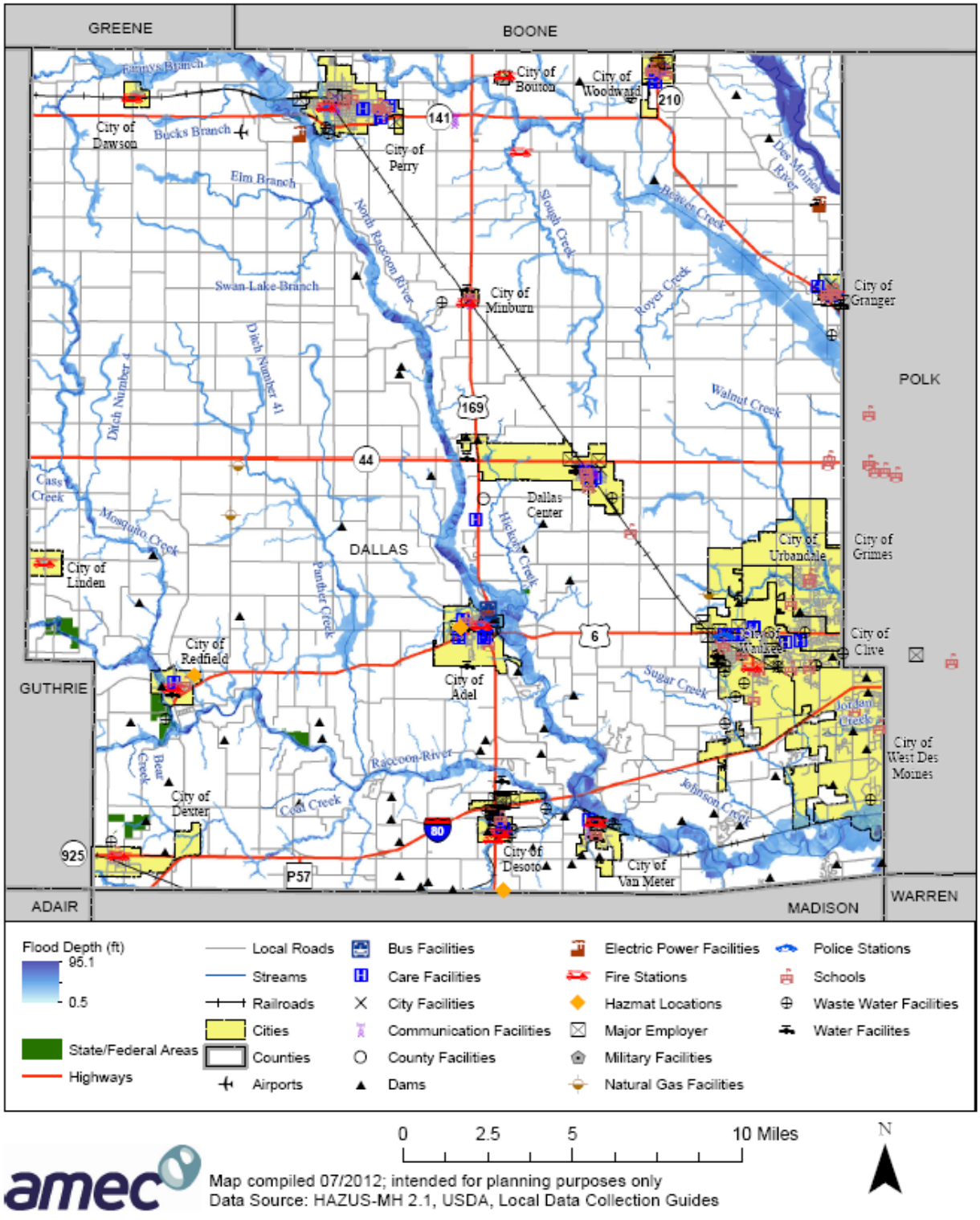
Floodplain depth grids were generated using the hydrology and hydraulic models available from the effective and preliminary DFIRMS and USDA LIDAR imagery data to produce maps depicting the 100-year floodplain areas for each jurisdiction. Figure 3.33 to Figure 3.51 provide the DFFIRM/Preliminary DFIRM 100-year floodplain for all jurisdictions in the planning area. The county-level map is provided first and the remaining maps are provided in alphabetical order by city. Locations of available critical facilities inventoried are included on the maps. These will be discussed in greater detail in the vulnerability section. Preceding each map is a general description of the flooding issues for each jurisdiction

The source of the data for the corporate boundaries is from the effective DFIRM. Since Dallas County and many of the incorporated areas have seen extensive growth, annexations have, and will likely, continue to occur. Annexations that have occurred subsequent to the DFIRM development have included mostly undeveloped land. Therefore, these annexed areas would not substantially alter risk assessment findings at this time. To access maps and other data regarding current corporate boundaries, please visit the Dallas County GIS Department's website at: http://www.co.dallas.ia.us/index.aspx?page=849.

Dallas County

The main flooding sources in Dallas County include Little Walnut Creek, north Raccoon River, Raccoon River, Raccoon River Mill Slough, and Walnut Creek. These areas were studied by detailed methods and reported in the 2007 Flood Insurance Study. An additional 212 stream reaches were studied by approximate methods. Figure 3.33 provides a county-level map depicting the rivers and tributaries in the planning area compiled using the effective DFIRM.

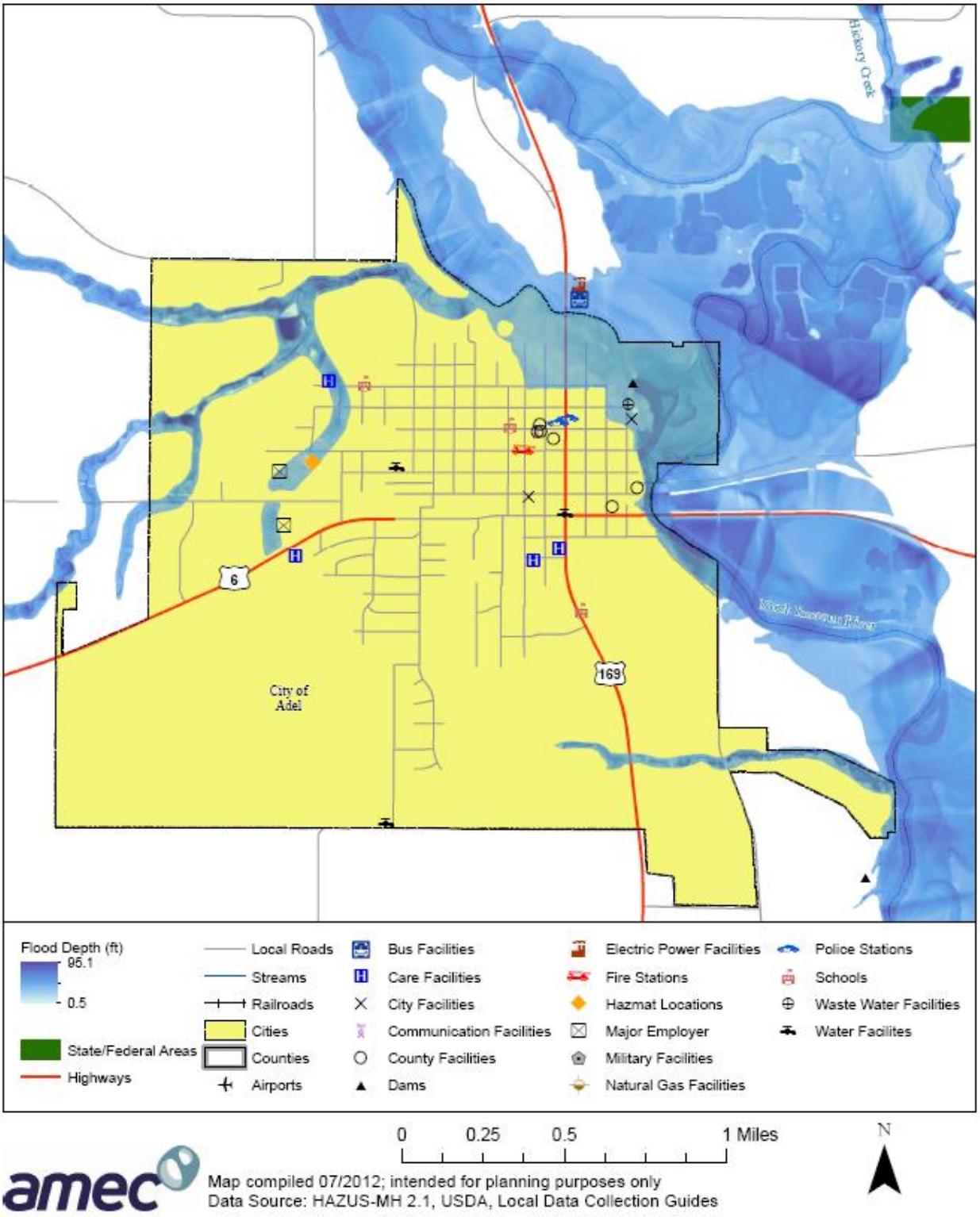
Figure 3.33. Dallas County 100-Year Floodplain (Effective DFIRM)



Adel

The City of Adel is located approximately 10 miles west of the City of Des Moines. The primary flooding sources are the North Raccoon River and Raccoon River Mill Slough, a man-made off-shoot of the North Raccoon River. As shown in the map in Figure 3.34, the northeast corner of the city boundary is at most risk to the 1-percent annual chance flood. Narrow floodplains from several small tributaries also are present in the northwest portion of the city.

Figure 3.34. Adel 100-Year Floodplain (Effective DFIRM)



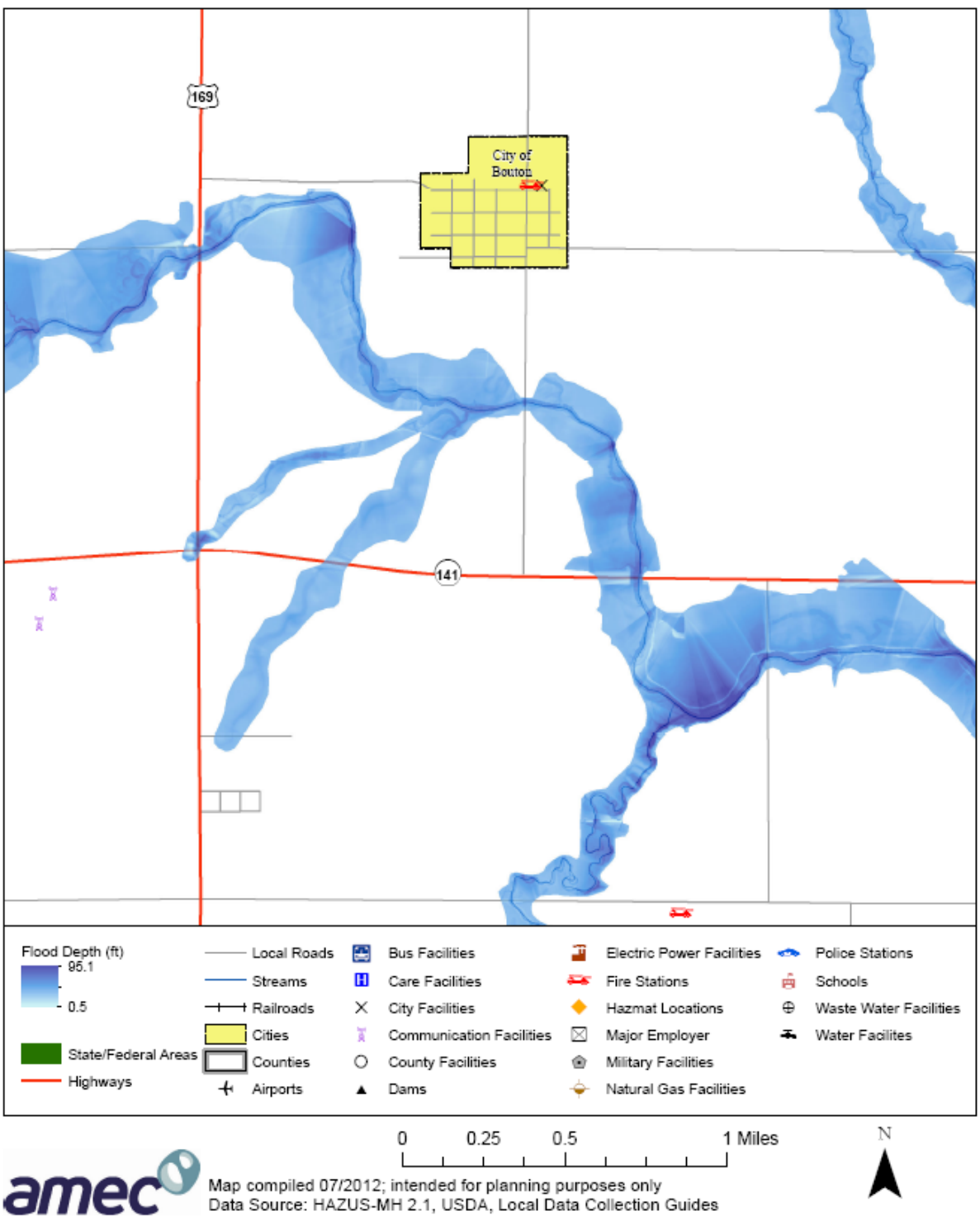
amec

Map compiled 07/2012; intended for planning purposes only
Data Source: HAZUS-MH 2.1, USDA, Local Data Collection Guides

Bouton

According to the 2007 Flood Insurance Study, the City of Bouton has been determined by FEMA to be a non flood-prone community. As shown in the map in Figure 3.35, there are no identified floodplains in the city limits of Bouton.

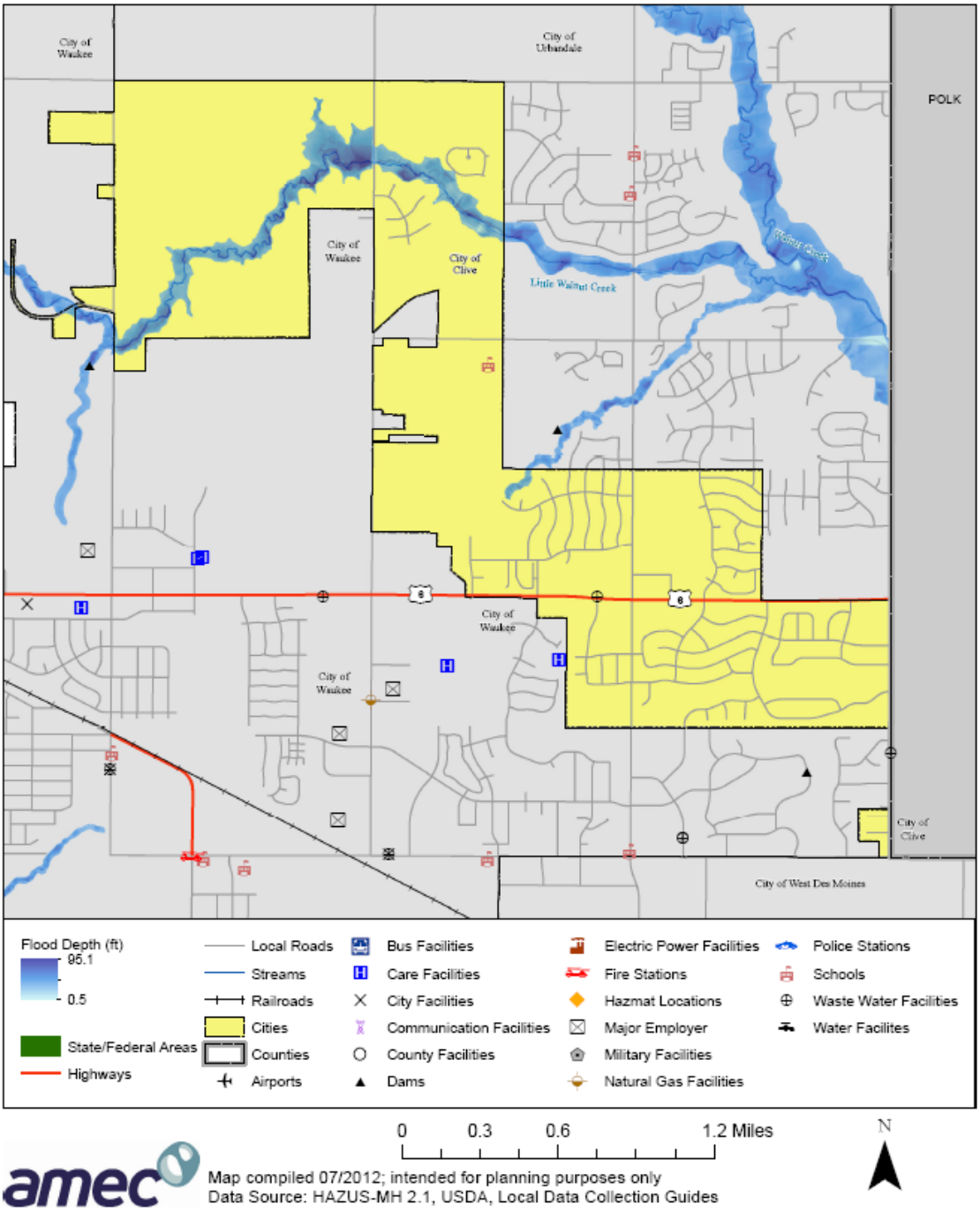
Figure 3.35. City of Bouton (Effective DFIRM)



Clive

The Little Walnut Creek Floodplain crosses through the northern portion of the city limits and a very small end of a tributary to Little Walnut Creek extends into the western portion of the city. The City of Clive is not an “official” participant of the Dallas County Multi-jurisdictional Hazard Mitigation Plan. See the Polk County plan update for additional details regarding flood risk of Clive.

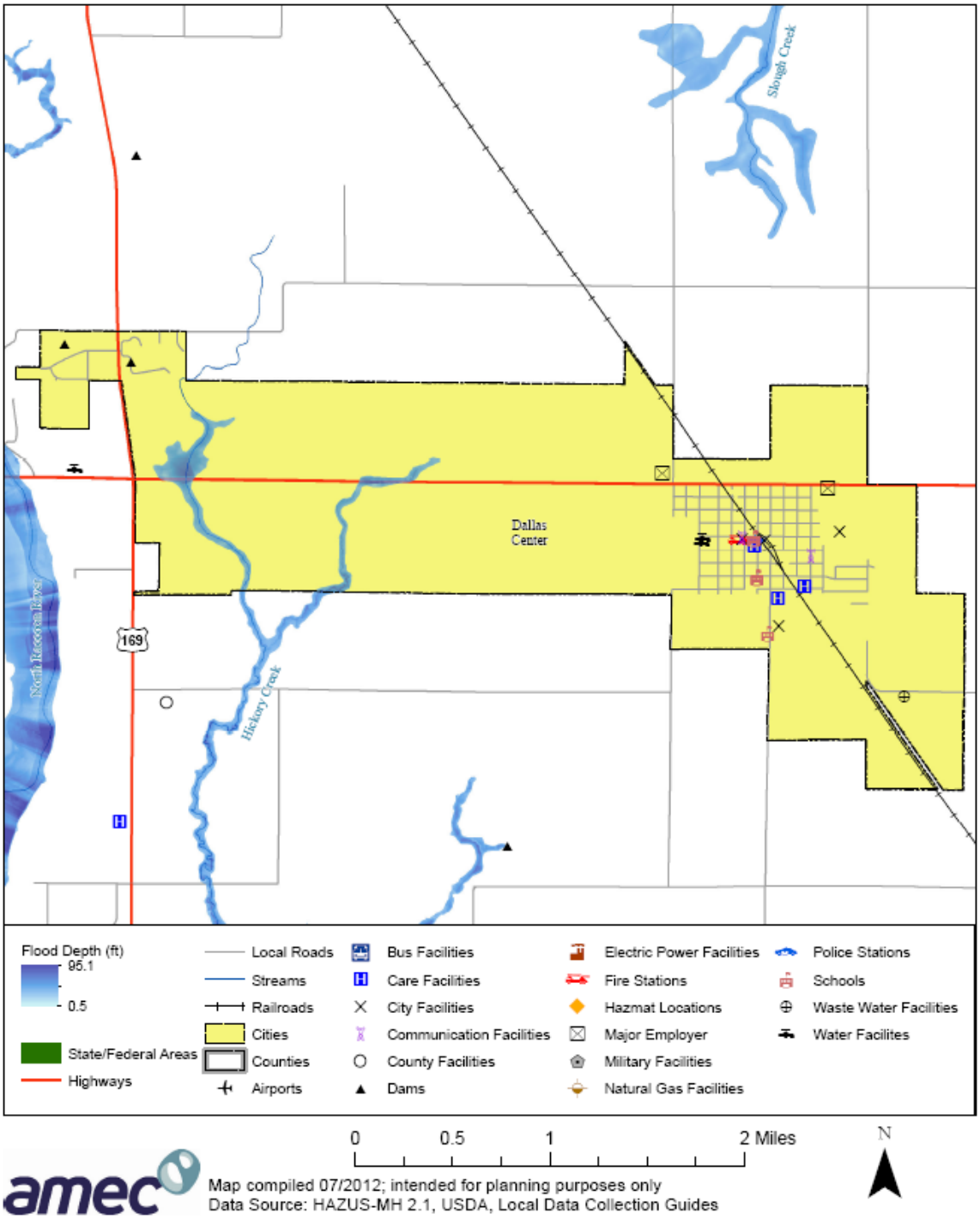
Figure 3.36. Clive 100-Year Floodplain (Preliminary DFIRM)



Dallas Center

Narrow floodplains of Hickory Creek and a small tributary extend into Dallas Center from the Southern boundary. Additionally, the North Raccoon River is in close proximity to the western city boundary.

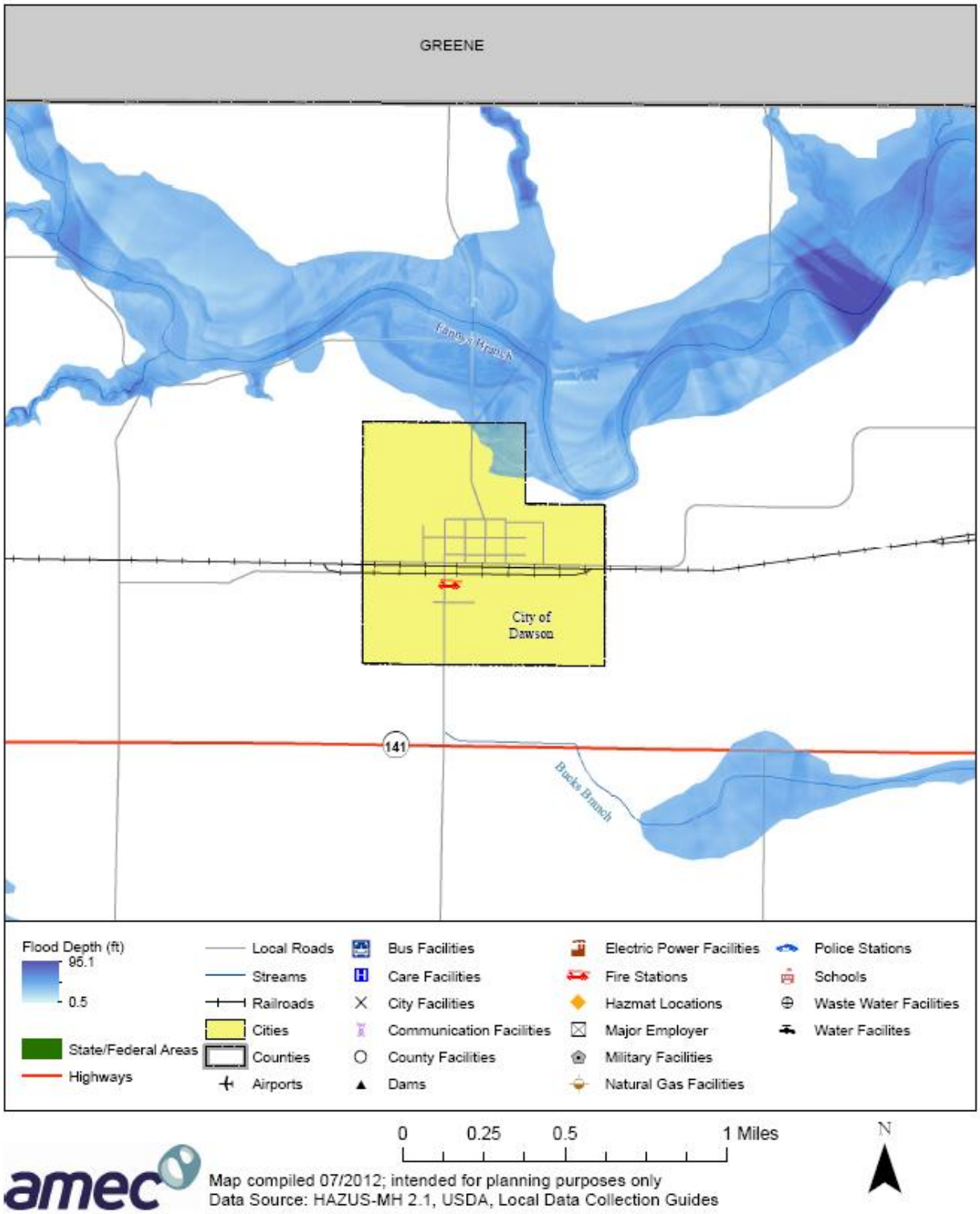
Figure 3.37. Dallas Center 100-Year Floodplain (Effective DFIRM)



Dawson

A small portion of the northeast corner of the City of Dawson lies in the floodplain of Fannys Branch.

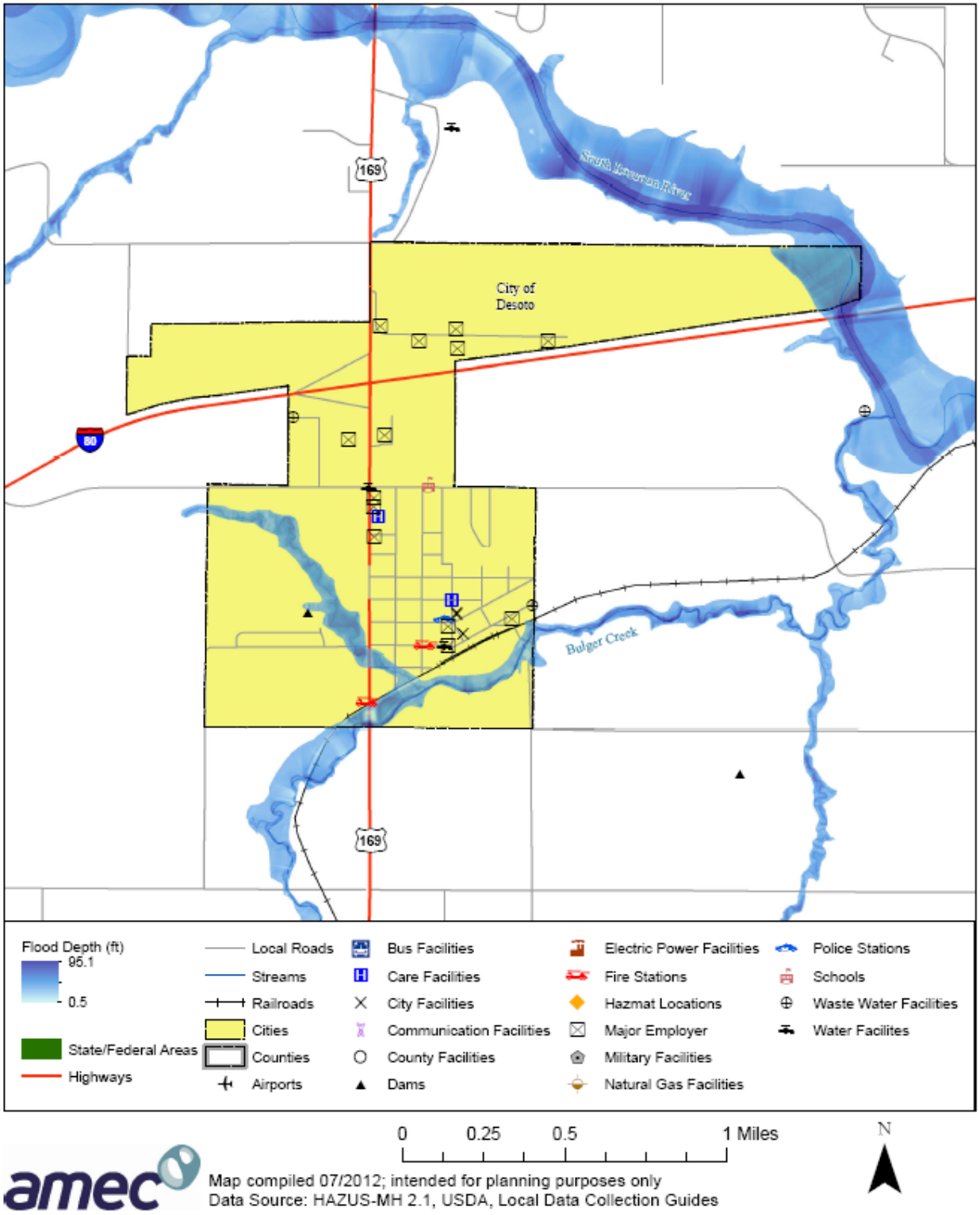
Figure 3.38. Dawson 100-Year Floodplain (Effective DFIRM)



DeSoto

The South Raccoon River floodplain extends over the far northeast portion of the City of DeSoto. In addition, narrow floodplains of Bulger Creek and a tributary, extend into southern city limits.

Figure 3.39. DeSoto 100-Year Floodplain (Effective DFIRM)

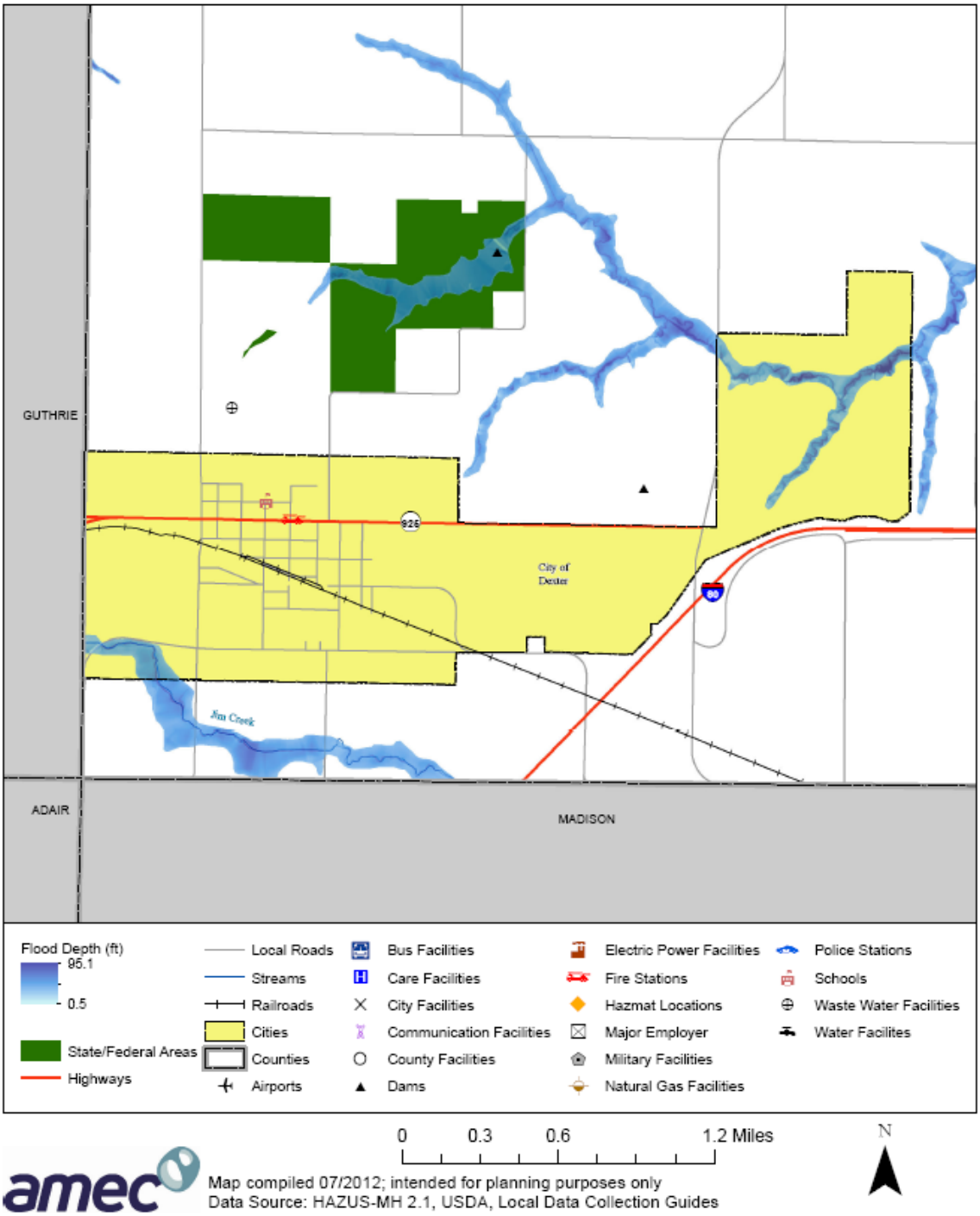


Map compiled 07/2012; intended for planning purposes only
Data Source: HAZUS-MH 2.1, USDA, Local Data Collection Guides

Dexter

According to the 2007 Flood Insurance Study, the City of Dexter has been determined by FEMA to be a non flood-prone community. However, Coal Creek extends into the northeast portion of the City of Dexter and Jim Creek extends into the far southwest corner of city limits as shown in the map below.

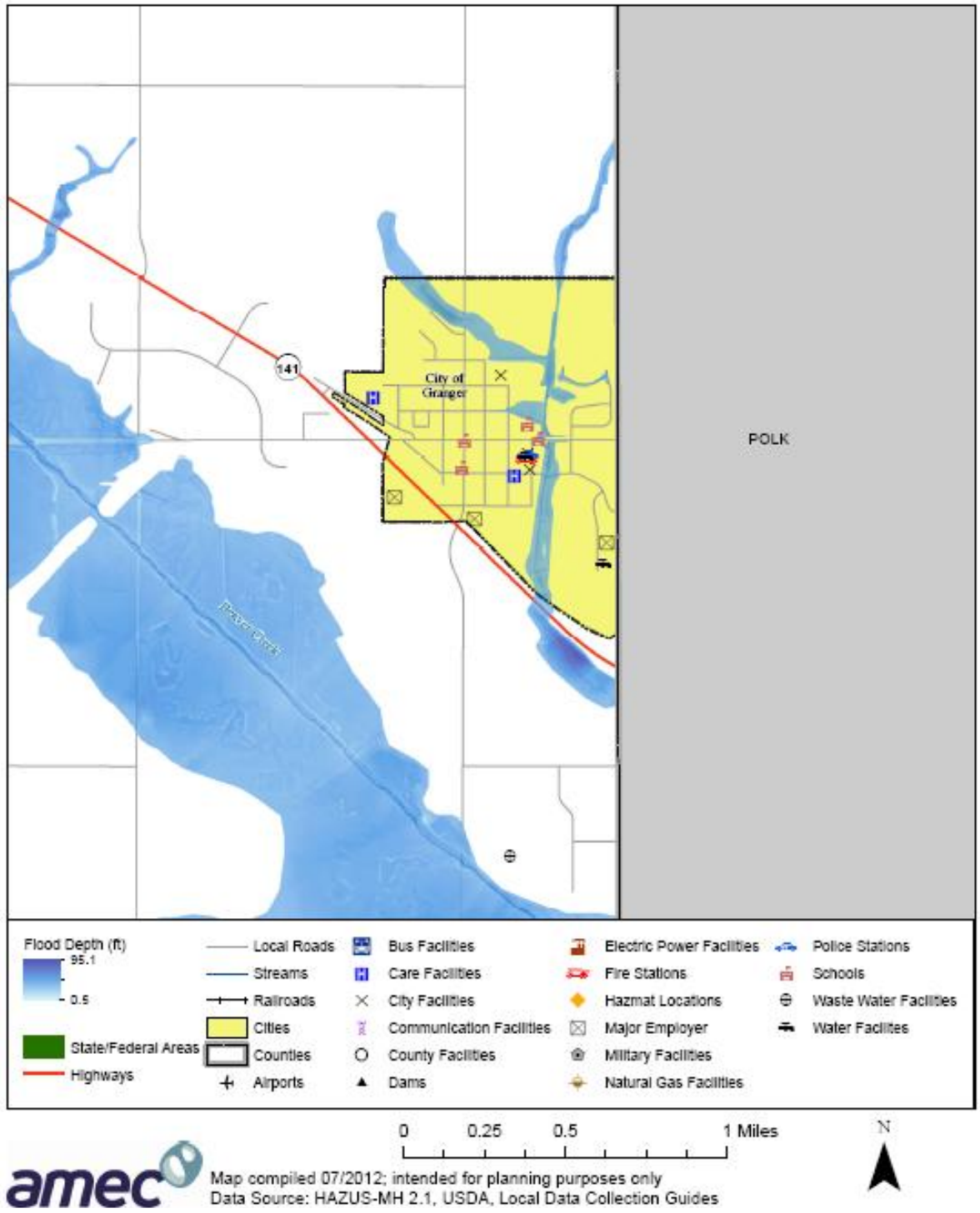
Figure 3.40. Dexter 100-Year Floodplain (Effective DFIRM)



Granger

Narrow tributaries of Beaver Creek extend into the City of Granger as depicted in the map below bisecting the city from north to south.

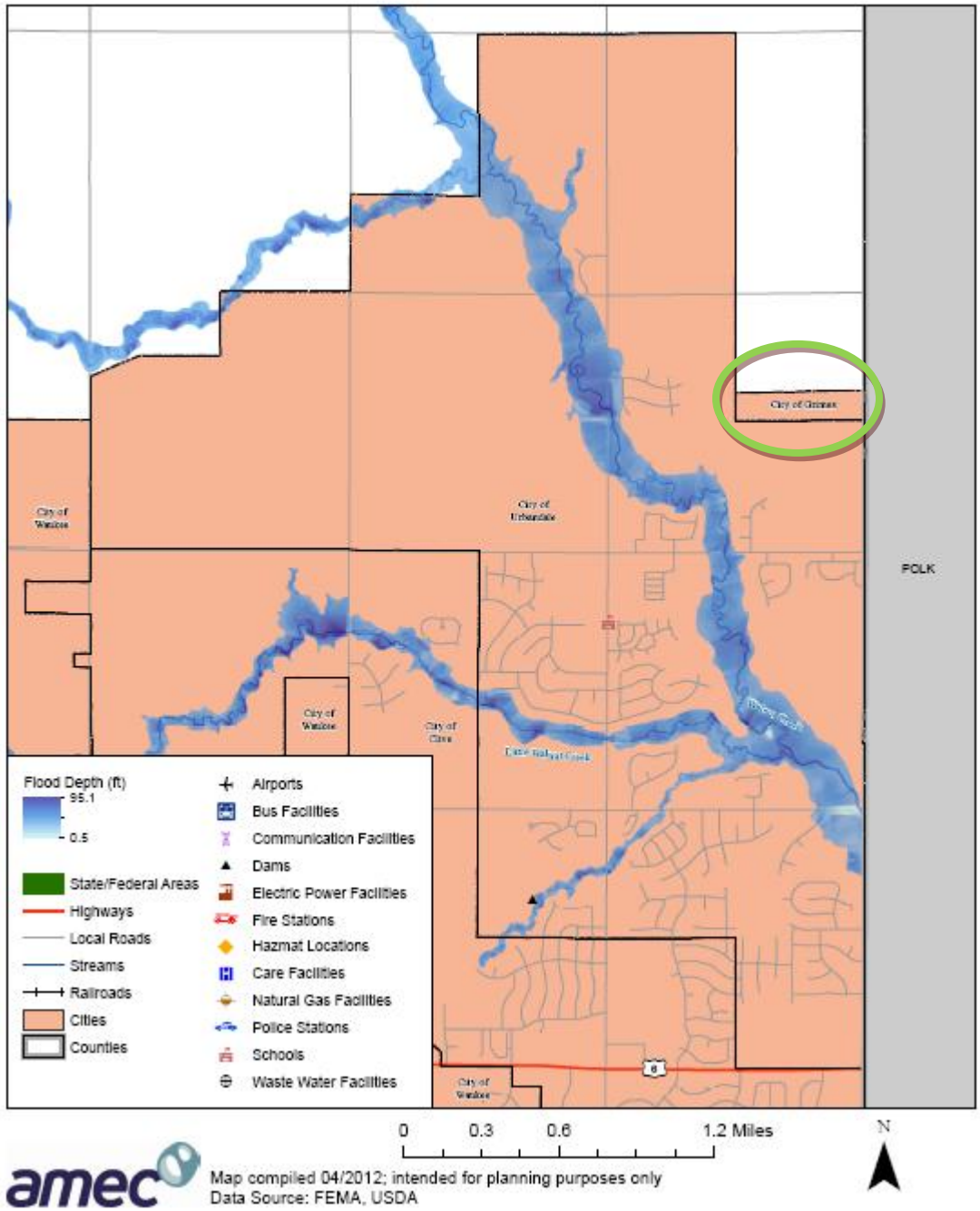
Figure 3.41. Granger 100-Year Floodplain (Effective DFIRM)



Grimes

There are no rivers/floodplains in the portion of Grimes that extends into Dallas County (see area circled in green). The City of Grimes is not an "official" participant of the Dallas County Multi-jurisdictional Hazard Mitigation Plan. See the Polk County plan update for additional details regarding flood risk of the City of Grimes.

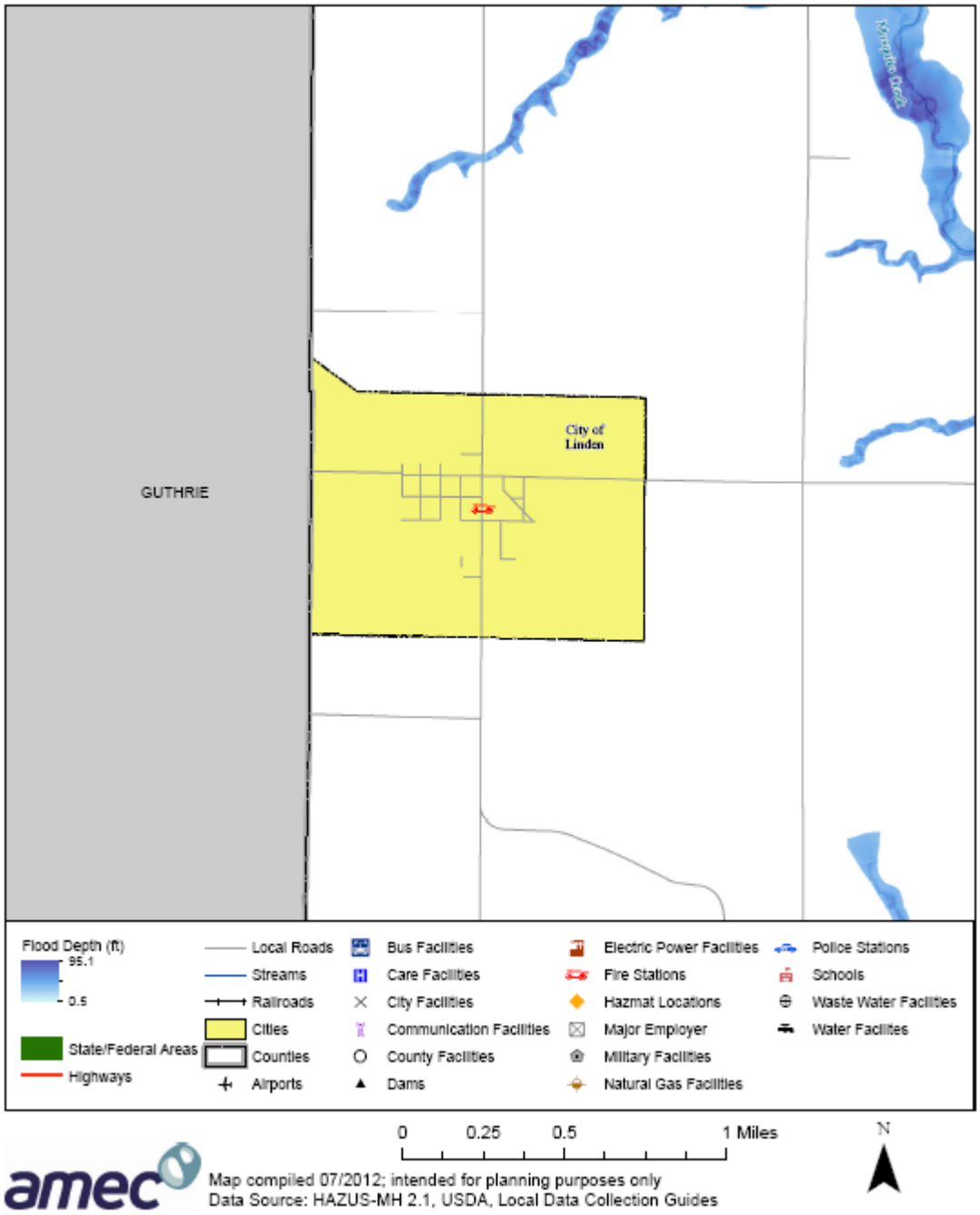
Figure 3.42. Grimes 100-Year Floodplain (Preliminary DFIRM)



Linden

According to the 2007 Flood Insurance Study, the City of Linden has been determined by FEMA to be a non flood-prone community. As shown in the map below, there are no rivers/floodplains in Linden city limits.

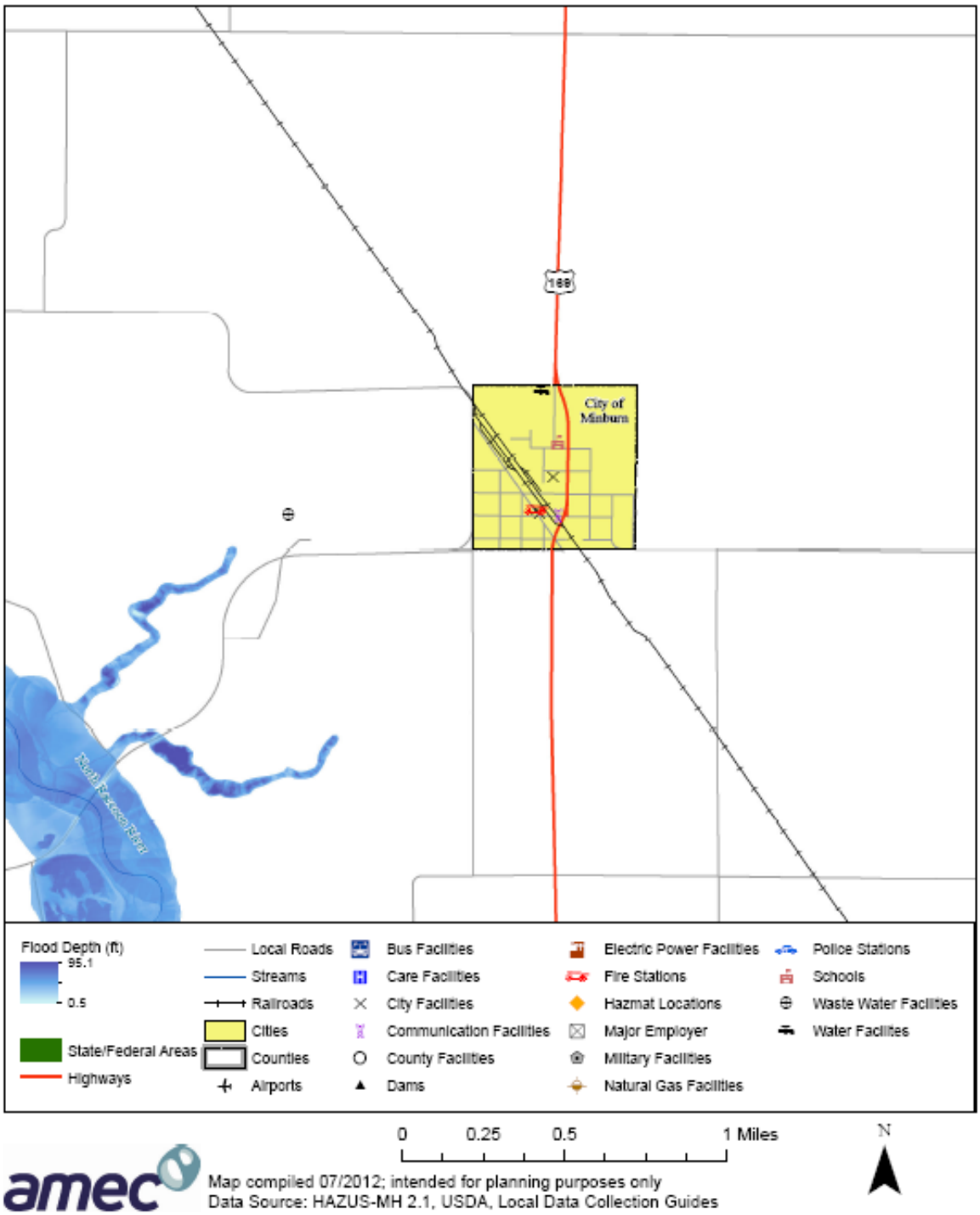
Figure 3.43. Linden (Effective DFIRM)



Minburn

According to the 2007 Flood Insurance Study, the City of Minburn has been determined by FEMA to be a non flood-prone community. As shown in the map below, there are no rivers/floodplains in Minburn city limits.

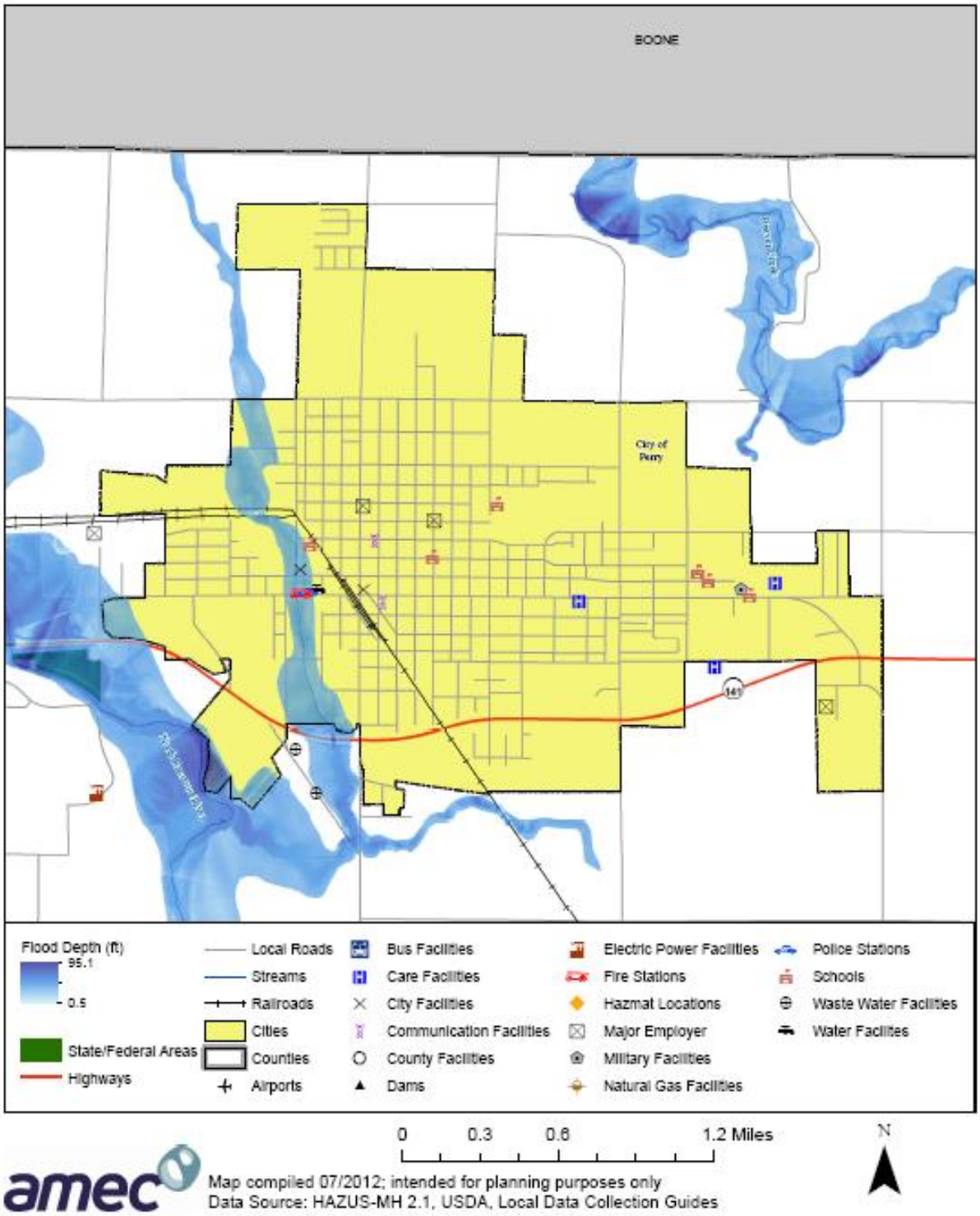
Figure 3.44. Minburn 100-Year Floodplain (Effective DFIRM)



Perry

Floodplains of the North Raccoon River and a tributary, Frog Creek, extend over portions of western city limits.

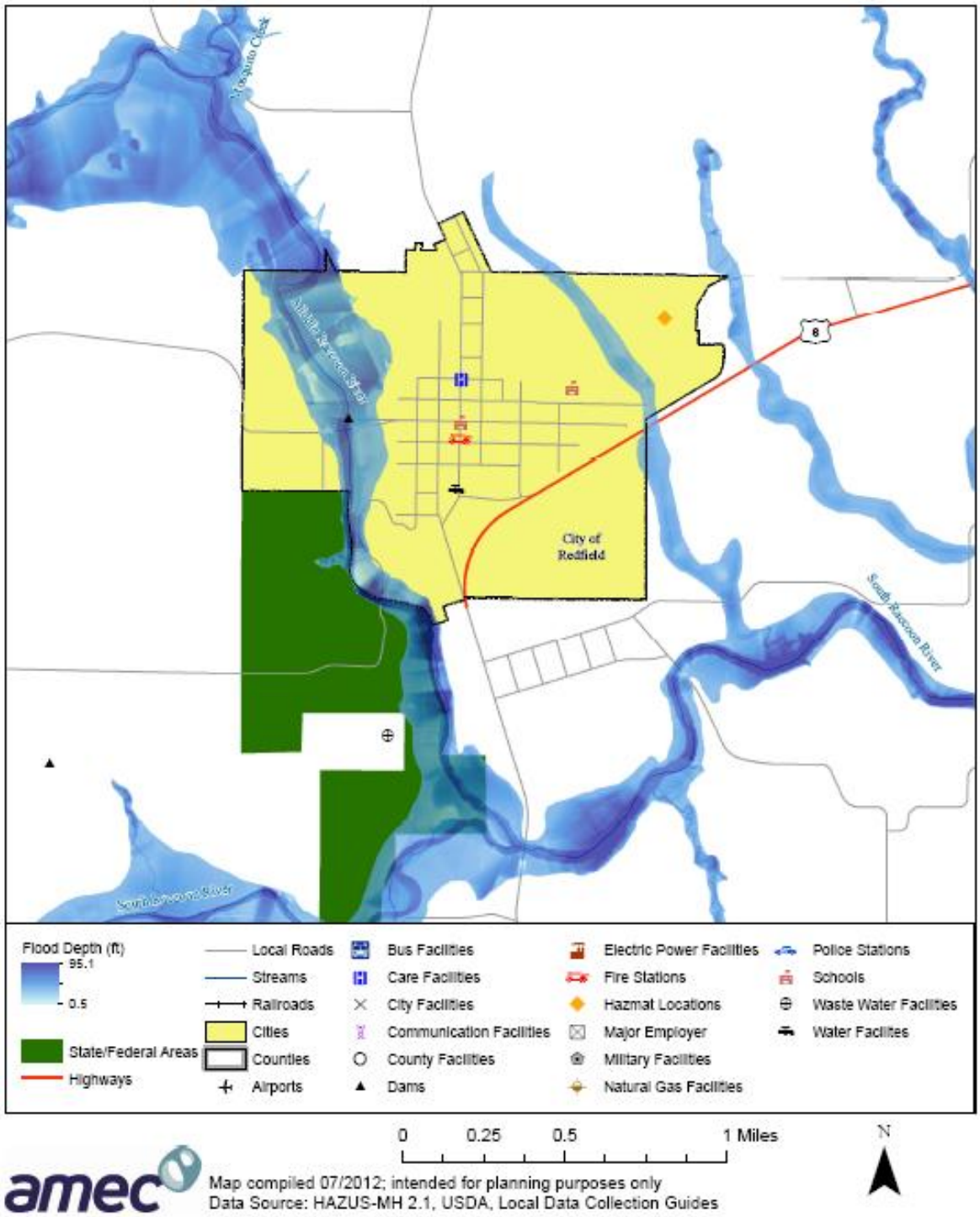
Figure 3.45. Perry 100-Year Floodplain (Effective DFIRM)



Redfield

Middle Raccoon River and its floodplain extend across the western portion of the City of Redfield. In addition, a narrow floodplain of a tributary of South Raccoon River crosses the eastern portion of the City.

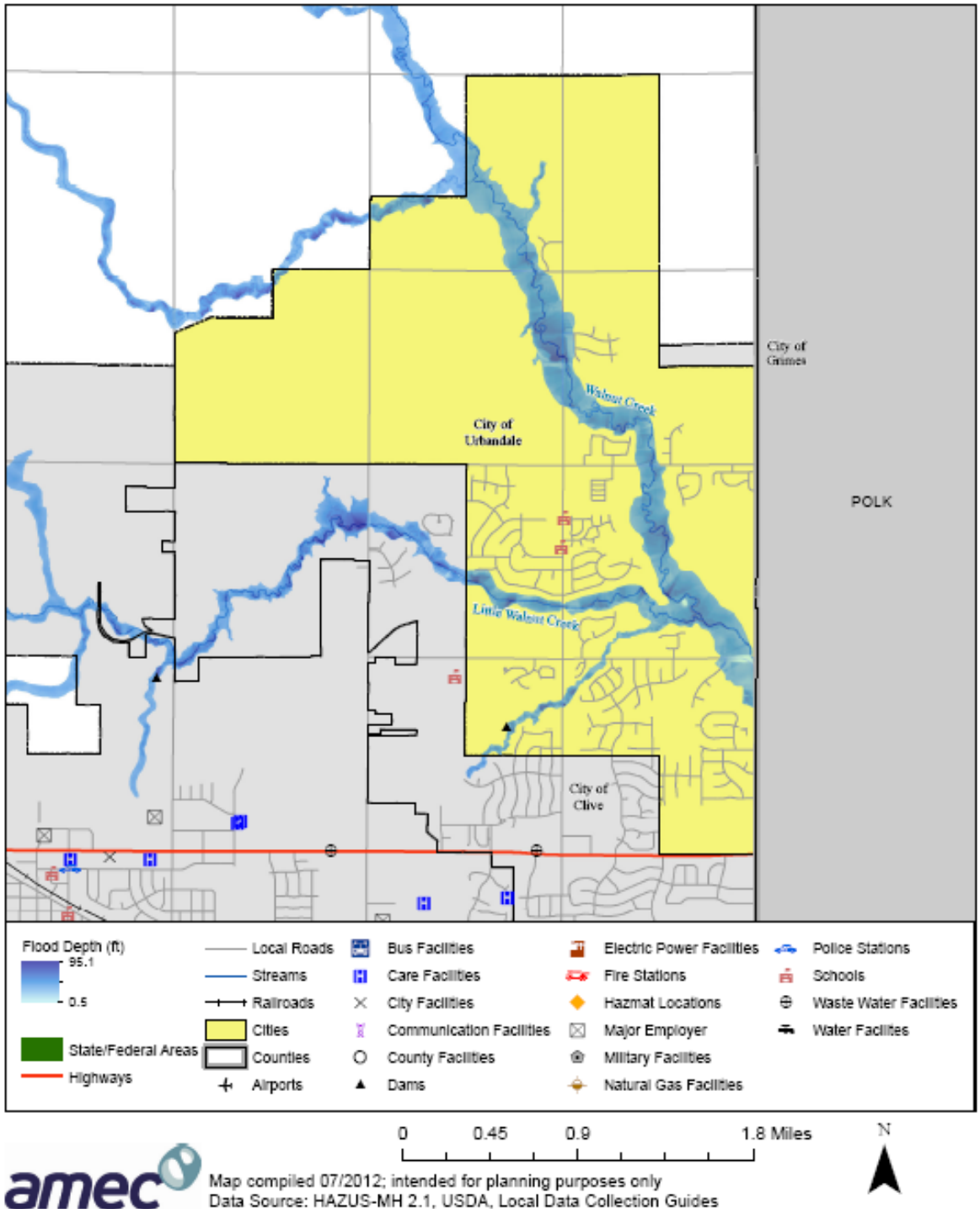
Figure 3.46. Redfield 100-Year Floodplain (Effective DFIRM)



Urbandale

Walnut Creek and Little Walnut Creeks extend into the City of Urbandale on the Dallas County Side of the County line. The City of Urbandale is not an "official" participant of the Dallas County Multi-jurisdictional Hazard Mitigation Plan. See the Polk County plan update for additional details regarding flood risk of the City of Urbandale.

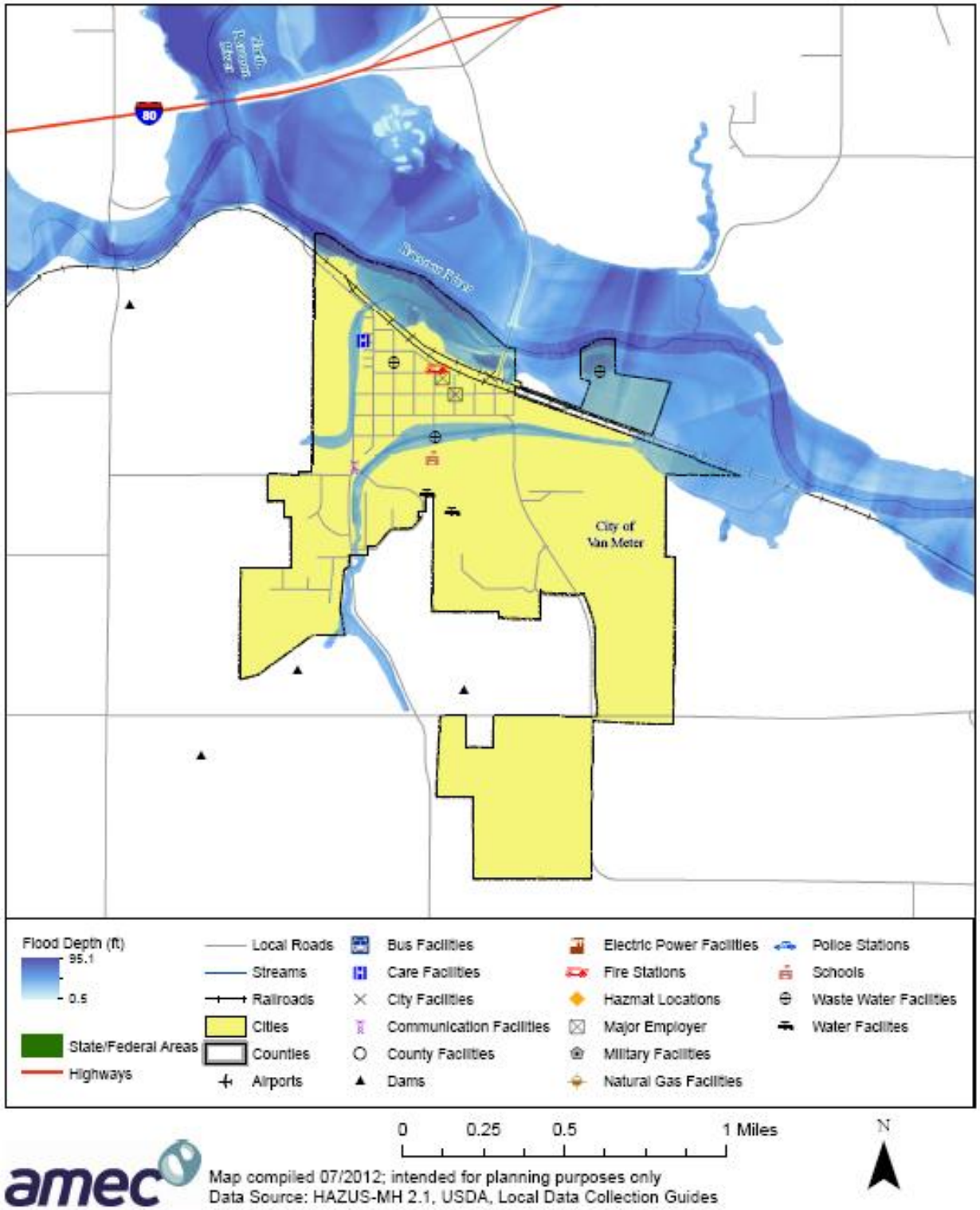
Figure 3.47. Urbandale 100-Year Floodplain (Preliminary DFIRM)



Van Meter

The Raccoon River floodplain extends across the northern boundary of the City of Van Meter.

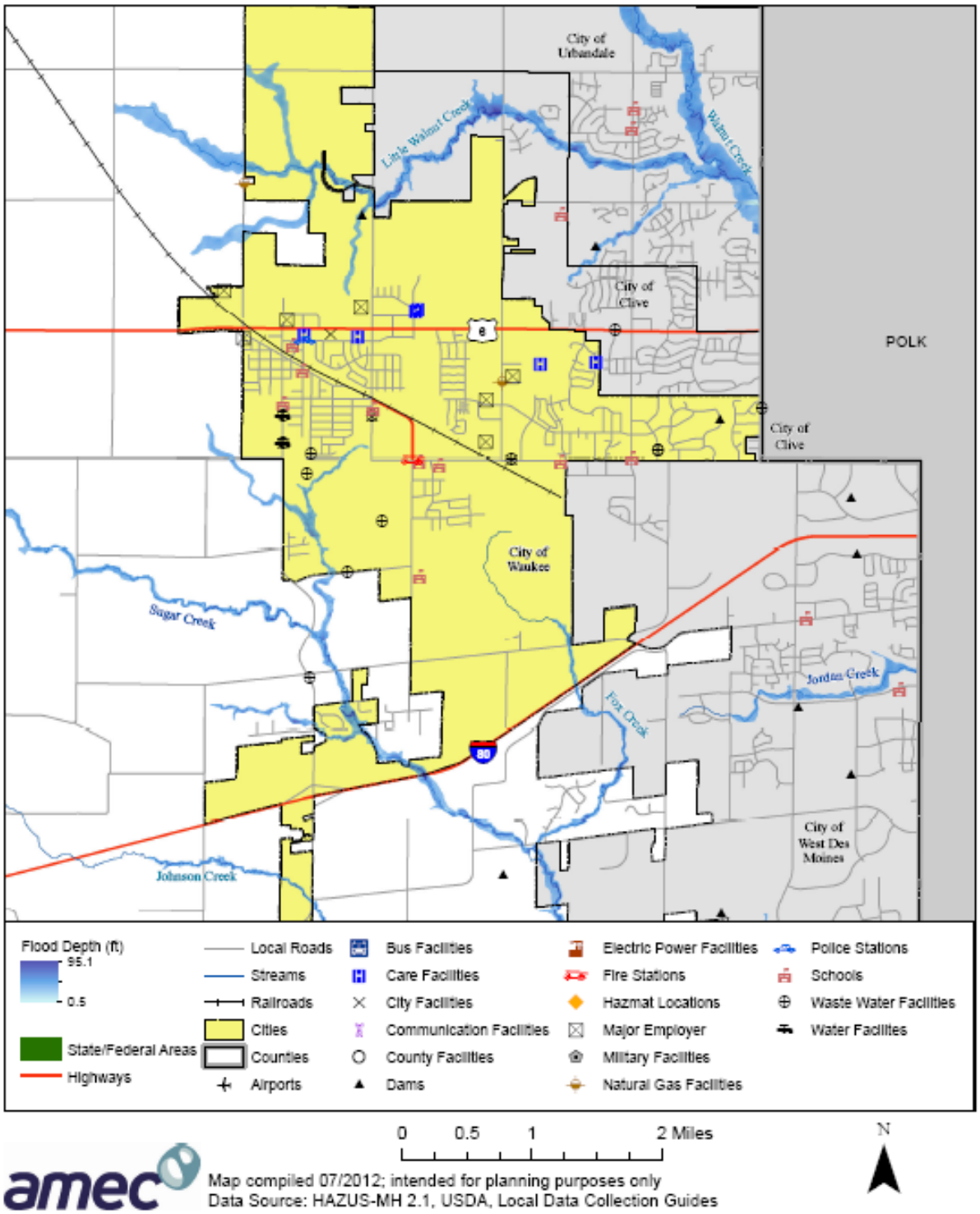
Figure 3.48. Van Meter 100-Year Floodplain (Effective DFIRM)



Waukee

Little Walnut Creek extends through the northern portion of the City of Waukee and Sugar Creek extends across the south.

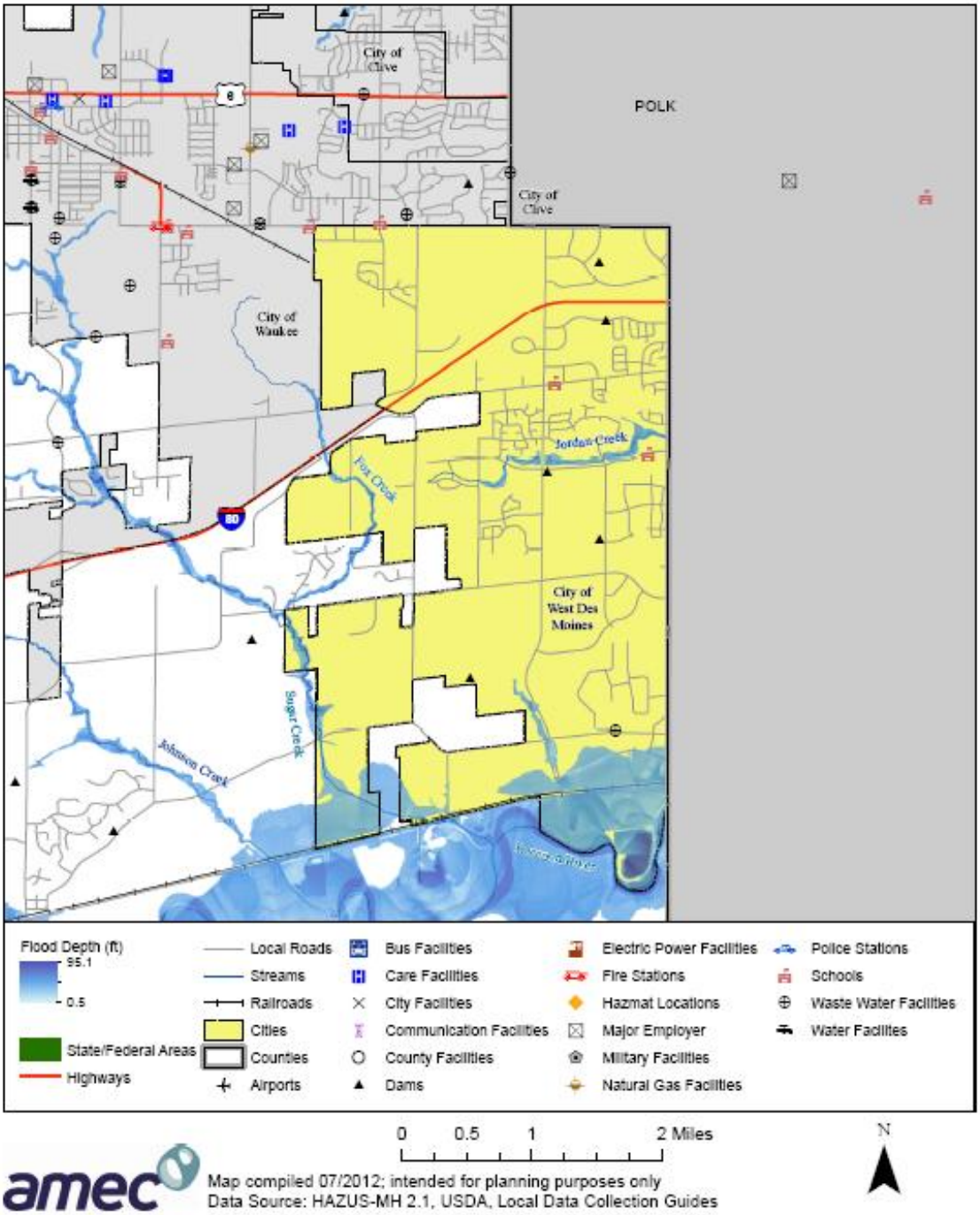
Figure 3.49. Waukee 100-Year Floodplain (Effective DFIRM)



West Des Moines

The floodplains of Fox Creek, Jordan Creek, Sugar Creek, and the Raccoon River impact the portions of West Des Moines that are in Dallas County. The City of West Des Moines is not an "official" participant of the Dallas County Multi-jurisdictional Hazard Mitigation Plan. See the Polk County plan update for additional details regarding flood risk of West Des Moines.

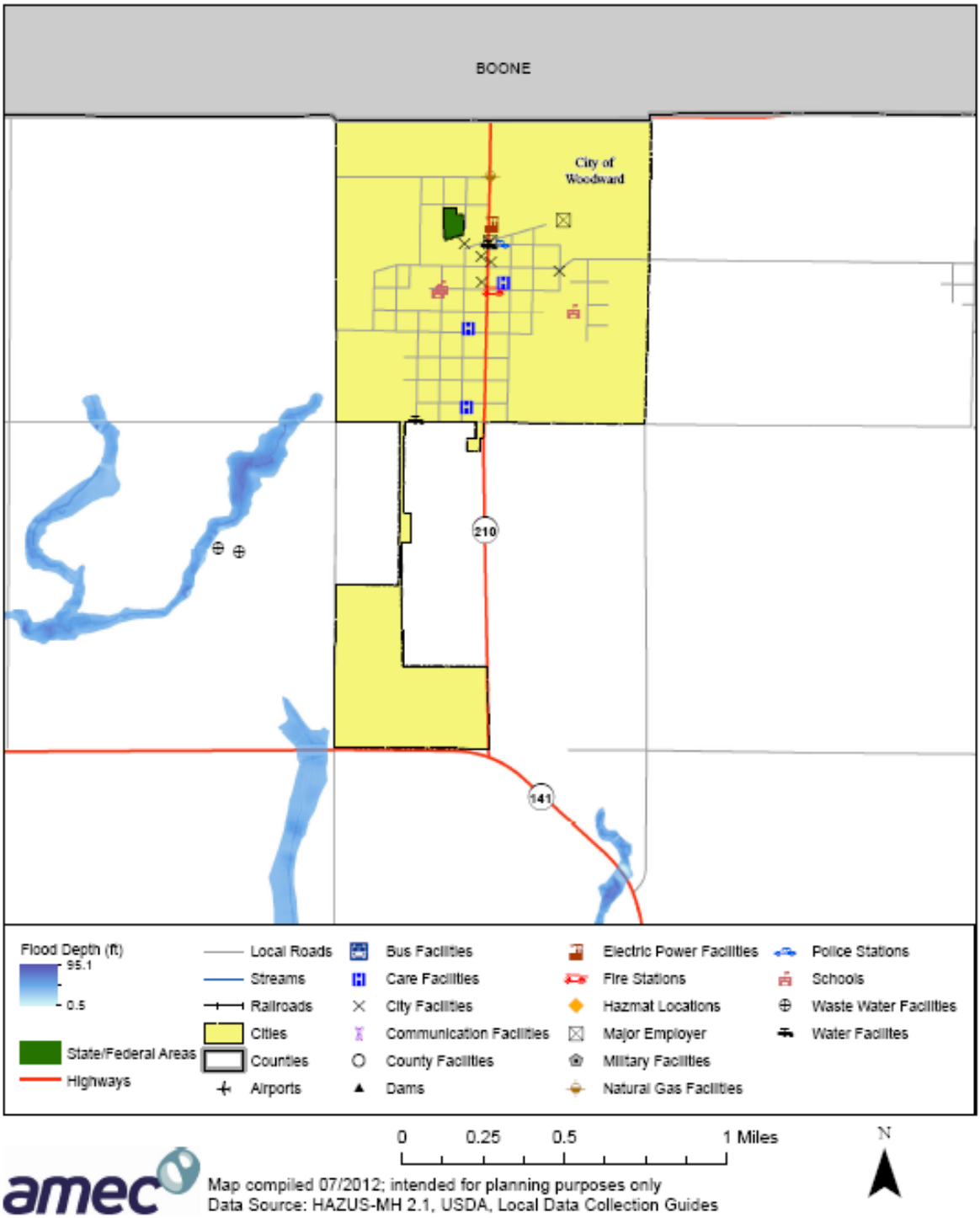
Figure 3.50. West Des Moines 100-Year Floodplain (Preliminary DFIRM)



Woodward

According to the 2007 Flood Insurance Study, the City of Woodward has been determined by FEMA to be a non flood-prone community. As shown in the map below, there are no rivers/floodplains in Woodward city limits.

Figure 3.51. Woodward 100-Year Floodplain (Effective DFIRM)



Previous Occurrences

Presidential Declarations for Flooding in Planning Area

Since 1965 there have been 9 Presidential Disaster Declarations that included flooding in the planning area. The details of these disaster declarations are provided in Table 3.50

Table 3.50. FEMA Flood Disaster Declarations that included Dallas County, Iowa, 1965-2011

Disaster Number	Description	Declaration Date (Incident Period)	IA/PA
DR-1930	Severe Storms, Flooding, & Tornadoes	7-29-2010 (6-1-2010 to 8-31-2010)	PA
DR-1763	Severe Storms, Tornadoes, & Flooding	5-27-2008 (5-25-2008 to 8-13-2008)	PA & IA
DR-1705	Severe Storms, Flooding, & Tornadoes	5-25-2007 (5-5-2007 to 5-7-2007)	IA
DR-1518	Severe Storms, Tornadoes, & Flooding	5-25-2004 (5-19-2004 to 6-24-2004)	IA
DR-1230	Severe Weather, Tornadoes, & Flooding	7-2-1998 (6-13-1998 to 7-15-1998)	IA & PA
DR-996	Flooding, Severe Storms	7-9-1993 (4-13-1993 to 10-1-1993)	IA & PA
DR-868	Flooding, Severe Storm	5-26-1990 (5-18-1990 to 7-6-1990)	IA & PA
DR-259	Flooding	4-25-1969 (4-25-1969 to 4-25-1969)	IA & PA
DR-193	Flooding	4-22-1965 (4-22-1965 to 4-22-1965)	IA & PA

Source: Federal Emergency Management Agency, www.fema.gov/; Note: Incident dates are in parentheses; PA= Public Assistance, IA= Individual Assistance

Previous Agricultural Impacts

Flooding and excess moisture take a toll on crop production in the planning area. According to the USDA's Risk Management Agency, payments for insured crop losses in the planning area as a result of excess moisture and flood conditions from 2001-2011 totaled $10,024,741. This translates to an annual average of $911,340.10. According to USDA Risk Management Agency's 2011 Iowa Crop Insurance Profile, 85percent of insurable crops in Iowa were insured. Table 3.51 summarizes the claims paid by year and type of event.

Table 3.51. Crop Insurance Claims Paid in Dallas County for Crop Loss as a result of Excess Moisture/Precipitation/Rain and flood (2001-2011)

Crop Year	Crop Name	Cause of Loss Description	Crop Insurance Paid
2001	OATS	Excess Moisture/Precip/Rain	$2,222.40
2001	CORN	Excess Moisture/Precip/Rain	$111,975.58
2001	SOYBEANS	Excess Moisture/Precip/Rain	$53,709.40
2002	SOYBEANS	Excess Moisture/Precip/Rain	$7,895.20
2003	CORN	Excess Moisture/Precip/Rain	$31,101.00
2003	SOYBEANS	Excess Moisture/Precip/Rain	$37,271.00
2004	CORN	Excess Moisture/Precip/Rain	$140,481.87
2004	SOYBEANS	Excess Moisture/Precip/Rain	$107,008.40
2005	CORN	Excess Moisture/Precip/Rain	$24,471.00
2005	SOYBEANS	Excess Moisture/Precip/Rain	$7,113.00

Crop Year	Crop Name	Cause of Loss Description	Crop Insurance Paid
2007	CORN	Excess Moisture/Precip/Rain	$188,687.00
2007	SOYBEANS	Excess Moisture/Precip/Rain	$47,415.00
2008	CORN	Excess Moisture/Precip/Rain	$2,247,445.83
2008	SOYBEANS	Excess Moisture/Precip/Rain	$1,582,695.41
2009	CORN	Excess Moisture/Precip/Rain	$96,242.32
2009	SOYBEANS	Excess Moisture/Precip/Rain	$52,430.00
2010	OATS	Excess Moisture/Precip/Rain	$2,047.00
2010	CORN	Excess Moisture/Precip/Rain	$3,827,536.21
2010	SOYBEANS	Excess Moisture/Precip/Rain	$230,475.00
2011	CORN	Excess Moisture/Precip/Rain	$276,698.50
2011	FRESH MARKET SWEET CORN	Excess Moisture/Precip/Rain	$42,018.00
2011	SOYBEANS	Excess Moisture/Precip/Rain	$103,779.00
2001	CORN	Flood	$12,216.00
2001	SOYBEANS	Flood	$2,009.00
2003	SOYBEANS	Flood	$3,156.50
2004	CORN	Flood	$49,059.00
2004	SOYBEANS	Flood	$18,150.00
2005	CORN	Flood	$1,821.00
2005	SOYBEANS	Flood	$4,002.00
2007	CORN	Flood	$13,630.48
2007	SOYBEANS	Flood	$13,806.00
2008	CORN	Flood	$442,165.50
2008	SOYBEANS	Flood	$210,520.50
2009	CORN	Flood	$1,140.00
2010	CORN	Flood	$7,451.00
2010	SOYBEANS	Flood	$23,250.00
2011	SOYBEANS	Flood	$1,646.00
Total			$10,024,741.10

Source: USDA Risk Management Agency, 2012

Jurisdictional Previous Occurrence Details

The following section provides previous occurrences for each jurisdiction within the planning area. First, historical events for the county are described, followed by reported events for each city

Dallas County

Historical Crests for the North Raccoon River near Perry are provided in Table 3.52 below. According to the National Weather Service's Advanced Hydrologic Prediction Service, levels above 14 feet are in "Action Stage", 15 feet is "Flood Stage", 18 feet is Moderate Flood Stage, and 20 feet is Major Flood Stage.

Table 3.52. Historical Crests for North Raccoon River Near Perry, Iowa

(1) 23.00 ft on 07/10/1993	(23) 16.26 ft on 08/27/2007
(2) 22.70 ft on 03/20/1979	(24) 16.20 ft on 03/10/1983
(3) 21.67 ft on 06/10/2008	(25) 16.15 ft on 05/14/1993
(4) 20.29 ft on 04/27/2007	(26) 16.06 ft on 06/25/1996
(5) 20.00 ft on 06/19/1990	(27) 15.80 ft on 04/30/1991
(6) 18.78 ft on 07/12/2003	(28) 15.74 ft on 05/19/1974
(7) 18.60 ft on 06/07/1991	(29) 15.70 ft on 06/25/1983
(8) 18.50 ft on 07/03/1983	(30) 15.17 ft on 04/18/1983
(9) 18.00 ft on 06/22/1984	(31) 15.16 ft on 04/24/1993
(10) 17.92 ft on 05/04/2001	(32) 15.00 ft on 07/11/1969
(11) 17.70 ft on 04/02/1984	(33) 14.95 ft on 04/03/1993
(12) 17.42 ft on 03/16/2007	(34) 14.89 ft on 07/02/1998
(13) 17.39 ft on 06/30/1986	(35) 14.82 ft on 03/21/1978
(14) 17.30 ft on 09/30/1973	(36) 14.80 ft on 06/21/1993
(15) 17.12 ft on 02/21/1971	(37) 14.70 ft on 05/20/1991
(16) 17.10 ft on 03/26/1969	(38) 14.63 ft on 03/05/1973
(17) 17.00 ft on 06/13/1967	(39) 14.59 ft on 09/19/1978
(18) 16.86 ft on 05/10/2007	(40) 14.46 ft on 05/10/1973
(19) 16.61 ft on 07/01/2005	(41) 14.40 ft on 05/14/1986
(20) 16.59 ft on 07/04/1973	(42) 14.35 ft on 06/17/2001
(21) 16.53 ft on 06/15/1998	(43) 14.24 ft on 10/14/1986
(22) 16.40 ft on 05/27/1990	(44) 14.09 ft on 08/20/1993

Source: National Weather Service, http://water.weather.gov/ahps2/hydrograph.php?wfo=dmx&gage=proi4&view=1,1,1,1,1,1,1,1

- **June/July/August 2010—**Heavy rainfall during the month of June caused considerable crop losses across the state. Crop damage was done through a combination of inundation flooding and losses due to crops not being able to be planted or rotting in the ground. Widespread flooding from June continued along several river systems across the state into July. For the most part, rivers crested early and then fell slowly during the first week of the month. The very wet weather pattern of June and July continued into the first two weeks of August. Central Iowa was hardest hit by rainfall with three consecutive nights of torrential rains on the 8th, 9th and 10th.

Table 3.53. Flood of 2010 in Adel, Iowa

Source: Jim McNeill, Adel Police Chief

- **June / July 2008—(DR-1763).** Federal Disaster declarations were issued by FEMA for much of the state as well with 80 of Iowa's 99 counties receiving the Federal Declaration. Reports from the state indicated that 125 miles of primary highway in Iowa was washed out by the flooding. Flooding forced the closure of 464 miles of Iowa's primary highway system and 303 bridges and culverts. Nearly 1500 miles of roads were in need of replacement following the floods. Preliminary damage estimates for road infrastructure was $80,000,000. The state's rail office had counted 17 railroad bridges and several hundred miles of track damaged or destroyed by the flood waters. Railroad damage was estimated in the $68 to $83 million range and it was expected to take 6 to 12 months to repair the damage. The county lost about $250,000 worth of gravel and had an estimated $100,000 worth of debris removal. In addition the estimated damages to Old Portland Bridge were $150,000. Governor Chet Culver estimated that damage across the state was nearly $10 billion, making it the worst disaster ever to occur in the state of Iowa.
- **May 2007— (DR-1705**). The heavy rains early in the month resulted in widespread moderate flooding. Elevated streamflow continued in May, with some periods of flooding at the beginning and end of the month. Flooding was mainly confined to the Raccoon, Des Moines, Nishnabotna, and Grand Basins, with elevated levels along the Des Moines continuing through the month.

- **April 25, 2007**—Precipitation was above normal for the preceding five months. Only three seasons (1950-51, 1972-73 and 1990-91) have brought more precipitation during this time period. Heavy rains kept stream flow elevated through much of the month. Soil conditions were wet enough that residual water from melting snow kept many rivers and streams well above normal. The heavy rainfall during the end of the month resulted in many rivers going into at least moderate flood and a few reaching major flood stage. The Raccoon River Basin which includes Dallas County was hit the hardest hit where heavy rains in the North Raccoon River flooded the river from rural north central Iowa around Sac City, to the confluence with the Des Moines River. Flooding was significant with many roads being closed due to flooding and some evacuations required due to the high water.
- **2004**
- **1998**
- **1993—(DR-996).** Iowa suffered greatly from the floods of 1993. All 99 counties were declared federal disaster areas. The flood crested in Van Meter on July 10, 1993 at 25.83 feet. Flood stage at this location is 13 feet.
- **1990**
- **1969**
- **1965**

Adel

- **March 2010**—Debris accumulated under U.S. Highway 169 Bridge over Mill Slough on the north side of Adel and had to be removed. Portions of Highway 169 were closed for two weeks during the flooding and debris accumulated n the City's parks and ball diamonds as well. The City hooked into the spillway system that was installed after the Flood of 2008 to redirect water around the Mill Slough lo-head dam and dump it back into the river. This is the system that is tied into a permanent earth levee embankment which also protects the City's water plant. This City also deployed the portable floodwall system that was purchased after the Flood of 2008 to protect areas of the City.
- **June 2008**—The City utilized sandbags to protect City facilities. Several City parks were damaged by floodwaters and littered with flood debris. Floodwaters tore a path around both sides of the Old Portland Road Bridge, causing an estimated $150,000 in damages. Other roads and bridges were also closed in the county.
- **April 2007**—Flood level reached 20.29 feet at Perry flood gage. Major flood stage at this gage is 20.0 feet.
- **July 1993**—Flood level reached 23.0 feet at Perry flood gage. Major flood stage at this gage is 20.0 feet.

Bouton—No Flood Hazard

Clive—Not Officially Participating

Dallas Center

No previous flood event details provided.

Dawson

No previous flood event details provided

DeSoto

No previous flood event details provided

Granger

No previous flood event details provided

Linden—No Flood Hazard

Minburn—No Flood Hazard

Perry

Flooding occurred on Frog Creek in 1993 and 2004. Residents have historically been evacuated and Park Street has closed. Tyson Foods has had floodwaters in their hold ponds and the City personnel have been unable to access the electrical substation because of the floodwaters. In 1993, the floodwaters were within 2 feet of reaching the Water Treatment Plant and Wastewater Treatment Plant.

Redfield

- **July 1993**—River flooding caused property from Bridge St. to Thomas Street. Several homes were damaged and the dam was damaged. Several roads were closed in town as a result of the flooding and there was damage to the lift station at Hanging Rock.

Van Meter

No previous flood event details provided

Waukee

No previous flood event details provided

Woodward

No previous flood event details provided

Dallas County School Districts

No previous flood event details provided

NFIP Participation

Table 3.54 Provides details on NFIP Participation for the communities in the planning area and Table 3.55 that follows provides the number of policies in force, amount of insurance in force,

number of closed losses, and total payments for each jurisdiction, where applicable. The claims information is for the period from January 1, 1978 to March 31, 2012.

Table 3.54. NFIP Participation

Community ID #	Community Name	NFIP Participant (Y/N)	County	Current Effective Map Date	Regular/Emergency Program Date
190860	Uninc. Dallas Co.	Y	Dallas	12/4/2007	05/01/94
190103	Adel	Y	Dallas	12/4/2007	08/04/87
N/A	Bouton	N	No Special Flood Hazard Area		
190488	Clive	Y	Dallas/Polk	10/16/1992	11/1/1979
190564	Dallas Center	Y	Dallas	12/4/2007	02/22/10
190358	Dawson	Y	Dallas	12/04/07(M)	08/12/11
190359	DeSoto	Y	Dallas	12/04/07(M)	09/27/85
190360	Dexter	N Sanctioned	Dallas	12/4/2007	Sanction Date 11/15/1977
190104	Granger	Y	Dallas	12/4/2007	06/01/87
	Grimes	Y	Dallas/Polk	04/30/86	11/6/1985
N/A	Linden	N	No Special Flood Hazard Area		
N/A	Minburn	N	No Special Flood Hazard Area		
190105	Perry	Y	Dallas	12/04/07(M)	09/04/85
190361	Redfield	Y	Dallas	12/04/07(M)	09/18/85
190230	Urbandale	Y	Dallas/Polk	07/19/00	06/15/79
190362	Van Meter	Y	Dallas	12/4/2007	01/26/09
190678	Waukee	Y	Dallas	12/4/2007	05/03/01
190231	West Des Moines	Y	Dallas/Polk	02/16/06	11/1/1979
N/A	Woodward	N	No Special Flood Hazard Area		

Source: NFIP Community Status Book, March 31, 2012

Table 3.55. NFIP Policy and Claim Statistics as of 3/31/2012

Jurisdiction	Policies in Force	Insurance In Force	Closed Losses*	Total payments
Uninc. Dallas Co.	28	4,823,300	6	129,621.20
Adel	26	$2,788,000	11	73,577.61
Bouton	Not Participating / No Special Flood Hazard Area			
Clive (Includes Polk Co. portion)	127	$41,050,700	28	$653,271.32
Dallas Center	1	$28,000	0	$0
Dawson	0	$0	0	$0
DeSoto	0	$0	0	$0
Dexter	Not Participating/Sanctioned			
Granger	2	$560,000	0	$
Grimes (Includes Polk Co. portion)	24	$6,077,500	2	$19,260.72
Linden	Not Participating / No Special Flood Hazard Area			
Minburn	Not Participating / No Special Flood Hazard Area			
Perry	13	$1,512,700	5	$15,028.05
Redfield	4	$285,100	1	$5,047.88
Urbandale (Includes Polk	47	$10,145,600	7	$49,543.22

Jurisdiction	Policies in Force	Insurance In Force	Closed Losses*	Total payments
Co. portion)				
Van Meter	4	$605,000	0	$0
Waukee	10	$1,522,200	0	$0
West Des Moines (Includes Polk Co. portion)	148	$38,808,500	294	$3,542,116.34
Woodward	Not Participating / No Special Flood Hazard Area			

Source: NFIP Community Status Book, 3/31/2012; BureauNet, http://bsa.nfipstat.com/reports/1040.htmt; *Closed Losses are those flood insurance claims that resulted in payment. Loss statistics are for the period from January 1, 1978 to March 31, 2012.

Repetitive Loss/Severe Repetitive Loss Properties

According to the Flood Insurance Administration, as of March 31, 2012, there are a total of 37 repetitive loss properties in the planning area. Repetitive Loss Properties are those properties with at least two flood insurance payments of $5,000 or more in a 10-year period. Table 3.56 provides a summary of the repetitive loss properties in the planning area.

Table 3.56. Dallas County Repetitive Loss Properties

Jurisdiction	Building Payments	Contents Payments	Total Payments	Average Payment	# of Losses	# of Properties
Adel	$12,200.00	$1,802.47	$14,002.47	$7,001.23	2	1
Clive (Includes Polk Co. portion)	$8,863.45	$989.25	$9,852.70	$4,926.35	2	1
Dallas County	$45,795.16	$17,327.79	$63,122.95	$31,561.48	2	1
Urbandale (Includes Polk Co. portion)	$3,209.52	$2,416.00	$5,625.52	$2,812.76	2	1
West Des Moines (Includes Polk Co. portion)	$1,006,805.25	$405,443.20	$1,412,248.45	$19,084.44	74	33
Totals	$1,076,873.38	$427,978.71	$1,504,852.09	$65,386.26	82	37

Source: Flood Insurance Administration as of 3/31/2012

There are no Severe Repetitive Loss properties in Dallas County.

Probability of Future Occurrence

With the extensive history of flooding in the planning area, it is highly likely that flooding of various levels will continue to occur frequently.

Probability Score: 4—Highly Likely

3.4.12.2 Vulnerability

Overview

The flood vulnerability and loss estimates for this plan were generated using the effective/preliminary DFIRM data. As indicated in the Geographic Location Section above, effective DFIRMs were available for: Adel, Bouton, Dallas Center, Dawson, DeSoto, Dexter,

Granger, Linden, Minburn, Perry, Redfield, Van Meter, Waukee, Woodward, and the unincorporated portions of Dallas County. For Clive, Grimes, Urbandale, and Wes Des Moines, *preliminary* DFIRMs were available during the development of this mitigation plan. These cities are dual county communities geographically located in southeast Dallas County and southwest Polk County. Because the majority of their landmasses are located in Polk County, the entire communities of the Cities of Clive, Grimes, Urbandale, and West Des Moines are being mapped with the Polk county FIS and FIRMS. Although the preliminary maps are not yet effective, they were utilized in this risk assessment as the best available data. Additionally, Clive, Grimes, Urbandale, and West Des Moines are not "official" plan participants of this Dallas County Multi-jurisdictional Hazard Mitigation Plan. Iowa Homeland Security and Emergency Management and Polk County Emergency Management have indicated that they will be included in the update to the Polk County Plan. However, since portions of these cities do cross into the Dallas County planning area, an overview assessment of their risk to this hazard will be provided *only for those portions of the cities on the Dallas County side of the boundary*.

In addition to the effective/preliminary DFIRM data, the Dallas County parcel data and assessors database were used in the analysis. GIS was used to create a centroid, or point representing the center of the parcel polygon. The DFIRM flood hazard layer was then overlaid on the parcel centroids. For the purposes of this analysis, the flood zone that intersected a parcel centroid was assigned as the flood zone for the entire parcel. From the analysis, information on the number of buildings, building value based on improvement value, and population at risk to the 1-percent annually chance flood was determined.

Since both DFIRM data and GIS parcel data were available for the planning area, it was determined that the methodology described above would provide more accurate results than a HAZUS analysis. The main reason for this is that HAZUS level I analysis utilizes census block data rather than actual parcel data. Additionally, the county parcel data did not have the necessary attributes to import into HAZUS building stock. As a result, the analysis utilizing the DFIRM and GIS parcel layer was chosen as the best method producing best available data.

According to the analysis overlaying the DFIRM on the parcel layer, the greatest exposure of building value in the 100-year floodplain is in the unincorporated areas of Dallas County with a total of $27,999,820 in improvements present in the floodplain. Adel and Granger both have more than $6 million in building improvements in the floodplain. In Granger, these are all residential buildings and in Adel, the improvements are comprised of residential, residential, and industrial uses. Table 3.57 below provides the building exposure values in the floodplain for all jurisdictions in the planning area. *Please note that for Clive, Grimes, Urbandale, and West Des Moines, these values represent only those improvements that are in the portions of the cities on the Dallas County side.*

Table 3.57. Dallas County, Iowa Building Exposure in the 100-year Floodplain

Jurisdiction	Residential	Commercial	Industrial	Agriculture	Total
Adel	$4,917,330	$719,290	$680,950	$-	$6,317,570
Bouton	$-	$-	$-	$-	$-
Clive*	$-	$-	$-	$-	$-
Dallas Center	$-	$-	$-	$457,000	$457,000
Dawson	$44,850	$-	$-	$-	$44,850
DeSoto	$-	$-	$-	$6,150	$6,150
Dexter	$-	$-	$-	$-	$-
Granger	$6,317,570	$-	$-	$-	$6,317,570
Grimes*	$-	$-	$-	$-	$-
Linden	$-	$-	$-	$-	$-
Minburn	$-	$-	$-	$-	$-
Perry	$1,435,000	$70,410	$-	$-	$1,505,410
Redfield	$473,760	$1,370	$-	$-	$475,130
Urbandale*	$-	$-	$-	$-	$-
Van Meter	$2,247,370	$1,059,670	$-	$-	$3,307,040
Waukee	$2,040,350	$379,240	$-	$427,660	$2,847,250
West Des Moines*	$-	$-	$-	$-	$-
Woodward	$-	$-	$-	$-	$-
Unincorporated	$18,591,260	$2,039,200	$-	$7,369,360	$27,999,820
Total	$36,067,490	$4,269,180	$680,950	$8,260,170	$49,277,790

Source: FEMA DFIRM, Dallas County Assessor's Office; * For Clive, Grimes, Urbandale, and West Des Moines, the analysis included only those portions of the cities that fall on the Dallas County side.

Table 3.58 provides the numbers of buildings per jurisdiction by type that are in the 100-year floodplain. Again, the unincorporated portion of the County has the greatest number of buildings in the floodplain with a total of 204, 115 of which are residential. The next highest number of buildings in the floodplain is in Adel with 91, followed by Perry with 37.

Table 3.58. Dallas County Building Counts in the 100-year Floodplain.

Jurisdiction	Residential	Commercial	Industrial	Agriculture	Total
Adel	61	18	12	0	91
Bouton	0	0	0	0	0
Clive*	0	0	0	0	0
Dallas Center	0	0	0	1	1
Dawson	1	0	0	0	1
DeSoto	0	0	0	1	1
Dexter	0	0	0	0	0
Granger	18	0	0	0	18
Grimes*	0	0	0	0	0
Linden	0	0	0	0	0
Minburn	0	0	0	0	0
Perry	29	8	0	0	37
Redfield	11	2	0	0	13
Urbandale*	0	0	0	0	0
Van Meter	22	7	0	0	29
Waukee	9	2	0	3	14

Jurisdiction	Residential	Commercial	Industrial	Agriculture	Total
West Des Moines*	0	0	0	0	0
Woodward	0	0	0	0	0
Unincorporated	115	19	0	70	204
Total	266	56	12	73	409

Source: FEMA DFIRM, Dallas County Assessor's Office; * For Clive, Grimes, Urbandale, and West Des Moines, the analysis included only those portions of the cities that fall on the Dallas County side.

For the entire planning area, the HMPC determined the magnitude of river flooding to be critical. Individual jurisdictional ratings are provided at the end of this hazard section.

Magnitude Score: 3—Critical

Potential Losses to Existing Development

The potential losses to existing development will be provided for the following categories of losses:

- Building Losses—this will include counts and values for buildings exposed to potential damage from the 1-percent annual chance flood for each jurisdictions in the planning area.
- Estimated Population Displaced
- Agricultural Impacts
- Critical Facilities and Infrastructure at Risk

Building Losses (counts and types of damaged buildings)

The result of the exposure analysis summarizes the values at risk in the floodplain. When a flood occurs, seldom does the event cause total destruction of an area. Potential losses from flooding are related to a variety of factors including flood depth, flood velocity, building type and construction. Based on FIA flood depth-damage curves, the percent of damage is directly related to the flood depth. FEMA's flood benefit/cost module uses this simplified approach to model flood damage based on building type and flood depth. A damage estimation of 20 percent of the total value was used based on FEMA Flood Insurance Administration (FIA) depth-damage curves based on an assumption of at least 20 percent of the value of the structure and 20 percent of the contents value to a one-story structure with no basement flooded to two feet. Contents exposure values were calculated by factoring a multiplier to the building exposure values based on usage type. The contents multipliers were derived from the HAZUS MH 2.1 and are defined below the table. While there are several limitations to this model, it does present a methodology to estimate potential damages. This model may include structures within the 100-year floodplain that may be elevated above the level of the base flood elevation, according to local floodplain development requirements, and thus mitigate the risk. Future updates to this plan should account for post-FIRM development in the analysis to more accurately present the potential for losses. Table 3.59 provides the summary of potential flood loss estimates for the 100-year flood by jurisdiction.

Table 3.59. Flood Loss Estimates for 100-Yr Flood Flood by Jurisdiction

Jurisdiction	Floodplain Building Count	Floodplain Building Exposure Value	Floodplain Contents Exposure Value	Floodplain Total Exposure Value	Potential Loss at 20%
Adel	91	$6,317,570	$ 4,199,380	$10,516,950	$2,103,390
Bouton	0	-	-	-	-
Clive*	0	-	-	-	-
Dallas Center	1	$ 457,000	$457,000	$914,000	$182,800
Dawson	1	$44,850	$22,425	$67,275	$13,455
DeSoto	1	$6,150	$6,150	$12,300	$ 2,460
Dexter	0	-	-	-	-
Granger	18	$6,317,570	$3,158,785	$9,476,355	$1,895,271
Grimes*	0	-	-	-	-
Linden	0	-	-	-	-
Minburn	0	-	-	-	-
Perry	37	$1,505,410	$787,910	$2,293,320	$458,664
Redfield	13	$475,130	$238,250	$713,380	$142,676
Urbandale*	0	-	-	-	-
Van Meter	29	$3,307,040	$2,183,355	$5,490,395	$1,098,079
Waukee	14	$2,847,250	$1,827,075	$ 4,674,325	$934,865
West Des Moines*	0	-	-	-	-
Woodward	0	-	-	-	-
Unincorporated	204	$27,999,820	$18,704,190	$46,704,010	$9,340,802
Total	409	$49,277,790	$31,584,520	$80,862,310	$16,172,462

Source: FEMA DFIRM, Dallas County Assessor's Office Contents Exposure derived by applying multiplier to Building Exposure based on HAZUS MH 2.1 standard contents multipliers per usage type as follows: Residential (50%), Commercial (100%), Industrial (150%), Agricultural (100%). * For Clive, Grimes, Urbandale, and West Des Moines, the analysis included only those portions of the cities that fall on the Dallas County side.

Table 3.60 provides the loss ratio of potential loss estimates to buildings and contents in a 1-percent annual chance flood event compared to the total building and contents exposure in the entire jurisdiction. This table demonstrates that the highest loss ratio would occur in Granger, followed by Van Meter and then Adel and the unincorporated county.

Table 3.60. Building Damage Loss Ratio (100-Yr Flood)

Jurisdiction	Jurisdiction Total Exposure ($)	100-Yr Flood Potential Loss at 20%	Loss Ratio
Adel	$276,924,220	$2,103,390	0.76%
Bouton	$5,223,165	0	0.00%
Clive*	$637,647,545	0	0.00%
Dallas Center	$159,520,745	$182,800	0.11%
Dawson	$7,765,245	$13,455	0.17%
DeSoto	$59,645,075	$2,460	0.00%
Dexter	$40,199,775	0	0.00%

Jurisdiction	Jurisdiction Total Exposure ($)	100-Yr Flood Potential Loss at 20%	Loss Ratio
Granger	$85,702,045	$1,895,271	2.21%
Grimes*	$37,860	0	0.00%
Linden	$7,639,825	0	0.00%
Minburn	$26,997,120	0	0.00%
Perry	$361,233,900	$458,664	0.13%
Redfield	$41,464,030	$142,676	0.34%
Urbandale*	$942,780,290	0	0.00%
Van Meter	$66,371,700	$1,098,079	1.65%
Waukee	$1,369,347,840	$934,865	0.07%
West Des Moines*	$2,559,730,680	0	0.00%
Woodward	$72,559,160	0	0.00%
Unincorporated	$1,368,971,955	$9,340,802	0.68%
Total	$8,089,762,175	$16,172,462	0.20%

* For Clive, Grimes, Urbandale, and West Des Moines, the analysis included only those portions of the cities that fall on the Dallas County side.

Estimated Population Displaced

Potential losses to the planning area were estimated based on the location of population and building assets in relation to the one percent annual chance flood. To estimate the population that would be displaced from a 1-percent annual chance flood, the number of residential buildings was multiplied by the average household size. According to the U. S. Census Bureau, American Community Survey, 5-Year Estimates for 2006-2010, the average household size in Dallas County is 2.56 persons per household. Table 3.61 provides the estimated numbers of people that would be displaced for each jurisdiction in the planning area. According to this analysis, over 681 people in the planning area are at risk of being displaced if a 100-year flood impacted their area. The unincorporated area would have the most persons displaced, with an estimate of 294 followed by the City of Adel with an estimated 156 persons displaced.

Table 3.61. Displaced Populations Resulting from 1-Percent Annual Chance Flood

Jurisdiction	Residential	Estimated Persons Displaced
Adel	61	156
Bouton	0	0
Clive*	0	0
Dallas Center	0	0
Dawson	1	3
DeSoto	0	0
Dexter	0	0
Granger	18	46
Grimes*	0	0
Linden	0	0
Minburn	0	0

Jurisdiction	Residential	Estimated Persons Displaced
Perry	29	74
Redfield	11	28
Urbandale*	0	0
Van Meter	22	56
Waukee	9	23
West Des Moines*	0	0
Woodward	0	0
Unincorporated	115	294
Total	266	681

* For Clive, Grimes, Urbandale, and West Des Moines, the analysis included only those portions of the cities that fall on the Dallas County side.

Agricultural Impacts

Additionally, USDA crop insurance claims for excess moisture/precipitation/rain and flood conditions for the eleven-year period from 2001-2011 totaled $10,024,741. Considering that 85 percent of insurable crops are insured in Iowa (2011 Iowa Crop Insurance Profile, USDA, RMA), the adjusted losses calculate to $11,793,813.06 for all insurable crops for the period. This results in an average annual loss of $1,072,164.82 to insurable crops as a result of excess moisture/precipitation/rain and flood conditions affecting agriculture.

Critical Facilities and Infrastructure at Risk

To analyze critical facilities at risk in the planning area, the planning committee compiled an inventory of 270 critical and essential facilities and infrastructure in the planning area. This list was compiled by conducting a query in the HAZUS MH 2.1 software for critical and essential facilities in Dallas County and adding critical and essential facilities that were reported by each jurisdiction on their Data Collection Guide. This combined list was sorted by jurisdiction and provided to planning committee members for correction and validation. The validated facilities from HAZUS were already available in a GIS format. The additional facilities were geo-referenced according to their address to enable GIS analysis of all facilities reported as critical and essential. Once all facilies were geo-located, a comparison was made with the Digital Flood Insurance Rate Maps to determine those facilities that would be damaged in a 100-year flood event. Table 3.62 provides the list of critical facilities in the 100-year floodplain that could be damaged in the event of a 100-year flood. Please refer to Appendix E. for the full list of critical/essential facilities. This Appendix is “For Official Use Only”. To obtain access for official use, contact the Dallas County Emergency Manager.

Table 3.62. Critical Facilities in the Floodplain in the Planning Area

Critical/Essential Facility	Name	Near City	Flood Elevation (ft)
Bus Facility	Hirta Public Transit	Adel	1.7
Fire Station	Perry Volunteer Fire Department	Perry	1.0
School	Woodward-Granger Elementary School	Granger	1.0
Police Station	Perry Police Dept	Perry	0.8
Waste Water Facility	City of Adel Sewage Treatment Plant	Adel	0.5
Waste Water Facility	Van Meter City of STP	Van Meter	3.8
Hazmat Location	United Brick & Tile Co. (Hydrogen Fluoride)	Adel	0.5
Hazmat Location	United Brick & Tile Co. (Manganese)	Adel	0.5
Hazmat Location	United Brick & Tile Co. (Barium)	Adel	0.5
Major Employer	United City Brick & Tile Co.	Adel	0.5
City Facility	Adel Public Works/Parks	Adel	0.5
Child Care	Kids Korner Two	Adel	0.6
City Facility	Perry Public Works	Perry	0.5
Sewer Facility	Pump	Van Meter	0.5

Source: HAZUS MH 2.1; * For Clive, Grimes, Urbandale, and West Des Moines, the analysis included only those portions of the cities that fall on the Dallas County side.

Future Development

Any future development in floodplains would increase risk in those areas. For those communities that participate in the National Flood Insurance Program, enforcement of the floodplain management regulations will ensure mitigation of future construction in those areas. However, even if structures are mitigated, evacuation may still be necessary due to rising waters. In addition, floods that exceed mitigated levels may still cause damages.

River Flooding Hazard Summary by Jurisdiction

To demonstrate how river flooding varies by jurisdiction, all jurisdictions that had any improvements in the 100-year floodplain (including school districts) received a rating of 4 for probability since the planning area has historically seen a high probability of flooding in any given year. To determine the magnitude rating, those jurisdictions with a loss ratio of .3 percent or higher were assigned a magnitude of 3 and those with a loss ratio higher than 0 but less than .3 were assigned a magnitude of 2. For school districts, if any school facilities are in the floodplain, a magnitude of 3 was assigned. The warning time and duration were considered to be 1 and 4 for all jurisdictions that have any properties in the floodplain. For those jurisdictions that do not have improvement exposures in the floodplain, all elements indicate Not Applicable (N/A)

Hazard Type	Probability	Magnitude	Warning Time	Duration	Score	Level
Dallas County	4	3	1	4	3.25	High
Cities						
Adel	4	3	1	4	3.25	High
Bouton	N/A	N/A	N/A	N/A	N/A	N/A
Clive*	N/A	N/A	N/A	N/A	N/A	N/A
Dallas Center	4	2	1	4	2.95	Moderate
Dawson	4	2	1	4	2.95	Moderate
DeSoto	4	2	1	4	2.95	Moderate
Dexter	N/A	N/A	N/A	N/A	N/A	N/A
Granger	4	3	1	4	3.25	High
Grimes*	N/A	N/A	N/A	N/A	N/A	N/A
Linden	N/A	N/A	N/A	N/A	N/A	N/A
Minburn	N/A	N/A	N/A	N/A	N/A	N/A
Perry	4	2	1	4	2.95	High
Redfield	4	3	1	4	3.25	Moderate
Urbandale*	N/A	N/A	N/A	N/A	N/A	N/A
Van Meter	4	3	1	4	3.25	High
Waukee	4	2	1	4	2.95	High
West Des Moines	N/A	N/A	N/A	N/A	N/A	N/A
Woodward	N/A	N/A	N/A	N/A	N/A	N/A
School Districts						
Adel-DeSoto-Minburn Schools	N/A	N/A	N/A	N/A	N/A	N/A
Dallas Center-Grimes Schools	N/A	N/A	N/A	N/A	N/A	N/A
Perry Schools	N/A	N/A	N/A	N/A	N/A	N/A
Van Meter Schools	N/A	N/A	N/A	N/A	N/A	N/A
Waukee Schools	N/A	N/A	N/A	N/A	N/A	N/A
West Central Valley Schools	N/A	N/A	N/A	N/A	N/A	N/A
Woodward- Granger Schools	4	3	1	4	3.25	High

These jurisdictions are included in the risk assessment although they are not officially participating jurisdictions in the Dallas County Plan. Portions of these jurisdictions are in both Dallas and Polk Counties. According to Iowa Emergency Management and Homeland Security, these jurisdictions will participate in the Polk County Hazard Mitigation Plan update.

3.4.13 Severe Winter Storm

Hazard Score Calculation					
Probability	Magnitude/Severity	Warning Time	Duration	Weighted Score	Level
4	2	3	4	3.25	High

3.4.13.1 Profile

Hazard Description

A major winter storm can last for several days and be accompanied by high winds, freezing rain or sleet, heavy snowfall, and cold temperatures. The National Weather Service describes different types of winter storm events as follows:

- **Blizzard**—Winds of 35 mph or more with snow and blowing snow reducing visibility to less than 1/4 mile for at least three hours.
- **Blowing Snow**—Wind-driven snow that reduces visibility. Blowing snow may be falling snow and/or snow on the ground picked up by the wind.
- **Snow Squalls**—Brief, intense snow showers accompanied by strong, gusty winds. Accumulation may be significant.
- **Snow Showers**—Snow falling at varying intensities for brief periods of time. Some accumulation is possible.
- **Freezing Rain**—Measurable rain that falls onto a surface with a temperature below freezing. This causes it to freeze to surfaces, such as trees, cars, and roads, forming a coating or glaze of ice. Most freezing-rain events are short lived and occur near sunrise between the months of December and March.
- **Sleet**—Rain drops that freeze into ice pellets before reaching the ground. Sleet usually bounces when hitting a surface and does not stick to objects.

Heavy accumulations of ice, often the result of freezing rain, can bring down trees, utility poles, and communications towers and disrupt communications and power for days. Even small accumulations of ice can be extremely dangerous to motorists and pedestrians.

Severe winter storms include extreme cold, heavy snowfall, ice, and strong winds which can push the wind chill well below zero degrees in the planning area. Heavy snow can bring a community to a standstill by inhibiting transportation (in whiteout conditions), weighing down utility lines, and by causing structural collapse in buildings not designed to withstand the weight of the snow. Repair and snow removal costs can be significant. Ice buildup can collapse utility lines and communication towers, as well as make transportation difficult and hazardous. Ice can also become a problem on roadways if the air temperature is high enough so that precipitation falls as freezing rain rather than snow.

Extreme cold often accompanies severe winter storms and can lead to hypothermia and frostbite in people who are exposed to the weather without adequate clothing protection. Cold can cause fuel to congeal in storage tanks and supply lines, stopping electric generators. Cold temperatures can also overpower a building's heating system and cause water and sewer pipes to freeze and rupture. Extreme cold also increases the likelihood for ice jams on flat rivers or

streams. When combined with high winds from winter storms, extreme cold becomes extreme wind chill, which is extremely hazardous to health and safety.

The National Institute on Aging estimates that more than 2.5 million Americans are especially vulnerable to hypothermia, with the isolated elderly being most at risk. About 10 percent of people over the age of 65 have some kind of temperature-regulating defect, and 3-4 percent of all hospital patients over 65 are hypothermic.

Also at risk are those without shelter or who are stranded, or who live in a home that is poorly insulated or without heat. Other impacts of extreme cold include asphyxiation (unconsciousness or death from a lack of oxygen) from toxic fumes from emergency heaters; household fires, which can be caused by fireplaces and emergency heaters; and frozen/burst pipes.

Wind can greatly amplify the impact of cold ambient air temperatures. Provided by the National Weather Service, Figure 3.52 below shows the relationship of wind speed to apparent temperature and typical time periods for the onset of frostbite.

Figure 3.52. Wind Chill Chart

Wind (mph)	Temperature (°F)																	
Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

Frostbite Times: 30 minutes, 10 minutes, 5 minutes

$$\text{Wind Chill (°F)} = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$$

Where, T= Air Temperature (°F) V= Wind Speed (mph)

Effective 11/01/01

Source: National Weather Service

Warning Time Score: 3—6-12 hours

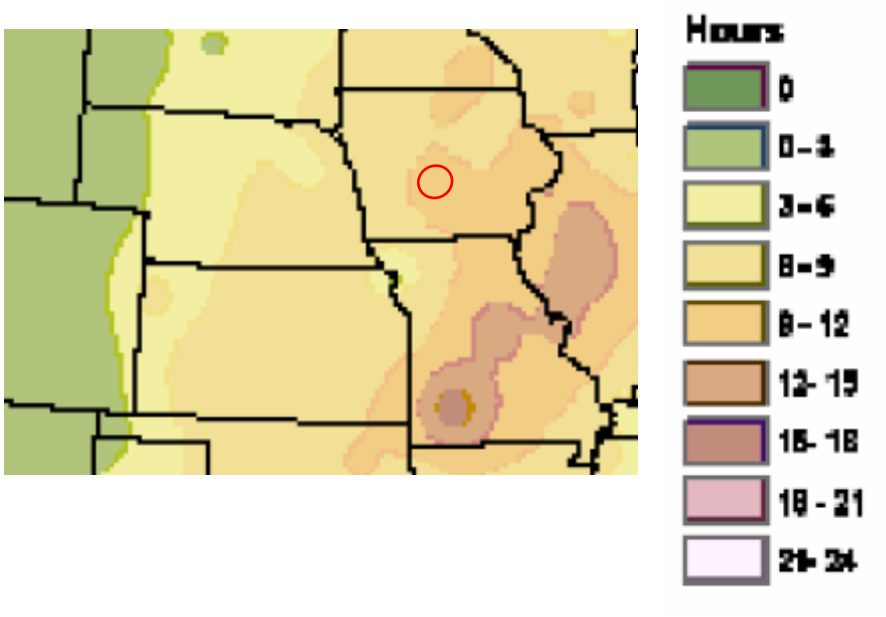
Duration Score: 4—more than 1 week

Geographic Location/Extent

The entire state of Iowa is vulnerable to heavy snow, extreme temperatures and freezing rain. The snow season normally extends from late October through mid-April but significant snows have fallen as early as September 16 (1881) to as late as May 28 (1947).

Figure 3.53 shows that the entire planning area (approximated within the red circle) is in the orange-shaded area that receives 9-12 hours of freezing rain per year.

Figure 3.53. Average Number of Hours per Year with Freezing Rain



Source: American Meteorological Society. "Freezing Rain Events in the United States." http://ams.confex.com/ams/pdfpapers/71872.pdf.; Note: red circle provides approximate location of planning area.

Previous Occurrences

During the period of record from 1951 to June 1, 2012, the Perry Weather Cooperative Station recorded an average of 10.81 inches of snow each year for this 62.4-year period. During this period, the snowfall event (one day snow total) with the most snow occurred on March 16, 2004 with a reported 16 inches of snow. The day with next highest amount of snow occurred on November 18, 1957 with 13 inches of snow. During this period of record, there have been 336 daily snowfall events with two or more inches of snow and 67 daily snowfall events with five or more inches of snow. This translates to an average of 1.07 daily snowfall events per year with 5 or more inches of snow.

Table 3.63. Number of Daily Snowfall Events Greater than 2 Inches Recorded at the Perry Cooperative Weather Station (1951-June 1, 2012)

Inches	# of Events
16 Inches	1
13 Inches	1
12 Inches	1
11 Inches	2
10 Inches	3
8 Inches	4
7 Inches	9
6.5 Inches	1
6 Inches	14
5.5 Inches	4
5.1 Inches	1
5 Inches	26
4.8 Inches	1
4.5 Inches	4
4 Inches	45
3.5 Inches	13
3 Inches	74
2.6 Inches	2
2.5 Inches	23
2.3 Inches	1
2.2 Inches	2
2.1 Inches	1
2 Inches	103

Source: Iowa Environmental Mesonet, Iowa State University Department of Agronomy, http://mesonet.agron.iastate.edu/request/coop/fe.phtml

From 1965 to 2011, there has been one Presidential Disaster Declaration for Severe Winter Storm and one Presidential Disaster Declaration for Ice Storm in Dallas County.

Table 3.64. Winter/Ice Storm Presidential Disaster Declarations (1965-5/2011)

Disaster Number	Description	Declaration Date (Incident Period)	IA/PA
DR-1880	Severe Winter Storms	3-2-2010 (1-19-2010 to 1-26-2010)	PA
DR-928	Ice Storm	12-26-1991 (10-31-1991 to 11-29-1991)	PA

Source: Federal Emergency Management Agency, www.fema.gov/; Note: Incident dates are in parentheses; PA= Public Assistance, IA= Individual Assistance

From 11/2006 to 12/2011, the National Climatic Data Center reports 6 winter storm events and 5 ice storm events that impacted the planning area during that 5-year time-period. This translates to an average of one winter storm event and one ice storm event each year.

Table 3.65. Winter/Ice Storm Events, National Climatic Data Center (11/2006 – 12/2011)

Date	Type	Property Damage
2/24/2007	Winter Storm	$250,000
2/5/2008	Winter Storm	$10,000
12/18/2008	Winter Storm	$ 5,000
4/5/2009	Winter Storm	$ -
12/24/2009	Winter Storm	$50,000
1/6/2010	Winter Storm	$25,000
12/1/2007	Ice Storm	$10,000
12/11/2007	Ice Storm	$75,000
12/27/2008	Ice Storm	$ 5,000
12/23/2009	Ice Storm	$500,000
1/20/2010	Ice Storm	$150,000
Total		$1,080,000

Source: National Climatic Data Center

The following section provides additional information for some of the winter storm and ice storm events that have impacted Dallas County:

- **January 20, 2010 (DR-1880-).** The event was not long lived, but did produce significant amounts of ice. The ice toppled large trees and knocked power out for thousands of customers. Roads were ice covered and numerous schools and businesses closed due to the ice. Outside of the hardest hit areas, there were scattered reports of large tree branches being downed by the weight of the ice. Power outages numbered in the 50,000 to 60,000 customer range at the peak during the evening of the 20th. Thirty six hours after the event, over 40,000 customers remained without service. Due to the extensive damage, it was difficult to return service to some of the rural areas. Some of the rural areas were without power for several days to a week after the ice storm. Most of the outages were in Sac and Carroll Counties. Freezing drizzle followed the main ice event. Though only very light additional accrual of ice took place, trees that were close to breaking continued to fall during the evening and resulted in the continued rise of power outages.
- **January 6, 2010**--The fresh fluffy snow fell on a deep snowpack already present across the state. Due to previous storms, many of the ditches had already drifted over, setting the stage for much more blowing and drifting than would normally be expected. As the surface low exited the area, strong northwest winds overspread the state with speeds in the 25 to 35 MPH range, with gusts to near 45 MPH at times. The winds picked up the light snow and caused considerable blowing and drifting of the snow. Whiteout conditions were reported at times across much of the state and travel became hazardous. Many of the state's schools were closed due to the storm on the 6th, with a large percentage remaining closed on the 7th as roads in many areas drifted shut and became impassible. Snow crews were taken off of the roads in many locations as it became too dangerous to clear the roads due to poor visibility and the fact that the roads drifted shut nearly as fast as the crews could clear them. Accidents were too numerous to mention and driving was not recommended across most of the state on the 7th. Numerous major roads were closed by drifts of 6 feet in height or more.
- **December 23 & 24, 2009**--A major winter storm system affected the central U.S. during Christmas week. Freezing rain broke out on the morning of the 23rd over west central Iowa, and spread into the north central counties by the afternoon of the 23rd. Freezing rain continued through the rest of the day, tapering off during the early morning hours of the

24th. To the north of the freezing rain area, 3 to 5 inches of snowfall occurred. Much of the area received one quarter to one half inch of ice.

- **April 5, 2009**--A late season snow event took place over Iowa.
- **December 27, 2008**--Ice accumulated quite quickly with one quarter inch amounts quite widespread. Spotty one half inch amounts were reported over parts of central, south central, and southeast Iowa as thunderstorms produced heavier rainfall in those areas. Scattered power outages were reported across the area and roadways became treacherous due to the icing.
- **December 18, 2008**--Over the central part of the state, ice pellets were predominant along the Interstate 80 corridor, with mostly snow falling north of U.S. Highway 30. Over the central sections, many areas reported ice pellet accumulations in excess of an inch. The heaviest amount was around 3 inches in Dallas County south of Perry. One and one half to two inches was common across the Metropolitan Des Moines area as well. Most other areas along the I-80 corridor were in the three quarters to one inch range. Snowfall amounts increased rapidly as you headed north with six inch or greater snowfall amounts common from near U.S. Highway 30 north. Seven to eight inch snow amounts were very common in a 50 mile wide band stretching east-west along the U.S. Highway 20 corridor. There were two areas of heavier snow.
- **December 5, 2008**--the heaviest band of snow occurred from south central into east central Iowa. During the early morning hours of the 6th, snow fell at the rate of 1 to 2 inches per hour in this band. By the morning of the 6th, snow and blowing snow caused significant disruptions in traffic and many activities, including nearly all schools, were canceled. A large area of Iowa received more than 8 inches of snow with many areas picking up over a foot.
- **December 11, 2007**--One quarter of an inch or more of ice accrual took place southeast of a Waterloo, Boone, to Atlantic line. Ice accumulated to at least one half inch southeast of a Tama, Dallas Center to the southeast corner of Cass County. The heaviest ice accumulations took place over south central Iowa from just south of Des Moines, southwest to Taylor County and east toward into Wapello and Davis Counties. Snow fell along the north edge of the freezing rain area. A band of 2 to 4 inch snow occurred over a large part of northern Iowa. Numerous trees and power lines were downed from about Interstate 80 south. Power outages were very numerous as well with Alliant Energy reporting 40,000 to 45,000 customers without power at one point, and MidAmerica Energy reporting nearly 30,000 out at one point. Tree damage was described as incredible by one observer in Monroe County at Albia. Damage was quite extensive over southern Iowa, especially from U.S. Highway 34 south, and up into Warren County. The Des Moines International Airport was closed for a 6 hour period as a plane slid off the tarmac in the icy conditions. No injuries were reported at the airport. The ice caused $200,000 damage to the Southern Iowa Electrical Cooperative. Due to the severity of the storm, Governor Chet Culver declared 23 southeast Iowa Counties disaster areas.
- **December 1, 2007**-- Precipitation moved into the area during the predawn hours on the 1st. Initially the precipitation fell as snow, but with the intense warm air advection it turned to freezing rain and sleet very quickly over southern Iowa, and within a few hours after inception over the north. Surface temperatures were slow to warm due to evaporative cooling. In spite of winds in the low levels between 900 and 800 mb being in the 70 plus knot range, surface temperatures warmed very slowly. Eventually, the surface low pressure system lifted northeast through west central into northeast Iowa resulting in temperatures

rising above freezing in most areas. Freezing rain was widespread over much of the south two thirds of Iowa. Widespread ice accretions of at least one quarter of an inch of ice were reported. Heavier icing occurred southwest of Des Moines in Adair and Madison Counties with widespread ice accumulations of up to three quarters of an inch. One half to three quarter inch ice accumulations were common across the south tier of counties from Interstate 35, east. The ice resulted in some tree and power line damage with scattered power outages reported. Southeast winds of 20 to 35 MPH caused branches to break, knocking out power for thousands of customers by the afternoon of the 1st.

- **February 24, 2007**--This winter storm went into the books as one of the worst winter storms in many years due to the large areal extent of the storm.
- **April 1997**—According to the City of Perry 2005 Hazard Mitigation Plan, two nursing home residents died due to exposure to the extreme cold.
- October/November 1991 (DR-928). Several trees and power lines were down and there was no water or power in Perry for one day.

Agricultural Impacts

Winter storms, cold, frost and freeze take a toll on crop production in the planning area. According to the USDA's Risk Management Agency, payments for insured crop losses in the planning area as a result of winter storm and cold conditions from 2001-2011 totaled $33,468.60. According to the State Profile (2011 Iowa Crop Insurance Profile, USDA, RMA), 85 percent of insurable crops are insured in Iowa.

Table 3.66. Crop Insurance Claims Paid in Dallas County as a Result of Winter Storm and Cold Conditions (2001-2011)

Crop Year	Crop Name	Cause of Loss Description	Crop Insurance Paid
2001	WHEAT	Cold Winter	$2,628.00
2001	SOYBEANS	Cold Winter	$1,951.60
2001	SOYBEANS	Cold Wet Weather	$95.00
2003	CORN	Cold Wet Weather	$4,383.00
2005	CORN	Frost	$3,968.00
2005	CORN	Cold Wet Weather	$1,135.00
2006	CORN	Cold Wet Weather	$456.00
2007	CORN	Cold Wet Weather	$909.00
2009	OATS	Cold Wet Weather	$1,659.00
2010	CORN	Cold Wet Weather	$11,252.00
2010	SOYBEANS	Cold Wet Weather	$2,707.00
2011	CORN	Cold Wet Weather	$2,325.00
Total			$33,468.60

Source: USDA Risk Management Agency, 2012; COL=Cause of Loss

Probability of Future Occurrence

According to NCDC, during the 5-year period from November 2006 to December 2011, the planning area experienced six winter storm events and five extreme cold events. This translates to an annual probability of approximately 1.2 winter storm events per year and one extreme cold event per year.

Probability Score: 1—Highly Likely

3.4.13.2 Vulnerability

Vulnerability Overview

The entire planning area is vulnerable to the effects of winter storm. Winter storms tend to make driving more treacherous and can impact the response of emergency vehicles. The probability of utility and infrastructure failure increases during winter storms due to freezing rain accumulation on utility poles and power lines. Elderly populations are considered particularly vulnerable to the impacts of winter storms.

Magnitude Score: 2—Limited

Potential Losses to Existing Development

Vulnerable Buildings, Infrastructure, and Critical Facilities

Buildings with overhanging tree limbs are more vulnerable to damage during winter storms. Businesses experience loss of income as a result of closure during power outages. In general heavy winter storms increase wear and tear on roadways though the cost of such damages is difficult to determine. Businesses can experience loss of income as a result of closure during winter storms.

Loss of Use

Overhead power lines and infrastructure are also vulnerable to damages from winter storms, in particular ice accumulation during winter storm events can cause damages to power lines due to the ice weight on the lines and equipment as well as damage caused to lines and equipment from falling trees and tree limbs weighted down by ice. Potential losses would include cost of repair or replacement of damaged facilities, lost economic opportunities for businesses. Secondary effects from loss of power could include burst water pipes in homes without electricity during winter storms. Public safety hazards include risk of electrocution from downed power lines. Specific amounts of estimated losses are not available due to the complexity and multiple variables associated with this hazard. According to FEMA standard values for loss of service for utilities reported in the 2009 BCA Reference Guide, the economic impact as a result of loss of power is $126 per person per day of lost service. The loss of use estimates in Table 3.67 are provided to estimate costs associated with the loss of power in relation to the populations in each jurisdiction. The loss of use is provided in the heading as the loss of use cost per person per day of loss. The estimated loss of use provided for each jurisdiction represents the loss of service of the indicated utility for one day for 10 percent of the population. It is understood that in rural areas, the typical loss of use may be for a larger percentage of the population for a longer time during weather extremes. These figures do not take into account physical damages to utility equipment and infrastructure.

Table 3.67. Loss of Use Estimates for Power Failure Associated with Severe Winter Storms

jurisdiction	Population (2010)	Estimated Affected Population (10%)	Electric Loss of Use Estimate ($126 pe r person per day)
Adel	3,682	368.2	$46,393.20
Bouton	129	12.9	$1,625.40
Clive*	4,721	472.1	$59,484.60
Dallas Center	1,623	162.3	$20,449.80
Dawson	131	13.1	$1,650.60
DeSoto	1,050	105	$13,230.00
Dexter	611	61.1	$7,698.60
Granger**	1244	124.4	$15,674.40
Grimes*	1	0.1	$12.60
Linden	199	19.9	$2,507.40
Minburn	365	36.5	$4,599.00
Perry	7,702	770.2	$97,045.20
Redfield	835	83.5	$10,521.00
Urbandale*	6,339	633.9	$79,871.40
Van Meter	1,016	101.6	$12,801.60
Waukee	13,790	1379	$173,754.00
West Des Moines	11,510	1151	$145,026.00
Woodward**	1,024	102.4	$12,902.40
Unincorporated	10,381	1038.1	$130,800.60
Total	66,135	6613.5	$836,047.80

Source: Population, U.S. Census Bureau, 2010; Loss of Use Estimates from FEMA BCA Reference Guide, 2009; * For Clive, Grimes, Urbandale, and West Des Moines, the analysis included only those portions of the cities that fall on the Dallas County side. **For Granger and Woodward, the estimates include populations in adjacent counties within city limits.

Property Losses

To estimate future losses as a result of winter storm, historical statistics from NCDC and the USDA Risk Management Agency were annualized. According to reports from the NCDC, there were 11 combined occurrences of winter storms and ice storms in the planning area with no reported injuries or deaths and total reported property damages of $ $1,080,000 during the 5-year period from November 2006 to December 2011. This computes to an average annual property loss of $216,000.

Additionally, USDA crop insurance claims for winter storm, and freeze conditions for the eleven-year period from 2001-2011 totaled $33,468.60. Considering that 85 percent of crops are insured in Iowa (2011 Iowa Crop Insurance Profile, USDA, RMA), the adjusted losses calculate to $39,374.82 for the period. This results in an average annual loss of $3,579.53 to insurable crops as a result of freeze and frost affecting agriculture.

Combined annualized losses for property and insurable crops as a result of winter storm in the planning area are $219,579.53.

Increase Risk Populations

Elderly populations are considered to be at increased risk to Severe Winter Storms and associated extreme cold events. Table 3.68 provides the number of population over 65 in each jurisdiction in the planning area.

Table 3.68. Number of Population Over Age 65 in Dallas County Jurisdictions

Jurisdiction	Population Over 65
Adel	468
Bouton	14
Clive	Not Available for Dallas County Portion Only
Dallas Center	287
Dawson	19
DeSoto	101
Dexter	81
Granger	143
Grimes	Not Available for Dallas County Portion Only
Linden	29
Minburn	47
Perry	1,061
Redfield	145
Urbandale	Not Available for Dallas County Portion Only
Van Meter	88
Waukee	1,110
West Des Moines	Not Available for Dallas County Portion Only
Woodward	134
Dallas County	2,006

Source: 2010 Census

Future Development

Future development could potentially increase vulnerability to this hazard by increasing demand on the utilities and increasing the exposure of infrastructure networks.

Severe Winter Storm Hazard Summary by Jurisdiction

Although crop loss as a result of severe winter storm occurs more in the unincorporated portions of the planning area, the density of vulnerable populations is higher in the urban areas of the planning areas. So, it is considered that the magnitude of this hazard is relatively equal. The factors of probability, warning time, and duration are also equal across the planning area. Therefore, the conclusion is that this hazard does not substantially vary by jurisdiction.

Hazard Type	Probability	Magnitude	Warning Time	Duration	Score	Level
Dallas County	4	2	3	4	3.25	High
Cities						
Adel	4	2	3	4	3.25	High
Bouton	4	2	3	4	3.25	High
Clive*	4	2	3	4	3.25	High
Dallas Center	4	2	3	4	3.25	High
Dawson	4	2	3	4	3.25	High
DeSoto	4	2	3	4	3.25	High
Dexter	4	2	3	4	3.25	High
Granger	4	2	3	4	3.25	High
Grimes*	4	2	3	4	3.25	High
Linden	4	2	3	4	3.25	High
Minburn	4	2	3	4	3.25	High
Perry	4	2	3	4	3.25	High
Redfield	4	2	3	4	3.25	High
Urbandale*	4	2	3	4	3.25	High
Van Meter	4	2	3	4	3.25	High
Waukee	4	2	3	4	3.25	High
West Des Moines*	4	2	3	4	3.25	High
Woodward	4	2	3	4	3.25	High
School Districts						
Adel-DeSoto-Minburn Schools	4	2	3	4	3.25	High
Dallas Center-Grimes Schools	4	2	3	4	3.25	High
Perry Schools	4	2	3	4	3.25	High
Van Meter Schools	4	2	3	4	3.25	High
Waukee Schools	4	2	3	4	3.25	High
West Central Valley Schools	4	2	3	4	3.25	High
Woodward- Granger Schools	4	2	3	4	3.25	High

*These jurisdictions are included in the risk assessment although they are not officially participating jurisdictions in the Dallas County Plan. Portions of these jurisdictions are in both Dallas and Polk Counties. According to Iowa Emergency Management and Homeland Security, these jurisdictions will participate in the Polk County Hazard Mitigation Plan update.

3.4.14 Sinkholes

Hazard Score Calculation					
Probability	Magnitude/Severity	Warning Time	Duration	Weighted Score	Level
1	1	2	1	1.15	Low

3.4.14.1 Profile

Hazard Description

The loss of surface elevation due to the removal of subsurface support defines a sinkhole. Sinkholes range from broad, regional lowering of the land surface to localized collapse. The primary causes of most subsidence are human activities: underground mining of coal, groundwater or petroleum withdraw, and drainage of organic soils. In addition, this is due to the erosion of subsurface limestone.

Land subsidence occurs slowly and continuously over time or on occasion abruptly, as in the sudden formation of sinkholes. Sinkholes can be aggravated by flooding.

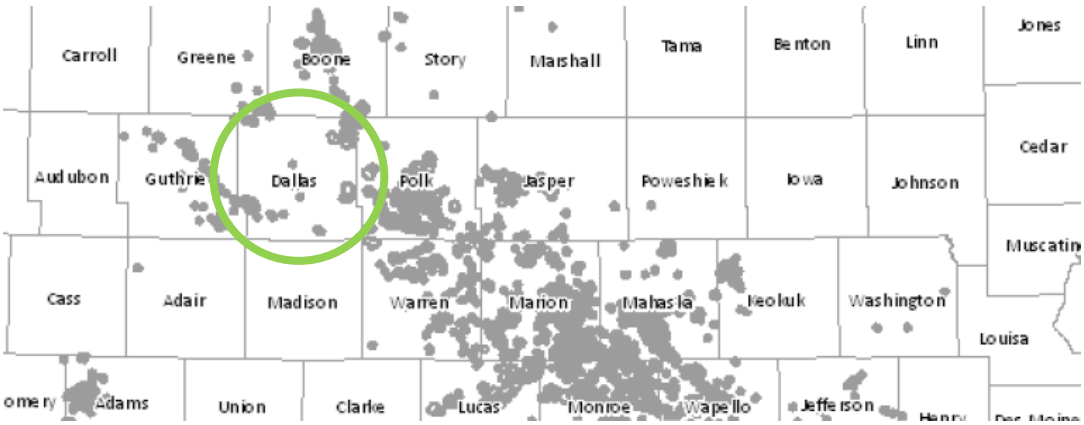
Warning Time Score: 2—12 - 24 hours

Duration Score: **1**—less than 6 hours

Geographic Location/Extent

The map in Figure 3.54 shows historic coal mining areas as reported by the Iowa Department of Natural Resources. As shown in this map, there are various locations in Dallas County with historic coal mining areas that could potentially be susceptible to sinkholes (Dallas County is identified by the green circle). The HMPC specifically identified the Clive and Waukee mining operations as areas where subsurface void space is present.

Figure 3.54. Historic Coal Mining Areas



Source: Iowa Department of Natural Resources.

Previous Occurrences

The sinkhole inventory maintained by the Iowa Department of Natural Resources did not include any known previous sinkhole occurrences in Dallas County.

Probability of Future Occurrence

The HMPC determined the probability of this hazard to be unlikely

Probability Score: 1—Unlikely

3.4.14.2 Vulnerability

Vulnerability Overview

Sinkholes have not historically occurred in Dallas County. However, due to the presence of old coal mines as well as subsurface limestone that could erode the potential exists.

Future Development

Future development should avoid areas of known subsurface void spaces such as old coal mines.

Sinkhole Hazard Summary by Jurisdiction

Jurisdiction	Probability	Magnitude	Warning Time	Duration	Score	Level
Dallas County	1	1	2	1	1.15	Low
Cities						
Adel	1	1	2	1	1.15	Low
Bouton	1	1	2	1	1.15	Low
Clive*	1	1	2	1	1.15	Low
Dallas Center	1	1	2	1	1.15	Low
Dawson	1	1	2	1	1.15	Low
DeSoto	1	1	2	1	1.15	Low
Dexter	1	1	2	1	1.15	Low
Granger	1	1	2	1	1.15	Low
Grimes*	1	1	2	1	1.15	Low
Linden	1	1	2	1	1.15	Low
Minburn	1	1	2	1	1.15	Low
Perry	1	1	2	1	1.15	Low
Redfield	1	1	2	1	1.15	Low
Urbandale*	1	1	2	1	1.15	Low
Van Meter	1	1	2	1	1.15	Low
Waukee	1	1	2	1	1.15	Low
West Des Moines8	1	1	2	1	1.15	Low
Woodward	1	1	2	1	1.15	Low
School Districts						
Adel-DeSoto-Minburn Schools	1	1	2	1	1.15	Low
Dallas Center-Grimes Schools	1	1	2	1	1.15	Low
Perry Schools	1	1	2	1	1.15	Low
Van Meter Schools	1	1	2	1	1.15	Low
Waukee Schools	1	1	2	1	1.15	Low
West Central Valley Schools	1	1	2	1	1.15	Low
Woodward-Granger Schools	1	1	2	1	1.15	Low

*These jurisdictions are included in the risk assessment although they are not officially participating jurisdictions in the Dallas County Plan. Portions of these jurisdictions are in both Dallas and Polk Counties. According to Iowa Emergency Management and Homeland Security, these jurisdictions will participate in the Polk County Hazard Mitigation Plan update.

3.4.15 Thunderstorms and Lightning

Hazard Score Calculation					
Probability	Magnitude/Severity	Warning Time	Duration	Weighted Score	Level
4	1	2	2	2.6	Moderate

3.4.15.1 Profile

Hazard Description

A thunderstorm is defined as a storm that contains lightning and thunder which is caused by unstable atmospheric conditions. When the upper air which is cold sinks and the warm moist air rises, storm clouds or 'thunderheads' develop resulting in thunderstorms. This can occur singularly, in clusters or in lines. The National Weather Service defines a thunderstorm as severe if it contains hail that is one inch or the wind gusts are at 58 mph or higher. At any given moment across the world, there are about 1,800 thunderstorms occurring. Severe thunderstorms most often occur in Iowa in the spring and summer, during the afternoon and evenings, but can occur at any time. The entire State of Iowa is at risk to the damaging effects of Severe Thunderstorms and Lightning. Other hazards associated with thunderstorms and lightning include: heavy rains causing flash flooding (discussed separately in Section 0), hail (discussed separately in Section 3.4.9) tornadoes (discussed separately in Section 3.4.16), and windstorm (discussed separately in Section 3.4.17).

Lightning

All thunderstorms produce lightning which often strikes outside of the area where it is raining and is known to fall more than 10 miles away from the rainfall area. Nationwide, lightning kills 75 to 100 people each year. Lightning strikes can also start structural fires, wildland fires, and damage electrical systems and equipment.

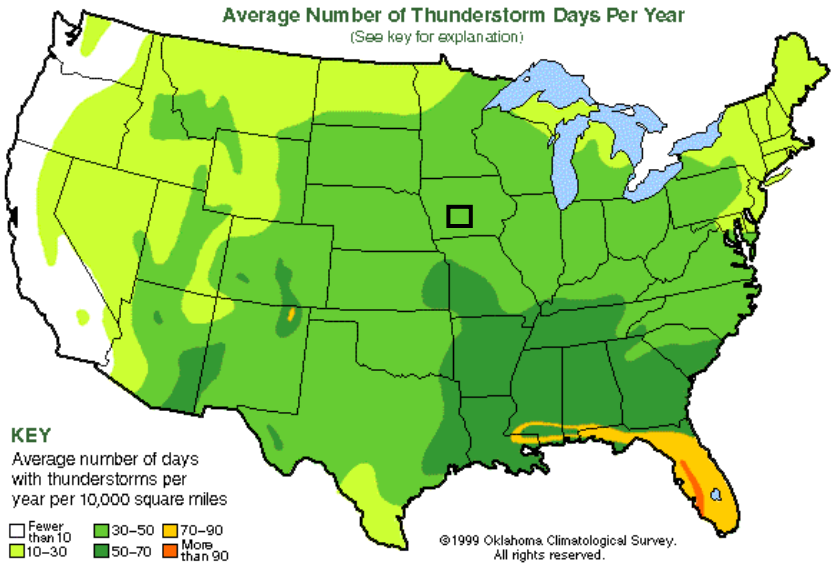
Warning Time Score: 2—12 - 24 hours

Duration Score: 2—less than 1 day

Geographic Location/Extent

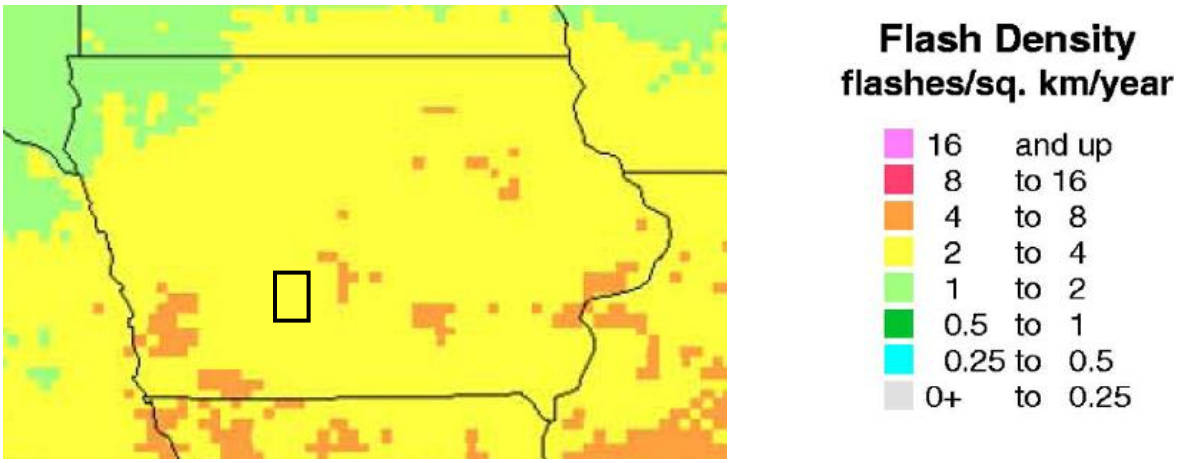
Severe thunderstorms and the associated lightning impact the entire County with relatively similar frequency. Although, these events occur similarly throughout the planning area, they are more frequently reported in more urbanized areas. In addition, damages are more likely to occur in more densely developed urban areas. Figure 3.55 provides the distribution and frequency of thunderstorms in the U.S. The entire state of Iowa has an average of 30-50 days with thunderstorms per year. Figure 3.56 shows 2 to 4 lightning strikes per square kilometer per year.

Figure 3.55. Distribution and Frequency of Thunderstorms



Note: Black Square indicates approximate location of Dallas County

Figure 3.56. Location and Frequency of Lightning in Iowa



Source: National Weather Service, www.lightningsafety.noaa.gov/lightning_map.htm
Note: Black Square indicates approximate location of Dallas County

Previous Occurrences

Some of the more notable damaging wind events that have occurred since 1994 are described in additional detail below. Also, seven Presidential Disaster Declarations have included Severe Storms. These descriptions are primarily from NCDC and FEMA sources as follows:

- ***FEMA-1930-DR: Severe Storms, Flooding, & Tornadoes, July 29, 2010—***Dallas County was included in the FEMA declarations for flood damages. June rainfall was very frequent throughout the month. June 2010 temperatures averaged 71.4B: or 1.6B: above normal while precipitation totaled 10.45 inches or 5.81 inches above normal. This ranked as the

wettest and 33rd warmest June among 138 years of state records and set the stage for significant river flooding. The only calendar month to bring more rain to Iowa was July 1993 with a statewide average of 10.50 inches while the previous June record was 10.33 inches in 1947.

- ***FEMA-1763-DR: Severe Storms, Flooding, & Tornadoes, May 27, 2008—*** Dallas County was included in the FEMA declarations for tornado and high wind damages. Thunderstorms erupted over western Iowa stretching into north central Iowa first. It did not take long for the storms to become severe with hail and high winds. The primary mode of severe weather was high winds and several tornadoes. The secondary, but significant threat was heavy rainfall. Farther south, a brief tornado touchdown was reported in Dallas County in open fields west of Minburn. Another tornado touched down in Dallas County later on, west of Adel, and was on the ground for about 4 miles. On May 25, 2008, the town of Parkersburg and nearby communities were struck by tornadoes. A few days later, devastating floods began affecting much of the state. Eighty-five counties were included in a Presidential Disaster Declaration as a result of the tornadoes and flooding. Losses from these disasters are estimated to total between $8 - 10 billion, and more than 40,000 were affected.
- ***FEMA-1705-DR: Severe Storms, Flooding, & Tornadoes, May 25, 2007—*** Dallas County was included in the FEMA declarations for flood damages. The first, on May 5-7, brought flooding rains to much of west central and southwest Iowa with 6.95 inches at Randolph and 6.77 inches at Logan. The heavy rains early in the month resulted in widespread moderate flooding over the south and west part of the Des Moines. Some damage occurred with the flooding, which lasted for several days, but much of the damage was not severe. Elevated streamflow continued in May, with some periods of flooding at the beginning and end of the month. Flooding was mainly confined to the Raccoon, Des Moines, Nishnabotna, and Grand Basins, with elevated levels along the Des Moines continuing through the month.
- ***FEMA-1518-DR: Severe Storms, Flooding, & Tornadoes, May 25, 2004—*** Dallas County was included in the FEMA declarations for hail, wind and tornado damages. May 24, 2004 during the evening hours, the frontal boundary and outflow boundary had converged and were located along Interstate 80. Explosive thunderstorm development took place during the very late afternoon and evening hours in spite of the weak shear profile. Discrete supercells formed in a narrow line along Interstate 80 from near Des Moines on west. The storms became tornadic quickly. A strong thunderstorm complex formed over Nebraska and moved east along the line of convection over Iowa. As the event took shape, all modes of severe weather occurred. The storms developed so rapidly that there was little more than a half hour from the first hail and wind report to the first tornado touchdown. Hail and high wind reports were numerous. Numerous reports of golf ball size hail were received.
- ***FEMA-1230-DR: Severe Weather, Flooding, & Tornadoes, July 2, 1998—***Dallas County was included in the FEMA declarations for wind and tornado damages. A complex weather situation was set up over the central U.S. as a mesoscale convective system passed to the south of Iowa during the overnight hours and early morning on June 29th. The storms became severe quickly as they moved and developed eastward into Iowa. The storms produced a variety of severe weather across Iowa. They initially moved east across the northern and central counties, but then began sinking southeast. The dominant severe weather with the storms was extremely high winds. Damage was very widespread across the state. Winds in excess of 100 MPH were reported with one unofficial wind speed measured at 126 MPH in the town of Washington at 1405 CST. There were several tornadoes during the event. There were several small tornadoes in central Iowa. They had

short tracks and only touched down briefly. One cut a mile long path east of Marshalltown through a corn field and a grove of trees. Another in Dallas County was on the ground through mostly open country for two miles. High winds were a major problem with these storms. Many places reported winds over 80 MPH with incredible tree damage and numerous buildings damaged or destroyed.

- ***FEMA-868-DR: Flooding, Severe Storms, May 26, 1990—*** Dallas County was included in the FEMA declarations for flooding and severe storm damages.

Lightning

Lightning events were not reported to NCDC prior to 1994. From 1994 to 2011, Dallas County experienced 8 reported lightning events. During this 18-year time period reported lightning events caused no deaths or injuries, but caused $1 million in reported property damages. Table 3.69 provides the statistics for Dallas County.

Table 3.69. Lightning Events in Dallas County 1994 to 2011

# Lightning Events	Deaths/ Injuries	Property Damages	Crop Damages
8	0	$1,085,000	$0

Source: National Climatic Data Center (http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwEvent~Storms)

Some of the more notable damaging lightning events are described in additional detail below:

- July 22, 2011—Lightning struck a house near Dexter, resulting in a small fire there. Ironically, on 11 August 2010 the home was burned as a result of another lightning strike. The house was still under construction from the previous fire and was not occupied.
- May 5, 2008—Lightning struck the water treatment plant in DeSoto. A generator has now been installed at water treatment plant to provide back-up power for future lightning strikes.
- May 2, 2008—Lightning struck several power poles and set them on fire in Linden near the intersection of Highway 44 and P46/El Paso Ave.
- July 9, 2007—Thunderstorms moved across parts of central Iowa and sagged into Dallas County during the morning. Lightning struck a house in Perry, setting it on fire. The fire was not a major blaze and damage was limited to smoke damage and minor fire damage.
- August 19, 1995—Thunderstorms moved through Dallas County during the early morning hours. Though not severe, lightning caused damage in Granger. The town water tower was struck by lightning, knocking three of the four water pumps out. Service was not restored to the city until the following Tuesday. Water had to be trucked into the city during the three and one-half day outage.
- August 4, 1994—Thunderstorms moved across Iowa during the early morning hours. Although no severe weather was reported with them, lightning did strike a house in Woodward. The lightning blew out all of the electrical appliances and started a fire in the home. Considerable damage occurred due to the smoke.

- Historically, lightning strikes hit the highest points in Linden that are the wooden ball field poles that have exploded and the Co-ops sweep augers and conveyors have been hit numerous times.

Agricultural Impacts

Severe thunderstorms can take a toll on crop production in the planning area. According to the USDA's Risk Management Agency, there have not been any payments for insured crop losses specifically for thunderstorms but payments have been made for the associated flooding, hail and wind.

Probability of Future Occurrence

High wind events 50 knots and greater occurred an average of four times per year in the planning area from 1962 to 2011. Hail events with hail 1.75 inch in diameter and larger has the probability of 71 percent to occur in any given year. Reported lightning events only occurred 8 times from 1994 to 2011, but since lightning accompanies thunderstorms, it can be assumed that lightning occurs more often than reported. These rates of occurrence are expected to continue in the future.

Probability Score: 4—Highly Likely

3.4.15.2 Vulnerability

Overview

In general, assets in the County are vulnerable to thunderstorm and lightning including people, crops, vehicles, and built structures.

According to the Iowa Hazard Mitigation Plan, the estimated statewide losses have the thunderstorm hazard listed as the 6th highest hazard losses with $24 million.

Potential Losses to Existing Development

Most damages occur to electronic equipment located inside buildings, but structural damage can also occur when a lightning strike causes a building fire. Communications equipment and warning transmitters and receivers can also be knocked out by lightning strikes. There have not been any fatalities in Dallas County from lightning strikes.

Property and Crop Losses

Table 3.70 provides the estimated annualized property damages resulting from Severe Thunderstorms, including hail, lightning, and wind. This annualized damage has been compared to the total building exposure for Dallas County. Building Exposure values are based on parcel data provided by the Dallas County Assessor's Office.

Table 3.70. Estimated Annualized Property Damages Resulting from Severe Thunderstorms (Hail/Lightning/Wind, 1994-2011)

Building Exposure	Hail/Lightning/Wind Property Damages	Annualized Property Damages
	Hail - $691,000 Lightning - $1,085,000 Wind - $7,900,000	
$3,148,130,000	Total $9,676,000	$537,555

Source: Building Exposure, Dallas County Assessor's Office, 2012; Hail, Lightning, & Wind Property Damage from NCDC records

Table 3.71 provides the annual crop losses for insurable resulting from hail and wind. The insurable loss is adjusted to estimate losses to all insurable crops by considering that 85 percent of insurable crops in the State were insured (2011 Iowa Crop Insurance Profile from USDA's Risk Management Agency).

Table 3.71. Estimated Insurable Annualized Crop Damages Resulting from Severe Thunderstorms (Hail//Wind)

Crop Exposure (2007)	Insurance Paid (2001-2011)	Adjusted Crop Damages	Annualized Adjusted Crop Damages
	Hail -$237,001 Wind -$465,960		
$156,900,000	Total -$702,961	$827,012	$75,183

Source: Crop Exposure is from Iowa State University, University Extension, 2007; Insurance paid is from USDA's RMA; Statewide Crop insurance Coverage is from USDA's RMA Iowa Crop Insurance Profile.
Note: This includes insurable crops that are insured.

Future Development

Current development trends for Dallas County are likely to substantively increase vulnerability to lightning. With more development of housing neighborhoods and businesses, the increased population and infrastructure will be vulnerable to this hazard.

Thunderstorms and Lightning Hazard Summary by Jurisdiction

The following hazard summary table shows how this hazard varies by jurisdiction. The magnitude was rated higher as a Level 2, with a Moderately High score of 2.9 for the cities and the school districts that have more built structures.

Jurisdiction	Probability	Magnitude	Warning Time	Duration	Score	Level
Dallas County	4	1	2	2	2.6	Moderate
Cities						
Adel	4	2	2	2	2.9	Moderate
Bouton	4	2	2	2	2.9	Moderate
Clive*	4	2	2	2	2.9	Moderate
Dallas Center	4	2	2	2	2.9	Moderate
Dawson	4	2	2	2	2.9	Moderate
DeSoto	4	2	2	2	2.9	Moderate
Dexter	4	2	2	2	2.9	Moderate
Granger	4	2	2	2	2.9	Moderate
Grimes*	4	2	2	2	2.9	Moderate
Linden	4	2	2	2	2.9	Moderate
Minburn	4	2	2	2	2.9	Moderate
Perry	4	2	2	2	2.9	Moderate
Redfield	4	2	2	2	2.9	Moderate
Urbandale*	4	2	2	2	2.9	Moderate
Van Meter	4	2	2	2	2.9	Moderate
Waukee	4	2	2	2	2.9	Moderate
West Des Moines*	4	2	2	2	2.9	Moderate
Woodward	4	2	2	2	2.9	Moderate
School Districts						
Adel-DeSoto-Minburn Schools	4	2	2	2	2.9	Moderate
Dallas Center-Grimes Schools	4	2	2	2	2.9	Moderate
Perry Schools	4	2	2	2	2.9	Moderate
Van Meter Schools	4	2	2	2	2.9	Moderate
Waukee Schools	4	2	2	2	2.9	Moderate
West Central Valley Schools	4	2	2	2	2.9	Moderate
Woodward- Granger Schools	4	2	2	2	2.9	Moderate

*These jurisdictions are included in the risk assessment although they are not officially participating jurisdictions in the Dallas County Plan. Portions of these jurisdictions are in both Dallas and Polk Counties. According to Iowa Emergency Management and Homeland Security, these jurisdictions will participate in the Polk County Hazard Mitigation Plan update.

3.4.16 Tornado

Hazard Score Calculation					
Probability	Magnitude/Severity	Warning Time	Duration	Weighted Score	Level
4	4	4	1	3.7	High

3.4.16.1 Profile

Hazard Description

The NWS defines a tornado as "a violently rotating column of air extending from a thunderstorm to the ground." Tornadoes are the most violent of all atmospheric storms and are capable of tremendous destruction. Wind speeds can exceed 250 miles per hour and damage paths can be more than one mile wide and 50 miles long. In an average year, more than 900 tornadoes are reported in the United States, resulting in approximately 80 deaths and more than 1,500 injuries. High winds not associated with tornadoes were profiled separately in this document in Section 3.4.17 Windstorm.

Tornadoes and high winds have been a part of life in Iowa since the time of pioneers in the 1800s. With its location at the frequent convergence area for Canadian, Gulf of Mexico, and Pacific air masses, Iowa is located in a part of the United States where tornadoes are a common occurrence. Iowa has experienced 1,466 tornadoes from 1980 through 2010 with 86 percent of them being rated F0 and F1, 14 percent rated F2 through F5. Only two F5 rated tornadoes have occurred in Iowa (Parkersburg in 2008 and Jordan in 1976). Since 1980, there have been on average 48 tornadoes per year in Iowa. Most tornadoes occurred in May and June, but tornadoes do occur in every month of the year in Iowa. Also mid afternoon until around sunset is the peak time of day for tornado activity. There have been 747 injuries and 26 deaths attributable to tornadoes (source: National Weather Service, Iowa Tornado Climatology Report 1980-2010).

Tornadoes are classified according to the EF- Scale (the original F – Scale was developed by Dr. Theodore Fujita, a renowned severe storm researcher). The Enhanced F- Scale (see Table 3.72) attempts to rank tornadoes according to wind speed based on the damage caused. This update to the original F scale was implemented in the U.S. on February 1, 2007.

Table 3.72. Enhanced F Scale for Tornado Damage

FUJITA SCALE			DERIVED EF SCALE		OPERATIONAL EF SCALE	
F Number	Fastest 1/4-mile (mph)	3 Second Gust (mph)	EF Number	3 Second Gust (mph)	EF Number	3 Second Gust (mph)
0	40-72	45-78	0	65-85	0	65-85
1	73-112	79-117	1	86-109	1	86-110
2	113-157	118-161	2	110-137	2	111-135
3	158-207	162-209	3	138-167	3	136-165
4	208-260	210-261	4	168-199	4	166-200
5	261-318	262-317	5	200-234	5	Over 200

Source: The National Weather Service, www.spc.noaa.gov/faq/tornado/ef-scale.html

The wind speeds for the EF scale and damage descriptions are based on information on the NOAA Storm Prediction Center as listed in Table 3.73. The damage descriptions are summaries. For the actual EF scale it is necessary to look up the damage indicator (type of

structure damaged) and refer to the degrees of damage associated with that indicator. Information on the Enhanced Fujita Scale's damage indicators and degrees or damage is located online at www.spc.noaa.gov/efscale/ef-scale.html.

Table 3.73. Enhanced Fujita Scale with Potential Damage

Enhanced Fujita Scale			
Scale	***Wind Speed (mph)***	***Relative Frequency***	***Potential Damage***
EF0	65-85	53.5%	Light. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over. Confirmed tornadoes with no reported damage (i.e. those that remain in open fields) are always rated EF0).
EF1	86-110	31.6%	Moderate. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF2	111-135	10.7%	Considerable. Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light object missiles generated; cars lifted off ground.
EF3	136-165	3.4%	Severe. Entire stores of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF4	166-200	0.7%	Devastating. Well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated.
EF5	>200	<0.1%	Explosive. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 300 ft.; steel reinforced concrete structure badly damaged; high rise buildings have significant structural deformation; incredible phenomena will occur.

Source: NOAA Storm Prediction Center

The best lead time for a tornado is about 30 minutes. Tornadoes have been known to change paths very rapidly, thus limiting the time in which to take shelter. Tornadoes may not be visible on the ground due to evening hours, blowing dust or driving rain and hail. Therefore, there is very little, or no, warning of when a specific tornado may be on the ground.

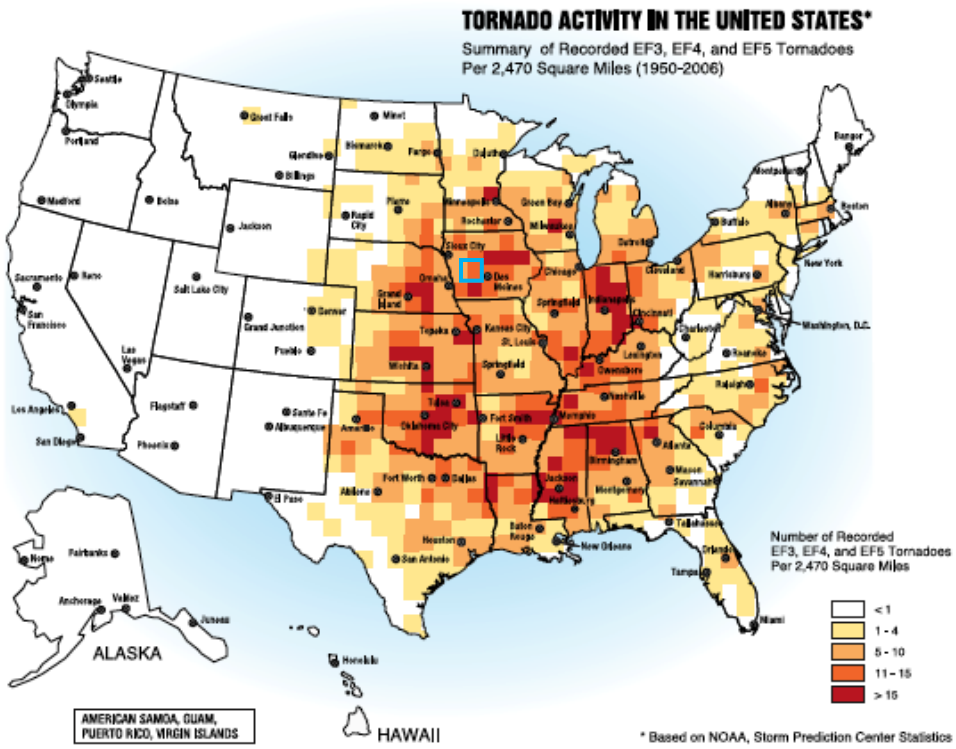
Warning Time Score: —less than 6 hours

Duration Score: 1—less than 6 hours

Geographic Location/Extent

Tornadoes can occur in the entire planning area. Figure 3.57 illustrates the number of F3, F4, and F5 tornadoes recorded in the United States per 3,700 square miles between 1950 and 2006. Dallas County is in the section shaded orange, indicating 5-10 tornadoes of this magnitude during this 57-year period.

Figure 3.57. Tornado Activity in the United States



Source: FEMA 320, Taking Shelter from the Storm, 3rd edition
Note: Blue square is approximate location of Dallas County

Previous Occurrences

According to statistics reported by the National Climatic Data Center, Dallas County has experienced 38 tornadoes from 1955 to 2011 (listings on the same date more than one hour apart or at different locations were considered multiple events). Of these, 2 were F3, 6 were F2, 8 were F1 and 22 were F0. These tornadoes caused a combined 2 injuries and over $14 Million in damages. There were no reported crop damages from tornadoes. Table 3.74 summarizes these events.

Dallas County has been included in six presidential disaster declarations that involved tornadoes since 1955 as follows:

- DR-1930, declared July 29, 2010,

- DR-1763, declared May 27, 2008,
- DR-1705, declared May 25, 2007,
- DR-1518, declared May 25, 2004,
- DR-1230, declared July 2, 1998, and
- DR-590, declared July 1, 1979.

The County was only included in DR-1763, DR-1518 and DR-1230 for tornadoes. For the other disasters DR-1930 and Dr-1705, Dallas County experienced storm and flooding damages, and for DR-590, Dallas County experienced high wind damages. These impacts are discussed separately under those hazards.

Table 3.74. Recorded Tornadoes in Dallas County, 1955-2011.

Location	Date	Magnitude	Deaths	Injuries	Property Damages ($)
Dallas County	4/4/1955	F2	0	0	25,000
Dallas County	5/5/1960	F1	0	0	25,000
Dallas County	6/22/1964	F2	0	0	250,000
Dallas County	5/17/1966	F2	0	0	25,000
Dallas County	7/26/1966	F0	0	0	0
Dallas County	6/14/1975	F1	0	0	2,500,000
Dallas County	4/14/1976	F2	0	0	25,000
Dallas County	6/12/1976	F1	0	0	25,000
Dallas County	6/13/1976	F3	0	0	250,000
Dallas County	6/28/1979	F1	0	0	250,000
Dallas County	7/10/1979	F0	0	0	25,000
Dallas County	6/17/1982	F0	0	0	3,000
Dallas County	5/6/1983	F1	0	0	2,500,000
Dallas County	6/26/1985	F0	0	0	0
Dallas County	5/9/1986	F0	0	0	0
Dallas County	5/9/1986	F0	0	0	0
Dallas County	5/9/1986	F0	0	0	0
Dallas County	5/31/1987	F0	0	0	2,500,000
Dallas County	3/13/1990	F0	0	0	2,500,000
Woodward	8/14/1997	F0	0	0	0
Granger	6/29/1998	F2	0	2	500,000
DeSoto	6/29/1998	F1	0	0	250,000
DeSoto	4/8/1999	F3	0	0	40,000
Perry	5/16/1999	F0	0	0	2,000
Woodward	5/30/2000	F0	0	0	0
Granger	5/30/2000	F0	0	0	0
Perry	6/12/2000	F0	0	0	0
Minburn	6/12/2000	F0	0	0	0
Waukee	4/8/2001	F0	0	0	0
Dexter	5/22/2004	F0	0	0	0

Location	Date	Magnitude	Deaths	Injuries	Property Damages ($)
Adel	5/22/2004	F1	0	0	2,000
Waukee	5/22/2004	F0	0	0	1,000
Dallas Center	5/22/2004	F0	0	0	0
Minburn & Woodward	11/12/2005	F2	0	0	2,500,000
DeSoto	3/30/2006	F0	0	0	0
Minburn	5/29/2008	F0	0	0	0
Adel	5/29/2008	F1	0	0	100,000
Waukee	6/7/2009	F0	0	0	10,000
Total					**$14,008,000**

Source: National Climatic Data Center

Descriptions of notable previous tornado events are provided below:

FEMA-1763-DR: Severe Storms, Flooding, & Tornadoes, May 29, 2008—A brief touchdown was reported in Dallas County in open fields west of Minburn. An F1 tornado touched down in Dallas County later on, west of Adel, and was on the ground for about 4 miles causing about $100,000 in property damages. Most of the damage was to power lines and trees as well as farm outbuildings. See Figure 3.58 for damage photos.

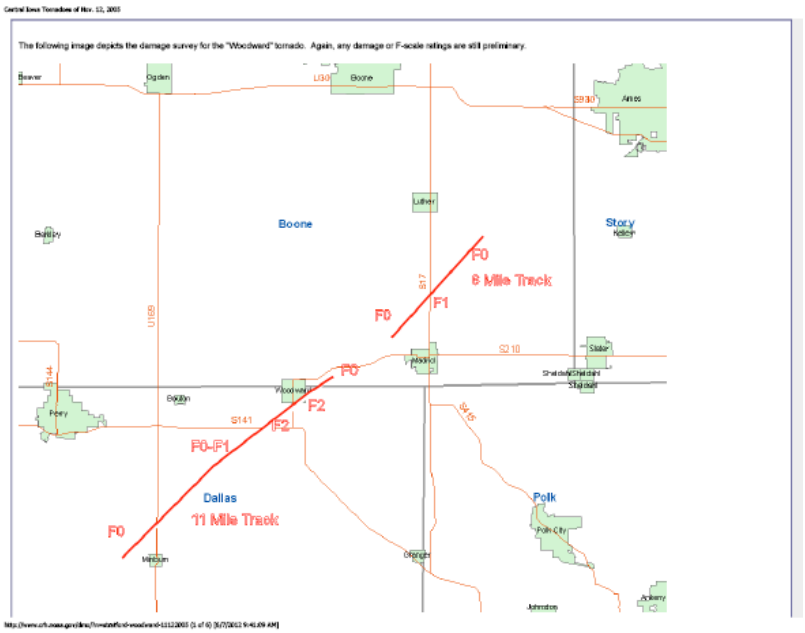
Figure 3.58. F1 Tornado Damage in Rural Dallas County from May 29, 2008

Source: Dallas County Emergency Management records

- **November 12, 2005—**Tornado touched down one mile west of Minburn according to the aerial survey. The tornado tracked northeast for about eight miles, producing F0-F1 damage before intensifying near Highway 141. The tornado produced F2 damage at a farm one mile southwest of Woodward and continued to produce F2 damage through the south and east portions of Woodward (see Figure 3.59 for tornado path). In a 2 or 3 block area of downtown Woodward, at least 12 houses were totally destroyed (see Figure 3.60 for

tornado damages in Woodward). The tornado dissipated one mile northeast of Woodward. Several houses slid off their foundations in Woodward, and a double-wide home was flipped upside down into the street. Total path length was 11 miles.

Figure 3.59. Path of November 12, 2005 Tornado in Dallas County



Source: http://www.crh.noaa.gov/dmx/?n=stratford-woodward-11122005

Figure 3.60. Tornado Damage in Woodward, November 12, 2005

Flattened garages and damaged homes in south Woodward.

House slid off foundation and Double-wide home flipped over in Woodward.

Source: http://www.crh.noaa.gov/dmx/?n=stratford-woodward-11122005

- **FEMA-1518-DR: Severe Storms, Tornadoes, & Flooding,** May 22, 2004—Two brief touch downs occurred near Dexter and Adel with minor damage reports. The County had other related damages to be included in the presidential declaration.
- FEMA-1230-DR: Severe Weather, Tornadoes, & Flooding, June 29,1998—An F2 tornado had a damage path that began fairly narrow but widened to nearly seven miles near Granger, where a duplex apartment home was destroyed, businesses and the water treatment plant where closed because of no electricity. The city of Granger received $68,000 from FEMA for their clean-up costs. The string of tornadoes continued southeast into Illinois, Indiana, and Kentucky.
- April 8, 1999—Tornado touched down in Union County and tracked across Madison and Dallas Counties. This tornado had F4 strength in Union and decreased to a strong F2 in Madison Counties before intensifying again to near F3 strength as it headed into Dallas County. Dallas County had around $40,000 in damages; Union County had $2,000,000 and around $350,000 in Madison County.

Probability of Future Occurrence

The National Climatic Data Center reported 38 tornadoes in Dallas County in a 57-year time period, which calculates to 66 percent chance of a tornado in any given year. Therefore it is a

high probability that some portion of Dallas County will experience tornado activity in any given year.

Probability Score: 4—Highly Likely

3.4.16.2 Vulnerability

Overview

Dallas County is located in a region of the U.S. with high frequency of dangerous and destructive tornadoes and is referred to as "Tornado Alley". Figure 3.61 is based on areas where dangerous tornadoes are most likely to take place.

Figure 3.61. Tornado Alley in the U.S.

Source: http://www.tornadochaser.net/tornalley.html

According to the Iowa Hazard Mitigation Plan, the estimated statewide losses have the tornado hazard listed as the 4th highest hazard losses with $37 million.

Magnitude Score: 4—Catastrophic

Potential Losses to Existing Development

In Dallas County, the NCDC estimate for past damages from 1955-2011 is $14,008,000 and the annualized property damage is $245,754 over the 57 years.

To estimate vulnerability to tornadoes, the HMPC decided to consider the impacts of an F2/EF2 tornado with wind speed of approximately 130 mph and a length of 5 miles and width of 100 yards in three different locations in the County. The three locations chosen are based on high, medium, and low housing and commercial structure density to show the variance of potential damages throughout the County. Based on information from the NOAA Storm Prediction Center, a F2/EF2 tornado of this magnitude would tear roofs off well-constructed houses, foundations of frame homes would shift, mobile homes would be completely destroyed, large

trees would snap or be uprooted, light objects would become missiles, and cars would be lifted off the ground. Several factors impact the severity of damage, including wind speed, time on the ground, length/width of the cell, population density, building density, age and construction of buildings, and time of day.

Three locations in Dallas County were considered for this tornado vulnerability analysis. The following three scenarios are analyzed using tornado path maps and a conservative 30 percent damage percentage for a F2/EF2 tornado. The parcel data values were provided by the Dallas County Assessor's Office.

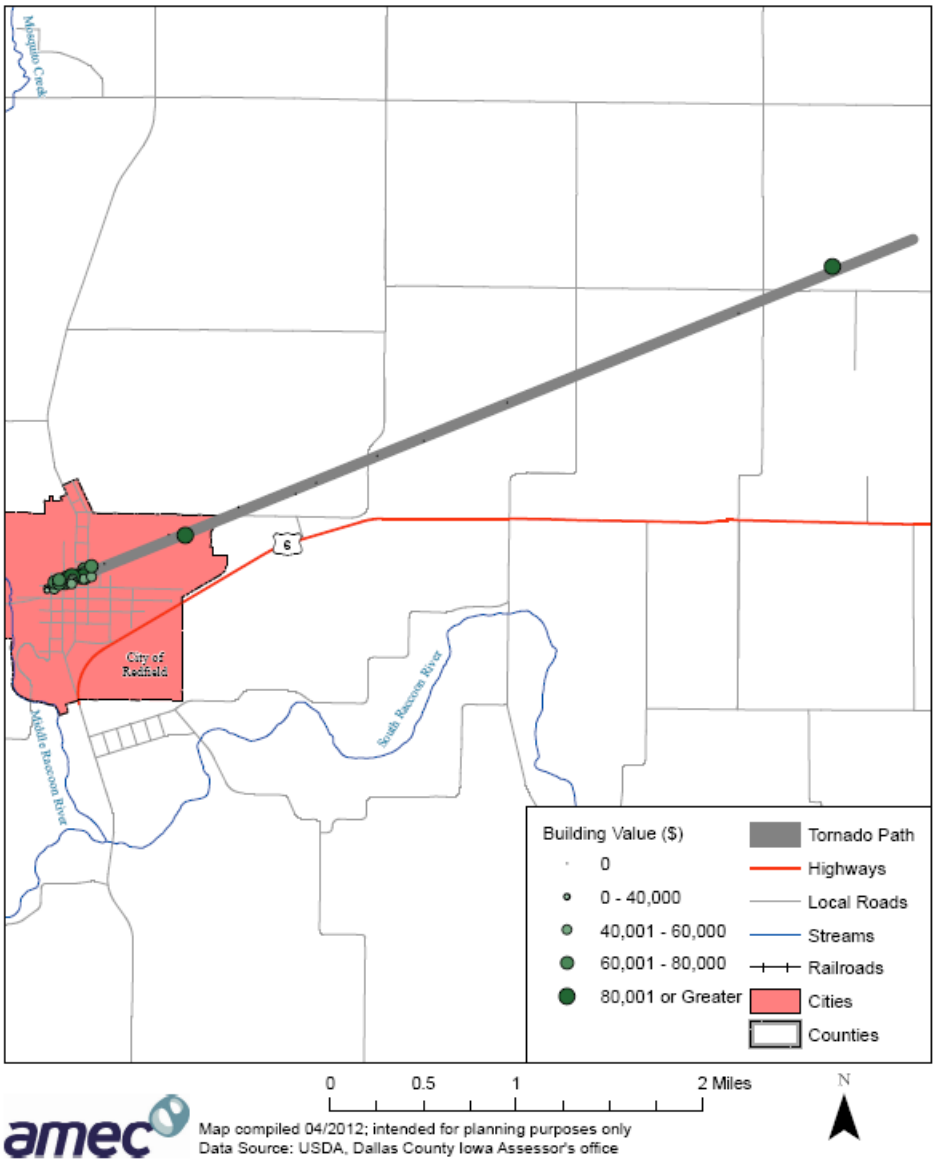
Scenario 1: Redfield, IA. The F2/EF2 tornado starts at approximately at 3rd Street & Taylor in town and moves northeast hitting the Redfield Medical Facility at 1st & High and the West Central Valley Middle School. Table 3.75 indicates that there would be a total of 35 buildings in the tornado path and those buildings would sustain $653,775 in damages from the tornado. Figure 3.62 shows a projected five mile path of scenario 1 and the value of buildings damaged in Redfield.

Table 3.75. F2/EF2 Tornado Scenario 1: Redfield, IA

Occupancy	Building Count within Scenario 1	Building Exposure	30% Damage
Residential	24	$1,235,950	$370,785
Commercial	10	$854,440	$256,332
Industrial	1	$88,860	$26,658
Agriculture	0	$0	$0
Total	35	$2,179,250	$653,775

Source: Dallas County Assessor's Office

Figure 3.62. Map of F2/EF2 Tornado Path Scenario 1: Redfield, IA

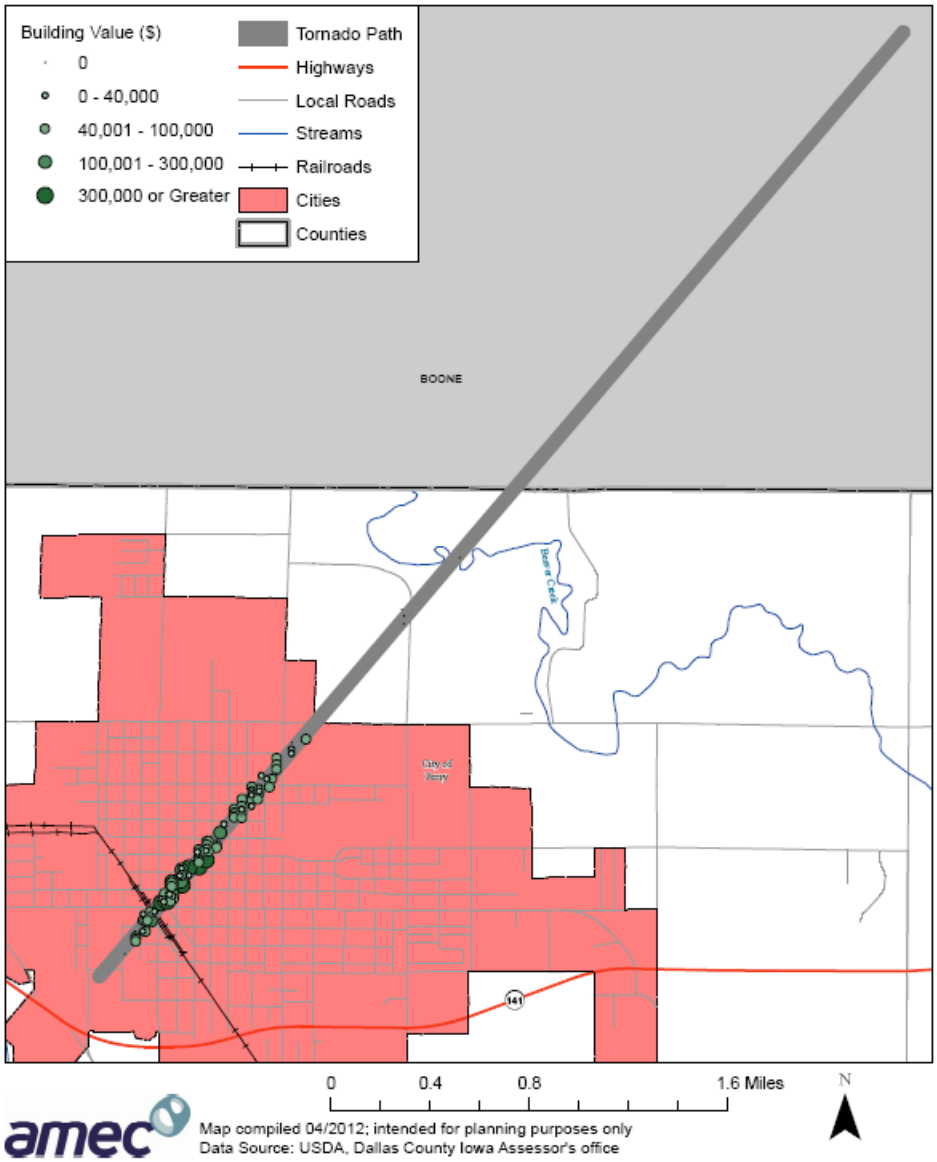


Scenario 2: Perry, IA. The F2/EF2 tornado touches down at Pattee Park (southwest corner of town) and moves across the intersection of Willis & 1st Ave causing damage to the City Office at 1102 Willis Ave. Table 3.76 indicates that there would be a total of 118 buildings in the tornado path and those buildings would sustain $2,659,470 in damages from the tornado. Figure 3.63 shows a projected five mile path of scenario 2 and the value of buildings damaged in Perry.

Table 3.76. F2/EF2 Tornado Scenario 2: Perry, IA

Occupancy	Building Count within Scenario 2	Building Exposure	30% Damage
Residential	53	$2,725,070	$817,521
Commercial	62	$5,959,100	$1,787,730
Industrial	3	$180,730	$54,219
Agricultural	0	0	0
Total	118	$8,864,900	$2,659,470

Figure 3.63. Map of F2/EF2 Tornado Path Scenario 2: Perry, IA

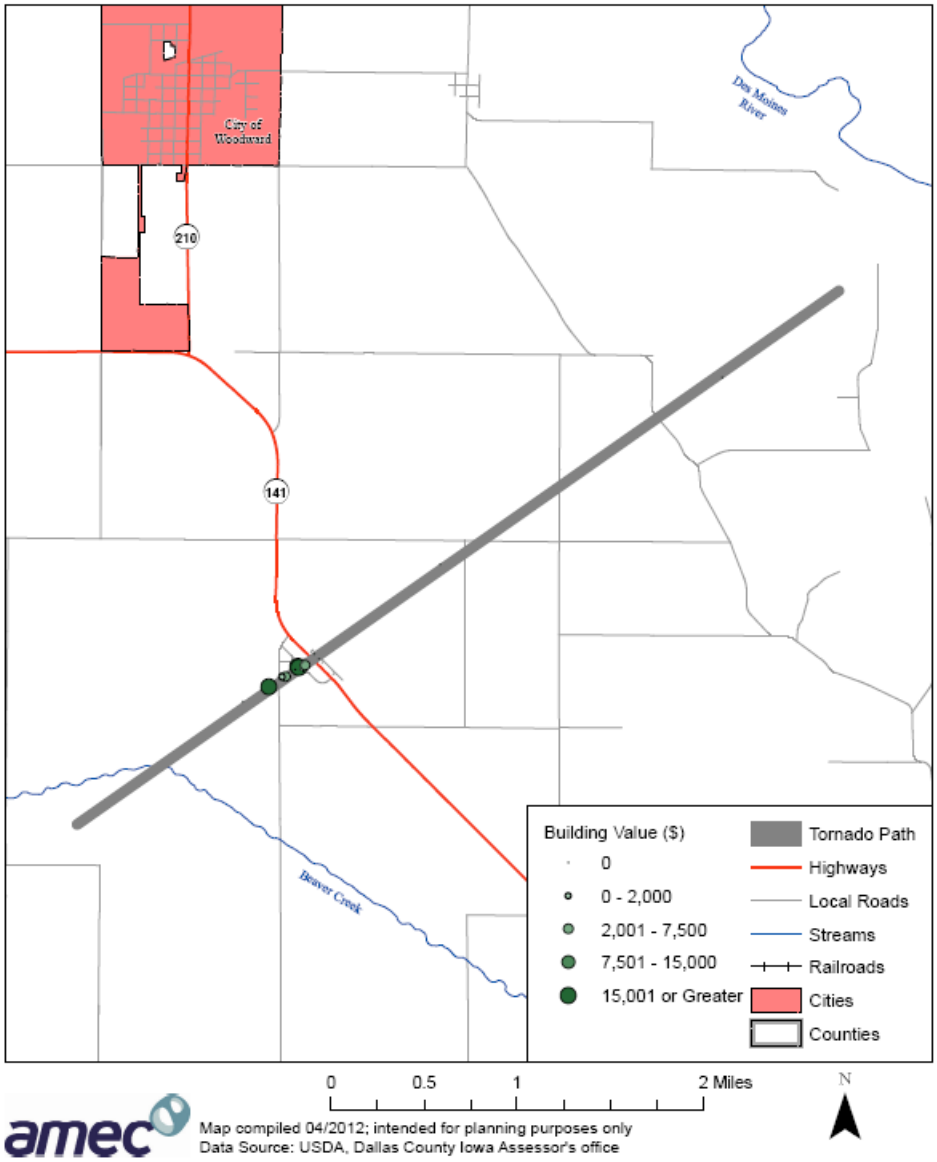


Scenario 3: General unincorporated area of the County. The F2/EF2 tornado touches down near Highway 141 in the northeast portion of the County. Table 3.77 indicates that there would be a total of 5 residential buildings in the tornado path and those buildings would sustain $28,440 in damages from the tornado. Figure 3.64 shows a projected five mile path of scenario 3 and the value of buildings damaged in the unincorporated county.

Table 3.77. F2/EF2 Tornado Scenario 3: Unincorporated Dallas County, IA

Occupancy	Building Count within Scenario 3	Building Exposure	30% Damage
Residential	5	$94,800	$28,440
Commercial	0	$0	0
Industrial	0	$0	0
Agricultural	0	$0	0
Total	5	$94,800	$28,440

Figure 3.64. Map of F2/EF2 Tornado Path Scenario 3: Unincorporated County



Future Development

Due to the increase in population and growth in the County, development trends are anticipated to increase vulnerability to tornados Future development that does occur in growing cities such as Adel, Clive, Dallas Center, DeSoto, Granger, Perry, Redfield, Urbandale, Waukee, West Des Moines, and the unincorporated county should consider tornado hazards at the planning, engineering and architectural design stages. Public buildings such as schools, government offices, as well as other buildings with a high occupancy and mobile home parks should consider inclusion of a tornado saferoom to shelter occupants in the event of a tornado. As the bike trails are expanded in the County and more people are outside exposed to the elements, future considerations should be made to shelter people on the High Trestle Trail and the Raccoon River Valley Trail.

Tornado Hazard Summary by Jurisdiction

The magnitude was rated as a Level 4 for all the participating jurisdictions as they are all vulnerable to tornado damage. The factors of probability, warning time, and duration are also equal across the planning area. Therefore, the conclusion is that this hazard does not substantially vary by jurisdiction.

Jurisdiction	Probability	Magnitude	Warning Time	Duration	Score	Level
Dallas County	4	4	4	1	3.7	High
Cities						
Adel	4	4	4	1	3.7	High
Bouton	4	4	4	1	3.7	High
Clive*	4	4	4	1	3.7	High
Dallas Center	4	4	4	1	3.7	High
Dawson	4	4	4	1	3.7	High
DeSoto	4	4	4	1	3.7	High
Dexter	4	4	4	1	3.7	High
Granger	4	4	4	1	3.7	High
Grimes*	4	4	4	1	3.7	High
Linden	4	4	4	1	3.7	High
Minburn	4	4	4	1	3.7	High
Perry	4	4	4	1	3.7	High
Redfield	4	4	4	1	3.7	High
Urbandale*	4	4	4	1	3.7	High
Van Meter	4	4	4	1	3.7	High
Waukee	4	4	4	1	3.7	High
West Des Moines*	4	4	4	1	3.7	High
Woodward	4	4	4	1	3.7	High
School Districts						
Adel-DeSoto-Minburn Schools	4	4	4	1	3.7	High
Dallas Center-Grimes Schools	4	4	4	1	3.7	High
Perry Schools	4	4	4	1	3.7	High
Van Meter Schools	4	4	4	1	3.7	High
Waukee Schools	4	4	4	1	3.7	High
West Central Valley Schools	4	4	4	1	3.7	High
Woodward- Granger Schools	4	4	4	1	3.7	High

*These jurisdictions are included in the risk assessment although they are not officially participating jurisdictions in the Dallas County Plan. Portions of these jurisdictions are in both Dallas and Polk Counties. According to Iowa Emergency Management and Homeland Security, these jurisdictions will participate in the Polk County Hazard Mitigation Plan update.

3.4.17 Windstorm

Hazard Score Calculation					
Probability	Magnitude/Severity	Warning Time	Duration	Weighted Score	Level
4	2	2	1	2.8	Moderate

3.4.17.1 Profile

Hazard Description

High winds, often accompanying severe thunderstorms, can cause significant property and crop damage, threaten public safety, and have adverse economic impacts from business closures and power loss.

The damaging winds of thunderstorms include downbursts, microbursts, and straight-line winds. Downbursts are localized currents of air blasting down from a thunderstorm, which induce an outward burst of damaging wind on or near the ground. Microbursts are minimized downbursts covering an area of less than 2.5 miles across. They include a strong wind shear (a rapid change in the direction of wind over a short distance) near the surface. Microbursts may or may not include precipitation and can produce winds at speeds of more than 150 miles per hour. Straight-line winds are generally any thunderstorm wind that is not associated with rotation (i.e., is not a tornado). It is these winds, which can exceed 100 mph, which represent the most common type of severe weather and are responsible for most wind damage related to thunderstorms. Since thunderstorms do not have narrow tracks like tornadoes, the associated wind damage can be extensive and affect entire (and multiple) counties. Objects like trees, barns, outbuildings, high-profile vehicles, and power lines/poles can be toppled or destroyed, and roofs, windows, and homes can be damaged as wind speeds increase. One type of straight-line wind is the downburst, which can cause damage equivalent to a strong tornado and can be extremely dangerous to aviation.

Thunderstorms over Iowa typically occur between late April and early September, but, given the right conditions, they can develop as early as March. They are usually produced by supercell thunderstorms or a line of thunderstorms that typically develop on hot and humid days.

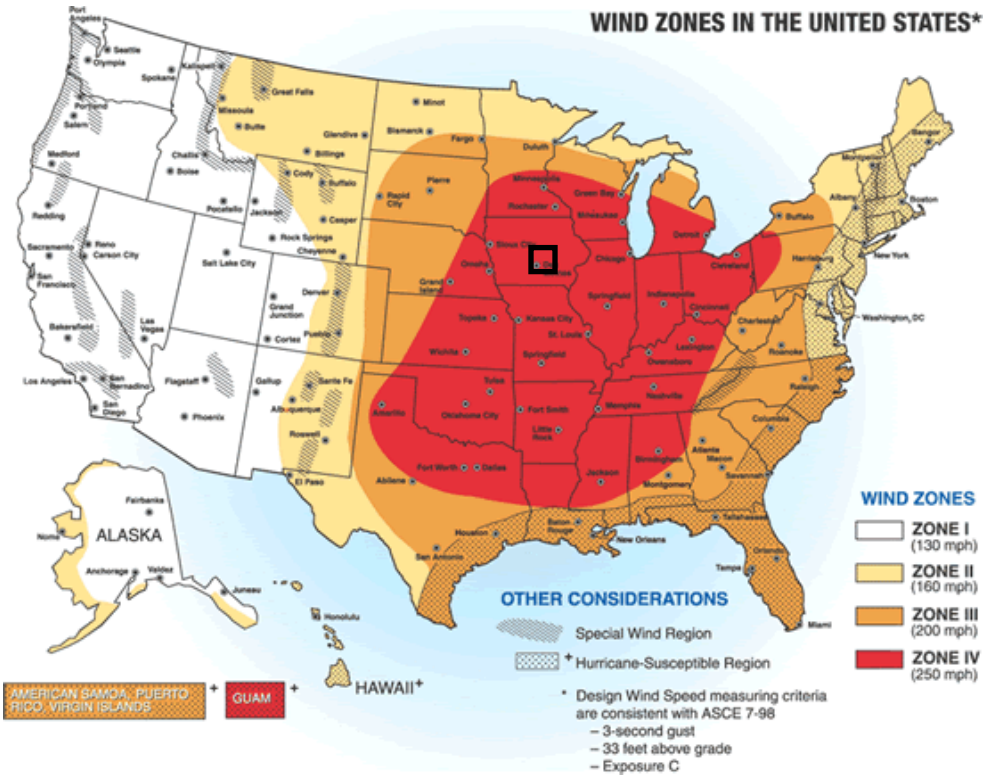
Warning Time: 2—less than one day

Duration: 1—less than 6 hours

Geographic Location/Extent

All of Dallas County is susceptible to high wind events. The County is located in Wind Zone IV, which is susceptible to winds up to 250 mph. All of the participating jurisdictions are vulnerable to this hazard. Figure 3.65 shows the wind zones of the United States based on maximum wind speeds; the entire state of Iowa is located within wind zone IV, the highest inland categories.

Figure 3.65. Wind Zones in the United States



Source: FEMA; http://www.fema.gov/plan/prevent/saferoom/tsfs02_wind_zones.shtm
Note: Black square indicates approximate location of Dallas County

Previous Occurrences

Dallas County was included in one presidential disaster for high winds and tornadoes in 1979.

According to the NCDC database, there were 204 wind events in Dallas County between 1962 and 2011 and 180 of the events had winds of 50 knots and higher. During this time period there were no reported deaths and 4 injuries as a result of windstorm events. Total property damage for events between 1994 and 2011 is estimated at $7.9 million.

Summaries of some of the more damaging events since 1994 are described below. These descriptions are primarily from the NCDC source:

- **June 26, 2011—**Thunderstorm winds caused widespread damage to trees and power lines. A semi-truck was overturned on Highway 141 west of Woodward by the winds. Another was overturned in Carroll County on U.S. highway 30. A high wind event also took place with the storm complex as a wake low formed. Strong easterly winds developed with wind speeds in the 60 to 75 MPH range common. Tree and power line damage was quite widespread over a 7 county area.
- **July 18, 2010—**Thunderstorms created high winds of 65 to 75 mph causing considerable tree damage in Waukee and Woodward and power outages were reported in Waukee.

- **August 8, 2010—**Ten to 15 foot mature tree was blown down at Centennial Park in Waukee from the high winds.
- **June 23, 2009**—The primary mode of severe weather with this event was in the form of high winds and hail. Some of the hail reached golf ball in size, however with the warm atmospheric conditions much of the hail remained below severe levels. High winds were reported all along the leading edge of the thunderstorm complex, with numerous reports in the 60 to 70 mph range. There were two areas where the most significant damage occurred and one area was over Dallas County. High winds caused considerable damage from around Dallas Center, west to the county line. An old airport field was hit by the winds with considerable damage to equipment and hangars. Winds were estimated to be at least 80 mph (see Figure 3.66 and Figure 3.67 for photos of windstorm damage)

Figure 3.66. Wind Storm Damage in Dallas Center, June 23, 2009

Source: Dallas County Emergency Management records

Figure 3.67. Wind Storm Damage At Small Airport North of Adel, June 23, 2009

Source: Dallas County Emergency Management records

- **July 21, 2008**—The thunderstorm system moved into Iowa after midnight and produced high winds and hail as it moved through. A portion of the system became a Derecho over west central Iowa and advanced across the state during the early morning hours. Derechoes are large clusters of thunderstorms that produce widespread wind damage. Winds of 60 to 75 mph were common, with a few gusts estimated as high as 100 mph in central Iowa. A radio tower was blown over by the winds in the Dawson area of Dallas County. Tree damage was very extensive from the winds with local utilities reporting as many as 200,000 homes were without power following the passage of the system. Roads were blocked by uprooted trees and heavy equipment was required to clear them. Propane tanks were leaking in town as they were thrown about and damaged by trees and the grain elevator in town sustained damaged.

Figure 3.68. Wind Damage in Dawson, July 21, 2008

Source: Dallas County Emergency Management records

- **August 6, 2007**—One storm produced a microburst northwest of Van Meter in Dallas County. The winds blew in a garage wall and tossed the roof down on a nearby car. An uninstalled modular home was demolished along with several trees being downed.
- **April 11, 2006**—The main mode of severe weather was high winds as the system became linear and raced northeast. Wind caused damage from southwest into central Iowa. There were several reports of tree limb damage with some spotty reports of more significant damage. A car lot sign was blown down on the northeast side of Des Moines, and a chimney was blown off of a house in Urbandale.
- **September 5, 2005**—High winds were a major problem with these storms. Many places reported winds over 80 MPH with incredible tree damage and numerous buildings damaged or destroyed. At least 38 counties were declared disaster areas by the Federal Government due to the severe damage and flooding.
- **March 23, 2004**—High winds reaching 50 mph tore a stop sign out at the base in Woodward. Trees and small limbs were taken down.
- **August 22, 2002**—Just as the storms approached central Iowa, a bow echo beta element formed in Dallas County. The bow echo tracked east into Polk County. Heavy wind damage occurred in eastern Dallas and Polk Counties. Winds gusted as high as 80 MPH as the storm roared through Des Moines. At one point, near 50,000 customers were without electricity in the metro Des Moines area. By the evening of the 23rd, power was restored to all but 13,000 to 15,000 customers. Some of the harder hit areas were without power for 2 to 3 days. Damage to trees and power lines was extensive. There were several reports of semi tractor-trailer trucks being blown over by the high winds and structural damage occurred to a few homes.
- **July 5, 2000**—Winds estimated around 85 MPH tore through Dallas County north of DeSoto. Two airplane hangars were destroyed and several ultra light aircraft were damaged. Damage in the area was estimated at around $100,000. The same storm system struck the west side of the Des Moines metropolitan area. High winds caused considerable tree and power line damage. At one point, power was knocked out to about 25,000 homes. A major transmission line was taken down in West Des Moines as the winds toppled three power poles. One housing development lost between 50 and 60 trees as the winds blew through.
- **May 16, 1999**—A tornado touched down briefly in rural areas west of Perry in Dallas County. The tornado did little damage however. The same storm knocked down power lines and trees south of Perry as winds were recorded at around 70 MPH a short time later.
- **May 26, 1996**—High winds from a thunderstorm caused damage around the city of Dallas Center. The roof of one mobile home was torn off by the winds as well.
- ***FEMA-590-DR: High Winds & Tornadoes, July 1, 1979***

Most of the events in the NCDC database included reports of downed power poles, trees and tree limbs. Although many of these events did not report damages to property or crops, debris removal from planted fields and other associated costs to agriculture are common as a result of the numerous high wind events.

According to the USDA Risk Management Agency, insurance payments for damages to crops as a result of wind and excessive wind from 2001-2011 totaled $465,960. State-wide in Iowa, 85 percent of the insurable row crops were insured in 2011 according to the USDA's Risk

Management Agency. Table 3.78 shows the insurable crop insurance claims paid in Dallas County as a result of windstorms.

Table 3.78. Insurable Crop Insurance Claims Paid in Dallas County as a Result of Windstorms, 2001-2011.

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid ($)
2008	SOYBEANS	Cyclone	1,527
2004	CORN	Wind/Excess Wind	17,633
2008	CORN	Wind/Excess Wind	222,783
2009	CORN	Wind/Excess Wind	66,151
2011	CORN	Wind/Excess Wind	55,099
2011	HYBRID CORN SEED	Wind/Excess Wind	83,509
2011	SOYBEANS	Wind/Excess Wind	1,625
2004	CORN	Wind/Excess Wind	17,633
Total			$465,960

Source: USDA Risk Management Agency Crop Insurance Payment FOIA Request; USDA Risk Management Agency Iowa Crop Insurance Profile, http://www.rma.usda.gov/pubs/2012/stateprofiles/iowa11.pdf

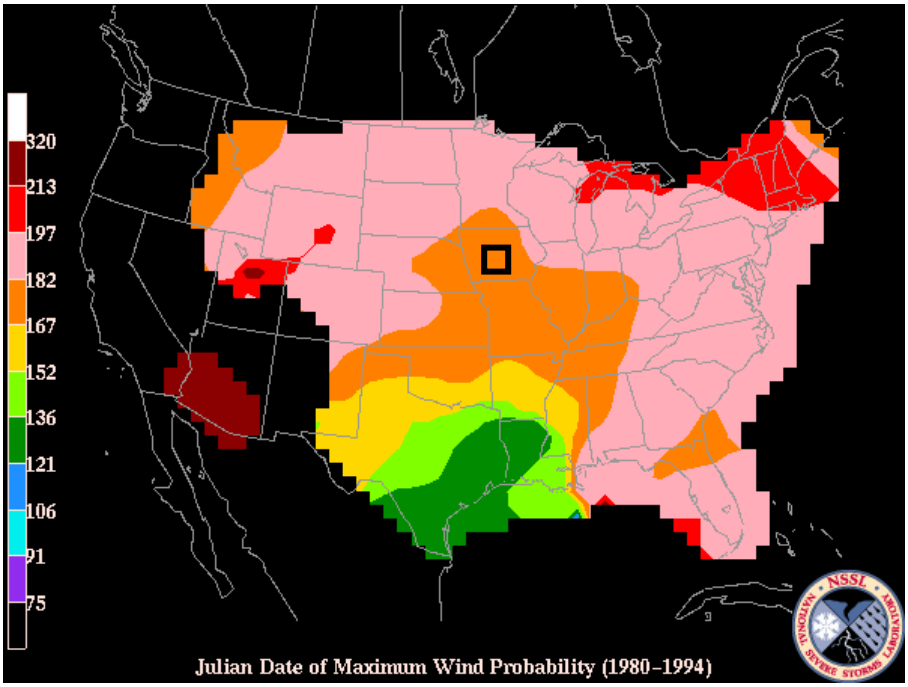
Probability of Future Occurrences

According to NCDC, there were 204 wind events in Dallas County between 1962 and 2011 (50 years) and 50 knots and greater events occurred an average of three times per year. Based on this information, the probability that at least four wind event will occur in Dallas County each year and these rates of occurrence are expected to continue in the future.

Probability Score: 4—Highly Likely

Figure 3.69 below shows when during the year the maximum time of probability of a windstorm (65 knots or greater) event occurs. The fill levels are labeled by Julian day of the year and the lowest non-black color is associated with 15-30 March timeframe on the calendar. The Dallas County planning area is colored orange thus the highest probability of a windstorm to occur is June 15th timeframe on the calendar of any given year.

Figure 3.69. Annual Windstorm Probability (65+ knots), United States 1980-1994



Source: NSSL, http://www.nssl.noaa.gov/users/brooks/public_html/bigwind.gif
Note: Black square indicates approximate location of Dallas County

3.4.17.2 Vulnerability

Overview

Windstorm is primarily a public safety and economic concern, and the planning area is located in a region with very high frequency of occurrence. Windstorm can cause damage to structures and power lines which in turn create hazardous conditions for people. Debris flying from high wind events can shatter windows in structures and vehicles and can harm people that are not adequately sheltered.

According to the Iowa Hazard Mitigation Plan, the estimated statewide losses have the windstorm hazard listed as the 9th highest hazard losses with $4 million.

Magnitude Score: 2 — Limited

Potential Losses to Existing Development

Campers, construction trailers, mobile homes, barns, and sheds and their occupants are particularly vulnerable as windstorm events in Dallas County can be sufficient in magnitude to overturn these lighter structures.

Table 3.79 provides the estimated numbers of mobile homes in each city in the planning area as well as the unincorporated areas of the County. The city with the most mobile homes is Waukee.

Table 3.79. Mobile Homes in Cities and Unincorporated Dallas County

Jurisdiction	Number of Mobile Homes
Adel	89
Bouton	6
Clive*	n/a
Dallas Center	13
Dawson	14
DeSoto	101
Dexter	4
Granger	15
Grimes*	n/a
Linden	2
Minburn	5
Perry	154
Redfield	25
Urbandale*	n/a
Van Meter	6
Waukee	333
West Des Moines*	n/a
Woodward	59
Unincorporated	295

Source: City-data.com
*Not Available the number of mobile homes in that city in Dallas County.

Loss of Use

Overhead power lines and infrastructure are also vulnerable to damages from windstorms. Potential losses would include cost of repair or replacement of damaged facilities, lost economic opportunities for businesses. Public safety hazards include risk of electrocution from downed power lines. Specific amounts of estimated losses are not available due to the complexity and multiple variables associated with this hazard. The loss of use estimates provided in Table 3.80 below were calculated using FEMA's publication *What is a Benefit?: Guidance on Benefit-Cost Analysis of Hazard Mitigation Project, June 2009*. These figures are used to provide estimated costs associated with the loss of power in relation to the populations in the Dallas County's jurisdictions. The loss of use is provided in the heading as the loss of use cost per person per day of loss. The estimated loss of use provided for each jurisdiction represents the loss of service of the indicated utility for one day for 10 percent of the population. It is understood that in rural areas, the typical loss of use may be for a larger percentage of the population for a longer time during weather extremes. These figures do not take into account physical damages to utility equipment and infrastructure.

Table 3.80. Loss of Use Estimates for Power Failure Associated with Windstorms

Jurisdiction	Population (2010)	Estimated Affected Population (10%)	Electric Loss of Use Estimate ($126 per person per day)
Adel	3,682	368.2	$46,393.20
Bouton	129	12.9	$1,625.40
Clive*	4,721	472.1	$59,484.60
Dallas Center	1,623	162.3	$20,449.80
Dawson	131	13.1	$1,650.60
DeSoto	1,050	105	$13,230.00
Dexter	611	61.1	$7,698.60
Granger**	1244	124.4	$15,674.40
Grimes*	1	0.1	$12.60
Linden	199	19.9	$2,507.40
Minburn	365	36.5	$4,599.00
Perry	7,702	770.2	$97,045.20
Redfield	835	83.5	$10,521.00
Urbandale*	6,339	633.9	$79,871.40
Van Meter	1,016	101.6	$12,801.60
Waukee	13,790	1379	$173,754.00
West Des Moines	11,510	1151	$145,026.00
Woodward**	1,024	102.4	$12,902.40
Unincorporated	10,381	1038.1	$130,800.60
Total	66,135	6613.5	$836,047.80

Source: Population, U.S. Census Bureau, 2010; Loss of Use Estimates from FEMA BCA Reference Guide, 2009; * For Clive, Grimes, Urbandale, and West Des Moines, the analysis included only those portions of the cities that fall on the Dallas County side. **For Granger and Woodward, the estimates include populations in adjacent counties within city limits.

Property and Crop Losses

Table 3.81 provides the estimated annualized property damages resulting from Windstorms as $438,888.

Table 3.81. Estimated Annualized Property Damages Resulting from Windstorms

Building Exposure	1994-2011 Wind Property Damages	Annualized Property Damages
$3,148,130,000	$7,900,000	$438,888

Source: Building Exposure, Dallas County Assessor's Office, 2012; Wind Property Damage from NCDC records

Table 3.82 provides the annual crop losses for insurable resulting from Windstorms. The insurable loss is adjusted to estimate losses to all insurable crops by considering that 85 percent of insurable crops in the State were insured (2011 Iowa Crop Insurance Profile from USDA's Risk Management Agency). This analysis indicates that in an average year, Dallas County receives a minimal amount of damages compared to the value crops as a result of Windstorms.

Table 3.82. Estimated Insurable Annualized Crop Damages Resulting from Windstorms

Crop Exposure (2007)	Insurance Paid (2001-2011)	Adjusted Crop Damages	Annualized Crop Damages
$156,900,000	$465,960	$548,188	$49,835

Source: Crop Exposure is from the National Agriculture Statistics Service 2007 Census of Agriculture; Insurance paid is from USDA's RMA; Statewide Crop insurance Coverage is from USDA's RMA Iowa Crop Insurance Profile.

Future Development

Future development projects should consider windstorm hazards at the planning, engineering and architectural design stage with the goal of reducing vulnerability.

Windstorm Hazard Summary by Jurisdiction

The following hazard summary table demonstrates how this hazard varies by jurisdiction. The magnitude is slightly higher in the cities and school districts with their built structures, but not high enough to warrant a higher magnitude level. Thus the magnitude level was not changed from the Dallas County level.

Jurisdiction	Probability	Magnitude	Warning Time	Duration	Score	Level
Dallas County	4	2	2	1	2.8	Moderate
Cities						
Adel	4	2	2	1	2.8	Moderate
Bouton	4	2	2	1	2.8	Moderate
Clive*	4	2	2	1	2.8	Moderate
Dallas Center	4	2	2	1	2.8	Moderate
Dawson	4	2	2	1	2.8	Moderate
DeSoto	4	2	2	1	2.8	Moderate
Dexter	4	2	2	1	2.8	Moderate
Granger	4	2	2	1	2.8	Moderate
Grimes*	4	2	2	1	2.8	Moderate
Linden	4	2	2	1	2.8	Moderate
Minburn	4	2	2	1	2.8	Moderate
Perry	4	2	2	1	2.8	Moderate
Redfield	4	2	2	1	2.8	Moderate
Urbandale*	4	2	2	1	2.8	Moderate
Van Meter	4	2	2	1	2.8	Moderate
Waukee	4	2	2	1	2.8	Moderate
West Des Moines	4	2	2	1	2.8	Moderate
Woodward	4	2	2	1	2.8	Moderate
School Districts						
Adel-DeSoto-Minburn Schools	4	2	2	1	2.8	Moderate
Dallas Center-Grimes Schools	4	2	2	1	2.8	Moderate
Perry Schools	4	2	2	1	2.8	Moderate
Van Meter Schools	4	2	2	1	2.8	Moderate
Waukee Schools	4	2	2	1	2.8	Moderate
West Central Valley Schools	4	2	2	1	2.8	Moderate
Woodward-Granger Schools	4	2	2	1	2.8	Moderate

*These jurisdictions are included in the risk assessment although they are not officially participating jurisdictions in the Dallas County Plan. Portions of these jurisdictions are in both Dallas and Polk Counties. According to Iowa Emergency Management and Homeland Security, these jurisdictions will participate in the Polk County Hazard Mitigation Plan update.

3.5 Hazard Analysis Summaries

Table 3.83 provides a tabular summary of the hazard ranking for each jurisdiction in the planning area.

Table 3.83. Planning Significance of Identified Hazards by Jurisdiction

Jurisdiction	Animal/Crop/Plant Disease	Dam Failure	Drought	Earthquake	Expansive Soils	Extreme heat	Flash Flood	Grass or Wildland Fire	Hailstorm	Landslide	Levee Failure	River Flooding	Severe Winter Storm	Sinkholes	Thunderstorms and Lightning	Tornado	Windstorm
Dallas County	M	M	M	L	L	M	M	M	M	L	N/A	H	H	L	M	H	M
Cities																	
Adel	L	L	L	L	M	M	M	L	M	L	M	H	H	L	M	H	M
Bouton	L	N/A	L	L	M	L	M	L	M	L	N/A	N/A	H	L	M	H	M
Clive*	L	M	L	L	M	**	M	L	M	L	N/A	N/A	H	L	M	H	M
Dallas Center	L	N/A	L	L	M	L	M	L	M	L	N/A	M	H	L	M	H	M
Dawson	L	N/A	L	L	M	L	M	L	M	L	N/A	M	H	L	M	H	M
DeSoto	L	M	L	L	M	L	H	L	M	L	N/A	M	H	L	M	H	M
Dexter	L	N/A	L	L	M	L	M	L	M	L	N/A	N/a	H	L	M	H	M
Granger	L	N/A	L	L	M	M	M	L	M	L	N/A	H	H	L	M	H	M
Grimes*	L	N/A	L	L	M	**	M	L	M	L	N/A	N/A	H	L	M	H	M
Linden	L	N/A	L	L	M	L	M	L	M	L	N/A	N/A	H	L	M	H	M
Minburn	L	N/A	L	L	M	L	M	L	M	L	N/A	N/A	H	L	M	H	M
Perry	L	N/A	L	L	M	M	M	L	M	L	N/A	H	H	L	M	H	M
Redfield	L	N/A	L	L	M	L	M	L	M	L	N/A	M	H	L	M	H	M
Urbandale*	L	N/A	L	L	M	**	M	L	M	L	N/A	N/A	H	L	M	H	M
Van Meter	L	M	L	L	M	L	M	L	M	L	M	H	H	L	M	H	M
Waukee	L	N/A	L	L	M	M	M	L	M	L	N/A	H	H	L	M	H	M
West Des Moines*	L	M	L	L	M	**	M	L	M	L	N/A	N/A	H	L	M	H	M
Woodward	L	N/A	L	L	M	L	M	L	M	L	N/A	N/A	H	L	M	H	M
School Districts																	
Adel-DeSoto-Minburn Schools	L	N/A	L	L	M	L	M	L	M	L	N/A	N/A	H	L	M	H	M
Dallas Center-Grimes Schools	L	N/A	L	L	M	L	M	L	M	L	N/A	N/A	H	L	M	H	M
Perry Schools	L	N/A	L	L	M	L	M	L	M	L	N/A	N/A	H	L	M	H	M
Van Meter Schools	L	N/A	L	L	M	L	M	L	M	L	N/A	N/A	H	L	M	H	M
Waukee Schools	L	N/A	L	L	M	L	M	L	M	L	N/A	N/A	H	L	M	H	M
West Central Valley Schools	L	N/A	L	L	M	L	M	L	M	L	N/A	N/A	H	L	M	H	M
Woodward-Granger Schools	L	N/A	L	L	M	L	M	L	M	L	N/A	H	H	L	M	H	M

H=High; M=Moderate; L=Low; *The risk assessment analyzed only the portions of these cities that fall on the Dallas County side of the county boundary; **Data factored into the magnitude rating was not available for the portions of these cities on the Dallas County side of the county boundary.

4 MITIGATION STRATEGY

44 CFR Requirement 201.6(c)(3): The plan shall include a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

This section presents the mitigation strategy developed by the Hazard Mitigation Planning Committee (HMPC) based on the risk assessment. The mitigation strategy was developed through a collaborative group process and consists of general goal statements to guide the jurisdictions in efforts to lessen disaster impacts as well as specific mitigation actions that can be put in place to directly reduce vulnerability to hazards and losses. The following definitions are based upon those found in FEMA publication 386-3, *Developing a Mitigation Plan* (April 2003):

- **Goals** are general guidelines that explain what you want to achieve. Goals are defined before considering how to accomplish them so that they are not dependent on the means of achievement. They are usually long-term, broad, policy-type statements.
- **Mitigation Actions** are specific actions that help achieve goals and objectives.

4.1 Goals

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

The HMPC developed goals to provide direction for reducing hazard-related losses in Dallas County. These were based upon the results of the risk assessment and a review of sample mitigation goals from other local plans.

Through a facilitated voting exercise and goal development discussion at their second meeting, the HMPC came to a consensus on five main goals. The facilitated exercise began with discussion of four general categories of mitigation goals:

- Public Education,
- Planning/Training/Communication,
- Reduce Risk to Life and Property, and
- Protection of Critical Facilities.

Then sample goal statements obtained from other local mitigation plans were discussed and the committee completed a voting exercise to reach consensus on the goal statements for the Dallas County Multi-jurisdictional Hazard Mitigation Plan. Each planning committee member was given four voting dots and asked to select the sample goals that most clearly stated the mitigation goals for Dallas County. After the voting exercise, the committee discussed the goals that received the most votes and made wording changes to tailor the goal statements. The

following goals statements were chosen for the Dallas County Multi-Jurisdictional Hazard Mitigation Plan:

1. Protect critical facilities and infrastructure from natural hazards;
2. Create a disaster resistant community by improving public understanding of natural hazards and risk by providing public awareness, preparedness, and mitigation information through various channels of communication;
3. Improve capabilities to mitigate natural hazards by incorporating mitigation strategies in plans, policies, and programs;
4. Prevent or reduce the impact of natural hazards for the residents, businesses, and municipalities of Dallas County;
5. Strengthen communication among agencies and between agencies and the public.

4.2 Identification and Analysis of Mitigation Actions

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

During the second meeting of the HMPC, the results of the risk assessment were provided to the HMPC members for review. After reviewing the results of the risk assessment, the committee discussed the key issues that were identified for specific hazards. Meeting #2 concluded with an introduction to mitigation actions to prompt discussions within and among the jurisdictions about the mitigation actions that they would like to develop and include in the plan. In addition, AMEC provided the HMPC with information on the Iowa Homeland Security and Emergency Management Division's funding priorities and the types of mitigation actions generally recognized by FEMA.

The third meeting of the HMPC, focused mainly on development of specific mitigation actions for the mitigation strategy. A handout was provided with the following types of mitigation actions, which originated from the National Flood Insurance Program's Community Rating System, as well as definitions and examples for each type of action:

- **Prevention:** Administrative or regulatory actions or processes that influence the way land and buildings are developed and built,
- **Property protection:** Actions that involve the modification of existing buildings or structures to protect them from a hazard or remove them from the hazard area,
- **Structural:** Actions that involve the construction of structures to reduce the impact of hazard,
- **Natural resource protection:** Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems,
- **Emergency services**: Actions that protect people and property during and immediately after a disaster or hazard event, and
- **Public education and awareness:** Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them.

Committee members engaged in discussion regarding the types of mitigation actions or projects that could be implemented in the planning area. Consideration was given to the identified key issues and the anticipated success of each project type. This type of group discussion allowed the committee as a whole to understand the broad priorities and discussion of the types of projects most beneficial to all jurisdictions within Dallas County. Appendix C contains a comprehensive list of the types of actions discussed that resulted in the final mitigation strategy for this mitigation plan.

4.3 Implementation of Mitigation Actions

44 CFR Requirement §201.6(c)(3)(ii): The mitigation strategy shall include an action strategy describing how the actions identified in paragraph (c)(2)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefits review of the proposed projects and their associated costs.

Projects were discussed within the context of the STAPLEE criteria and the likelihood of success/failure for each action. STAPLEE is a tool used to assess the costs and benefits, and overall feasibility of mitigation actions. STAPLEE stands for the following:

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

A modified STAPLEE form was completed by local planning committee members for each mitigation action submitted for the mitigation strategy. A sample modified STAPLEE form is included in Figure 4.1. The STAPLEE scores are recorded for each action in Table 4.1.

Figure 4.1. Modified STAPLEE Form

DALLAS COUNTY
MULTI-JURISDICTIONAL
LOCAL HAZARD MITIGATION PLAN

Action Title:	Jurisdiction:
Action ID:	

Note: Make sure the Action ID Matches the Action ID on the corresponding Mitigation Action Implementation Worksheet. Action ID format is Jurisdiction-# (Ex. Adel-1, Adel-2, Adel3, etc.)

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?		
T: Is it Technically feasible and potentially successful?		
A: Does the jurisdiction have the administrative capacity to execute this action?		
P: Is it Politically acceptable?		
L: Is there Legal authority to implement?		
E: Is it Economically beneficial?		
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)		
Will historic structures be saved or protected?		
Could it be implemented quickly?		
STAPLEE Score		

Mitigation Effectiveness Criteria	Evaluation Rating	Score
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	
Mitigation Effectiveness Score		

Total Score (STAPLEE Score + Mitigation Effectiveness Score): _____

Priority Level: ☐High (30+ points) ☐Medium (20-29 points) ☐Low (less than 20 points)

Completed by (name/title/phone #): _____

Throughout the discussion of the types of projects that the committee would include in the mitigation plan, emphasis was placed on the importance of a benefit-cost analysis in determining project priority. The Disaster Mitigation Act regulations state that benefit-cost review is the primary method by which mitigation projects should be prioritized. Recognizing the federal regulatory requirement to prioritize by benefit-cost, and the need for any publicly funded project to be cost-effective, the HMPC decided to pursue implementation according to when and where damage occurs, available funding, political will, jurisdictional priority, and priorities identified in the Iowa State Hazard Mitigation Plan. Due to many variables that must be examined during

project development, the benefit/cost review at the planning stage, will primarily consist of a qualitative analysis. For each action, the jurisdictions included a narrative describing the types of benefits that could be realized with implementation of the action. Where possible, the cost was estimated as closely as possible with further refinement to occur as project development occurs. Cost-effectiveness will be considered in additional detail when seeking FEMA mitigation grant funding for eligible projects identified in this plan. At that time, additional information will be researched to provide for a quantitative benefit-cost analysis.

After the group brainstorming session, individual jurisdictions were instructed to coordinate meetings with his or her jurisdictional planning team (where available) to discuss mitigation actions and to complete the mitigation action worksheets and STAPLEE Worksheets for each action that they wanted to include in the plan. Committee members were instructed to return completed action worksheets to AMEC.

It was decided that each individual jurisdiction should separately prioritize the actions they chose to include in the plan. This decision was made to avoid “competition” among jurisdictions in prioritizing actions. Each jurisdiction used the STAPLEE worksheet and scoring system to assist in developing the priority level for each action. All actions submitted to the plan are indicated with a high, medium, or low priority level based on the modified STAPLEE score.

Table 4.1 summarizes the mitigation actions that the participating jurisdictions selected to submit to the plan, including the priority level, the STAPLEE score, plan goals addressed, and the hazards addressed. The mitigation action implementation worksheets follow the action table in the same order they are presented in the summary table:

- County Actions
- City Actions
- School District Actions

Table 4.1. Mitigation Action Matrix

Action ID	Jurisdiction	Action Title	Mitigation Measure Category #	Goal #	Hazards	STAPLEE Score
Dallas County-1	Dallas County	County Road System-200th St-B Ave.	5	4	Flash Flood, River Flooding	29
Dallas County-2	Dallas County	County Road System-Beaumont Ave-bike trail	5	4	Flash Flood, River Flooding	29
Dallas County-3	Dallas County	County Road System-205th St-Pioneer Ave.	5	4	Flash Flood, River Flooding	29
Dallas County-4	Dallas County	County Road System-210th St-V. Ave.	5	4	Flash Flood, River Flooding	29
Dallas County-5	Dallas County	County Road System 250th St-T. Ave.	5	4	Flash Flood, River Flooding	29
Dallas County-6	Dallas County	County Road System-Other	5	4	Flash Flood, River Flooding	33
Dallas County-7	Dallas County	Backup Generators for County Buildings	6	1	Tornado, Severe Winter Storm, Thunderstorm & Lightning, Windstorm, River Flooding	30
Dallas County-8	Dallas County	Saferooms in New Dallas County Buildings	5	4	Tornado, Thunderstorm & Lightning, Windstorm, Severe Winter Storm, River Flooding	30
Dallas County-9*	Dallas County	Annual Review of Floodplain Management Ordinance	1	3	Flash Flood, River Flooding, Dam Failure, Levee Failure	30
Adel-1	City of Adel	Expand/Improve Outdoor Warning Siren network	6	2	Thunderstorms & Lightning, Tornado, Windstorm	37
Adel-2	City of Adel	Saferoom Construction in Public Buildings and Near Outdoor Recreation Areas	5	4	Tornado, Thunderstorms & Lightning, Windstorm, Hailstorm	37

Action ID	Jurisdiction	Action Title	Mitigation Measure Category #	Goal #	Hazards	STAPLEE Score
Adel-3	City of Adel	Maintain/Upgrade Levee System/Floodwalls	5	1	Flash Flood, Levee Failure, River Flooding	43
Adel-4	City of Adel	Purchase Floodprone Properties	2	4	River Flooding	36
Adel-5	City of Adel	Stream Corridor Restoration	4	4	Flash Flood	34
Adel-6	City of Adel	Back-up Power for Critical Facilities	6	1	Severe Winter Storm, Thunderstorms & Lightning, Tornado, Windstorm	36
Adel-7	City of Adel	Upgrade/Expand/Improve Stormwater Management System	4	4	Flash Flood	41
Adel-8*	City of Adel	Continue Compliance with the National Flood Insurance Program	3	2	Flash Flood, River Flooding	33
Bouton-1	City of Bouton	Upgrade to Storm Drainage System	5	4	Flash Flood	37
Bouton-2	City of Bouton	Construction of a Community Saferoom	5	4	Tornado	37
Dallas Center-1	City of Dallas Center	Construct Public Safety Facility that includes a Saferoom and Emergency Operations Center	5	4	All Hazards	36
Dallas Center-2	City of Dallas Center	Educate Citizens on Disasters	3	2	All Hazards	29
Dallas Center-3	City of Dallas Center	Upgrade/Expand/Improve Stormwater Management System	5	4	Flash Flood, River Flooding	35
Dallas Center-4	City of Dallas Center	Back-up Power for Critical Facilities	6	4	All Hazards	35
Dallas Center-5	City of Dallas Center	Expand/Improve Outdoor Warning Siren network	6	5	Tornado	37
Dallas Center-6	City of Dallas Center	Emerald Ash Borer Education	3	2	Animal/Plant/Crop Infestation	37
Dallas Center-7*	City of Dallas Center	Continue Compliance with the National Flood Insurance Program	1	3	Flash Flood, River Flooding	38

Action ID	Jurisdiction	Action Title	Mitigation Measure Category #	Goal #	Hazards	STAPLEE Score
Dawson-1	City of Dawson	Generator for Pump House	6	1	Severe Winter Storm, Thunderstorms & Lightning, Tornado, Windstorm, River Flooding	30
Dawson-2	City of Dawson	Ring Levee Around Pump house	5	1	Flash Flood, River Flooding	31
Dawson-3	City of Dawson	Tree Trimming Around power Lines	1	1	Severe Winter Storm, Windstorm	30
Dawson-4*	City of Dawson	Public Information Regarding Availability of Flood Insurance	3	2	Flash Flood, River Flooding	27
DeSoto-1	City of DeSoto	City of DeSoto Saferoom	5	4	Tornado	42
DeSoto-2*	City of DeSoto	National Flood Insurance Program Public Education	3	2	Flash Flood, River Flooding	47
Dexter-1	City of Dexter	Tree Branch Clearing from Power Lines	6	2	Severe Winter Storm, Thunderstorms & Lightning, Windstorm, Tornado	34
Dexter-2	City of Dexter	Two Generators for Emergency Back-up Power at Water Treatment Plant and Stand Pipe Pump	1	6	Severe Winter Storm, Thunderstorms & Lightning, Windstorm, Tornado	32
Granger-1	City of Granger	500,000 Gallon Water Tower	5	1	Drought	33
Granger-2	City of Granger	Emergency Services Building	6	1	All Hazards	41
Granger-3	City of Granger	Tornado Saferoom	5	4	Tornado	38
Granger-4	City of Granger	Tornado Siren	6	5	Tornado, Windstorm	38
Granger-5	City of Granger	All City Employees NIMS Certified	6	5	All Hazards	31
Granger-6*	City of Granger	Continue Compliance with the National Flood Insurance Program-Floodplain Ordinance Annual Review	1	3	Flash Flood, River Flooding	37
Linden-1	City of Linden	Construct New City Hall/Fire Station/Library with a Community Saferoom.	5	4	Tornado, Windstorm	40

Action ID	Jurisdiction	Action Title	Mitigation Measure Category #	Goal #	Hazards	STAPLEE Score
Minburn-1	City of Minburn	Safe Room	5	4	Tornado, Thunderstorms & Lightning	31
Minburn-2	City of Minburn	Install Transfer Switch to Enable a Portable Generator to be Hooked up to City Hall	6	1	Tornado, Severe Winter Storm, Thunderstorm & Lightning, Windstorm	37
Minburn-3	City of Minburn	Public Education	3	2	All Hazards	
Perry-2	City of Perry	Cultural Severe Weather Education	3	2	All Hazards	30
Perry-3	City of Perry	Bury Power Lines and Phone Lines Under Ground	6	1	Severe Winter Storms, Windstorms, and Tornadoes	28
Perry-5	City of Perry	Designate Public Shelters	6	4	Tornadoes, Windstorms, Severe Winter Storms, Extreme Heat, River Flooding	33
Perry-11	City of Perry	Develop a Plan for Emergency Water Supply	6	4	Drought	28
Perry-12	City of Perry	Increase Frequency of Fire/Building Inspections	1	4	Windstorm	25
Perry-13	City of Perry	Adopt a Year-round Burning Ban	1	3	Grass or Wildland Fire	25
Perry-15	City of Perry	Establish an Emergency Translation Team	6	5	All Hazards	31
Perry-19	City of Perry	Conduct an Earthquake Drill at Schools	6	2	Earthquake	19
Perry-21	City of Perry	Have all City Employees NIMS Certified	6	5	All Hazards	40
Perry-22*	City of Perry	Continue Participation in the National Flood Insurance Program and promote availability of flood insurance to citizens	1	2	Flash Flood, River Flooding	31
Perry-23	City of Perry	Continue to Enforce Local Building Codes	1	3	Windstorms, Expansive Soils, Landslide, River Flooding	29
Perry-24	City of Perry	Clear Brush from Frog Creek	4	4	Flash Flood, River Flooding	35

Action ID	Jurisdiction	Action Title	Mitigation Measure Category #	Goal #	Hazards	STAPLEE Score
Redfield-1	City of Redfield	Purchase Floodprone Properties	2	4	Flash Flood, River Flooding	24
Redfield-2	City of Redfield	Construct Community Saferoom	5	4	Tornado	39
Redfield-3*	City of Redfield	Annual Review of Floodplain Management Ordinance	1	3	Flash Flood, River Flooding	28
Van Meter-1	City of Van Meter	Saferoom Construction for Schools and Public Buildings	5	4	Tornado, Thunderstorms & Lightning, Windstorm, Severe Winter Storm, Extreme Heat	38
Van Meter-2	City of Van Meter	Expand/Improve Warning Sirens	6	4	Tornado, Windstorm, Thunderstorms & Lightning	47
Van Meter-3*	City of Van Meter	Continue Compliance with the National Flood Insurance Program	1	3	Flash Flood, Dam Failure, Landslide, River Flooding, Levee Failure	33
Van Meter-4	City of Van Meter	Public Education on Hazards	3	2	All Hazards	32
Van Meter-5	City of Van Meter	Back-up Power for Critical Facilities	6	1	Winter Storm, Extreme Heat, Tornado, Flash Flood, Windstorm, Thunderstorms & Lightning	33
Waukee-1*	City of Waukee	Continue Participation in the National Flood Insurance Program and Annually Review Ordinance	1	3	Flash Flood, River Flooding	34
Waukee-2	City of Waukee	Consider Construction of Tornado Saferooms in Public Areas	5	4	Tornado, Windstorm	37
Waukee-3	City of Waukee	Drainage Improvements to Alleviate Flash Flooding in the area of LA Grant and Booth Drive	5	4	Flash Flood	30
Woodward-1	City of Woodward	Community Wildfire Protection Plan	1	3	Grass or Wildland Fire	42
Woodward-2	City of Woodward	Construction of Saferooms/Shelter	5	4	Tornado, Windstorm	36

Action ID	Jurisdiction	Action Title	Mitigation Measure Category #	Goal #	Hazards	STAPLEE Score
Woodward-3	City of Woodward	Install Second Warning Siren in Annexed Areas	6	5	Windstorm, Tornado	36
Woodward-4	City of Woodward	Repair/Replace/Upgrade Storm Sewer Program	5	4	Flash Flood, River Flooding	39
Woodward-5	City of Woodward	Install Transfer Switches and Connections on Critical Facilities to Enable Generator Hook-up	6	4	Winter Storm, Extreme Heat, Tornado, Flash Flood, Windstorm, Thunderstorms & Lightning	44
Woodward-6	City of Woodward	Community Education Initiative	3	2	Tornado, Windstorm	42
Adel-DeSoto-Minburn Schools-1	Adel-DeSoto-Minburn Schools	Saferoom Construction	5	4	Tornado	36
Adel-DeSoto-Minburn Schools-2	Adel-DeSoto-Minburn Schools	Educate Students on Disasters	3	2	All Hazards	29
Dallas Center Grimes Schools-1	Dallas Center-Grimes Schools	Saferoom Construction	5	4	Tornado	31
Perry Schools-1	Perry Schools	Saferooms at HS/MS and Elementary Facilities	5	4	Tornado, Windstorm	38
Perry Schools-2	Perry Schools	Back-up Power Generator	6	1	Tornado, Windstorm	35
Perry Schools-3	Perry Schools	Replace Aging Infrastructure	2	1	Windstorm, Severe Winter Storm, Tornado, Thunderstorms & Lightning	30
Van Meter Schools-1	Van Meter Schools	Saferoom Construction	5	4	Tornado	39
Van Meter Schools-2	Van Meter Schools	Van Meter Schools Storm Water Drainage	5	4	Flash Flood, River Flooding	37
Van Meter Schools-3	Van Meter Schools	Purchase Generator	6	1	Tornado, Windstorm, Severe Winter Storm, Thunderstorms & Lightning	33

Action ID	Jurisdiction	Action Title	Mitigation Measure Category #	Goal #	Hazards	STAPLEE Score
Waukee Schools	Waukee Schools	Construction of Tornado Saferooms	5	4	Tornado	36
West Central Valley Schools-1	West Central Valley Schools	Dexter Elementary Saferoom Construction	5	4	Tornado	32
West Central Valley Schools-2	West Central Valley Schools	Middle School in Redfield Saferoom Construction	5	4	Tornado	32
Woodward-Granger Schools-1	Woodward-Granger Schools	Stormwater Management	5	1	Flash Flood, River Flooding	34
Woodward-Granger Schools-2	Woodward-Granger Schools	Woodward-Granger Saferoom	5	4	Tornado	34

*Denotes Actions related to continued compliance with the NFIP

The tables that follow provide additional details for each mitigation action identified by the planning committee. This information serves as the action plan describing how the actions will be prioritized, implemented, and administered by the local jurisdiction. The section on benefits or losses avoided if the action is implemented is primarily a qualitative review at this time. A more detailed and quantitative benefit-cost analysis was discussed and will be performed prior to implementation of actions when additional detailed project cost information has been developed.

Since the City of Perry had an expired Hazard Mitigation Plan from 2005, the actions from that plan were updated as part of this planning process. At the beginning of the section including the Actions for the City of Perry, there is a table indicating the status of each of the 23 actions from the 2005 plan. Of those, 4 are completed, 8 addressed non-natural hazards and have been forwarded to other planning mechanisms for consideration, and 11 have been continued in this plan update. In addition, the City developed one additional action for a total of 12 actions in this plan. For tracking purposes, the original action number from the 2005 plan has been carried over into this plan.

Dallas County Actions

Dallas County-1

Jurisdiction: Dallas County	Local Priority (high, medium, low) From STAPLEE worksheet: 29-Medium	Hazards Addressed: Flash Flood, River Flooding
Action Title/Description:	Mitigation - County road system/200th St-B Av.	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	4-Prevent or reduce the impact of natural hazards for the residents, businesses, and municipalities of Dallas County.	
Issue/Background: Why is this action needed? What is the problem?	Recurring damage from floods.	
Ideas for Implementation: How can the problem be solved?	Place additional drainage structures and raise road profile.	
Obstacles to Implementing?	Funding	
Responsible Office: Which department in Jurisdiction would implement/track?	Dallas County Road Department with day labor or contract labor.	
Partners: Who would help?	N/A	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Local funding as available.	
Cost Estimate:	$22,000	
Benefits: (Describe Losses Avoided)	Protects roadway - minimizes recurring damage and subsequent repair.	
Timeline: (How many months/years to complete?)	2 months	Completed by: (name/title/phone #) Jim George/County Engineer/515 993 4289

Dallas County-2

Jurisdiction: Dallas County	Local Priority (high, medium, low) From STAPLEE worksheet: 29-Medium	Hazards Addressed: Flash Flood, River Flooding
Action Title/Description:	Mitigation - County road system/Beaumont Av.-bike trail	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	Prevent or reduce the impact of natural hazards for the residents, businesses, and municipalities of Dallas County.	
Issue/Background: Why is this action needed? What is the problem?	Recurring damage from floods.	
Ideas for Implementation: How can the problem be solved?	Place additional drainage structures and raise road profile.	
Obstacles to Implementing?	Funding	
Responsible Office: Which department in Jurisdiction would implement/track?	Dallas County Road Department with day labor or contract labor.	
Partners: Who would help?	N/A	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Local funding as available.	
Cost Estimate:	$15,000	
Benefits: (Describe Losses Avoided)	Protects roadway - minimizes recurring damage and subsequent repair.	
Timeline: (How many months/years to complete?)	2 months	Completed by: (name/title/phone #) Jim George/County Engineer/515 993 4289

Dallas County-3

Jurisdiction: Dallas County	Local Priority (high, medium, low) From STAPLEE worksheet: 29-Medium	Hazards Addressed: Flash Flood, River Flooding
Action Title/Description:	Mitigation - County road system/205th St-Pioneer Av.	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	Prevent or reduce the impact of natural hazards for the residents, businesses, and municipalities of Dallas County.	
Issue/Background: Why is this action needed? What is the problem?	Recurring damage from floods.	
Ideas for Implementation: How can the problem be solved?	Place larger drainage structure and raise road profile.	
Obstacles to Implementing?	Funding	
Responsible Office: Which department in Jurisdiction would implement/track?	Dallas County Road Department with day labor or contract labor.	
Partners: Who would help?	N/A	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Local funding as available.	
Cost Estimate:	$18,000	
Benefits: (Describe Losses Avoided)	Protects roadway - minimizes recurring damage and subsequent repair.	
Timeline: (How many months/years to complete?)	2 months	Completed by: (name/title/phone #) Jim George/County Engineer/515 993 4289

Dallas County-4

Jurisdiction: Dallas County	Local Priority (high, medium, low) From STAPLEE worksheet: 29-Medium	Hazards Addressed: Flash Flood, River Flooding
Action Title/Description:	Mitigation - County road system/210th St-V Av.	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	Prevent or reduce the impact of natural hazards for the residents, businesses, and municipalities of Dallas County.	
Issue/Background: Why is this action needed? What is the problem?	Recurring damage from floods.	
Ideas for Implementation: How can the problem be solved?	Place additional drainage structures and raise road profile.	
Obstacles to Implementing?	Funding	
Responsible Office: Which department in Jurisdiction would implement/track?	Dallas County Road Department with day labor or contract labor.	
Partners: Who would help?	N/A	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Local funding as available.	
Cost Estimate:	$15,000	
Benefits: (Describe Losses Avoided)	Protects roadway - minimizes recurring damage and subsequent repair.	
Timeline: (How many months/years to complete?)	2 months	Completed by: (name/title/phone #) Jim George/County Engineer/515 993 4289

Dallas County-5

Jurisdiction: Dallas Countyt	Local Priority (high, medium, low) From STAPLEE worksheet: 29-Medium	Hazards Addressed: Flash Flood, River Flooding
Action Title/Description:	Mitigation - County road system/250th St-T Av.	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	Prevent or reduce the impact of natural hazards for the residents, businesses, and municipalities of Dallas County.	
Issue/Background: Why is this action needed? What is the problem?	Recurring damage from floods.	
Ideas for Implementation: How can the problem be solved?	Place additional drainage structures and raise road profile.	
Obstacles to Implementing?	Funding	
Responsible Office: Which department in Jurisdiction would implement/track?	Dallas County Road Department with day labor or contract labor.	
Partners: Who would help?	N/A	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Local funding as available.	
Cost Estimate:	$18,000	
Benefits: (Describe Losses Avoided)	Protects roadway - minimizes recurring damage and subsequent repair.	
Timeline: (How many months/years to complete?)	2 months	Completed by: (name/title/phone #) Jim George/County Engineer/515 993 4289

Dallas County-6

Jurisdiction: Dallas Countyt	Local Priority (high, medium, low) From STAPLEE worksheet: 33-High	Hazards Addressed: Flash Flood, River Flooding
Action Title/Description:	Mitigation - County road system/Other	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	Prevent or reduce the impact of natural hazards for the residents, businesses, and municipalities of Dallas County.	
Issue/Background: Why is this action needed? What is the problem?	Recurring damage from floods.	
Ideas for Implementation: How can the problem be solved?	Place additional drainage structures and raise road profile.	
Obstacles to Implementing?	Funding	
Responsible Office: Which department in Jurisdiction would implement/track?	Dallas County Road Department with day labor or contract labor.	
Partners: Who would help?	N/A	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Local funding as available.	
Cost Estimate:	$250,000	
Benefits: (Describe Losses Avoided)	Protects roadway - minimizes recurring damage and subsequent repair.	
Timeline: (How many months/years to complete?)	1 year	Completed by: (name/title/phone #) Jim George/County Engineer/515 993 4289

Dallas County-7

Jurisdiction: Dallas Co	Local Priority (high, medium, low) From STAPLEE worksheet: 30-High	Hazards Addressed: Tornado, Severe Winter storm, Thunderstorm and Lightning,Windstorm, River Flooding
Action Title/Description:	Mitigation - Backup generators for County roads and other county buildings.	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☒ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	1-Protect critical facilities and infrastructure from natural hazards.	
Issue/Background: Why is this action needed? What is the problem?	When power is disrupted to County buildings there is no backup electrical generation to keep those needed facilities in operation, or in some cases sump pumps running.	
Ideas for Implementation: How can the problem be solved?	Addition of backup generators to new and exeisting county facilities.	
Obstacles to Implementing?	funding	
Responsible Office: Which department in Jurisdiction would implement/track?	Dallas County Board of Supervisors	
Partners: Who would help?	N/A	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Local Tax Dollars.	
Cost Estimate:	Unknown at this time. Would depend on the building and its needs.	
Benefits: (Describe Losses Avoided)	Would allow for use after a hazard event and would protect some buildings by keeping sump pumps operational after electrical disruption.	
Timeline: (How many months/years to complete?)	Unknown. Depends on bulding and availabilityof generators.	Completed by: (name/title/phone #) Barry Halling/ Dallas County EMC/515-993-2134

Dallas County-8

Jurisdiction: Dallas County	Local Priority (high, medium, low) From STAPLEE worksheet: 30-High	Hazards Addressed: Tornado, Thunderstorm & Lightning, Windstorm, Severe Winter Storm, River Flooding
Action Title/Description:	Saferooms in New Dallas County Buildings	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	Prevent or reduce the impact of natural hazards for the residents, businesses, and municipalities of Dallas County	
Issue/Background: Why is this action needed? What is the problem?	To prevent harm and shelter the public and employees of Dallas County during severe weather	
Ideas for Implementation: How can the problem be solved?	Place safe rooms in new construction County public buildings.	
Obstacles to Implementing?	Funding	
Responsible Office: Which department in Jurisdiction would implement/track?	Dallas County Board of Supervisors	
Partners: Who would help?	N/A	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Local Tax dollars if Available.	
Cost Estimate:	Unknown at this time. Depends on type of building construction.	
Benefits: (Describe Losses Avoided)	Prevents possible injury or loss of life to the public and employees of Dallas County.	
Timeline: (How many months/years to complete?)	Unknown - depends on type and length of construction	Completed by: (name/title/phone #) Barry Halling/Dallas County EMC/515-993-2134

Dallas County-9

Jurisdiction: Dallas Co	Local Priority (high, medium, low) From STAPLEE worksheet: 30	Hazards Addressed: River Flooding, Flash Flood, Levee Failure, Dam Failure
Action Title/Description:	Annual Review of Floodplain Management Ordinance	
Mitigation Measure Category:	☒ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	Prevent or reduce the impact of flooding hazards for the residents, businesses, and municipalities of Dallas County.	
Issue/Background: Why is this action needed? What is the problem?	To keep the Flood Plain management ordinance relevant to a fast growing county, and to make sure that updates/modifications are made in a timely manner.	
Ideas for Implementation: How can the problem be solved?	Annual Floodplain ordinance review.	
Obstacles to Implementing?	none	
Responsible Office: Which department in Jurisdiction would implement/track?	Dallas County Planning & Zoning	
Partners: Who would help?	N/A	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Local Tax Dollars.	
Cost Estimate:	Unknown at this time.	
Benefits: (Describe Losses Avoided)	Would allow for updates and modifications to plan and continue participation in NFIP program.	
Timeline: (How many months/years to complete?)	Annually	Completed by: (name/title/phone #) Barry Halling/ Dallas County EMC/515-993-2134

City of Adel Actions

Adel-1

Jurisdiction: City of Adel	Local Priority (high, medium, low) From STAPLEE worksheet: 37-High	Hazards Addressed: Thunderstorms & Lightning, Tornado, Windstorm
Action Title/Description:	Expand/Improve Outdoor Warning Siren Network	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☒ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	2--Create a disaster resistant community by improving public understanding of natural hazards and risk by providing public awareness, preparedness, and mitigation information through various channels of communication.	
Issue/Background: Why is this action needed? What is the problem?	This action is needed to provide a comprehensive network of coverage of warning during times of severe weather. The current system does not encompass the annexation area of the city. A verbal communication warning system is needed for all hazards	
Ideas for Implementation: How can the problem be solved?	Install additional outdoor warning siren locations within the annexation area. Upgrade the current outdoor warning system to provide direct communication to residents via an outdoor warning verbal communications	
Obstacles to Implementing?	Lack of funding	
Responsible Office: Which department in Jurisdiction would implement/track?	City of Adel-City Hall	
Partners: Who would help?	None identified at this time	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	local funds and FEMA Hazard Mitigation Assistance Grant if available	
Cost Estimate:	$40,000 (estimated)	
Benefits: (Describe Losses Avoided)	Avoid/minimize the loss of life from tornadoes and severe weather by being able to adequately warn all residents.	
Timeline: (How many months/years to complete?)	5 years	Completed by: (name/title/phone #) Jim McNeill, Adel Emergency Manager 515-993-6723

Adel-2

Jurisdiction: City of Adel	Local Priority (high, medium, low) From STAPLEE worksheet: 37-High	Hazards Addressed: Tornado, Thunderstorms & Lightning, Windstorm, Hailstorm
Action Title/Description:	Saferoom construction in public buildings and near outdoor recreation areas	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	4-Prevent or reduce the impact of natural hazards for the residents, businesses, and municipalities of Dallas County	
Issue/Background: Why is this action needed? What is the problem?	A saferoom is not available for the aquatic center. Residents attending the outdoor recreation area need a place of safety in the event of severe weather.	
Ideas for Implementation: How can the problem be solved?	Construct a saferoom at the aquatic center.	
Obstacles to Implementing?	Lack of funds	
Responsible Office: Which department in Jurisdiction would implement/track?	City of Adel-City Hall	
Partners: Who would help?	City Engineer	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Local Funds and FEMA Hazard Mitigation Assistance Grants	
Cost Estimate:	$75,000 (estimated)	
Benefits: (Describe Losses Avoided)	Decrease injury and/or loss of life from tornadoes, thunderstorms & lightning, windstorms, and hailstorm	
Timeline: (How many months/years to complete?)	5 years	Completed by: (name/title/phone #) Jim McNeill, Emergency Manager 515-993-6127

Adel-3

Jurisdiction: City of Adel	Local Priority (high, medium, low) From STAPLEE worksheet: 43-High	Hazards Addressed: Flash Flood, Levee Failure, River Flooding
Action Title/Description:	Maintain/Upgrade levee system/floodwalls	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	1-Protect critical facilities and infrastructure from natural hazards	
Issue/Background: Why is this action needed? What is the problem?	The City of Adel is vulnerable to flooding during times of excessive precipitation in the watershed. The flooding puts the town's water supply at risk to damage and puts the town's residents in danger.	
Ideas for Implementation: How can the problem be solved?	Provide a levee/floodwall system to permanentlly protect the residents of Adel from flooding.	
Obstacles to Implementing?	lack of funding	
Responsible Office: Which department in Jurisdiction would implement/track?	City of Adel-City Hall	
Partners: Who would help?	City Engineer	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Local funds and available grant funds	
Cost Estimate:	$150,000 (estimated)	
Benefits: (Describe Losses Avoided)	Decrease the potential for loss of life as a result of flooding as well as add needed protection to ensure the water treatment plant does not flood.	
Timeline: (How many months/years to complete?)	5 years	Completed by: (name/title/phone #) Jim McNeill, Emergency Manager 515-993-6723

Adel-4

Jurisdiction: City of Adel	Local Priority (high, medium, low) From STAPLEE worksheet: 36-High	Hazards Addressed: River Flooding
Action Title/Description:	Purchase floodprone properties	
Mitigation Measure Category:	☐ 1. Prevention ☒ 2. Property Protection ☒ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	4-Prevent or reduce the impact of natural hazards for the residents, businesses, and municipalities of Dallas County.	
Issue/Background: Why is this action needed? What is the problem?	Several businesses are located within the floodprone areas. These properties become flooded during times of severe flooding on a regular basis	
Ideas for Implementation: How can the problem be solved?	Purchase and remove the structures from the flood prone area	
Obstacles to Implementing?	lack of funding	
Responsible Office: Which department in Jurisdiction would implement/track?	City of Adel-City Hall	
Partners: Who would help?		
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Local funds and FEMA Hazard Mitigation Assistance Grant funds	
Cost Estimate:	$250,000 (estimated)	
Benefits: (Describe Losses Avoided)	Reduce repetitive damages to floodprone properties.	
Timeline: (How many months/years to complete?)	5 years	Completed by: (name/title/phone #) Jim McNeill, Emergency Manager 515-993-6723

Adel-5

Jurisdiction: City of Adel	Local Priority (high, medium, low) From STAPLEE worksheet: 34-High	Hazards Addressed: Flash Flood
Action Title/Description:	Stream Corridor Restoration	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☒ 4. Natural Resource Protection ☐ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	4-Prevent or reduce the impact of natural hazards for the residents, businesses, and municipalities of Dallas County	
Issue/Background: Why is this action needed? What is the problem?	The sides of the streambed have degraded along the waterway from S. 6th Street to S. 10th Street along the bike path.	
Ideas for Implementation: How can the problem be solved?	1200 ft. of streambank stabilization would prevent future degredation of the stream bank.	
Obstacles to Implementing?	lack of funding	
Responsible Office: Which department in Jurisdiction would implement/track?	City of Adel-City Hall	
Partners: Who would help?	City Engineer	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	local funds and FEMA Hazard Mitigation Assistance Grants or other grant funds	
Cost Estimate:	$10,000 (estimated)	
Benefits: (Describe Losses Avoided)	Prevent the loss of the streambank due to flooding.	
Timeline: (How many months/years to complete?)	3 years	Completed by: (name/title/phone #) Jim McNeill, Emergency Manager 515-993-6723

Adel-6

Jurisdiction: City of Adel	Local Priority (high, medium, low) From STAPLEE worksheet: 36-High	Hazards Addressed: Severe Winter Storm, Thunderstorms & Lightining, Tornado, windstorm
Action Title/Description:	Back-up Power for Critical Facilities	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☒ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	1-Protect critical facilities and infrastructure from natural hazards.	
Issue/Background: Why is this action needed? What is the problem?	The current water treatment and sewer treatment facilities do not have a back-up power system for operation of these facilities in the event of power outage.	
Ideas for Implementation: How can the problem be solved?	Provide a back-up power system (generators) to provide power to the water treatment and sewer treatment facilities.	
Obstacles to Implementing?	lack of funding	
Responsible Office: Which department in Jurisdiction would implement/track?	City of Adel-City Hall	
Partners: Who would help?	City Engineer	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Local funds and FEMA Hazard Mitigation Assistance Grants or other available grant funding.	
Cost Estimate:	$350,000 to $750,000 (estimated)	
Benefits: (Describe Losses Avoided)	Continued provision of water and sewer services during times of power outages as a result of severe weather.	
Timeline: (How many months/years to complete?)	5-10 years	Completed by: (name/title/phone #) Jim McNeill, Emergency Manager 515-993-6723

Adel-7

Jurisdiction: City of Adel	Local Priority (high, medium, low) From STAPLEE worksheet: 41-High	Hazards Addressed: Flash Flood
Action Title/Description:	Upgrade/Expand/Improve Stormwater Management Systems	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☒ 4. Natural Resource Protection ☐ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	4-Prevent or reduce the impact of natural hazards fo rhte residents, businesses, and municipalities of Dallas County.	
Issue/Background: Why is this action needed? What is the problem?	During times of Flash Flooding, a feeder to Butler Creek becomes inundated and does not allow proper drainage.	
Ideas for Implementation: How can the problem be solved?	The feeder to Butler Creek needs to be upgraded and expanded as well as additional improvements to the stormwater sytem to carry water away during times of flash flooding. The system needs to be bigger to carry a larger volume of water to allow for redirection of the flash flood water.	
Obstacles to Implementing?	lack of funding	
Responsible Office: Which department in Jurisdiction would implement/track?	City of Adel-City Hall	
Partners: Who would help?	City Engineer	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	City funds and available grant funds	
Cost Estimate:	$1,000,000 to $3,000,000 (estimated)	
Benefits: (Describe Losses Avoided)	Alleviate flash flooding problems for businesses and residents.	
Timeline: (How many months/years to complete?)	5-10 years	Completed by: (name/title/phone #) Jim McNeill, Emergency Manager 515-993-6723

Adel-8

Jurisdiction: City of Adel	Local Priority (high, medium, low) From STAPLEE worksheet: 33-High	Hazards Addressed: Flash Flood, River Flooding
Action Title/Description:	Continued compliance with the National Flood Insurance Program	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☒ 3. Public Education and Awareness	☒ 4. Natural Resource Protection ☐ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	2-Create a disaster resistant community by improving public understanding of natural hazards and risk by providing public awareness, preparedness,a nd mitigation information through various channels of communication	
Issue/Background: Why is this action needed? What is the problem?	Adel currently participates in the National Flood Insurance Program. Citizens may not be aware of the availability of flood insurance.	
Ideas for Implementation: How can the problem be solved?	Provide notification to citizens, through city government publications or website, regarding the availability of flood insurance	
Obstacles to Implementing?	None	
Responsible Office: Which department in Jurisdiction would implement/track?	City of Adel-City Hall	
Partners: Who would help?	None	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	City funds and available grant funds	
Cost Estimate:	Minimal	
Benefits: (Describe Losses Avoided)	insurance can offset costs due to losses from flood events	
Timeline: (How many months/years to complete?)	1 month to 1 yr.	Completed by: (name/title/phone #) Jim McNeill, Emergency Manager 515-993-6723

City of Bouton Actions

Bouton-1

Jurisdiction: City of Bouton	Local Priority (high, medium, low) From STAPLEE worksheet: 37-High	Hazards Addressed: Flash Flood
Action Title/Description:	Upgrade to the Storm Drainage System	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	4-Prevent or reduce the impact of natural hazards for the residents, businesses, and municipalities of Dallas County.	
Issue/Background: Why is this action needed? What is the problem?	Existing drain tiles are insufficient for water capacity during intense rainfall events and drainage from farm field does not drain properly into existing stormwater drainage system. Upgrades to the system are needed to correct these problems. Approx. 10 homes get flooded due to the water going over the road and into houses. Additionally, roads are damaged and undermined during significant events.	
Ideas for Implementation: How can the problem be solved?	Upgrade to the City's storm drain system	
Obstacles to Implementing?	lack of funds	
Responsible Office: Which department in Jurisdiction would implement/track?	Maintenance Dept.	
Partners: Who would help?		
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	FEMA Hazard Mitigation Assistance Grants	
Cost Estimate:	Estimate $60,000	
Benefits: (Describe Losses Avoided)	Avoid damages to road washing out and being undermined.	
Timeline: (How many months/years to complete?)	4 years	Completed by: (name/title/phone #) Betty Tingwald

Bouton-2

Jurisdiction: City of Bouton	Local Priority (high, medium, low) From STAPLEE worksheet: 37-High	Hazards Addressed: Tornado
Action Title/Description:	Contruction of a Community Saferoom	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	4-Prevent or reduce the impact of natural hazards for the residents, businesses, and municipalities of Dallas County.	
Issue/Background: Why is this action needed? What is the problem?	There is no existing community saferoom in Bouton.	
Ideas for Implementation: How can the problem be solved?	Construct a community saferoom on city-owned property near existing community center for approx 75 residents in 10 block area.	
Obstacles to Implementing?	lack of funds	
Responsible Office: Which department in Jurisdiction would implement/track?	City Council	
Partners: Who would help?	Memorial Trust out of Ogden	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	FEMA Hazard Mitigation Assistance Grants	
Cost Estimate:	TBD	
Benefits: (Describe Losses Avoided)	Life safety for 75 residents	
Timeline: (How many months/years to complete?)	3-5 years	Completed by: (name/title/phone #) Betty Tingwald

City of Dallas Center

Dallas Center-1

Jurisdiction: Dallas Center	Local Priority (high, medium, low) From STAPLEE worksheet: 36-High	Hazards Addressed: All Hazards
Action Title/Description:	Construct a public safety facility which would include a tornado saferoom and emergency operation center	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	Prevent or reduce the impact of natural hazards for the residents and businesses of Dallas Center.	
Issue/Background: Why is this action needed? What is the problem?	To protect Dallas Center citizens in the event of a tornado and provide a facility to run emergency operations from.	
Ideas for Implementation: How can the problem be solved?	Construct a facility to provide shelter and emergency operations during a tornado.	
Obstacles to Implementing?	Cost	
Responsible Office: Which department in Jurisdiction would implement/track?	Police Department and Fire Department	
Partners: Who would help?		
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Grants and local funds	
Cost Estimate:	Unknown	
Benefits: (Describe Losses Avoided)	Avoid injury and death	
Timeline: (How many months/years to complete?)	4-5 years	Completed by: (name/title/phone #) Cindy Riesselman, City Clerk 515-992-3725

Dallas Center-2

Jurisdiction: Dallas Center	Local Priority (high, medium, low) From STAPLEE worksheet: 29-medium	Hazards Addressed: All Hazards
Action Title/Description:	Education of citizens on disasters.	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☒ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	Create a disaster resistant community by improving public understanding of natural hazards and risk by providing public awareness, preparedness, and mitigation information through various channels of communication	
Issue/Background: Why is this action needed? What is the problem?	To educate citizens on natural disasters and safety measures to increase safety.	
Ideas for Implementation: How can the problem be solved?	Education and awareness of hazards and how to mitigate losses.	
Obstacles to Implementing?	Time and personnel	
Responsible Office: Which department in Jurisdiction would implement/track?	Fire Department	
Partners: Who would help?	Dallas Center-Grimes Community School District	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Grants and local funds	
Cost Estimate:	Unknown	
Benefits: (Describe Losses Avoided)	Avoid injury and death	
Timeline: (How many months/years to complete?)	1-2 years	Completed by: (name/title/phone #) Cindy Riesselman, City Clerk 515-992-3725

Dallas Center-3

Jurisdiction: Dallas Center	Local Priority (high, medium, low) From STAPLEE worksheet: 35-High	Hazards Addressed: Flash Flood, River Flooding
Action Title/Description:	Upgrade/expand/improve stormwater management systems	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	Prevent or reduce the impact of natural hazards for the residents and businesses of Dallas Center.	
Issue/Background: Why is this action needed? What is the problem?	During heavy rains several streets in town flood due to inadequate stormwater systems	
Ideas for Implementation: How can the problem be solved?	Improve stormwater drainage throughout the city.	
Obstacles to Implementing?	Cost	
Responsible Office: Which department in Jurisdiction would implement/track?	Public works	
Partners: Who would help?		
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Grants and local funds	
Cost Estimate:	Unknown	
Benefits: (Describe Losses Avoided)	Alleviate flooded streets	
Timeline: (How many months/years to complete?)	4-5 years	Completed by: (name/title/phone #) Cindy Riesselman, City Clerk 515-992-3725

Dallas Center-4

Jurisdiction: Dallas Center	Local Priority (high, medium, low) From STAPLEE worksheet: 35-High	Hazards Addressed: All Hazards
Action Title/Description:	Back-up power for critical facilities	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☒ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	Prevent or reduce the impact of natural hazards for the residents and businesses of Dallas Center.	
Issue/Background: Why is this action needed? What is the problem?	At the present time we are unable to run our sewer plant, water treatment plant, water storage facilities and city hall during a power outage.	
Ideas for Implementation: How can the problem be solved?	Purchase three generators and the electric transfer gear for our water treatment plant.	
Obstacles to Implementing?	Cost	
Responsible Office: Which department in Jurisdiction would implement/track?	Public works department	
Partners: Who would help?		
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Grants and local funds	
Cost Estimate:	Unknown	
Benefits: (Describe Losses Avoided)	Avoid sewer back ups and be able to provide adequate water supply during a power outage	
Timeline: (How many months/years to complete?)	2-3 years	Completed by: (name/title/phone #) Cindy Riesselman, City Clerk 515-992-3725

Dallas Center-5

Jurisdiction: Dallas Center	Local Priority (high, medium, low) From STAPLEE worksheet: 37-High	Hazards Addressed: Tornado
Action Title/Description:	Expand/improve outdoor warning siren network	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☒ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	5-Strengthen communication among agencies and between agencies and the public.	
Issue/Background: Why is this action needed? What is the problem?	To protect Dallas Center citizens in the event of a tornado or severe storm	
Ideas for Implementation: How can the problem be solved?	Purchase additional outdoor warning sirens	
Obstacles to Implementing?	Cost	
Responsible Office: Which department in Jurisdiction would implement/track?	Fire Department	
Partners: Who would help?		
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Grants and local funds	
Cost Estimate:	Unknown	
Benefits: (Describe Losses Avoided)	Avoid injury and death	
Timeline: (How many months/years to complete?)	2-3 years	Completed by: (name/title/phone #) Cindy Riesselman, City Clerk 515-992-3725

Dallas Center-6

Jurisdiction: Dallas Center	Local Priority (high, medium, low) From STAPLEE worksheet: 37-High	Hazards Addressed: Animal/Plant/Crop Infestation
Action Title/Description:	Emerald Ash Borer Education	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☒ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	Create a Emerald Ash Borer resistant community by improving public understanding of the threat and risk by providing public awareness, preparedness, and mitigation information through various channels of communication	
Issue/Background: Why is this action needed? What is the problem?	To educate citizens on the effects of the Emerald Ash Borer	
Ideas for Implementation: How can the problem be solved?	Education and awareness of hazards and how to mitigate losses.	
Obstacles to Implementing?	Time, personnel and cost	
Responsible Office: Which department in Jurisdiction would implement/track?	Park and Recreation Board	
Partners: Who would help?	DNR	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Grants and local funds	
Cost Estimate:	Unknown	
Benefits: (Describe Losses Avoided)	Avoid property damage	
Timeline: (How many months/years to complete?)	3-4 years	Completed by: (name/title/phone #) Cindy Riesselman, City Clerk 515-992-3725

Dallas Center-7

Jurisdiction: Dallas Center	Local Priority (high, medium, low) From STAPLEE worksheet: 38-High	Hazards Addressed: Flash Flood, River Flooding
Action Title/Description:	Continue compliance with National Flood Insurance Program	
Mitigation Measure Category:	☒ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	3-Improve capabilities to mitigate natural hazards by incorporating mitigation strategies in plans, policies, and programs.	
Issue/Background: Why is this action needed? What is the problem?	To educate citizens on the availability of the National Flood Insurance Program in our community and reduce the impact of flooding and the financial impact on property owners.	
Ideas for Implementation: How can the problem be solved?	Publicize availability of flood insurance to citizens and review floodplain management ordinance on a regular basis to determine if improvements/modifications are needed to prevent risk to future construction.	
Obstacles to Implementing?	Time, personnel and cost	
Responsible Office: Which department in Jurisdiction would implement/track?	Zoning Administrator	
Partners: Who would help?	DNR	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Grants and local funds	
Cost Estimate:	Unknown	
Benefits: (Describe Losses Avoided)	Avoid property damage and minimize flood losses	
Timeline: (How many months/years to complete?)	ongoing	Completed by: (name/title/phone #) Cindy Riesselman, City Clerk 515-992-3725

City of Dawson Actions

Dawson-1

Jurisdiction: City of Dawson	Local Priority (high, medium, low) From STAPLEE worksheet: 30-High	Hazards Addressed: Severe Winter Storm, Thunderstorms & Lightining, Tornado, Windstorm; River Flooding
Action Title/Description:	Generator for Pump house	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☒ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	1-Protect critical facilities and infrastructure from natural hazards.	
Issue/Background: Why is this action needed? What is the problem?	The pump house has a relay switch already installed, but no generator. If power is lost to the pump house, the City of Dawson could be without potable water.	
Ideas for Implementation: How can the problem be solved?	Provide a back-up power system (generators) to provide power to pump house in the event of power outage	
Obstacles to Implementing?	lack of funding	
Responsible Office: Which department in Jurisdiction would implement/track?	City of Dawson	
Partners: Who would help?		
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Local funds and FEMA Hazard Mitigation Assistance Grants or other available grant funding.	
Cost Estimate:	$TBD	
Benefits: (Describe Losses Avoided)	Continued provision of water services during times of power outages.	
Timeline: (How many months/years to complete?)	1-3 years	Completed by: (name/title/phone #) Billy Samuel

Dawson-2

Jurisdiction: City of Dawson	Local Priority (high, medium, low) From STAPLEE worksheet: 31-High	Hazards Addressed: Flash Flood, River Flooding
Action Title/Description:	Ring levee around pump house	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	1-Protect critical facilities and infrastructure from natural hazards.	
Issue/Background: Why is this action needed? What is the problem?	The pump house is located in the floodplain and at risk to inundation from floodwaters. Previously, the City has had to place sandbags around the pump house to keep it from flooding	
Ideas for Implementation: How can the problem be solved?	Construct a permanent earthen ring levee around the pump house to protect it from flooding	
Obstacles to Implementing?	lack of funding	
Responsible Office: Which department in Jurisdiction would implement/track?	City of Dawson	
Partners: Who would help?		
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Local funds and FEMA Hazard Mitigation Assistance Grants or other available grant funding.	
Cost Estimate:	$TBD	
Benefits: (Describe Losses Avoided)	Continued provision of water services during times of flooding	
Timeline: (How many months/years to complete?)	1-3 years	Completed by: (name/title/phone #) Billy Samuel

Dawson-3

Jurisdiction: City of Dawson	Local Priority (high, medium, low) From STAPLEE worksheet: 30-High	Hazards Addressed: Severe Winter Storm, Windstorm
Action Title/Description:	Tree/Trimming around Power Lines	
Mitigation Measure Category:	☒ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	1-Protect critical facilities and infrastructure from natural hazards.	
Issue/Background: Why is this action needed? What is the problem?	Overhanging tree limbs can break off and damage power infrastructure during severe winter storms/ice storms and windstorms.	
Ideas for Implementation: How can the problem be solved?	Routinely clean-up overhanging limbs around power lines. Consider hiring a contractor to do this for the whole town.	
Obstacles to Implementing?	lack of funding	
Responsible Office: Which department in Jurisdiction would implement/track?	City of Dawson	
Partners: Who would help?		
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	local funds	
Cost Estimate:	$TBD	
Benefits: (Describe Losses Avoided)	Continued provision of electricity/phone service during severe winter storms and windstorms.	
Timeline: (How many months/years to complete?)	1-3 years	Completed by: (name/title/phone #) Billy Samuel

Dawson-4

Jurisdiction: City of Dawson	Local Priority (high, medium, low) From STAPLEE worksheet: 27-Medium	Hazards Addressed: Flash Flood, River Flooding
Action Title/Description:	Public Information Regarding Availability of Flood Insurance	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☒ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	2-Create a disaster resistant community by improving public understanding of natural hazards and risk by providing public awareness, preparedness, and mitigation information through various channels of communication.	
Issue/Background: Why is this action needed? What is the problem?	The City of Dawson is a participant in good standing with the National Flood Insurance Program, making flood insurance available to residents and businesses within the community. However, residents and businesses may not be aware that flood insurance is available for purchase.	
Ideas for Implementation: How can the problem be solved?	Distribute flyers notifying residents and businesses of the availability of flood insurance along with water bill mailings.	
Obstacles to Implementing?	lack of funding	
Responsible Office: Which department in Jurisdiction would implement/track?	City of Dawson, Floodplain Manager	
Partners: Who would help?	National Flood Insurance Program, FEMA Publications Warehouse	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	local funds	
Cost Estimate:	$TBD	
Benefits: (Describe Losses Avoided)	Inform residents and businesses of the availability of flood insurance so that they can ensure they are adequately covered.	
Timeline: (How many months/years to complete?)	1-3 years	Completed by: (name/title/phone #) Billy Samuel

City of DeSoto Actions

DeSoto-1

Jurisdiction: City of DeSoto	Local Priority (high, medium, low) From STAPLEE worksheet: 42-HIgh	Hazards Addressed: Tornado
Action Title/Description:	City of DeSoto Saferoom	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	4-Prevent or reduce the impact of natural hazards for the residents, businesses, and municipalities of Dallas County.	
Issue/Background: Why is this action needed? What is the problem?	The City of DeSoto has a mobile home park within city limits and the residents do not have a tornado shelter.	
Ideas for Implementation: How can the problem be solved?	Construct a new Public Safety building which would include the Police Department, Fire Department, and public saferoom.	
Obstacles to Implementing?	Lack of funding	
Responsible Office: Which department in Jurisdiction would implement/track?	City of DeSoto City Administration Office	
Partners: Who would help?	Engineering Firm, Public Works, Police and Fire Departments	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Local Funds and FEMA Hazard Mitigation Assistance grants	
Cost Estimate:	$1,200,000	
Benefits: (Describe Losses Avoided)	Life-safety protection of DeSoto residents in case of a tornado	
Timeline: (How many months/years to complete?)	1 year	Completed by: (name/title/phone #) Marcia Thomas, City Clerk 515-834-2233

DeSoto-2

Jurisdiction: City of DeSoto	Local Priority (high, medium, low) From STAPLEE worksheet: 47-High	Hazards Addressed: Fash Flood and River Flooding
Action Title/Description:	NFIP Public Education	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☒ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	2-Create a disaster resistant community by improving public understanding of natural hazards and risk by providing public awareness, preparedness, and mitigation information through various channels of communication.	
Issue/Background: Why is this action needed? What is the problem?	The City of DeSoto currently participates in the NFIP butaal;l residents may not be aware of the availability of flood insurance.	
Ideas for Implementation: How can the problem be solved?	Inform residents and businesses within DeSoto of the availabilitly of flood insurance	
Obstacles to Implementing?	lack of funding	
Responsible Office: Which department in Jurisdiction would implement/track?	Public Works	
Partners: Who would help?	Administrative Staff	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Local funds as available	
Cost Estimate:	Minimal	
Benefits: (Describe Losses Avoided)	Safety and well being of De Soto residents	
Timeline: (How many months/years to complete?)	Ongoing	Completed by: (name/title/phone #) Marcia Thomas, City Clerk

City of Dexter Actions

Dexter-1

Jurisdiction: Dexter	Local Priority (high, medium, low) From STAPLEE worksheet: 34-High	Hazards Addressed: SevereWinterSstorm, Tstorms & Lightning, Windstorm, Tornado
Action Title/Description:	Tree Branch Clearing from Power Lines	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☒ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	2-Create a disaster resistant community by improving public understanding of natural hazards & risk by providing public awareness, preparedness, and mitigation information through various channels of communication.	
Issue/Background: Why is this action needed? What is the problem?	Tree trimming branches from utility lines throughout Dexter.	
Ideas for Implementation: How can the problem be solved?	Contacting Mid America or a combination of contracting a tree service	
Obstacles to Implementing?	Cost to the City and to the Citizens of Dexter	
Responsible Office: Which department in Jurisdiction would implement/track?	City Superintendent	
Partners: Who would help?	Mid America, City Council members?	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Combination of local funds or help from utility company	
Cost Estimate:	TBD	
Benefits: (Describe Losses Avoided)	Decrease power outages during wind/tornado/winter storms due to limbs being the cause of outage.	
Timeline: (How many months/years to complete?)	1-3 years	Completed by: (name/title/phone #) Tawnee Eckhart/City Council/515-669-4932

Dexter-2

Jurisdiction: Dexter	Local Priority (high, medium, low) From STAPLEE worksheet: 32-High	Hazards Addressed: Severe Winter Storm, Thunderstorms & Lightining, Windstorm, Tornado
Action Title/Description:	Two Generators for Emergency Back-Up Power at Water Treatment Plant and Stand Pipe Pump	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☒ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	1-Protect critical facilities and infrastructure from natural hazards.	
Issue/Background: Why is this action needed? What is the problem?	There is no back-up power for the Water Treatment Plant or Stand Pipe Pump	
Ideas for Implementation: How can the problem be solved?	Install Emergency Generators at Water Treatment Plant and Stand Pipe Pump	
Obstacles to Implementing?	Lack of funding	
Responsible Office: Which department in Jurisdiction would implement/track?	Water Superintendent	
Partners: Who would help?	Electric provider?	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	FEMA Hazard Mitigation Assistance Grants and local funds	
Cost Estimate:	$7,000 ea. ($14,000 total)	
Benefits: (Describe Losses Avoided)	Avoid impacts/cost of loss of water to the town	
Timeline: (How many months/years to complete?)	2 years	Completed by: (name/title/phone #) Tawnee Eckhart/City Council/515-669-4932

City of Granger Actions

Granger-1

Jurisdiction: City of Granger	Local Priority (high, medium, low) From STAPLEE worksheet: 33-High	Hazards Addressed: Drought
Action Title/Description:	500,000 Gallon Water Tower	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	1-Protect critical facilities and infrastructure from natural hazards	
Issue/Background: Why is this action needed? What is the problem?	Additional water capacity is needed due to population growth of the City of Granger	
Ideas for Implementation: How can the problem be solved?	Construct additional in-ground water tower/storage	
Obstacles to Implementing?	lack of funding	
Responsible Office: Which department in Jurisdiction would implement/track?	Public Works Department	
Partners: Who would help?	City Engineer	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Combination of Funds	
Cost Estimate:	$1.2 to $2 million	
Benefits: (Describe Losses Avoided)	Avoid shortage of water	
Timeline: (How many months/years to complete?)	2 years	Completed by: (name/title/phone #) Mike Greif, Public Works Superintendent 515-999-2210

Granger-2

Jurisdiction: City of Granger	Local Priority (high, medium, low) From STAPLEE worksheet: 41-High	Hazards Addressed: All Hazards
Action Title/Description:	Emergency Services Building	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☒ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	1-Protect critical facilities and infrastructure from natural hazards	
Issue/Background: Why is this action needed? What is the problem?	Due to the population growth, the City has outgrown the existing building. The building would be used to store vital city records and used as an EOC during/after a disaster.	
Ideas for Implementation: How can the problem be solved?	Construct a new Emergency Services Building	
Obstacles to Implementing?	lack of funding	
Responsible Office: Which department in Jurisdiction would implement/track?	Fire Department	
Partners: Who would help?	City Engineer	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Combination of Funds	
Cost Estimate:	$3.5 million	
Benefits: (Describe Losses Avoided)	Better facility to hold educational meetings for the public and house better equipment to help after a disaster	
Timeline: (How many months/years to complete?)	2 years	Completed by: (name/title/phone #) Jarrod Sturtz, Water Plant Operator & Fire Chief 515-999-2210

Granger-3

Jurisdiction: City of Granger	Local Priority (high, medium, low) From STAPLEE worksheet: 38-High	Hazards Addressed: Tornado
Action Title/Description:	Tornado Saferoom	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	4-Prevent or reduce the impact of natural hazards for the residents, businesses, and municipalities of Dallas County	
Issue/Background: Why is this action needed? What is the problem?	There are no saferooms in schools or City buildings at this time.	
Ideas for Implementation: How can the problem be solved?	Build a new saferoom to house the public in the event of tornadoes	
Obstacles to Implementing?	lack of funding	
Responsible Office: Which department in Jurisdiction would implement/track?	Parks and Recreation Department	
Partners: Who would help?	Public Works Department	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Combination of Funds	
Cost Estimate:	$280,000	
Benefits: (Describe Losses Avoided)	Lives Saved	
Timeline: (How many months/years to complete?)	6 months-1 year	Completed by: (name/title/phone #) Kristy Trzeciak, City Clerk 515-999-2210

Granger-4

Jurisdiction: City of Granger	Local Priority (high, medium, low) From STAPLEE worksheet: 38-High	Hazards Addressed: Tornado, Windstorm
Action Title/Description:	Tornado Siren	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☒ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	5-Strengthen communication among agencies and between agencies and the public.	
Issue/Background: Why is this action needed? What is the problem?	The City has grown pas the coverage capacity of existing sirens and is in need of two additional sirens	
Ideas for Implementation: How can the problem be solved?	Install two new sirens placed strategically at designatd areas to provide full coverage	
Obstacles to Implementing?	lack of funding	
Responsible Office: Which department in Jurisdiction would implement/track?	Fire Department	
Partners: Who would help?	Public Works Department	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Combination of Funds	
Cost Estimate:	$60,000	
Benefits: (Describe Losses Avoided)	Lives Saved	
Timeline: (How many months/years to complete?)	1 month after funding	Completed by: (name/title/phone #) Kristy Trzeciak, City Clerk 515-999-2210

Granger-5

Jurisdiction: City of Granger	Local Priority (high, medium, low) From STAPLEE worksheet: 31-High	Hazards Addressed: All Hazards
Action Title/Description:	All City Employees NIMS Certified	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☒ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	5-Strengthen communication among agencies and between agencies and the public.	
Issue/Background: Why is this action needed? What is the problem?	U.S. Department of Homeland Security recommends all local governments receive training on the National Incident Management System(NIMS)	
Ideas for Implementation: How can the problem be solved?	Have all the City employees take the NIMS classes offered online	
Obstacles to Implementing?	Time	
Responsible Office: Which department in Jurisdiction would implement/track?	City Clerk	
Partners: Who would help?	Mayor	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	None needed	
Cost Estimate:	$0	
Benefits: (Describe Losses Avoided)	City employees will be able to better manage coordinated responses to emergencies	
Timeline: (How many months/years to complete?)	Up to 3 months	Completed by: (name/title/phone #) Kristy Trzeciak, City Clerk 515-999-2210

Granger-6

Jurisdiction: City of Granger	Local Priority (high, medium, low) From STAPLEE worksheet: 37-High	Hazards Addressed: Flash Flood, River Flooding
Action Title/Description:	Continue Compliance with the National Flood Insurance Program-Floodplain Ordinance Annual Review	
Mitigation Measure Category:	☒ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	3--Improve capabilities to mitigate natural hazards by incorporating mitigation strategies in plans, policies, and programs.	
Issue/Background: Why is this action needed? What is the problem?	Granger currently participates in the National Flood Insurance Program and is committed to ensuring that eligibility is maintained for property owners in the community to purchase flood insurance through the National Flood Insurance Program.	
Ideas for Implementation: How can the problem be solved?	Annually review the floodplain ordinance and consider applying for the Community Rating System	
Obstacles to Implementing?	None	
Responsible Office: Which department in Jurisdiction would implement/track?	City Clerk	
Partners: Who would help?	Mayor	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	None needed	
Cost Estimate:	$0	
Benefits: (Describe Losses Avoided)	Prevent the cost of property damage in the event of a flood	
Timeline: (How many months/years to complete?)	ongoing	Completed by: (name/title/phone #) Kristy Trzeciak, City Clerk 515-999-2210

City of Linden Actions

Linden-1

Jurisdiction: Linden	Local Priority (high, medium, low) From STAPLEE worksheet: 40-High	Hazards Addressed: Tornado, Windstorms
Action Title/Description:	Construct a new city hall/fire station/library that will also serve as a saferoom for the community of 220 people.	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	Prevent or reduce the impact of natural hazards for the residents and businesses of Dallas County/Linden.	
Issue/Background: Why is this action needed? What is the problem?	The existing city hall/fire station/library building is old. A new facility could house these important offices/departments as well as serve as a community saferoom for the town's 220 residents. Currently there is no saferoom for residents to take shelter.	
Ideas for Implementation: How can the problem be solved?	Construct a facility to provide shelter to citizens and city/fire department and library staff in the event of a tornado.	
Obstacles to Implementing?	lack of funds	
Responsible Office: Which department in Jurisdiction would implement/track?	City of Linden-City Hall/Library	
Partners: Who would help?	Farmer's Co-Op, small businesses	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	FEMA Hazard Mitigation Assistance grants and local funds	
Cost Estimate:	To Be Determined	
Benefits: (Describe Losses Avoided)	Avoid injury and death	
Timeline: (How many months/years to complete?)	5-years	Completed by: (name/title/phone #) Mayor Dave Hutchins

City of Minburn Actions

Minburn-1

Jurisdiction: City of Minburn	Local Priority (high, medium, low) From STAPLEE worksheet: 31-High	Hazards Addressed: Tornado, Thunderstorms-Lighting
Action Title/Description:	Safe Room	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	Prevent or reduce the impact of natural hazards for the residents, businesses, and municipalities of Dallas County	
Issue/Background: Why is this action needed? What is the problem?	No storm shelter for residents and bikers using bike trail	
Ideas for Implementation: How can the problem be solved?	Construct "safe room" by Depot (once moved to trail head position)	
Obstacles to Implementing?	Funding	
Responsible Office: Which department in Jurisdiction would implement/track?	City Hall	
Partners: Who would help?		
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	FEMA	
Cost Estimate:	$11,195 (for 8' X 8' per Iowa Safe Rooms)	
Benefits: (Describe Losses Avoided)	Lives saved	
Timeline: (How many months/years to complete?)	6-12 months once Depot is moved	Completed by: (name/title/phone #) Phyllis Moss/City Council Member/677-2733

Minburn-2

Jurisdiction: City of Minburn	Local Priority (high, medium, low) From STAPLEE worksheet: 37-High	Hazards Addressed: Severe Winter Storm, Thunderstorms & Lightning, Tornado, Windstorm
Action Title/Description:	Install Transfer Switch to enable a portable generator to be hooked up to City Hall	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☒ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	Protect critical facilities and infrastructure from natural hazards	
Issue/Background: Why is this action needed? What is the problem?	In the event a hazard brought a power outage to City Hall using a generator for power would enable City Hall to function as a heating/cooling center in extreme weather; and the building and equipment to be used as a base for emergency services after a hazard.	
Ideas for Implementation: How can the problem be solved?	Have a qualified electrician come and install the switch	
Obstacles to Implementing?	Funding	
Responsible Office: Which department in Jurisdiction would implement/track?	City Hall	
Partners: Who would help?	City Hall and electrical contractor	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Local Funds	
Cost Estimate:	unkown	
Benefits: (Describe Losses Avoided)	Citizens can avoid prolonged exposure to extreme heat/cold, oxygen users can plug in tanks in the event of power outage, response crews/city workers will have access to phones and other office equipment	
Timeline: (How many months/years to complete?)	1-6 months	Completed by: (name/title/phone #) Kris Fitch/Utility Billing Clerk/677-2245

Minburn-3

Jurisdiction: City of Minburn	Local Priority (high, medium, low) From STAPLEE worksheet: 42-High	Hazards Addressed: All Hazards
Action Title/Description:	Public Education	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☒ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	Create a disaster resistant community by improving public understanding of natural hazards and risk by providing public awareness, preparedness, and mitigation information through various channels of communication.	
Issue/Background: Why is this action needed? What is the problem?	To make sure the public is aware of actions to take to prevent and respond to hazards and disasters.	
Ideas for Implementation: How can the problem be solved?	Through pamplets and brochures, information on web page, etc.	
Obstacles to Implementing?	funding	
Responsible Office: Which department in Jurisdiction would implement/track?	City Hall	
Partners: Who would help?	Local civic organizations	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	grants, local funds	
Cost Estimate:	$1,000 - 2,000 estimate	
Benefits: (Describe Losses Avoided)	Damage to home and property, possible loss of life	
Timeline: (How many months/years to complete?)	1 year	Completed by: (name/title/phone #) Kris Fitch/Utility Billing Clerk/677-2245

City of Perry Actions

Since the City of Perry had an expired Hazard Mitigation Plan from 2005, the actions from that plan were updated as part of this planning process. The following table indicates the status of each of the 23 actions from the 2005 plan. Of those, 4 are completed, 8 addressed non-natural hazards and have been forwarded to other planning mechanisms for consideration, and 11 have been continued in this plan update. In addition, the City developed one additional action for a total of 12 actions in this plan. For tracking purposes, the original action number from the 2005 plan has been carried over into this plan. The gray shaded actions below are actions that are new/to be continued in the current plan.

Action #	Project Title	Status	Mitigation Measure Category	Mitigation Measure -Completion Date (or Estimated Date) of Completion	Funding Sources	Funding Amount
1	Upgrade Outdoor Warning System	Completed	Emergency Services	7/1/2007	USDA Grant	$50,000.00
2	Continue to educate Hispanics on severe weather conditions and Iowa climate	In-Progress/Continue	Public Education and Awareness	Not Reported	Not Reported	$ -
3	Bury power lines and phone lines underground	Continue	Emergency Services	Not Reported	Not Reported	$ -
4	Acquire generator to power City hall/Police Station/Fire Station Building	Completed	Emergency Services	2/1/2007	Dallas Co. E911 Board	$41,000.00
5	Designate Public Shelters	Continue	Emergency Services	Not Reported	Not Reported	$ -
6	Train Perry Fire Department at Hazardous Materials “operations” Level	Move to LEPC Plan	Emergency Services	Not Reported	Not Reported	$ -
7	Develop an Evacuation Plan	Move to LEPC Plan	Emergency Services	Not Reported	Not Reported	$ -
8	Begin discussion about improving ambulance service in Dallas County	Move to LEPC Plan	Emergency Services	Not Reported	Not Reported	$ -
9	Upgrade Emergency Communication System	Completed	Emergency Services	Not Reported	E911 Board/Dallas Co. Emergency management	Not Reported
10	Increase Security around water supply and treatment facilities	Move to LEPC Plan	Emergency Services	Not Reported	Not Reported	$ -
11	Develop a plan for emergency water supply	Continue	Emergency Services	Not Reported	Not Reported	$ -
12	Increase frequency of fire/building inspections	Continue	Prevention	Not Reported	Not Reported	$ -

Action #	Project Title	Status	Mitigation Measure Category	Mitigation Measure -Completion Date (or Estimated Date) of Completion	Funding Sources	Funding Amount
13	Adopt a year round burning ban	In-Progress/Continue	Prevention	Not Reported	Not Reported	$ -
14	Educate public departments about early warning signs of disease outbreaks	Move to County Health Dept. Plans	Public Education and Awareness	Not Reported	Not Reported	$ -
15	Establish an emergency translation team	In-Progress/Continue	Emergency Services	Not Reported	Not Reported	$ -
16	Educate local businesses about violence in the workplace	Move to LEPC Plan	Public Education and Awareness	Not Reported	Not Reported	
17	Complete storm sewer project from Third Street, west to Frog Creek	Completed	Property Protection	Not Reported	CDBG General Loan	Not Reported
18	Maintain integrity of food supply at Tyson Foods by implementing stricter security measures	Move to LEPC Plan	Emergency Services	Not Reported	Not Reported	
19	Conduct earthquake drill at schools	Continue	Emergency Services	Not Reported	Not Reported	
20	Conduct a mock school violence drill	Move to School Emergency Plans	Emergency Services	Not Reported	Not Reported	
21	Have all City employees NIMS certified	Continue	Emergency Services	Not Reported	Not Reported	
22	Continue participation in the National Flood Insurance Program	Continue	Prevention	Not Reported	Not Reported	
23	Continue to Enforce local building codes.	Continue	Prevention	Not Reported	Not Reported	
24	Clear Brush from Frog Creek	NEW	Natural Resource Protection	New Action	TBD	TBD

The details of the 11 continuing actions and one new action are provided in the action tables that follow:

Perry-2

Jurisdiction: City of Perry	Local Priority (high, medium, low) From STAPLEE worksheet: 30-High	Hazards Addressed: All Hazards
Action Title/Description:	Cultural Severe Weather Education	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☒ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	#2--Create a disaster resistant community by improving public understanding of natural hazards and risk by providing public awareness, preparedness, and mitigation information through various channels of communication	
Issue/Background: Why is this action needed? What is the problem?	New residents of Perry that speak English as a second language may not know what the warning sirens mean, nor know how to react. An estimated twenty-one percent of citizens in Perry do not speak English "very well" according to the U.S. Census American Community Survey.	
Ideas for Implementation: How can the problem be solved?	Schools provide education to students on these topics and newspapers run announcements about actions to take in severe weather. It is recommended that theses outlets continue to distribute this type of public information. Additionally, a brochure or poster with various temperatures and types of weather-appropriate closthing could be developed in English and Spanish to help Hispanic citizens prepare for weather they are not familiar with.	
Obstacles to Implementing?	language barrier	
Responsible Office: Which department in Jurisdiction would implement/track?	Perry Safety Committee	
Partners: Who would help?	Perry Public Schools	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	available grants and local funding	
Cost Estimate:	$2,500 (estimated)	
Benefits: (Describe Losses Avoided)	prevent injuries to individuals	
Timeline: (How many months/years to complete?)	6 months	Completed by: (name/title/phone #) Eric Vaughn, Assistant Chief

Perry-3

Jurisdiction: City of Perry	Local Priority (high, medium, low) From STAPLEE worksheet: 28-Medium	Hazards Addressed: Severe Winter Storms, Windstorms, and Tornadoes
Action Title/Description:	Bury power lines and phone lines underground	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☒ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	#1--Protect critical facilities and infrastructure from natural hazards	
Issue/Background: Why is this action needed? What is the problem?	Ice, winds, and tornadoes can cause outages for above-ground utilities	
Ideas for Implementation: How can the problem be solved?	Encourage Alliant Energy (electric provider) and Qwest (communications) to bury utility lines	
Obstacles to Implementing?	The City does not own the utilities and does not have control of these efforts.	
Responsible Office: Which department in Jurisdiction would implement/track?	Building Official	
Partners: Who would help?	Alliant energy and Qwest	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Hazard Mitigation Grant Program	
Cost Estimate:	$500,000 (estimated)	
Benefits: (Describe Losses Avoided)	Avoid interruptions to power supply, Reduce risk of fire	
Timeline: (How many months/years to complete?)	10 years	Completed by: (name/title/phone #) ERk Vaughn, Asst. Chief

Perry-5

Jurisdiction: City of Perry	Local Priority (high, medium, low) From STAPLEE worksheet: 33-High	Hazards Addressed: Tornadoes, Windstorms, Severe Winter Storms, Extreme Heat, River Flooding
Action Title/Description:	Designate Public Shelters	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☒ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	#4--Prevent or reduce the impact of natural hazards for the residents businesses, and municipalities of Dallas County	
Issue/Background: Why is this action needed? What is the problem?	There are no public storm shelters in Perry. The Bar-Jac mobile home park has a storm shelter. But it is only for park residents. The committee recommended designation of several shelters thorughout the community that would provide some level of protection.	
Ideas for Implementation: How can the problem be solved?	Designated shelters could be used during thunderstorms, tornadoes, winter storms, or evacuations. Suggested shelters may include the schools, McCreary Recreation Center, churches, National Guard Amory, and the library. Once shelters are designated, their locations would be publicized through local media and signage.	
Obstacles to Implementing?	City-owned shelters may not have space available; private owners may not be willing to designate their buildings.	
Responsible Office: Which department in Jurisdiction would implement/track?	NIMS Committee	
Partners: Who would help?	Perry Community Schools, Iowa National Guard	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	none needed	
Cost Estimate:	$0	
Benefits: (Describe Losses Avoided)	prevent injuries/loss of life in emergencies	
Timeline: (How many months/years to complete?)	6 months	Completed by: (name/title/phone #) Eric Vaugn, Asst. Chief

Perry-11

Jurisdiction: City of Perry	Local Priority (high, medium, low) From STAPLEE worksheet: 28-Medium	Hazards Addressed: Drought
Action Title/Description:	Develop a plan for emergency water supply	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☒ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	#4--Prevent or reduce the impact of natural hazards for the residents businesses, and municipalities of Dallas County	
Issue/Background: Why is this action needed? What is the problem?	If severe drought conditions diminsh the water supply, the City will need to have an alternate plan.	
Ideas for Implementation: How can the problem be solved?	Develop a plan and agreements to either transport water in from Xenia Rural Water District or utilize the Tyson Foods wells. The plan would need to address issues such as who would transport the water and how and where the water would be distributed to the public.	
Obstacles to Implementing?	Cost	
Responsible Office: Which department in Jurisdiction would implement/track?	Perry Water Dept.	
Partners: Who would help?	National Guard., Xenia Rural Water District.	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Unknown-available grants and local funds from Water Dept.	
Cost Estimate:	TBD	
Benefits: (Describe Losses Avoided)	Avoid disruption of water supply	
Timeline: (How many months/years to complete?)	2 years	Completed by: (name/title/phone #) Eric Vaugh, Asst. Chief

Perry-12

Jurisdiction: City of Perry	Local Priority (high, medium, low) From STAPLEE worksheet: 25-Medium	Hazards Addressed: Windstorm
Action Title/Description:	Increase frequency of building inspections	
Mitigation Measure Category:	☒ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	#4--Prevent or reduce the impact of natural hazards for the residents businesses, and municipalities of Dallas County	
Issue/Background: Why is this action needed? What is the problem?	With the large number of older buildings in the community and large number of tenants in a single unit, the planning committee determined it is desirable to inspect apartments on a regular basis to determine structural integrity of buildings.	
Ideas for Implementation: How can the problem be solved?	Hire an additional staff person to conduct inspections.	
Obstacles to Implementing?	lack of funds	
Responsible Office: Which department in Jurisdiction would implement/track?	Building Officials	
Partners: Who would help?	N/A	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	local funds	
Cost Estimate:	$35,000	
Benefits: (Describe Losses Avoided)	prevent structural failuire	
Timeline: (How many months/years to complete?)	5 years	Completed by: (name/title/phone #) Eric Vaughn, Asst. Chief

Perry-13

Jurisdiction: City of Perry	Local Priority (high, medium, low) From STAPLEE worksheet: 25-Medium	Hazards Addressed: Grass or Wildland Fire
Action Title/Description:	Adopt a year round burning ban	
Mitigation Measure Category:	☒ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	#3--Improve capabilities to mitigate natural hazards by incorporating mitigation strategies in plans, policies, and programs.	
Issue/Background: Why is this action needed? What is the problem?	Fires often start during the spring or fall of the year when people burn their yard waste. The City of Perry currently allows open burning twice a year for residents to burn yard yaste.	
Ideas for Implementation: How can the problem be solved?	Prohibit burning altogether in the city and have a yard waste collection or disposal program.	
Obstacles to Implementing?	Residents may oppose	
Responsible Office: Which department in Jurisdiction would implement/track?	Public Works	
Partners: Who would help?	Metro Water Authority	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	local funds	
Cost Estimate:	$0	
Benefits: (Describe Losses Avoided)	Avoid accidental fires, environmental health benefits	
Timeline: (How many months/years to complete?)	1 year	Completed by: (name/title/phone #) Erick Vaughn, Asst. Chief

Perry-15

Jurisdiction: City of Perry	Local Priority (high, medium, low) From STAPLEE worksheet: 31-High	Hazards Addressed: All Hazards
Action Title/Description:	Establish an Emergency Translation Team	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☒ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	#5--strengthen communication among agencies and between agencies and the public	
Issue/Background: Why is this action needed? What is the problem?	This is a large population of Spanish-speaking residents.	
Ideas for Implementation: How can the problem be solved?	Develop a team of a few individuals that could be called upon to assist emergency personnel in communicating to the Spanish-speaking residents during emergency situations. The emergency translation team would also be available to have at the local emergency commend center and/or at community shelters to keep Spanish-speaking residents informed of the situation.	
Obstacles to Implementing?	cost	
Responsible Office: Which department in Jurisdiction would implement/track?	Perry NIMS Committee	
Partners: Who would help?	Hispanics United for Perry/Perry Community Schools	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	local funds	
Cost Estimate:	$2,000	
Benefits: (Describe Losses Avoided)	Health and Safety of Residents	
Timeline: (How many months/years to complete?)	1 year	Completed by: (name/title/phone #) Eric Vaughn, Asst. Chief

Perry-19

Jurisdiction: City of Perry	Local Priority (high, medium, low) From STAPLEE worksheet: 19-Low	Hazards Addressed: Earthquake
Action Title/Description:	Conduct earthquake drill at schools	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☒ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	#2--Create a disaster resistant community by improving public understanding of natural hazards and risk by providing public awareness, preparedness, and mitigation information through various channels of communication.	
Issue/Background: Why is this action needed? What is the problem?	Dallas County is located between two fault lines. The Redfield and Perry Hamilton Fault lines run along the east and west county lines. Since construction in Iowa is not built to withstand earthquakes and retrofitting buildings would be costly, the committee determined that community education would be the best way to reduce injuries.	
Ideas for Implementation: How can the problem be solved?	Conduct earthquake drills in schools and encourage children to take the information home to share with their families. In addition, it is recommended that local media report about school drill events and provide additional pertinent information about what to do during an earthquake.	
Obstacles to Implementing?	time and education	
Responsible Office: Which department in Jurisdiction would implement/track?	Building Official	
Partners: Who would help?	Perry Community Schools	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	local	
Cost Estimate:	$1,000	
Benefits: (Describe Losses Avoided)	Health and Safety	
Timeline: (How many months/years to complete?)	2 years	Completed by: (name/title/phone #) Eric Vaughn, Asst. Chief

Perry-21

Jurisdiction: City of Perry	Local Priority (high, medium, low) From STAPLEE worksheet: 40-High	Hazards Addressed: All Hazards
Action Title/Description:	Have all City employees NIMS certified	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☒ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	#5--Strengthen communication among agencies and between agencies and the public.	
Issue/Background: Why is this action needed? What is the problem?	U.S. Department of Homeland Security recommends all local governments receive training on the National Incident Management System (NIMS).	
Ideas for Implementation: How can the problem be solved?	Employee Education through online courses	
Obstacles to Implementing?	none	
Responsible Office: Which department in Jurisdiction would implement/track?	NIMS Committee	
Partners: Who would help?	Dallas County Emergency Management	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	n/a	
Cost Estimate:	$0	
Benefits: (Describe Losses Avoided)	Better coordination during emergencies	
Timeline: (How many months/years to complete?)	6 months	Completed by: (name/title/phone #) Eric Vaughn, Asst. Chief

Perry-22

Jurisdiction: City of Perry	Local Priority (high, medium, low) From STAPLEE worksheet: 31-High	Hazards Addressed: Flash Flood, River Flooding
Action Title/Description:	Continue participation in the National Flood Insurance Program and promote availability of flood insurance to citizens	
Mitigation Measure Category:	☒ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	#2--Create a disaster resistant community by improving public understanding of natural hazards and risk by providing public awareness, preparedness, and mitigation information through various channels of communication.	
Issue/Background: Why is this action needed? What is the problem?	The City of Perry has been a participant in the NFIP since 1985.	
Ideas for Implementation: How can the problem be solved?	The City should stay up-to-date with the ordinance and periodically review it to ensure its effectiveness. Enforcing this ordinance will also help to regulate new development northeast of Perry which is in the vicinity of Beaver Creek.	
Obstacles to Implementing?	none	
Responsible Office: Which department in Jurisdiction would implement/track?	Building Official	
Partners: Who would help?	FEMA, National Flood Insurance Program	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	N/A	
Cost Estimate:	$0	
Benefits: (Describe Losses Avoided)	Residents and businesses that choose to purchase flood insurance will minimize economic loss in the event of flooding.	
Timeline: (How many months/years to complete?)	2 years	Completed by: (name/title/phone #) Eric Vaughn, Asst. Chief

Perry-23

Jurisdiction: City of Perry	Local Priority (high, medium, low) From STAPLEE worksheet: 29-Medium	Hazards Addressed: Windstorms, Expansive Soils, landslide, River Flooding,
Action Title/Description:	Continue to enforce building codes	
Mitigation Measure Category:	☒ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	#3--Improve capabilities to mitigate natural hazards by incorporating mitigation strategies in plans, policies, and programs.	
Issue/Background: Why is this action needed? What is the problem?	The City has a full time building inspector on staff to review building permits and plans. With a significant amount of new housing developments planned in the coming years, it will be important to continue to enforce the building codes as well as periodically review them to make sure they are applicable and enforceable.	
Ideas for Implementation: How can the problem be solved?	As construction methods change and developments grows into new areas, it is important to stay up-to-date with enforcement and administration.	
Obstacles to Implementing?	Cost	
Responsible Office: Which department in Jurisdiction would implement/track?	Building Official	
Partners: Who would help?	City Administration	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	loca funds	
Cost Estimate:	$0	
Benefits: (Describe Losses Avoided)	minimize damages to structures by ensuring they are built to code	
Timeline: (How many months/years to complete?)	ongoing	Completed by: (name/title/phone #) Eric Vaughn, Asst. Chief

Perry-24

Jurisdiction: Perry	Local Priority (high, medium, low) From STAPLEE worksheet: 35-High	Hazards Addressed: Flash Flood, River Flooding
Action Title/Description:	Clear Brush from Frog Creek	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☒ 4. Natural Resource Protection ☐ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	4-Prevent or reduce the impact of natural hazards for the residents, businesses, and municipalities of Dallas County.	
Issue/Background: Why is this action needed? What is the problem?	Clear out overgrown brush and trees in the Frog Creek drainage area to prevent flash flooding occurences.	
Ideas for Implementation: How can the problem be solved?	Trees will be removed through the hiring of a tree serve/s to remove overgrowth.	
Obstacles to Implementing?	Access to entire creek area and cost	
Responsible Office: Which department in Jurisdiction would implement/track?	Perry Public Works	
Partners: Who would help?	Perry Parks Department as well as City Administration	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Budgeting	
Cost Estimate:	$15,000	
Benefits: (Describe Losses Avoided)	Prevent flodding of water departement, publicworks and residential housing, a	
Timeline: (How many months/years to complete?)	2 months	Completed by: (name/title/phone #) Eric Vaughn (515) 465 – 4636

City of Redfield Actions

Redfield-1

Jurisdiction: City of Redfield	Local Priority (high, medium, low) From STAPLEE worksheet: 24-Medium	Hazards Addressed: Flash Flood, River Flooding
Action Title/Description:	Purchase Foodprone Properties	
Mitigation Measure Category:	☐ 1. Prevention ☒ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	4-Prevent or reduce the impact of natural hazards for the residents, businesses, and municipalities of Dallas County.	
Issue/Background: Why is this action needed? What is the problem?	There are properties at risk in floodprone areas within the City of Redfield.	
Ideas for Implementation: How can the problem be solved?	Acquire the properties and deed-restrict the land against future development.	
Obstacles to Implementing?	Action must be voluntary and homeowners may not wish to participate	
Responsible Office: Which department in Jurisdiction would implement/track?	City of Redfield	
Partners: Who would help?	Iowa Homeland Security and Emergency Management	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	FEMA Hazard Mitigation Assistance Grants	
Cost Estimate:	TBD	
Benefits: (Describe Losses Avoided)	Avoid repetitive flooding and risk to life and property	
Timeline: (How many months/years to complete?)	3 years	Completed by: (name/title/phone #) John Hoy

Redfield-2

Jurisdiction: City of Redfield	Local Priority (high, medium, low) From STAPLEE worksheet: 39-High	Hazards Addressed: Tornado
Action Title/Description:	Construct Community Saferoom	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	4-Prevent or reduce the impact of natural hazards for the residents, businesses, and municipalities of Dallas County.	
Issue/Background: Why is this action needed? What is the problem?	The City does not currently have a Tornado Saferoom.	
Ideas for Implementation: How can the problem be solved?	Construct a community saferoom in accordance with FEMA standards	
Obstacles to Implementing?	lack of funding	
Responsible Office: Which department in Jurisdiction would implement/track?	City of Redfield	
Partners: Who would help?	Iowa Homeland Security and Emergency Management	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	FEMA Hazard Mitigation Assistance Grants	
Cost Estimate:	TBD	
Benefits: (Describe Losses Avoided)	Save lives in the event of a tornado	
Timeline: (How many months/years to complete?)	3-5 years	Completed by: (name/title/phone #) John Hoy

Redfield-3

Jurisdiction: City of Redfield	Local Priority (high, medium, low) From STAPLEE worksheet: 28-Medium	Hazards Addressed: Flash Flood, River Flooding
Action Title/Description:	Annually Review Floodplain Management Ordinance	
Mitigation Measure Category:	☒ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	3-Improve capabilities to mitigate natural hazards by incorporating mitigation strategies in plans, policies, and programs.	
Issue/Background: Why is this action needed? What is the problem?	The City currently participates in the National Flood Insurance Program and is committed to ensuring that the floodplain management ordinance remains current and effective.	
Ideas for Implementation: How can the problem be solved?	Annually Review Floodplain Management Ordinance	
Obstacles to Implementing?	None	
Responsible Office: Which department in Jurisdiction would implement/track?	City of Redfield	
Partners: Who would help?	Iowa Department of Natural Resources	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	None	
Cost Estimate:	None	
Benefits: (Describe Losses Avoided)	Updating and enforcing floodplain management ordinance will ensure construction in the floodplain is in accordance with requirements, minimizing risk to life and property	
Timeline: (How many months/years to complete?)	annually	Completed by: (name/title/phone #) John Hoy

City of Van Meter Actions

Van Meter-1

Jurisdiction: City of Van Meter	Local Priority (high, medium, low) From STAPLEE worksheet: 38-High	Hazards Addressed: Tornado, Thunderstorms & Lightning, Windstorm, Severe Winter Storm, Extreme Heat
Action Title/Description:	Saferoom Construction for Schools and Public Buildings	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	4-Prevent or reduce the impact of natural hazards for the residents, businesses, and municipalities of Dallas County.	
Issue/Background: Why is this action needed? What is the problem?	The City of Van Meter needs saferooms that can also serve as shelters/cooling centers	
Ideas for Implementation: How can the problem be solved?	Construct Tornado Saferooms/Shelters	
Obstacles to Implementing?	lack of funding	
Responsible Office: Which department in Jurisdiction would implement/track?	City of Van Meter for Public Buildings	
Partners: Who would help?		
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	FEMA Hazard Mitigation Assistance Grants and/or State grant funds	
Cost Estimate:	Unknown	
Benefits: (Describe Losses Avoided)	Prevent loss of life	
Timeline: (How many months/years to complete?)	2-3 years	Completed by: (name/title/phone #) Jake Anderson

Van Meter-2

Jurisdiction: City of Van Meter	Local Priority (high, medium, low) From STAPLEE worksheet: 47-High	Hazards Addressed: Tornado, Windstorm, Thunderstorms & Lightning
Action Title/Description:	Expand/Improve Warning Sirens	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☒ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	4-Prevent or reduce the impact of natural hazards for the residents, businesses, and municipalities of Dallas County.	
Issue/Background: Why is this action needed? What is the problem?	Warning Siren Coverage does not currently include all of the Van Meter Community. This leaves some residents without warning.	
Ideas for Implementation: How can the problem be solved?	Upgrade current sirens and install additional sirens	
Obstacles to Implementing?	Lack of Funding	
Responsible Office: Which department in Jurisdiction would implement/track?	Fire Deprtment/Public Works	
Partners: Who would help?	Unknown	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Local Funds and FEMA hazard Mitigation Assistance grants or other grant funds that may be available	
Cost Estimate:	$40,000 to $80,000	
Benefits: (Describe Losses Avoided)	Prevent loss of life by giving citizens adequate warning to take shelter	
Timeline: (How many months/years to complete?)	8 Months	Completed by: (name/title/phone #) Brad Anderson

Van Meter-3

Jurisdiction: City of Van Meter	Local Priority (high, medium, low) From STAPLEE worksheet: 34-High	Hazards Addressed: Flash Flood, Dam Failure, Landslide, River Flooding, Levee Failure
Action Title/Description:	Continue Compliance with the National Flood Insurance Program	
Mitigation Measure Category:	☒ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	3-Improve capabilities to mitigate natural hazards by incorporating mitigation strategies in plans, policies, and programs.	
Issue/Background: Why is this action needed? What is the problem?	The City of Van Meter is a current participant in good standing with the National Flood Insurance Program with an adopted floodplain management ordinance to reduce the impact of flooding and financial impact on property owners.	
Ideas for Implementation: How can the problem be solved?	Regularly review and continue enforcement of the City of Van Meter's floodplain management ordinance to ensure continued compliance with the National Flood Insurance Program.	
Obstacles to Implementing?	None	
Responsible Office: Which department in Jurisdiction would implement/track?	City Administrator's Office	
Partners: Who would help?	Homeowners and FEMA	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Not Applicable	
Cost Estimate:	No Funds Needed	
Benefits: (Describe Losses Avoided)	Continue management of Van Meter's floodplain to prevent flood losses as well as continue to make flood insurance available to Van Meter residents.	
Timeline: (How many months/years to complete?)	Ongoing	Completed by: (name/title/phone #) Brad Anderson

Van Meter-4

Jurisdiction: City of Van Meter	Local Priority (high, medium, low) From STAPLEE worksheet: 32-High	Hazards Addressed: All Hazards
Action Title/Description:	Public Education on Hazards	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☒ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	2-Create a disaster resistant community by improving public understanding of natural hazards and risk by providing public awareness, preparedness, and mitigation information through various channels of communication.	
Issue/Background: Why is this action needed? What is the problem?	Providing education to the public on hazards that can occur in Van Meter as well as preparedness and prevention information is needed to ensure an informed public.	
Ideas for Implementation: How can the problem be solved?	Develop and implement educational campaigns such as classes and pamphlets available in the library.	
Obstacles to Implementing?	lack of funding	
Responsible Office: Which department in Jurisdiction would implement/track?	City Administrator's Office	
Partners: Who would help?	All City and County Departments	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	local funds and available grants	
Cost Estimate:	$3,000 per year	
Benefits: (Describe Losses Avoided)	An educated public can result in a reduction in injuries, loss of life and property damage as a result of hazard events.	
Timeline: (How many months/years to complete?)	1 year	Completed by: (name/title/phone #) Brad Anderson

Van Meter-5

Jurisdiction: City of Van Meter	Local Priority (high, medium, low) From STAPLEE worksheet: 33-High	Hazards Addressed: Winter Storm, Extreme Heat, Tornado, Flash Flood, Windstorm, Thunderstorms & Lightning
Action Title/Description:	Back-up Power for Critical Facilities	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☒ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	1-Protect critical facilities and infrastructure from natural hazards.	
Issue/Background: Why is this action needed? What is the problem?	Critical Facilities within the City do not have back-up power such as the Water Plant, wells, and pump station, Sewer Plant and lift stations, Public Health Dept, and Emergency Services.	
Ideas for Implementation: How can the problem be solved?	Purchase and install back-up generators for these critical facilities.	
Obstacles to Implementing?	lack of funding	
Responsible Office: Which department in Jurisdiction would implement/track?	Public Works	
Partners: Who would help?	City, Fire/EMS, Public	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	local funds and available grants	
Cost Estimate:	$60,000	
Benefits: (Describe Losses Avoided)	Back-up generators could prevent the loss of water, sewer, wells, pump station, lift stations, emergency communications, and emergency services.	
Timeline: (How many months/years to complete?)	Unknown	Completed by: (name/title/phone #) Brad Anderson

City of Waukee Actions

Waukee-1

Jurisdiction: City of Waukee	Local Priority (high, medium, low) From STAPLEE worksheet: 34-High	Hazards Addressed: River Flooding, Flash Flooding
Action Title/Description:	Continue participation in the National Flood Insurance Program and Annually Review Ordinance	
Mitigation Measure Category:	☒ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	#3—Improve capabilities to mitigate natural hazards by incorporating mitigation strategies in plans, policies, and programs.	
Issue/Background: Why is this action needed? What is the problem?	The City of Waukee participates in the NFIP. Regular review of the floodplain management ordinance will ensure it is applicable and effective in management of floodplain areas.	
Ideas for Implementation: How can the problem be solved?	The City should stay up-to-date with the ordinance and periodically review it to ensure its effectiveness. Enforcing this ordnance will also help to regulate new development as it occurs.	
Obstacles to Implementing?	None	
Responsible Office: Which department in Jurisdiction would implement/track?	Public Works and Development Services	
Partners: Who would help?	FEMA, National Flood Insurance Program, Iowa Department of Natural Resources	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	N/A	
Cost Estimate:	$0	
Benefits: (Describe Losses Avoided)	Ensure effective management of floodplain areas to minimize flood impacts.	
Timeline: (How many months/years to complete?)	Annually	Completed by: (name/title/phone #) Clint Robinson, Fire Chief

Waukee-2

Jurisdiction: City of Waukee	Local Priority (high, medium, low) From STAPLEE worksheet: 37-High	Hazards Addressed: Tornado
Action Title/Description:	Consider Construction of Tornado Saferooms in Public Areas	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	#4--Prevent or reduce the impact of natural hazards for the residents, businesses, and municipalities of Dallas County.	
Issue/Background: Why is this action needed? What is the problem?	Outdoor Public areas do not have safe areas for visitors to take refuge in the event of severe weather.	
Ideas for Implementation: How can the problem be solved?	Consider construction of tornado saferooms in public areas.	
Obstacles to Implementing?	Lack of funding,	
Responsible Office: Which department in Jurisdiction would implement/track?	Parks Department	
Partners: Who would help?	Racoon River Valley Trail Association	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	FEMA Hazard Mitigation Assistance Grants, local funds	
Cost Estimate:	TBD	
Benefits: (Describe Losses Avoided)	Life Safety	
Timeline: (How many months/years to complete?)	1-year	Completed by: (name/title/phone #) Clint Robinson

Waukee-3

Jurisdiction: City of Waukee	Local Priority (high, medium, low) From STAPLEE worksheet: 30-High	Hazards Addressed: Flash Flood
Action Title/Description:	Drainage Improvements to Alleviate Flash Flooding in the area of LA Grant and Booth Drive	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	#4—Prevent or reduce the impact of natural hazards for the residents, businesses, and municipalities of Dallas County	
Issue/Background: Why is this action needed? What is the problem?	Water runoff from adjacent properties causes this area to repetitively flood during periods of intense rain. This situation requires the road to be closed. Additionally, costly cleanup is required due to debris that washes onto the roadway and nearby houses get water in basements due to this problem.	
Ideas for Implementation: How can the problem be solved?	Improve Stormwater Drainage in this area.	
Obstacles to Implementing?	Lack of funding, landowner participation	
Responsible Office: Which department in Jurisdiction would implement/track?	Public Works Department	
Partners: Who would help?	Landowners	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	FEMA Hazard Mitigation Assistance Grants, local funds	
Cost Estimate:	TBD	
Benefits: (Describe Losses Avoided)	Road closure would not be necessary, avoid costly clean-up	
Timeline: (How many months/years to complete?)	1-year	Completed by: (name/title/phone #) Clint Robinson, Fire Chief

City of Woodward Actions

Woodward-1

Jurisdiction: City of Woodward	Local Priority (high, medium, low) From STAPLEE worksheet: 42-High	Hazards Addressed: Grass or Wildland Fire
Action Title/Description:	Community Wildfire Protection Plan	
Mitigation Measure Category:	☒ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	#3--Improve capabilities to mitigatioe natural hazards by incorporating mitigation strategies in plans, policies, and programs.	
Issue/Background: Why is this action needed? What is the problem?	Due to the large amount of agricultural land, CRP, and bike trails, grass and wildfire fuels are present. Fires could impact the natural environment as well as historic structures if not mitigated	
Ideas for Implementation: How can the problem be solved?	Develop a Community Wildfire Protection Plan (CWPP) which will then be disseminated to the public. Mitigation ideas for grass or wildfire prevention can then be implemented from the plan.	
Obstacles to Implementing?	Council approval and multiple landowners	
Responsible Office: Which department in Jurisdiction would implement/track?	Woodward Fire Department and Iowa Department of Natural Resources	
Partners: Who would help?	U.S. Forest Service, City of Woodward, DC Cons. BC Cons, U.s. Army Corps of Engineers, Iowa Department of Natural Resources, City of madrid, and City of Granger	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	U.S. Forest Service through IA Department of Natural Resources Fire Fund	
Cost Estimate:	$65,000	
Benefits: (Describe Losses Avoided)	Potential losses to crops, historic buildings would be prevented with implementation of the plan. Negative economic impact as a result of lost crops could be prevented	
Timeline: (How many months/years to complete?)	1 year	Completed by: (name/title/phone #) Karl Harris, Woodward Fire and Iowa DNR Fire 515-290-9381

Woodward-2

Jurisdiction: Woodward	Local Priority (high, medium, low) From STAPLEE worksheet: 36-High	Hazards Addressed: Tornado, Windstorm
Action Title/Description:	Construction of Saferooms/Shelter	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	Prevent or reduce the impact (loss of life) of natural hazards for the residents, businesses and municipalities of Dallas County.	
Issue/Background: Why is this action needed? What is the problem?	Tornado's cause loss of life. It is important that there is a place for people to go that is safe. We have a new trail which is a high use recreational area. There is currently no place for those people to take shelter if there is an Emergency Weather situation.	
Ideas for Implementation: How can the problem be solved?	Construction of an above ground storm shelter with 200 person capacity as well as retrofitting another structure as an underground shelter. Building a large capacity shelter we can accommodate large numbers of people. Reducing the potential for loss of life. By retro-fitting an inground cement container as a shelter we can offer multiple venues for protection.	
Obstacles to Implementing?	Financing/property location of new construction	
Responsible Office: Which department in Jurisdiction would implement/track?	City of Woodward Public Works and the City Engineer Veenstra & Kimm	
Partners: Who would help?	City of Woodward, V & K Engineering.	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Available Grants, City funds	
Cost Estimate:	72,000 for new construction / 35,000 for retrofit.	
Benefits: (Describe Losses Avoided)	Avoidance of Loss of life.	
Timeline: (How many months/years to complete?)	12-24 months	Completed by: (name/title/phone #) Valerie Purvis, Assistant City Clerk 515-438-2560 Jerome Hill, Chief of Police 515-438-2560

Woodward-3

Jurisdiction: Dallas County/ Woodward	Local Priority (high, medium, low) From STAPLEE worksheet: 36-High	Hazards Addressed: Tornado, Windstorm
Action Title/Description:	Install second warning siren in annexed areas.	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☒ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	Prevent or reducethe impact of natural hazards for residents, businesses and municipalities of Dallas County.	
Issue/Background: Why is this action needed? What is the problem?	Recently annexed areas have no early warning system in places and are outside the perimeter of the current warning system	
Ideas for Implementation: How can the problem be solved?	Purchase and install at least one warning siren	
Obstacles to Implementing?	financing	
Responsible Office: Which department in Jurisdiction would implement/track?	City of Woodward, Woodward Fire Department	
Partners: Who would help?	City of Woodward, Woodward Fire Department	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Grant funding/ City funds.	
Cost Estimate:	30,053 each.	
Benefits: (Describe Losses Avoided)	Early warning systems give those outdoors the opportunity to seek shelter and safety.	
Timeline: (How many months/years to complete?)	12 months	Completed by: (name/title/phone #) Valerie Purvis, Asst. City Clerk 515-438-2560

Woodward-4

Jurisdiction: Dallas County / Woodward	Local Priority (high, medium, low) From STAPLEE worksheet: 39-High	Hazards Addressed: Flash Flood, River Flooding
Action Title/Description:	Repair/replace/upgrade Storm Sewer Program	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	Prevent or reduce the impact of natural hazards for the residents, businesses, and municipalities of Dallas County.	
Issue/Background: Why is this action needed? What is the problem?	1. To reduce amount of property damage caused by heavy rain events 2. Lack of storm sewer in the City.	
Ideas for Implementation: How can the problem be solved?	By adding properly sized storm sewers in different areas of town it mitigates the damaging effects of a significant rain event	
Obstacles to Implementing?	Funding	
Responsible Office: Which department in Jurisdiction would implement/track?	Public Works, Clerks, and Council	
Partners: Who would help?	Contractors	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Combination of CDBG Grants, Storm sewer User Fees and Local funds in addition to any other Grant Funding available.	
Cost Estimate:	1,0006,250 plus any increase in costs between now and the time the project is implemented and completed.	
Benefits: (Describe Losses Avoided)	Lessen basement flooding, take the pressure off sanitary sewer lines so as not to back up into basements, mitigate street damage.	
Timeline: (How many months/years to complete?)	2 years	Completed by: (name/title/phone #) Chris Newland, Director of Public Works, 515-438-2560

Woodward-5

Jurisdiction: Dallas County / Woodward	Local Priority (high, medium, low) From STAPLEE worksheet: 44-HIGH	Hazards Addressed: All Hazards where loss of power is experienced
Action Title/Description:	Install Transfer Switches and Connections on Critical Facilities to Enable Generator Hook-up	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☒ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	Inprove capabilities to mitigate natural hazards by incorporating mitigation straegies in plans, plicies, and programs. Prevent or reduce the impact of natural hazards for the residents, businessess, and municipalities of Dallas County	
Issue/Background: Why is this action needed? What is the problem?	When we experience high winds, tornado, severe winter storms, etreme heat or heavy rains the potential exists that power is lost to the entire community. The generator we have recently obtained needs to be able to be connected to up to 3 facilities for use in a time of need. Currently we do not have that capability rendering the generator useless at this point.	
Ideas for Implementation: How can the problem be solved?	The equipment needs to be purchased and installed in the 3 buildings, Police Station, Fire Station and City Hall and potentially any above ground shelter that is built. This will allow power to be restored to continue vital functions and provides continuity of services.	
Obstacles to Implementing?	funding	
Responsible Office: Which department in Jurisdiction would implement/track?	City of Woodward	
Partners: Who would help?	Police Department, Fire Department, CIty of Woodward, V & K Engineering, any contracted supplier of the equipment	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Grants as available and city funding	
Cost Estimate:	$8500/bldg for a total of 25,500	
Benefits: (Describe Losses Avoided)	Avoid loss of computer data, potential loss of life if medical equipment needs electricity, avoid loss of life in extreme temperatures.	
Timeline: (How many months/years to complete?)	12 months	Completed by: (name/title/phone #) Valerie Purvis, Asst. City Clerk, 515-438-2560

Woodward-6

Jurisdiction: Dallas County / Woodward	Local Priority (high, medium, low) From STAPLEE worksheet: 42-High	Hazards Addressed: Tornado, Windstorm
Action Title/Description:	Community Education Initiative	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☒ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	Create a disaster resistant community by improving public understanding of natural hazards and risk by providing public awareness, preparedness, and mitigation information through varous channels of communication.	
Issue/Background: Why is this action needed? What is the problem?	The City of Woodard has a bike trail and camp ground located where an old trailer park use to exist. The trail and the camp ground have no where for anyone to take shelter during a sever storm. This is not safe for the people camping at the camp grounds and for the bikers that are on the trail riding at all hours of the day and night. Education on open area safety/where to seek shelter is needed.	
Ideas for Implementation: How can the problem be solved?	This action item could be implemented by obtaining funding, hiring contractors to complete the project, and someone to make educational material about storm and the new storm shelter. Signage, and promotion materials, as well as public events and news articles to highlight.	
Obstacles to Implementing?	Funding	
Responsible Office: Which department in Jurisdiction would implement/track?	City of Woodward, police department, public works	
Partners: Who would help?	All educational classes would be presented by the police department. We could also look for assistance from our local Envision Woodward club, and our parks and recreationtrail committee.	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	All funds must come from grants, due to the City of Woodwards currently budgetary status.	
Cost Estimate:	$25,000	
Benefits: (Describe Losses Avoided)	Knowledge and education is the first step in prevention of loss of life and or property in inclement weather. It would be beneficial not only for users of the trail but also those in the entire community to become more knowledgeable about existing and potential hazards.	
Timeline: (How many months/years to complete?)	12 months to ongoing.	Completed by: (name/title/phone #) Chief of Police Jerome Hill

Adel-DeSoto-Minburn Schools Actions

ADM-1

Jurisdiction: ADM Schools	Local Priority (high, medium, low) From STAPLEE worksheet: 36-High	Hazards Addressed: Tornado
Action Title/Description:	Saferoom construction	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	Prevent or reduce the impact of natural hazards for the residents, businesses, and municipalities of Dallas County.	
Issue/Background: Why is this action needed? What is the problem?	To protect ADM staff and students in the event of a tornado.	
Ideas for Implementation: How can the problem be solved?	Construct saferoom to provide shelter during a tornado.	
Obstacles to Implementing?	Cost	
Responsible Office: Which department in Jurisdiction would implement/track?	Superintendent	
Partners: Who would help?		
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Grants and local funds	
Cost Estimate:	Unknown	
Benefits: (Describe Losses Avoided)	Avoid injury and death	
Timeline: (How many months/years to complete?)	2-3 years	Completed by: (name/title/phone #) Greg Dufoe, Superintendent 515-993-4283

ADM-2

Jurisdiction: ADM Schools	Local Priority (high, medium, low) From STAPLEE worksheet: 29-medium	Hazards Addressed: All Hazards
Action Title/Description:	Education of students on disasters.	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☒ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	Create a disaster resistant community by improving public understanding of natural hazards and risk by providing public awareness, preparedness, and mitigation information through various channels of communication	
Issue/Background: Why is this action needed? What is the problem?	To educate students on natural disasters to increase safety.	
Ideas for Implementation: How can the problem be solved?	Education and awareness of hazards and how to mitigate losses.	
Obstacles to Implementing?	Loss of instructional time	
Responsible Office: Which department in Jurisdiction would implement/track?	Superintendent	
Partners: Who would help?	Cities of Adel, DeSoto, and Minburn	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Grants and local funds	
Cost Estimate:	Unknown	
Benefits: (Describe Losses Avoided)	Avoid injury and death	
Timeline: (How many months/years to complete?)	1-2 years	Completed by: (name/title/phone #) Greg Dufoe, Superintendent 515-993-4283

Dallas Center Grimes Schools Actions

Dallas Center-Grimes Schools-1

Jurisdiction: Dallas Center-Grimes School District	Local Priority (high, medium, low) From STAPLEE worksheet: 31-High	Hazards Addressed: Tornado
Action Title/Description:	Safe Room Construction	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	4-Prevent or reduce the impact of natural hazards for the residents, businesses, and municipalities of Dallas County	
Issue/Background: Why is this action needed? What is the problem?	There are currently no safe rooms in the school district.	
Ideas for Implementation: How can the problem be solved?	Add safe rooms to current schools buildings and/or when building new faciliteis, include safe rooms in the construction.	
Obstacles to Implementing?	lack of funding/need of new facility	
Responsible Office: Which department in Jurisdiction would implement/track?	Administration Office	
Partners: Who would help?	Architect, school officials	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Sales tax, PPEL, Bond, FEMA Hazard Mitigaiton Assistance grant funds, or other available grant funds.	
Cost Estimate:	Unknown	
Benefits: (Describe Losses Avoided)	Ensuring life-safety of students and faculty	
Timeline: (How many months/years to complete?)	TBD	Completed by: (name/title/phone #) Kathy Moline, Clerk of Works 515-992-3866

Perry Schools Actions

Perry Schools-1

Jurisdiction: Perry Comm. School	Local Priority (high, medium, low) From STAPLEE worksheet: 38- High	Hazards Addressed: Tornado, Windstorms
Action Title/Description:	Safe Rooms at HS/MS and Elementary Facilities	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	Prevent or reduce the impact of natural hazards.	
Issue/Background: Why is this action needed? What is the problem?	Life Safety from Severe Weather. Over 1,000 people at each complex during the day and large numbers at activities complex on weekends/evenings.	
Ideas for Implementation: How can the problem be solved?	Seek input from staff/community and formulate needs to plan/design structure.	
Obstacles to Implementing?	Available funds/dollars to implement plan/safe rooms.	
Responsible Office: Which department in Jurisdiction would implement/track?	Administration Building & Grounds Director	
Partners: Who would help?	City of Perry, Dallas County Emergency Management, Architects, Engineers	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Combination of grants & local district funding	
Cost Estimate:	$1.5 million for each Safe Room	
Benefits: (Describe Losses Avoided)	Life Safety … save thousands of people concentrated in one area	
Timeline: (How many months/years to complete?)	1-3 yrs.	Completed by: (name/title/phone #) M. Lynn Ubben & Kevin McLaughlin Superintendent (515) 465-4656

Perry Schools-2

Jurisdiction: Perry Comm. School	Local Priority (high, medium, low) From STAPLEE worksheet: 35-High	Hazards Addressed: Severe Winter Storm, Thunderstorms & Lightning, Tornado, Windstorm
Action Title/Description:	Backup Power Generator	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☒ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	Protect Critical Facilities	
Issue/Background: Why is this action needed? What is the problem?	Provide Protection and Operation of Critical Facilities Due to Power Disruption from Severe Weather	
Ideas for Implementation: How can the problem be solved?	Purchase generators for district buildings	
Obstacles to Implementing?	Cost/Upkeep	
Responsible Office: Which department in Jurisdiction would implement/track?	Administration Building & Grounds Director	
Partners: Who would help?	City of Perry, Emergency Management Personnel	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Combination of grants and district facility funds	
Cost Estimate:	$150,000 (3 generators)	
Benefits: (Describe Losses Avoided)	Food Storage, Heating/Cooling, Safe Haven	
Timeline: (How many months/years to complete?)	1 yr.	Completed by: (name/title/phone #) M. Lynn Ubben-Superintendent (515) 465-4656

Perry Schools-3

Jurisdiction: Perry Comm. School	Local Priority (high, medium, low) From STAPLEE worksheet: 30-Medium	Hazards Addressed: Severe Winter Storm, Thunderstorms & Lightning, Tornado, Windstorm
Action Title/Description:	Replace Aging Infrastructure	
Mitigation Measure Category:	☐ 1. Prevention ☒ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	Protect Critical Facilities	
Issue/Background: Why is this action needed? What is the problem?	Protect Critical Facilities, Operation of Critical Facilities, Fire-System Overloads	
Ideas for Implementation: How can the problem be solved?	Replacing aging utility infrastructure/wiring will alleviate this concern.	
Obstacles to Implementing?	Cost	
Responsible Office: Which department in Jurisdiction would implement/track?	Administration Buildings & Grounds	
Partners: Who would help?	City of Perry, Electrical/Utility Service Providers	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Combination of Grants & School District Infrastructure Dollars	
Cost Estimate:	$200,000	
Benefits: (Describe Losses Avoided)	Fire , Food Storage, Lost Education Days, Heating/Cooling, Safe Haven	
Timeline: (How many months/years to complete?)	1 yr.	Completed by: (name/title/phone #) M. Lynn Ubben - Superintendent (515) 465-4656

Van Meter Schools Actions

Van Meter Schools-1

Jurisdiction: Van Meter Schools	Local Priority (high, medium, low) From STAPLEE worksheet: 39-High	Hazards Addressed: Tornado
Action Title/Description:	Saferoom construction	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	Prevent or reduce the impact of natural hazards for the residents, businesses, and municipalities of Dallas County.	
Issue/Background: Why is this action needed? What is the problem?	To protect Van Meter students, staff and citizens in the event of a tornado.	
Ideas for Implementation: How can the problem be solved?	Construct saferoom to provide shelter during a tornado.	
Obstacles to Implementing?	Cost	
Responsible Office: Which department in Jurisdiction would implement/track?	Superintendent	
Partners: Who would help?		
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Local Funds and Grants	
Cost Estimate:	$2.5 Million	
Benefits: (Describe Losses Avoided)	Avoid injury and death	
Timeline: (How many months/years to complete?)	1-2 years	Completed by: (name/title/phone #) Deron Durflinger, Superintendent 515-996-2221

Van Meter Schools-2

Jurisdiction: Van Meter Schools	Local Priority (high, medium, low) From STAPLEE worksheet: 37-High	Hazards Addressed: Flash Flood, River Flooding
Action Title/Description:	Van Meter Schools #2, Storm Water Drainage	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	Reduce impact of natural disasters.	
Issue/Background: Why is this action needed? What is the problem?	Storm water management is inadequate. The facilities and grounds needs better storm water management, intake, flow, discharge, and rentention.	
Ideas for Implementation: How can the problem be solved?	Provide more disperse intake, provide greater diameter piping, provide more points of discharge, and provide areas of retention.	
Obstacles to Implementing?	Cost and demolition of existing facilities.	
Responsible Office: Which department in Jurisdiction would implement/track?	Superintendent	
Partners: Who would help?	City of Van Meter	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Local funds and grants	
Cost Estimate:	$300,000	
Benefits: (Describe Losses Avoided)	Reduce flash flooding and building damages	
Timeline: (How many months/years to complete?)	3-4 months	Completed by: (name/title/phone #) Johnny Boyd, School Architect, (515) 238-8134

Van Meter Schools-3

Jurisdiction: Van Meter Schools	Local Priority (high, medium, low) From STAPLEE worksheet: 33-High	Hazards Addressed: Severe Winter Storm, Thunderstorms & Lightning, Tornado, Windstorm
Action Title/Description:	Generator	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☐ 5. Structural Projects ☒ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	#1 Protect critical facilities and infrastructure from natural hazards.	
Issue/Background: Why is this action needed? What is the problem?	Provide power as needed when electricity goes out.	
Ideas for Implementation: How can the problem be solved?	Purchase a generator to support energy needs of the district during times of need.	
Obstacles to Implementing?	Cost and facility to house it.	
Responsible Office: Which department in Jurisdiction would implement/track?	Superintendent	
Partners: Who would help?	Possibly the city of Van Meter	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Local funds and grants	
Cost Estimate:	$100,000	
Benefits: (Describe Losses Avoided)	Protect data from servers and to protect people in the buildings	
Timeline: (How many months/years to complete?)	2-3 months	Completed by: (name/title/phone #) Deron Durflinger, Superintendent. (515) 996-2221

Waukee Schools Actions

Waukee Schools-1

Jurisdiction: Waukee Schools	Local Priority (high, medium, low) From STAPLEE worksheet: 36-High	Hazards Addressed: Tornado
Action Title/Description:	Construction of Tornado Saferooms	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	4-Prevent or reduce the impact of natural hazards for residents, businesses, and municipalities of Dallas County	
Issue/Background: Why is this action needed? What is the problem?	Waukee School District is a growing School District. Existing buildings do not have saferooms and future buildings should consider incorporation of a saferoom.	
Ideas for Implementation: How can the problem be solved?	Construct saferooms adjacent to existing school buildings and/or incorporate saferooms in the design of new school buildings.	
Obstacles to Implementing?	lack of fundng	
Responsible Office: Which department in Jurisdiction would implement/track?	Superintendent's Office	
Partners: Who would help?	City of Waukee, Iowa Homeland Secuirty and Emergency Management Division	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	FEMA Hazard Mitigation Assistance Grants	
Cost Estimate:	TBD	
Benefits: (Describe Losses Avoided)	Life Safety of students and faculty	
Timeline: (How many months/years to complete?)	1-5 years	Completed by: (name/title/phone #) Eric M. Rose

West Central Valley Schools Actions

West Central Valley Schools-1

Jurisdiction: West Central Valley Schools	Local Priority (high, medium, low) From STAPLEE worksheet: 32-High	Hazards Addressed: Tornado
Action Title/Description:	Dexter Elementary Safe Room Construction	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	4-Prevent or reduce the impact of natural hazards for the residents, businesses, and municipalities of Dallas county.	
Issue/Background: Why is this action needed? What is the problem?	Safe rooms are needed to protect students and staff in case of a tornado.	
Ideas for Implementation: How can the problem be solved?	Construct a saferoom	
Obstacles to Implementing?	Cost	
Responsible Office: Which department in Jurisdiction would implement/track?	Superintendent	
Partners: Who would help?	West Central Valley Staff	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	FEMA Hazard Mitigation Assistance grants, local funds, and other grants as avaialble	
Cost Estimate:	$320,000	
Benefits: (Describe Losses Avoided)	Avoid death and injuries	
Timeline: (How many months/years to complete?)	3-6 years	Completed by: (name/title/phone #) Dr. David Arnold, Superintendent 515-789-4480

West Central Valley Schools-2

Jurisdiction: West Central Valley Schools	Local Priority (high, medium, low) From STAPLEE worksheet: 32-High	Hazards Addressed: Tornado
Action Title/Description:	Middle School in Redfield Safe Room Construction	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	4-Prevent or reduce the impact of natural hazards for the residents, businesses, and municipalities of Dallas county.	
Issue/Background: Why is this action needed? What is the problem?	Safe rooms are needed to protect students and staff in case of a tornado.	
Ideas for Implementation: How can the problem be solved?	Construct a saferoom	
Obstacles to Implementing?	Cost	
Responsible Office: Which department in Jurisdiction would implement/track?	Superintendent	
Partners: Who would help?	West Central Valley Staff	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	FEMA Hazard Mitigation Assistance grants, local funds, and other grants as avaialble	
Cost Estimate:	$400,000	
Benefits: (Describe Losses Avoided)	Avoid death and injuries	
Timeline: (How many months/years to complete?)	3-6 years	Completed by: (name/title/phone #) Dr. David Arnold, Superintendent 515-789-4480

Woodward-Granger Schools Actions

Woodward-Granger Schools-1

Jurisdiction: Woodward-Granger Schools	Local Priority (high, medium, low) From STAPLEE worksheet: 34-High		Hazards Addressed: Flash Flood, River Flooding
Action Title/Description:	Stormwater Management		
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services	
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	1-Protect critical facilities and infrastructure from natural hazards.		
Issue/Background: Why is this action needed? What is the problem?	The elementary school in Granger is currently located in a 100-year floodplain. The current ball field (located north of the school) is a potential building site but has served as a water retention area for the community. A study is currently underway with the City of Granger to understand the community needs, water flow, retention, and management of this site.		
Ideas for Implementation: How can the problem be solved?	Retention ponds, larger storm drains, elevation of the existing property in strategic areas to drain the water away from assets.		
Obstacles to Implementing?	city vs. school plans, lack of funding, Need to find resident and engineering experts to evaluate the situation and provide proposed solutions.		
Responsible Office: Which department in Jurisdiction would implement/track?	Woodward-Granger Schools Board of Education and the City of Granger would collaborate on this project with the help of the City Engineer, School Enginner to determine the scope of the problem and the best course of action.		
Partners: Who would help?	Veenstra and Kim (City Engineers), Olsson and Assoc. (school engineer), Dallas County Conservation, Department of Natural Resources, etc.		
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Local tax dollars, available grant programs.		
Cost Estimate:	$90,000 to $160,000		
Benefits: (Describe Losses Avoided)	Prevent school flooding, water backing up into residential property and added pressure downstream on existing Oxley Creek		
Timeline: (How many months/years to complete?)	1 year	Completed by: (name/title/phone #) Woodward-Granger Board of Education Brad Anderson (Superintendant of Schools) 515-438-4158Gra	

Woodward-Granger Schools-2

Jurisdiction: Woodward-Granger Schools	Local Priority (high, medium, low) From STAPLEE worksheet: 34-High	Hazards Addressed: Tornado
Action Title/Description:	Woodward-Granger Saferoom	
Mitigation Measure Category:	☐ 1. Prevention ☐ 2. Property Protection ☐ 3. Public Education and Awareness	☐ 4. Natural Resource Protection ☒ 5. Structural Projects ☐ 6. Emergency Services
Applicable Goal Statement (choose one of the 5 goals for Dallas Co. Plan):	4-Prevent or reduce the impact of natural hazards for the residents, businesses, and municipalities of Dallas County.	
Issue/Background: Why is this action needed? What is the problem?	The Cities of Woodward and Granger have both been identified as having no area in the community for tornado/inclement weather protection. The district is currently exploring building opportunities and will consider accommodating one community or the other with a potential safe room within these new plans.	
Ideas for Implementation: How can the problem be solved?	If the District decides to build in Granger, a safe room will be considered as part of the overall plan. It will be advertised within the community and open to anyone who needs it during inclement weather.	
Obstacles to Implementing?	Bond issue being passed to build the entire elementary project	
Responsible Office: Which department in Jurisdiction would implement/track?	Woodward-Granger Board of Education and the City of Granger	
Partners: Who would help?	School engineer, City of Granger	
Potential Funding Source: (Grants-specific if known, local funds, combination, etc.)	Local funds, FEMA Hazard Mitigation Assistance Grants, other available grant funds.	
Cost Estimate:	$750,000 to $1,500,000	
Benefits: (Describe Losses Avoided)	Life-safety to students, faculty, and residents that could take shelter in the saferoom	
Timeline: (How many months/years to complete?)	2-4 yrs	Completed by: (name/title/phone #) Woodward-Granger Board of Education Brad Anderson (Superintendant of Schools) 515-438-4158Gra

5 PLAN MAINTENANCE PROCESS

This chapter provides an overview of the overall strategy for plan maintenance and outlines the method and schedule for monitoring, updating and evaluating the plan. The chapter also discusses incorporating the plan into existing planning mechanisms and how to address continued public involvement.

5.1 Monitoring, Evaluating, and Updating the Plan

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

5.1.1 Hazard Mitigation Planning Committee

With adoption of this plan, the HMPC will be tasked with plan monitoring, evaluation and maintenance of the plan. The participating jurisdictions and agencies, led by the Dallas County Emergency Management Coordinator, agree to

- Meet annually, and after a disaster event, to monitor and evaluate the implementation of the plan;
- Act as a forum for hazard mitigation issues;
- Disseminate hazard mitigation ideas and activities to all participants;
- Pursue the implementation of high priority, low- or no-cost recommended actions;
- Maintain vigilant monitoring of multi-objective, cost-share, and other funding opportunities to help the community implement the plan's recommended actions for which no current funding exists;
- Monitor and assist in implementation and update of this plan;
- Keep the concept of mitigation in the forefront of community decision making by identifying plan recommendations when other community goals, plans, and activities overlap, influence, or directly affect increased community vulnerability to disasters;
- Report on plan progress and recommended changes to the Dallas County Commissioners and governing bodies of participating jurisdictions; and
- Inform and solicit input from the public.

The HMPC is an advisory body and can only make rcommendations to county, city, town, or district elected officials. Its primary duty is to see the plan successfully carried out and to report to the community governing boards and the public on the status of plan implementation and mitigation opportunities. Other duties include reviewing and promoting mitigation proposals, hearing stakeholder concerns about hazard mitigation, passing concerns on to appropriate entities, and posting relevant information on the County website.

5.1.2 Plan Maintenance Schedule

The HMPC agrees to meet annually and after a state or federally declared hazard event as appropriate to monitor progress and update the mitigation strategy. The Dallas County Emergency Management Coordinator is responsible for initiating these plan reviews. In conjunction with the other participating jurisdictions, a five-year written update of the plan will be submitted to the Iowa Homeland Security and Emergency Management Division and FEMA Region VII per Requirement §201.6(c)(4)(i) of the Disaster Mitigation Act of 2000, unless disaster or other circumstances (e.g., changing regulations) require a change to this schedule.

5.1.3 Plan Maintenance Process

Evaluation of progress can be achieved by monitoring changes in vulnerabilities identified in the plan. Changes in vulnerability can be identified by noting:

- Decreased vulnerability as a result of implementing recommended actions,
- Increased vulnerability as a result of failed or ineffective mitigation actions, and/or
- Increased vulnerability as a result of new development (and/or annexation).

Updates to this plan will:

- Consider changes in vulnerability due to action implementation,
- Document success stories where mitigation efforts have proven effective,
- Document areas where mitigation actions were not effective,
- Document any new hazards that may arise or were previously overlooked,
- Incorporate new data or studies on hazards and risks,
- Incorporate new capabilities or changes in capabilities,
- Incorporate growth and development-related changes to inventories, and
- Incorporate new action recommendations or changes in action prioritization.

In order to best evaluate any changes in vulnerability as a result of plan implementation, the participating jurisdictions will follow the following process:

- A representative from the responsible office identified in each mitigation action will be responsible for tracking and reporting on an annual basis to the jurisdictional HMPC member on action status and providing input on whether the action as implemented meets the defined objectives and is likely to be successful in reducing vulnerabilities.
- If the action does not meet identified objectives, the jurisdictional HMPC member will determine what additional measures may be implemented, and an assigned individual will be responsible for defining action scope, implementing the action, monitoring success of the action, and making any required modifications to the plan.

Changes will be made to the plan to accommodate for actions that have failed or are not considered feasible after a review of their consistency with established criteria, time frame, community priorities, and/or funding resources. Actions that were not ranked high but were identified as potential mitigation activities will be reviewed as well during the monitoring and update of this plan to determine feasibility of future implementation. Updating of the plan will be by written changes and submissions, as the Dallas County Hazard Mitigation Planning

Committee deems appropriate and necessary, and as approved by the Dallas County Commissioners and the governing boards of the other participating jurisdictions.

5.2 Incorporation into Existing Planning Mechanisms

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

Where possible, plan participants will use existing plans and/or programs to implement hazard mitigation actions. Based on the capability assessments of the participating jurisdictions, communities in Dallas County will continue to plan and implement programs to reduce losses to life and property from hazards. This plan builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing actions, where possible, through the following plans:

- General or master plans of participating jurisdictions;
- Ordinances of participating jurisdictions;
- Dallas County Emergency Operations Plan;
- Capital improvement plans and budgets;
- Other community plans within the County, such as water conservation plans, stormwater management plans, and parks and recreation plans;
- School Plans; and
- Other plans and policies outlined in the capability assessments in the jurisdictional annexes.

HMPC members involved in updating these existing planning mechanisms will be responsible for integrating the findings and actions of the mitigation plan, as appropriate. The HMPC is also responsible for monitoring this integration and incorporating the appropriate information into the five-year update of the multi-hazard mitigation plan.

Additionally, after the annual review of the Hazard Mitigation Plan, the Dallas County Emergency Coordinator will provide the updated Mitigation Strategy with current status of each mitigation action to the County Commission as well as all Mayors, City Clerks, and School District Superintendents requesting that the mitigation strategy be incorporated, where appropriate in other planning mechanisms.

5.3 5.3 Continued Public Involvement

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

The update process provides an opportunity to publicize success stories from the plan's implementation and seek additional public comment. Information about the annual reviews will be posted in the *Dallas County News*, the *Perry Chief*, and on the County website following the each annual review of the mitigation plan. When the HMPC reconvenes for the update, it will

coordinate with all stakeholders participating in the planning process, including those who joined the HMPC after the initial effort, to update and revise the plan. Public notice will be posted and public participation will be invited, at a minimum, through available website postings and press releases to the local media outlets, primarily newspapers.

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The following materials are provided to document the planning process:

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B.1 Dallas County Hazard Mitigation planning Committee (HMPC) Members

Name		Agency/Organization
Jim	McNeill	City of Adel
Bob	Ockerman	City of Adel
Kip	Overton	City of Adel
Camilla	McCain	City of Bouton
Betty	Tingwald	City of Bouton
Cindy	Riesselman	City of Dallas Center
Clarence	Norman	City of Dawson
Billy	Samuel	City of Dawson
Nick	Eikstein	City of DeSoto
Marcia	Thomas	City of DeSoto
Dan	VanLagen	City of DeSoto
Tawnee	Eckhart	City of Dexter
Mike	Grief	City of Granger
Don	Hocking	City of Granger
Jarrod	Sturtz	City of Granger
Kristy	Trzeciak	City of Granger
Dave	Hutchins	City of Linden
Kris	Fitch	City of Minburn
Dan	Brickner	City of Perry
Jack	Butler	City of Perry
Brian	Eiterman	City of Perry
Chris	Hinds	City of Perry
Mary	Murphy	City of Perry
Lori	Riley	City of Perry
Steve	Tibble	City of Perry
Eric	Vaugh	City of Perry
Josh	Wuebker	City of Perry
Tyler	Clausen	City of Redfield
Terry	Dunielson	City of Redfield
John	Hoy	City of Redfield
Deb	Light	City of Redfield
Allan	Adams	City of Van Meter
Jake	Anderson	City of Van Meter
Adam	Coyle	City of Van Meter
Gary	Herrick	City of Van Meter
Bob	Lacy	City of Van Meter
David	Herman	City of Van Meter
Clint	Robinson	City of Waukee
Valerie	Purvis	City of Woodward
Jim	George	Dallas County
Chad	Leonard	Dallas County
Lynn	Royer	Dallas County
Tom	Tierney	Dallas County
Barry	Halling	Dallas County Emergency Management

Name		Agency/Organization
Greg	Dufoe	Adel-DeSoto-Minburn Schools
Scott	Grimes	Dallas Center-Grimes Schools
Kathy	Moline	Dallas Center-Grimes Schools
Lynn	Ubben	Perry Schools
Kevin	McLaughlin	Perry Schools & Perry Fire
Kelly	Bell	Van Meter School
John C.	Carver	Van Meter School
Deron	Durflinger	Van Meter Schools
Keith	Elmquist	Waukee Schools
Eric	Rose	Waukee Schools
Dave	Wilkerson	Waukee Schools
David	Arnold	West Centeral Valley Schools
Brad	Anderson	Woodward Granger Schools
Peggy	Reelitz	Polk County
Jeff	Johnson	National Weather Service
Johnny	Boyd	ORIS Plc
Gail	Kantak	Iowa Department of Natural Resources, Forestry
Ray	Anderson	Iowa Department of Natural Resources, Geological and Water Survey-DNR
Jennifer	Ellison	Iowa Homeland Secuirty and Emergency Management Division
Mathew	Noble	Iowa Homeland Secuirty and Emergency Management Division
Linda	Roose	Iowa Homeland Secuirty and Emergency Management Division
Karl	Harris	Iowa Department of natural Resources,Fire
AMEC Staff		
Susan	Belt	AMEC Environment & Infrastructure, Inc.
Laurie	Bestgen	AMEC Environment & Infrastructure, Inc.
Kari	Valentine	AMEC Environment & Infrastructure, Inc.
Phil	Waring	AMEC Environment & Infrastructure, Inc.

B.2 Hazard Mitigation Plan Informational Meeting Minutes (3/9/12)

To	**Barry Halling, Coordinator** **Dallas County Emergency Management**
From	**Susan Belt, Kari Valentine & Laurie Bestgen, AMEC Mitigation Planners**
Tel / E-mail	**785-272-6830 / susan.belt@amec.com, kari.valentine@amec and laurie.bestgen@amec.com**
Date	**3/13/2012**
Subject	**Minutes from Dallas County Mitigation Planning Informational Meeting held on 3/9/2012**

This document is a record of attendance and a summary of the topics discussed at the above meeting including the following:

- AMEC Environment & Infrastructure's Experience;
- Purpose of Hazard Mitigation Planning;
- Grant Program Availability Linked to Approved Plan;
- Multi-jurisdictional Plan Approach;
- Planning Requirements;
- Planning Process;
- Plan Document Structure; and
- Planning Process Timeline.

The formal presentation portion of the meeting began at 1:00 pm and concluded at 2:30 pm.

Attendees

Name		Agency/Organization
Allan	Adams	City of Van Meter
Barry	Halling	Dallas County
Bob	Ockerman	City of Adel
Chad	Leonard	Dallas County
Clint	Robinson	City of Waukee
Dave	Wilkerson	Waukee Schools
Don	Hocking	City of Granger
Greg	Dufoe	Adel-DeSoto-Minburn Schools
Jake	Anderson	City of Van Meter
Jarrod	Sturtz	City of Granger
John	Hoy	City of Redfield
John C.	Carver	Van Meter School
Johnny	Boyd	ORIS Plc
Lynn	Ubben	Perry Community Schools
AMEC Staff		
Susan Belt		
Laurie Bestgen		
Kari Valentine		

Introductions

Mr. Halling, with Dallas County Emergency Management began the meeting by welcoming and thanking the attendees for being a part of the Informational Meeting for the Hazard Mitigation Planning Process for the Dallas County Multi-jurisdictional Hazard Mitigation Plan. The attendees introduced themselves and the jurisdiction they were representing.

Overview

Mr. Halling introduced Susan Belt, Project Manager with AMEC Environment and Infrastructure. AMEC has been hired by the County to facilitate development of the plan. Ms. Belt presented an overview of the topics to be discussed during the meeting as well as a brief summary of AMEC's qualifications and experience in Iowa.

Ms. Belt introduced Ms. Kari Valentine and Laurie Bestgen, AMEC planners on the planning team for this project. They presented the remainder of the formal presentation which is detailed in the attached PowerPoint Presentation (Attachment A).

Discussion/Questions

In addition to the material covered in the formal presentation, the following specific items were addressed:

- The cities of Clive, Grimes, Urbandale, and West Des Moines were discussed. These cities were officially participating jurisdictions in the currently effective Polk County Hazard Mitigation Plan and are planned for inclusion in the Polk County Plan update scheduled for completion in August 2014. Since these cities were officially participating jurisdictions in the Polk County Plan, they will not be officially participating jurisdictions in the Dallas County Plan. However, since portions of these cities overlap into Dallas County, the Risk Assessment will take these cities into account up to the county line. Representatives from these cities will be invited to participate in the planning process as stakeholders and all information will be shared with Polk County for incorporation in the plan update, as appropriate.
- Various methods of notifying the public during the drafting stage of the plan were discussed. The representative from the Perry School District indicated that any public information/public surveys would need to be translated. She has translators on staff that can assist with translating information for the public.
- After presentation of the target schedule for this planning project, the school district representatives were asked if meetings scheduled during the summer months would be difficult for them to attend. The school district representatives indicated that they maintain office hours all summer and that they should be able to attend meetings.
- Mr. Halling discussed the soft-match requirements of the planning grant awarded to the County by FEMA through the Iowa Department of Homeland Security and Emergency Management. Meeting participants were asked to document their time spent working on the plan and coordinate documentation of time spent by others in their jurisdiction. To ensure time is reported in a consistent format, AMEC offered to develop a form to be used for documentation of time to be used as soft match (Attachment B).

Attachment A

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

amec

Informational Meeting
March 9, 2012

Project Manager: Susan Belt

Project Planners: Laurie Bestgen & Kari Valentine
AMEC Environment & Infrastructure

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Overview

- AMEC Environment & Infrastructure's Experience
- The Purpose of Hazard Mitigation Planning
- Grant Program Availability Linked to Approved Plan
- Multi-jurisdictional Plan Approach
- Planning Requirements
- Planning Process
- Plan Document Structure
- Planning Process Timeline

Informational Meeting
March 9, 2012

amec

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

AMEC's Experience in FEMA R.7

- **Completed 3 State Hazard Mitigation Plan Updates (KS & MO)**
- **Completed 24 Multi-jurisdictional Hazard Mitigation plans in Kansas**
- **Completed Papio-Missouri River NRD, Nebraska Multi-jurisdictional risk assessment portion of plan.**
- **Federal Hazard Mitigation Technical Assistance Program Subcontractor to Dewberry & Davis LLC for Iowa Hazard Mitigation Grant Program Project Reviews** – complete eligibility and benefit cost analysis reviews on Hazard Mitigation Assistance grants submitted to FEMA Region VII.
- **FEMA Region VII** - contract to complete Digital Flood Insurance Rate Maps (DFIRM) Map Modernization Services in Mills, Harrison, and Woodbury Counties.
- **Iowa Department of Natural Resources** – completing hydrologic and hydraulic studies to select watersheds, FEMA compliant floodplain mapping, and community outreach at the end of these studies in Warren & Story Counties.

Informational Meeting
March 9, 2012

amec

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

What Is Mitigation?

- Sustained action taken to reduce or eliminate long-term risk to human life and property from hazard events.
- Mitigation planning is a process for communities to:
  - Identify the hazards to which they are at risk
  - Assess the potential impacts of those hazards
  - Develop goals, objectives, and actions to reduce impacts
  - Prioritize and implement mitigation actions

Informational Meeting
March 9, 2012

amec

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Disaster Mitigation Act of 2000 (DMA 2K)

- Requires local governments to adopt a natural hazard mitigation plan to maintain eligibility for FEMA mitigation funds

Informational Meeting
March 9, 2012

amec

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Increasing Costs of Disaster Response and Recovery

- Population Growth and Development
  - More People, Buildings, Infrastructure in Hazardous Areas
- More Disaster Declarations
  - Average 61 Declarations/Year since 2000
  - Thousands Made Homeless
  - Billions of Tax Dollars Spent

Informational Meeting
March 9, 2012

amec

Attachment B

DALLAS COUNTY HAZARD MITIGATION PLAN
Documentation of In-Kind hours provided by local partners

This form is intended to capture a record of in-kind hours provided by local partners while attending meetings, gathering data, sharing information regarding the mitigation planning process with others, and reviewing materials prepared as a result of the mitigation planning process.

One form should be completed for **each person** assisting in the planning process. This form is to be turned in at each mitigation meeting or forwarded to AMEC at 1129 SW Wanamaker Road, Suite 101, Topeka, KS 66604 or faxed to 785-272-6878 or e-mailed to Susan Belt at susan.belt@amec.com Please turn in forms at least once a month.

Name: _____
Organization: _____
Position: _____
Organization Address: _____
_____

__ Law Enforcement	___ Fire / HazMat
__ Governmental	___ Health Care
__ Public Works	___ Emergency Mgmt
__ PSAP / 911	___ VOAD
__ School	___ Other / Volunteer

Please record your time assisting with the mitigation plan in the chart below and sign at the bottom before returning to AMEC.

Date	Activity	Hours Spent

Signature: _____ Date: _____

B.3 Hazard Mitigation Plan Informational Meeting Sign-In Sheets

Dallas County Office of Emergency Management
Sign-in-Sheet

Location: County Office Title: Hazard Mitigation Planning Information Meeting Date: 3/9/12

Name: Bob Ockermen Agency: Adel County: Dallas
Address: 1112 Sundance Cir Adel IA Phone: 515.993.4063 E-mail: R.Ockermen@mchsi.com

Name: Don Hocking Agency: Granger PD County: Dallas
Address: 1906 Main St. Granger, IA 50109 Phone: (515)999-2775 E-Mail: grangerpolice@mchsi.com

Name: Jacrod Stutz Agency: Granger FD County: Dallas
Address: 1906 Main St Phone: 515-999-2338 E-Mail: grangerfire@mchsi.com

Name: Jake Anderson Phone: 515-996-2644 County: Dallas
Address: 505 Grant St, VM Agency: Van Meter E-Mail: janderson@cityofvanmeter.com

Name: Clint Robinson Phone: 987 4712 County: C
Address: Agency: E-Mail: Clrobinson@wavlice.org

Name: Johnny Boyd Phone: 515-987 4798 County: Dallas
Address: P.O. Box 760 Agency: Architect with Van Meter Community School E-Mail: jboyd@orisple.com

Dallas County Office of Emergency Management
Sign-in-Sheet

Location: County Office Title: Hazard Mitigation Planning Information Meeting Date: 3/12/12

Name: JOHN C. CARLER Agency: VAN METER SCHOOLS County: DALLAS
Address: 581 1ST AVE VANMETER Phone: 515 996 9960 E-mail: JOHN.CARLER@VMBULDOGS.com

Name: Chad Leonard Agency: Dallas County County: Dallas
Address: 101 N Nile Circle Adel IA 50003 Phone: 993-6941 E-Mail: chad.leonard@co.dallas.ia.us

Name: Lynn Ubben Agency: Perry Gran School County: Dallas
Address: Perry Phone: 515-465-4656 E-Mail: lynn.ubben@perry.k12.ia.us

Name: JOHN HOY Phone: 515-833-2662 County: DALLAS
Address: PO BOX 363 Agency: REDFIELD CITY COUNCIL E-Mail: JKHOY@AOL.COM

Dallas County Office of Emergency Management
Sign-in-Sheet

Location: County Office Title: Hazard Mitigation Planning Information Meeting Date: 3/9/12

Name: Allan Adams **Agency:** Van Meter Mayor **County:** Dallas
Address: 2480 Winston Circle Van Meter, IA 50261 **Phone:** (515) 996-2702 **E-mail:** Allan.B.Adams@wellsfargo.com

Name: Greg Dufoe **Agency:** ADM Schools **County:** Dallas
Address: 801 Nile Kinnick Dr. **Phone:** 515 993-4283 **E-Mail:** gdufoe@adel.k12.ia.us

Name: Dave Wilkerson **Agency:** Waukee Schools **County:** Dallas
Address: 560 SE University Ave, Waukee **Phone:** 515-987-5161 ext 4507 **E-Mail:** dwilkerson@waukee.k12.ia.us

B.4 Kick-off Meeting Invite

Subject: Dallas County Multi-jurisdictional Hazard Mitigation Plan

Dear, Hazard Mitigation Planning Committee Members;

Dallas County has received funding to develop a Multi-jurisdictional Hazard Mitigation Plan. The purpose of this plan is to reduce or eliminate long-term risk to the people and property of Dallas County from the effects of natural hazard events. The Disaster Mitigation Act of 2000 requires all local governments to assess their risks to natural hazards and identify actions that can be taken in advance to reduce future losses. The law requires all local governments and special districts to have an approved Hazard Mitigation Plan to be eligible for certain federal disaster assistance and hazard mitigation funding programs.

The hazard mitigation planning process is heavily dependent on the participation of representatives from local government agencies and departments, the public, and other stakeholder groups. A Hazard Mitigation Planning Committee will be formed to support this project and will include representatives from the County, cities, school districts, and other local, state, and federal agencies in or that serve Dallas County.

Please provide **at least two** representatives from your organization to serve on the Hazard Mitigation Planning Committee. **Your participation is required in order for your agency to be eligible to receive any future FEMA hazard mitigation assistance funding.**

The Hazard Mitigation Planning Committee will meet a minimum of three times, beginning with the kickoff meeting listed below. At this meeting, we will discuss the benefits of developing a hazard mitigation plan, the project schedule, and all of the hazards that affect Dallas County, such as tornadoes, wildfire, floods, winter storms, and more.

Dallas County Multi-jurisdictional Hazard Mitigation Plan Kickoff Meeting

Date: April 19th 2012
Time: 1:00pm to 4:00pm
Place: Towne Craft Center
Address: Corner of 2nd Street & Willis Ave.
Perry, Iowa 50220

The Dallas County Emergency Management Commission has taken the lead in developing this plan. The County has hired a consultant, AMEC Environment & Infrastructure, Inc., to manage the planning project. AMEC will facilitate the planning process, collect the necessary data, and perform other technical services, including preparing the risk assessment and plan document. However, to successfully complete this project and ensure your organization is eligible for FEMA hazard mitigation assistance funding, we need your participation and input.

As part of this planning process, we will review and incorporate appropriate information from existing plans, studies, reports, and technical information. Please bring copies of any of the following documents that your organization has previously prepared. If possible, please provide on CD, flash drive, or email to me at dcema@dwx.com. Paper documents are also acceptable. If your organization has developed other plans, studies, or reports that are not on this list and

which may be helpful in describing your ability to minimize risk and mitigate damages from hazards, please provide those as well.

Master Plan
Emergency operations plan
School crisis plan
Growth management ordinance
Fire mitigation plan
Floodplain ordinance
Flood insurance study or other engineering study for streams such as watershed plans
Other special purpose ordinance (stormwater, steep slope, wildfire)
Storm water management program
Capital improvements plan
Economic development plan
Local mitigation plan
Iowa Wetlands & Riparian Areas Conservation Plan

Please respond as to whether or not you or your representative will be able to attend the kickoff meeting by contacting me via telephone at 515-993-2134 or via e-mail at dcema@dwx.com or Barry.Halling@co.dallas.ia.us Thank you for your early attention and response to this important project. I look forward to seeing you.

Sincerely,

Barry Halling – Coordinator

Dallas County Office of Emergency Management

B.5 Kick-Off Meeting Agenda

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan
Kick-off Planning Meeting

April 19, 2012
1:00-4:00 pm
Towne Craft Center
Perry, Iowa

Agenda

Introductions — Barry Halling, Coordinator
Dallas County Office of Emergency Management

Hazard Mitigation Planning Purpose

Multi-jurisdictional Approach

Grant Programs Linked to Approved Plan

Hazard Mitigation Planning Requirements-Review

Public Involvement

Data Collection Guides

Discussion/Prioritization of Hazards

Next Steps in the Planning Process

AMEC Team:

Susan Belt
Project Manager/soft-match documentation
- Work phone (785) 272-6830
- Cell phone (785) 217-7957
- Email: susan.belt@amec.com

Laurie Bestgen
- Phone (816) 637-6378
- Email: aurie.bestgen@amec.com

Kari Valentine
- Phone (816) 436-6351
- Email: kari.valentine@amec.com

B.6 Kick-Off Meeting Minutes (4/19/2012)

To	**Barry Halling, Coordinator** **Dallas County Emergency Management**
From	**Laurie Bestgen & Kari Valentine, AMEC Mitigation Planners**
Tel / E-mail	**785-272-6830 / kari.valentine@amec.com and laurie.bestgen@amec.com**
Date	**5/4/2012**
Subject	**Minutes from Dallas County Mitigation Planning Kickoff Meeting held on 4/19/2012**

This document is a record of attendance and a summary of the issues discussed during the above meeting, including an introduction to the hazard mitigation planning process, the benefits to a multi-jurisdictional approach, classifying the probability, magnitude, warning time, and duration of hazards affecting Dallas County, and next steps in this process.

The formal presentation portion of the meeting began at 1:00pm and concluded at 4:00pm.

Attendees

First Name	Last Name	Agency/Organization
Allan	Adams	City of Van Meter
Jake	Anderson	City of Van Meter
Kelly	Bell	Van Meter School
Johnny	Boyd	ORIS Plc
Dan	Brickner	City of Perry
Jack	Butler	City of Perry
John C.	Carver	Van Meter School
Tyler	Clausen	City of Redfield
Greg	Dufoe	Adel-DeSoto-Minburn Schools
Terry	Dunielson	City of Redfield
Nick	Eikstein	City of DeSoto
Brian	Eiterman	City of Perry
Barry	Halling	Dallas County Emergency Management
David	Herman	Van Meter PWD
Gary	Herrick	City of Van Meter
Chris	Hinds	City of Perry
Chad	Leonard	Dallas County
Kevin	McLaughlin	Perry Community Schools & Perry Fire
Kathy	Moline	Dallas-Center-Grimes Schools
Clarence	Morman	City of Dawson
Mary	Murphy	City of Perry
Bob	Ockerman	City of Adel
Kip	Overton	City of Adel
Lori	Riley	City of Perry
Eric	Rose	Waukee Schools
Lynn	Royer	Dallas County
Billy	Samuel	City of Dawson
Jarrod	Sturtz	City of Granger
Steve	Tibble	City of Perry

The ranking elements and rating descriptions were placed on large sheets of paper and posted on the walls for committee members to refer to. These elements are used in the Enhanced Iowa State Hazard Mitigation Plan to figure the Calculated Priority Risk Index (CPRI). The CPRI provides a hazard ranking mechanism as well as a planning significance rating, to focus planning efforts on those hazards with the highest scores.

The group reviewed the list of hazards already identified by Dallas County Emergency Management that could affect the planning area. Ms. Valentine and Ms. Bestgen presented preliminary research on each hazard and asked the committee to validate the probability, magnitude, warning time, and duration elements. Participants discussed past hazard events and the types of damage experienced by the local area.

Listed below are the 17 hazards listed alphabetically that the Dallas County plan will focus on:

- Animal/Crop/Plant Disease
- Dam Failure
- Drought
- Earthquake
- Expansive Soils
- Extreme Heat
- Flash Flood
- Grass or Wildland Fire
- Hailstorm
- Landslide
- Levee Failure
- River Flooding
- Severe Winter Storm
- Sinkholes
- Thunderstorms and Lightning
- Tornado
- Windstorm

The committee had the following comments to add to the hazard research:

Tornadoes: A committee member noted that because of the dense development around the Jordan Creek Parkway and that Dallas County is now ranked as the 7th fastest growing county in the nation, the magnitude should be increased to a level 4 rating.

Hailstorm: A committee member mentioned a thunderstorm in 2009 that had golf-ball size hail which did extensive damage to homes and cars in Perry. It was estimated that 90 percent of the homes in Perry needed new roofs because of the damage.

Thunderstorms/Lightning: Committee members agreed to change the magnitude to a level 1 rating.

Flash Flood: Committee members agreed to change warning time to a level 3 rating.

Grass/Wildland Fire: Committee members agreed to change warning time to a level 4 rating.

Landslides: It was mentioned that road cuts in southwest corner of county have had previous landslides. Committee members agreed to change magnitude to a level 2 rating.

Levee Failure: Committee members agreed to change magnitude to a level 2 rating. Van Meter levee is not accredited. It is an area where the creek was straightened and now railroad runs along. It did not flood in 1993.

Preliminary Hazard Ranking Results

Hazard Type	Probability	Magnitude	Warning Time	Duration	CPRI	Planning Significance
Tornado	4	4	3	1	3.55	High
River Flooding	4	3	1	4	3.25	High
Severe Winter Storm	4	2	3	4	3.25	High
Flash Flood	4	2	3	1	2.95	Moderate
Windstorm	4	2	2	1	2.8	Moderate
Grass or Wildland Fire	3	2	4	1	2.65	Moderate
Hailstorm	4	1	3	1	2.65	Moderate
Thunderstorms and Lightning	4	1	2	2	2.6	Moderate
Dam Failure	1	3	4	4	2.35	Moderate
Animal/Crop/Plant Disease	1	3	4	4	2.35	Moderate
Levee Failure	1	2	4	4	2.05	Moderate
Drought	2	2	1	4	2.05	Moderate
Landslide	2	2	2	1	1.9	Low
Expansive Soils	3	1	1	1	1.9	Low
Extreme Heat	2	1	1	4	1.75	Low
Earthquake	1	1	4	1	1.45	Low
Sinkholes	1	1	2	1	1.15	Low

As data collection guides are received, and/or additional research is completed, the hazard rankings may need to be updated. If this occurs, pertinent information will be brought before the HMPC to review the information and update the hazard ranking elements, as appropriate.

Next Steps

Attendees were asked to complete their jurisdiction's Data Collection Guide and to talk with other staff that may be knowledgeable about requested data. Attendees were also reminded to keep track of their time spent conducting research and completing their Data Collection Guides on the Soft Match Documentation Sheet handed out at the meeting and provided electronically via email on April 20th. The Data Collection Guides are due back to AMEC by Friday, May 11th and participants are encouraged to contact Laurie Bestgen or Kari Valentine if they have any questions.

The next meeting of the Hazard Mitigation Planning Committee will be June 21, 2012. The location and time will be announced. A draft of the risk assessment will be provided at this meeting. The meeting will involve a review of the risk assessment results and development of the plan's goals and objectives.

B.7 Kick-Off Meeting Sign-In Sheets

DALLAS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN – KICK-OFF MEETING SIGN-IN SHEET

Project:	Dallas County Hazard Mitigation Plan – Kick-off Meeting	**Meeting Date/Time:**	April 19, 2012, 1:00 – 4:00 pm
Facilitators:	Laurie Bestgen & Kari Valentine, AMEC	**Place/Room:**	Towne Craft Center, Corner of 2nd Street & Willis Ave. Perry, Iowa 50220

Name	Department/Agency	Email	Phone #	Signature
Tyler Clausen	City of Redfield. Fire Dept		(515)-710-1158	
Jarrod Sturtz	City of Granger		515-999-2210	
Kelly Bell	VAN METER SCHOOL	Kelly.Bell@vmBuildings.com	515 996-9960	
Eric Rose	Waukee Schools	erose@waukee.k12.ia.us	(515)987-5161	
Lynn Ubben	Perry Schools			
Mary Murphy	City of Perry	mmurphy@perry.lib.ia.us	515.465 3569	
Dan Brickner	City of Perry	dbricknerppd@gmail.com	465-4636	
Chad Leonard	Dallas County	chad.leonard@co.dallas.ia.us	202-5468	
Eric Vaugh	Perry	evaughnppd@gmail.com	515.465.5076	
Levi Riley	Perry	lrileyppd@gmail.com		
Kip Overton	Adel	koverton@adeliowa.org	515-993-4525	
Gary Herrick	VAN METER FIRE & RESCUE	herrick_gary@juno.com	515-996-2861	
DAVID HERMAN	VAN METER PWD		(515)240-5250	

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DALLAS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN – KICK-OFF MEETING SIGN-IN SHEET

Project:	Dallas County Hazard Mitigation Plan – Kick-off Meeting	**Meeting Date/Time:**	April 19, 2012, 1:00 – 4:00 pm
Facilitators:	Laurie Bestgen & Kari Valentine, AMEC	**Place/Room:**	Towne Craft Center, Corner of 2nd Street & Willis Ave. Perry, Iowa 50220

Name	Department/Agency	Email	Phone #	Signature
Chris Hinds	Perry Fire	perryiafirechief@yahoo.com	515-435-4285	
Josh Wuebker	Perry Pub. Works	josh.wuebker@perryia.org	490-6626	
Jack Butler	Perry Public Works	jack.butler@perryia.org	515-360-7271	
Bob Ackerman	City of Adel	r.ackerman@mchsi.com	515 238 9935	
Brian Eiterman	City of Perry	Firehunter702@yahoo.com	515-465-2967	
Clarence Morman	City of Dawson		515 428-8474	
Kevin D. McLaughlin	PCS Perry Fire	KEVIN.MCLAUGHLIN@PERRY.KIZUTA.US	515-490-8466	
Steve Tibbles	City of Perry	steve.tibbles@perryia.org	515-214-9621	
Terry Danielson	City of Redfield	Redfieldshop@wi.rr.com	515-371-1364	
Greg DuFoe	ADM Superintendent	gdufoe@adel.k12.ia.us	515-993-4283	
Tom Tierney	Dallas Co. Roads	Tom.Tierney@co.dallas.ia.us	371 9851	
Jacob Anderson	City of Van Meter	janderson@cityofvanmeter.com	515 996 2644	
Nick Eckstein	City of De Soto	–	515-834-2233	

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DALLAS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN – KICK-OFF MEETING SIGN-IN SHEET

Project:	Dallas County Hazard Mitigation Plan – Kick-off Meeting	**Meeting Date/Time:**	April 19, 2012, 1:00 – 4:00 pm
Facilitators:	Laurie Bestgen & Kari Valentine, AMEC	**Place/Room:**	Towne Craft Center, Corner of 2nd Street & Willis Ave. Perry, Iowa 50220

Name	Department/Agency	Email	Phone #	Signature
Billy Sammell	City of Dawson	boadboy71@Hotmail	480-1752	Billy Sammell
Kathy Moline	DCG School Dist	Kmoline@dc-grimes.k12.ia.us	515 992 3566	Kathy Moline
John Carver	Van Meter Schools	JOHN.CARVER@VMBULLDOGS.COM	515 9969960	John Carver
Daryl Boyd	Architect Van Meter School			
Dave Van Laningham	City of DeSoto	desoto-pwd@mchsi.com	834-2233	
Lynn Royer	Public Health	lynn.royer@co.dallas.ia.us	993-3720	
Allan Adams	Van Meter City	allan.b.adams@wellsfargo.com	996-2702	Allan B Adams
Barry Holley	Dallas Co EMA	dcema@dwx.com	993-2134	

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B.8 Meeting #2 Agenda

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan
Planning Meeting #2

June 21, 2012
1:00-4:00 pm
Washington Township School Building

Agenda

Introductions Barry Halling, Coordinator
Dallas County Office of Emergency Management

Review Planning Requirement

Discuss Participation Requirements/Status

Review/Validate Critical Facilities

Present Results of Countywide Risk Assessment

Discuss Comments, Corrections, Questions

Determine Mitigation Goals

Discuss Mitigation Actions

Next Steps

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B.9 Meeting #2 Minutes (6/21/2012)

To	Barry Halling, Coordinator Dallas County Emergency Management
From	**Susan Belt, Kari Valentine & Laurie Bestgen, AMEC Mitigation Planners**
Tel / E-mail	785-272-6830 / susan.belt@amec.com, kari.valentine@amec.com, and laurie.bestgen@amec.com
Date	6/26/2012
Subject	**Minutes from Dallas County Mitigation Planning Meeting #2 held on 6/21/2012**

This document is a record of attendance and a summary of the issues discussed during the above meeting, including: a brief review of the purpose of a Hazard Mitigation Plan, participation requirements and the status of each jurisdiction, validation/corrections to critical facilities included in the risk assessment, results of the risk assessment, development of mitigation goals, introduction to mitigation actions, and the next steps in this process.

Attendees

First Name	Last Name	Jurisdiction Represented
Allan	Adams	City of Van Meter
Jake	Anderson	City of Van Meter
David	Arnold	West Central Valley Schools
Jack	Butler	City of Perry
Adam	Coyle	City of Van Meter
Greg	Dufoe	Adel-DeSoto-Minburn Schools
Deron	Durflinger	Van Meter Schools
Jennifer	Ellison	Iowa HSEMD
Kris	Fitch	City of Minburn
Jim	George	Dallas County
Mike	Grief	City of Granger
Scott	Grimes	Dallas Center-Grimes Schools
Barry	Halling	Dallas County Emergency Management
John	Hoy	City of Redfield
Bob	Lacy	City of Van Meter
Camilla	McCain	City of Bouton
Kevin	McLaughlin	Perry Community Schools & Perry Fire
Jim	McNeill	City of Adel
Clarence	Moreman	City of Dawson
Mary	Murphy	City of Perry
Mathew	Noble	Iowa HSEMD
Bob	Ockerman	City of Adel
Valerie	Purvis	City of Woodward
Peggy	Reelitz	Polk County Emergency Management
Cindy	Riesselman	City of Dallas Center
Clint	Robinson	City of Waukee
Linda	Roose	Iowa HSEMD
Eric	Rose	Waukee Schools
Billy	Samuel	City of Dawson
Marcia	Thomas	City of DeSoto
Betty	Tingwald	City of Bouton
Kristy	Trzeciak	City of Granger
Eric	Vaughn	City of Perry

Introductions

Mr. Halling, with Dallas County Emergency Management began the meeting by welcoming and thanking the attendees. The attendees introduced themselves and the jurisdiction they were representing. Kari Valentine, with AMEC Environment & Infrastructure, Inc., the firm contracted to assist in the development of the Dallas County multi-jurisdictional hazard mitigation plan, began the formal portion of the presentation.

Purpose/Requirements/Participation Status

Ms. Valentine provided a brief summary of the purpose of the Hazard Mitigation Plan and the Disaster Mitigation Act of 2000 that codified the requirement of local governments to adopt a natural hazard mitigation plan to maintain eligibility for FEMA Hazard Mitigation Assistance Grants. The twelve-step planning process was summarized and participants were informed that at the conclusion of the meeting, the planning committee will be ready to begin step 9, "develop potential mitigation actions". Ms. Valentine also provided a status update on the Public Surveys that have been disseminated in both hard copy and via survey monkey at http://www.surveymonkey.com/s/TMHN8K6. To date, 22 survey monkeys have been completed and over 20 hard copy responses have been received. Planning Committee representatives were encouraged to continue dissemination of the surveys and to notify Mr. Halling or AMEC of these efforts so that they can be described in the planning process section of the plan. A comparison of the public and planning committee's hazard rankings was provided (see attached PowerPoint Presentation.)

Ms. Valentine then provided a review of the requirements for jurisdictions to officially participate in the Multi-jurisdictional Hazard Mitigation Plan as well as a table summarizing each jurisdiction's participation to date (see attached PowerPoint Presentation).

Validation of Critical Facilities

Ms. Bestgen, also with AMEC Environment & Infrastructure, Inc. passed out inventories of each jurisdiction's critical and essential facilities for validation and/or correction by jurisdictions. The inventories were assembled from the critical facility database that is part of FEMA's loss estimation software, HAZUS, as well as critical facilities that were provided by jurisdictions via their completed data collection guides that were distributed at the kick-off meeting. Planning committee members were instructed to carefully review the lists and make any corrections, deletions, or additions, as necessary and return to Ms. Bestgen by July 13, 2012. AMEC will geo-locate all facilities that have a good address to contribute the vulnerability analysis for geographic hazards, such as riverine flooding.

A meeting participant asked about whether private schools should be included on the critical facility lists. Ms. Bestgen answered that private schools should be added to the critical facility lists for cities and/or the unincorporated county where they are located. However, public schools should be recorded on the critical facility lists for the public school districts.

Results of Countywide Risk Assessment

The draft Risk Assessment was distributed in hard copy to meeting participants. In addition, a PDF file is being distributed along with these minutes. Ms. Bestgen asked that the planning committee review the risk assessment along with other representatives of their jurisdiction and provide comments and additional data back to her by July 13, 1012. Ms Susan Belt, AMEC Project Manager pointed out to the planning committee members that there are several areas in the draft risk assessment that are highlighted in blue where we are asking for clarification or additional information.

Ms. Bestgen then provided an overview of hazards that received a high or moderate ranking level (see attached PowerPoint Presentation).

Ms. Bestgen also asked the committee to re-evaluate the warning time for the tornado hazard. The planning committee decided that the warning time should be changed to a level 4—less than 6 hours. The planning committee also discussed changing the probability rating for Animal/Crop Plant Disease. After discussion, it was decided to keep the "unlikely" probability as the plant disease that does occur annually is not really considered a hazard event, but rather expected occurrences.

During the discussion of flash flooding, the representative from the City of DeSoto reported that a berm has been constructed to help protect the water treatment facility.

Mobile homes were identified as structures vulnerable to high winds and the numbers of mobile homes in each jurisdiction were discussed. Woodward, Dallas Center, and Van Meter reported that they no longer have any mobile homes. Dawson currently has 5 mobile homes.

The chart below provides the revised ranking levels for all hazards.

Hazard Type	Probability	Magnitude	Warning Time	Duration	Weighted Score	Level
Tornado	4	4	4	1	3.7	High
River Flooding	4	3	1	4	3.25	High
Severe Winter Storm	4	2	3	4	3.25	High
Flash Flood	4	2	3	1	2.95	Moderate
Windstorm	4	2	2	1	2.8	Moderate
Grass or Wildland Fire	3	2	4	1	2.65	Moderate
Hailstorm	4	1	3	1	2.65	Moderate
Thunderstorms and Lightning	4	1	2	2	2.6	Moderate
Dam Failure	1	3	4	4	2.35	Moderate
Animal/Crop/Plant Disease	1	3	4	4	2.35	Moderate
Levee Failure	1	2	4	4	2.05	Moderate
Drought	2	2	1	4	2.05	Moderate
Landslide	2	2	2	1	1.9	Low
Expansive Soils	3	1	1	1	1.9	Low
Extreme Heat	2	1	1	4	1.75	Low
Earthquake	1	1	4	1	1.45	Low
Sinkholes	1	1	2	1	1.15	Low

Mitigation Goals

Following the discussion of the risk assessment, Ms. Valentine provided the four main categories of mitigation goals:

- Public Education,
- Planning/Training/Communication,
- Reduce Risk to Life and Property, and
- Protection of Critical Facilities.

Then sample goal statements obtained from other local mitigation plans. were discussed and the committee completed a voting exercise to reach consensus on the goals for the Dallas County mitigation plan. Each planning committee member was given four voting dots and asked to select the sample goals that most clearly stated the mitigation goals for Dallas County. After the voting exercise, the committee discussed each goal that received the most votes and made wording changes to tailor the goal statements.

After discussion the following goals statements were chosen for the Dallas County Multi-Jurisdictional Hazard Mitigation Plan:

- Protect critical facilities and infrastructure from natural hazards. (20 votes)
- Create a disaster resistant community by improving public understanding of natural hazards and risk by providing public awareness, preparedness, and mitigation information through various channels of communication. (19 votes)
- Improve capabilities to mitigate natural hazards by incorporating mitigation strategies in plans, policies, and programs. (18 votes)
- Prevent or reduce the impact of natural hazards for the residents, businesses, and municipalities of Dallas County. (14 votes)
- Strengthen communication among agencies and between agencies and the public. (14 votes)

Mitigation Actions

The planning committee was then provided an introduction to development of mitigation actions. The final planning meeting, scheduled for August 23, 2012, will continue this discussion and focus on development of mitigation actions.

Next Steps

The meeting concluded with a discussion of the remaining steps to complete the planning process as follows:

- Draft Risk Assessment/Critical Facilities will be emailed
- July 13—Draft Risk Assessment/Critical Facility Comments Due
- August 23—Final Meeting
- Promote Public Survey (and tell us about it)
- Fall 2012
    - Final Public Comment Period
    - Submit Plan to IA HS&EM
    - Submittal to FEMA

Attachment: Power Point Presentation from June 21, 2012 planning meeting

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

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Meeting 2:
Risk Assessment Results
Developing Mitigation Goals
June 21, 2012

Project Manager: Susan Belt

Project Planners: Kari Valentine & Laurie Bestgen
AMEC Environment & Infrastructure, Inc.

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Meeting Purpose

- Review
- Discuss Participation Requirements/Status
- Review/Validate Critical Facilities
- Present Results of Countywide Risk Assessment
- Discuss Comments, Corrections, Questions
- Determine Mitigation Goals
- Discuss Mitigation Actions
- Next Steps

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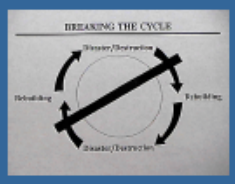
Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Disaster Mitigation Act of 2000

- Requires local governments to adopt a natural hazard mitigation plan to maintain eligibility for FEMA Hazard Mitigation Assistance funds



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Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Mitigation Planning Steps

Phase 1	1. Organize Resources
	2. *Plan for Public Involvement*
	3. Coordinate with Other Departments and Agencies
Phase 2	4. Identify the Hazards
	5. Profile the Hazards
	6. Identify Assets
	7. Estimate Losses
Phase 3	8. Identify Goals and Objectives
	9. Develop Potential Mitigation Actions
Phase 4	10. Draft the Mitigation Plan
	11. Adopt the Plan
	12. Implement and Maintain the Plan

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Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Public Survey Update

- Survey Monkey—22 responses to date (http://www.surveymonkey.com/s/TMHN8K6)
- Hard Copy Surveys—over 20 responses to date
- FEMA Publications available from Barry
- Dallas County Emergency Management distributed via email
- Dallas County Public Health Dept. distributed via email
- City of Adel distributed via City Newsletter

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Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Hazard Ranking Comparison

Public Survey Hazard Ranking	HMPC Hazard Ranking
Tornado	Tornado
Severe Winter Storm	River Flooding
Windstorm	Severe Winter Storm
Drought	Flash Flood
River Flooding	Windstorm
Extreme Heat	Grass or Wildland Fire
Flash Flood	Hailstorm
Thunderstorms and Lightning	Thunderstorms and Lightning
Hailstorm	Dam Failure
Animal/Crop/Plant Disease	Animal/Crop/Plant Disease
Grass or Wildland Fire	Levee Failure
Earthquake	Drought
Expansive Soils	Landslide
Dam Failure	Expansive Soils
Levee Failure	Extreme Heat
Sinkholes	Earthquake
Landslide	Sinkholes

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Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Participating Jurisdictions—Review Requirements

- **Meeting Participation** —Designate a representative to serve on the Dallas County Hazard Mitigation Planning Committee, which will meet three times during the planning process,
- **Data Collection Guides** —Provide data and comment on plan drafts as requested,
- **Mitigation Actions**— Assist in the development of a risk assessment and mitigation actions (at least one) specific to the jurisdiction,
- **Disseminate Information** —Inform the public, local officials, and other interested parties about the planning process and provide opportunity for them to comment on the plan, and
- **Formally adopt the mitigation plan**

Jurisdiction	Informational Meeting	Kick-Off Meeting	Data Collection Guide
Dallas County	x	x	x
Adel	x	x	x
Bouton			
Clive*	N/A	N/A	N/A
Dallas Center			x
Dawson		x	x
DeSoto		x	x
Dexter			
Granger	x	x	x
Grimes*	N/A	N/A	N/A
Linden			x
Minburn			x
Perry		x	x
Redfield	x	x	x
Urbandale*	N/A	N/A	N/A
Van Meter	x	x	x
Waukee	x		x
West Des Moines*	N/A	N/A	N/A
Woodward			x
Adel-DeSoto-Minburn Schools	x	x	x
Dallas Center-Grimes Schools		x	x
Perry Community Schools	x	x	x
Van Meter Schools	x	x	x
Waukee Schools	x	x	x
West Central Valley Schools			x
Woodward- Granger Schools			x

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Validate Critical Facilities (handout)

- Impacts of Hazards will be considered for critical facilities
- Source column indicates HAZUS, DCG or Both
- Those from HAZUS are mapped
- Those from DCG are not currently mapped. If address is provided, we can geo-locate and place on maps.
- Return to Laurie Bestgen 7/13

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Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Dallas County Risk Assessment Results

- Presentation will be overview of high and moderate hazards
- Hazard Ranking is for entire planning area
- Hazard Ranking by Jurisdiction is provided at the end of each hazard section. Please review/validate. (ex. pg. 3.48, 3.58).

Hazard Ranking Summary for Dallas County

Hazard Type	Probability	Magnitude	Warning Time	Duration	Score	Level
Tornado	4	4	3	1	3.55	High
River Flooding	4	3	1	4	3.25	High
Severe Winter Storm	4	2	3	4	3.25	High
Flash Flood	4	2	3	1	2.95	Moderate
Windstorm	4	2	2	1	2.8	Moderate
Grass or Wildland Fire	3	2	4	1	2.65	Moderate
Hailstorm	4	1	3	1	2.65	Moderate
Thunderstorms and Lightning	4	1	2	2	2.6	Moderate
Dam Failure	1	3	4	4	2.35	Moderate
Animal/Crop/Plant Disease	1	3	4	4	2.35	Moderate
Levee Failure	1	2	4	4	2.05	Moderate
Drought	2	2	1	4	2.05	Moderate
Landslide	2	2	2	1	1.9	Low
Expansive Soils	3	1	1	1	1.9	Low
Extreme Heat	2	1	1	4	1.75	Low
Earthquake	1	1	4	1	1.45	Low
Sinkholes	1	1	2	1	1.15	Low

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Tornado

- Consider change to Warning Time (6-12 hrs)
- 38 Tornadoes in Dallas Co. 1955-2011: 2 F3, 6 F2, 8 F1, and 22 F0
  - 2 injuries/$14 Million in damages
  - $245,754 annualized losses over 57 yrs.
- Not all schools/public buildings have safe rooms
- Outdoor Recreation Areas Expanding (bike trails)
- Public may not be aware of existing shelter locations

- Probability: 4
- Magnitude: 4
- Warning Time: 3
- Duration: 1

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Tornado Contd.

- Loss Estimation Scenario—F2/EF2
  - 130 MPH, 5 miles long, 100 yards wide
  - County Assessor's Parcel Layer/Data
  - 3 locations chosen for analysis
    - Redfield—medium development density
    - Perry—high development density
    - Unincorporated Area—low development density

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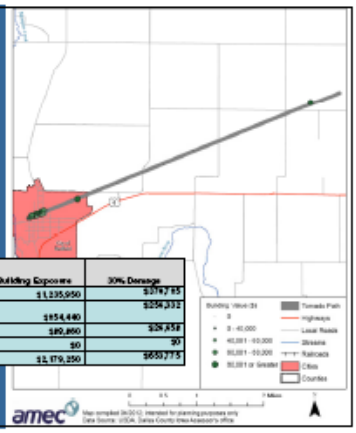
- Redfield Scenario



Occupancy	Building Count within Scenario 1	Building Exposure	30% Damage
Residential	24	$1,235,950	$370,785
Commercial	10	$854,440	$256,332
Industrial	1	$92,860	$28,458
Agriculture	0	$0	$0
Total	35	$2,179,250	$653,775

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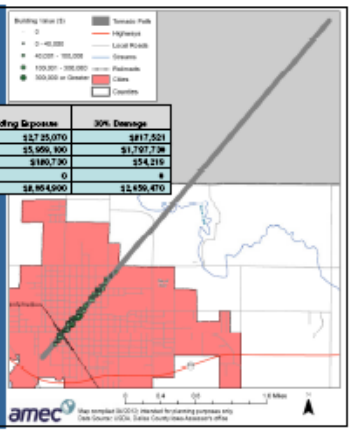
- Perry Scenario



Occupancy	Building Count within Scenario 2	Building Exposure	30% Damage
Residential	53	$2,725,070	$817,521
Commercial	62	$5,999,190	$1,797,736
Industrial	3	$180,730	$54,219
Agricultural	0	0	0
Total	118	$8,904,900	$2,669,470

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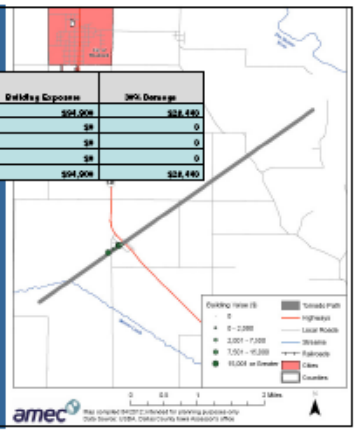
- Unincorporated Scenario



Occupancy	Building Count within Scenario 3	Building Exposure	30% Damage
Residential	5	$94,906	$28,440
Commercial	0	$0	0
Industrial	0	$0	0
Agricultural	0	$0	0
Total	5	$94,906	$28,440

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Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

River Flooding

- 9 Presidential Disaster Declarations including Dallas County since 1965 included flooding
- Some Critical Facilities in the 100-year floodplain
- Insurance Coverage is less than damage estimates in some areas
- Loss estimates developed for 1-percent annual chance flood
  - Preliminary/Effective Digital Flood Insurance Rate Maps
  - County Assessor's Office Parcel Layer/Data

- Probability: 4
- Magnitude: 3
- Warning Time: 1
- Duration: 4

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Multi-Jurisdictional Hazard Mitigation Plan

Critical Facilities in 100-year Floodplain

- Growing Data Set as categories of facilities are added—lists will be validated with each city
- Current Analysis Includes Only Facilities out of HAZUS

Flooded Critical Facility	Name	Near City	Flood Elevation (ft)
Fire Station	Perry Volunteer Fire Department	Perry	1.0
School	Woodward-Granger Elementary School	Granger	1.0
Police Station	Perry Police Dept	Perry	0.8
Waste Water Facility	City of Adel Sewage Treatment Plant	Adel	0.5
Waste Water Facility	Van Meter City of STP	Van Meter	3.8
Hazmat Location	Sioux City Brick & Tile Co. (Hydrogen Fluoride)	Adel	0.5
Hazmat Location	Sioux City Brick & Tile Co. (Manganese)	Adel	0.5
Hazmat Location	Sioux City Brick & Tile Co. (Barium)	Adel	0.5

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Estimated Losses: 100-Year Flood Event

Jurisdiction	Floodplain Building Count	Floodplain Building Exposure Value	Floodplain Contents Exposure Value	Floodplain Total Exposure Value	Potential Loss at 20%
Adel	91	$6,317,570	$4,199,380	$10,516,950	$2,103,390
Bouton	0	-	-	-	-
Clive*	0	-	-	-	-
Dallas Center	1	$457,000	$457,000	$914,000	$182,800
Dawson	1	$44,850	$22,425	$67,275	$13,455
DeSoto	1	$6,150	$6,150	$12,300	$2,460
Dexter	0	-	-	-	-
Granger	18	$6,317,570	$3,158,785	$9,476,355	$1,895,271
Grimes*	0	-	-	-	-
Linden	0	-	-	-	-
Minburn	0	-	-	-	-
Perry	37	$1,505,410	$787,910	$2,293,320	$458,664
Redfield	13	$475,130	$238,250	$713,380	$142,676
Urbandale*	0	-	-	-	-
Van Meter	29	$3,307,040	$2,183,355	$5,490,395	$1,098,079
Waukee	14	$2,847,250	$1,827,075	$4,674,325	$934,865
West Des Moines*	0	-	-	-	-
Woodward	0	-	-	-	-
Unincorporated	284	$27,999,820	$18,704,190	$46,704,010	$9,340,802
Total	499	$49,277,790	$31,584,520	$80,862,310	$16,172,462

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Estimated Losses: Loss Ratio (100-yr flood losses compared to exposure value)

Jurisdiction	Jurisdiction Total Exposure ($)	100-year Flood Potential Loss at 20%	Loss Ratio
Adel	$276,924,220	$2,103,390	0.76%
Bouton	$5,223,165	0	0.00%
Clive*	$537,647,545	0	0.00%
Dallas Center	$159,520,745	$182,800	0.11%
Dawson	$7,765,245	$13,455	0.17%
DeSoto	$59,645,075	$2,460	0.00%
Dexter	$40,199,775	0	0.00%
Granger	$85,702,045	$1,895,271	2.21%
Grimes*	$37,960	0	0.00%
Linden	$7,639,825	0	0.00%
Minburn	$25,997,120	0	0.00%
Perry	$361,233,900	$458,664	0.13%
Redfield	$41,464,030	$142,676.00	0.34%
Urbandale*	$942,780,290	0	0.00%
Van Meter	$66,371,700	$1,098,079	1.65%
Waukee	$1,369,347,840	$934,865	0.07%
West Des Moines*	$2,559,730,690	0	0.00%
Woodward	$72,559,160	0	0.00%
Unincorporated	$1,368,971,955	$9,340,802	0.68%
Total	$8,089,762,175	$16,172,462	0.20%

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Estimated Losses: Population Displaced

Jurisdiction	Residential	Estimated Persons Displaced
Adel	61	156
Bouton	0	0
Clive*	0	0
Dallas Center	0	0
Dawson	1	3
DeSoto	0	0
Dexter	0	0
Granger	18	46
Grimes*	0	0
Linden	0	0
Minburn	0	0
Perry	29	74
Redfield	11	28
Urbandale*	0	0
Van Meter	22	56
Waukee	9	23
West Des Moines*	0	0
Woodward	0	0
Unincorporated	115	294
Total	266	681

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Flood Insurance Coverage

Jurisdiction	Policies in Force	Insurance in Force	Closed Losses*	Total payments
Uninc. Dallas Co.	28	4,823,300	5	120,621.20
Adel	26	$2,788,000	11	73,577.61
Bouton	Not Participating / No Special Flood Hazard Area			
Clive (includes Polk Co. portion)	127	$41,050,700	28	$653,271.32
Dallas Center	1	$28,000	0	$0
Dawson	0	$0	0	$0
De Soto	0	$0	0	$0
Dexter	Not Participating/Sanctioned			
Granger	2	$560,000	0	$
Grimes (includes Polk Co. portion)	24	$6,077,500	2	$10,260.72
Linden	Not Participating / No Special Flood Hazard Area			
Minburn	Not Participating / No Special Flood Hazard Area			
Perry	13	$1,512,700	5	$15,028.06
Redfield	4	$295,100	1	$5,047.88
Urbandale (includes Polk Co. portion)	47	$10,145,600	7	$49,543.22
Van Meter	4	$805,000	0	$0
Waukee	10	$1,522,200	0	$0
West Des Moines (includes Polk Co. portion)	148	$38,808,900	294	$3,542,116.34
Woodward	Not Participating / No Special Flood Hazard Area			

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Repetitive Loss Properties

37 Total Repetitive Loss properties in Dallas County—2 or more payments of $5,000 or more in 10 yrs.

Claims History:

Jurisdiction	Building Payments	Contents Payments	Total Payments	Average Payment	# of Losses	# of Properties
Adel	$12,200.00	$1,802.47	$14,002.47	$7,001.23	2	1
Clive (includes Polk Co. portion)	$8,863.45	$989.25	$9,852.70	$4,926.35	2	1
Dallas County	$45,795.16	$17,327.79	$63,122.95	$31,561.48	2	1
Urbandale (includes Polk Co. portion)	$3,209.52	$2,416.00	$5,625.52	$2,812.76	2	1
West Des Moines (includes Polk Co. portion)	$1,006,805.25	$405,443.20	$1,412,248.45	$19,084.44	74	33
Totals	$1,076,873.38	$427,978.71	$1,504,852.09	$65,386.26	82	37

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Severe Winter Storm

- Includes Considerations for Extreme Cold
- Power Outages
- Road Conditions
- Tree Debris
- 1965-2011—Two Presidential Declarations
  - Jan. 2010
  - Oct./Nov. 1991
- NCDC 2006-2011
  - 6 winter storm; 5 ice storm events
  - Annualized Losses are $216,000
- Agricultural Damages
  - USDA Risk Management Agency Crop Insurance 2001-2011
  - Adjusted Annualized Losses $3,579.53

- Probability: 4
- Magnitude: 2
- Warning Time: 3
- Duration: 4

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Multi-Jurisdictional Hazard Mitigation Plan

Loss of Electricity Damage Estimates

Jurisdiction	Population (2010)	Estimated Affected Population (10%)	Electric Loss of Use Estimate ($126 per person per day)
Adel	3,682	368.2	$ 46,393.20
Bouton	129	12.9	$ 1,625.40
Clive*	4,721	472.1	$ 59,484.60
Dallas Center	1,679	167.9	$ 21,155.40
Dawson	131	13.1	$ 1,650.60
DeSoto	1,050	105	$ 13,230.00
Dexter	611	61.1	$ 7,698.60
Granger	1,032	103.2	$ 13,003.20
Grimes*	1	0.1	$ 12.60
Linden	199	19.9	$ 2,507.40
Minburn	365	36.5	$ 4,599.00
Perry	7,693	769.3	$ 96,931.80
Redfield	835	83.5	$ 10,521.00
Urbandale*	6,339	633.9	$ 79,871.40
Van Meter	1,017	101.7	$ 12,814.20
Waukee	13,659	1365.9	$ 172,103.40
West Des Moines	11,510	1151	$ 145,026.00
Woodward	1,018	101.8	$ 12,826.80
Unincorporated	10,464	1046.4	$ 131,846.40
Total	66,135	6613.5	$ 833,301.00

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Vulnerable Populations

Jurisdiction	Population Over 65
Adel	468
Bouton	14
Clive	Not Available for Dallas County Portion Only
Dallas Center	287
Dawson	19
DeSoto	101
Dexter	81
Granger	143
Grimes	Not Available for Dallas County Portion Only
Linden	29
Minburn	47
Perry	1,061
Redfield	145
Urbandale	Not Available for Dallas County Portion Only
Van Meter	88
Waukee	1,110
West Des Moines	Not Available for Dallas County Portion Only
Woodward	134
Dallas County	2,006

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Multi-Jurisdictional Hazard Mitigation Plan

Flash Flood

- Probability: 4
- Magnitude: 2
- Warning Time: 3
- Duration: 1

- NCDC Reported 51 Events—1993-2011
  - 5 county-wide
  - 11 in the unincorporated county
  - 3 in Adel
  - 15 in Dallas Center
  - 1 in DeSoto
  - 3 in Granger
  - 2 in Perry
  - 1 in Van Meter
  - 2 in Waukee
  - 2 in Woodward
- Flooded low-lying roads & bridges
- Water in basements
- Overloaded/Aged storm/sanitary sewer systems
- DeSoto Water Treatment Plant Vulnerable

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Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Flash Flood

- Probability: 4
- Magnitude: 2
- Warning Time: 3
- Duration: 1

- DeSoto WTP Loss of Use
  - $292,950 for 3 days
  - $93 per person per day
- NCDC Annualized Losses
  - Property—$176,842
  - Crops—$95,263

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Multi-Jurisdictional Hazard Mitigation Plan

Windstorm

- Probability: 4
- Magnitude: 2
- Warning Time: 2
- Duration: 1

- 1 Presidential Declaration in 1979
- 204 wind events 1962-2011
  - 180 were 50 knots and higher
  - No deaths, 4 injuries.
  - Annualized Damages $438,888
- Damage to mobile homes/metal bldgs.
- Power outages—same loss of use as winter storm
- Crop Damages
  - Adjusted Annualized Crop Damages $49,835
- Debris from fallen trees/limbs

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Mobile Homes in Planning Area

Jurisdiction	Number of Mobile Homes
Adel	89
Bouton	6
Clive*	n/a
Dallas Center	13
Dawson	14
DeSoto	101
Dexter	4
Granger	23
Grimes*	n/a
Linden	2
Minburn	5
Perry	154
Redfield	25
Urbandale*	n/a
Van Meter	6
Waukee	333
West Des Moines*	n/a
Woodward	59
Unincorporated	295

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Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Grass or Wildland Fire

- 26 accidental/nature-caused Fires 2005-2011
  - Dexter—1
  - Perry—2
  - Unincorporated—20
  - Unreported locations—3
- Average 3.7 fires/year burning 31 acres.
- Associated with Drought
- Urban/rural interface is growing as metro areas expand.
- 9,578 acres active in Conservation Reserve Program (CRP) in Dallas County
- 3,000 acres of parks, wildlife areas, and trails

- Probability: 3
- Magnitude: 2
- Warning Time: 4
- Duration: 1

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Grass or Wildland Fire— Acres Burned by Cause

YEAR	Lightning	Campfire	Smoking	Debris Burning	Arson	Equip Use	Railroads	Children	Misc	Controlled Burn	Injuries	Fatalities
2011	0	0	0	0	0	0	0	0	0	270.5	0	0
2010	0	0	0	53.25	0	0	0	0	20	103	0	0
2009	1	0	0	18	0	0	0	0	1	117	1	0
2008	0	0	0	3	0	0	0	0	0	38.8	0	0
2007	0	0	0	0	0	0	0	0	0	20.6	0	0
2006	0	0	5	0	30	0	0	80	0	0	0	0
2005	0	0.01	8	0	0	0	0	0	0	0	0	0
Total	1	0.01	73	75.05	30	15	0	80	21	549.9	1	0

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Hailstorm

- 166 events reported in 42 years
- 30 events with 1.75 inches or greater diameter
- Damages to cars, roofs, windows is common
- Annualized Property Damages $40, 647
- Adjusted Annualized Crop Damages $25,347

- Probability: 4
- Magnitude: 1
- Warning Time: 3
- Duration: 1

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Thunderstorm and Lightning

Building Exposure	Hail/Lighning/Wind Property Damages	Annualized Property Damages
$3,148,130,000	Hail - $691,000 Lightning - $1,085,000 Wind - $7,900,000 Total $9,676,000	$537,555

Crop Exposure (2007)	Insurance Paid (2001-2011)	Adjusted Crop Damages	Annualized Adjusted Crop Damages
$156,900,000	Hail-$237,001 Wind-$465,060 Total-$702,061	$827,012	$75,183

- Probability: 4
- Magnitude: 1
- Warning Time: 2
- Duration: 2

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Dam Failure

- 6 High Hazard Dams Impact:
  - W. Des Moines, Van Meter, De Soto, Clive
- 9 Significant Hazard Dams Impact:
  - Adel, W. Des Moines, De Soto, Van Meter
- Lake Panorama Dam in Guthrie County would impact Dallas County
- No Previous Occurrences
- All High Hazard Dams received Satisfactory Rating by IDNR in last 2 yrs.

- Probability: 1
- Magnitude: 3
- Warning Time: 4
- Duration: 4

Review Pg. 3.56

Dam Name	Class	River	Nearest Downstream City	Distance to Nearest City (miles)	Assets Downstream
Jordan Creek Mall-Northwest Dam	H	Tr- Jordan Creek	West Des Moines	0	Integral part of Jordan Creek Mall development; Dam serves as West Des Moines City street.
Jordan Creek Mall- South Dam	H	Tr- Jordan Creek	West Des Moines	0	Integral part of Jordan Creek Mall development; Dam serves as West Des Moines City street.
RALI II Dam	H	Tr- South Raccoon River	Van Meter	4	One (1) house in floodplain area located below structure.
JGC FARMS DAM	H	TR- BULGER CREEK	De Soto	6	Potential for loss of life at one (1) residence located approximately one-fourth mile below dam; damage could also occur to the Iowa Interstate Railroad located about one-half mile downstream of the dam.
Moffitt Reservoir Dam	H	TR- RACCOON RIVER	West Des Moines	1	Used for water supply; has aesthetic and recreational value; embankment top serves as a paved county road; presence of urban properties downstream; Interstate Highway downstream; loss of life would be expected from sudden failure.
SOUTHFORK DAM	H	TR- WALNUT CR.	Clive	1	Integral part of a residential subdivision; downstream development exists and there is potential for additional downstream development.
Greenbriar Dam	S	TR- RACCOON RIVER	West Des Moines	2	Paved road on embankment top serves as access to residences on west side of lake; embankment serves as utility corridor to houses.
BEAVER LAKE DAM	S	TR- BEAR CREEK	Van Meter	16	Land use downstream is agricultural with no development that would affect the hazard classification.

Dam Name	Hazard Class	Max. Storage (acre-ft)	Review Pg. 3.55 River	Nearest Downstream City	Distance to Nearest City (miles)	Potential Magnitude
Jordan Creek Mall - Northwest Dam	H	46.5	Tr- Jordan Creek	West Des Moines	0	Critical
Jordan Creek Mall - South Dam	H	37.5	Tr- Jordan Creek	West Des Moines	0	Critical
RA-LI Dam	H	120	Tr- South Raccoon River	Van Meter	4	Critical
JGC FARMS DAM	H	620	TR- BULGER CREEK	DE SOTO	6	Critical
Martin Reservoir Dam	H	6700	TR-RACCOON RIVER	WEST DES MOINES	1	Critical
SOUTHFORK DAM	H	204	TR- WALNUT CR.	CLIVE	1	Critical
CROSS COUNTRY ESTATES DAM	S	35	TR- NORTH RACCOON RIVER	ADEL	7	Negligible
Dawn Lake Dam	S	140	Tr- Raccoon River	Adel	6	Negligible
LAKE POINT DAM	S	58	TR-WALNUT CREEK	WEST DES MOINES	0	Limited
Oak Hill Plantation Dam	S	92	Tr- Bulger Creek	De Soto	0	Limited
WOODHILL LAKE DAM	S	155	TR- RACCOON RIVER	WEST DES MOINES	7	Negligible
Country Club Business Park Dam	S	109	TR- CLIVE LAKE	WEST DES MOINES	0	Limited
DOTY DAM	S	67	TR-SOUTH RACCOON	VAN METER	1	Negligible
Greenbriar Dam	S	440	TR-RACCOON RIVER	WEST DES MOINES	2	Limited
BEAVER LAKE DAM	S	696	TR-BEAR CREEK	VAN METER	16	Negligible

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Animal/Crop/Plant Disease

- Probability: 1
- Magnitude: 3
- Warning Time: 4
- Duration: 4

- Consider Changing Probability Rating?
- Worst-case scenario of 75% livestock lost would exceed $2.5 Million in damages.
- Worst-case scenario of 50% crops lost would exceed $78 Million
- Adjusted Annualized Insurable Crop Losses from Infestation—$7,288

HMPC Meeting 2
June 21, 2012

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Levee Failure

- Probability: 1
- Magnitude: 2
- Warning Time: 4
- Duration: 4

- Van Meter Levee
  - Need description of built environment behind levee
- Adel Water Treatment Facility—earthen berm/levee and spillway system
  - The loss of potable water in Adel (2010 population of 3,682) as a result of failure of the levee would result in $342,426 per day in loss of use damages.

HMPC Meeting 2
June 21, 2012

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Drought

- 2002-2011 28 Reported Drought Impacts (Drought Impact Reporter)
  - Agriculture – 12
  - Business & Industry – 2
  - Energy - 1
  - Fire – 2
  - Relief, Response & Restrictions – 3
  - Society & Public Health – 2
  - Water Supply & Quality – 6
- Adjusted Annualized Insurable Crop Loss—$489,269

- Probability: 2
- Magnitude: 2
- Warning Time: 1
- Duration: 4

HMPC Meeting 2
June 21, 2012

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Risk Assessment/Critical Facility Comments due 7/13

- Mail to:

  AMEC

  Attn: Laurie Bestgen

  1129 SW Wanamaker, Suite 101

  Topeka, KS 66604
- E-mail to:

  laurie.bestgen@amec.com

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Determine Collective Goals for the Dallas County Multi-jurisdictional Hazard Mitigation Plan

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Mitigation Strategy:
Goals and Actions

- **Goals:** Describe the overall direction of the plan
- **Actions:** Describe specific activities or projects designed to achieve goals

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Common Categories of Mitigation Goals

- Public Education
- Planning/Training/Communication
- Reduce Risk to Life and Property
- Protection of Critical Facilities

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Public Education Sample Goals

- Increase citizen awareness and preparedness by providing educational materials on natural hazards.
- Improve public understanding of natural hazards and risk by providing public awareness, preparedness, and mitigation information through various channels of communication

HMPC Meeting 2
June 21, 2012

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Planning/Training/Communication Sample Goals

- Create a disaster resistant community by involving individuals in the private and public sector to participate in hazard mitigation planning and training activities geared toward reducing the impact of disasters in Dallas County.
- Promote effective training and education opportunities in hazard mitigation and related programs for jurisdictions, businesses, and the public.
- Strengthen communication among agencies and between agencies and the public/

HMPC Meeting 2
June 21, 2012

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Reduce Risk to Life and Property Sample Goals

- Minimize the vulnerability of the people, property, environment, and economy of Dallas County to the impacts of natural hazards
- Improve capabilities to mitigate natural hazards by incorporating mitigation strategies in plans, policies, and programs
- Prevent or reduce the impact of natural hazards for the residents, businesses and municipalities of Dallas County.

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Protection Of Critical facilities Sample Goals

- Reduce utility outages during times of severe weather.
- Protect critical facilities and infrastructure from natural hazards

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Voting Exercise

- Everyone please take 4 Red Dots
- Please vote for sample goals that you prefer on each large piece of paper. You may vote for one goal more than once.
- It is not mandatory to have a goal in each category.
- Then as a group we will reach consensus on the goals and refine wording, if necessary.
- As you think ahead about your possible action ideas for this plan, do they fit under one of these goals?

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Multi-Jurisdictional Hazard Mitigation Plan

Mitigation Actions

- Final Meeting will focus on development of Mitigation Actions.
- As you review the risk assessment, consider what mitigation actions could reduce/eliminate damages.
- Discuss with other representatives from your jurisdiction.
- Mitigation Strategy should be comprehensive.....not just those that IA HS&EM / FEMA will fund.

HMPC Meeting 2
June 21, 2012

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Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Mitigation Actions

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

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Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

NFIP Mitigation Actions

- ***Requirement: §201.6(c)(3)(ii): [The mitigation strategy] must also address the jurisdiction's participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate.***

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Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

State Mitigation Project Types From State Hazard Mitigation Plan

- Flood-prone Property Acquisition & Structure Demolition /Relocation
- Flood-Prone Structure Elevation
- Dry Floodproofing of Historical Residential Structures
- Dry Floodproofing of Non-residential Structures
- Minor Localized Flood Reduction Projects (storm water management or localized flood control projects)
- Structural Retrofitting of Existing Buildings (adding a tornado safe room)
- Non-structural Retrofitting of Existing Buildings, and Facilities from wind damage.
- New Tornado Safe Room Construction
- Electrical Utilities Infrastructure Retrofit
- Soil Erosion Stabilization
- Wildfire Mitigation

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Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

Next Steps

- **Risk Assessment/Critical Facilities will be emailed**
- **July 13—Risk Assessment/Critical Facility Comments Due**
- **August 23—Final Meeting**
- **Promote Public Survey (and tell us about it ☺)**
- **Fall 2012**
  - **Final Public Comment Period**
  - **Submit Plan to IA HS&EM**
  - **Submittal to FEMA**

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B.10 Meeting #2 Sign-In Sheets

DALLAS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN – MEETING #2
SIGN-IN SHEET

Project:	Dallas County Hazard Mitigation Plan – Meeting #2	**Meeting Date/Time:**	June 21, 2012, 1:00 – 4:00 pm
Facilitators:	Susan Belt, Laurie Bestgen & Kari Valentine, AMEC	**Place/Room:**	Washington Township School Building. (Corner of Dallas Co. road P-58 and Dallas Co. road F-31

Name	Department/Agency	Email	Phone #	Signature
Jim McNeill	Adel	jmcneill@adeliowa.org	(515) 993-6723	
Kris Fitch	Minburn	minburnubclerk@netins.net	515 677-2245	
Camilla McCain	Bouton	none	676-2022	Camilla McCain
JOHN HOY	REDFIELD	JKHOY@AOL.COM	515-833-2662	
Scott Grimes	Dallas Center Grimes Schools	sgrimes@DC-Grimes.k12.ia.us		
Eric Vaughn	Perry PD	evaughnppd@gmail.com	515 465-4636	
Greg Dufoe	ADM Schools	gdufoe@adel.k12.ia.us	515-993-4283	
Allan Adams	Van Meter Mayor	allan.b.adams@wellsfargo.com	515-222-8988	Allan B. Adams
Darin Durflinger	Van Meter Superintendent	darin.durflinger@vanbuilders.com	515 996-2221	
Adam Coyle	Van Meter	ADAMCOYLE@IOWAREALTY.com	515-210-8282	
John Anderson	Van Meter	janderson@cityofvanmeter.com	515-996-2694	

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DALLAS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN – MEETING #2
SIGN-IN SHEET

Project:	Dallas County Hazard Mitigation Plan – Meeting #2	**Meeting Date/Time:**	June 21, 2012, 1:00 – 4:00 pm
Facilitators:	Susan Belt, Laurie Bestgen & Kari Valentine, AMEC	**Place/Room:**	Washington Township School Building. (Corner of Dallas Co. road P-58 and Dallas Co. road F-31

Name	Department/Agency	Email	Phone #	Signature
Bob Long	Van Meter, City	CHIEFCOOTER@MCHSI.com	996-2867	Bob Long
Bob Ockerman	City of Adel	r.Ockerman@mchsi.com	238 9835	Bob Ockerman
Peggy Reelitz	Polk Co. EMA	peggy.reelitz@polkcounty	886-2107 iowa.gov	Peggy Reelitz
Jack Butler	City of Perry	jack.butler@perryia.org	465-2481	Jack Butler
Marcia Thoma	City of Desoto	desotoch@mchsi.com	834-2233	Marcia Thoma
Clint Robinson	" " Waukee	Crobinson@Waukee.org	987-4712	[illegible]
Eric Rose	Waukee Schools	erose@waukee.k12.ia.us	313-1170	Eric M. Rose
Valerie Purvis	City of Woodward	citywd@netins.net	438-2560	Valerie Purvis
Kristy Trzeciak	City of Granger	citycleркgranger@mchsi.com	999-2210	Kristy Trzeciak
Mike Greif	City of Granger	grangercityhall@mchsi.com	999-2210	Mike Greif
Mary Murphy	City of Perry	mmurphy@perry.lib.ia.us	465-3568	Mary Murphy

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DALLAS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN – MEETING #2
SIGN-IN SHEET

Project:	Dallas County Hazard Mitigation Plan – Meeting #2	**Meeting Date/Time:**	June 21, 2012, 1:00 – 4:00 pm
Facilitators:	Susan Belt, Laurie Bestgen & Kari Valentine, AMEC	**Place/Room:**	Washington Township School Building. (Corner of Dallas Co. road P-58 and Dallas Co. road F-31

Name	Department/Agency	Email	Phone #	Signature
Mathew Noble	IA HSEMD	Mathew.Noble@Iowa.gov		NV
Jennifer Ellison	IA HSEMD	jennifer.ellison@iowa.gov		NV
LINDA ROOSE	IA HSEMD	linda.roose@Iowa.gov		NV
Betty Tinguald	Bouton City Clerk	betty@iowatelecom.net		
DAVID ARNOLD	West Central Valley	darnold@wcv.k12.ia.us		
Cindy Riesselman	Dallas Center	cityhall@dallascenter.com	992.3725	
JIM GEORGE	Dallas County	jim.george@co.dallas.ia.us	993-4289	

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DALLAS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN – MEETING #2
SIGN-IN SHEET

Project:	Dallas County Hazard Mitigation Plan – Meeting #2	**Meeting Date/Time:**	June 21, 2012, 1:00 – 4:00 pm
Facilitators:	Susan Belt, Laurie Bestgen & Kari Valentine, AMEC	**Place/Room:**	Washington Township School Building. (Corner of Dallas Co. road P-58 and Dallas Co. road F-31

Name	Department/Agency	Email	Phone #	Signature
Billy Samuell	Dawson city	bbadboy 71@Hotmail	480-1752	Billy Samuell
clarence Moreman	city of Dawson	—	—	—
KEVIN D. MCLAUGHLIN	PERRY COMM SCHOOL	Kevin.McLaughlin mclaughlinkevin@Perry.k12.ia.us	515-490-8466	Kevin D McLaughlin

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B.11 Meeting #3 Agenda

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan
Planning Meeting #3

August 23, 2012
1:00-4:00 pm
Waukee Public Safety Building

Agenda

- Introduction Barry Halling, Coordinator
  Dallas County Office of Emergency Management
- Review Purpose/Requirements
- Status of Draft Plan
- Review Plan Goals
- Develop Mitigation Actions
- Discuss Prioritization of Mitigation Actions
- Plan Maintenance Strategy
- Next Steps

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B.12 Meeting #3 Minutes (8/23/2012)

To	Barry Halling, Coordinator Dallas County Emergency Management
From	Laurie Bestgen, Mitigation Planner
Tel / E-mail	785-272-6830 / laurie.bestgen@amec.com
Date	8/27/2012
Subject	**Minutes from Dallas County Mitigation Planning Meeting #3—"Developing the Mitigation Strategy" held on 8/23/2012**

This document is a record of attendance and a summary of the issues discussed during the above meeting, including a review of the planning requirements, status of the draft plan, review of plan goals, development of mitigation actions, prioritization of mitigation actions, hazard mitigation assistance grants, plan maintenance strategy, and the next steps in the planning process.

Attendees

Name		Representing
Allan	Adams	City of Van Meter
Brad	Anderson	Woodward Granger Schools
Jake	Anderson	City of Van Meter
Ray	Anderson	Iowa Geological and Water Survey-DNR
David	Arnold	West Central Valley Schools
Kelly	Bell	Van Meter School
Laurie	Bestgen	AMEC
Johnny	Boyd	ORIS Plc
Jack	Butler	City of Perry
Adam	Coyle	City of Van Meter
Greg	Dufoe	Adel-DeSoto-Minburn Schools
Deron	Durflinger	Van Meter Schools
Tawnee	Eckhart	City of Dexter
Jennifer	Ellison	Iowa HSEMD
Keith	Elmquist	Waukee Community Schools
Kris	Fitch	City of Minburn
Barry	Halling	Dallas County Emergency Management
Karl	Harris	Iowa DNR-Fire
Gary	Herrick	City of Van Meter
Dave	Hutchins	City of Linden
Jeff	Johnson	National Weather Service
Gail	Kantak	IA DNR Forestry
Bob	Lacy	City of Van Meter
Deb	Light	City of Redfield
Camilla	McCain	City of Bouton
Kevin	McLaughlin	Perry Community Schools & Perry Fire
Jim	McNeill	City of Adel
Kathy	Moline	Dallas Center-Grimes Schools
Mathew	Noble	Iowa HSEMD
Clarence	Norman	City of Dawson
Bob	Ockerman	City of Adel
Valerie	Purvis	City of Woodward

Name		Representing
Peggy	Reelitz	Polk County
Cindy	Riesselman	City of Dallas Center
Clint	Robinson	City of Waukee
Lynn	Royer	Dallas County
Billy	Samuel	City of Dawson
Tom	Tierney	Dallas County
Betty	Tingwald	City of Bouton
Kristy	Trzeciak	City of Granger
Lynn	Ubben	Perry Community Schools

Introductions

Barry Halling, Dallas County Emergency Management Coordinator, began the meeting by welcoming and thanking the attendees. Mr. Halling then introduced Laurie Bestgen, with the consulting firm, AMEC Environment & Infrastructure, Inc. hired by the County to facilitate the development of the multi-jurisdictional plan. Mrs. Bestgen facilitated the remainder of the meeting starting with having the attendees introduce themselves and the jurisdiction that they represented.

Review Purpose/Requirements

Ms. Bestgen provided a brief review of the Disaster Mitigation Act of 2000 which requires local governments to adopt a natural hazard mitigation plan to maintain eligibility for FEMA mitigation funds. Although this is the statutory requirement to be able to apply for FEMA mitigation funds, mitigation planning is useful to communities to help prevent damages from hazards regardless of whether or not they ever apply for FEMA mitigation funds.

After this brief review the requirements for jurisdictions to officially participate in the multi-jurisdictional plan were discussed. They are:

- **Meeting Participation** —Designate a representative to serve on the Hazard Mitigation Planning Committee, which will meet three times during the planning process,
- **Data Collection Guides** —Provide data and comment on plan drafts as requested,
- **Mitigation Actions**— Assist in the development of a risk assessment and mitigation actions (at least one) specific to the jurisdiction,
- **Disseminate Information** —Inform the public, local officials, and other interested parties about the planning process and provide opportunity for them to comment on the plan, and
- **Formally adopt the mitigation plan.**

Status of Draft Plan

Ms. Bestgen reviewed the planning steps in the process and provided a status update. Ms. Bestgen reminded the planning committee that the draft risk assessment was provided at meeting #2 in June. AMEC has incorporated all comments received to date and encouraged members of the HMPC to review the Draft Risk Assessment if they have not done so already. The remaining sections of the plan will be in draft form by mid-September and will be circulated for committee review and comment at that time.

Review Plan Goals

Ms. Bestgen then reviewed the mitigation plan goals that were developed during the previous meeting. It was explained that the main focus of the current meeting was to continue development of the mitigation strategy by discussing mitigation actions to be incorporated in the plan.

Develop Mitigation Actions

Mitigation Actions were defined. Then the list of state priorities for use of Hazard Mitigation Assistance Grants was provided. For comparison, the results of the public survey were provided indicating that over 74 percent of respondents considered minor localized flood reduction projects to be a priority consideration. 61.8 percent of respondents indicated new tornado saferoom construction as a priority. All response summaries are available in the attached PowerPoint Presentation. Next, six general categories of mitigation actions were discussed. These action categories correspond to the six categories of mitigation activities provided in FEMA's publication *Developing the Mitigation Plan*. They are:

1. Prevention
2. Property protection
3. Public education and awareness
4. Natural resource protection
5. Structural projects
6. Emergency services protection

Meeting participants were reminded that each jurisdiction must submit at least one action for publication in the plan. Communities participating in the National Flood Insurance Program must also have an action addressing continued compliance.

After a short break, Ms. Gail Kantak, with Iowa Department of Natural Resources, Forestry Division also provided a brief summary of the types of projects/programs that they can assist with in mitigation of Grass or Wildland Fires.

Ms. Bestgen then directed participants to a handout of sample actions in their meeting packets and asked them to use these samples, the discussion of the state priorities, as well as the ideas generated from reviewing the six general categories of actions to brainstorm actions that their jurisdiction might consider submitting to the plan. Meeting participants wrote their ideas on provided Sticky-notes and when all were finished each jurisdiction reported out the ideas that they had for mitigation actions. After each jurisdiction reported, they put their mitigation action ideas on large sheets of paper containing each of the 5 goal statements that were developed for the plan in meeting #2.

Documentation Requirements for Each Action: Determining Cost-effectiveness and Local Prioritization of Actions

Mrs. Bestgen then provided information on the documentation that would be required for each action that jurisdictions wish to submit to the plan. For each action to be included in the plan, the responsible jurisdiction must provide 1) a completed Mitigation Action Implementation Worksheet and 2) a completed STAPLEE Worksheet. The action implementation worksheet provides general information for each action such as who, when, how, etc. the action will be implemented. The STAPLEE worksheet provides a framework to determine the general effectiveness in accomplishing the goals of life safety and/or reduction or prevention of damage from a hazard event. This method analyzes the Social, Technical, Administrative, Political, Legal, Economic and Environmental aspects of a project and is commonly used by public administration officials and planners for making planning decisions.

Participants had handouts of these two forms and Mrs. Bestgen instructed participants to complete the forms for one of their action ideas and then discussed any questions that the group had about the forms. One of the questions was whether or not the cost estimate was required. Ms. Bestgen answered that if a cost estimate is possible, it should be provided. However, if the action is for a project that has an undefined scope, the estimate may not be available. In this case, jurisdictions can indicate "not available".

All action forms are due to AMEC by September 7th. HMPC members are expected to work with others in their jurisdiction to determine the final actions to submit for the plan.

Hazard Mitigation Assistance Grants

Ms. Linda Roose, with the Iowa Homeland Security and Emergency Management Division provided information on the Hazard Mitigation Assistance Grants available, including the types of projects that the State considers as priorities for use of mitigation funds. She reported that they are not receiving new applications at this time as the funds available from open disasters are already spoken for. However, if the State receives a new Presidential declaration for an event, it will generate additional funds for the Hazard Mitigation Grant Program and they will be soliciting applications. She reminded meeting participants that having an approved, adopted Local Hazard Mitigation Plan is a required for jurisdictions to be eligible to apply.

Plan Maintenance Strategy

Mrs. Bestgen discussed the requirements for the plan to provide a formal plan maintenance process to ensure that the mitigation plan remains an active and relevant document. After discussion, the following plan maintenance process was agreed to by group consensus:

- The HMPC will meet annually and after disaster events to review/update plan;
- The Dallas County Emergency Management Coordinator will organize the meetings,
- Current HMPC members will be invited to participate in the review as well as mayors, city clerks, and school superintendents;
- The Dallas County Emergency Management Coordinator will coordinate the updated/re-submitted to FEMA every 5 years;

- Individual Representatives on the HMPC will ensure their jurisdictions review the Mitigation Plan during the process to update other jurisdictional plans such as Comprehensive Plans, Capital Improvement Plans, and School Emergency Plans;
- After the annual or post-disaster reviews, the Emergency Management Coordinator will forward the Mitigation Strategy with status updates to mayors, city clerks, and school superintendents for consideration in other planning mechanisms; and
- The public will be involved in the plan maintenance process by publication of a Press Release indicating the team has met with a website where the mitigation actions and status updates can be viewed. The press release and status updates will be published in both English and Spanish.

Next Steps

- **Sept. 7, 2012—Final Mitigation Action Worksheets/STAPLEES Due**
- **Mid Sept.—Complete Draft Plan available to HMPC**
- **End of September (at least 2 wk review period)—HMPC Comments Due on Draft Plan**
- **Oct 15-26 (target date)—Final Public Comment Period**
    - Planning committee members responsible to notify governing boards of plan availability;
    - E-mail to Stakeholders regarding plan availability;
    - Provide e-mail addresses to Laurie Bestgen of additional stakeholders that you want to receive notice of draft plan;
    - Plan will be on county website and in hard copy at select locations;
    - Dallas County will coordinate a Press Release; and
    - Please place links and/or county web address in newsletters/flyers, etc. to help get the word out.
- **Oct. 26—All Comments Due**
- **November—Submit Plan to IA HSEMD**
    - Submit Plan to IA HSEMD in November for Review and Submittal to FEMA (45-day review period);
    - Submit Plan to FEMA in December (45-day review period);
    - **After** Preliminary Approval Is Received;
    - Governing Boards Adopt the plan for ALL participating jurisdictions;
    - Adoption Documents submitted to FEMA; and
    - Final Plan Approval—target Jan/Feb 2013.

Soft Match Forms

All HMPC members were encouraged to complete the soft match forms. Copies of the form were provided in the meeting packets with task descriptions filled in for Risk Assessment Review and Developing Actions/Completing Worksheets. All HMPC members should have or be spending time on these tasks. In addition, if HMPC members spent time completing Data Collection Guides or Validating Critical Facilities and have not turned in their forms they need to do so ASAP.

Dallas County
Multi-Jurisdictional Local Hazard Mitigation Plan

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Meeting 3: Mitigation Strategy & Plan Maintenance
August 23, 2012

Dallas County Multi-Jurisdictional Local Hazard Mitigation Plan

Meeting Purpose

- Review Purpose/Requirements
- Status of Draft Plan
- Review Plan Goals
- Develop Mitigation Actions
- Discuss Prioritization of Mitigation Actions
- Hazard Mitigation Assistance Grants
- Plan Maintenance Strategy
- Next Steps

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Dallas County Multi-Jurisdictional Local Hazard Mitigation Plan

Disaster Mitigation Act of 2000

- Requires local governments to adopt a natural hazard mitigation plan to maintain eligibility for FEMA mitigation funds

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Dallas County Multi-Jurisdictional Local Hazard Mitigation Plan

Participating Jurisdictions—Review Requirements

- Meeting Participation —Designate a representative to serve on the Hazard Mitigation Planning Committee, which will meet three times during the planning process,
- Data Collection Guides —Provide data and comment on plan drafts as requested,
- Mitigation Actions— Assist in the development of a risk assessment and mitigation actions (at least one) specific to the jurisdiction,
- Disseminate Information —Inform the public, local officials, and other interested parties about the planning process and provide opportunity for them to comment on the plan, and
- Formally adopt the mitigation plan

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Dallas County Multi-Jurisdictional Local Hazard Mitigation Plan

Mitigation Planning Steps

Phase I
- 1. Organize Resources
- 2. *Plan for Public Involvement*
- 3. Coordinate with Other Departments and Agencies

Phase 2
- 4. Identify the Hazards
- 5. Estimate Losses

Phase 3
- 6. Identify Goals
- 7. Develop Potential Mitigation Actions
- 8. Draft the Mitigation Plan

Phase 4
- 9. Adopt the Plan
- 10. Implement and Maintain the Plan

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Dallas County Multi-Jurisdictional Local Hazard Mitigation Plan

Status of Draft Plan

- Draft Risk Assessment (Chapter 3)
  - Provided to HMPC at Meeting #2
  - Also still available on FTP site (address/instructions will be sent out again to all on sign-in sheet)
  - It is not too late to submit comments

Provide Comments to:
Laurie Bestgen
AMEC

E-mail to:
Laurie.bestgen@amec.com

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Dallas County Multi-Jurisdictional Local Hazard Mitigation Plan

Status of Draft Plan

Partially Drafted
- Executive Summary
- Chapter 1, Introduction and Planning Process

Fully Drafted
- Chapter 2, Community Profiles and Capabilities
- Chapter 3, Risk Assessment

Not Drafted
- Chapter 4, Mitigation Strategy
- Chapter 5, Plan Maintenance

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Dallas County Multi-Jurisdictional Local Hazard Mitigation Plan

Development of Dallas County Mitigation Strategy

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Dallas County Multi-Jurisdictional Local Hazard Mitigation Plan

Mitigation Strategy

- **Goals** are general guidelines that explain what you want to achieve. They are usually long-term, broad, policy-type statements.
- **Mitigation Actions** are specific actions that help achieve goals and objectives.

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Dallas County Multi-Jurisdictional Local Hazard Mitigation Plan

Plan Goals—Developed at Meeting #2

1. Protect critical facilities and infrastructure from natural hazards;
2. Create a disaster resistant community by improving public understanding of natural hazards and risk by providing public awareness, preparedness, and mitigation information through various channels of communication;
3. Improve capabilities to mitigate natural hazards by incorporating mitigation strategies in plans, policies, and programs;
4. Prevent or reduce the impact of natural hazards for the residents, businesses, and municipalities of Dallas County;
5. Strengthen communication among agencies and between agencies and the public.

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Dallas County Multi-Jurisdictional Local Hazard Mitigation Plan

Mitigation Actions

- Losses from hazards can be reduced if communities take action before the next disaster
- Actions have long term and cumulative benefits
- Some may be low-cost initiatives readily adopted
- Others may be dependent on available funding or best implemented following a disaster
- **Not all actions identified through this planning process will be eligible for FEMA grants**

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Dallas County Multi-Jurisdictional Local Hazard Mitigation Plan

State Project Priorities

- Flood-prone Property Acquisition & Structure Demolition /Relocation
- Flood-Prone Structure Elevation
- Dry Floodproofing of Historical Residential Structures
- Dry Floodproofing of Non-residential Structures
- Minor Localized Flood Reduction Projects (storm water management or localized flood control projects)
- Structural Retrofitting of Existing Buildings (adding a tornado safe room)
- Non-structural Retrofitting of Existing Buildings, and Facilities from wind damage.
- New Tornado Safe Room Construction
- Electrical Utilities Infrastructure Retrofit
- Soil Erosion Stabilization
- Wildfire Mitigation

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Dallas County Multi-Jurisdictional
Local Hazard Mitigation Plan

Dallas County Public Opinion of Mitigation Priorities: Survey Monkey Results

Project Type	Percent
Minor Localized Flood Reduction Projects (stormwater management or localized flood control projects)	74.5%
New Tornado Safe Room Construction	61.8%
Structural Retrofitting of Existing Buildings (adding a tornado saferoom)	58.4%
Flood-prone Property Acquisition & Structure Demolition/Relocation	41.8%
Electrical Utilities Infrastructure Retrofit	36.4%
Soil Erosion Stabilization	36.4%
Flood-prone Structure Elevation	27.3%
Dry Floodproofing of Historical Residential Structures	25.5%
Non-structural Retrofitting of Existing Buildings and Facilities from Wind Damage	20.0%
Wildfire Mitigation	20.0%
Dry Floodproofing of Non-residential Structures	18.2%

Dallas County Multi-Jurisdictional
Local Hazard Mitigation Plan

General Categories of Mitigation Actions

1. Prevention
2. Property protection
3. Public education and awareness
4. Natural resource protection
5. Structural projects
6. Emergency services protection

Dallas County Multi-Jurisdictional
Local Hazard Mitigation Plan

Prevention

- Building codes
- Open space preservation
- Planning and zoning
- Stormwater management
- Capital improvement programs

Dallas County Multi-Jurisdictional
Local Hazard Mitigation Plan

Property Protection

- Acquisition
- Relocation
- Elevation
- Floodproofing
- Structural retrofits
- Firewise construction

Dallas County Multi-Jurisdictional
Local Hazard Mitigation Plan

Public Information

- Outreach projects
- Real estate disclosure
- Hazard maps
- Education programs (children and adults)

Dallas County Multi-Jurisdictional
Local Hazard Mitigation Plan

Natural Resource Protection

- Erosion and sediment control
- Stream corridor restoration
- Wetlands restoration/ preservation
- Public open space expansion
- Forest and vegetation management

Dallas County Multi-Jurisdictional Local Hazard Mitigation Plan

Structural

- Detention/retention structures
- Sediment basins/low-head weirs
- Culvert resizing/replacement
- Flood walls
- Safe rooms

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Dallas County Multi-Jurisdictional Local Hazard Mitigation Plan

Emergency Services

- Warning systems
- Protection of critical facilities
- Protection of lifeline utilities
- Emergency response services

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Dallas County Multi-Jurisdictional Local Hazard Mitigation Plan

Mitigation Actions for the Plan

- Each jurisdiction must submit **at least one** action
  - Can be currently on-going
  - Can be for the future
  - Can be for any funding source
- Communities Participating in the National Flood Insurance Program (NFIP) **must have** an action addressing continued compliance.

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Dallas County Multi-Jurisdictional Local Hazard Mitigation Plan

15 minute BREAK

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Dallas County Multi-Jurisdictional Local Hazard Mitigation Plan

Mitigation Actions

- Hand-out of Sample Actions
- Brainstorming Session—discuss potential actions to be submitted in the plan
  - Record Potential Actions on Post-It
  - Report out to group and place under appropriate goal statements
- **Reminder: not all actions identified through this planning process will be eligible for FEMA grants. This local hazard mitigation plan should be a comprehensive planning document that identifies all relevant mitigation activities, not just the ones FEMA might fund.**

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Dallas County Multi-Jurisdictional Local Hazard Mitigation Plan

Mitigation Action Implementation Worksheet

- Provides details on each action

Dallas County Multi-Jurisdictional Local Hazard Mitigation Plan

Prioritizing Mitigation Actions

- STAPLEE Worksheet:
  - Social
  - Technical
  - Administrative
  - Political
  - Legal
  - Economical
  - Environmental

Dallas County Multi-Jurisdictional Local Hazard Mitigation Plan

Form Completion Instructions

- Fill out Action Worksheets for **one** potential action
- Any questions on forms?

Dallas County Multi-Jurisdictional Local Hazard Mitigation Plan

Action Worksheets Due Sept. 7th

- Work with others in your jurisdiction to determine final actions to submit for the plan
- For each action you submit for the plan
  - Completed Action Worksheet
  - Completed STAPLEE Worksheet

Provide Worksheets to:

Mail to:
AMEC
Attn: Laurie Bestgen

E-mail to:

Laurie.bestgen@amec.com
Fax to: 785-272-6878
Phone: 816-637-6378

Dallas County Multi-Jurisdictional Local Hazard Mitigation Plan

Hazard Mitigation Assistance Grants:

Iowa Homeland Security and Emergency Management Division

- Grant Programs
- Application Process
- Available Funds

Contact Person
Dan Schmitz
Deputy State Hazard Mitigation Officer
515-725-9369

HMPC Meeting 3
August 23, 2012

Dallas County Multi-Jurisdictional Local Hazard Mitigation Plan

Development of Maintenance Strategy

Dallas County Multi-Jurisdictional Local Hazard Mitigation Plan

Plan Implementation and Maintenance

- FEMA Regulations require complete plan update every 5 years.
- FEMA requires a formal plan maintenance process to ensure that the mitigation plan remains an active and relevant document
- Who, how, and when will plan be monitored, evaluated, and updated?
- How will mitigation strategy be incorporated into other planning mechanisms?
- How will public be involved in plan maintenance process?

Dallas County Multi-Jurisdictional Local Hazard Mitigation Plan

Plan Implementation and Maintenance

- Who, how, and when will plan be monitored, evaluated, and updated?
  - Annual Review?
  - After hazard events?
  - Who will organize?
  - Who will participate?
  - Update Status of Mitigation Actions

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Dallas County Multi-Jurisdictional Local Hazard Mitigation Plan

Plan Implementation and Maintenance

- How will mitigation strategy be incorporated into other planning mechanisms?
  - Review Mitigation Plan during planning process to update other plans?
    - Comprehensive Plans
    - Capital Improvement Plans
    - School Emergency Plans
  - After review of Mitigation Plan, forward strategy with updates for consideration in other planning mechanisms?

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Dallas County Multi-Jurisdictional Local Hazard Mitigation Plan

Plan Implementation and Maintenance

- How will public be involved in plan maintenance process?
  - Press Release on annual reviews?
  - Provide action status to public annually?
  - Other ideas?

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Dallas County Multi-Jurisdictional Local Hazard Mitigation Plan

Homework & Next Steps

- **Sept. 7—Final Mitigation Action Worksheets/STAPLEES Due**
- **Mid Sept.—Complete Draft Plan to HMPC**
- **Sept 28—HMPC Comments Due on Draft Plan**
- **Oct 8-19—Final Public Comment Period**
- **Oct. 19—All Comments Due**
- **November—Submit Plan to IA HSEMD**

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Dallas County Multi-Jurisdictional Local Hazard Mitigation Plan

Final Public Comment-Details

- Final Public Comment Period—Target Date October 8-19
  - Planning committee members responsible to notify governing boards of plan availability
  - E-mail to Stakeholders regarding plan availability
    - Provide e-mail addresses to Laurie Bestgen of additional stakeholders that you want to receive notice of draft plan.
  - Plan will be on county website and in hard copy at select locations.
  - Dallas County will coordinate a Press Release
  - Please place links and/or county web address in newsletters/flyers, etc. to help get the word out.

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Dallas County Multi-Jurisdictional Local Hazard Mitigation Plan

Plan Submission Details

- Submit Plan to IA HSEMD in November for Review and Submittal to FEMA (45-day review period)
- Submit Plan to FEMA in December (45-day review period)
- **After** Preliminary Approval Is Received.....
  - Governing Boards Adopt the plan for ALL participating jurisdictions
  - Adoption Documents submitted to FEMA
- Final Plan Approval—target Jan/Feb 2013

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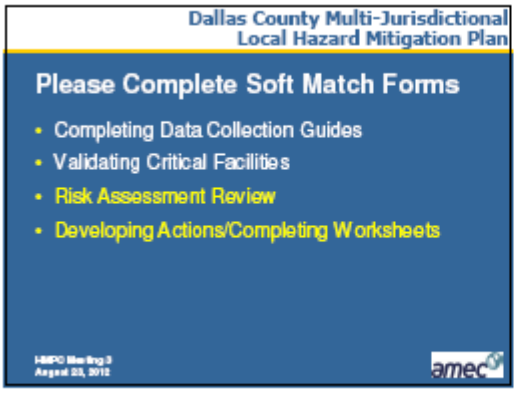
Dallas County Multi-Jurisdictional
Local Hazard Mitigation Plan
Please Complete Soft Match Forms
• Completing Data Collection Guides
• Validating Critical Facilities
• Risk Assessment Review
• Developing Actions/Completing Worksheets
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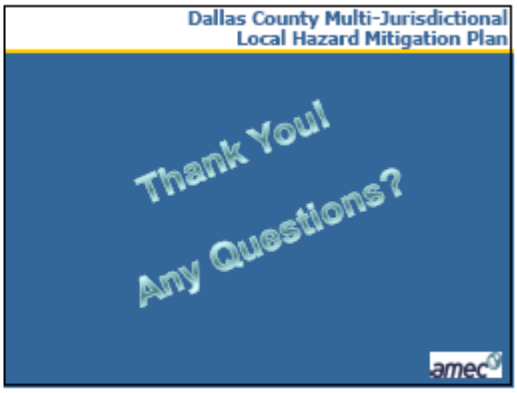
Dallas County Multi-Jurisdictional
Local Hazard Mitigation Plan
Thank You!
Any Questions?
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B.13 Meeting #3 Sign-In Sheets

DALLAS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN – MEETING #3
SIGN-IN SHEET

Project:	Dallas County Hazard Mitigation Plan – Meeting #3	**Meeting Date/Time:**	August 23, 2012, 1:00 – 4:00 pm
Facilitator:	Laurie Bestgen, AMEC	**Place/Room:**	Waukee Public Safety Building 1300 LA Grant Parkway

Name	Department/Agency	Email	Phone #	Signature
Jack Butler	City of Perry	jack.butler@perryia.org	515-465-2481 office 515-360-7271 cell	
Cindy Riesselman	Dallas Center	cityhall@dallascenter.com	515-992-3725	
Dave Hutchins	city of Linden	dj Falcon@windstream.net	641 757-0589	
Kelly A. Bell	VAN METER SCHOOL DIST.	Kelly.bell@vmbulldogs.com	515-669-8523	
Adam Coyle	City Of Van Meter	AdamCoyle@IowaRealty.com	515-210-8282	
Ray Anderson	Iowa Geological and water Survey - DNR	raymond.anderson@dnr.iowa.gov	319-335-1575	
Kari Harris	Iowa DNR Fire	Karl.Harris@dnr.iowa.gov	515-890-9381	
Valerie Purvis	City of Woodward	city wd@netins.net	515-438-2560	
Jennifer Ellison	HSEMD	jennifer.ellison@iowa.gov	515-725-9401	
Matt Noble	HSEMD	Matthew.Noble@iowa.gov	515 725 3245	
Greg DuFoe	ADM Schools	gdufoe@adm.k12.ia.us	515-993-4283	
DAVE Arnold	WCV Schools	darnold@wcv.k12.ia.us	515-989-4480	
Clint Robinson	City of Waukee	CRobinson@waukee.city	515-987-4712	
Jeffrey LeBoyd	VAN METER SCHOOL	jboyle@mpk.com	515-288-5734	

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DALLAS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN – MEETING #3
SIGN-IN SHEET

Project:	Dallas County Hazard Mitigation Plan – Meeting #3	**Meeting Date/Time:**	August 23, 2012, 1:00 – 4:00 pm
Facilitator:	Laurie Bestgen, AMEC	**Place/Room:**	Waukee Public Safety Building 1300 LA Grant Parkway

Name	Department/Agency	Email	Phone #	Signature
Brad Anderson	Woodward Granger CSD	banderson@wg.k12.ia.us	(515) 438-4263	
Betty Tingwald	City of Bouton	betty@iowatelecom.net	515.676-2985	Betty J Tingwald
Camilla McCain	City of Bouton		515-676-2022	Camilla McCain
Bob Ockerman	City of Adel	r.ockerman@mchsi.com	515 238 5835	
Jim McNeill	City of Adel	jmcneill@adeliowa.org	515-993-6723	
Deb Light	City of Redfield	Redfield@mchsi.com	833-2512	Deb Light
Barry Hallong	Dallas Co. EMA	dcema@dwx.com	993-2134	
Jeff Johnson	NATIONAL Weather Service	jeff.johnson@noaa.gov	515 270 9501	
Kris Fitch	City of Minburn	minburnuboclerk@minburn.org	515-677-2245	Kris Fitch
Deron Durflinger	Van Meter Schools	deron.durflinger@vmbulldogs.com	515 996 2221	
GAIL KANTAK	IA DNR FORESTRY	Gail.Kantak@dnr.iowa.gov	515-233-8067	
Billy Samuel	City of Dawson	bbadboy71@Hotmail	515.480.1752	Billy Samuel
Clarence Morman	City of Dawson		515-537-6786	Clarence Morman

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DALLAS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN – MEETING #3
SIGN-IN SHEET

Project:	Dallas County Hazard Mitigation Plan – Meeting #3	**Meeting Date/Time:**	August 23, 2012, 1:00 – 4:00 pm
Facilitator:	Laurie Bestgen, AMEC	**Place/Room:**	Waukee Public Safety Building 1300 LA Grant Parkway

Name	Department/Agency	Email	Phone #	Signature
KEVIN D. McLAUGHLIN	PERRY COMM SCHOOLS	KEVIN.McLAUGHLIN@PERRY.K12.IA.US	515-490-8466	Kevin D McLaughlin
McLynn Ubben	Perry Comm. Schools	lynn.ubben@perry.k12.ia.us		M. Lynn Ubben
Jake Anderson	Van Meter	janderson@cityofvanmeter.com	515-996-2644	
Bob Lacy	Van Meter	CHIEFCOOTER@MCHSI.COM	515-996-2867	Bob Lacy
Keith Elmquist	Waukee Comm. Schools	Kelmquist@waukee.k12.ia.us	515-987-5161	Keith Elmquist
Kristy Trzeciak	Granger	cityclerkgranger@mchsi.com	515-999-2210	Kristy Trzeciak
Kathy Moline	DCG School Dist	kmoline@dc-grimes.k12.ia.us	515-992-3846	Kathy Moline
Tawnee Eckhart	City of Dexter	jewelrylady01@gmail.com	515 669 4932	
Lynn Royer	Dallas Co. Public Health	lynn.royer@co.dallas.ia.us	515 993 3750	
Peggy Rulloff	Polk Co EMA	Peggy.Teslitz@polkcountyiowa.gov	515-286-2178	Peggy Rulloff
Allan Adams	Van Meter	Allan.B.Adams@wellsfargo.com	515-996-2702	Allan B. Adams
Gary Herrick	VAN METER FD	herrick_gary@juno.com	515 996 2861	Gary Herrick
Tom Tierney	Dallas Co. Roads	Tom.Tierney@co.dallas.ia.us		Tom T
Laurie Bestgen	AMEC	laurie.bestgen@amec.com	515 371 9851 816.637.6378	amec

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B.14 Press Release for Comment during Drafting Stage

Dallas County, Iowa
PRESS RELEASE

For Immediate Release

Contact: Barry Halling
515-993-2134

Dallas County Planning Committee Seeks Public Input

Dallas County, IA — The Dallas County Hazard Mitigation Planning Committee is seeking public input for the Dallas County Multi-jurisdictional Hazard Mitigation Plan currently under development. A summary of the planning effort underway, as well as a questionnaire to capture public opinion and comments, is available online until September 7, 2012 and in hard-copy at public libraries in Dallas County from July 30 to August 17, 2012. The purpose is to provide information to the public on the Multi-jurisdictional Hazard Mitigation Plan under development as well as gain public input.

A planning committee comprised of Dallas County, the incorporated cities and public school districts is currently developing a comprehensive Multi-jurisdictional Hazard Mitigation Plan with a strategy to reduce the vulnerability of people and property in the County to the impacts of natural hazards and to become eligible for mitigation funding programs from the Federal Emergency Management Agency (FEMA). The plan will address a comprehensive list of hazards—ranging from tornadoes to flooding, and severe winter weather—and will assess the likely impacts of these hazards to communities in Dallas County.

Plan Information and a public questionnaire will be available as follows:

Online until September 7, 2012: at **http://www.surveymonkey.com/s/TMHN8K6**

In hard-copy from July 30-August 12, 2012at the following Public Libraries during normal operating hours:

Adel Public Library 303 South 10th Street Adel, Iowa	Granger Public Library 2216 Broadway Street Granger, Iowa	Redfield Public Library 1112 Thomas St. Redfield, Iowa
Roy R. Estle Memorial Library 1308 Walnut Street Dallas Center, Iowa	Linden Public Library Main Street Linden, Iowa	Van Meter Public Library 505 Grant St. Van Meter, Iowa
DeSoto Public Library 405 walnut Street DeSoto, Iowa	Minburn Public Library 315 Baker Street Minburn, Iowa	Waukee Public Library 950 Warrior Lane Waukee, Iowa
Dexter Public Library 724 Marshall Dexter, Iowa	Perry Public Library 1101 Willis Ave. Perry, Iowa	Woodward Public Library 118 South Main Street Woodward, Iowa

Dallas County Emergency Management has taken the lead to coordinate development of this plan under the direction of Emergency Manager, Barry Halling. Mr. Halling has drawn on the expertise of consultants with AMEC Environment & Infrastructure, Inc., a firm that specializes in hazard mitigation and emergency management.

Feedback from the public will be incorporated into the draft plan, which will be available for public review and comment later this fall. Upon approval by the Iowa Homeland Security and Emergency Management Division and FEMA, the plan will be presented to the Dallas County Board of Supervisors, City Councils, and School Boards of each participating jurisdiction for formal adoption. For more information on this project, contact Barry Halling. Dallas County Emergency Manager at 515-993-2134 or via e-mail at barry.halling@co.dallas.ia.us.

B.15 Newspaper Articles of Press Release during Drafting Stage (Dallas County News & Perry Chief)

Proof Of Publication In
DALLAS COUNTY NEWS

STATE OF IOWA, DALLAS COUNTY,ss.

I, Geoff Schumacher, on oath depose and say that I am Publisher of The Dallas County News, a weekly newspaper, published at Adel, Dallas County, Iowa; that the annexed printed:

DALLAS COUNTY EMERGENCY MANAGEMENT
DALLAS COUNTY PLANNING COMMITTEE
SEEKS PUBLIC INPUT

was published in said newspaper one time on July 26, 2012; the last of said publication was on the 26th day of July, 2012.

Notarial Seal Iowa
Betty Liebsack
Commission Number: 754986
My Commission Expires: 10/05/13
Betty Liebsack

Geoff M Sc

sworn to before me and subscribed in my presence by Geoff Schumacher this the 26th day of July, 2012.

FEE: $44.80
AD: DC7879
ACCT: DCEM30

Legal Notice

DCN-NER #7879
Dallas County Planning Committee Seeks Public Input

Dallas County, IA — The Dallas County Hazard Mitigation Planning Committee is seeking public input for the Dallas County Multi-jurisdictional Hazard Mitigation Plan currently under development. A summary of the planning effort underway, as well as a questionnaire to capture public opinion and comments, is available online until September 7, 2012 and in hard-copy at public libraries in Dallas County from July 30 to August 17, 2012. The purpose is to provide information to the public on the Multi-jurisdictional Hazard Mitigation Plan under development as well as gain public input.

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Plan information and a public questionnaire will be available as follows:

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In hard-copy from July 30-August 12, 2012 at the following Public Libraries during normal operating hours:

Adel Public Library
303 South 10th Street, Adel, Iowa
Roy R. Estle Memorial Library
1308 Walnut Street
Dallas Center, Iowa
DeSoto Public Library
405 Walnut Street, DeSoto, Iowa
Dexter Public Library
724 Marshall, Dexter, Iowa
Granger Public Library
2216 Broadway Street
Granger, Iowa
Linden Public Library
Main Street, Linden, Iowa
Redfield Public Library
1112 Thomas St., Redfield, Iowa
Minburn Public Library
315 Baker Street, Minburn, Iowa
Perry Public Library
1101 Willis Ave., Perry, Iowa
Van Meter Public Library
505 Grant St., Van Meter, Iowa
Waukee Public Library
950 Warrior Lane, Waukee, Iowa
Woodward Public Library
118 South Main Street
Woodward, Iowa

Dallas County Emergency Management has taken the lead to coordinate development of this plan under the direction of Emergency Manager, Barry Halling. Mr. Halling has drawn on the expertise of consultants with AMEC Environment & Infrastructure, Inc., a firm that specializes in hazard mitigation and emergency management.

Feedback from the public will be incorporated into the draft plan, which will be available for public review and comment later this fall. Upon approval by the Iowa Homeland Security and Emergency Management Division and FEMA, the plan will be presented to the Dallas County Board of Supervisors, City Councils, and School Boards of each participating jurisdiction for formal adoption. For more information on this project, contact Barry Halling, Dallas County Emergency Manager at 515-993-2134 or via e-mail at barry.halling@co.dallas.ia.us.

Published July 26, 2012. (1T)

The Perry Chief
Friday, July 27, 2012 — 3
www.theperrychief.com

County seeks input on disaster plan

PERRY CHIEF
Staff Report

The Dallas County Hazard Mitigation Planning Committee is seeking public input for the Dallas County multi-jurisdictional Hazard Mitigation Plan currently under development.

A summary of the planning effort underway, as well as a questionnaire to capture public opinion and comments, is available online until Sept. 7 and in hard-copy at public libraries in Dallas County from July 30 to Aug. 17.

The purpose is to provide information to the public on the Multi-jurisdictional Hazard Mitigation Plan under development as well as gain public input.

A planning committee comprised of Dallas County, the incorporated cities and public school districts is currently developing a comprehensive multi-jurisdictional Hazard Mitigation Plan with a strategy to reduce the vulnerability of people and property in the County to the impacts of natural hazards and to become eligible for mitigation funding programs from the Federal Emergency Management Agency (FEMA). The plan will address a comprehensive list of hazards—ranging from tornadoes to flooding, and severe winter weather—and will assess the likely impacts of these hazards to communities in Dallas County.

Plan information and a public questionnaire will be available as follows: online until Sept. 7 at www.surveymonkey.com/s/TMHN8K6; and in hard-copy from July 30-Aug. 12 at the following public libraries during normal operating hours:

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303 South 10th Street
Adel, Iowa

Granger Public Library
2216 Broadway Street
Granger, Iowa

Redfield Public Library
1112 Thomas St.
Redfield, Iowa

Roy R. Estle Memorial Library
1308 Walnut Street
Dallas Center, Iowa

Linden Public Library
Main Street
Linden, Iowa

Van Meter Public Library
505 Grant St.
Van Meter, Iowa

DeSoto Public Library
405 Walnut Street
DeSoto, Iowa

Minburn Public Library
315 Baker Street
Minburn, Iowa

Waukee Public Library
950 Warrior Lane
Waukee, Iowa

Dexter Public Library
724 Marshall
Dexter, Iowa

Perry Public Library
1101 Willis Ave.
Perry, Iowa

Woodward Public Library
118 South Main Street
Woodward, Iowa

Dallas County Emergency Management has taken the lead to coordinate development of this plan under the direction of Emergency Manager, Barry Halling. Halling has drawn on the expertise of consultants with AMEC Environment & Infrastructure, Inc., a firm that specializes in hazard mitigation and emergency management.

Feedback from the public will be incorporated into the draft plan, which will be available for public review and comment later this fall. Upon approval by the Iowa Homeland Security and Emergency Management Division and FEMA, the plan will be presented to the Dallas County Board of Supervisors, City Councils, and School Boards of each participating jurisdiction for formal adoption. For more information on this project, contact Barry Halling, Dallas County Emergency Manager at (515) 993-2134 or via e-mail at barry.halling@co.dallas.ia.us.

B.16 Plan Summary/Questionnaire for Public Comment during Drafting Stage

Dallas County
Multi-Jurisdictional Hazard Mitigation Plan

The federal government requires all states and local governments to have hazard mitigation plans approved by FEMA that are consistent with the Disaster Mitigation Act of 2000 (DMA 2000). This is required to maintain eligibility for certain types of federal disaster assistance, such as pre-disaster and post-disaster mitigation funding.

Dallas County is developing a comprehensive Multi-Jurisdictional Hazard Mitigation Plan to better address potential natural hazards **before they occur** and now seeks public comment. This plan is intended to identify feasible strategies to reduce the potential loss of life, human suffering, and loss of property from natural disasters, such as floods, severe winter storms, tornados, and windstorms.

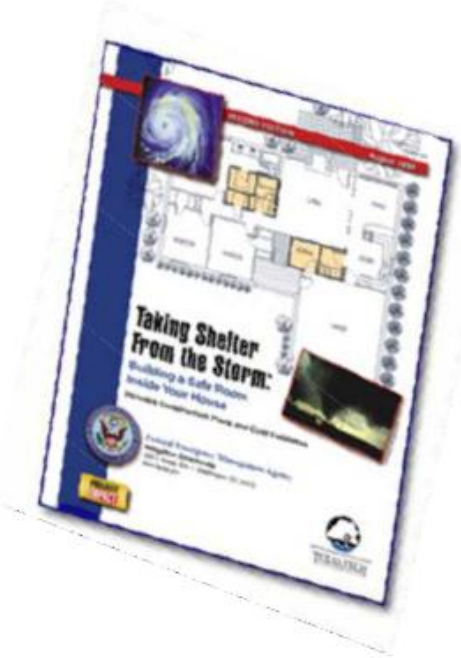
Please take a minute to review the material below and complete the very short questionnaire on the back.

City of Perry - Pattee Park Tree Damage - Dawson Storm

This is a **multi-jurisdictional planning process** and is a cooperative effort between Dallas County, the incorporated cities, and the school districts.

Planning Committee's Ranking of Hazards Likely to Affect Dallas County

Hazard Type	Planning Significance
Tornado	High
River Flooding	High
Severe Winter Storm	High
Flash Flood	Moderate
Windstorm	Moderate
Grass or Wildland Fire	Moderate
Hailstorm	Moderate
Thunderstorms and Lightning	Moderate
Animal/Crop/Plant Disease	Moderate
Dam Failure	Moderate
Drought	Moderate
Levee Failure	Moderate
Expansive Soils	Low
Landslide	Low
Extreme Heat	Low
Earthquake	Low
Sinkholes	Low



1. The hazards addressed in the Multi-Jurisdictional Hazard Mitigation Plan are listed below. Please indicate the level of risk, or extent of potential impacts, in Dallas County that you perceive for each hazard. **Please rate EACH hazard 1 through 5 as follows:**

1=negligible, 2=limited, 3=moderate, 4=critical, or 5=catastrophic.

- ☐ Animal/Crop/Plant Disease
- ☐ Dam Failure
- ☐ Drought
- ☐ Earthquake
- ☐ Expansive Soils
- ☐ Extreme Heat
- ☐ Flash Flood
- ☐ Grass or Wildland Fire
- ☐ Hailstorm
- ☐ Landslide
- ☐ Levee Failure
- ☐ River Flooding
- ☐ Severe Winter Storm
- ☐ Sinkholes
- ☐ Thunderstorms and Lightning
- ☐ Tornado
- ☐ Windstorm

2. Requests for FEMA Hazard Mitigation Grant Program funds are currently reviewed initially by the Iowa Homeland Security & Emergency Management Agency. Listed below are their eligible project types. **Please check those that could benefit your community in your opinion:**

- ☐ Flood-prone Property Acquisition & Structure Demolition /Relocation
- ☐ Flood-Prone Structure Elevation
- ☐ Dry Floodproofing of Historical Residential Structures
- ☐ Dry Floodproofing of Non-residential Structures
- ☐ Minor Localized Flood Reduction Projects (storm water management or localized flood control projects)
- ☐ Structural Retrofitting of Existing Buildings (adding a tornado safe room)
- ☐ Non-structural Retrofitting of Existing Buildings, and Facilities from wind damage.
- ☐ New Tornado Safe Room Construction
- ☐ Electrical Utilities Infrastructure Retrofit
- ☐ Soil Erosion Stabilization
- ☐ Wildfire Mitigation

3. Please comment on any other issues that the planning committee should consider in developing a strategy to reduce future losses caused by natural hazard events.

Return / Contact Information: Mr. Barry Halling, Dallas County Emergency Management Coordinator, at phone # (515) 993-2134, fax # (515) 993-3476, email at: Barry.Halling@co.dallas.ia.us, P.O. Box 56, Adel, IA 50003

B.17 Press Release for Final Public Comment Period

Dallas County, Iowa
PRESS RELEASE

For Immediate Release
10/11/2012

Contact: Barry Halling
515-993-2134

Dallas County Planning Committee Seeks Public Input

Dallas County, IA — The public is encouraged to review and comment on the Dallas County Multi-jurisdictional Hazard Mitigation Plan before it is finalized. This plan was created to develop a strategy to reduce damage and losses caused by natural hazard events. The final draft of the plan will be available online and in hard-copy at select public locations in Dallas County from October 22 to November 2, 2012. The purpose is to provide information to the public on the Multi-jurisdictional Hazard Mitigation Plan under development as well as gain public input.

Taxpayers pay billions of dollars each year for disaster recovery. Some events are predictable, and often, damages can be reduced or eliminated. The federal Disaster Mitigation Act of 2000 requires communities to develop an approved local hazard mitigation plan to remain eligible for certain federal funding.

The Dallas County Emergency Management Coordinator, Barry Halling, invited representatives from County departments, the incorporated cities, and school districts to work together to develop this plan. The planning committee addressed 17 natural hazards—ranging from flooding and tornadoes to severe winter storms—and considered the impacts of these events on local communities. Based on the results of a risk assessment of the hazards, committee members suggested ways for their jurisdictions to reduce damages caused by the various hazards. The committee consulted with AMEC Environment & Infrastructure, Inc. to assist with the plan development and ensure that the final plan meets federal regulations.

The planning committee would like input from the public on the strategy being developed to lessen impacts of future disasters on people and property in Dallas County. The Plan will be sent to the Iowa Homeland Security and Emergency Management Division and FEMA after this public comment period. Your comments will be considered by the Hazard Mitigation Planning Committee and incorporated into the plan, as appropriate.

From October 22 to November, 2, 2012, the final draft plan will be available for your review at the following locations:

Online at: http://www.co.dallas.ia.us/index.aspx?page=133

In hard-copy during normal operating hours at:

Adel Public Library	Perry Public Library
303 South 10th Street	1101 Willis Avenue
Adel, Iowa	Perry, Iowa

The final plan must be approved by the governing body of each participating jurisdiction, the State of Iowa, and FEMA before becoming official.

For more information on this planning effort, or to provide your comments, please contact Barry Halling at 515-993-2134 or via e-mail at barry.halling@co.dallas.ia.us. You can also mail comments to Mr. Halling at P.O. Box 56, Adel, Iowa 50003.

B.18 Newspaper Articles of Press Release for Final Public Comment Period

Dallas County News

NEWS

www.adelnews.com

Public invited to review County's Hazard Mitigation Plan until Nov. 2

May be reviewed at Adel, Perry libraries or online

Special to DCN

The public is encouraged to review and comment on the Dallas County Multi-Jurisdictional Hazard Mitigation Plan before it is finalized.

The plan was created to develop a strategy to reduce damage and losses caused by natural hazard events.

The final draft of the plan will be available online and in hard copy at select public locations in Dallas County through Nov. 2. The purpose is to provide information to the public on the Multi-Jurisdictional Hazard Mitigation Plan under development, as well as to gain public input.

To view online, visit http://www.co.dallas.ia.us/index.aspx?page=133. The plan is also available to view at the Adel Public Library and Perry Public Library.

Taxpayers pay billions of dollars each year for disaster recovery. Some events are predictable, and often, damages can be reduced or eliminated. The federal Disaster Mitigation Act of 2000 requires communities to develop an approved local hazard mitigation plan to remain eligible for federal funding.

Dallas County Emergency Management Coordinator Barry Halling invited representatives from county departments, incorporated cities and school districts to work together to develop this plan.

The planning committee addressed 17 natural hazards — ranging from flooding and tornadoes to severe winter storms — and considered the impacts of these events on local communities.

Based on the results of a risk assessment of the hazards, committee members suggested ways for their jurisdictions to reduce damages caused by the various hazards. The committee consulted with AMEC Environment & Infrastructure, Inc., to assist with the plan development and ensure that the final plan meets federal regulations.

The planning committee is seeking public input on the strategy being developed to lessen impacts of future disasters on people and property in Dallas County. The plan will be sent to the Iowa Homeland Security and Emergency Management Division and FEMA after the public comment period.

All comments will be considered by the Hazard Mitigation Planning Committee and incorporated into the plan, as appropriate.

The final plan must be approved by the governing body of each participating jurisdiction, the State of Iowa, and FEMA befxore becoming official.

For more information on the planning effort, or to provide comments, contact Halling at 515-993-2134, or by email at: barry.halling@co.dallas.ia.us.

Comments may be mailed to Halling at P.O. Box 56, Adel 50003.

Perry Chief

Dallas County Planning Committee Seeks Public Input

The Public is encouraged to review and comment on the Dallas County Multi-jurisdictional Hazard Mitigation Plan before it is finalized. This plan was created to develop a strategy to reduce damage and losses caused by natural hazard events. The final draft of the plan will be available online and in hard-copy at select public locations in Dallas County from October 22 to November 2, 2012. The purpose is to provide information to the public on the Multi-jurisdictional Hazard Mitigation Plan under development as well as gain public input.

Taxpayers pay billions of dollars each year for disaster recovery. Some events are predictable, and often, damages can be reduced or eliminated. The federal Disaster Mitigation Act of 2000 requires communities to develop an approved local hazard mitigation plan to remain eligible for certain federal funding.

Dallas County Emergency Management Coordinator, Barry Halling, invited representatives from County departments, the incorporated cities, and school districts to work together to develop this plan. The planning committee addressed 17 natural hazards—ranging from flooding and tornadoes to severe winter storms—and considered the impacts of these events on local communities. Based on the results of a risk assessment of the hazards, committee consulted with AMEC Environment & Infrastructure, Inc. to assist with the plan development and ensure that the final plan meets federal regulations.

The planning committee would like input from the public on the strategy being developed to lessen impacts of future disasters on people and property in Dallas County. The Plan will be sent to the Iowa Homeland Security and Emergency Management Division and FEMA after this public comment period. Your comments will be considered by the Hazard Mitigation Planning Committee and incorporated into the plan, as appropriate.

From October 22 to November, 2, 2012, the final draft plan will be available for your review online at http://www.co.dallas.ia.us/index.aspx?page=133.

B.19 Additional Stakeholders Invited to Meetings and to Comment on Final Draft Plan

First Name	Last Name	Title	Agency/Organization	Invite to 2nd Mtg	Invite to 3rd Mtg.	Invite to comment on Draft Plan
Adjacent Counties						
A.J.	Mumm		Polk County EM	X	X	X
David	Morlan		Boone County EM	X	X	X
Dennis	Morlan		Greene County EM	X	X	X
Robert	Kempf		Guthrie County EM	X	X	X
Todd	Brown		Madison County EM	X	X	X
State Agencies						
Bill	Cappuccio		DNR	X	X	X
Terry	Jensen		Dept of Ag & Land Stewardship	X	X	X
Linda	Roose		HSEM	X	X	X
Jonathan	Garton	Environmental Engineer Senior	DNR, Dam Safety Program	X	X	X
Gail	Kantak	Wildland Fire Supervisor	DNR-Forestry	X	X	X
Ray	Anderson	Research Geologist	NDR-Geological & Water Survey	X	X	X
Robert	Libra	State Geologist	NDR- Geological & Water Survey	X	X	X
					X	X
Federal Agencies						
Jeff	Johnson		NWS	X	X	X
Jeff	Zogg		NWS	X	X	X
Andrew	Leichty		USCOE Rock Island District	X	X	X
Rob	Middlemis-Brown		USGS	X	X	X
Steve	Russell		USCOE Rock Island District	X	X	X
Jerry	Skalak		USCOE Rock Island District	X	X	X
Tom	Taylor		EPA/Water Resources Protection Branch	X	X	X
Joe	Chandler		FEMA Region VII	X	X	X
						X
						X
Business Contacts						
Kevin	Igli	Chief Environmental, Health, and Safety Officer	Tyson Foods		X	X
Linda	Wunsch	Executive Director	Greater Dallas County Development Alliance	X	X	X
		Academia				
Sara	Steussy		Iowa State University, Iowa Flood Center		X	X
		Regional Planning				
Des Moines Area Metropolitan Planning Organization						X

APPENDIX C: MITIGATION ACTIONS CONSIDERED

Mitigation Action Idea	Mitigation Measure Category	Goal Addressed
Adopt building codes to require safe rooms in residential structures and public buildings--including schools	1	4
Adopt/Enforce code to bury utility lines in future development	1	1
Adopt/Implement/Enforce building code standard for the installation of lightning protection systems	1	4
Back-up power for critical facilities	6	1
Ban the use of fireworks	1	4
Build bridges/raise road grade in low lying areas	2	4
Bury existing utility lines	2	1
Encourage High Hazard Dam Owners to Complete Emergency Action Plans and Inundation Maps	3	2
Conduct controlled burns in rural areas to mitigate wildfire	4	4
Conduct mine inspections	1	4
Encourage dam owners to conduct regular dam Maintenance	1	3
Continued Compliance with the National Flood Insurance Program	1	3
County-wide Reverse 911 system, (Code Red)	6	5
Create and train volunteer sandbagging brigade	6	3
Create redundancy in utility distribution lines (loops) and key equipment at production facilities	2	1
Develop a standard drought management plan	1	3
Develop and Enfforce building resrictions in dam inundation areas	1	3
Develop and Implement a Utility Line Clearance Program (like Tree City USA)	2	1
Develop and utilize alternative energy production. (solar or wind power)	2	1
Develop watershed management to ensure adequate river levels during drought	5	3
Develop/Enforce building codes that would prevent damage from earthquake	1	3
Develop/Enforce building codes to prevent damage to foundations from expansive soils	1	3
Develop/Implement water usage restrictions	1	3
Develop/Implement/Enforce codes to mow high grass and weeds to reduce the potential for wildfires in increased fuel load (brush)areas	4	3
Expand/Improve outdoor warning siren network	6	5
Identify and map specific underground void space areas prone to collapse failure and limit future development in these areas	3	3
Identify potential landslide areas and install reinforcement barriers to nullify potential disasters and protect infrastructure. Do not allow building in these identified areas. Water redirection and specific planting of deep root vegetation to mitigate landslide	3,2	4
Install additional lightning arrestors on power infrastructure	2	1
Maintain/Upgrade levee systems	5	4
Prevent Spread of Emerald Ash Borer by quarantine of infected firewood, use of woodpeckers to eat larvae, and injection systems to eradicate	1	4
Protect or relocate floodprone critical facilities	2	1
Public Education safety during extreme temperatures heat/cold conditions	3	2
Public Education use of ground outlets and surge protectors in homes and businesses.	3	2
Public Education--drought impacts on tree roots and preventative measures to take	3	2
Public Education--Emerald Ash Borer threat	3	2
Public Education-Energy Consumption during extreme heat events, cooling center locations, free fan programs	3	2
Public Education--hailstorm damage prevention	3	2
Public Education--home improvement programs to conserve water and electricity usage to help eliminate hardship on the infrastructure and lower consumption during peak demand. HVAC, window, and insulation programs could deter problems with the elderly	3	2
Public Education--promote NOAA weather radios	3	2
Public Education--shelter locations	3	2
Public Education-tornado safety	3	2
Public Education--winter weather driving	3	2
Purchase floodprone properties--especially repetitive loss properties	2	4
Removal of debris from floodway and stormwater systems to mitigate floodwater back-up	4	4
Replace aging utility infrastructure.	2	1
Saferoom construction in schools, public buildings, and near outdoor recreation areas..	5	4
Upgrade power distribution system through replacement of porcelain insulators and switches with polymer components	2	1
Upgrade/Expand/Improve Stormwater Management Systems	5	4
Real-time flood monitoring on Rivers	6	5
Install Generators in school buildings	6	4

<placeholder for resolutions after FEMA provides approval pending adoption letter>

Appendix E: Critical/Essential Facilities

Source	Type	Other Y/N	Address	Census Tract	City	ZIP Code	Facility Name	Latitude	Longitude	Replacement cost	Contents Value		Jurisdiction	Not Mapped
HAZUS	Bus Facility		718 Greene Street	19049050700	Adel	50003-8281	Hirta Public Transit	41.62402	-94.01669	$ 1,079,100			Adel	
DCG	Childcare		1808 Grove Street		Adel	50003	Kids Corner						Adel	
DCG	City Facility		301 S. 10th St.		Adel	50003	Adel City Hall			$ 944,500	$ 47,200		Adel	
DCG	City Facility		208 N. 5th St.		Adel	50003	Adel Public Works/Parks			$ 175,900	$ 53,200		Adel	
DCG	Comm. Facility		902 Court St.		Adel	50003	Dallas County Radio Communications						Adel	
DCG	Elder Care		1919 Greene Street		Adel	50003	Sunny Brook of Adel Nursing Home						Adel	
DCG	Electric Power Facility		Hwy 169 & bike Trail		Adel	50003	Mid American Energy						Adel	
HAZUS/DCG	Fire/Police/EOC		102 S Tenth ST	19049050700	Adel	50003	Department/Police Station/EOC	41.617254	-94.019962	$ 472,500	$ 83,600		Adel	
HAZUS	HAZ-MAT		1831 W. MAIN ST.	19049050700	Adel	50003	UNITED BRICK & TILE	41.61667	-94.0325	HYDROGEN FLUORIDE			Adel	
HAZUS	HAZ-MAT		1831 W. MAIN ST.	19049050700	Adel	50003	UNITED BRICK & TILE	41.61667	-94.0325	MANGANESE			Adel	
HAZUS	HAZ-MAT		1831 W. MAIN ST.	19049050700	Adel	50003	UNITED BRICK & TILE	41.61667	-94.0325	BARIUM			Adel	
DCG	Major Employer		2112 Greene		Adel	50003	Iowa Spring Manufacturing						Adel	
DCG	Major Employer		1901 Main		Adel	50003	United Brick& Tile						Adel	
DCG	Medical Care Facilities		1120 Greene St.		Adel	50003	Mercy Adel Medical Clinic						Adel	
HAZUS	Police Facility		201 Nile Kinnick Dr. N.	19049050700	Adel	50003-1440	Dallas County Sheriff	41.61873	-94.01733	$ 1,386,000			Adel	
HAZUS/DCG	Waste Water Facility		1701 S. 4th St.	0700	Adel	50003	SEWAGE TREATMENT	41.61932	-94.01374	$ 703,950	$ 105,650		Adel	
DCG	Water Facility		23539 Pasco Lane		Adel	50003	Adel Water Wells			$ 211,600			Adel	
DCG	Water Facility		1920 S. 15th St.		Adel	50003	Adel Water Tower			$ 336,300			Adel	
DCG	Water Facility		1510 Prairie St.		Adel	50003	Adel Water Tower			$ 283,500			Adel	
HAZUS	School Facilities		1608 GROVE ST.	19049050700	Adel	50003	A-D-M ELEMENTARY SCHOOL	41.62022	-94.02946	$ 7,953,701	$ 775,710		ADM Schools	
HAZUS	School Facilities		801 NILE KINNICK DR S	19049050700	Adel	50003	A-D-M SENIOR HIGH SCHOOL	41.61014	-94.01649	$ 15,183,800	$ 1,518,130		ADM Schools	
HAZUS	School Facilities		DR S	0700	Adel	50003	SCHOOL	41.61014	-94.01649	$ 9,918,450	$ 992,250		ADM Schools	
HAZUS	School Facilities		215 N 11TH	0700	Adel	50003	SCHOOL (vacant)	41.61835	-94.02079	$ 6,922,152	$ 675,194		ADM Schools	
HAZUS	School Facilities		315 SPRUCE ST	0801	De Soto	50069	INTERMEDIATE	41.53571	-94.00911	$ 6,725,786	$ 650,000		ADM Schools	

Source	Type	Other Y/N	Address	Census Tract	City	ZIP Code	Facility Name	Latitude	Longitude	Replacement cost	Contents Value		Jurisdiction	Not Mapped
HAZUS	School Facilities		618 5TH ST	19049050200	Minburn	50167	ELEMENTARY SCHOOL (vacant)	41.7587	-94.02833	$ 6,031,412	$ 600,000		ADM Schools	
DCG	Community Center		110 E. First St.		Bouton	50039	Bouton Community Center						Bouton	
HAZUS	Fire Station		112 E First ST	19049050200	Bouton	50039	Bouton Fire Department	41.820066	-93.999314				Bouton	
DCG	Childcare		1106 Linden Street		Dallas Center	50063	Kid's Korner Day Care Center						Dallas Center	
DCG	City Facility		1502 Walnut Street		Dallas Center	50063	City Hall						Dallas Center	
DCG	City Facility		601 Walnut Street		Dallas Center	50063	City Maintenance Shed						Dallas Center	
DCG	Elder Care		1204 Linden Street		Dallas Center	50063	Spurgeon Manor Nursing Home						Dallas Center	
DCG	Fire Station		1502 Walnut Street		Dallas Center	50063	Dallas Center Fire Station						Dallas Center	
DCG	Library	Y	1308 Walnut Street		Dallas Center	50063	Roy R. Estle Memorial Library						Dallas Center	
DCG	Major Employer		810 Sugar Grove Ave.		Dallas Center	50063	Pioneer International						Dallas Center	
DCG	Major Employer		2500 Block of 24th (Sugar Grove Ave.)		Dallas Center	50063	Hyline International						Dallas Center	
DCG	Medical Care Facilities		507 14th Street		Dallas Center	50063	DC Medical Associates						Dallas Center	
DCG	Police Facility		1402 Walnut Street		Dallas Center	50063	Dallas Center Police Station						Dallas Center	
DCG	Shelter		1204 13th Street		Dallas Center	50063	First Presbyterial Church/Shelter						Dallas Center	
DCG	Siren	Y	602 10th Street		Dallas Center	50063	Tornado Siren						Dallas Center	
DCG	Siren	Y	1502 Walnut Street		Dallas Center	50063	Tornado Siren						Dallas Center	
HAZUS	Waste Water Facility		2711 250th St.	19049050200	Dallas Center	500630000	DALLAS CENTER CITY OF STP	41.6725	-93.9465	$ 65,934			Dallas Center	
DCG	Water Facility		2281 240th Street		Dallas Center	50063	Dallas Center Water Treatment Plant						Dallas Center	
DCG	Water Facility		1708 Walnut Street		Dallas Center	50063	Water Tower						Dallas Center	
DCG	Water Facility		1708 Walnut Street		Dallas Center	50063	Underground Water Storage						Dallas Center	
HAZUS/DCG	School Facilities		1400 VINE STREET	19049050200	Dallas Center	50063	GRIMES MIDDLE SCHOOL	41.68119	-93.96122	$ 10,891,552	$ 1,816,853		Dallas Center-Grimes Schools	
HAZUS/DCG	School Facilities		1205 13TH ST	19049050200	Dallas Center	50063	ELEMENTARY ELEMENTARY	41.67713	-93.96006	$ 6,991,933	$ 1,085,777		Dallas Center-Grimes Schools	
HAZUS	School Facilities		2555 W. 1st Street	19049050100	Grimes	50111	GRIMES COMMUNITY HIGH SCHO	41.68822	-93.82355	$ 25,957			Dallas Center-Grimes Schools	

Source	Type	Other Y/N	Address	Census Tract	City	ZIP Code	Facility Name	Latitude	Longitude	Replacement cost	Contents Value		Jurisdiction	Not Mapped
DCG	School Facilities		2555 W. 1st Street, Grimes, IA		Grimes	50111	DCG High School & Auditorium			$ 18,689,552	$ 1,582,964		Dallas Center-Grimes Schools	
DCG	School Facilities		Grimes, IA		Grimes	50111	Building/Finished			$ 20,000,000	NA		Schools	
DCG	School Facilities		500 SW James St., Grimes, IA		Grimes	50111	South Prairie Elementary			$ 7,912,813	$ 1,409,479		Dallas Center-Grimes Schools	
DCG	School Facilities		400 NW 27th St., Grimes, IA		Grimes	50111	North Ridge Elementary			$ 8,355,026	$ 1,428,000		Dallas Center-Grimes Schools	
DCG	School Facilities		2555 W. 1st Street, Grimes, IA		Grimes	50111	Athletic Complex – High School			$ 1,200,000	$ 350,000		Dallas Center-Grimes Schools	
DCG	School Facilities		1400 Vine Street, Dallas Center, IA		Dallas Center	50063	Athletic Complex – Middle School			$ 850,000	$ 150,000		Dallas Center-Grimes Schools	
DCG	School Facilities		Grimes, IA		Grimes	50111	Bus Barn			$ 121,346	$ 53,060		Schools	
DCG	School Facilities		1414 Walnut St., Dallas Center, IA		Dallas Center	50063	Administrative Office			Rent	$ 41,567		Dallas Center-Grimes Schools	
DCG	School Facilities		255 SW Jazzwood, Grimes, IA		Grimes	50111	New Bus Barn Site			$ 280,000	$ 100,000		Dallas Center-Grimes Schools	
DCG	School Facilities		1414 Walnut, Dallas Center, IA		Dallas Center	50063	Property in Garage			Rent	$ 26,530		Dallas Center-Grimes Schools	
DCG	County Facility		801 Court St. Adel, Iowa		Adel	50003	Court House						Dallas County	
DCG	County Facility		121 North 9th Adel Iowa 50003		Adel	50003	County Office Building						Dallas County	
DCG	County Facility		902 Court, Adel, Iowa 50003		Adel	50003	County Office Building						Dallas County	
DCG	County Facility		908 Court, Adel, Iowa 50003		Adel	50003	County Office Building						Dallas County	
DCG	County Facility		23380 250th St, Adel, Iowa		Adel	50003	County Shop						Dallas County	
DCG	County Facility		415 River St. Adel, Iowa		Adel	50003	County Enginners Office						Dallas County	
DCG	County Facility		518 Greene St. Adel, Iowa		Adel	50003	County Shop						Dallas County	
DCG	Elder Care		23749 N. Ave Adel, Iowa		Adel	50003	County Care Facility						Dallas County	
DCG	Jail/Sheriff's Office		201 North 8th St Adel, Iowa		Adel	50003	County Jail & Sheriff Office						Dallas County	
DCG	Medical Care Facilities		512 Nile Kinnick Dr. Adel,Iowa		Adel	50003	County Ambulance Quarters						Dallas County	
DCG	Natural Gas Facility		24338 G. Ave.		Adel		Northern Natural Gas						Dallas County	
DCG	Fire Station/EOC		208 s. 1st		Dawson	50066	Dawson Fire Station and EOC			$ 116,000	$ 33,010		Dawson	
DCG	Childcare		805 Guthrie		De Soto	50069	100 Acre Woods						De Soto	
DCG	City Facility		405 Walnut Street		De Soto	50069	De Soto City Hall						De Soto	
DCG	City Facility		419 Elm		De Soto	50069	De Soto Public Works Bldg						De Soto	

Source	Type	Other Y/N	Address	Census Tract	City	ZIP Code	Facility Name	Latitude	Longitude	Replacement cost	Contents Value		Jurisdiction	Not Mapped
DCG	Comm. Facility		Madison St.		De Soto	50069	Madison St.						De Soto	
HAZUS/DCG	Fire Station		329 Elm	19049050801	De Soto	50069	De Soto Fire & Rescue	41.528578	-94.009214				De Soto	
DCG	Library	Y	405 Walnut Street		De Soto	50069	De Soto Library						De Soto	
DCG	Major Employer		1100 Greene St		De Soto	50069	Casey's						De Soto	x
DCG	Major Employer		1203 Guthrie		De Soto	50069	Kum & Go						De Soto	
DCG	Major Employer		909 Guthrie		De Soto	50069	B&B Leasing						De Soto	
DCG	Major Employer		901 Guthrie		De Soto	50069	Cleary Buildings						De Soto	
DCG	Major Employer		#4 Ellefson Drive		De Soto	50069	Right Turn						De Soto	
DCG	Major Employer		#10 Ellefson Drive		De Soto	50069	All States Ag						De Soto	
DCG	Major Employer		#3 Ellefson Drive		De Soto	50069	Whiskers on Kittens						De Soto	
DCG	Major Employer		#16 Ellefson Drive		De Soto	50069	DeSoto Equipment						De Soto	
DCG	Major Employer		#7 Ellefson Drive		De Soto	50069	Raccoon River Rental						De Soto	
DCG	Major Employer		705 Guthrie		De Soto	50069	E-Bank						De Soto	
DCG	Major Employer		1204 Guthrie		De Soto	50069	County Side INN						De Soto	
DCG	Major Employer		812 Guthrie		De Soto	50069	Edge Towner Motel						De Soto	
DCG	Major Employer		328 Walnut		De Soto	50069	Raytech Manufacturing						De Soto	
DCG	Major Employer		418 Elm		De Soto	50069	Structures Inc.						De Soto	
DCG	Major Employer				De Soto	50069	ACW Manufacturing						De Soto	
DCG	Police Facility		419 Elm		De Soto	50069	De Soto Police Department						De Soto	
DCG	Sewer Facility		Oak Hill & Lagoons		De Soto	50069	De Soto Sewer Lift Stations						De Soto	
HAZUS	Waste Water Facility			19049050801	De Soto	500690000	DESOTO CITY OF STP	41.53908	-93.98319	$ 65,934			De Soto	
DCG	Water Facility		Overton Circle		De Soto	50069	De Soto Water Treatment Plant						De Soto	
DCG	Water Facility		Hwy 169 & Spruce St.		De Soto	50069	De Soto Water Storage Towers						De Soto	

Source	Type	Other Y/N	Address	Census Tract	City	ZIP Code	Facility Name	Latitude	Longitude	Replacement cost	Contents Value		Jurisdiction	Not Mapped
DCG	Water Facility		326 Elm		De Soto	50069	De Soto Water Sales Bldg.						De Soto	
HAZUS	Fire Station		911 State ST	0600	Dexter	50070	Dexter Fire & Rescue	41.518111	-94.225977				Dexter	
HAZUS	Waste Water Facility			19049050600	Dexter	500700000	DEXTER CITY OF STP	41.52428	-94.23058	$ 65,934			Dexter	
DCG	Childcare		1813 Walnut St.		Granger	50109	Granger Day Care Center						Granger	
DCG	City Facility		1908 Main St.		Granger	50109	Granger Public Works Shop			$ 19,000	$ 1,268		Granger	
DCG	Community Center		2200 Walnut St.		Granger	50109	Granger Community Center			$ 681,569	$ 20,000		Granger	
DCG	Elder Care		2001 Kennedy St.		Granger	50109	Granger Nursing Home						Granger	
DCG	Electric Power Facility		1605 Xavier		Granger	50109	Mid American Sub Station						Granger	
DCG	Fire Station/city hall		1906 Main St.		Granger	50109	Granger Fire Station/city Hall			$ 309,000	$ 297,413		Granger	
DCG	Library	Y	2216 Broadway		Granger	50109	Granger Library				$ 54,121		Granger	
DCG	Major Employer		1803 Burr Oak Blvd		Granger	50109	Transportation						Granger	
DCG	Major Employer		Hwy 141		Granger	50109	Granger Motors						Granger	
DCG	Major Employer		3333 Hwy 141		Granger	50109	Beneventi Chevrolet						Granger	
DCG	Police Facility		1906 Main St.		Granger	50109	Granger Police Trailer			$ 15,000	$ 5,412		Granger	
DCG	Police Facility		1906 Main St.		Granger	50109	Granger Police Garage			$ 14,922	$ 1,268		Granger	
HAZUS/DCG	Waste Water Facility		20142 Xavier Ave.	19049050100	Granger	501090000	GRANGER CITY OF STP	41.74242	-93.82158	$ 244,000	$ 10,909		Granger	
DCG	Water Facility		1799 Burr Oak Rd.		Granger	50109	Granger Water Booster Station			$ 257,765			Granger	
DCG	Water Facility		1906 Main St.		Granger	50109	Granger Water Towers			$ 800,000			Granger	
DCG	Water Facility		1603 Xavier Ave.		Granger	50109	Treatment Plant and WII Field			$ 1,479,578			Granger	
DCG	Fire Station		Main Street		Linden		Linden Fire Station/City Hall?Library						Linden	
DCG	Waste Water Facility				Linden		Linden Sewer lagoons						Linden	x

Source	Type	Other Y/N	Address	Census Tract	City	ZIP Code	Facility Name	Latitude	Longitude	Replacement cost	Contents Value		Jurisdiction	Not Mapped
DCG	Water Facility				Linden		Water Wells						Linden	x
DCG	Water Facility				Linden		Water Tower						Linden	x
DCG	City Facility		315 Baker St.		Minburn	50167	Hall/Masonic Bldg.						Minburn	
DCG	City Facility		318 Baker St.		Minburn	50167	Minburn City Maintenance Bldg.						Minburn	
DCG	Comm. Facility		416 Chestnut		Minburn	50167	Minburn Communications						Minburn	
DCG	CO-OP	Y	500 Walnut St.		Minburn	50167	Minburn Co-OP						Minburn	
HAZUS	Fire Station		320 Baker ST	19049050200	Minburn	50167	Minburn Community Fire Department	41.755609	-94.029575				Minburn	
HAZUS/DCG	Waste Water Facility		22085 Minburn Rd. (closest address)	19049050200	Minburn	501670000	MINBURN CITY OF STP	41.75533	-94.04436	$ 65,934			Minburn	
DCG	Water Facility		812 5th St.	19049050200	Minburn	501670000	Water Intake						Minburn	
HAZUS	Airport		1102 Willis Ave.	0500	Perry	50220	PERRY MUNI	41.828006	-94.1598961	$ 10,651			Perry	
DCG	City Facility		1102 willis Ave.		Perry	50220	Perry City Hall						Perry	
DCG	City Facility		724 Warford		Perry	50220	Perry Public Works						Perry	
HAZUS/DCG	Comm. Facility		22562 141st Dr.	CBR	Perry	50220	KDLS 1310 AM	41.83276	-94.03773			-94	Perry	
HAZUS/DCG	Comm. Facility		22562 141st Dr.	CBR	Perry	50220	KDLS-FM 105.5	41.83415	-94.0369			-94	Perry	
DCG	Comm. Facility		1014 2nd Street		Perry	50220	Pegasus						Perry	
DCG	Comm. Facility		1323 2nd Street		Perry	50220	Perry Chief						Perry	
DCG	Elder Care		3000 Willis Ave.		Perry	50220	Masonic Home						Perry	
DCG	Elder Care		2323 willis Ave.		Perry	50220	Lutheran Home						Perry	
HAZUS	Electric Power Facility		905 Otley	19049050500	Perry	50220	Alliant Energy	41.82727	-94.12613	$ 108,900			Perry	
HAZUS/DCG	Fire Station		908 Willis AVE	19049050400	Perry	50220	Perry Volunteer Fire Department	41.838509	-94.110937				Perry	
DCG	Major Employer		13500 I Court		Perry	50220	Tyson Fresh Meats						Perry	
DCG	Major Employer		1501 5th St.		Perry	50220	Weise Industry						Perry	
DCG	Major Employer		1518 1st St.		Perry	50220	Progressive Foundry						Perry	
DCG	Major Employer		505 Research Drive		Perry	50220	Percival Scientific						Perry	
HAZUS/DCG	Medical Care Facilities		610 10TH STREET	19049050700	Perry	50220	DALLAS COUNTY HOSPITAL	41.61234	-94.01934	$ 3,465			Perry	
DCG	Medical Care Facilities		2625 Iowa Street		Perry	50220	Perry Health Care						Perry	
DCG	National Guard Armory		2930 Willis Ave		Perry	50220	Perry National Guard Armory						Perry	

Source	Type	Other Y/N	Address	Census Tract	City	ZIP Code	Facility Name	Latitude	Longitude	Replacement cost	Contents Value		Jurisdiction	Not Mapped
HAZUS/DCG	Police Facility		908 Willis Ave	19049050400	Perry	50220-1612	Perry Police Dept	41.83854	-94.11057	$ 1,386			Perry	
HAZUS	Waste Water Facility		1419 IVY PLACE	19049050400	Perry	50220	PERRY CITY OF STP	41.82978	-94.11131	$ 65,934			Perry	
DCG	Waste Water Facility		14323 Ivy Place		Perry	50220	Perry Waste Water Treatment Plant						Perry	
DCG	Water Facility		1101 W. 3rd		Perry	50220	Perry Water Department						Perry	
HAZUS/DCG	School Facilities		1600 8TH STREET	19049050300	Perry	50220	PERRY ELEMENTARY	41.84358	-94.09641	$ 15,671,077	$ 1,518,000		Perry Community Schools	
HAZUS/DCG	School Facilities		1200 18TH STREET	19049050300	Perry	50220	PERRY HIGH SCHOOL	41.83985	-94.0814	included in MS	included in MS		Perry Community Schools	
HAZUS/DCG	School Facilities		1200 18TH STREET	19049050300	Perry	50220	PERRY MIDDLE SCHOOL	41.83985	-94.0814	$ 30,860,000	$ 3,069,000		Perry Community Schools	
DCG	School Facilities		17th & Taft		Perry	50220	PCS Fieldhouse			$ 430,000	$ 50,000		Perry Community Schools	
DCG	School Facilities		2900 Warford St.		Perry	50220	PCS Bus Garage			$200,00	$ 25,000		Perry Community Schools	
DCG	School Facilities		1308 W. 4th St.		Perry	50220	PCS Maintenance Shop			$ 230,000	$ 50,000		Perry Community Schools	
HAZUS	School Facilities		1904 SYCAMORE ST	19049050100	Granger	50109	ASSUMPTION SCHOOL	41.759777	-93.824554	$ 4,275			Granger	
HAZUS	School Facilities		1302 5TH ST	19049050400	Perry	50220	ST PATRICKS SCHOOL	41.840612	-94.101191	$ 4,809			Perry	
HAZUS	School Facilities		2930 WILLIS	19049050300	Perry	50220	PERRY ALTERNATIVE SCHOOL	41.8386	-94.07754	$ 850			Perry	
DCG	Community Center		Thomas & First		Redfield	50233	Legion			$ 400,000			Redfield	
HAZUS/DCG	Fire Station/City Hall		808 1st Street	19049050600	Redfield	50233	Redfield Fire Department	41.58979	-94.196033	$ 400,000			Redfield	
HAZUS	HAZ-MAT		1521 HWY. 6 E.	19049050600	Redfield	50233	MIDLAND INTL. TILEWORKS	41.59528	-94.18389	ZINC COMPOUNDS			Redfield	
HAZUS	HAZ-MAT		HWY. 6 E.	19049050801	Redfield	50233	GLEN-GERY CORP.	41.50417	-94.00694	HYDROGEN FLUORIDE			Redfield	
HAZUS	HAZ-MAT		HWY. 6 E.	19049050801	Redfield	50233	GLEN-GERY CORP.	41.50417	-94.00694	MANGANESE COMPOUNDS			Redfield	
HAZUS	HAZ-MAT		HWY. 6 E.	19049050801	Redfield	50233	GLEN-GERY CORP.	41.50417	-94.00694	BARIUM COMPOUNDS			Redfield	

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DCG	Medical Care Facilities		1110 High Street		Redfield	50233	Redfield Medical Clinic			$ 200,000			Redfield	
HAZUS	Natural Gas Facility		2420 G AVENUE	19049050500	Redfield	50233	NORTHERN NATURAL GAS COMPANY	41.66407	-94.1641	$ 1,079			Redfield	
HAZUS	Waste Water Facility			0600	Redfield	502330000	STP	41.57656	-94.20019	$ 65,934			Redfield	
DCG	Water Facility		606 First St.		Redfield	50233	Redfield Water Treatment Plant			$ 1,000,000			Redfield	
DCG	Childcare		111 DeSoto Road		Van Meter	50261	County Kids Club						Van Meter	
DCG	City Facility		600 Debra Drive		Van Meter	50261	Van Meter Public Works			$ 500,000	$ 3,000,000		Van Meter	
DCG	City Facility		416 w. St.		Van Meter	50261	City Garage						Van Meter	x
DCG	Major Employer		510 Grant		Van Meter	50261	Rhodes Trucking						Van Meter	
DCG	Major Employer		601 Main Street		Van Meter	50261	Company						Van Meter	
DCG	Senior Housing		620 Pleasant St.		Van Meter	50261	Housing						Van Meter	
DCG	Sewer Facility		207 Wilson St		Van Meter	50261	Pump						Van Meter	
DCG	Sewer Facility		600 Ellis St.		Van Meter	50261	Pump						Van Meter	
DCG	Siren	Y	101 Hazel St.		Van Meter	50261	Storm Siren						Van Meter	
HAZUS	Waste Water Facility		800 Lagoon Dr.	0801	Van Meter	502610000	STP	41.53314	-93.94478	$ 65,934			Van Meter	
DCG	Water Facility		2688 Brookview Ln		Van Meter	50261	Water Tower						Van Meter	
DCG	Water Facility		2684 Brookview Ln		Van Meter	50261	Water Storage						Van Meter	
HAZUS/DCG	Fire Station		505 Grant ST	19049050801	Van Meter	50261	Van Meter Fire & Rescue	41.533234	-93.954468	$ 2,000,000	$ 10,000,000		Van Meter	
HAZUS/DCG	School Facilities		520 1ST AVE	19049050801	Van Meter	50261	ELEMENTARY SCHOOL	41.52926	-93.95473	$ 15,858,386			Van Meter Schools	
HAZUS/DCG	School Facilities		520 1ST AVE	19049050801	Van Meter	50261	VAN METER JR-SR HIGH SCHOOL	41.52926	-93.95473				Van Meter Schools	
DCG	Childcare		75 4th Street		Waukee	50263	Kids Company Daycare						Waukee	
DCG	Childcare		255 NE Dartmoor Drive		Waukee	50263	Westside Kids Daycare						Waukee	
DCG	Childcare		125 NE Dartmoor Drive		Waukee	50263	Little Wonders Daycare						Waukee	
DCG	Childcare		95 Laurel Street		Waukee	50263	First Steps Childcare						Waukee	
DCG	City Facility		805 University Avenue		Waukee	50263	Waukee Public Works Building						Waukee	
DCG	City Facility		230 W. Hickman Road		Waukee	50263	Waukee City Hall						Waukee	
DCG	Elder Care		1505 SE Laurel Street		Waukee	50263	Village at Legacy Pointe Memory Care						Waukee	
DCG	Elder Care		1645 SE Holiday Crest Blvd		Waukee	50263	Village at Legacy Pointe (nursing facility)						Waukee	

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HAZUS/DCG	Fire Station		1300 L.A. Grant Pkwy	19049050802	Waukee	50263	Waukee Fire Rescue	41.600327	-93.866123	$ 3,395,366	$ 410,741		Waukee	
DCG	Library	Y	950 Warrior Lane		Waukee	50263	Waukee Public Library						Waukee	
DCG	Major Employer		16185 Highway 6		Waukee	50263	Atlantic Bottling (Coca-Cola)						Waukee	
DCG	Major Employer		400 N. Deming Avenue		Waukee	50263	Quad Graphics						Waukee	
DCG	Major Employer		1100 SE Alice's Road		Waukee	50263	Gilcrest Jewett Lumber Co.						Waukee	
DCG	Major Employer		210 N. Warrior Lane		Waukee	50263	Waukee Family YMCA						Waukee	
DCG	Major Employer		165 N. 10th Street		Waukee	50263	Selectivend						Waukee	
DCG	Major Employer		1130 SE Westbrooke Drive		Waukee	50263	Riekes Material Handling						Waukee	
DCG	Major Employer		955 SE Olson Drive		Waukee	50263	Syrvet, Inc						Waukee	
DCG	Natural Gas Facility		555 SE Alice's Road		Waukee	50263	Waukee Natural Gas Station						Waukee	
DCG	Natural Gas Facility		90 N. 10th Street		Waukee	50263	Waukee Natural Gas Station						Waukee	
HAZUS	Police Facility		1300 Grant Pkwy	19049050801	Waukee	50263	Waukee City Police Dept	41.61354	-93.88239	$ 1,386			Waukee	
DCG	Recreation	Y	1505 6th Street		Waukee	50263	Course (Club House & Maintenance Shop)						Waukee	
HAZUS	Waste Water Facility			19049050802	Waukee	50263	WAUKEE CITY OF STP	41.59881	-93.88192	$ 65,934			Waukee	
DCG	Waste Water Facility		397 Hickman Road, Waukee, IA		Waukee	50263	LS #2	41.614944	-93.8361223	2,000,000			Waukee	
DCG	Waste Water Facility		[illegible] Waukee, IA		Waukee	50263	LS #4	41.606248	-93.8142723	1,500,000			Waukee	
DCG	Waste Water Facility		1300 3rd Street, Waukee, IA		Waukee	50263	LS #1	41.600973	-93.8813228	2,500,000			Waukee	
DCG	Waste Water Facility		31653 Ute Avenue, Waukee, IA		Waukee	50263	LS #8	41.575922	-93.8813469	1,000,000			Waukee	
DCG	Waste Water Facility		1255 Northeast Hickman Road, Waukee, IA		Waukee	50263	LS #6	41.614931	-93.8564848	2,000,000			Waukee	
DCG	Waste Water Facility		950 Warrior Lane, Waukee, IA		Waukee	50263	LS #9	41.605204	-93.8722438	150,000			Waukee	
DCG	Waste Water Facility		1505 6th Street, Waukee, IA		Waukee	50263	LS #11	41.602251	-93.8854506	50,000			Waukee	

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DCG	Waste Water Facility		3129 312th Street, Waukee, IA		Waukee	50263	LS #12	41.587803	-93.8757889	3,000,000			Waukee	
DCG	Waste Water Facility		106 Baytree Drive, Waukee, IA		Waukee	50263	LS #15	41.593526	-93.8707388	1,000,000			Waukee	
DCG	Waste Water Facility		1080 Westwoods Drive, Waukee, IA		Waukee	50263	LS #16	41.601499	-93.829689	500,000			Waukee	
DCG	Waste Water Facility		1080 Westwoods Drive, Waukee, IA		Waukee	50263	LS #3	41.601499	-93.829689	3,000,000			Waukee	
DCG	Waste Water Facility		805 University Avenue, Waukee, IA		Waukee	50263	LS #5	41.600489	-93.8515327	100,000			Waukee	
DCG	Water Facility		1300 6th Street		Waukee	50263	Waukee Water Treatment Facility						Waukee	
DCG	Water Facility		1255 6th Street		Waukee	50263	Waukee Water Tower						Waukee	
HAZUS/DCG	School Facilities		400 LOCUST ST	19049050801	Waukee	50263	Old Waukee Elementary	41.61024	-93.88262	$ 9,714,131	$ 852,000		Waukee Community Schools	
HAZUS/DCG	School Facilities		605 SE BOONE DR	19049050802	Waukee	50263	EASON ELEMENTARY	41.60076	-93.83364	$ 8,179,088	$ 1,460,640		Waukee Community Schools	
HAZUS/DCG	School Facilities		655 SE UNIVERSITY AVE	19049050802	Waukee	50263	PRAIRIEVIEW SCHOOL	41.60033	-93.84419	$ 28,718,255	$ 2,916,323		Waukee Community Schools	
HAZUS/DCG	School Facilities		905 WARRIOR LANE	19049050802	Waukee	50263	WAUKEE MIDDLE SCHOOL	41.60614	-93.87214	$ 20,607,460	$ 2,295,000		Waukee Community Schools	
HAZUS/DCG	School Facilities		555 SE UNIVERSITY	19049050802	Waukee	50263	WAUKEE SENIOR HIGH SCHOOL	41.60025	-93.8653	$ 51,786,140	$ 5,426,600		Waukee Community Schools	
HAZUS/DCG	School Facilities		8000 E.P. TRUE PARKWAY	19049050802	West Des Moines	50266	BROOKVIEW ELEMENTARY	41.57505	-93.79366	$ 10,026,504	$ 1,564,680		Waukee Community Schools	
DCG	School Facilities		1455 98th St.		West Des Moines		Maple Grove Elementary			$ 13,780,459	$ 2,346,000		Waukee Community Schools	
DCG	School Facilities		16400 Douglas Parkway		Clive		Shuler elementary			$ 10,253,000	$ 1,800,000		Waukee Community Schools	
DCG	School Facilities		4240 156th St.		Urbandale		Walnut Hills Elementary			$ 14,601,860	$ 2,118,295		Waukee Community Schools	
DCG	School Facilities		850 N. 6th St.		Waukee	50263	Waukee Elementary			$ 10,450,000	$ 1,800,000		Waukee Community Schools	
DCG	School Facilities		2350 La Grant Parkway		Waukee	50263	South Middle School			$ 18,829,000	$ 2,200,000		Waukee Community Schools	

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DCG	School Facilities		560 SE University Ave.		Waukee	50263	Waukee Community Schools District Office			$ 2,999,957	$ 942,973		Waukee Community Schools	
DCG	School Facilities		2950 260th St.		Dallas Center		Central Receiving			$ 664,694	$ 227,664		Waukee Community Schools	
DCG	School Facilities		445 5th St.		Waukee	50263	Waukee Community Schools IT Office			$ 401,838	$ 230,333		Waukee Community Schools	
HAZUS/DCG	School Facilities		803 WASHINGTON STREET	19049050600	Dexter	50070	ELEMENTARY SCHOOL	41.51913	-94.22799	$ 4,700,000			West Central Valley Schools	
HAZUS/DCG	School Facilities		1104 GRANT STREET	19049050600	Redfield	50233	VALLEY MIDDLE SCHOOL	41.59215	-94.1894	$ 6,800,000			West Central Valley Schools	
DCG	Childcare		108 West 5th Street		Woodward	50276	Lil Sprouts Daycare			$ 569,970			Woodward	
DCG	City Facility		105 E 2nd St, Woodward, IA		Woodward	50276	Woodward City Hall			$ 220,000	$ 35,000		Woodward	
DCG	City Facility		102 Railroad Street		Woodward	50276	Public Works Buildings			$ 450,000	$ 250,000		Woodward	
DCG	Electric Power Facility		N Main Street		Woodward	50276	Electric Sub Station						Woodward	
DCG	Fire Station		301 S. Main Street Woodward , IA 50276		Woodward	50276	Woodward Fire Department						Woodward	
DCG	Library	Y	118 S. Main St		Woodward	50276	Woodward Public Library			$ 300,000	$ 362,000		Woodward	
DCG	Major Employer		1251 334th Street		Woodward	50276	Woodward Resource Center						Woodward	
DCG	Major Employer		110 Railroad St		Woodward	50276	West Central Coop.						Woodward	
DCG	Major Employer		1251 134th Street		Woodward	50276	Woodward Academy						Woodward	
DCG	Major Employer		100 S. Main Street		Woodward	50276	Minburn Telecommunications						Woodward	
DCG	Natural Gas Facility		Hwy 210 and N Main Street		Woodward	50276	Natural Gas Main						Woodward	
DCG	Police Facility		108 E. 1st Street Woodward, IA 50276		Woodward	50276	Woodward Police Dept.			$ 227,000	$ 200,000		Woodward	
DCG	Recreation	Y	218 S. Main St.		Woodward	50276	Woodward Social Center			$ 200,000			Woodward	
DCG	Recreation	Y	214 Oak Ave		Woodward	50276	Woodward City Park/McColl's Park			$ 100,000	$ 2,000		Woodward	

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DCG	Recreation	Y	99 S. Main		Woodward	50276	Colton Park Depot Trail Head w/Bathroom facilities			$ 100,000	Antiques		Woodward	
DCG	Senior Housing		CENTER E1/2 SEC 6 (FORMER RR LAND)(EX PT		Woodward	50276	Woodward Senior Citizens Housing						Woodward	
DCG	Senior Housing		210 CEDAR AVE WOODWARD		Woodward	50276	Woodward Senior Citizens Housing						Woodward	
DCG	Sewer Facility		2784 130th Street		Woodward	50276	Sewer Lagoons			$ 200,000			Woodward	
HAZUS	Waste Water Facility		2784 130th St.	19049050100	Woodward	50276	WOODWARD CITY OF STP	41.84389	-93.93678	$ 65,934			Woodward	
DCG	Water Facility		401 West 9th Street.		Woodward	50276	Woodward Water Plant			$ 2,800,000	$ 850,000		Woodward	
DCG	Water Facility		104 E. 1st Street		Woodward	50276	City of Woodward Water Tower			$ 542,000			Woodward	
HAZUS/DCG	School Facilities		2200 STATE ST	19049050100	Granger	50109	GRANGER ELEMENTARY SCHOOL	41.76117	-93.81997	$ 6,201,736	$ 803,883		Woodward-Granger Schools	
HAZUS/DCG	School Facilities		306 W 3RD ST	19049050100	Woodward	50276	WOODWARD-GRANGER MIDDLE SCHOOL	41.85562	-93.92499	$ 16,145,303	$ 2,671,455		Woodward-Granger Schools	
HAZUS/DCG	School Facilities		306 W 3RD ST	19049050100	Woodward	50276	WOODWARD-GRANGER HIGH SCHOOL	41.85562	-93.92499	included in MS	included in MS		Woodward-Granger Schools	
DCG	School Facilities		1251 334th St.		Granger	50109	Woodward State Hospital			$ 41,352			Woodward-Granger Schools	
DCG	School Facilities		306 W. 3rd St.		Woodward	50276	Bus Barn			$ 85,169	$ 15,394		Woodward-Granger Schools	
DCG	School Facilities		2200 State St.		Granger	50109	Bus Barn			$ 56,566	$ 13,394		Woodward-Granger Schools	
DCG	School Facilities		306 W. 3rd St.		Woodward	50276	Industrial Arts Bldg			$ 169,783	$ 146,117		Woodward-Granger Schools	
DCG	School Facilities		311 E. 3rd St.		Woodward	50109	Football Field			$ 150,000			Woodward-Granger Schools	
DCG	School Facilities		2200 State St.		Granger	50109	Shop			$ 12,189	$ 8,004		Woodward-Granger Schools	
DCG	School Facilities		306 W. 3rd St.		Woodward	50276	Softball Fields			$ 73,672			Woodward-Granger Schools	
DCG	School Facilities		2200 State St.		Granger	50109	Concession Stand/Dugouts			$ 20,981			Woodward-Granger Schools	
DCG	School Facilities		306 W. 3rd St.		Woodward	50276	Garage			$ 12,735			Woodward-Granger Schools	

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DCG	School Facilities		2200 State St.		Granger	50109	Modular Bldg			$ 212,242	$ 31,836		Woodward-Granger Schools	
DCG	School Facilities		306 W. 3rd St.		Woodward	50276	Wrestling Bldg			$ 382,035	$ 53,060		Woodward-Granger Schools	