



FEMA

June 3, 2019

V. Joyce Flinn, Director
Iowa Homeland Security & Emergency Management Division
7900 Hickman Road, Suite 500
Windsor Heights, IA 50324

Subject: Review of the Lyon County, Iowa Hazard Mitigation Plan

Dear Ms. Flinn:

The purpose of this letter is to provide the status of the above referenced Local Hazard Mitigation Plan, pursuant to the requirements of 44 CFR Part 201 - Mitigation Planning and the Local Multi-Hazard Mitigation Planning Guidance. The Local Hazard Mitigation Plan Review Tool documents the Region's review and the plan compliance with all required elements of 44 CFR Part 201.6. The Plan Review Tool also identifies the jurisdictions participating in the planning process. FEMA's approval will be for a period of five years effective starting with the approval date indicated below.

Prior to the expiration of the plan the community will be required to review and revise their plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval in order to continue to be eligible for mitigation project grant funding.

Plan Name	Date Submitted	Date Approved	Date of Plan Adoption	Date of Plan Expiration	Review Status
Lyon County	May 30, 2019	June 3, 2019	May 30, 2019	June 3, 2024	Approved

If you have any questions or concerns, please contact Joe Chandler, Planning Team Lead, at (816) 283-7071.

Sincerely,

MICHAEL
R SCOTT
Michael Scott
Mitigation Division Director

Digitally signed by
MICHAEL R SCOTT
Date: 2019.06.03
13:49:23 -05'00'

Jurisdiction: Lyon County	Title of Plan: Lyon County Hazard Mitigation Plan	Date of Plan: September 2018
Local Point of Contact: Erin Pingel	Address: 217 West 5 th Street	
Title: Planner Northwest Iowa Planning and Development Commission		
Agency: Northwest Iowa Planning and Development Commission		
Phone Number: 7122627225	E-Mail: erin.pingel@nwipdc.org	
Funding Source: F#6#298		
State Reviewer: Mat Noble	Title: Planner	Date: 12.14.18
FEMA Reviewer: Justin Sorg	Title: HM Community Planner	Date: January 14, 2019 April 26, 2019
Date Received in FEMA Region VII	1) December 14, 2018; 2) March 12, 2019; 3) May 9, 2019	
Plan Not Approved	Returned for Technical Assistance January 14, 2019; April 26, 2019	
Plan Approvable Pending Adoption	May 21, 2019	
Plan Approved		

Jurisdiction:	NFIP Status*	
	Y	NP
1. Lyon County	X	
2. Alvord		X
3. Doon		X
4. George	X	
5. Inwood		X
6. Larchwood	X	
7. Lester	X	
8. Little Rock		X
9. Rock Rapids	X	
10. Rock Rapids Municipal Utilities		X

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

SECTION 1: REGULATION CHECKLIST

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
ELEMENT A. PLANNING PROCESS				
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))	Section 1 pg 4	✓		
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))	Section 1 pg 4,5,6	✓		
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))	Section 1 pg 4, 5	✓		
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))	Section 1 pg 9 Section 9 pg 109	✓		
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))	Section 8 pg 106 Section 9 pg 110	✓		
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))	Section 8 pg 106 Section 9 pg 110	✓		
ELEMENT A: REQUIRED REVISIONS				
None.				
Plan Strengths:				
• Outreach to neighboring counties				
Opportunities for Improvement:				
• Table 1.3: Multijurisdictional Involvement in the Lyon County Hazard Mitigation Plan (pg. 8) only lists Lyon County as participating in the plan.				

1. REGULATION CHECKLIST	Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)			
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT			
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))	Section 3, pg 28 Section 4, pg 33,34	✓	
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))	Section 3, pg 28 Section 4	✓	
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))	Section 3, pg 28 Section 4	✓	
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))	Section 7, pg 105-108	✓	
ELEMENT B: REQUIRED REVISIONS			
None.			
Plan Strengths:			
The critical facilities maps found in each jurisdictional profile sections are excellent and quickly and clearly communicate risk from and vulnerability to wildfire and flood for critical facilities. Other area hazards (dams, levees, sinkholes, landslides) could also be included. Then potential loss of facilities in or in proximity to these hazard locations could be analyzed for a more realistic assessment of vulnerability, rather than relying on the generic 25%, 10%, 5% damage assumptions for all critical facilities (which may or may not actually be in hazard areas) found starting on page 78.			
Opportunities for Improvement:			
- Drought.gov is the best resource for drought information and a much better resource than the NCEI. - The information on past disaster declarations is duplicated on pgs. 11 -12. - In 2015, the NCDC, along with 2 other national data centers, was consolidated into the National Centers for Environmental Information (NCEI). References to the NCDC should be revised to the NCEI. - Pg. 29 notes Lyon County has received more than \$32M in Federal funds for 4 disaster declarations since 2013. This figure is the total cost of all federal funds allocated for all declared counties in these disasters, not just Lyon County. Lyon County received some \$5.75M total across the 4 disasters. - In the next plan update, the planning team is highly encouraged to develop problem statements that describe the unique vulnerabilities of each community to identified hazards and that are the greatest concern to communities. These statements can be simple: "City A experiences frequent summertime flash flooding along 3rd and Main. Current storm water systems in the area are undersized to meet demand." This problem statement can then be used to develop mitigation actions such as, "Improve storm water management system along 3rd and Main" or "Develop a comprehensive storm water management plan."			
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))	Section 1.7 pg 9-13 Section 9, pg 110,111	✓	
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))	Section 7, pg 105,106	*✓	

1. REGULATION CHECKLIST**Regulation (44 CFR 201.6 Local Mitigation Plans)**

	Location in Plan (section and/or page number)	Met	Not Met
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))	Section 6, pg 93-95	✓	
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))	Section 6, pg 93-95	**✓	
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))	Section 6, pg 92-95	**✓	
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))	Section 9, pg 109-111	✓	

1. REGULATION CHECKLIST	Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)			
ELEMENT C: REQUIRED REVISIONS			
None.			
Opportunities for Improvement:			
• *Future updates must more fully describe each jurisdiction's participation in the NFIP and describe their floodplain management program for continued compliance. Simply stating "The community will continue to comply with NFIP," will not meet this requirement. • Mitigation actions should only support one goal. If an action supports more than one goal, then either the action is not well-developed or goals are not sufficiently unique and should be combined or re-developed. • Mitigation strategies could be strengthened by encouraging each individual jurisdiction to use the risk analysis and problem/issue statements relative to their own community to develop unique mitigation actions. While jurisdictions can certainly implement similar actions, developing a "laundry list" of mitigation strategies for jurisdictions to select and evaluate may lead to jurisdictions considering actions not relevant to their jurisdiction, capabilities or risks. • Pg. 101 states, "For those responsible for implementing and administering the mitigation actions when it states Local Jurisdiction (LJ) it means that the communities are small and don't have the full personnel to designate the action to a single person and will have to be a group effort for the local jurisdiction." The intent for identifying a specific responsible agency for implementing actions is to ensure that, as opportunities arise for actions or projects to be implemented, the responsible entity will be able to take action towards completion of the activities. FEMA recognizes that local jurisdictions will vary in their capabilities; however, if jurisdictions have limited personnel, they should reconsider mitigation actions that fall outside of their capabilities to implement. • FEMA's latest <u>Local Mitigation Planning Handbook (March 2013)</u> consolidated the 6 mitigation action categories in previous guidance (listed on page 96 in the Plan) into 4 categories: 1) local plans and regulations, 2) structure and infrastructure projects, 3) natural systems protection, and 4) education and awareness programs. Using the current categories would discourage including preparedness or operational readiness actions in the mitigation plan, and result in more substantive, actionable strategies. • Mitigation actions are "<i>specific actions, projects, activities or process taken to reduce or eliminate long-term risk</i>". Future plans should avoid generic actions developed from a laundry list of possible actions and instead focus on specific projects unique to each community that address specific vulnerabilities (as identified in the Risk Assessment through problem statements). The planning team should consider removing routine maintenance or "ongoing" projects from mitigation strategies as these are not specific actions to reduce or eliminate long-term risk, nor can their progress be measured. • **For the next plan update, STAPLEE scores should also be done separately, by each individual jurisdiction and not as a group, as the scores should reflect the unique circumstances and capabilities of each jurisdiction. • **Each jurisdiction needs to identify Cost Estimates, Priority, Funding Source, Responsible Party, Project Status and Timeline for each mitigation action. In order to more clearly display this information, a separate mitigation action table for each individual jurisdiction should be developed. In future updates, aggregating all mitigation actions for all jurisdictions into one table will not be accepted. • Alford, Inwood and Little Rock are encouraged to reconsider participation in the NFIP and are reminded that Federal financial assistance for acquisition or construction purposes, including, in some cases, Federal disaster assistance, may not be available in identified Special Flood Hazard Areas.			

1. REGULATION CHECKLIST

Regulation (44 CFR 201.6 Local Mitigation Plans)

Location in Plan
(section and/or
page number)

Met

Not
Met**ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION** (applicable to plan updates only)

D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))	Section 9, pg 110	✓	
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))	Section 6, 102-104 Table 7	✓	
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))	Section 9, pg 110	✓	

ELEMENT D: REQUIRED REVISIONS

None

Required Revisions for Next Update:

D1. a. The plan must describe changes in development that have occurred in hazard prone areas and increased or decreased the vulnerability of each jurisdiction since the last plan was approved. If no changes in development impacted the jurisdiction's overall vulnerability, plan updates may validate the information in the previously approved plan.

- If changes in land use or building infrastructure development in each jurisdiction occur within the next 5 years, the next plan update must fully explain these changes and how they impact jurisdictional vulnerability.

D2. a. The plan must describe the status of hazard mitigation actions in the previous plan by identifying those that have been completed or not completed. For actions that have not been completed, the plan must either describe whether the action is no longer relevant or be included as part of the updated action plan.

- The status of actions from the 2013 Plan were not fully described as completed, ongoing or deleted. The next plan update must describe the status of actions adopted in this (2019) plan.

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))		pending	
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))	Plan will be adopted when FEMA approves, resolutions will then be sent into FEMA	pending	

ELEMENT E: REQUIRED REVISIONS

E1 and E2: Written proof that all jurisdictions' governing bodies have formally adopted the plan (usually a resolution) must be submitted to FEMA.

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

SECTION 2: PLAN ASSESSMENT

A. Overall Plan Strengths and Opportunities for Improvement

Overall Plan Strengths

Overall Opportunities for Improvement

- The *Local Mitigation Planning Handbook* (Handbook) is the official guide for local governments to develop, update and implement local mitigation plans to meet the requirements of the Stafford Act and Title 44 Code of Federal Regulations (CFR) §201.6, and is a much improved resource over the formerly developed *How-To Guides*.

B. Resources for Implementing Your Approved Plan

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

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

Review of the FEMA HMA guidance (FY15 is the most current) is also encouraged as guidance provides information about application and eligibility requirements. This guidance is available from <http://www.iowahomelandsecurity.org/grants/HMA.html> or through FEMA's grant applicant resources page at http://www.fema.gov/government/grant/hma/grant_resources.shtm.

The FEMA Hazard mitigation planning site <http://www.fema.gov/plan/mitplanning/index.shtm> contains the official guidance to meet the requirements of the Stafford Act, as well as other resources and procedures for the development of hazard mitigation plans.

Various funding programs are available from several state and federal agencies to assist local jurisdictions in accomplishing their mitigation activities and goals. A detailed listing of programs, information on each program, and contact information is also available from the 2018 State Hazard Mitigation Plan.

FEMA

- [FEMA Climate Change](#): Provides resources that address climate change.
- [FEMA Hazard Mitigation Planning Online Bibliography](#): This compilation of government and private online sites is a useful source of information for developing and implementing hazard mitigation programs and plans.
- [FEMA Library](#): FEMA publications can be downloaded from the library website. These resources may be especially useful in public information and outreach programs. Topics include building and construction techniques, NFIP policies, and integrating historic preservation and cultural resource protection with mitigation.
- [FEMA RiskMAP](#): Technical assistance is available through RiskMAP to assist communities in identifying, selecting, and implementing activities to support mitigation planning and risk reduction. Attend RiskMAP discovery meetings that may be scheduled in the state, especially any in neighboring communities with shared watersheds boundaries.

Federal

- [EPA Drinking Water and Wastewater Resilience](#): Provides a comprehensive list of accessible materials for managing emergency plans, trainings, and response and recovery efforts

- [EPA Soak Up the Rain](#): Soak Up the Rain is a public outreach campaign focused on stormwater quality and flooding. The website contains helpful resources for public outreach and easy implementation projects for individuals and communities.

State

- [Iowa Homeland Security and Emergency Management](#): The Iowa State Hazard Mitigation Officer (SHMO) and State Mitigation Planner(s) can provide guidance regarding grants, technical assistance, available publications, and training opportunities.
- Iowa [Department of Natural Resources](#) can provide technical assistance and resources to communities seeking to implement their hazard mitigation plans.
- [Iowa DNR Mapping and GIS Portal](#): Interactive mapping tool with downloadable data

Not for Profit

- [Kresge Foundation Online Library](#): Reports and documents on increasing urban resilience, among other topics.
- [Naturally Resilient Communities](#): A collaboration of organizations put together this guide to nature-based solutions and case studies so that communities can learn which nature-based solutions can work for them.
- [Rockefeller Foundation Resilient Cities](#): Helping cities, organizations, and communities better prepare for, respond to, and transform from disruption.

Funding Sources:

- [Iowa DNR Low Head Dams Grants](#): Intended to reduce accidents at dams through cost-share funds that are available to all dam owners on navigable streams
- [Iowa Watershed Resources](#): Clean water grants that can be used for river restoration or other kinds of hazard mitigation implementation projects.
- [Federal Grants Resource Center](#) and [Grants.gov](#): Lists of grant opportunities from federal agencies (HUD, DOT/FHWA, EPA, etc.) to support rural development, sustainable communities and smart growth, climate change and adaptation, historic preservation, risk analyses, wildfire mitigation, conservation, Federal Highways pilot projects, etc.
- [FEMA Hazard Mitigation Assistance](#) (HMA): FEMA's Hazard Mitigation Assistance provides funding for projects under the Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM), and Flood Mitigation Assistance (FMA). States, federally recognized tribes, local governments, and some not for profit organizations are eligible applicants.
- [GrantWatch](#): The website posts current foundation, local, state, and federal grants on one website, making it easy to consider a variety of sources for grants, guidance, and partnerships. Grants listed include The Partnership for Resilient Communities, the Institute for Sustainable Communities, the Rockefeller Foundation Resilience, The Nature Conservancy, The Kresge Climate-Resilient Initiative, the Threshold Foundation's Thriving Resilient Communities funding, the RAND Corporation, and ICLEI Local Governments for Sustainability.
- USDA [Natural Resource Conservation Service](#) (NRCS) and [Rural Development Grants](#): NRCS provides conservation technical assistance, financial assistance, and conservation innovation grants. USDA Rural Development operates over fifty financial assistance programs for a variety of rural applications.



FEMA

May 21, 2019

V. Joyce Flinn, Director
Iowa Homeland Security & Emergency Management Division
7900 Hickman Road, Suite 500
Windsor Heights, IA 50324

Subject: Review of the Lyon County, Iowa Hazard Mitigation Plan

Dear Ms. Flinn:

The purpose of this letter is to provide the status of the above referenced Local Hazard Mitigation Plan, pursuant to the requirements of 44 CFR Part 201 - Mitigation Planning and the Local Multi-Hazard Mitigation Planning Guidance. The Local Hazard Mitigation Plan Review Tool documents the Region's review and the plan compliance with all required elements of 44 CFR Part 201.6. The Plan Review Tool also identifies the jurisdictions participating in the planning process. FEMA's approval will be for a period of five years effective starting the date of receipt of adoption documentation. Formal adoption documentation must be submitted to the Regional office within one calendar year of the date of this letter, or the plan will need to be updated and resubmitted for review.

Prior to the expiration of the plan the community will be required to review and revise their plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval in order to continue to be eligible for mitigation project grant funding.

Local Jurisdiction	Date Submitted	Date Approved Pending Adoption	Date of Plan Adoption	Date of Plan Expiration	Review Status
Lyon County	May 9, 2019	May 21, 2019			Approved pending FEMA's receipt of adoption documentation

If you have any questions or concerns, please contact Joe Chandler, Planning Team Lead, at (816) 283-7071.

Sincerely,

MICHAEL R SCOTT
Digitally signed by MICHAEL R SCOTT
Date: 2019.05.24 13:10:56 -05'00'
Michael Scott, Director
Mitigation Division

Lyon County Iowa Multijurisdictional Hazard Mitigation Plan

Included Jurisdictions:

Lyon County (Rural)
Alvord
George
Inwood
Larchwood
Lester
Little Rock
Rock Rapids

Prepared by
Northwest Iowa Planning and Development Commission

Spencer, IA 51301
www.nwipdc.org

Lyon County
Courthouse
206 S. 2nd Ave
Rock Rapids, IA 51246
Hours: M-F 8-4:30pm
Phone: 712-472-8517

Board of Supervisors

Steve Michael	District 1
Merle Koedam	District 2
Mark Behrens	District 3
Randy Bosch	District 4
Kirk J. Peters	District 5

County Departments

Marilee Schleusner	Assessor
Jen Smit	Auditor
Craig Van Otterloo	Conservation
Shayne Mayer	County Attorney
Stephen Simons	Economic Development
Arden Kopischke	Emergency Management
Melissa Stillson	Health Services
Stewart Vander Stoep	Sheriff
Eldon Kruse	Recorder
Russ Hopp	Treasurer
Jared Ageson	Veterans Affairs

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GLOSSARY of terms to be defined in this Hazard Mitigation Plan

1. ***County***: Lyon County, Iowa
2. ***CME***: Crop Moisture Index
3. ***EF or EF-Scale***: Enhanced Fujita Tornado Scale
4. ***EPA***: Environmental Protection Agency
5. ***FEMA***: Federal Emergency Management Agency
6. ***FIRM***: Flood Insurance Rate Map or ***DFIRM***: Digital Flood Insurance Rate Map
7. ***HAZMAT***: Hazardous materials response team from Sioux City, Iowa
8. ***HLSEM***: Iowa Homeland Security Emergency Management
9. ***HMGP***: Hazard Mitigation Grant Program
10. ***IDNR***: Iowa Department of Natural Resources
11. ***IDOT***: Iowa Department of Transportation
12. ***LCEM***: Lyon County Emergency Management
13. ***NCDC***: National Climatic Data Center
14. ***NOAA***: National Oceanic and Atmospheric Administration
15. ***NWIPDC***: Northwest Iowa Planning & Development Commission
16. ***NWS***: National Weather Service
17. ***PDSI***: Palmer Drought Severity Index
18. ***Planning Committee***: Hazard Mitigation Planning Committee
19. ***LCS***: Lyon County Schools
20. ***SPC***: Storm Prediction Center
21. ***STAPLEE***: Social, Technical, Administrative, Political, Legal, Economic, & Environmental, evaluation criteria in establishing priority for hazard mitigation alternatives
22. ***State***: State of Iowa
23. ***USGS***: United States Geological Survey

Introduction

Floods, tornados, windstorms, and severe winter storms – these are all examples of natural hazards that affect Iowans each year. These events threaten thousands, even millions of dollars of property damage annually and can sometimes be fatal to persons and animals that are in harm's way. To protect lives and property from natural or man-made hazards, it is vital for local leaders to identify potential losses and take measures to prevent such losses; this process is known as hazard mitigation planning.

Hazard mitigation is defined as any sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event. Potential hazards can be natural, such as those described above or man-made such as an energy disruption/failure or transportation accidents involving hazardous materials. Mitigation encourages long-term reduction of vulnerability to natural and man-made hazards. The goal of mitigation is to save lives and reduce property damage. Mitigation actions should provide a cost-effective and environmentally sound method to reduce the enormous cost of disasters to property owners and all levels of government. Mitigation should also minimize disruption to communities by protecting critical resources and infrastructure such as water, food, shelter, energy, medical treatment, and transportation.

Background

The Federal Emergency Management Agency (FEMA) provides assistance to local governments for disaster response and recovery through the Stafford Disaster Relief and Emergency Assistance Act (Stafford Act). The Stafford Act aims at assisting communities that are affected by disasters. The Act was amended in 2000 to include The Disaster Mitigation Act of 2000. This amendment requires local governments to have adopted an approved Hazard Mitigation Plan in order to qualify for mitigation project funding. The purpose of this change is to encourage cities and counties to identify prevalent hazards and to determine appropriate mitigation strategies to protect property and save lives.

A Hazard Mitigation Plan is intended to accomplish several things. First, through the planning process, hazards that pose a risk to the community are identified. Next, an assessment of those hazards is made that takes into account the historical occurrences, probability, vulnerability, maximum threat, severity of impact and speed of onset of the hazard. Once the assessment is completed, a list of current and historic mitigation efforts is evaluated.

Once the hazards have been assessed and mitigation actions have been identified, the plan outlines implementation strategies. Some proposed projects are small in scope and thus relatively low cost. Other projects are broad in nature and would require more funding than the local community can reasonably provide. The plan highlights potential funding sources and identifies city/county departments responsible for implementation. Lastly, the plan outlines how to keep the public involved, and what steps should be taken by local government to ensure that the concept of hazard mitigation is always a priority.

When implemented appropriately, mitigation projects can save lives, reduce property damage, save public money, and protect the environment. Mitigation can reduce the enormous cost of disasters to property owners and all levels of government. In addition, mitigation can protect critical community facilities, reduce exposure to liability, and minimize community disruption.

Basis for Planning Authority

The basis for authority to create a natural hazard mitigation plan lies in Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), 42 U.S.C. 5165. This act was enacted under Section 104 of the Disaster Mitigation Act of 2000 (DMA 2000), P.L. 106-390. Section 104 is the legal basis

for FEMA's Interim Final Rule for 44 CFR Parts 201 and 206, published in the Federal Register on February 26, 2002.

Purpose

The purpose of the Lyon County Multi-Jurisdictional Hazard Mitigation Plan is to substantially and permanently reduce the county's vulnerability to natural hazards. The plan is intended to promote sound public policy designed to protect citizens, critical facilities, infrastructure, private property and the natural environment. This can be achieved by increasing public awareness, documenting resources for risk reduction and loss-prevention, and identifying activities to guide the community towards the development of a safer, more sustainable community.

Section 1. Planning participation, Participating Jurisdictions and Adoption

This hazard mitigation plan is being developed to assess the ongoing mitigation goals in each participating community, to evaluate mitigation alternatives that should be undertaken, and to outline a strategy for implementation. Building a disaster resistant community is an initiative that challenges for Lyon County and participating jurisdictions, to undertake actions that protect families, businesses, and public facilities by reducing the effects of natural and man-made disasters. Reducing the effects of natural disasters makes economic sense, and it is good public policy because it protects our citizens and our future.

1.1 Regional Planning Participation

The county and cities have developed this Multijurisdictional Hazard Mitigation Plan with planning assistance from Northwest Iowa Planning & Development Commission. Northwest Iowa Planning & Development Commission is council of governments public planning agency established by Iowa Code 28E, 28H & 28I to provide planning assistance to a nine-county area comprised of 79 cities and towns. Northwest Iowa Planning & Development Commission assisted in drafting the plan and provided input throughout the process.

1.2 Local Planning Participation

The Emergency Management Director Arden Kopischke contacted each jurisdiction to inform them that of the plan update and meeting dates, as well as follow up questions. The respective jurisdictions tried to designate hazard mitigation members which represented local government officials, utilities, police, fire, schools, businesses and the county sheriff's department. A listing of the "planning committee" is in Section 1 of this plan. The jurisdictions established the planning committee members based on their knowledge of the city/county's infrastructure, emergency response services, historical occurrences of natural disasters and willingness to participate.

Table 1.1 Planning Committee for the County and Cities		
Lyon County:	Arden Kopischke – Emergency Management	Mellissa Stillson-Public Health
	Steve Simons – Economic Development	Stewart Vander Stoep– Sheriff
Alvord	Mark Nagel- Mayor	Dennis Thielvoldt- Council
	Shawn Boster- Fire Chief	
Doon	Tim Mantel – Mayor	
	Adam Van Engen-Fire Dept	
George	Jerry Nichols – Mayor	John Eyedy-School Admin
	Billy Sprock—Fire Chief	Todd Klein-Water/Sewer
Inwood	Carol Vanderkolk – City Clerk	Scott Hanson – Maintenance
	Dan Moen - Mayor	
Larchwood	Damon Langenhorst-Fire Chief	Brian Meffert-Council
	Dean Snyders – Mayor	Ted Underberg-Council
Lester	Michael Leuthold- EMS	Ladell Frellenberger-Council
	Curtis Dourneweerd – Council	
Little Rock	Shellie VerSteeg – City Clerk	Tom VerSteeg – Fire Dept
	Jeff Kruse - Council	Joe Schilling – Fire Chief
Rock Rapids	Jordan Kordahl – City Manager	Ed Reck - Fire
	Jim Hoye – Utilities	

The public input was represented by the members of the planning committee. All of the committee members reside within the county limits. The hazard mitigation planning committee as a whole represents a good

general cross section of those interested in and representing the critical facility interests of the jurisdictions. Through the planning process, public meeting notices were posted within the community to encourage public participation and input. Before adoption of the plan public hearings were held and notice of the meeting was publicized in the Lyon County Reporter Newspaper which is considered a regional countywide newspaper with circulation across all of Lyon County. The publication in this regional circulation provided yet another opportunity for public comment and an opportunity for neighboring communities input prior to adoption. A copy of the public notice published for the public hearing prior to adoption of the plan can be seen on page ii of this planning document. Throughout the planning process all meetings were held according to Open Meeting Law Chapter 21, Code of Iowa.

Sample Notice

LYON COUNTY MITIGATION PLANNING COMMITTEE NOTICE OF PLANNING COMMITTEE MEETING

Lyon County, with assistance from NW IA Planning & Development Commission, is preparing a local Hazard Mitigation Plan for the community. The purpose of this planning process is to identify those natural hazards that pose a threat to the city and ways to mitigate against the loss of life and property from these hazards. Representatives from the school system in Lyon County are strongly encouraged to attend this public meeting and offer input on the hazard mitigation planning process. For more information, or to make arrangements for persons with disabilities or non-English speaking individuals, please contact Arden Kopischke or Erin Pingel at 712-262-7225

The Lyon County Hazard Mitigation Planning Committee will be holding a public meeting at:

Time: 7:00 p.m.

Date: July 11th, 2018

1.3 Opportunity for Neighboring Counties to Participate

All meetings were announced as public meetings and any representative from any neighboring cities or counties was welcomed and encouraged to attend. In an effort to reach out to neighboring counties, Osceola and Sioux counties were contacted and offered an opportunity to assist in the process of drafting this plan. Neither county attended any of the meetings. Below is a sample letter that was sent to these neighboring cities for their consideration.

SAMPLE NOTICE

June 27, 2016

Russell Jergens, Coordinator
Pocahontas Co Emergency Management Agency
99 Court Square
Pocahontas, IA 50574

Dear Mr. Jergens,

Lyon County is in the process of completing a Countywide Multijurisdictional Hazard Mitigation Plan Update pursuant to 44 CFR 201.6. According to FEMA regulations Lyon County must provide an opportunity for neighboring counties and cities within and surrounding Lyon County to participate in the planning process and development of this plan and to provide opportunities for the public to comment on the plan during the draft stage and prior to plan approval. There is no obligation for your county to participate in this process. The county is simply fulfilling its obligation to notify and provide the opportunity for neighboring communities to participate in this process. The Lyon County Hazard Mitigation Committee will be holding its first meeting on July 19th at 6:30pm at the Lyon County Law Enforcement Center, Training Room, Storm Lake, Iowa. The Hazard Mitigation Committee anticipates meeting on a monthly basis thereafter until the plan is completed. For more information or to answer questions, you may contact Arden Kopischke, Lyon County EMA Coordinator at (712) 749-2705 or Cara Elbert, Northwest Iowa Planning and Development at (712) 262-7225 ext 152.

Sincerely,

Cara Elbert
Northwest Iowa Planning and Development
Planner

.4 Opportunity for School Districts Participation

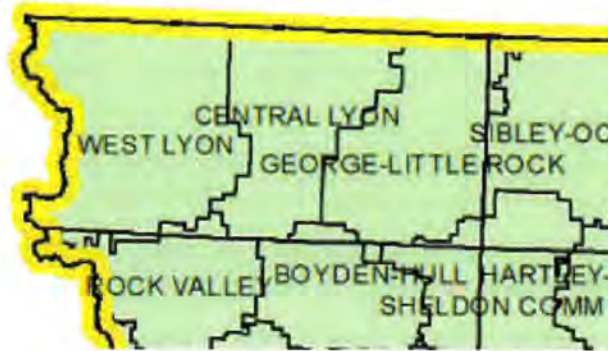
In order to be eligible for mitigation project grants, a college, university, or school district must be an active participant in a FEMA-approved State/Tribal or local plan or have an approved plan of their own that meets the requirements of 44 CFR Part 201. If the entity is participating in a multi-jurisdictional plan, the plan must specifically identify those land areas that pertain to the entity. The plan must also list the entity's specific hazards and include an analysis of those hazards. Any aspects that are unique to the entity relative to the community in which the entity is located must be clearly set forth. After the entity's hazards and risks are identified, at least one specific mitigation action must be developed to reduce the impact of future hazards on the entity. Participation does not have to be direct, but can be indirect; however, the plan must provide a narrative description of this process. Some jurisdictions or entities may lack sufficient personnel to attend planning team meetings. Those jurisdictions can delegate authority to another planning team member. It is the responsibility of the party with delegated authority to ensure that the interests of the delegating jurisdiction or entity are served.

The Lyon County Planning Committee provided an opportunity for the following School Districts:

- Central Lyon Community School
- George Community School
- Little Rock Community School
- West Lyon Community School
- Inwood Christian School
- Doon Christian School
- Northwest Iowa Protestant Reform School

They were reached out to participate in the planning process and mitigation actions of the Lyon County Multijurisdictional Hazard Mitigation Plan. We did have School Administrators who participated in this plan,

Figure 1.1 Lyon County School Districts.



1.5 Lyon County Multijurisdictional Hazard Mitigation Meetings and Minutes (Public Participation Process)

Date	Meeting Place	Countywide or City	Hours	# People	Topics Covered
8-16-2017 7pm	Rock Rapids Community Center	Countywide	2	17	Intro, Identify Natural Disasters, Hazard profiling
4-25-2018 7pm	Rock Rapids Community Center	Countywide	2	20	Review Previous Mtg, Utility Info, Hazard Scoring
5-16-2018 7pm	Rock Rapids Community Center	Countywide	2	15	Risk Assessment, Goals and Mitigation Actions
7-11-2018 7pm	Rock Rapids Community Center	Countywide	2	9	Review Previous Meetings, Critical Facilities,
5-03-2018 9am	Lester	City	1	5	Review plan, review goals from previous
5-03-2018 10am	Inwood	City	1	10	Review plan, review goals from previous plan
5-03-2018 1pm	Lester	City	1	1	Review plan, review goals from previous plan
5-03-2018 3pm	Larchwood	City	1	2	Review plan, review goals from previous plan
5-10-2018 8am	Alvord	City	1	5	Review plan, review goals from previous plan
5-10-2018 9am	George	City	1	5	Review plan, review goals from previous plan

5-10-2018 11am	Doon	City	1	2	Review plan, review goals from previous plan
5-10-2018 1pm	Rock Rapids	City	1	21	Review plan, review goals from previous plan
5-10-2018 3pm	Little Rock	City	1	2	Review plan, review goals from previous plan

The minutes and agendas for the previous meetings are in the Appendix. No public comment was received at any of the meetings. All meeting sign-ins are attached in the Appendix.

This document will be a planning effort for Lyon County and participating jurisdictions to address potential and real natural hazards, and the jurisdictions approach and efforts to mitigate against losses from these hazards. This document is intended to serve as a guide and resource document for those persons in Lyon County and participating jurisdiction that are responsible for the daily protection of the community's residents. Below is a table of all participating jurisdictions in the Lyon County Multijurisdictional Hazard Mitigation Plan.

Table 1.3: Multijurisdictional Involvement in the Lyon County Hazard Mitigation Plan				
	Abbreviation in the plan	Last Hazard Plan	Update	Represented in Plan
Lyon County	LC	Multijurisdictional 6/12/2018	YES	YES

1.6 Iowa's Open Meetings Law – Iowa Code

Iowa's open meetings law "seeks to assure, through a requirement of open meetings of governmental bodies, that the basis and rationale of governmental decisions, as well as those decisions themselves, are easily accessible to the people." All actions and discussions at meetings of governmental bodies, whether formal or informal, including work sessions, must be conducted in open session unless exceptions or exemptions are specifically provided by law. "Open session" means a meeting to which all members of the public have access.

The definition of "governmental bodies" includes school boards and any joint board established with other school districts, cities, counties or other units of government. Advisory committees created by statute are subject to the open meetings law whether or not they make recommendations on public policy issues. Advisory committees that are board-created are subject to the open meetings law if they develop and make

recommendations on public policy issues. Since it is unlikely that a board would appoint or create an advisory committee that doesn't make recommendations on public policy issues, it is safe to say that all board-created or board-appointed advisory committees are subject to the open meetings law. Any ambiguity should be resolved in favor of openness. "Meeting" means a gathering in person or by electronic means, formal or informal, of a majority of the members of a governmental body where there is deliberation or action upon any matter within the scope of the governmental body's policy-making duties. Gatherings for purely social purposes or purely ministerial duties (mandatory acts requiring no discretion or judgment) when there is no discussion of policy, are exempt from the open meetings law (Iowa Code, Chapter 21.2).

This document will be a planning effort for Lyon County and participating jurisdictions to address potential and real natural hazards, and the jurisdictions approach and efforts to mitigate against losses from these hazards. This document is intended to serve as a guide and resource document for those persons in Lyon County and participating jurisdiction that are responsible for the daily protection of the community's residents.

The Lyon County Multijurisdictional Hazard Mitigation Plan, is a updated plan. If the participating jurisdiction had a previous plan approved by FEMA, even if it is expired or current it will be considered an update this current planning document. So all jurisdictions in Lyon County were contacted and participated in developing with this plan with respects to their own community and those that had a previous plan, they updated and went of their previous information and bring it to the current.

Section 1.7 Record Review

During the development of the Lyon County Hazard Mitigation Plan, existing plans, studies, reports and technical information were reviewed. It is intended that Lyon County Multijurisdictional Hazard Mitigation Plan can be incorporated, where appropriate, into the existing plans in the county. Previously FEMA approved plans with the exception of Rock Rapids did not include information on documents and policies that were available to be included or referenced to. The list below detail documents that were reviewed:

Lyon County:

- Lyon County Comprehensive Land Use Plan
- Lyon County Zoning
- Lyon County Emergency Operations Plan
- County Recovery Plan
- Subdivision Ordinance
- Nuisance Ordinance

Alvord

- Zoning & Subdivision
- Tree Trimming Ordinance
- Nuisance Ordinance

Doon

- Doon Hazard Mitigation Plan – Expired
- Building Code
- Tree Trimming Ordinance
- Nuisance Ordinance

George

- George Hazard Mitigation Plan – Expired
- Comprehensive Plan

- Economic Development Plan
- Tree Trimming Ordinance
- Flood Ordinance
- Zoning Ordinance
- Subdivision Ordinance
- Nuisance Ordinance

Inwood

- Inwood Hazard Mitigation Plan – Expired
- Comprehensive Plan
- Local Emergency Plan
- Zoning Ordinance
- Subdivision Ordinance
- Nuisance Ordinance

Larchwood

- Larchwood Hazard Mitigation Plan – Expired
- Comprehensive Plan
- Land use Plan
- Local Emergency Plan
- Economic Development Plan
- Building Code
- Tree Trimming Ordinance
- Zoning Ordinance
- Subdivision Ordinance
- Nuisance Ordinance

Lester

- Lester Hazard Mitigation Plan – Expired
- Comprehensive Plan
- Land use Plan
- Building Code
- Zoning Ordinance
- Subdivision Ordinance
- Tree Trimming Ordinance
- Nuisance Ordinance

Little Rock

- Comprehensive Plan
- Land use Plan
- Building Code
- Tree Trimming Ordinance
- Storm Water Ordinance
- Zoning Ordinance
- Nuisance Ordinance

Rock Rapids

- Rock Rapids Hazard Mitigation Plan
- Comprehensive Plan
- Land use Plan
- Tree Trimming Ordinance

- Zoning Ordinance

„Subdivision Ordinance

- Nuisance Ordinance

Previous Disaster Declarations

July 29, 2010 – FEMA DR 1930 – 6/1/10-8/31/10

- Severe storms
- Flooding
- Tornadoes May 27, 2008 – FEMA DR

1763– 5/25/08-8/13/08

- Severe weather
- Tornadoes
- Flooding July 9, 1993 – FEMA DR

996 – 4/13/93-10/1/93

- Flooding
- Severe storms

August 14, 1969 – FEMA DR 269 – 8/14/69-8/14/69

- Heavy Rains
- Flooding April 25, 1969 – FEMA DR

259 – 4/25/69-4/25/69

- Flooding April 22, 1965 – FEMA DR

193 – 4/22/65-4/22/65

- Flooding

With a majority of the declarations being for flooding and with the past couple years of heavy rainfall greatly increased the awareness for flooding. The previous 2005 plans did not even address flooding.

Previous Disaster Declarations

July 29, 2010 – FEMA DR 1930 – 6/1/10-8/31/10

- Severe storms
- Flooding
- Tornadoes May 27, 2008 – FEMA DR

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- Flooding
- Severe storms

August 14, 1969 – FEMA DR 269 – 8/14/69-8/14/69

- Heavy Rains
- Flooding April 25, 1969 – FEMA DR

259 – 4/25/69-4/25/69

- Flooding April 22, 1965 – FEMA DR 193 – 4/22/65-4/22/65

- Flooding

06/23	2018-04	<u>Severe Storm System, June 14 and continuing</u> Lyon, Plymouth, Sioux, and Woodbury (Suspension of regulatory provisions of Iowa Code - pertaining to hours of service for disaster repair crews and drivers delivering goods and services while responding to train derailment, effective for 30 days)
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With a majority of the declarations being for flooding and with the past couple years of heavy rainfall greatly increased the awareness for flooding.

Section 1.8 Sources

The following resources were used to compile data and complete this plan include: State of Iowa Hazard Mitigation Plan (2010), National Climatic Data Center (NCDC), US Census data, Lyon County Assessor's Office, Hazard Mitigation Plans for the cities of Doon, George, Inwood, Larchwood, Lester and Rock Rapids, FEMA floodplain maps, Lyon County Zoning Ordinance and Comprehensive Plan, and critical facilities information in participating jurisdictions. These resources were used to compile information on community background information, vulnerability analysis, development of mitigation goals, critical facilities, hazard identification and profiles and historical weather events.

The information and data present in this hazard mitigation plan, was what was used for this plan. It reflects what was used at the time of creation and analysis for this plan. The state plans of 2007 and 2010 were used in creation of this plan for ideas and information.

Section 1.9 Review of Previous Hazard Mitigation Plans

If the cities or county had a previous hazard mitigation plan it was review at the city meetings to determine what had changed since that plan was approved.

1.10 Community Organizations Active in Disaster (COAD)

The Northwest Iowa COAD (NIC) consists of 11 counties in Northwest Iowa with the Board of Coordinators comprised of the Emergency Management Coordinators from each of these counties along with the volunteer base encompassing citizens from all over Region 3.

Mission – To present to the larger community a united volunteer front of support when disaster strikes in Northwest Iowa or the Region.

Goal – Actively striving towards establishing a strong volunteer base in Northwest Iowa prepared to respond to a community's devastation in the wake of disaster through partnerships with various organizations and the generosity of the public.

Our actions:

- Assistance in meeting with victims and documenting losses
- Searching debris
- Documenting volunteer hours
- Trauma counseling
- Setting up shelters
- Keeping shelters clean and hospitable
- Caring for children
- Distributing food
- Sending out crews necessary for the recovery process

Section 2. Background

2.1 Brief County History

The land that makes up Lyon County was ceded to the federal government by the Sioux Indians through a treaty signed on July 23, 1851. The boundaries of the county were set on January 15, 1851 and attached to Woodbury County (then called Waukaw County) for administration purposes. The land was originally named Buncombe County. In 1862, the name was changed to Lyon to honor General Nathaniel Lyon. General Lyon was leading the First Iowa Infantry into the Civil War Battle of Wilson's Creek in Missouri and was killed in August of 1861. It was the first battle of the Civil War to involve Iowa troops.

Although field surveys for the southern tier of townships were made in the late 1850s, Lyon County remained uninhabited by white settlers for many years. The abundance of game and fur-bearing animals brought numerous hunters and trappers through the area. Early adventurers included Daniel McLaren, Roy McGregor, George Clark, and Thomas Lockhart. Dan McLaren was the first white man to construct a cabin in the county. The cabin was along the Big Sioux River, where beaver were plentiful. Members of the local Sioux tribe were not always welcoming of these early settlers and some were slain. Others moved on to parts further west.

Eventually the county began to draw population and claims were made to land and cabins were built. Many early settlers planted trees on the vast expanse of prairie. The first schoolhouse was built near Rock Rapids in the spring of 1871. L. A. Ball was the first County Superintendent.

Lyon County was officially organized in 1872. Much of the early business of the county happened in private homes of officials, who often lived many miles apart. The tiny settlement of Beloit functioned as an early county seat, but by 1873 the county offices were centered in the town of Rock Rapids (near the geographic center of the county). Bids were let for the first courthouse in spring of 1873 and the cornerstone was laid by summer of 1874. The \$14,000 frame structure was formally dedicated in 1875.

In 1873 and 1874 there was a devastating grasshopper plague in Lyon County and much of the rest of northwest Iowa. In late 1873, the Rock Rapids Seed Company was incorporated under the laws of the State of Iowa to supply settlers with seed grain for 1874. In 1879, O.P. Miller went into partnership with James and Francis Thompson to open a bank. Another bank opened in Larchwood by 1886. In 1881, the Close brothers of England bought 19,000 acres near Larchwood and in 1882 B.B. Richards of Dubuque opened up 5,000 acres.

The first railway to come into Lyon County was the Milwaukee Railroad. The Rock Island, in 1886, gave a direct eastern outlet. A branch of the Illinois Central was built a few years later.

Lyon County continued to grow and so did county business. After 1900 there was a need to build a new courthouse. A modern structure was started in 1916 and completed in 1917. The cost of the new building was \$109,000 and an additional \$39,000 was spent on fixtures for the three-story building. The outer walls are made of cut Bedford stone lined with brick. The building measures approximately 110 feet by 71 feet and is 52 feet high. A full-size cast stone lion guards the main entryway and Italian marble lines the corridors leading to a rotunda. The building remains in nearly original condition today.

Taken from "A Sesquicentennial History of Iowa From Century to Century", vols. IV-VII, by Donald L. Kimball, published in 1996 by Historic Publications

2.2 COUNTY GOVERNMENT OVERVIEW

The Lyon county government serves as the regional government and the provider of essential services to the residents of the county. The county performs many state administrative functions such as issuance of licenses and permits. It also provides public services on a local level such as zoning ordinances, provisions for health and indigent care and the maintenance of county jails.

The Board of Supervisors for Lyon County is elected by residents from within their district. They serve a 4-year term. Meetings are held each Monday at 9:00 a.m. in the Lyon County Courthouse. While the County Board of Supervisors is the chief policymaker for the county, the administration of county government is guided by a variety of elective and appointive offices and a number of semi-autonomous boards and commissions.

Assessors are appointed to their position by a Conference Board consisting of the members of the Board of Supervisors, the Mayors of all incorporated cities and a member from each school district within the jurisdiction. A city with a population of ten thousand or more may elect to have their own assessor. The Conference Board approves the assessor's budget and after a public hearing acts on its adoption.

The Lyon County Attorney is the chief legal representative for the county. The County Attorney is elected to a four-year term by the citizens of the county.

Emergency Management is a coordinated effort, involving local, state, and federal government agencies as well as volunteer organizations and businesses. Within an integrated emergency management framework, these entities assist citizens and their communities to prepare for, respond to, recover from, and eliminate or reduce the effects of natural, man-made, civil, and technological emergencies and disasters. Because disasters start locally, county emergency management coordinators and agencies have a vital role in preparation for, response to, and recovery from disasters - both natural and man-made. County emergency management agencies are the backbone of the state's emergency management system. They provide coordination of local resources and work in partnership with HSEMD to ensure the emergency management and response communities have adequately planned, and are well-equipped, trained, and exercised.

The Northwest Iowa Development is a group of six counties creating a unified, targeted approach to developing and branding/marketing the Northwest Iowa region to attract quality new corporate locations and expansions and to attract skilled talent to support business growth. The counties that encompass Northwest Iowa include: Cherokee, Lyon, O'Brien, Osceola, Plymouth and Sioux.

2.3 TRANSPORTATION SYSTEM

Highways: State highways 9 (running east-west), 75 (running north-south) and 182 (running north-south) bisect the county and are the major routes of travel through and within the county. A short segment of state highway 18 (running east and west) also runs through the very southwest corner of the county near the South Dakota border. According to the Iowa DOT traffic survey of 2009, which records annual average daily traffic on the heavily used sections of roads and intersections in Lyon County, Highway 9 has traffic counts from 1,230 to 3,210 vehicles per day and Highway 75 has traffic counts from 1,070 to 1,430 per day. Highway 182 has traffic counts from 570 to 1,690 vehicles per day and Highway 18 has traffic counts from 1,690 to 1,910 vehicles per day.

Streets and Roads: As of January 1, 2010, according to the Iowa Department of Transportation, Lyon County's secondary road network consists of 1,010.7 total miles. Secondary roads are those roads not classified as either a federal or state highway route. Of these, 64.7 miles are considered rural primary miles

and the remaining 946 miles comprise the secondary road system. There are 3.6 miles of dirt roads, which accounts for .35% of all secondary roads in the county. Additionally, 753.3 miles of gravel roads account for 74.5% of all secondary roads in the county. Asphalt and PCC surface total 251.9 miles or 24.9% of all secondary roads in Lyon County. Currently there are 328.58 miles of farm to market roads in Lyon County. All of these farm to market roads are paved, with either asphalt or PCC.

Public Transit Services: The Regional Transit Authority (RTA) known as RIDES is the local transit provider for Lyon County. RIDES is the regional transit provider for a nine (9) county region in Northwest Iowa.

Specifically for Lyon County, RIDES provides fixed route and on demand transit services to several communities in Lyon Vista County. Anyone living in Lyon County can contact the regional transit provider for on-demand taxi service to schedule rides either inter-county or anywhere else within the nine county service area covered by RIDES. Other services provided to Lyon County residents include the Medivan. When residents of the county need transportation assistance to healthcare appointments, RIDES provides a safe, reliable form of transportation.

Railroads: The Burlington Northern and Santa Fe Railroad services Lyon County, with a rail line running north/northwest and south/southeast in the western part of the county through the towns of Lester, Alvord, and Doon.

Airports: There is one municipal airport in Lyon County: the Rock Rapids Municipal Airport. The Rock Rapids Municipal Airport is located 2 miles northwest of Rock Rapids and considered a general service airport and has an on sight attendant/manager. The airport does not offer commercial passenger service but serves small private aircraft. Its primary hard surface runway is 3,097 feet long and 50 feet wide. According to resource AirNav.com, there are 16 aircraft based at the airport and all 16 are single-engine aircraft. Operations average 67 per week, with 57% of the aircraft activity being for transient general aviation usage and 43% for local general aviation. These figures were calculated for a 12-month period ending in August of 2009.

Zangger Vintage Airpark is Lyon County's one privately owned airport. Established in 1953 and open to the public, it is located 2 miles east of Larchwood and has one 3500 foot long grass and sod runway (Source: <http://www.iowadot.gov> and <http://www.zanggervintageairpark.com/1960.htm>).

Other general aviation airports within close proximity to Lyon County include Quentin Aanenson Field Airport in Luverne, MN (10 mi N), Sibley Municipal Airport (19 mi E), Sioux Center Municipal Airport (19 mi S), Sheldon Municipal Airport (21 mi SE), and Joe Foss Field Airport in Sioux Falls, SD (26 mi W). The closest airport offering commercial air service would be Joe Foss Field/Sioux Falls Regional Airport in Sioux Falls, South Dakota. The Sioux Falls Airport is also the nearest airport offering international service.

2.4 Major Rivers/Watersheds

Watersheds are areas in which all water, sediments and dissolved materials flow or drain into a common river, lake or other body of water. Watersheds may vary in size from the largest river basins to just a few acres, but within their boundaries, all living things are linked by their common watercourse. EPA provides a number of different financial and technical resources to support local watershed protection efforts undertaken by state and tribal governments, public interest groups, industry, academic institutions, private landowners and concerned citizens. Through the EPA's Office

Figure 2.1 –Watershed Topography



of Water, along with many local groups and other federal agencies can integrate solutions and measure success of these efforts through monitoring and other data gathering.



There are two river watersheds in Lyon County, shown opposite (with the county border shown in red): the Lower Big Sioux and the Rock watershed. The major river watershed for the county is the Rock.

Figure 2.2 – River Watersheds (Source: US EPA website: <http://cfpub.epa.gov/surf/county>)

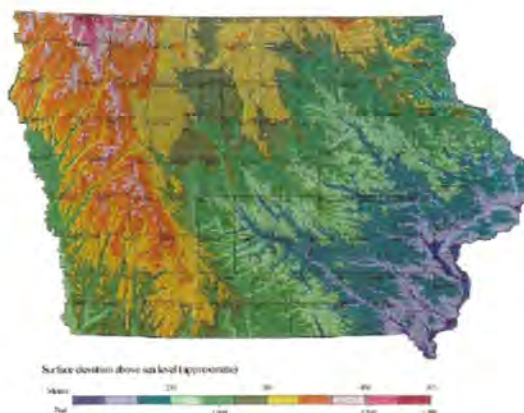
Lyon County has one man-made lake, Lake Pahoja. The major rivers of Lyon County are the Big Sioux River (forms the western border between Lyon County and South Dakota), the Little Rock River and the Rock River. The Otter River flows into the Little Rock in the far southeastern part of the county.

2.5 Elevation

The average elevation for Lyon County is between 1250 and 1525 feet above sea level.

Lyon County

Figure 2.3- Elevation Map of Iowa



2.6 Geology

The geology of Lyon County is almost entirely from the Cretaceous Era (74-102 million years ago). Iowa's geologic history lies buried beneath the ground. The deeper, older and least frequently seen portions of this history consist mostly of sedimentary rocks such as sandstone, limestone, dolomite and shale, which are over 3,000 feet thick in places.

Figure 2.4- Geology Map of Iowa



These rocks originated as layers of loose sediment accumulating in shallow seas and along coastal and floodplain environments that occupied Iowa between 74 million years ago (Cretaceous) and 530 million years. With time, this sediment hardened into rock containing fossil remains of past animal and plant life. Bedrock is occasionally exposed along the state's river valleys, at road cuts, and in quarries. Across much of the state,

the bedrock surface is covered with younger glacial-age materials. As a result, much of our information about Iowa's bedrock geology comes from rock samples brought up to the land surface during the drilling of wells. The present land surface across Iowa is dominated by loose materials much younger than the bedrock beneath. These materials consist of sediment originating from ice sheets, meltwater streams, and strong winds during a series of glacial events between 2.5 million and 10,000 years ago (Quaternary). This familiar "dirt" consists of pebbly clay, sand, gravel, and abundant silt, which over time have weathered into Iowa's

productive loamy soils. These easily eroded "Ice Age" deposits account for the gently rolling appearance of much of the Iowa (and Midwestern) landscape.



Figure 2.56 – Landform Regions

Differences observed in the landscapes across Iowa are the result of overlapping glacial advances coupled with the effects of erosion and wind. The last glacier to enter the state formed the Des Moines Lobe region (map, right) between 14,000 and 12,000 years ago. Knobby moraine ridges and numerous wetlands are the direct result of a stagnant, disintegrating ice sheet. The rest of Iowa's land surface is formed of much older glacial deposits, left between 2.5 million and 500,000 years ago.

Across southern Iowa, erosion has carved these deposits into steeply rolling, well-drained terrain (Southern Iowa Drift Plain). Across the northern half of Iowa, however, these same deposits were leveled by intense erosion activity during a peak of glacial cold between 21,000 and 16,000 years ago. The result is more gently rolling terrain across the Iowan Surface and Northwest Iowa Plains, which lie on either side of (and beneath) the Des Moines Lobe. About the same time, strong winds swept glacially ground "rock flour" from river floodplains. This airborne silt was deposited as loess across much of the Iowa landscape, and unusually thick deposits along the Missouri Valley in western Iowa became the steep, picturesque ridges of the Loess Hills. Lyon County resides entirely in the Northwest Iowa Plains landform region.

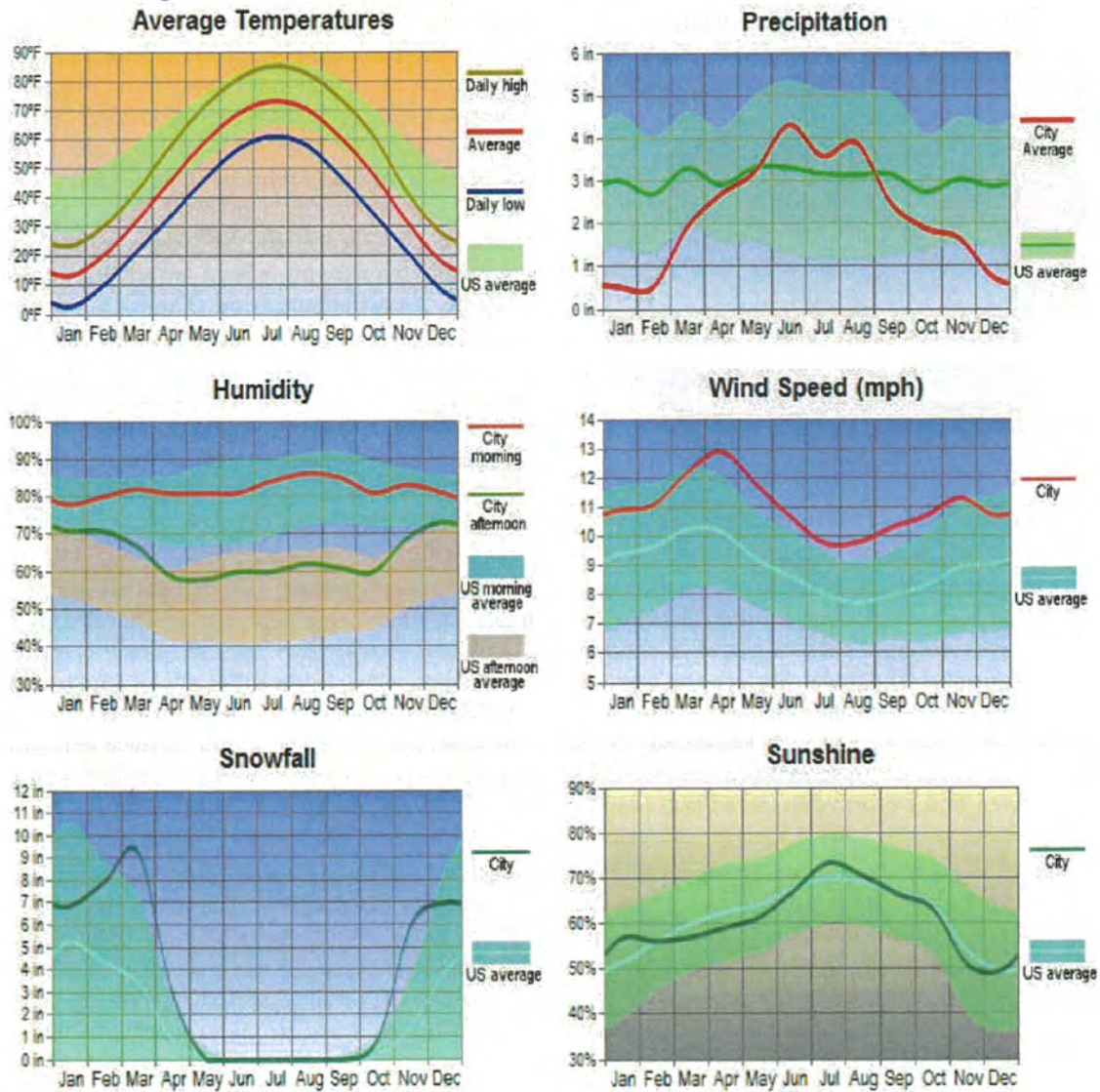
The flow of rivers is the primary geologic process affecting Iowa's landscape today (note valleys on Landform Regions map above). Many valleys, such as the Missouri and Mississippi alluvial plains, are much wider than the rivers within them, which indicates excavation by flood flows during glacial melting. Abundant gravel deposits along the valleys also reflect the power of meltwater to move coarse material. Even modern floods demonstrate how earth materials are eroded from one portion of a valley, sorted by flowing water, and redeposited downstream. Such episodes of sediment transport by rivers are an on-going part of the geologic evolution of Iowa.

Iowa's earth history continues to be shaped by slow, gradual processes as well as by brief, intense events. We live on the surface of a deep geologic inheritance, whose materials and processes – past, present, and future – affect the lives of us all.

(Adapted from *Iowa Geology 1997*, Iowa Department of Natural Resources)

2.7 CLIMATOLOGY AND WEATHER

Table 2.1 - Average Climate Data for Rock Rapids/Lyon County, Iowa



Source: <http://www.city-data.com>

2.8 HISTORICAL PLACES AND ARCHEOLOGICAL SITES

Table 2.2 - Historic Places of Lyon County

First Methodist Church (added 1978 -- #78001244) also known as **United Methodist Church**,
302 S. Carroll St., Rock Rapids, IA



Historic Significance:Architecture/Engineering
Architect, builder, or engineer:Schwartz, Joseph
Architectural Style:Romanesque, Other
Area of Significance:Architecture
Period of Significance:1875-1899
Owner:**Local**
Historic Function:Religion
Historic Sub-function:Religious Structure
Current Function:Religion
Current Sub-function:Religious Structure

Klondike Bridge (added 1998 -- #98000510)
180th St. over Big Sioux River, Larchwood, IA



Historic Significance:Architecture/Engineering
Architect, builder, or engineer:Western Bridge & Construction
Co., Iowa State Highway Com.
Architectural Style:Other
Area of Significance:Engineering
Period of Significance:1900-1924
Owner:**Local**
Historic Function:Transportation
Historic Sub-function:Road-Related
Current Function:Vacant/Not in Use

Kruger Mill (added 2003-- #75000696) also known as **Klondike Mill**
SW of Larchwood on Sioux River, Larchwood, IA



Historic Significance:Event
Area of Significance:Agriculture/Industry
Period of Significance:1875-1899
Owner:**Private**
Historic Function:Industry/Processing/Extraction
Historic Sub-function:Manufacturing Facility
Current Function:Vacant/Not in Use

Big Sioux Prehistoric Prairie Procurement System Archaeological District ** (added 1989 --
#88001169) Address Restricted , Klondike



Historic Significance: Information Potential
 Area of Significance: Prehistoric
 Cultural Affiliation: Late Prairie Archaic, Early-Middle Archaic, Plains Woodland
 Period of Significance: 8999 BC -1900 AD
 Owner: **State, Private**
 Historic Function: Domestic, Industry/
 Processing/Extraction
 Historic Sub-function: Camp, Processing Site
 Current Function: Agriculture/Subsistence, Landscp
 Current Sub-function: Agricultural Fields, Forest

Blood Run Site (added 1970 --#70000246)
Address Restricted, Sioux Falls, SD



Historic Significance: Information Potential
 Area of Significance: Prehistoric, Historic-Aboriginal
 Cultural Significance: Oneota, Upper Miss, Woodland
 Period of Significance: 1749-1500 AD, 1499-1000 AD
 Owner: **Private**
 Historic Function: Domestic, Funerary
 Historic Sub-function: Graves/Burial, Village Site
 Current Function: Agriculture/Subsistence
 Current Sub-function: Agricultural Fields

Broad View Ranch Historic District (added 1994 -- #94001137)
2572 Log Ave., Sheldon, IA

Historic Significance: Event
 Area of Significance: Agriculture
 Period of Significance: 1925-1949, 1900-1924, 1875-1899
 Owner: **Private**
 Historic Function: Agriculture/Subsistence, Domestic
 Historic Sub-function: Agricultural Fields, Agricultural Outbuildings, Single Dwelling
 Current Function: Agriculture/Subsistence, Domestic
 Current Sub-function: Agricultural Fields, Agricultural Outbuildings, Single Dwelling

Burlington, Cedar Rapids and Northern Railroad – Rock Rapids Station, Railroad Track and Bridge (added 1976 -- #76000783) also known as Rock Rapids Depot, Bridge # 2834, track and hand switch, North Story Street, Rock Rapids, IA



Historic Significance: Event
 Area of Significance: Transportation
 Period of Significance: 1850-1874
 Owner: **Private**
 Historic Function: Other, Transportation
 Historic Sub-function: Rail-Related
 Current Function: Education, Transportation

Duncan-Duitsman Farm Historic District (added 1994 - - #94001138)
4324 180th St. George, IA

Historic Significance: Architecture/Engineering, Event
 Architect, builder, or engineer: Unknown
 Architectural Style: No style listed
 Area of Significance: Architecture, Agriculture,

Exploration/Settlement
 Period of Significance:1925-1949, 1900-1924, 1875-1899
 Owner:**Private**
 Historic Function:Agriculture/Subsistence,
 Domestic
 Historic Sub-function:Agricultural Fields, Agricultural
 Outbuildings, Single Dwelling
 Current Function:Agriculture/Subsistence, Vacant
 Current Sub-function:Agricultural Fields

Lakewood Farm Historic District (added 1994- - #94001139)
 2146 Grant Ave., Rock Rapids, IA



Historic Significance:Person, Event
 Historic Person:McMillan, Horace Greeley
 Area of Significance:Agriculture
 Period of Significance:1900-1924, 1875-1899
 Owner:**Private**
 Historic Function:Agriculture/Subsistence,
 Domestic
 Historic Sub-function:Agricultural Fields, Agricultural
 Outbuildings, Single Dwelling
 Current Function:Agriculture/Subsistence, Vacant
 Current Sub-function:Agricultural Fields, Outbuildings

Lyon County Courthouse (added 1979- - #79000913)
 3rd and Story Sts., Rock Rapids, IA

Historic Significance:Architecture/Engineering
 Architect, builder, or engineer:Schwartz, Joseph
 Architectural Style:Beaux Arts
 Area of Significance:Agriculture
 Period of Significance:1900-1924
 Owner:**Local**
 Historic Function:Government
 Historic Sub-function:Courthouse
 Current Function:Government
 Current Sub-function:Courthouse

Melan Bridge (added 1974- - #74000797)
 E of Rock Rapids in Emma Sater Park, Rock Rapids, IA



Historic Significance:Architecture/Engineering
 Architect, builder, or engineer:Hewett, W.S., Olsen, John
 Architectural Style:Other
 Area of Significance:Engineering
 Period of Significance:1875-1899
 Owner:**Local**
 Historic Function:Transportation
 Historic Sub-function:Road-Related
 Current Function:Landscape, Transportation
 Current Sub-function:Pedestrian Related

Reynolds, Charles B., Round Barn (added 1999- - #99000737) also known as Jansma, Tunis Round Barn,
 2382 Harrison Ave., Doon, IA

Historic Significance:Architecture/Engineering Architect, builder, or engineer:Reynolds, Charles B.
Architectural Style:Other

Area of Significance:Agriculture, Architecture Period of Significance:1900-1924

Owner:**Private**

Historic Function:Agriculture/Subsistence Historic Sub-function:Animal Facility

Current Function:Agriculture/Subsistence Current Sub-function:Animal Facility

Source: National Register of Historic Places: <http://www.nationalregisterofhistoricplaces.com/LA/Lyon>



2.9 POPULATION AND DEMOGRAPHICS

Population analysis plays a critical role in the planning process. Analysis of past trends and current population structure is important in making future population projections. Those projections, along with information about population characteristics such as age, are fundamental in considering the need for current and future mitigation activities and infrastructure improvements. This section will examine past trends, future projections, and current structure, and discuss their impact on the future of Lyon County.

Population Trends (History and Future Projections)

Shifts and growth in population play a critical role in the planning process. Analysis of past trends and current population structure is important in making future population projections. Those projections, along with information about population characteristics such as age and household size, are fundamental in considering the need for future infrastructure improvements and the need for the development of residential, commercial and industrial areas. This section will examine past trends, current structure, future projections, and discuss their impact on the future of Lyon County.

Lyon County's first recorded census was in 1870. Its population was only 221. From there the county population grew rapidly until 1900 and then steadily until 1920, when its highest population was recorded at 15,431. The population remained fairly steady through the 1920's, 1930's and 1940's. Since 1940, the county has experienced a slight decrease every decade. During the 60s decade, Lyon County experienced its largest recorded population decline of 1128 residents or a decline of 7.8%. In the most recent decade from 2000 to 2010, Lyon County lost 182 residents for a population decline of 1.5%

Table 2.3 - Historic Population Trends, Lyon County

YEAR	1900	1910	1920	1930	1940	1950	2017
POPULATION	13,165	14,624	15,431	15,293	15,374	14,697	11,792
YEAR	1960	1970	1980	1990	2000	2010	
POPULATION	14,468	13,340	12,896	11,952	11,763	11,581	

As of the 2010 Census, Lyon County has a total population of 11,581 persons, estimated population in 2017 of 11,792 of which 4,746 are rural residents. From 2000 to 2010, the rural unincorporated population of Lyon County decreased from 5,016 to 4,746, a difference of 270 residents and a 5.4 percent decrease. This trend is typical of most other counties across northwest Iowa who are also experiencing a loss of rural population.

Of the total population, 49.9 percent, or 5,783, are male, while 50.1 percent, or the remaining 5,798 residents, are female. This proportion of males to females is typical of the area due to the longer life expectancy of females.

The median age of 38.7 years for Lyon County residents is slightly higher than that of the State of Iowa, which is at 38.1. The aging factor in Lyon County is also unfortunately reflected in the declining enrollment of the local school districts. Nearly 16.8 percent of the county's 2010 population or 1,946 persons meet the U.S. Census' definition of elderly, which includes persons aged 65 and older. This demonstrates a clear need for special consideration when providing future county services and planning future land use growth decisions.

The 2010 Census for Lyon County indicated that 97.9 percent of the county's population were identified as White, while 9 residents were American Indian, 10 individuals are Black or African American and 25 more residents are identified as Asian. According to statistics, there are 70 persons that declared "two or more

racess". Of all races, 212 persons in Lyon County declared they were of Hispanic or Latino decent constituting 1.8% of the total population. These numbers of minorities are important when determining the services that are to be provided. As these segments of the population continue to grow, the county's policies and goals with respect to personnel and service provisions may need to be evaluated and adjusted.

Individually, population trends among Lyon County's cities have varied widely over the past 20 years. During the 1980s, the populations of only two of the eight cities grew, while the remainder saw population losses. This trend continued during the 1990's when only three of the cities in Lyon County experienced population gains varying from 6.0% percent (Inwood) to 11.9% percent (Doon). The town of Larchwood is the only community that has steadily gained population from 1980 (701) to 2010 (866). Many of the communities have either steadily lost population or have moved up and down by single digit percentages. The largest city and county seat of Rock Rapids, has lost population by a range of 1-3% each decade since 1980.

While many Iowa counties have seen a shift in population from rural areas to urban centers in the county, Lyon county has seen a gradually decrease in population in both sectors. Lyon County's total population has decreased approximately 10% since 1980, while the rural population of Lyon County has seen a 20% decrease in population since 1980. Overall, the city totals for Lyon County have decreased approximately 1.5% since 1980. In this case, as farm sizes grow and more large corporate farms emerge, the population not only has shifted away from rural townships, residents may be moving entirely out of the county to larger urban centers such as nearby Sioux Falls, South Dakota or further.

Table 2.4 - Population Trends of Communities in Lyon County

City	1980	1990	2000	2010	2020 (est.)	2030 (est.)
Alvord	246	204	187	196	189	188
Doon	537	476	533	577	557	554
George	1241	1066	1,051	1,080	1003	997
Inwood	755	824	875	814	780	775
Larchwood	701	739	788	866	914	997
Lester	274	257	251	294	250	249
Little Rock	490	493	489	459	445	443
Rock Rapids	2693	2601	2,573	2,549	2452	2438
Total City	6937	6660	6,747	6835	6959	6641
Rural	5959	5292	5,016	4,746	4553	4443
Total County	12,896	11,952	11,763	11,581	11,147	11,084

Source: US Census Bureau, 1980, 1990, 2000 Census. Total county estimates from Woods and Poole, Inc.

Note: Individual city estimates, total city estimates and rural estimates for 2010 and 2020 were calculated using average percentages of county total estimates. For example if the city of Alvord's population in 1980, 1990 and 2000 represented approximately 2% of the total county population, then the estimated population for 2010 and 2020 were calculated using 2% of the projected total county population for those years.

Table 2.5 – Estimated Population & Persons per Household

YEAR	LYON COUNTY POPULATION	PERSONS PER HOUSEHOLD FOR LYON COUNTY
1970	13,340	3.22
1980	12,896	2.83
1990	11,952	2.75
2000	11,763	2.61
2010	11,581	2.48
2015	11,181	2.42
2020	11,147	2.37
2025	11,117	2.34

2030	11,084	2.32
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Source: Census Data 1970- 2010; 2015 to 2030 are projections extrapolated from Woods & Poole Inc

Of particular interest is the declining size of households in Lyon County. Between 1970 and 2010 the average persons per households has decreased from 3.22 to 2.48. Future projections indicate a continuing trend in declining household size, down to a projected low of 2.32 in 2030. The decline in household size is typically attributed to an aging population, the decline in family size, and an increase in the divorce rate, which can create additional households with no increase in population. With a projected declining household size, and a projected decreasing population, this may have a complex impact on predicting the number of future housing units required in future years to accommodate the county's housing needs. As experienced in recent trends throughout Lyon County, Woods and Poole data predicts the county's population will continue to decrease, with a population estimate of 11,084 by the year 2030.

2.10 CURRENT POPULATION STATISTICS

As of the census of 2010, there are 11,581 people, 4,442 households, and 3,237 families residing in the county. The population density is 19.7/square mile. The racial makeup of the county is 99.4% White, 0.1% Black or African American, 0.1% Native American, 0.2% Asian, 0.0% Pacific Islander, 1.1% from other races, and 0.6% from two or more races. 1.8% of the population is Hispanic or Latino.

2.11 HOUSING CHARACTERISTICS AND OCCUPANCY

There were 4,848 housing units in Lyon County according to the 2010 Census. There were 4,442 households out of which 32.1% had children under the age of 18 living with them, 64.6% were married couples living together, 5.3% had a female householder with no husband present, and 27.1% were non-families. 24.6% of all households were made up of individuals and 12.4% had someone living alone who was 65 years of age or older. The average household size was 2.57 and the average family size was 3.08.

In the county the population was spread out with 27.7% under the age of 18, 6.5% from 18 to 24, 22.8% from 25 to 44, 26.0% from 45 to 64, and 16.8% who were 65 years of age or older. The median age was 38.7 years. For every 100 females there were 95.00 males. For every 100 females age 18 and over, there were 95.9 males.

2.12 AGRICULTURAL TRENDS

Agriculture is historically and remains one of the primary economic sectors in Lyon County. The 2007 Census of Agriculture counted 2,204,792 farms in the United States, according to results released by the U.S. Department of Agriculture's National Agriculture Statistics Service. Since the last census in 2002, the number of reported U.S. farms increased 4 percent. In Iowa the number of farms increased by 2 percent to 92,856. In Lyon County the number of farms increased by 4% to 1,087 in 2007. The amount of land in farms in the county decreased by 5%, going from 341,534 acres in 2002 to 323,054 acres in 2007. The average farm size in Lyon County decreased from 327 to 297 acres.

Nationally, the latest census results show a continuing trend towards smaller and very large farms and fewer mid-sized operations--a trend echoed in Iowa. Overall, the majority of U.S. farms are smaller operations with more than half characterized as residential/lifestyle or retirement farms.

In addition to looking at all aspects of farming, the Census of Agriculture provides a comprehensive look at operator demographics--with 2007 results indicating that farmers continue to become more diverse. The 2007 Census counted nearly 30 percent more female principal farm operators in the United States, while the count in Iowa increased by 36 percent from 2002. Nationwide, the count of Hispanic operators grew by 10 percent, and the counts of American Indian, Asian and Black farm operators increased as well.

With changing trends in farming experienced in Lyon County, northwest Iowa, and the state, continued shifts in farming can be expected in the future. One of the criteria that will have significant impact on future trends in the agricultural economy in both Iowa and Lyon County is the value of agricultural land. The land value measure dictates to farmers and farm corporations how much equity they have in their land based against their debt and often is the factor allowing agricultural operations to borrow funds for new equipment and operations. Lyon County, like most of Northwest Iowa, is fortunate to have some of the most nutrient rich black topsoil in the state, therefore keeping land values higher than statewide averages.

Lyon County's primary agricultural commodities include corn, soybeans, hogs, and cattle. Market prices for all of these commodities have increased over the past ten years (as shown in Table 10). Yields for Lyon County from 2001-2010 averaged 174 bushels/acre for corn and 51 bushels/acre for soybeans.

Table 2.6 - Average Annual Market Prices

Commodity	2000 Average Price	2005 Average Price	2010 Average	2017 Average	Peak Price
Corn (per bushel)	\$1.78	\$1.90	\$3.86	4.01	\$6.60 (Jun'11)
Soybeans (per bushel)	\$4.67	\$5.88	\$9.87	9.96	\$13.30 (Jun'11)
Hogs (US #1-2 210-240 lb. barrows and	\$42.76	\$49.43	\$56.30	58.60	\$69.21 (Apr'11)
Cattle (Choice Steers)	\$69.31	\$86.99	\$94.32	96.56	\$120.55 (Apr'11)

Source: www.extension.iastate.edu/agdm

Section 3. Identifying Hazards

There are many different natural events such as floods, tornadoes, thunderstorms and extreme heat incidents that have adverse affects on the public safety and welfare of a community. The Hazard Analysis and Risk assessment focuses your attention on areas most in need by analyzing the populations and facilities that are most vulnerable to natural and man-made hazards and to what extent damages may occur. The risk assessment identifies how people properties and structures will be damaged due to a hazardous event. If the hazard can harm structures and people, they are considered vulnerable. Finding weak points in the system include identifying building types that are vulnerable to damage and anticipating the loss in high risk areas. This will help the community to decide what mitigation efforts are required or should be undertaken and how to implement the selected activities. A community can best prepare for mitigation by understanding the following:

- What hazards is your community susceptible to;
- What these hazards can do to physical, social, and economic resources;
- Which areas are most vulnerable to damage from these hazards; and
- The resulting cost of damages or cost avoided through future mitigation projects.

The first step in the analysis is to identify all hazards that have occurred or that could potentially affect the community. The list of potential hazards that can occur in Iowa and examined in the Plan comes from the 2010 State of Iowa Hazard Mitigation Plan. The State of Iowa 2010 Plan identifies 16 natural hazards that may affect all or parts of the State of Iowa. (The Lyon County Hazard Mitigation Plan, specifically this section, addresses 14 of the 16 identified natural hazards identified in the State of Iowa) This identification process allows the local planning committee to examine the statewide listing of all hazards and make a local determination of which hazards have already affected Lyon County, which hazards may affect the county in the future and which hazards will likely not impact the county at all.

The planning committee's next step was to profile each hazard that was identified from the first step. Through the profiling process the planning committee discussed historical occurrences, the probability of the hazard occurring again in the future, the vulnerability of the population that will be affected by the hazard, the maximum geographic extent, the severity of the hazard in terms of injuries/fatalities, personal property, and infrastructure, and the speed of onset or warning time available before the hazard occurs. Table 3.1 shows which hazards were identified as either have occurred or potentially could occur in your Lyon County, and how each of the hazards was profiled.

The first step in the analysis is to identify all hazards that have occurred or that could potentially affect the community. The planning committee's next step was to profile each hazard that was identified from the first step. Through the profiling process the planning committee discussed probability of occurrence in any given year; magnitude and severity of impact in terms of life, property, infrastructure, etc; amount of warning time available before the hazard occurs; duration of the hazard's impact on the state.

The 2005 plans looked at anywhere from 13 to 19 hazards, they included: Summer storm, severe winter storm, tornado, fixed/transportation hazardous material incident, energy disruption, transportation hazard, structural fire, pipeline incident, terrorism/attack, drought, extreme heat/cold, communication failure, grass or timber fire, structural failure, river flood, flash flooding, animal disease, human disease, air transportation incident, and rail incident. Not all plans looked into flash flood which has been increasing important especially in northwest Iowa in recent flooding events of 2008 and 2011. The planning committee determined that it would like to concentrate on the natural hazards of the State 2010 plan and the risk assessment and vulnerability had to be created from scratch. The 2011 Rock Rapids plan included the State's 16 natural hazards which are reflected in this plan. The technical hazards were removed because are unlikely to impact the rural agriculturally based Lyon County with a widely dispersed population. Also the technical hazards are

not required and resources are limited, the planning committee determined to concentrate on the natural hazards in accordance with FEMA regulations.

The planning committee reviewed data for those hazards selected, which is supplied in this section. After each hazard was scored, the overall planning committee ranked them based on the score for each. Then each community was then able to rank them to their liking, as an example some communities didn't have a river in their city and then removed that from their chart. Each community was then able to change the ranking if they thought their community was more susceptible to the hazard than the county. Each community's rankings are supplied in the city data section towards the back of this plan.

Table 3.1 Identified Hazards

Natural Hazards	Has Occurred	Potentially Could Occur	Unlikely to Occur	Hazard
	X			Drought
			X	Earthquake
			X	Expansive Soils
	X			Extreme Heat
	X			Flash Flood
	X			Landslide
	X			River Flood
	X			Severe Winter Storm
		X		Sinkhole
	X			Thunderstorm and Lightning and Hail
	X			Tornado and Windstorm
		X		Dam Failure
		X		Levee Failure (Includes Over Topping)
	X			Grass or Wildland Fire

The previous table again shows the 14 natural hazards that can occur in Iowa, as indicated in the State of Iowa Hazard Mitigation Plan. Of the 14 hazards there were two that did not receive a: has occurred or could occur in any of the jurisdictions. There for those two will not be profiled, which are earthquake and expansive soils. The Planning Committees determined that because they pose no threat or possibility to occur within the community or jurisdiction. These two hazards will no longer be addressed or discussed throughout the remainder of this plan. The following are the hazards that were decided by the planning committees *unlikely to occur* in the community, along with why each of these identified hazards will not occur.

- *Earthquake* – The information and data presented below are the supporting reasons why the all planning committees decided to eliminate this hazard for this plan. The planning committees recognizes certain portions of southern and central Iowa have the potential to be affected by earthquakes, however the planning committee also believes the potential for negative effects in Lyon County to be minuscule, if any. According to the Iowa Hazard Mitigation Plan, the state is located in low risk Seismic Zones 0 and 1. Although this does not mean an earthquake will not happen in Iowa, it does provide a relatively assured measure that the vulnerability of cities in Iowa, especially northwest Iowa is considerably low. Iowa has only experienced 13 total earthquakes in the past 175 years, most of which have occurred along the Mississippi corridor (eastern Iowa) and in southern Iowa. In the limited possibility that an earthquake hits northwest Iowa, property damage would be minimal. Again, according to data from the Iowa State Hazard Mitigation Plan, seismologists attempt to forecast earthquakes. Professionals estimate a 90% chance of a magnitude 6.0 earthquake occurring within the New Madrid Fault Zone by the year 2040. This magnitude of earthquake in Missouri would create an estimated 4.0 magnitude or less effect in Iowa, resulting in minimal damage and little or no fear. City of George included this in their 2005 plan, but determined in this plan update that it was unlikely to affect George in a way that would hinder normal daily activity.

- *Expansive Soils* – The local planning committees determined that this hazard would be “unlikely to occur” in the Lyon County region and the affects would be negligible. The information and data presented below are the supporting reasons why the local planning committee decided to eliminate this hazard in the updated plan. According to the NRCS (Natural Resource Conservation Service) Soil Survey for Lyon County, Iowa, there are very few soils within the Lyon County that show properties conducive to extreme expansive properties. Additionally, planning committees and community leaders report that no history of expansive soils or incidents relating to any damages or problems resulting from soil subsidence.

The Planning Committee determined that it would be best to leave all other potential hazards up for discussion and then, if through further research or discussion hazards that were not seen as a threat to Lyon County could be eliminated by the team.

Section 4. Profiling Hazards and Risk Assessment

Hazard Scoring Methodology

The assessment of the risk to people and property in Iowa from a variety of hazards requires a tremendous amount of data from all levels of government and the private sector. To accomplish this task and to do it as objectively as possible, a number of factors were taken into account:

- Probability of occurrence in any given year;
- Magnitude and Severity of impact in terms of life, property, infrastructure, etc;
- Amount of warning time available before the hazard occurs;
- Duration of the hazard's impact on the state.

The economic impact of disasters is a relatively new area of record-keeping and is generally restricted to major disasters involving both state and federal funding. Smaller, less significant events often do not reflect the economic impact of the incident. For these smaller events, there is a greater reliance on local information and records of impacts.

Members of the State Hazard Mitigation Team were asked to discuss each of the hazards. They were also asked with respect to the agency's goals and mission for their expertise and input as to applicable hazards considered in the hazard mitigation plan using the updated methodology for scoring.

This hazard analysis seeks to strike a balance between evaluation criteria, for example, the evaluation of low probability-high impact events versus high probability-low impact events. Each category of a particular hazard is rated on a scale of one (1) through four (4). Totaling and averaging categorical ratings will provide an overall rating for each hazard (for a total average in the range of 1 to 4). The hazard worksheet score was recorded in the worksheet score column of the composite scoring worksheets.

It was important for the assessment team to score each hazard as a single event. Only impacts from that particular hazard were to be considered in the analysis. The effects of applying an additional methodology to analyze the effects of cascading hazards were considered for application in the new methodology but it was determined that this added analysis yielded little to no effect on the overall scoring of hazards and analysis of vulnerability to individual hazards.

A scale of one (1) through four (4) was used in all of the scoring guide tables outlined on pages 8 and 9 of this section because of the large variation in historical occurrences and probabilities, percentages of vulnerabilities and spatial extent, the number of casualties, or the value of property damaged. Often this data was not available or would have been impossible to extract from aggregate data. Using this scale provided the best option for comparison of vastly different types of hazards. The use of overlapping values between each of the categories was analyzed but decided against due to the nature of including a proper narrative with the scoring. Other hazard analyses across the country have used the "high, medium, and low" criteria to score the categories. Using a quantifiable system gives more detail and still allows for adjustments where necessary.

The idea of weighting certain categories relative to the other categories was discussed and considered. It was determined that Iowa would use a weighting criteria to allow for state priorities to be reflected in the final scoring of the hazards and to allow for a higher priority to be placed on hazards that have a higher occurrence in the state and have a high potential for adverse impact. Using the four elements described above the formula the SHMT determined to be the most effective for the Iowa risk analysis was determined with the justification that Iowa's priorities in criteria considers the probability and historical occurrence of a hazard is the highest priority for mitigation with the duration that the hazard affects Iowa being the lowest. The formula used for this risk assessment is as follows:

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

Probability

This is a measure of how many times has this hazard occurred in the past. Each hazard may or may not have a comprehensive documented historical record. Local, state, and federal government agencies have increasingly improved record-keeping with respect to incidents, accidents, and disasters which affect people and property. The National Weather Service, a division of the National Oceanic and Atmospheric Administration (NOAA) maintains a thorough history of weather events, as does the State Climatologist's office. Agencies in recent years have initiated record-keeping efforts in the areas of hazardous materials incidents, transportation accidents, and fires.

The probability score reflects the likelihood of the hazard occurring again in the future, considering both the hazard's historical occurrence and the projected likelihood of the hazard occurring in any given year. Many times, the historical occurrence can be extrapolated into the future using best available data, but others, due to the nature of the hazard are more difficult to estimate the probability of future occurrence. If a hazard or its impacts have been mitigated against, the probability of future occurrence decreases. Conversely, hazards that have not occurred in the past may present themselves to the community in the future.

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

Magnitude / Severity

The magnitude of the impact of a hazard event (past and perceived) is related directly to the extent that hazards affect the State and is measured using technical measures specific to the hazard (ideally determined with standard scientific scales). This is also a function of when the event occurs (year-round, seasonal), the location affected (both geographically and non-geographically determined), the resilience of the community, and the effectiveness of the emergency response and disaster recovery efforts.

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 state		
Score	Description	
1	Negligible	• Less than 10% of property severely damaged, shutdown of facilities and services for less than 24 hours, and/or injuries/illnesses treatable with first aid
2	Limited	• 10% to 25% of property severely damaged, shutdown of facilities and services for more than a week, and/or injuries/illnesses that do not result in permanent disability
3	Critical	• 25% to 50% of property severely damaged, shutdown of facilities and services for a 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

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

Warning Time: Rating of the potential amount of warning time that is available before the hazard occurs	
Score	Description
1	More than 24 hours warning time
2	12 to 24 hours warning time
3	6 to 12 hours warning time
4	Minimal or no warning (Up to 6 hours warning)

Duration

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

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

The scoring was based on the scoring criteria from the previous criteria tables. Scores for each jurisdiction that identified the hazard is shown on the first table of each hazard. The scoring is reflected by the scoring criteria and the determination of the planning committee. Data is from the NCDC that present in the plan is the data that was available when the committee was determining their scores.

Table 4.1 – Scoring hazards for Lyon County

	Probability Score			Magnitude Severity Score			Warning Time Score			Duration Score			Score	
Drought	3	x	0.45	2	x	0.3	1	x	0.15	4	x	0.1	=	2.5
Extreme Heat	4	x	0.45	1	x	0.3	1	x	0.15	3	x	0.1	=	2.55
Flash Flood	4	x	0.45	3	x	0.3	4	x	0.15	3	x	0.1	=	3.6
Landslide	2	x	0.45	2	x	0.3	4	x	0.15	4	x	0.1	=	2.5
River Flood	4	x	0.45	3	x	0.3	3	x	0.15	4	x	0.1	=	3.55
Severe Winter Storm	4	x	0.45	4	x	0.3	2	x	0.15	4	x	0.1	=	3.7
Sinkhole	1	x	0.45	1	x	0.3	4	x	0.15	4	x	0.1	=	1.75
Thunderstorm and Lightning , Hail	4	x	0.45	3	x	0.3	3	x	0.15	1	x	0.1	=	3.25
Tornado/Windstorm	4	x	0.45	3	x	0.3	4	x	0.15	1	x	0.1	=	3.4
Dam Failure	1	x	0.45	2	x	0.3	4	x	0.15	4	x	0.1	=	2.05
Levee Failure	2	x	0.45	2	x	0.3	4	x	0.15	4	x	0.1	=	2.5
Grass or Wildland Fire	4	x	0.45	2	x	0.3	4	x	0.15	2	x	0.1	=	3.2
Source: Lyon County Hazard Mitigation Committee														

4.2 - Lyon County	
1	Severe Winter Storm
2	Flash Flood
3	River Flood
4	Tornado/Windstorm
5	Thunderstorm and Lightning/Hail
6	Grass and Wildland Fire
7	Extreme Heat
8	Landslide
9	Levee Failure
10	Drought
11	Dam Failure
12	Sinkhole

Source: Lyon County Planning Committee

**This hazard scoring, which was completed by the Lyon County Hazard Mitigation Planning Team, was used for all jurisdictions in Lyon County. The hazard ranking comprised from the scoring was given to each jurisdiction and the jurisdictions identified which hazards could impact them and re-ranked the hazards according to their historical knowledge of their community.*

Table 4.3 - Jurisdiction Abbreviation In This Plan

Lyon County	=	LC	Larchwood	=	LA
Alvord	=	AL	Lester	=	LE
Doon	=	DO	Little Rock	=	LR
George	=	GE	Rock Rapids	=	RR
Inwood	=	IN			

Table 4.4 – Hazards selected for jurisdictions

	Alvord	Doon	George	Inwood	Larchwood	Lester	Little Rock	Rock Rapids	Unincorporated Lyon County
Drought	X	X	X	X	X	X	X	X	X
Extreme Heat	X	X	X	X	X	X	X	X	X
Flash Flood	X	X	X	X	X	X	X	X	X
Landslide									X
River Flood			X			X	X	X	X
Severe Winter Storm	X	X	X	X	X	X	X	X	X
Sinkhole									X
Thunderstorms and Lightning/ Hail	X	X	X	X	X	X	X	X	X
Tornado/Windstorm	X	X	X	X	X	X	X	X	X
Dam Failure								X	X
Levee Failure	X		X	X	X		X	X	X
Grass/Wildland Fire	X	X	X	X	X	X	X	X	X

Drought

4.1.1 Definition and description:

Drought is defined as a period of prolonged lack of precipitation for weeks at a time producing severe dry conditions. There are four (4) types of drought conditions relevant to Iowa:

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

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

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

4.1.3.

4.2.2. Hazards Identified by Jurisdiction:

The table below shows which jurisdictions identified Extreme Heat as a hazard they are susceptible to.

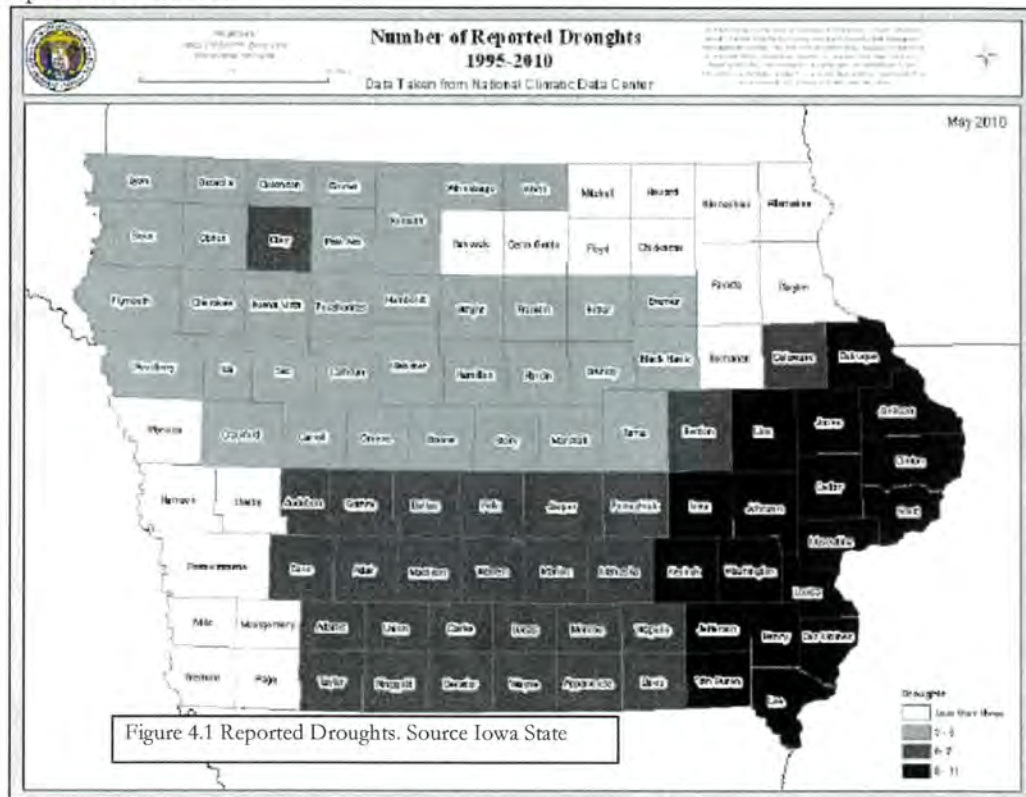
	Unincorporated Lyon County	Alvord	Doon	George	Inwood	Larchwood	Lester	Little Rock	Rock Rapids
Drought	X	X	X	X	X	X	X	X	X

Table 4.5 Iowa Drought Events. Source Iowa State Plan. **Probability:**

Drought Period	Geographic Impact
8/1/95 – 8/31/95	Statewide
7/20/99 – 7/30/99	24 percent of the state
11/1/99 – 11/30/99	11 percent of the state
12/1/99 – 12/31/99	11 percent of the state
2/1/00 – 2/29/00	11 percent of the state
3/1/00 – 3/31/00	11 percent of the state
4/1/00 – 4/30/00	11 percent of the state
8/14/00 – 8/31/00	32 percent of the state
9/1/00 – 9/5/00	32 percent of the state
9/1/01 – 9/23/01	51 percent of the state
9/1/03 – 9/31/03	51 percent of the state
7/1/05 – 7/31/05	20 percent of the state
8/1/05 – 8/31/05	20 percent of the state
9/1/05 – 9/30/05	20 percent of the state
10/1/05 – 10/31/05	20 percent of the state
11/1/05 – 11/30/05	18 percent of the state
12/1/05 – 12/31/05	18 percent of the state
1/1/06 – 1/31/06	18 percent of the state
2/1/06 – 2/28/06	17 percent of the state
3/1/06 – 3/31/06	16 percent of the state

The committee determined that the 'Occasional' drought would affect the county. They concluded that there could be a 1 in 5 chance to occur in any given year.

During the period from 1980 to 2009, there was \$2.010 billion in crop damages resulting from drought periods. The most common trend was the consistency of drought periods during the months of July through August; out of the twenty (20) periods, nine (9) of them were between July through August. While some may have been more severe than others, agricultural areas were impacted much more than the metropolitan areas where impacts were indirect.



All jurisdictions determined there have been less than 4 occurrences that have affected them in a negative impact. The NCDC data shows 5 different events, however all jurisdictions concluded that was one continuous event.

Table 4.6 - 5 DROUGHT event(s) were reported in Lyon County, Iowa between 01/01/1950 and 01/31/2011.				Mag: Magnitude Dth: Deaths Inj: Injuries PrD: Property Damage CrD: Crop Damage				
Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 Lyon County	11/01/1999	12:00 AM	Drought	N/A	0	0	0	0
2 Lyon County	12/01/1999	12:00 AM	Drought	N/A	0	0	0	0
3 Lyon County	02/01/2000	12:00 AM	Drought	N/A	0	0	0	0
4 Lyon County	03/01/2000	12:00 AM	Drought	N/A	0	0	0	0
5 Lyon County	04/01/2000	12:00 AM	Drought	N/A	0	0	0	0
TOTALS:					0	0	0	0

Source: National Climate Data Center

4.1.4. Magnitude/Severity:

Droughts are considered to have negligible magnitude and severity. 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.

The 2010 State of Iowa Hazard Mitigation Plan estimates Lyon County, has an annual estimation loss of 0.00 due to drought.

4.1.5. Warning Time:

Drought events often occur with more than 24 hours warning time. A drought is an event that occurs over time due to lack of precipitation. Therefore, there would be signs more than 24 hours ahead of time that a drought could occur.

4.1.6. Duration:

The duration of a drought is more than 1 week. Typically, droughts will last for long periods of time, but that situation could change quickly if there is precipitation. Factors that also determine the duration is how severe the drought is and how long the areas has gone without precipitation.

4.1.7. Hazard Total Score: 2.5

4.2 Extreme Heat

4.2.1 Definition and description:

Conditions for extreme heat are defined by summertime weather that is substantially hotter and/or more humid than average for a location at that time of year. This includes temperatures (including heat index) in excess of 100 degrees Fahrenheit or at least three (3) successive days of 90+ degrees Fahrenheit. A heat advisory is issued when temperatures reach 105 degrees and a warning is issued at 115 degrees. The heat index is a number in degrees Fahrenheit that tells how hot it really feels when relative humidity is added to the actual air temperature. Exposure to full sunshine can increase the heat index by at least 15 degrees. Extreme heat can impose stress on humans and animals. Heatstroke, sunstroke, cramps, exhaustion, and fatigue are possible with prolonged exposure and/or physical activity due to the body's inability to dissipate the heat. Urban areas are particularly at risk because of air stagnation and large quantities of heat absorbing materials such as streets and buildings. Extreme heat can also result in distortion and failure of structures and surfaces such as roadways and railroad tracks.

4.2.2. Hazards Identified by Jurisdiction:

The table below shows which jurisdictions identified Extreme Heat as a hazard they are susceptible to.

	Unincorporated Lyon County	Alvord	Doon	George	Inwood	Larchwood	Lester	Little Rock	Rock Rapids
Extreme Heat	X	X	X	X	X	X	X	X	X

4.2.3. Probability:

The planning committee determined that it is 'Highly Likely' that a extreme heat event will occur in the next year. That is a 1 in 1 chance to occur on any given year. The NCDC listed several events of extreme heat for Lyon County, but when it was to be downloaded from their site it was removed from their website. Events will be included in future updates. What follows is supporting information on extreme heat events.

Table 4.7 Heat Index Chart

HEAT INDEX °F													
	RELATIVE HUMIDITY												
Temp.	40%	45%	50%	55%	60%	65%	70%	75%	80%	85%	90%	95%	100%
110°	136												
108°	130	137											
106°	124	130	137										
104°	119	124	131	137									
102°	114	119	124	130	137								
100°	109	114	118	124	129	136							
98°	105	109	113	117	123	128	134						
96°	101	104	108	112	116	121	126	132					
94°	97	100	103	106	110	114	119	124	129	135			
92°	94	96	99	101	105	108	112	116	121	126	131		
90°	91	93	95	97	100	103	106	109	113	117	122	127	132
88°	88	89	91	93	95	98	100	103	106	110	113	117	121

86°	85	87	88	89	91	93	95	97	100	102	105	108	112
84°	83	84	85	86	88	89	90	92	94	96	98	100	103
82°	81	82	83	84	84	85	86	88	89	90	91	93	95
80°	80	80	81	81	82	82	83	84	84	85	86	86	87

Source: National Oceanic and Atmospheric Administration http://www.crh.noaa.gov/jkl/?n=heat_index_calculator

Table 4.8 – Negative Affects from Extreme Heat

Category Heat Index		Possible heat disorders for people in high risk groups
Extreme Danger	130°F +	Heat stroke or sunstroke likely.
Danger	105 - 129°F	Sunstroke, muscle cramps, and/or heat exhaustion likely. Heatstroke possible with prolonged exposure and/or physical activity.
Extreme Caution	90 - 105°F	Sunstroke, muscle cramps, and/or heat exhaustion possible with prolonged exposure and/or physical activity.
Caution	80 - 90°F	Fatigue possible with prolonged exposure and/or physical activity.

Source: National Oceanic and Atmospheric Administration http://www.crh.noaa.gov/jkl/?n=heat_index_calculator

During the period between 1995 and 2009 Iowa experienced nineteen (19) extreme heat events. The heat wave that occurred in July of 1995 had a major impact across the entire state, temperatures ranged from 98 degrees to 108 degrees with heat indices reaching a high of 131 degrees. This event lasted two (2) days causing 3.8 million dollars of property damage and resulted in three (3) fatalities. The following map depicts

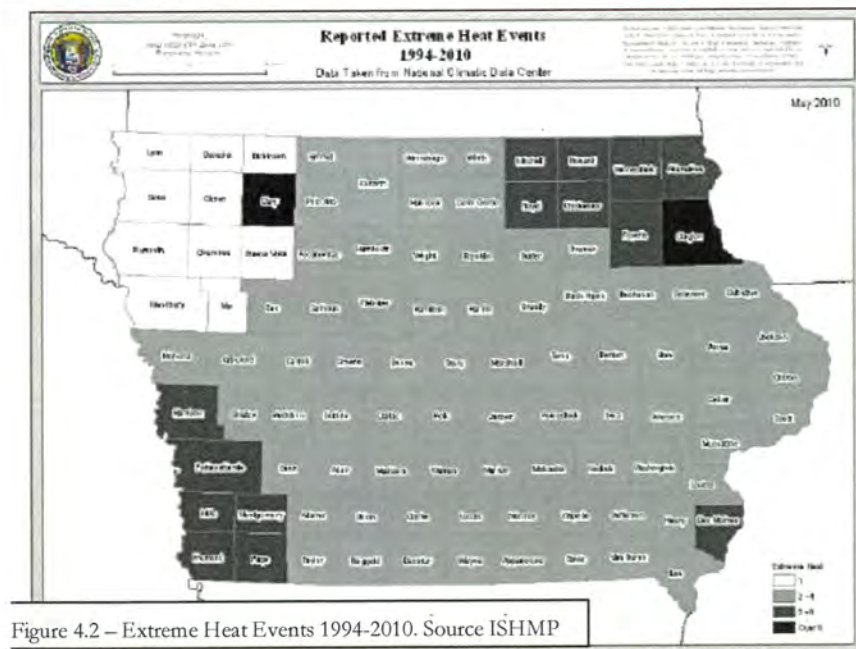


Figure 4.2 – Extreme Heat Events 1994-2010. Source ISHMP

the number of extreme heat occurrences from 1994-2009.

4.2.4. Magnitude/Severity:

The severity that comes with extreme heat events, the planning committee determined that it would be 'Negligible' to the county. Less than 10% of local property would be affected. The committee determined that those to be most affected would those that are elderly or young, and believe that there are enough assets in the communities that those that are disadvantaged and with out AC could find a place to find comfort in an event.

The 2010 State of Iowa Hazard Mitigation Plan estimates Lyon County, has an estimation loss of 0.00 due to extreme heat.

4.2.5. Warning Time:

The committee determined that there would be more than 24 hours warning time in the event of extreme heat. The committee felt that weather forecasters usually get this event correct and are able to determine ahead of time if the temperatures are going to be extreme.

4.2.6. Duration:

The committee determined that an event of extreme heat would typically last a couple days up to a week before the temperatures would become bearable again.

4.2.7. Hazard Total Score: 2.55

.3 Flash Flood

4.3.1 Definition and description:

A flash flood is an event that occurs with little or no warning where water levels rise at an extremely fast rate. Flash flooding results from intense rainfall over a brief period, sometimes combined with rapid snowmelt, ice jam release, frozen ground, saturated soil, or impermeable surfaces. Most flash flooding is caused by slow-moving thunderstorms or thunderstorms repeatedly moving over the same area. 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.

	Unincorporated Lyon County	Alvord	Doon	George	Inwood	Larchwood	Lester	Little Rock	Rock Rapids
Flash Flood	X	X	X	X	X	X	X	X	X

4.3.3. Probability:

The committee determined that it would be 'Highly Likely' that a flash flood would occur in the next year. They believe not all events have been recorded by the NCDC. They concluded that every year there are events in Lyon County, but not every event bothers daily life of several people so they therefore don't get reported.

Table 4.9 - 10 FLASH FLOOD event(s) were reported in Lyon County, Iowa between 01/01/1950 and 01/31/2011.				Mag:	Magnitude			
				Dth:	Deaths			
				Inj:	Injuries			
				PrD:	Property Damage			
				CrD:	Crop Damage			
Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 LYON	06/12/1994	1:00 PM	Flash Flood	N/A	0	0	500K	50K
2 George	06/12/2001	09:09 PM	Flash Flood	N/A	0	0	4.0M	0
3 Doon	06/05/2005	01:00 AM	Flash Flood	N/A	0	0	0	0
4 Inwood	06/13/2005	07:00 PM	Flash Flood	N/A	0	0	0	0
5 Lester	07/25/2005	12:00 AM	Flash Flood	N/A	0	0	0	0
6 Doon	06/10/2007	16:05 PM	Flash Flood	N/A	0	0	0	0
7 Rock Rapids	06/05/2008	16:30 PM	Flash Flood	N/A	0	0	0	0
8 Inwood	07/21/2010	23:40 PM	Flash Flood	N/A	0	0	0	0
9 Rock Rapids Muni Arp	07/21/2010	23:40 PM	Flash Flood	N/A	0	0	0	0
10 Edna	07/21/2010	23:42 PM	Flash Flood	N/A	0	0	80K	0
TOTALS:					0	0	4.58M	50K

Source: National Climate Data Center

The table about shows 10 events, there have been no deaths or injuries resulting from flash floods according to NCDC Data. Property damages totaled an estimated \$4.58 Million. Crop damages totaled an estimated \$50,000, according to NCDC data.

3.4. Magnitude/Severity:

The committee determined that there would it would be critical in severity for the county and that 25-50% of the population could be damaged or lost. Doon and Larchwood are the only ones that are not mapped. On the critical facility maps the SFHA are depicted them or if there are areas prone to flooding (determined by each community committee). Communities came up with an estimated number of structures in that area. Some of the flood maps are very outdated and that area is no longer a rivers or creeks in some areas. Loss areas are displayed on the critical facilities map also numbers are below for their estimated structures and values which are based off of the average number of structures and average prices of each in the communities. Communities that did not determine an exact amount of structures vulnerable would like to use the vulnerability assessment that is in Section 5.2 for a breakdown % of structures and values vulnerable. It is to be known that flash floods are a natural hazard that usually occurs at unknown time and location, therefore these are just estimates in good faith to get the communities thinking of the possible outcomes for damages from flash floods. The maps are to be found in Section 9. It is to be noted that Lyon County did not determine damage estimates the same way as the communities determined, because of time and resources it was to large of task to determine that number, because again it is difficult to determine when and where and how much will be affected.

Table 4.10 - Vulnerable structures for flash flood

City	# of residential	Average Cost	# of Commercial, Industrial, others.	Average Cost	Total Lost Estimate
Alvord	1	\$61,123.53	3	\$113,618.00	\$401,977.53
Doon	2	\$72,934.33	0	\$131,490.43	\$145,868.66
George	21	\$53,327.95	15	\$234,632.59	\$4,639,375.80
Inwood	3	\$33,293.88	0	\$242,079.97	\$99,881.64
Larchwood	0	\$90,600.06	0	\$209,450.23	\$0.00
Lester	0	\$100,154.50	1	\$274,047.55	\$274,047.55
Little Rock	1	\$34,816.34	0	\$182,906.06	\$34,816.34
Rock Rapids	15	\$75,732.22	24	\$367,994.80	\$9,967,858.50

The 2010 State of Iowa Hazard Mitigation Plan estimates Lyon County, has an annual estimation loss of \$476,470.59 due to flood. The State Plan does not separate annual estimation loss for flash flood and river flood.

4.3.5. Warning Time:

The committee determined that there is minimal or no warning time in the event of a flash flood.

4.3.6. Duration:

The consensus of the committee was that the affected from a flash flood would be a week or less. By then those that were affected would be able to get into cleanup mode.

4.3.7. Hazard Total Score: 3.6

4.4 Hailstorm

4.4.1 Definition and description:

Hailstorms are an outgrowth of a severe thunderstorm in which pellets or irregularly shaped lumps of ice greater than 1 inch in diameter fall with rain. Hail is produced in many strong thunderstorms by strong rising currents of air carrying water droplets to a height where freezing occurs, the ice particles grow in size until they are too heavy to be supported by the updraft and fall back to earth. Hail can be smaller than a pea or as large as a softball and can be very destructive to plants and crops; pets and livestock are particularly vulnerable to hail. The following map depicts a geographic breakdown of the number of hailstorms in Iowa since 1956.

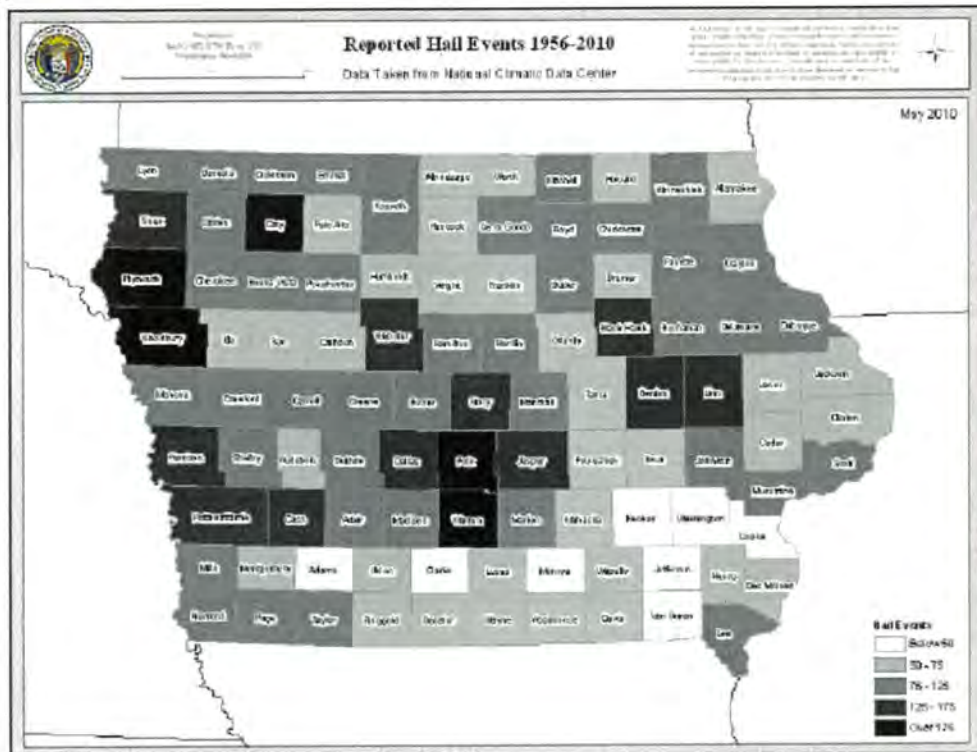


Figure 4.3 – Hail Events 1956-2010. Source ISHMP

4.4.2. Hazards Identified by Jurisdiction:

The table below shows which jurisdictions identified hailstorm as a hazard they are susceptible to.

	Unincorporated Lyon County	Alvord	Doon	George	Inwood	Larchwood	Lester	Little Rock	Rock Rapids
Hailstorm	x	x	x	x	x	x	x	x	x

4.4.3. Probability:

The committee determined the probability of hailstorm to occur again to be 'Highly Likely' to affected the county in a negative way. The committee referenced the following table that a 116 events have occurred in the 47 years, which is about 2.5 events per year and that corresponds with the rating criteria which is a 1 to 1 chance to occur in any given year.

Table 4.11 - 116 HAIL event(s) were reported in Lyon County, Iowa between 06/01/2011-through 09-01-2108.

Mag: Magnitude
Dth: Deaths
Inj: Injuries
PrD: Property Damage
: Crop Damage

Source: National Climate Data Center

<u>Location</u>	<u>County/Zone</u>	<u>St.</u>	<u>Date</u>	<u>Time</u>	<u>T.Z.</u>	<u>Type</u>	<u>Mag</u>	<u>Dth</u>	<u>Inj</u>	<u>PrD</u>	<u>CrD</u>
Totals:								0	0	0.00K	0.00K
INWOOD	LYON CO.	IA	06/01/2011	17:05	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
ALVORD	LYON CO.	IA	06/01/2011	17:18	CST-6	Hail	1.75 in.	0	0	0.00K	0.00K
LAKEWOOD	LYON CO.	IA	06/01/2011	17:25	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
ROCK RAPIDS	LYON CO.	IA	08/22/2011	23:10	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
INWOOD	LYON CO.	IA	05/01/2012	18:34	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
ALVORD	LYON CO.	IA	05/01/2012	18:45	CST-6	Hail	2.00 in.	0	0	0.00K	0.00K
LAKEWOOD	LYON CO.	IA	05/01/2012	19:15	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
INWOOD	LYON CO.	IA	05/27/2012	18:48	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
LARCHWOOD	LYON CO.	IA	06/22/2013	19:03	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
DOON	LYON CO.	IA	08/31/2013	22:10	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K
GEORGE	LYON CO.	IA	05/07/2014	02:15	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
GEORGE	LYON CO.	IA	05/07/2014	02:15	CST-6	Hail	1.75 in.	0	0	0.00K	0.00K
ROCK RAPIDS	LYON CO.	IA	05/30/2014	20:05	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
INWOOD	LYON CO.	IA	06/05/2014	15:34	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
GEORGE	LYON CO.	IA	06/16/2014	12:56	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
GEORGE SUDENGA ARPT	LYON CO.	IA	06/16/2014	13:13	CST-6	Hail	1.75 in.	0	0	0.00K	0.00K

LAKEWOOD	LYON CO.	IA	06/16/2014	18:17	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
ROCK RAPIDS MUNI ARP	LYON CO.	IA	08/18/2014	16:56	CST-6	Hail	1.75 in.	0	0	0.00K	0.00K
DOON	LYON CO.	IA	09/19/2014	19:54	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
ROCK RAPIDS MUNI ARP	LYON CO.	IA	05/25/2015	16:35	CST-6	Hail	1.75 in.	0	0	0.00K	0.00K
EDNA	LYON CO.	IA	05/25/2015	16:46	CST-6	Hail	1.75 in.	0	0	0.00K	0.00K
EDNA	LYON CO.	IA	09/09/2015	15:42	CST-6	Hail	1.75 in.	0	0	0.00K	0.00K
EDNA	LYON CO.	IA	09/09/2015	15:47	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
LARCHWOOD	LYON CO.	IA	09/09/2015	16:35	CST-6	Hail	1.50 in.	0	0	0.00K	0.00K
GEORGE SUDENGA ARPT	LYON CO.	IA	09/09/2015	16:55	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
GEORGE SUDENGA ARPT	LYON CO.	IA	05/23/2016	16:58	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
GEORGE SUDENGA ARPT	LYON CO.	IA	05/23/2016	17:05	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
GEORGE SUDENGA ARPT	LYON CO.	IA	05/23/2016	17:08	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
ROCK RAPIDS	LYON CO.	IA	05/30/2016	20:33	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K
LARCHWOOD	LYON CO.	IA	08/16/2016	16:35	CST-6	Hail	1.25 in.	0	0	0.00K	0.00K
ROCK RAPIDS	LYON CO.	IA	08/21/2017	10:48	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

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4.4.4. Magnitude/Severity:

The committee determined that the severity in a hailstorm would be 'Critical' to the county. There will be 25-50% of the property in the county to be damaged. The committee stated that the information supplied by the NCDC was correct in the number of events but off on the property and crop damage. Although they didn't

have figures for the events they determined that what the NCDC supplied was too low and that future events would not be reflected correctly if those damage numbers were projected for future events.

The 2010 State of Iowa Hazard Mitigation Plan estimates Lyon County, has an annual estimation loss of \$25,000.00 due to hailstorm.

4.4.5. Warning Time:

There usually is minimal or no warning time with hailstorms. The trained storm spotters from the fire departments on the committee determined that you can determine when there are going to be thunderstorms, but not if that storm is going to hail until several moments before it actually occurs.

4.4.6. Duration:

The committee determined that a hailstorm usually only last several hours at the most.

4.4.7. Hazard Total Score: 3.4

4.5 Landslide

4.5.1 Definition and description:

Landslides occur when susceptible rock, earth, or debris moves down a slope under the force of gravity and water. Landslides may be very small or very large, and can move at slow to very high speeds. A natural phenomenon, 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.

4.5.2. Hazards Identified by Jurisdiction:

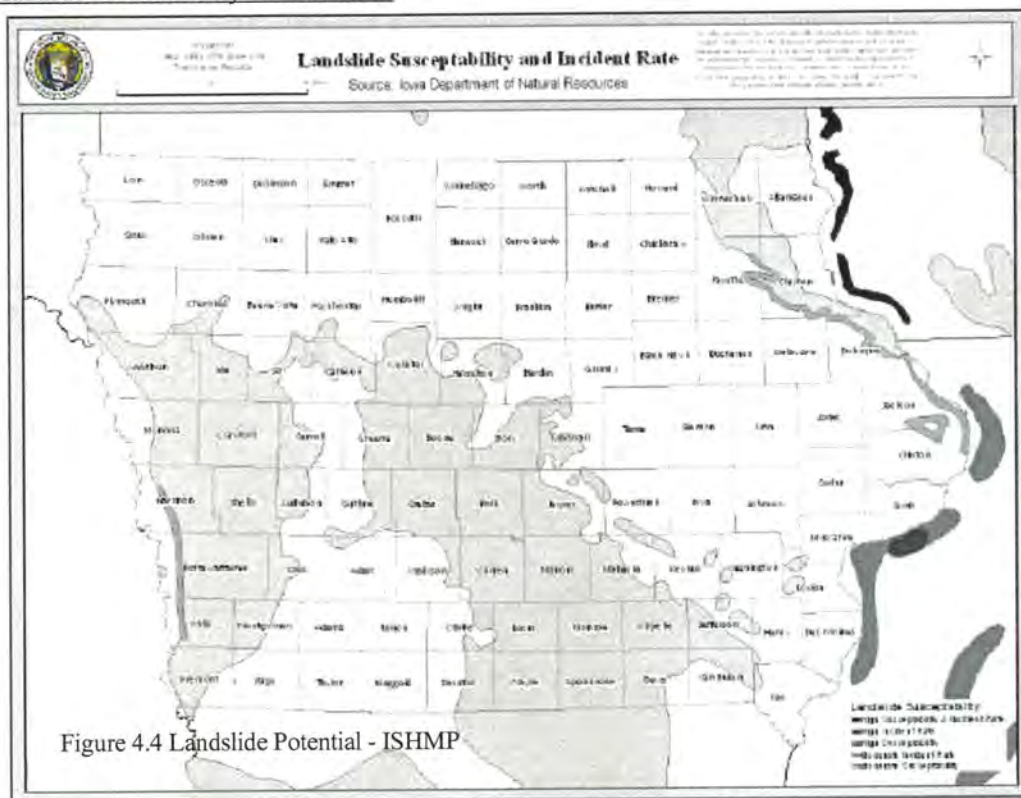


Figure 4.4 Landslide Potential - ISHMP

The table below shows which jurisdictions identified landslide as a hazard they are susceptible to. All communities determined that their lands are not likely to be susceptible to landslides and

	Unincorporated Lyon County	Alford	Doon	George	Inwood	Larchwood	Lester	Little Rock	Rock Rapids
Landslide	x								

determined not add them to their rankings.

4.5.3. Probability:

The committee determined that the 'Occasional' landslide could happen and affect the county in a negative way. The committee had no records of events but think it's highly possible on the far western border of the county, which have more steep lands.

4.5.4. Magnitude/Severity:

The committee decided that if a landslide would happen in the county it would most likely be away from development and there for it would be 'Limited' in severity for Lyon County.

4.5.5. Warning Time:

There is no warning time in the event of a landslide.

4.5.6. Duration:

The committee determined that if a landslide would occur in the county that it would affect people for more than a week, because of analysis of the site and cleanup or repair.

4.4.7. Hazard Total Score: 2.5

4.6 River Flood

4.6.1 Definition and description:

River flooding is a rising or overflowing of a tributary or body of water that covers adjacent land, not usually covered by water, when the volume of water in a stream exceeds the channel's capacity. Floods are the most common and widespread of all natural disasters, except fire.

Most communities may experience some kind of flooding after spring rains, heavy thunderstorms, winter snow thaws, waterway obstructions, or levee or dam failures. Winter snow thaws, waterway obstructions, or levee or dam failures snow thaws, waterway obstructions, or levee or dam failures.

4.6.2. Hazards Identified by Jurisdiction:

The table below shows which jurisdictions identified river flood as a hazard they are susceptible to.

	Unincorporated Lyon County	Alvord	Doon	George	Inwood	Larchwood	Lester	Little Rock	Rock Rapids
River Flood	X			X			X	X	X

4.6.3. Probability:

After the committee reviewed the following NCDC data they determined that there is a flooding event about 1+ a year. Therefore they determined that river flooding was 'Highly Likely' to occur in any given year.

Results for Lyon County, Iowa

Event Types: **Flash Flood**

0 events were reported between 06/01/2011 and 09/01/2018 (2650 days)

Summary Info:

Number of County/Zone areas affected:	0
Number of Days with Event:	0
Number of Days with Event and Death:	0
Number of Days with Event and Death or Injury:	0
Number of Days with Event and Property Damage:	0
Number of Days with Event and Crop Damage:	0
Number of Event Types reported:	0

Source: National Climate Data Center

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	2.050M	1.000M
ROCK RAPIDS	LYON CO.	IA	06/16/2011	06:00	CST-6	Flood		0	0	0.00K	0.00K
GRANITE	LYON CO.	IA	07/10/2011	06:00	CST-6	Flood		0	0	0.00K	0.00K
ROCK RAPIDS	LYON CO.	IA	07/15/2011	06:00	CST-6	Flood		0	0	0.00K	0.00K
GRANITE	LYON CO.	IA	05/06/2012	06:00	CST-6	Flood		0	0	0.00K	0.00K
ROCK RAPIDS	LYON CO.	IA	05/28/2012	06:00	CST-6	Flood		0	0	0.00K	0.00K
GRANITE	LYON CO.	IA	05/26/2013	06:00	CST-6	Flood		0	0	0.00K	0.00K
ROCK RAPIDS	LYON CO.	IA	06/23/2013	06:00	CST-6	Flood		0	0	0.00K	0.00K
GRANITE	LYON CO.	IA	06/15/2014	01:05	CST-6	Flood		0	0	0.00K	0.00K
ROCK RAPIDS	LYON CO.	IA	06/15/2014	06:00	CST-6	Flood		0	0	2.000M	1.000M
GRANITE	LYON CO.	IA	06/16/2014	06:00	CST-6	Flood		0	0	0.00K	0.00K
GRANITE	LYON CO.	IA	06/16/2014	18:25	CST-6	Flood		0	0	50.00K	0.00K
ROCK RAPIDS MUNI ARP	LYON CO.	IA	03/06/2018	02:00	CST-6	Flood		0	0	0.00K	0.00K
GRANITE	LYON CO.	IA	05/01/2018	00:00	CST-6	Flood		0	0	0.00K	0.00K
Totals:								0	0	2.050M	1.000M

4.6.4. Magnitude/Severity:

The severity for a river flood was determined to be 'Critical,' the committee concluded that roads and bridges could be washed out and house near rivers could also receive damages. The 2010 State of Iowa Hazard Mitigation Plan estimates Lyon County, has an annual estimation loss of \$476,470.59 due to flood. The State Plan does not separate annual estimation loss for flash flood and river flood.

Table 4.13 - Vulnerable structures for river/flash flood

City	# of residential	Average Cost	# of Commercial, Industrial, others.	Average Cost	Total Lost Estimate
Alvord	1	\$61,123.53	3	\$113,618.00	\$401,977.53
Doon	2	\$72,934.33	0	\$131,490.43	\$145,868.66
George	21	\$53,327.95	15	\$234,632.59	\$4,639,375.80
Inwood	3	\$33,293.88	0	\$242,079.97	\$99,881.64
Larchwood	0	\$90,600.06	0	\$209,450.23	\$0.00
Lester	0	\$100,154.50	1	\$274,047.55	\$274,047.55
Little Rock	1	\$34,816.34	0	\$182,906.06	\$34,816.34
Rock Rapids	15	\$75,732.22	24	\$367,994.80	\$9,967,858.50

4.6.5. Warning Time:

The committee determined that with river floods there are 6-12 hours of warning time. The committee stated that if it has been a heavy rainy season then the area will be more prone to flood and will occur quicker.

4.6.6. Duration:

The committee determined that those affected by a river flood would be affected for more than a week. They concluded that roads or bridges could be washed out, or those croplands that are near the river will be unable to grow crops for at least the year after an event.

4.6.7. Hazard Total Score: 3.55

4.7 Severe Winter Storm

4.7.1 Definition and description:

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

The various types of severe winter weather can cause considerable damage. Heavy snows can immobilize transportation systems, down trees and power lines, collapse buildings, and the loss of livestock and wildlife. Blizzard conditions are winter storms lasting at least three (3) hours with sustained winds of 35 mph or more, reduced visibility of 1/4 mile or less, and white out conditions. Heavy snows of more than six (6) inches in a 12 hour period or freezing rain greater than 1/4 inch accumulation causing hazardous conditions in the community can slow or stop the flow of vital supplies as well as disrupting emergency and medical services.

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

Ice storms have resulted in fallen trees, broken tree limbs, downed power lines and utility poles, fallen communications towers, and impassable transportation routes. Severe ice storms have caused total electric power outages over large areas of Iowa and rendered assistance unavailable to those in need due to impassable roads.

4.7.2. Hazards Identified by Jurisdiction:

The table below shows which jurisdictions identified severe winter storm as a hazard they are susceptible to.

	Unincorporated Lyon County	Alford	Doon	George	Inwood	Larchwood	Lester	Little Rock	Rock Rapids
Severe Winter Storm	X	X	X	X	X	X	X	X	X

4.7.3. Probability:

The committee determined that with 75 events from 1993-2011 which amounts to just over 4 events per year.

They decided that it is 'Highly Likely' to occur every year.

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Ini	PrD	CrD
Totals:								0	0	5.000M	0.00K
LYON (ZONE)	LYON (ZONE)	IA	04/09/2013	09:00	CST-6	Winter Storm		0	0	5.000M	0.00K
LYON (ZONE)	LYON (ZONE)	IA	01/05/2015	11:00	CST-6	Winter Storm		0	0	0.00K	0.00K
LYON (ZONE)	LYON (ZONE)	IA	01/31/2015	19:00	CST-6	Winter Storm		0	0	0.00K	0.00K
LYON (ZONE)	LYON (ZONE)	IA	02/01/2015	00:00	CST-6	Winter Storm		0	0	0.00K	0.00K

LYON (ZONE)	LYON (ZONE)	IA	11/30/2015	02:00	CST-6	Winter Storm		0	0	0.00K	0.00K
LYON (ZONE)	LYON (ZONE)	IA	12/01/2015	00:00	CST-6	Winter Storm		0	0	0.00K	0.00K
LYON (ZONE)	LYON (ZONE)	IA	12/25/2015	22:00	CST-6	Winter Storm		0	0	0.00K	0.00K
LYON (ZONE)	LYON (ZONE)	IA	03/23/2016	12:00	CST-6	Winter Storm		0	0	0.00K	0.00K
LYON (ZONE)	LYON (ZONE)	IA	12/16/2016	11:00	CST-6	Winter Storm		0	0	0.00K	0.00K
LYON (ZONE)	LYON (ZONE)	IA	01/24/2017	15:00	CST-6	Winter Storm		0	0	0.00K	0.00K
LYON (ZONE)	LYON (ZONE)	IA	04/02/2018	23:00	CST-6	Winter Storm		0	0	0.00K	0.00K
Totals:								0	0	5.000M	0.00K

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Source: National Climate Data Center

4.7.4. Magnitude/Severity:

The committee determined that with a severe winter storm would be 'Catastrophic' in terms of severity. The committee stated that there have been several deaths that are not on the NCDC data. They did not know the exact storm from the list but knew there have been several deaths related to severe winter storms. They also stated that there are a lot of older properties in the county that are kept up as they should be and some properties may be more prone to roof collapse because of their age and lack of upkeep.

The 2010 State of Iowa Hazard Mitigation Plan estimates Lyon County, has an annual estimation loss of \$11,4064.77 due to snow and ice.

4.7.5. Warning Time:

The committee determined that there would be 12-24 hours of warning for a severe winter storm.

4.7.6. Duration:

The committee determined that typically Iowa severe winter storms will usually have lasting affects for more than a week, typically the initial storm with be complimented with wind which will make the affects felt longer.

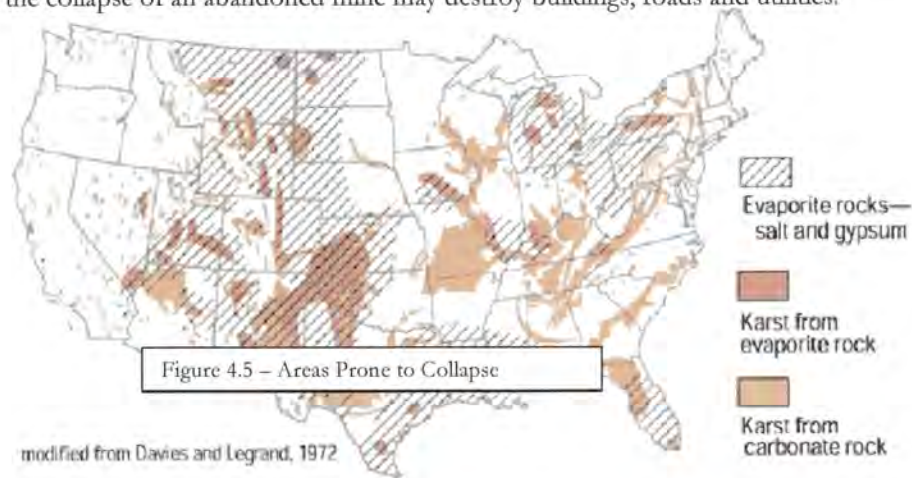
4.7.7. Hazard Total Score: 3.7

4.8 Sinkhole

4.8.1 Definition and 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 limestone of the subsurface.

Land subsidence occurs slowly and continuously over time or on occasion abruptly, as in the sudden formation of sinkholes. Sinkholes can aggravate flooding potential, collapses such as the sudden formation of sinkholes or the collapse of an abandoned mine may destroy buildings, roads and utilities.



The map above shows areas of the United States where certain rock types that are susceptible to dissolution in water occur. In these areas the formation of underground cavities can form and catastrophic sinkholes can happen. These rock types are evaporites (salt, gypsum, and anhydrite) and carbonates (limestone and dolomite). Evaporite rocks underlie about 35 to 40 percent of the United States, though in many areas they are buried at great depths. This map shows that sinkholes do not have an impact in Lyon County.

4.8.2. Hazards Identified by Jurisdiction:

The table below shows which jurisdictions identified sinkholes as a hazard they are susceptible to.

	Unincorporated Lyon County	Alvord	Doon	George	Inwood	Larchwood	Lester	Little Rock	Rock Rapids
Sinkholes	x								

All communities have no history of sinkholes and don't believe that there community would have future events and would like to focus on more of the more prevalent hazards.

4.8.3. Probability:

Since there have been no recorded events nor could the committee remember a sinkhole, they determined that it would be 'Unlikely' for an event to occur in Lyon County.

4.8.4. Magnitude/Severity:

Depending on what a sinkhole would hit would determine how damage would be done. The committee determined that since there have been no history and no recorded damages the severity would be 'Negligible' if sinkhole would occur in Lyon County

4.8.5. Warning Time:

There would be no warning time in the event of a sinkhole.

4.8.6. Duration:

The effects of a sinkhole would last for more than a week. The committee determined that there would be an investigation of what caused it and there would be a clean up and repair.

4.8.7. Hazard Total Score: 1.75

4.9 Thunderstorm and Lightning and Hail

4.9.1 Definition and description:

Thunderstorms are common in Iowa and can occur singly, in clusters, or in lines. Resulting in heavy rains, winds reaching or exceeding 58 mph, producing a tornado, or dropping surface hail at least 1.00 inch in diameter. They are created from a combination of moisture, rapidly raising warm air, and a lifting mechanism such as clashing warm and cold air masses.

Between 1955 and March of 2010, at least 10,090 severe thunderstorm events have impacted Iowa. Because thunderstorms may occur singly, in clusters, or in lines, it is possible that several thunderstorms may affect the same area in the course of a few hours. It is likely that more than 10,090 individual severe storms systems occurred in the state, one system may spawn multiple events. The map that follows indicates that thunderstorms and wind events occur across the State without significant pattern. The associated hazards related to thunderstorms are discussed further as individual hazards in this section 1.3.

4.9.2. Hazards Identified by Jurisdiction:

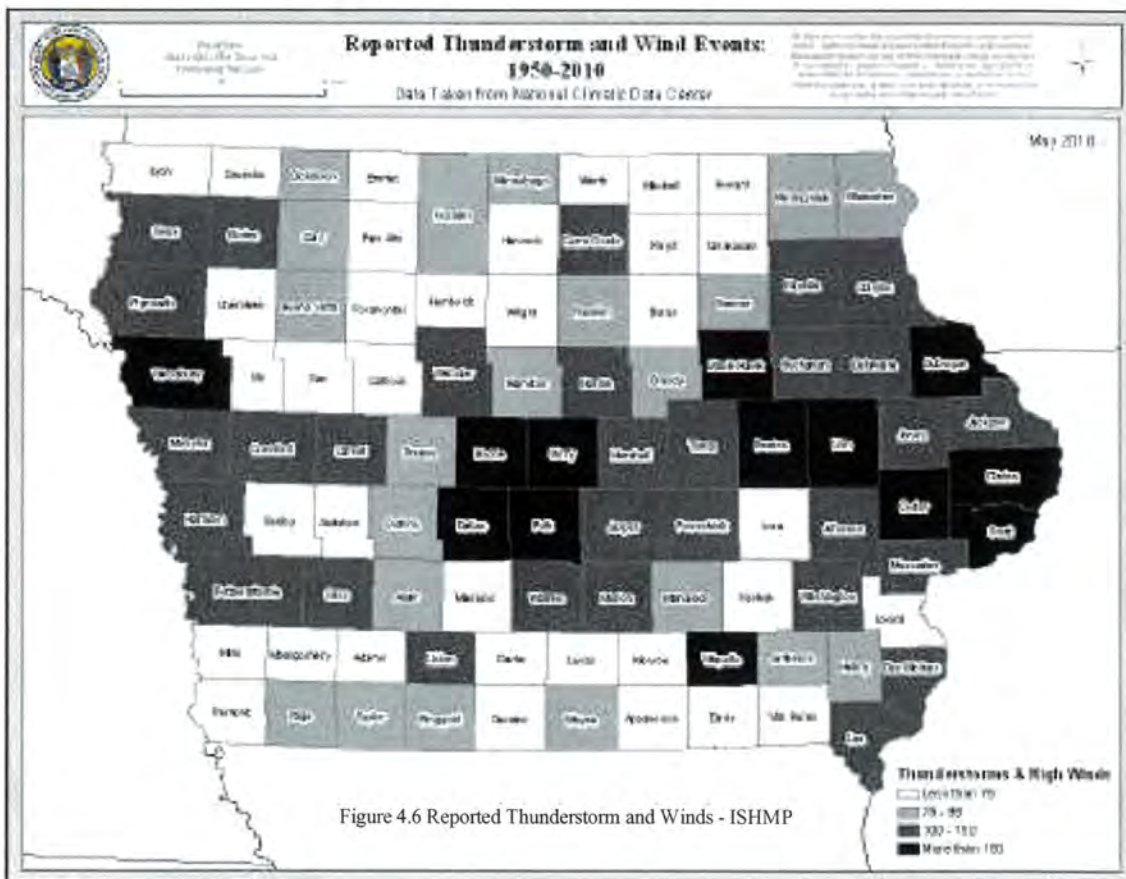


Figure 4.6 Reported Thunderstorm and Winds - ISHMP

The table below shows which jurisdictions identified thunderstorm and lightning as a hazard they are susceptible to.

	Unincorporated Lyon County	Alvord	Doon	George	Inwood	Larchwood	Lester	Little Rock	Rock Rapids
Thunderstorm and Lightning	x	x	x	x	x	x	x	x	x

4.9.3. Probability:

The committee determined that based on previous data that there would be a 'Highly Likely' chance for an event to occur. Based on the NCDC that follows the county sees 1+ event per year.

<u>Location</u>	<u>County/Zon</u> <u>e</u>	<u>St</u> <u>i</u>	<u>Date</u>	<u>Time</u>	<u>T.Z.</u>	<u>Type</u>	<u>Ma</u> <u>g</u>	<u>Dt</u> <u>h</u>	<u>In</u> <u>i</u>	<u>PrD</u>	<u>CrD</u>
Totals:								0	0	25.00 K	0.00 K
ROCK RAPIDS	LYON CO.	I A	08/22/201 1	23:1 0	CST -6	Thunderstor m Wind	52 kts. EG	0	0	0.00K	0.00 K
LITTLE ROCK	LYON CO.	I A	08/22/201 1	23:5 0	CST -6	Thunderstor m Wind	52 kts. EG	0	0	10.00 K	0.00 K
ALVORD	LYON CO.	I A	05/27/201 2	17:1 0	CST -6	Thunderstor m Wind	56 kts. EG	0	0	10.00 K	0.00 K
ROCK RAPIDS	LYON CO.	I A	05/27/201 2	17:2 0	CST -6	Thunderstor m Wind	56 kts. EG	0	0	5.00K	0.00 K
GEORGE	LYON CO.	I A	08/31/201 3	22:0 0	CST -6	Thunderstor m Wind	52 kts. EG	0	0	0.00K	0.00 K
LITTLE ROCK	LYON CO.	I A	06/16/201 4	15:1 0	CST -6	Thunderstor m Wind	52 kts. EG	0	0	0.00K	0.00 K
GEORGE	LYON CO.	I A	06/22/201 5	04:2 0	CST -6	Thunderstor m Wind	65 kts. M G	0	0	0.00K	0.00 K
LITTLE ROCK	LYON CO.	I A	06/27/201 5	22:4 3	CST -6	Thunderstor m Wind	61 kts. EG	0	0	0.00K	0.00 K

GEORGE SUDENG A ARPT	LYON CO.	I A	07/17/201 6	00:0 8	CST -6	Thunderstor m Wind	56 kts. EG	0	0	0.00K	0.00 K
LITTLE ROCK	LYON CO.	I A	05/28/201 7	18:5 3	CST -6	Thunderstor m Wind	56 kts. EG	0	0	0.00K	0.00 K
LITTLE ROCK	LYON CO.	I A	06/13/201 7	21:0 7	CST -6	Thunderstor m Wind	56 kts. EG	0	0	0.00K	0.00 K
Totals:								0	0	25.00 K	0.00 K

4.9.4. Magnitude/Severity:

The committee determined that in the event of a thunderstorm or lightning strike there would 'Critical' severity to the county. Depending on the strength of the strong, there could be more than 25% of property or cropland destroyed. The NCDC data recorded property damage to \$436,000 which is \$5,813 per event.

The 2010 State of Iowa Hazard Mitigation Plan estimates Lyon County, has an estimation loss of 0.00 due to Lightning.

The 2010 State of Iowa Hazard Mitigation Plan estimates Lyon County, has an estimation loss of \$25,411.76 due to Thunderstorm.

4.9.5. Warning Time:

The committee determined that there would be a 6-12 hour notice before a thunderstorm or lightning storm would hit.

4.9.6. Duration:

Either a thunderstorm or lightning storm would typically last less than 6 hours.

4.9.7. Hazard Total Score: 3.25

4.10 Tornado

4.10.1 Definition and description:

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

The new EF-scale was unveiled by the National Weather Service to the public in 2006. In February 2007, the Enhanced Fujita scale replaced the original Fujita scale in all tornado damage surveys in the United States. Below is a table comparing the estimated winds in the original F-scale and the operational EF-scale that is currently in use by the NWS.

Table 4.16 – Original vs. Enhanced Fujita Scales

ORIGINAL FUJITA F-SCALE		NEW ENHANCED FUJITA EF- SCALE	
F Number	3 Second Gust (mph)	EF Number	3 Second Gust (mph)
0	45-78	0	65-85
1	79-117	1	86-110
2	118-161	2	111-135
3	162-209	3	136-165
4	210-261	4	166-200
5	262-317	5	Over 200

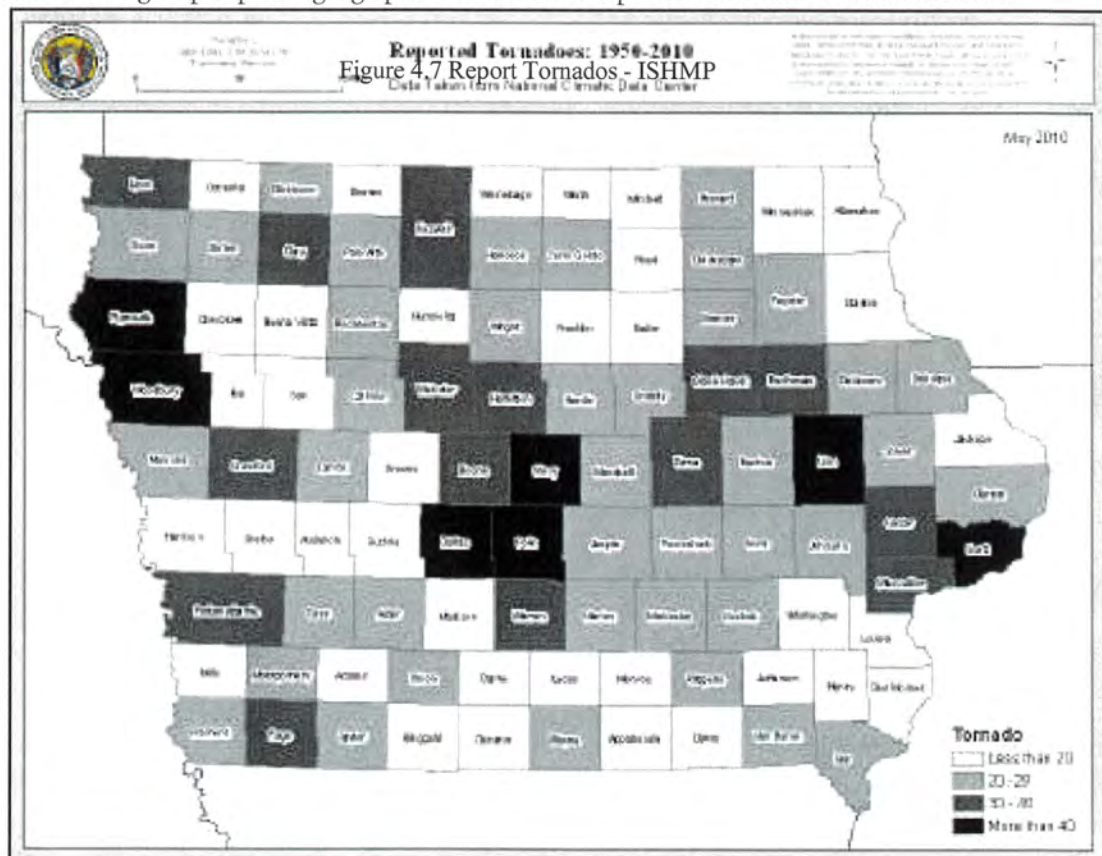
<u>Location</u>	<u>County/Zone</u>	<u>St.</u>	<u>Date</u>	<u>Time</u>	<u>T.Z.</u>	<u>Type</u>	<u>Mag</u>	<u>Dth</u>	<u>Inj</u>	<u>PrD</u>	<u>CrD</u>
Totals:								0	0	0.00K	0.00K
ALVORD	LYON CO.	IA	06/16/2014	14:43	CST-6	Tornado	EF0	0	0	0.00K	0.00K
GEORGE	LYON CO.	IA	06/17/2014	22:27	CST-6	Tornado	EF0	0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

Table 4.17 - EF Scale Classifications and Types of Damage Done

EF-Scale			
EF-Scale	Wind Speed	Classification	Type of Damage Done
EF-0	65-85 mph (105-137 km/h)	Light damage	Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.
EF-1	86-110 mph (138-178 km/h)	Potential damage	Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF-2	111-135 mph (179-218 km/h)	Considerable damage	Roofs torn off houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF-3	136-165 mph (219-266 km/h)	Severe damage	Entire stories 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.
EF-4	166-200 mph (267-322 km/h)	Devastating damage	Well-constructed houses and whole frame houses completely leveled; cars thrown, and small missiles generated.
EF-5	200 mph +	Total destruction	Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 m (109 yd); steel reinforced

source: Tornado EF Scale.com <http://www.tornadoefscale.com/pages/t/tornadoefscale.com-index-nav-1.html>

The following map depicts a geographic breakdown of reported tornadoes in Iowa since 1950.



Since the Enhanced Fujita Scale was introduced on February 1, 2007, there have only been two EF5 tornadoes recorded in the United States. The most recent one occurred in Parkersburg, Iowa on May 25, 2008 and leveled half the city.

4.10.2. Hazards Identified by Jurisdiction:

The table below shows which jurisdictions identified tornado as a hazard they are susceptible to.

Tornado	x	x	x	x	x	x	x	x	x
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4.10.3. Probability:

The committee determined that it would be 'Highly Likely' for a tornado to affect the county. They believe

	Unincorporated Lyon County	Alvord	Doon	George	Inwood	Larchwood	Lester	Little Rock	Rock Rapids
--	-------------------------------	--------	------	--------	--------	-----------	--------	-------------	-------------

there is a 33% chance for one to occur any given year. With the recorded NCDC data that have one occur every other year.

The following table shows that there have been thirty-five tornado events reported in Lyon County since 1950. These tornadoes resulted in 1 reported injury and two deaths. Total property damages were \$9.962 million and crop damage totaled \$00. The highest magnitude tornado to strike the county were several F2's

Table 4.18 – Tornadoes in Lyon County. Source NCDC. 35 TORNADO(s) were reported in Lyon County, Iowa between 01/01/1950 and 01/31/2011.				Mag : Dth : Inj:	Magnitude Deaths Injuries Property Damage Crop Damage			
Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 LYON	06/19/1951	16:00 PM	Tornado	F1	0	0	0	0
2 LYON	07/02/1952	17:50 PM	Tornado	F1	0	0	0	0
3 LYON	06/19/1954	21:00 PM	Tornado	F2	0	0	25K	0
4 LYON	07/25/1960	23:54 PM	Tornado	F1	0	0	250K	0
5 LYON	07/16/1963	20:15 PM	Tornado	F1	0	0	25K	0
6 LYON	04/19/1973	16:00 PM	Tornado	F1	0	0	25K	0
7 LYON	05/20/1975	17:45 PM	Tornado	F1	0	0	3K	0
8 LYON	06/19/1978	16:50 PM	Tornado	F	0	0	0	0
9 LYON	07/06/1978	19:05 PM	Tornado	F2	0	0	2.5M	0
10 LYON	05/29/1980	16:15 PM	Tornado	F0	0	0	0K	0
11 LYON	04/21/1985	18:00 PM	Tornado	F1	0	0	250K	0
12 LYON	04/21/1985	18:14 PM	Tornado	F0	0	0	250K	0
13 LYON	04/26/1986	18:30 PM	Tornado	F2	1	2	2.5M	0
14 LYON	04/26/1986	18:42 PM	Tornado	F2	0	0	2.5M	0
15 LYON	06/07/1987	17:18 PM	Tornado	F0	0	0	0	0
16 LYON	05/23/1989	19:25 PM	Tornado	F0	0	0	3K	0
17 Larchwood	05/07/1993	14:57 PM	Tornado	F2	0	0	500K	0
18 Doon	04/25/1994	18:01 PM	Tornado	F1	0	0	500K	0
19 Rock Rapids	06/12/1994	17:00 PM	Tornado	F0	0	0	1K	0
20 George	08/04/1995	17:35 PM	Tornado	F0	0	0	0	0
21 Inwood	07/07/1997	03:55 PM	Tornado	F0	0	0	0	0
22 Inwood	07/07/1997	04:25 PM	Tornado	F0	0	0	0	0
23 George	06/27/1998	03:30 PM	Tornado	F0	0	0	0	0
24 Doon	07/09/2000	08:15 PM	Tornado	F1	0	0	50K	0
25 George	06/12/2001	08:12 PM	Tornado	F0	0	0	0	0
26 Rock Rapids	06/24/2003	10:12 PM	Tornado	F0	0	0	0	0
27 Inwood	04/18/2004	03:58 PM	Tornado	F1	0	0	50K	0
28 George	05/09/2004	07:15 PM	Tornado	F0	0	0	1K	0
29 Inwood	05/01/2008	18:16 PM	Tornado	F1	0	0	10K	0
30 Doon	05/01/2008	18:30 PM	Tornado	F0	0	0	0	0
31 George	05/01/2008	18:44 PM	Tornado	F0	0	0	0	0
32 George	06/11/2008	16:25 PM	Tornado	F0	0	0	0	0
33 Doon	06/21/2009	16:29 PM	Tornado	F0	0	0	0	0
34 Little Rock	06/25/2010	20:53 PM	Tornado	F2	0	0	500K	0
35 Little Rock	06/25/2010	20:55 PM	Tornado	F1	0	0	20K	0
TOTALS:					1	2	9.962M	0

Source: National Climate Data Center

4.10.4. Magnitude/Severity:

With a tornado you never know if it is going to hit a populated area or the rural county. The committee determined the level of severity to be 'Critical' to the county. There would most likely be a loss of utilities for

some time and injuries depending on where the strike was. The NCDC recorded that in the 35 events of tornado that it caused \$9,962,000 of damage, caused two injuries and one death.

The 2010 State of Iowa Hazard Mitigation Plan estimates Lyon County, has an estimation loss of \$158,200.00 due to tornado.

4.10.5. Warning Time

There is typically minimal or no warning time. The committee stated that you can tell that bad weather is approaching, but you can't always tell if a storm is going to bring a tornado or not until it hits. That is why they typically use their sirens when any bad weather approaches the communities.

4.10.6. Duration

The duration of a tornado is going to be less than six hours, however the cleanup after event can sometimes last months depending on the size and the area populated that is affected.

4.10.7. Hazard Total Score: 3.4

4.11 Windstorm

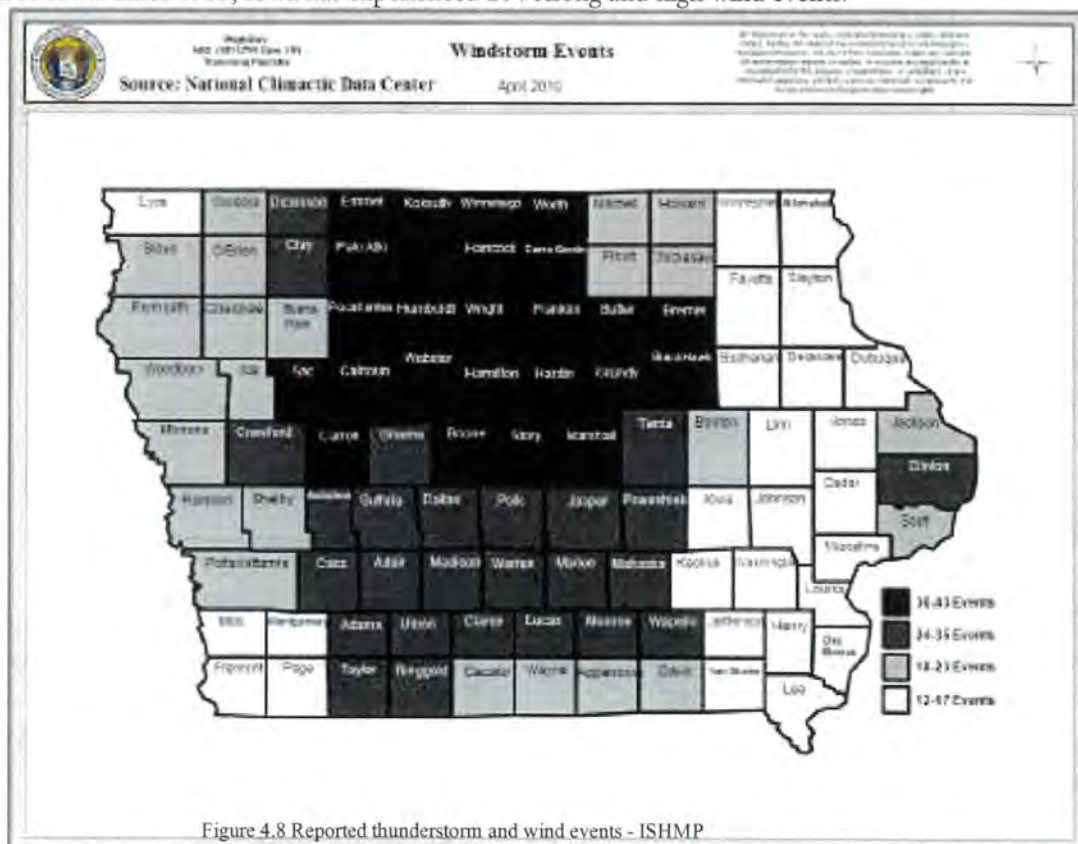
4.11.1 Definition and description:

Windstorms can be described as extreme winds associated with severe winter storms, severe thunderstorms, downbursts, and very steep pressure gradients. Windstorms, other than tornados, are experienced in all regions of the United States. It is difficult to separate the various wind components that cause damage from other wind-related natural events that often occur with or generate windstorms.

Although Iowa does not experience direct impacts from hurricanes, the state is no stranger to strong, damaging winds. Unlike tornadoes, windstorms may have a destructive path that is tens of miles wide and the duration of the event could range from hours to days. These events can produce straight line winds in excess of 64 knots causing some power outages, property damage, impaired visibility, and crop damage. Windstorms occur in every county in Iowa. Historically, windstorm events are associated with severe thunderstorms and blizzards. It is often difficult to separate windstorms and tornado damage when winds get above 64 knots.

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

Based on historical averages, Iowa would expect to have about 15 to 20 wind events each year where wind speeds exceed 64 knots (73 mph). The map below presents the regional occurrences of windstorms in the State of Iowa. Since 1993, Iowa has experienced 204 strong and high wind events.



4.11.2. Hazards Identified by Jurisdiction: The table below shows which jurisdictions identified windstorm as a hazard they are susceptible to.

	Unincorporated Lyon County	Alvord	Doon	George	Irwood	Larchwood	Lester	Little Rock	Rock Rapids
Windstorm	x	x	x	x	x	x	x	x	x

4.11.3. Probability:

The committee determined that there is more than a 33% chance for a windstorm to affect the county. There have been 17 recorded NCDC events to happen in the past 20 years, which almost amounts to one each year. The committee stated that with Lyon County being majorly flat like the rest off Iowa, that there are probably some more events that are recorded through the NCDC.

Table 4.19 17 HIGH WIND event(s) were reported in Lyon County, Iowa between 01/01/1950 and 01/31/2011.				Mag : Dth: Inj: PrD	Magnitude Deaths Injuries Property Damage Crop Damage			
Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 Lyon County	12/05/1993	15:00 PM	High Winds	0 kts.	0	0	500K	0
2 All Of Iowa	04/14/1994	22:00 PM	High Winds	0 kts.	0	0	500K	0
3 Lyon County	11/17/1994	05:00 AM	High Winds	0 kts.	0	0	150K	0
4 Lyon County	11/18/1994	02:30 AM	High Winds	0 kts.	0	0	200K	0
5 All Of Iowa	02/10/1995	00:00	High Winds	0 kts.	0	0	100K	0
6 Lyon County	02/10/1996	04:00 AM	High Winds	50 kts.	0	0	25K	0
7 Lyon County	04/25/1996	09:00 AM	High Winds	50 kts.	0	0	0	0
8 Lyon County	10/26/1996	10:00 AM	High Winds	50 kts.	0	0	10K	0
9 Lyon County	10/29/1996	05:00 PM	High Winds	50 kts.	0	0	60K	0
10 Lyon County	04/06/1997	09:00 AM	High Winds	55 kts.	0	0	0	0
11 Lyon County	11/02/1997	01:00 AM	High Winds	50 kts.	0	0	12K	0
12 Lyon County	04/05/2000	01:00 PM	High Winds	59 kts.	0	0	130K	0
13 Lyon County	02/11/2003	12:40 PM	High Winds	54 kts.	0	0	0	0
14 Lyon County	12/12/2004	06:00 AM	High Winds	57 kts.	0	0	0	0
15 Lyon County	03/10/2005	10:00 AM	High Winds	55 kts.	0	0	190K	0
16 Lyon County	10/26/2008	13:00 PM	High Winds	39 kts.	0	0	0K	0
17 Lyon County	10/26/2010	07:00 AM	High Winds	52 kts.	0	0	0K	0
TOTALS:					0	0	1,877 M	0

Source: National Climate Data Center

4.11.4. Magnitude/Severity:

The committee determined that a windstorm would be 'Critical' to the county. The most damage that would be seen they determined was to be down branches possibly on power lines, lost of shingles or roofs and crop damage of taller plants.

The 2010 State of Iowa Hazard Mitigation Plan estimates Lyon County, has an estimation loss of \$3,726.35 due to windstorm.

4.11.5. Warning Time:

The windstorms that cause the most damage have minimal warning time, or up to 6 hours warning.

4.11.6. Duration:

With Iowa's normal weather conditions and its relatively flatness the committee determined that windstorms can last more than a week.

4.11.7. Hazard Total Score: 3.6

4.12 Dam Failure

4.12.1 Definition and description:

Dam failure is the uncontrolled release of impounded water resulting in downstream flooding, which can affect life and property. Flooding, earthquakes, blockages, landslides, lack of maintenance, improper operation, and poor construction, vandalism, or terrorism cause dam failures. Dams are constructed for a variety of uses, including flood control, erosion control, water supply impoundment, hydroelectric power generation, and recreation.

Dams are classified into three (3) categories based on the potential risk to people and property should a failure occur. The classification may change over time because of development downstream from the dam since its construction. Older dams may not have been built to the standards of its new classification. Below are the hazard classifications defined by Iowa Department of Natural Resources (DNR):

- **High Hazard** – 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) Hazard** – 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 Hazard** – 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 life is considered unlikely;

Dam hazard potential classifications have nothing to do with the material condition of a dam, only the potential for death and/or destruction due to the size of the dam, the size of the impoundment, and the characteristics of the area downstream of the dam. The Iowa Department of Natural Resources (DNR) tracks all dams in Iowa with a height of at least 25 feet or a total storage of at least 50 acre feet of water. The inventory excludes all dams less than six (6) feet high regardless of storage capacity and dams less than fifteen (15) acre feet of storage regardless of height.

Table 4.20

Dam Name State ID#	Owners	Hazard Level	County	Location	Nearest City or Feature and Distance	Dam Ht. (feet)	Max. Storage (acre-ft)
FLUITT DAM	JOHN FLUITT	Low	Lyon	SW,S29,T09 8N,R48W	HAWARDEN, 30 mi	32	40
FOLKERTS DAM	ROY FOLKERTS	Low	Lyon	SE,S27,T098 N,R48W	BELOIT, 8 mi	35	49
JANSMA DAM	FLOYD JANSMA	Low	Lyon	NW,S32,T09 8N,R45W	DOON, 2 mi	22	132
LAKE PAHOJA DAM	LYON CO CONSERVATION BOARD	S	Lyon	SE,NE,S23, T099N,R48 W	CANTON, SD 10	50	2283
LEE DAM	PAUL LEE	Low	Lyon	SE,S04,T098 N,R48W	BELOIT 1 mi	30	42
LYON COUNTY ROADGRADE DAM 10-98-48	LYON CO. BOARD OF SUPERVISORS	Low	Lyon	SE,S10,T098 N,R48W	BELOIT 7 mi	31	35
ROCK RAPIDS MILLDAM	CITY OF ROCK RAPIDS	Low	Lyon	SW,S04,T10 0N,R45W	ROCK RAPIDS 0	7	75

The classification of dams may change over time because of development downstream from the structure since its construction. Older dams may not have been built to the standards of its new classification. Dam hazard potential classifications have nothing to do with the material condition of a dam, only the potential for death or destruction due to the size of the dam, the size of the impoundment, and the characteristics of the area downstream of the dam. Currently 6 dams located in Lyon County are rated a low hazard risk and one the Lake Pahoja Dam is considered Medium Hazard because it holds water at a recreational area.

4.12.2. Hazards Identified by Jurisdiction:

The table below shows which jurisdictions identified Dam Failure as a hazard they are susceptible to.

	Unincorporated Lyon County	Alford	Doon	George	Inwood	Larchwood	Lester	Little Rock	Rock Rapids
Dam Failure	x								x

Only Unincorporated Lyon County and Rock Rapids have identified dam failure as a hazard they are vulnerable to. There are no dams in Lyon County that are located within city limits and portions of the county that are most vulnerable if a dam fails, are in the unincorporated county.

4.12.3. Probability:

Based on previous events of dam failure in Lyon County, the committee determined that there is an 'Unlikely' chance for a dam failure to occur. The committee determined that there is less than a 10% chance to occur on any given year(1 in 10 chance). There are no documented dam failures in the committees recollection.

4.12.4. Magnitude/Severity:

The committee determined that there would be 'Limited' affect from a dam failure. There would be 10-25% in property damage, to those areas near or down stream from the dams. Mainly croplands are present near river or streams and would be lost first. Most buildings have been removed from low points near rivers or creeks in past years.

4.12.5. Warning Time:

There is minimal to no warning in the event of a dam failure. Even if regular maintenance and inspections are given to the dams, failure points can be missed and a failure can occur suddenly and without warning.

4.12.6. Duration:

Would affect those in the area for more than a week. The two main concerns would be the loss of revenue from the lost cropland or the lost recreational dollars from the dam on Lake Pahoja.

4.12.7. Hazard Total Score: 2.05

*No studies have been conducted to determine which structures would be damage due to a dam failure. It is unknown what number of structures would possibly be affected by an event. This will be reviewed in updates of this plan, to see if there is any information or studies available.

4.13 Levee Failure

4.13.1 Definition and description:

The failure of a levee can be attributed to the loss of structural integrity of a wall, dike, berms, or elevated soil by erosion, piping, saturation, or under seepage causing water to inundate normally dry areas. Levees constructed of compacted clay with a high plasticity tend to crack during cycles of long dry spells, during heavy rainfalls that follow the dry spells; water fills the cracks and fissures. In addition to increasing the hydrostatic forces, the water is slowly absorbed by the clay causing an increase in the unit weight of the clay as well as a decrease in its shear strength. This results in a simultaneous increase of the slide (driving) forces and a decrease of the resisting (shear strength) forces. The levees that are in question for all of the jurisdictions are those that support their sewer lagoons.

4.13.2. Hazards Identified by Jurisdiction:

The table below shows which jurisdictions identified Levee Failure as a hazard they are susceptible to.

	Unincorporated Lyon County	Alford	Doon	George	Inwood	Larchwood	Lester	Little Rock	Rock Rapids
Levee Failure	x	x		x	x	x		x	x

Doon and Lester did not have a concern of levee failure in their community and will not address them with mitigation actions. These two communities don't have levees that would fail.

4.13.3. Probability:

The committee determined that an occasional levee failure could occur. That is roughly a 10-20% chance in any given year for one to occur. There haven't been any failure of recent history that have done considerable amount of damage. However the committee determined that most of the levee failures are old and are continuing to get older. That even with yearly maintenance is care, levees will one day give out and have the potential to causing damage to more than the level itself. There have been no records keep on levee failures in the past.

4.13.4. Magnitude/Severity:

The severity that would come with a levee failure would be 'Limited'. The committee determined that roughly 10-25% of property surrounding the levee. Typically the land around the levee is cropland or rivers/streams which could lead to crop damage or environmental pollution.

4.13.5. Warning Time

There is minimal or no warning time in the event of a levee failure. Even with yearly maintenance and care can't prevent levee failures.

4.13.6. Duration

Levee failure would affect the community for more than a week if their sewer lagoons were to fail.

4.13.7. Hazard Total Score: 2.5

*No studies have been conducted to determine which structures would be damage due to a levee failure. It is unknown what number of structures would possibly be affected by an event. This will be reviewed in updates of this plan, to see if there is any information or studies available.

4.14 Grass or Wildland Fire

4.14.1 Definition and description:

A grass or wild-land fire is an uncontrolled fire that threatens life and property in either a rural or a wooded area. Grass and wild-land fires can occur when conditions are favorable, such as during periods of drought when natural vegetation would be drier and subject to combustibility. These events could also occur regularly from other natural occurrences such as lightning strikes.

4.14.2. Hazards Identified by Jurisdiction: The table below shows which jurisdictions identified grass or wildland fire as a hazard they are susceptible to.

	Unincorporated Lyon County	Alvord	Doon	George	Inwood	Larchwood	Lester	Little Rock	Rock Rapids
Grass or Wildland Fire	X	X	X	X	X	X	X	X	X

4.14.3. Probability:

The committee determined that it is 'Likely' for a grass or wildland fire to occur in Lyon County. It is likely that there is a 1 in 3 chance for this to occur any given year. The committee determined that each community having a fire department goes to grass or wildland fires each, typically in the fall with farmers harvesting the crops and working cropland. No exact number of responses of grass or wildland fires have been recorded, but the committee determined that each fire department responds to at least 4 calls a year.

4.14.4. Magnitude/Severity:

Of grass or wildland fire would be 'Limited' in the county. The committee determined that 10%-25% of property could be severely damaged. Most property that would be affected would be farm equipment, cropland, buildings close to croplands and fire response personnel and equipment.

Each committee was asked to designate on their critical facilities map which areas were most prone to grass or wildland fires. Most communities determined that those buildings closest to farm fields would be the most likely to be damaged by a wildland fire. The communities marked on their maps the areas most prone then estimated the type of structures and cost based on the average. The estimated buildings and value are presented below. It is to be known that grass or wildland fires are a natural hazard that usually occurs at unknown time and location, therefore these are just estimates in good faith to get the communities thinking of the possible outcomes for damages from grass or wildland fires. The maps are to be found in Section 9. It is to be noted that Lyon County did not determine damage estimates the same way as the communities determined, because of time and resources it was to large of task to determine that number, because again it is difficult to determine when and where and how much will be affected.

City	# of residential	Average Cost	# of Commercial, Industrial, others.	Average Cost	Total Lost Estimate
Alvord	4	\$61,123.53	4	\$113,618.00	\$698,966.12
Doon	4	\$72,934.33	4	\$131,490.43	\$817,699.04
George	38	\$53,327.95	2	\$234,632.59	\$2,495,727.28
Inwood	23	\$33,293.88	2	\$242,079.97	\$1,249,919.18

Larchwood	35	\$90,600.06	3	\$209,450.23	\$3,799,352.79
Lester	11	\$100,154.50	2	\$274,047.55	\$1,649,794.60
Little Rock	10	\$34,816.34	2	\$182,906.06	\$713,975.52
Rock Rapids	7	\$75,732.22	3	\$367,994.80	\$1,634,109.94

4.14.5. Warning Time:

There is minimal or no warning time in the event of a grass or wildland fire.

4.14.6. Duration:

Typically grass or wildland fires are less than one day. The committee determined that in most events

4.14.7. Hazard Total Score: 3.2

Section 5. Vulnerability

The methodology used to define vulnerability was to identify vulnerable structures in Lyon County and all jurisdictions participating in the Lyon County Hazard Mitigation Plan. All vulnerable structures were determined to be critical facilities and infrastructure by the planning team. Each jurisdiction planning team has identified critical facilities and infrastructure that could be in potential hazard areas. If any of these facilities were affected by a hazard, it would have a large affect on cities and the county to maintain current operations. The potential dollar losses for facilities are the most recent assessed value and are valuations for total structure loss. Vulnerability is also assessed by types and number of structures. Types of structural vulnerability expressed are: residential, commercial, industrial, agricultural and exempt (religious, utilities, education, government). These categories are used to show potential dollar losses to structural uses. The potential losses were used to show the vulnerability to critical facilities/infrastructure and structural uses in all hazard events investigated in this plan. Data limits were that no data was available for contents and functional loss of facilities. Sources used to identify valuations was the Lyon County Assessor for valuations of critical facilities. Vulnerability is also described in terms of a percentage or dollar amount of structural damage. The vulnerability percentages are based on the scoring criteria for severity in the Criteria Category Table at the beginning of Section 4. The magnitude/severity breakdown helped the planning team to decide the vulnerability percentages in relation to the hazards that were identified.

The following wording is from the Criteria Category Table found in the beginning of Section Four scoring section on severity: 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, Limited-10% to 25% of property severely damaged, shutdown of facilities and services for more than a week, and/or minor injuries/illnesses that do no result in permanent damage, Critical-25% to 50% of property severely damaged, shutdown of facilities and services for more than two weeks, and/or serious injuries/illnesses that result in permanent disability, Catastrophic- More than 50% of property severely damaged, shutdown of facilities and services for more than 30 days, and/or multiple deaths. Those severity percentages were estimated at 5%, 10%, 25% and 50%. The following hazards had a score of 1 for severity and were considered to have an estimated 5% of critical facilities and infrastructure vulnerable: extreme heat and sinkhole. For the score severity of 2 and were considered to have an estimated 10% of critical facilities and infrastructures vulnerable: drought, landslide, dam failure, levee failure and grass or wildland fires. The next hazards had a score of 3 for severity and were considered to have an estimated 25% of critical facilities and infrastructure vulnerable: flash flood, hailstorm, river flood, thunderstorm and lightning, tornado and windstorm. The next hazard had a score of 4 for severity and was considered to have an estimated 50% of critical facilities and infrastructure vulnerable: severe winter storm. Description of vulnerability specific to each hazard and jurisdictions affected is included in Section 4: Hazard Analysis/Risk Assessment in each hazard profile and continued on further following the table in Section 5: Assessing Vulnerability.

Table 5.1 - ASSESSING VULNERABILITY OF HAZARDS

Lyon County Totals						
Type of Structure	Number of Structures		Value of Structures		Number of People	
	# in County	% in Hazard Area	\$ in County	% in Hazard Area	# in County	% in Hazard Area
Residential	3192	100%	\$236,257,870	100%	11,581	100%
Commercial	405	100%	\$81,661,708	100%	*	*
Industrial	17	100%	\$9,055,998	100%	*	*
Agricultural	1300	100%	\$171,635,656	100%	*	*
Exempt : Religious, Utilities, Education, Govt,	141	100%	\$7,939,518	100%	*	*
	5,055		\$506,550,750		11,581	

Lyon County Rural Totals						
Type of Structure	Number of Structures		Value of Structures		Number of People	
	# in County	% in Hazard Area	\$ in County	% in Hazard Area	# in County	% in Hazard Area
Residential	463	100%	\$45,437,444	100%	4,746	100%
Commercial	43	100%	\$30,013,521	100%	*	*
Industrial	3	100%	\$7,413,980	100%	*	*
Agricultural	1270	100%	\$168,715,990	100%	*	*
Exempt : Religious, Utilities Education, Govt,	51	100%	\$120,895,518	100%	*	*
	1,830		\$372,476,453		4,746	

City of Alvord						
Type of Structure	Number of Structures		Value of Structures		Number of People	
	# in City	% in Hazard Area	\$ in City	% in Hazard Area	# in City	% in Hazard Area
Residential	85	100%	\$5,195,500	100%	196	100%
Commercial	12	100%	\$1,370,427	100%	*	*
Industrial	15	100%	\$784,810	100%	*	*
Agricultural	3	100%	\$230,847	100%	*	*
Exempt : Religious, Utilities Education, Govt,	7	100%	\$1,817,819	100%	*	*
	122		\$9,399,403		196	

City of Doon						
Type of Structure	Number of Structures		Value of Structures		Number of People	
	# in City	% in Hazard Area	\$ in City	% in Hazard Area	# in City	% in Hazard Area
Residential	213	100%	\$15,535,012	100%	1,162	100%
Commercial	40	100%	\$4,730,587	100%	*	*
Industrial	3	100%	\$71,810	100%	*	*
Agricultural	4	100%	\$480,847	100%	*	*
Exempt : Religious, Utilities Education, Govt,	7	100%	\$1,817,239	100%	*	*
	267		\$22,635,495		1,162	

City of George						
Type of Structure	Number of Structures		Value of Structures		Number of People	
	# in City	% in Hazard Area	\$ in City	% in Hazard Area	# in City	% in Hazard Area
Residential	470	100%	\$25,064,136	100%	1,080	100%
Commercial	51	100%	\$4,684,574	100%	*	*
Industrial	3	100%	\$173,860	100%	*	*
Agricultural	5	100%	\$2,332,170	100%	*	*
Exempt : Religious, Utilities Education, Govt,	11	100%	\$9,233,677	100%	*	*
	540		\$41,488,417		1,080	

City of Inwood						
Type of Structure	Number of Structures		Value of Structures		Number of People	
	# in City	% in Hazard Area	\$ in City	% in Hazard Area	# in City	% in Hazard Area
Residential	373	100%	\$12,418,617	100%	814	100%
Commercial	46	100%	\$6,015,529	100%	*	*
Industrial	0	100%	0	100%	*	*
Agricultural	3	100%	\$1,420,395	100%	*	*
Exempt : Religious, Utilities Education, Govt,	9	100%	\$6,604,714	100%	*	*
	593		\$16,459,255		814	

City of Larchwood						
Type of Structure	Number of Structures		Value of Structures		Number of People	
	# in City	% in Hazard Area	\$ in City	% in Hazard Area	# in City	% in Hazard Area
Residential	329	100%	\$29,807,420	100%	866	100%
Commercial	40	100%	\$8,157,197	100%	*	*
Industrial	1	100%	\$56,940	100%	*	*
Agricultural	5	100%	\$1,216,561	100%	*	*
Exempt : Religious, Utilities Education, Govt,	11	100%	\$2,507,965	100%	*	*
	386		\$41,746,083		866	

City of Lester						
Type of Structure	Number of Structures		Value of Structures		Number of People	
	# in City	% in Hazard Area	\$ in City	% in Hazard Area	# in City	% in Hazard Area
Residential	111	100%	\$11,117,150	100%	294	100%
Commercial	21	100%	\$2,712,727	100%	*	*
Industrial	1	100%	\$347,170	100%	*	*
Agricultural	4	100%	\$1,853,223	100%	*	*
Exempt : Religious, Utilities Education, Govt,	7	100%	\$4,130,449	100%	*	*
	144		\$20,160,719		294	

City of Little Rock						
Type of Structure	Number of Structures		Value of Structures		Number of People	
	# in City	% in Hazard Area	\$ in City	% in Hazard Area	# in City	% in Hazard Area
Residential	212	100%	\$7,381,065	100%	459	100%
Commercial	21	100%	\$2,272,234	100%	*	*
Industrial	0	100%	0	100%	*	*
Agricultural	3	100%	\$814,002	100%	*	*
Exempt : Religious, Utilities Education, Govt,	8	100%	\$2,766,758	100%	*	*
	244		\$13,234,059	459		

City of Rock Rapids						
Type of Structure	Number of Structures		Value of Structures		Number of People	
	# in City	% in Hazard Area	\$ in City	% in Hazard Area	# in City	% in Hazard Area
Residential	975	100%	\$73,838,914	100%	2,549	100%
Commercial	133	100%	\$21,621,093	100%	*	*
Industrial	5	100%	\$976,958	100%	*	*
Agricultural	4	100%	\$2,225,060	100%	*	*
Exempt : Religious, Utilities Education, Govt,	34	100%	\$39,943,974	100%	*	*
	1,151		\$138,605,999		2,549	

Source: Lyon County Assessor's Office and US Census 2010

5.2 Vulnerability Assessment and Critical Facilities

Lyon County

Facility Name	People at Facility at Peak Hours	Valuation (2018)	Severity 25% of Total Structure Value for the following hazards: Flash Flood, Hailstorm, River Flood, Thunderstorm and Lightning, Tornado, Windstorm	Severity 10% of Total Structure Value for the following hazards: Drought, Landslide, Dam Failure, Levee Failure, Grass and Wildland Fire	Severity 5% of Total Structure Value for the following hazards: Extreme Heat, Sinkhole
Grand Falls Casino	10,000	\$67,643,400	\$16,910,850	\$6,764,340	\$3,382,170
4 Electrical substations	5	\$132,000	\$33,000	\$13,200	\$6,600
West Lyon School	3,000	\$18,700,000	\$4,675,000	\$1,870,000	\$935,000
Vintage Airpark	250	\$234,300	\$58,575	\$23,430	\$11,715
Rural Water Plant	25	\$3,850,000	\$962,500	\$385,000	\$192,500
Rural Water	10	\$136,400	\$34,100	\$13,640	\$6,820
Lake Pahoja Recreation Area	500	\$550,000	\$137,500	\$55,000	\$27,500
5 Electrical substations	5	\$165,000	\$41,250	\$16,500	\$8,250

Alvord

Facility Name	People at Facility at Peak Hours	Valuation (20182	Seventy 25% of Total Structure Value for the following hazards: Flash Flood, Hailstorm, Thunderstorm and Lightning, Tornado, Windstorm	Seventy 10% of Total Structure Value for the following hazards: Drought, Levee Failure, Grass and Wildland Fire	Seventy 5% of Total Structure Value for the following hazards: Extreme Heat
City Offices	10	\$55,000	\$80,387	\$16,077	\$8,039
Fire Dept	25	\$152,000	\$21,458	\$4,292	\$2,146
Public Works	1	\$20,000	\$4,480	\$896	\$448
Post Office	5	\$25,000	\$177,402	\$35,480	\$17,740
Railroad	n/a		\$745,436	\$149,087	\$74,544
Lagoons	3	\$380,000	\$104,500	\$41,800	\$20,900
Water tower	1	\$50,000	\$13,750	\$5,500	\$2,750
Outdoor Warning Siren	1	\$10,000	\$2,750	\$1,100	\$550
Natural Gas Station	1	\$5,000	\$0	\$0	\$0
Natural Gas Main	1		\$0	\$0	\$0
Church	150	\$200,000	\$55,000	\$22,000	\$11,000
Designated Shelter	100	\$220,000	\$60,500	\$24,200	\$12,100

Doon

Facility Name	People at Facility at Peak Hours	Valuation (2018)	Severely 25% of Total Structure Value for the following hazards: Flash Flood, Hailstorm, Thunderstorm and Lightning, Tornado, Windstorm	Severely 10% of Total Structure Value for the following hazards: Landslide, Grass and Wildland Fire	Severely 5% of Total Structure Value for the following hazards: Extreme Heat
City Offices	10	\$30,000	\$80,387	\$16,077	\$8,039
Fire Dept	150	\$77,684	\$21,458	\$4,292	\$2,146
Public Works	1	\$180,000	\$4,480	\$896	\$448
Post Office	5	\$116,790	\$177,402	\$35,480	\$17,740
EMS/Ambulance	Fire Dept		\$745,436	\$149,087	\$74,544
City Storage	Public Works		\$0	\$0	\$0
Designated Safe Room	Community Center		\$0	\$0	\$0
Railroad	n/a		\$0	\$0	\$0
Wastewater Treatment Plant	1	\$100,000	\$0	\$0	\$0
Water Plant/Tower	1	\$424,000	\$116,600	\$46,640	\$23,320
Outdoor Warning siren	1	\$3,000	\$825	\$330	\$165
Doon Christian School	40	\$91,761	\$25,234	\$10,094	\$5,047
NW IA Prot. Reformed School	80	\$179,118	\$49,257	\$19,703	\$9,851
Doon Ball Diamond	150	\$50,000	\$13,750	\$5,500	\$2,750
United Reformed Church	300	\$524,093	\$144,126	\$57,650	\$28,825
First Reformed Church	150	\$151,223	\$41,586	\$16,635	\$8,317
First United Methodist Church	50	\$61,310	\$16,860	\$6,744	\$3,372
Protestant Reformed Church	300	\$246,107	\$67,679	\$27,072	\$13,536
Daycare			\$0	\$0	\$0
Library	15	\$62,168	\$17,096	\$6,838	\$3,419
Community Center	400	\$145,372	\$39,977	\$15,991	\$7,995
Ag Grow Plus Hazardous Materials	5		\$0	\$0	\$0
Doon Elevator	12	\$1,609,601	\$442,640	\$177,056	\$88,528
Farmers Elevator Co	25	\$1,649,269	\$453,549	\$181,420	\$90,710
Hazardous Materials Transported - Railroad	n/a		\$0	\$0	\$0
City Well	1	\$100,000	\$27,500	\$11,000	\$5,500
Natural Gas Border Station	2	\$5,000	\$1,375	\$550	\$275

George

Facility Name	People at Facility at Peak Hours	Valuation (2018)	Severity 25% of Total Structure Value for the following hazards: Flash Flood, Hailstorm, River Flood, Thunderstorm and Lightning, Tornado, Windstorm	Severity 10% of Total Structure Value for the following hazards: Drought, Levee Failure, Grass and Wildland Fire	Severity 5% of Total Structure Value for the following hazards: Extreme Heat
City Offices	12	\$164,396	\$80,387	\$16,077	\$8,039
Fire Dept	40	\$881,816	\$21,458	\$4,292	\$2,146
Sanford Medical Clinic	20		\$4,480	\$896	\$448
Public Works Building	4	\$186,171	\$177,402	\$35,480	\$17,740
Post Office	12		\$745,436	\$149,087	\$74,544
EMS/Ambulance	w/Fire		\$0	\$0	\$0
City Maintenance	3	\$165,894	\$45,621	\$18,248	\$9,124
Designated Shelter	200	\$617,140	\$169,714	\$67,885	\$33,943
Highway 34	n/a		\$0	\$0	\$0
H St	N/a		\$0	\$0	\$0
Trails	n/a		\$0	\$0	\$0
Wastewater Treatment	1	\$198,010	\$54,453	\$21,781	\$10,891
Ballfield Pump House	1	\$42,230	\$11,613	\$4,645	\$2,323
Water Tower	1	\$266,208	\$73,207	\$29,283	\$14,641
Warning Sirens	1	\$16,830	\$4,628	\$1,851	\$926
Warning Sirens	1	\$16,830	\$4,628	\$1,851	\$926
School	600		\$0	\$0	\$0
Retirement Home	75		\$0	\$0	\$0
Lutheran Church	120		\$0	\$0	\$0
Baptist Church	500		\$0	\$0	\$0
Presbyterian Church	150		\$0	\$0	\$0
Library	30	\$617,140	\$169,714	\$67,885	\$33,943
Community Center	w/designated shelter		\$0	\$0	\$0
Pump House Well #2	1	\$14,004	\$3,851	\$1,540	\$770
Sewer Lift Station	2	\$20,812	\$5,723	\$2,289	\$1,145
Red Equip&Main Storage Shed	3	\$326,209	\$89,707	\$35,883	\$17,941
Museum	50	\$53,031	\$14,584	\$5,833	\$2,917
Pool	150		\$0	\$0	\$0
Old Park Shelter and Restrooms	100	\$42,668	\$11,734	\$4,693	\$2,347
Veteran's Memorial	40	\$32,473	\$8,930	\$3,572	\$1,786
Park (Shelter, Campground)	500	\$95,262	\$26,197	\$10,479	\$5,239
North Park Shelter	20	\$3,311	\$911	\$364	\$182

Inwood

Facility Name	People at Facility at Peak Hours	Valuation (2018)	Seventy 25% of Total Structure Value for the following hazards: Flash Flood, Hailstorm, Thunderstorm and Lightning, Tornado, Windstorm	Seventy 10% of Total Structure Value for the following hazards: Drought, Levee Failure, Grass and Wildland Fire	Seventy 5% of Total Structure Value for the following hazards: Extreme Heat
City Offices	300	\$1,500,000	\$412,500	\$165,000	\$82,500
Police/Fire Dept	50	\$200,000	\$55,000	\$22,000	\$11,000
Clinic	20	\$300,000	\$82,500	\$33,000	\$16,500
City Maintenance	2	\$125,000	\$34,375	\$13,750	\$6,875
Post Office	10	\$300,000	\$82,500	\$33,000	\$16,500
Designated Shelter	200	\$1,500,000	\$412,500	\$165,000	\$82,500
Designated Shelter	W/office s		\$0	\$0	\$0
Wastewater Treatment Plant/ 2 Lift stations	2	\$1,500,000	\$412,500	\$165,000	\$82,500
Water Plant	2	\$120,000	\$33,000	\$13,200	\$6,600
Electrical Substation	1		\$0	\$0	\$0
Water Tower	1	\$150,000	\$41,250	\$16,500	\$8,250
Warning Siren	1	\$10,000	\$2,750	\$1,100	\$550
Natural Gas Border Station	1		\$0	\$0	\$0
Inwood Christian School&ball park	300	\$1,500,000	\$412,500	\$165,000	\$82,500
Retirement Home	200	\$2,000,000	\$550,000	\$220,000	\$110,000
Church First Reformed	200	\$2,000,000	\$550,000	\$220,000	\$110,000
Church Bethany Lutheran	300	\$2,000,000	\$550,000	\$220,000	\$110,000
Church Christian Reformed	450	\$2,000,000	\$550,000	\$220,000	\$110,000
Church New Life Assembly	200	\$2,000,000	\$550,000	\$220,000	\$110,000
Library	W/office s		\$0	\$0	\$0
Hazardous material storage	12	\$125,000	\$34,375	\$13,750	\$6,875
Hazardous Material Transportation	w/above		\$412,500	\$165,000	\$82,500
Highway 182	n/a		\$0	\$0	\$0
Highway 18	n/a		\$55,000	\$22,000	\$11,000

Lester

Facility Name	People at Facility at Peak Hours	Valuation (2018)	Seventy 25% of Total Structure Value for the following hazards: Flash Flood, Hailstorm, River Flood, Thunderstorm and Lightning, Tornado, Windstorm	Seventy 10% of Total Structure Value for the following hazards: Drought, Grass and Wildland Fire	Seventy 5% of Total Structure Value for the following hazards: Extreme Heat
City Offices	200	\$130,000	\$80,387	\$16,077	\$8,039
Police/Fire Dept	w/above		\$21,458	\$4,292	\$2,146
Public Works	w/above		\$4,480	\$896	\$448
Post Office	10	\$15,000	\$177,402	\$35,480	\$17,740
EMS/Ambulance	w/city off.		\$745,436	\$149,087	\$74,544
City Maintenance/Park	25	\$2,500	\$688	\$275	\$138
Designated Shelter	400	\$75,000	\$20,625	\$8,250	\$4,125
Highway	n/a		\$0	\$0	\$0
Highway	n/a		\$0	\$0	\$0
Railroad	n/a		\$0	\$0	\$0
Wastewater Treatment Plant	4	\$95,000	\$26,125	\$10,450	\$5,225
Water Plant	2	\$17,000	\$4,675	\$1,870	\$935
Warning Siren	1	\$3,000	\$825	\$330	\$165
Retirement Home	140	\$1,600,000	\$440,000	\$176,000	\$88,000
Apostolic Christian Church	2500	\$1,200,000	\$330,000	\$132,000	\$66,000
Bethel Reformed	250	\$650,000	\$178,750	\$71,500	\$35,750
Seeds of Faith Methodist	350	\$575,000	\$158,125	\$63,250	\$31,625
Community Center	w/desig shel		\$0	\$0	\$0
Hazardous Materials Storage	25	\$500,000	\$137,500	\$55,000	\$27,500
Hazardous Materials Transportation			\$0	\$0	\$0
Large Manufacturing	w/above		\$0	\$0	\$0

Larchwood

Facility Name	People at Facility at Peak Hours	Valuation (2018)	Seventy 25% of Total Structure Value for the following hazards: Flash Flood, Hailstorm, Thunderstorm and Lightning, Tornado, Windstorm	Seventy 10% of Total Structure Value for the following hazards: Drought, Levee Failure, Grass and Wildland Fire	Seventy 5% of Total Structure Value for the following hazards: Extreme Heat
City Offices	150	\$327,392.0	\$401,935.50	\$160,774	\$80,387
Fire Dept	50	\$115,479.0	\$107,288.00	\$42,915	\$21,458
Larchwood Medical Clinic	20	\$126,000.0	\$22,399.00	\$8,960	\$4,480
Public Works	3	\$132,098.0	\$887,007.50	\$354,803	\$177,402
Post Office	5	\$60,000.00	\$3,727,180.00	\$1,490,872	\$745,436
EMS/Ambulance	18	\$63,411.00		\$69,752	\$17,438
City Maintenance	1	\$10,142.00		\$11,156	\$2,789
Designated Shelter	150	\$764,545.0		\$841,000	\$210,250
Highway 9	n/a				\$0
Airport	50	\$100,000.0		\$110,000	\$27,500
Trails	500	\$90,000.00		\$99,000	\$24,750
Wastewater Treatment Plant	2	\$200,000.0		\$220,000	\$55,000
Water Plant	2	\$1,047,000		\$1,151,700	\$287,925
City Well	2	\$157,000.0		\$172,700	\$43,175
Electrical Sub-station	1	\$1,500,000		\$1,650,000	\$412,500
Water Tower	1	\$480,000.0		\$528,000	\$132,000
Warning Sirens	1	\$3,000.00		\$3,300	\$825
St. Marys Church	800	\$1,642,000		\$1,806,200	\$451,550
English Lutheran Church	25	\$89,000.00		\$97,900	\$24,475
United Church of Christ	100	\$1,079,624		\$1,187,586	\$296,897
Daycare	40	\$325,000.0		\$357,500	\$89,375
Library	50	\$217,249.0		\$238,974	\$59,743
Community Center	w/city off			\$0	\$0
Farmers Elevator	25	\$7,025,000		\$7,727,500	\$1,931,875

Little Rock

Facility Name	People at Facility at Peak Hours	Valuation (2018)	Severely 25% of Total Structure Value for the following hazards: Flash Flood, Hailstorm, River Flood, Thunderstorm and Lightning, Tornado, Windstorm	Severely 10% of Total Structure Value for the following hazards: Drought, Levee Failure, Grass and Wildland Fire	Severely 5% of Total Structure Value for the following hazards: Extreme Heat
City Offices	20	\$1,000,000	\$401,935.5	\$160,774	\$80,387
Fire	400		\$107,288.0	\$42,915	\$21,458
Public Works	200	\$150,000.0	\$22,399.00	\$8,960	\$4,480
Post Office	8	\$25,000.00	\$887,007.5	\$354,803	\$177,402
Old City hall/Shelter	w/city off		\$3,727,180.00	\$1,490,872	\$745,436
T&C Building/Shelter	300	\$150,000.0		\$165,000	\$41,250
Salem Reformed Church/Shelter	350	\$1,600,000.00		\$1,760,000	\$440,000
Presbyterian Church/Shelter	300	\$1,600,000		\$1,760,000	\$440,000
Lift Station	1	\$100,000.0			\$0
Water Tower	1	\$450,000.0		\$495,000	\$123,750
Warning Siren	1	\$30,000.00		\$33,000	\$8,250
School	500			\$0	\$0
Library	w/city off			\$0	\$0
Hazardous Materials Storage	50	\$1,000,000	\$401,935.5	\$160,774	\$80,387

Rock Rapids

Facility Name	People at Facility at Peak Hours	Valuation (2018)	Severely 25% of Total Structure Value for the following hazards: Flash Flood, Hailstorm, River Flood, Thunderstorm and Lightning, Tornado, Windstorm	Severely 10% of Total Structure Value for the following hazards: Drought, Dam Failure, Levee Failure, Grass and Wildland Fire	Severely 5% of Total Structure Value for the following hazards: Extreme Heat
City Office/Warning Siren	200	\$1,607,742.00	\$401,935.50	\$160,774	\$80,387
Fire Station	75	\$429,152.00	\$107,288.00	\$42,915	\$21,458
Post Office	20	\$89,596.00	\$22,399.00	\$8,960	\$4,480
Police Department	50	\$3,548,030.0	\$887,007.50	\$354,803	\$177,402
Central Lyon School	750	\$14,908,720.	\$3,727,180.00	\$1,490,872	\$745,436

Ambulance Building	25	\$280,160.00		\$308,176	\$77,044
Lyon County Courthouse	150	\$1,581,983.00		\$1,740,181	\$435,045
Forster Community Center	550	\$1,640,000.00		\$1,804,000	\$451,000
Warning Siren (Total for 4)	1	\$100,000.00		\$110,000	\$27,500
Iowa Highway 9		\$3,500,000.0		\$3,850,000	\$962,500
U.S. Highway 75		\$3,500,000.0		\$3,850,000	\$962,500
Wastewater Treatment Plant	6	\$6,000,000.00		\$6,600,000	\$1,650,000
Water Plant	6	\$4,065,103.0		\$4,471,613	\$1,117,903
Electric Substation	1	\$3,069,787.0			\$0
Water Towers	4	\$1,762,225.0		\$1,938,448	\$484,612
Hospital/Medical Clinic	100	\$3,774,826.0		\$4,152,309	\$1,038,077
Retirement/Aging Center	200	\$3,587,480.00		\$3,946,228	\$986,557
Daycare Center	100	\$230,000.00		\$253,000	\$63,250
Rock Rapids Library	100	\$2,242,600.0		\$2,466,860	\$616,715
Grain Elevator (Farmers Coop Society)	20	\$3,386,710.00		\$3,725,381	\$931,345
Natural Gas (Rock Rapids Utilities)	1	\$909,350.00		\$1,000,285	\$250,071
Community Swimming Pool	320	\$415,825.00		\$457,408	\$114,352
City Maintenance Building	100	\$326,842.00		\$359,526	\$89,882
Electric Generator Plant	6	\$2,123,082.0		\$2,335,390	\$583,848
Lyon County Roads Dept. Building	20	\$403,172.00		\$443,489	\$110,872
IDOT Maintenance Building	15	\$1,016,600.00		\$1,118,260	\$279,565
Congregational UCC	452	\$24,359.00		\$26,795	\$6,699
Christian (Disciples)	400	\$131,253.00		\$144,378	\$36,095
Holy Name Catholic	1357	\$1,478,493.0		\$1,626,342	\$406,586
Peace Lutheran	695	\$661,055.00		\$727,161	\$181,790
Immanuel Lutheran	1182	\$701,052.00		\$771,157	\$192,789
Faith Baptist	243	\$425,594.00		\$468,153	\$117,038
Christian Reformed	335	\$298,951.00		\$328,846	\$82,212
First Reformed	1511	\$3,502,527.0		\$3,852,780	\$963,195
United Methodist	994	\$380,899.00		\$418,989	\$104,747

DATE: 8/14/19
TIME: 14:48:39

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2018
Abstract of Assessment for 2019
LYON

ESL3100

Agricultural Realty
Do Not include Dwellings

Townships and Unincorporated Areas	Number of Agricultural Acres	Actual Value of Land Only	Actual Value of Structures Do not include Dwigs-	Total Actual Value of Land and Structures
ELGIN	16,275.82	44,064,360	4,934,210	48,998,570
MIDLAND	17,023.72	47,737,980	2,042,880	49,780,860
RIVERSIDE	15,971.93	35,089,660	2,344,990	37,434,650
ALLISON	16,212.53	35,312,540	4,001,090	39,313,630
LARCHWOOD	15,352.14	32,506,150	2,321,600	34,827,750
SIOUX	20,113.22	37,120,220	1,711,330	38,831,550
CENTENNIAL	16,882.18	25,990,151	2,405,170	28,395,321
LOGAN	21,891.28	45,563,280	7,067,240	52,630,520
CLEVELAND	21,409.92	44,918,350	4,820,170	49,738,520
ROCK	20,005.68	44,988,740	2,398,930	47,387,670
LIBERAL	21,505.80	61,972,780	3,600,590	65,573,370
GRANT	21,873.76	57,341,980	4,143,710	61,485,690
DALE	22,079.73	61,696,421	2,895,970	64,592,391
WEBSTER	21,112.59	54,224,421	2,617,540	56,841,961
GARFIELD	22,395.66	51,283,090	5,867,340	57,150,430
DOON	21,122.41	41,332,272	4,885,840	46,218,112
RICHLAND	21,217.17	44,418,350	9,149,190	53,567,540
LYON	17,949.31	28,159,480	2,856,250	31,015,730
Township * Village Totals	350,314.96	796,323,425	70,064,040	866,387,465
Cities and Towns				
ROCK RAPIDS	1,313.04	2,412,250	290,490	2,702,740
GEORGE	1,011.13	2,668,250	65,720	2,733,970
LITTLE ROCK	410.72	810,130	1,900	812,030
INWOOD	597.24	1,283,430	29,610	1,313,040
LESTER	964.20	2,133,500	39,670	2,173,170
DOON	181.54	277,540	60,490	338,030
ALVORD	195.08	375,270	37,070	412,340
LARCHWOOD	351.37	744,820	19,330	764,150
Cities and Towns Totals	5,024.38	10,705,190	544,280	11,249,470
County Totals	355,339.34	807,028,615	70,608,320	877,636,935
CSR Total Points	.00	0	0	0

correct

Residential Dwellings on Agricultural Realty

Townships and Unincorporated Areas	Number of Dwlg	Actual Value of Dwlg
ELGIN	55	5,352,977
MIDLAND	45	4,846,704
RIVERSIDE	46	5,610,108
ALLISON	58	6,129,925
LARCHWOOD	60	8,446,606
STOUX	71	8,568,757
CENTENNIAL	64	10,090,868
LOGAN	77	9,502,331
CLEVELAND	85	11,489,005
ROCK	62	7,223,510
LIBERAL	64	6,059,933
GRANT	71	7,011,183
DALE	70	6,061,752
WHEELER	79	7,878,046
CARFIELD	90	11,511,580
DOON	85	11,836,081
RICHLAND	91	12,721,352
LYON	66	9,775,736
Township * Village Totals	1,239	150,116,454
Cities and Towns		
ROCK RAPIDS	4	786,480
GEORGE	6	414,090
LITTLE ROCK	3	309,310
INWOOD	2	334,436
LESTER	4	213,435
DOON	3	413,008
ALVORD	3	316,764
LARCHWOOD	4	630,379
Cities and Towns Totals	29	3,417,902
County Totals	1,268	153,534,356

DATE: 8/14/18
TIME: 14:48:41

Abstract of Assessment for 2019
LYON

RSL3102

Residential Realty - Does not include Residential Dwellings on Agricultural Land

Townships and Unincorporated Areas	Actual Value of Residential Lots	Actual Value of Residential Bldgs	Actual Value Residential Lots and Buildings	Number of Dwellings
ELGIN	323,938	1,203,355	1,527,793	14
MIDLAND	224,644	1,285,877	1,510,521	10
RIVERSIDE	1,551,673	9,379,662	10,931,340	53
ALLISON	254,457	964,286	1,218,743	7
LARCHWOOD	3,786,607	13,269,852	22,056,459	74
SIOUX	1,551,317	9,210,699	10,762,016	49
CENTENNIAL	881,630	3,643,079	4,529,709	29
LOGAN	1,140,274	4,382,864	5,123,138	32
CLEVELAND	723,585	2,396,505	3,720,090	21
ROCK	943,436	5,278,879	6,222,315	29
LIBERAL	780,239	2,615,652	3,395,891	28
GRANT	810,103	2,265,437	3,075,542	28
DALE	556,070	1,333,983	1,890,053	19
WHEELER	475,561	1,817,224	2,292,885	17
GARFIELD	432,223	1,608,058	2,040,281	14
DOON	725,374	2,642,571	3,368,445	23
RICHLAND	623,190	3,263,559	3,886,749	19
LYON	926,325	4,389,280	5,215,605	41
Township * Village Totals	16,611,253	77,156,322	93,767,575	507
Cities and Towns				
ROCK RAPIDS	23,225,780	98,568,835	121,794,615	957
GEORGE	4,986,890	32,145,720	37,132,610	470
LITTLE ROCK	1,617,330	8,811,040	10,428,370	207
INWOOD	6,418,644	34,743,482	41,162,126	340
LESTER	1,506,217	15,477,934	16,984,151	114
DOON	2,770,601	23,849,463	26,620,064	224
ALVORD	440,848	6,421,447	6,862,295	89
LARCHWOOD	5,260,826	42,662,929	47,923,755	347
Cities and Towns Totals	46,227,136	262,680,850	308,907,986	2,743
County Totals	62,838,389	339,837,172	402,675,561	3,255

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2018 REPORT OF ACTUAL VALUES SUBJECT TO FULL EXEMPTION
LYON

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For the exemptions listed below, report the appropriate classification
and exempt values which are NOT included in the abstract and reconciliation report

Exemption Type	Agricultural	Aq Dwellings	Residential	Commercial	Industrial	Multi-Res	
RELIGIOUS INSTITUTIONS							
CHURCH	.00	.00	515,974.00	35,274,818.00	.00	.00	35,792,792.00
SCHOOLS	.00	.00	47,240.00	1,518,135.00	.00	.00	1,565,375.00
CHURCH CAMP	.00	.00	.00	.00	.00	.00	.00
RECREATIONAL	.00	.00	94,850.00	.00	.00	.00	94,850.00
RESIDENTIALS	1,780.00	.00	5,104,089.00	.00	.00	.00	5,105,869.00
OTHER (PARKING)	.00	.00	.00	.00	.00	.00	.00
CEMETERIES	39,180.00	.00	.00	221,958.00	.00	.00	262,138.00
Total	40,960.00	.00	5,762,153.00	37,017,911.00	.00	.00	42,821,024.00
LITERARY							
HISTORICAL SOC/MUS	.00	.00	.00	245,970.00	.00	.00	245,970.00
Total	.00	.00	.00	245,970.00	.00	.00	245,970.00
CHARITABLE							
HOSPITALS	.00	.00	.00	5,255,079.00	.00	.00	5,255,079.00
NURSING HOMES	.00	.00	.00	.00	.00	4,224,380.00	4,224,380.00
RETIREMENT HOMES	.00	.00	.00	.00	.00	.00	.00
FRATERNAL ORGANIZAT.	.00	.00	.00	64,549.00	.00	.00	64,549.00
AGRICULTURE SOCIETY	.00	.00	.00	71,441.00	.00	.00	71,441.00
OTHER	.00	.00	.00	40,401.00	.00	.00	40,401.00
Total	.00	.00	.00	5,431,470.00	.00	4,224,380.00	9,655,850.00
EDUCATIONAL INSTITUTIONS							
CAMPUS PROPERTY	.00	.00	.00	.00	.00	.00	.00
Total	.00	.00	.00	.00	.00	.00	.00
LOW RENT HOUSING							
LOW-RENT HOUSING	.00	.00	.00	.00	.00	2,787,320.00	2,787,320.00
Total	.00	.00	.00	.00	.00	2,787,320.00	2,787,320.00
ASSOC WAR VETS							
WAR VETS PROPERTY	.00	.00	.00	42,951.00	.00	.00	42,951.00
Total	.00	.00	.00	42,951.00	.00	.00	42,951.00
POLLUTION/DECONTAMINATION							
POLLUTION CONTROL	.00	.00	.00	.00	.00	.00	.00
POLLUTION CONTROL	.00	.00	.00	.00	.00	.00	.00
IMPROVEMENTS	.00	.00	.00	.00	.00	.00	.00
Total	.00	.00	.00	.00	.00	.00	.00
OTHER EXEMPT							
STATE OWNED	558,530.00	.00	.00	5,515,099.00	.00	.00	6,073,629.00
CITY OWNED	135,130.00	.00	50,535.00	12,380,497.00	.00	.00	12,566,253.00
COUNTY OWNED	199,410.00	.00	168.00	10,321,017.00	.00	.00	10,520,795.00
NON-RELIG CEMETERIES	.00	.00	.00	.00	.00	.00	.00
SCHOOLS	11,410.00	.00	.00	39,323,322.00	.00	.00	39,334,732.00
ASSESSED WITH CORP	.00	.00	.00	.00	.00	.00	.00
OTHER MISC	913,240.00	.00	.00	3,134,289.00	.00	.00	4,047,529.00
FOREST RESERVE	.00	.00	.00	.00	.00	.00	.00
Total	1,806,520.00	.00	50,794.00	71,574,324.00	.00	.00	73,432,138.00

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2019 REPORT OF ACTUAL VALUES SUBJECT TO FULL EXEMPTION
LUCAS

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For the exemptions listed below, report the appropriate classification
and exempt values which are NOT included in the abstract and reconciliation report.

Exemption Type	Agricultural	As Dwellings	Residential	Commercial	Industrial	Multi-Res	
CENTRALLY ASSESSED							
RAILROAD	.00	.00	.00	.00	.00	.00	.00
TELEPHONE	.00	.00	.00	.00	.00	.00	.00
UTILITIES	28,370.00	.00	.00	.00	.00	.00	.00
CABLE (TELEPHONE)	.00	.00	.00	.00	.00	.00	28,370.00
Total	28,370.00	.00	.00	.00	.00	.00	.00
							28,370.00
Totals by Classification	1,875,850.00	.00	5,812,947.00	114,113,126.00	.00	7,011,700.00	
Total of All Exempt Property							129,013,623.00

Section 6. Hazard Mitigation Goals

The participating jurisdiction planning committees identified the mitigation plan goals. The committee developed broad-based goals that would address a large number of hazards and cover a variety of mitigation activities. The hazard mitigation plan goals identified are as follows:

Goals to help reduce or avoid long term vulnerabilities to identified natural hazards.

1. Injuries, sickness, deaths, property loss, utility services disruption and economic loss due to natural hazards will be reduced and mitigated against.
2. Protect critical infrastructure and city/county assets from damages due to natural hazards.
3. Educate the public on the hazards that are associated and are most prone to cause a disturbance or result in damage in Lyon County. Offer information on what to do during events.

The purpose of establishing goal statements is to set a general guideline for eliminating or reducing the longterm effects to property and life, reducing costs of response and recovery and minimizing disruption to all of Lyon County following a natural hazard event. Goal statements do not spell out specific strategies that can be measured but are written in general terms. Mitigation actions or measures are designed to be measured. The subsections of the hazards worksheets sections, i.e., historical occurrence, probability, vulnerability, maximum extent, severity, and speed of onset (which form the methodology of the assessment) were consulted as necessary.

The individual jurisdictions accepted the goals for each of their respective communities.

The mitigation actions from the 2005 plans were reviewed for relevance. Most off the actions were for technical hazards that are no longer in the multijurisdictional plan and were not included in this plan update. Typically in the development of multijurisdictional hazard mitigation plans, often include ideas from the 2005 plan, but the changes between the 2005 and 2013 warranted developing even more useful actions for the natural hazards selected. Those mitigation actions from those plans are attached in the Appendix and described if they were completed, ongoing or deleted at this point in time. Most of the actions from those plans were never completed because of the lack of resources and time. A good portion of them have been included in this multijurisdictional plan and the committees hope to have more resources and time to be able to complete more mitigation actions in the near future. The actions that are in the FEMA approved Rock Rapids plan have been carried over into this plan since, they have not completed any to date. There haven't been sufficient funds or time to complete any of their actions.

The following two tables are showing the abbreviations used for the local jurisdictions and a number system for the natural hazards.

Table 6.1 - Jurisdiction Abbreviation In This Plan					
Lyon County	=	LC	Larchwood	=	LA
Alvord	=	AL	Lester	=	LE
Doon	=	DO	Little Rock	=	LR
George	=	GE	Rock Rapids	=	RR
Inwood	=	IN			

Table 6.2 – Weather Events by Number					
1	=	Drought	8	=	Sinkhole
2	=	Extreme Heat	9	=	Thunderstorm and Lightning

3	=	Flash Flood	10	=	Tornado
4	=	Hailstorm	11	=	Windstorm
5	=	Landslide	12	=	Dam Failure
6	=	River Flood	13	=	Levee Failure
7	=	Severe Winter Storm	14	=	Grass of Wildland Fire

SECTION 6.1 MITIGATION ACTIONS

To be able to complete or help meet the goals of the Lyon County Multi-Hazard Mitigation Plan, different mitigation measures were developed. The following table shows those mitigation actions and what actions are to be followed by what entity.

Mitigation Action	Community Choosing this Mitigation	Hazard Addressed	Category	Goal
Enforce Tree Trimming	LC, AL, GE, IN, LA, LE, DN	7, 10, 11	Natural Resource Protection	1, 2
Purchase Back Up Power Generators	LC, IN, LA, LE, LR, RR, DN	2, 3, 4, 6, 7, 9, 10, 11	Property Protection	1, 2
Bury Utility Lines	GE, LA, LE, DN	2, 4, 7, 9, 10, 11	Structural Projects	1, 2
Buy and Distribute NOAA Weather Radios	LC, GE, LA, LE, DN	2, 3, 4, 6, 7, 9, 10, 11	Public Awareness	1, 3
Designate a Local Community Shelters	GE, IN, LA, LE, LR, RR	1, 2, 3, 6, 9, 10, 11	Public Awareness	1, 3
Purchase Snow/Plowing Equipment	LC, AL, GE, IN, LA, LE,	7		1
Establishing a Good Neighbor Program to Check on Residents	LA, LE, LR, RR, DN	2, 7, 9, 10, 11	Public Awareness	1, 3
Build a Safe Room	LC, GE, IN, LA, LE, RR	7, 9, 10, 11	Structural Projects	1, 3
Build or Update Warning Sirens	LC, AL, GE, IN, LA, LR, RR, DN	4, 9, 10, 11	Prevention	1
Conduct a Watershed Study and Implement the findings	LC, IN	3, 6	Prevention	1,2
Enforce Building and Zoning Codes	LC, GE, IN, LA, LR, DN	3, 5, 6	Prevention	1, 2
Continue you Fire Dept HAZMAT Training	LC, AL, IN, LA, LE, LR, RR, DN	9, 10, 11, 14	Emergency Services	1
Continue Fire Dept Training	LC, AL, GE, IN, LA, LE, LR, DN	9, 10, 11, 14	Emergency Services	1
Enforce the Snow Removal Policy	LC, AL, GE, IN, LA, LR, RR, DN	7	Prevention	1, 2
Develop a list of Storm Shelters and Distribute to Residents	LA, RR	2, 3, 4, 7, 9, 10, 11	Public Awareness	3
Develop Public Education/Awareness and Distribute	LC, LA, IN	All	Public Awareness	3
Maintain Outdoor Warning Sirens	AL, GE, IN, LA, DN, LR	4, 9, 10, 11	Prevention	1,3
Update or Create Local Emergency Plans	LC, AL, GE, IN, LA, LE, LR, DN, RR	All	Prevention	1, 2, 3

Clean or Enlarge Sewage Lagoons	IN, LA, RR, DN	3, 9	Structural Projects	1,2
Construct Sewer Lift Station	AL, GE, IN, LE, RR	3, 9	Structural Projects	2
Replace and Rehab Sewer Lines	GE, IN, LA, LE, DN	3, 6, 13	Structural Projects	1, 2
Monitor Storm Sewer	RR	3, 6	Prevention	1, 2
Maintain Dams and Records of Maintenance	LC, RR	12	Prevention	1, 2
Install Riprap	LC, GE, IN,	3, 5, 6	Natural Resources Protection	1, 2
Continue with NFIP Participation	LC, GE, LA, LE, RR, DN	3, 6	Property Protection	2
Develop Alternative Fire Suppression	LA,	10, 11, 14	Emergency Services	1
Purchase Portable Pumps	GE, IN, LA, LR, DN	3, 6, 9, 10, 11	Emergency Services	1, 2
Purchase Fire Gear (PPE)	LC, AL, GE, IN, LA, LR, DN	14	Emergency Services	1
Develop a list of Elderly, Disabled or Medically Distressed and Furnish to Law Enforcement	AL, LA,	2, 7, 9, 10	Public Awareness	1, 3
Purchase Shelter Rations (Cots, Blankets, Water, etc.)	LA,	7, 9, 10, 11	Emergency Services	1
Backup City Records	GE, LA, DN	2, 3, 4, 7, 9, 10, 11	Prevention	1, 2
Establish a Technical Weather Warning System	LA,	4, 9, 10, 11	Public Awareness	1, 3
Create Dry Hydrants	LC	1, 14	Emergency Services	1
Enforce Burn Bans	LC, GE, LA, LR,	1, 14	Prevention	1, 2
Reaffirm Rural Water Connections	LC, AL, IN, LA, DN	1, 14	Emergency Services	1, 2
Purchase Sandbags	LC, GE,	3, 6	Property Protection	1, 2
Determine Which Areas are Most Prone to Flood	GE,	3, 6	Natural Resources Protection	1, 2
Soils Testing for Areas Prone to Sinkholes	LC	8	Prevention	1
Develop a Better Connection with the Iowa DNR	LA, LR,	3, 6, 12, 13, 14	Natural Resources Protection	2
Reaffirm Mutual AID	AL, GE, IN, LA, LE, DN	14	Emergency Services	1, 2
Purchase Paramedic Equipment	GE, LA, LR,	2, 9, 10, 11, 14	Emergency Services	1
Transportation for Critical Employees to Work	GE, LA, RR	7, 9, 10	Emergency Services	1, 3
EMT Snowmobile	GE, LA, RR	7	Emergency	1

			Services	
Test Warning Sirens Monthly	AL, GE, IN, LA, LR, RR, DN	4, 9, 10, 11	Prevention	1, 3
Maintain and Expand Debris Removal Site	AL, GE, IN, LA, RR, DN	3, 4, 7, 9, 10, 11	Emergency Services	1
Monitor Levees Closely	RR	13	Prevention	1, 2
Funding for Strengthening Levees	RR	13	Structural Projects	1, 2
Look into Joining NFIP and Getting Mapped (Updated Also)	AL, DO, IN, LR	3, 6	Property Protection	1, 2
Enforce Floodplain Ordinance	GE	3, 6	Prevention	1, 2
Build Temporary Earth Dykes	LC, RR	3, 6	Property Protections	2
Review/Update Local Operations Plan	LC, GE, LA,	All	Prevention	1
Build Safe Rooms for Critical Facilities	LC, AL, DO, GE, IN, LA, LE, LR, RR	4, 9, 10, 11	Structural Projects	1, 2, 3

Mitigation Measures

The identified mitigation measures can be grouped into six categories. The Lyon County Mitigation Actions Table identifies which group a specific measure falls within.

Prevention

Government administrative or regulatory measures or processes that influence the way land and buildings are developed and built. These measures also include public activities to reduce hazard losses. Examples include:

- Planning and zoning
- Hazard mapping
- Building codes
- Subdivision regulations
- Studies/data collection and analysis to support prevention measures
- Floodplain regulations
- Storm water management regulations
- Multi-jurisdictional agreements that reduce hazard risks
- Other regulatory measures or processes that reduce hazard risks

Property Protection

Measures that involve modifying existing buildings or structures to protect them from a hazard, or removing buildings or structures from the hazard area or providing insurance to cover potential losses. Examples include:

- Acquisition, elevation, or relocation of hazard-prone property
- Safe room/storm shelter retrofits
- Security retrofits
- Critical facility protection
- Risk reduction retrofits (modifications) to hazard prone properties
- Studies/data collection and analysis to develop property protection measures
- National Flood Insurance Program (NFIP) participation

Public Education and Awareness

Measures to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them.

Examples include:

- Programs to improve awareness of hazard risk
- Programs to improve awareness of hazard risk prevention and reduction
- Education programs directed toward specialized audience, i.e. buildings, developers, and hazard prone neighborhoods

Natural Resource Protection

Measures that, in addition to minimizing hazard losses; preserve or restore the functions of natural systems.

Examples include:

- Sediment and erosion control
- Stream corridor restoration, watershed management
- Forest and vegetation management
- Wetland restoration and preservation

Emergency Services

Measures taken before, during and after a hazard event to protect people, and property; although these measures are not typically considered "mitigation, they significantly minimize the events impact and preserve the community's health and safety.

Examples include:

- Emergency/response facilities and personnel
- Hazard warning systems and equipment
- Health/safety/environmental risk prevention/reduction
- Emergency/response infrastructure
- Emergency/response planning
- Emergency/response training
- Emergency/response vehicles, equipment and protective gear
- Emergency/response services studies and data collection
- Emergency/response communication systems

Structural Projects

Measures that involve the construction and maintenance of structures and infrastructure that will reduce the impact of a hazard or redirect the impact away from people and property.

Examples include:

- Channel modification/maintenance
- Dam and reservoir construction/maintenance
- Levee and floodwall construction and maintenance
- Safe room construction
- Infrastructure construction and maintenance — roads and bridges
- Infrastructure construction and maintenance — utility systems
- Infrastructure construction and maintenance — urban and rural drainage systems
- Studies and data collection to develop structural projects

SECTION 6.2 STAPLEE

STAPLEE is an evaluation tool explained in the FEMA How to Guide, 386-3 to re-evaluate and prioritize mitigation measures. This tool is also used by local communities to evaluate and prioritize mitigation measures selected for inclusion in local mitigation plans. This is how the Lyon County Planning Team wished to evaluate the mitigation actions and strategies that were discussed in mitigation meetings. This acronym indicates the various factors that should be considered in planning decisions standing for Social, Technical, Administrative, Political, Legal, Economic, and Environmental elements.

Explanation of STAPLEE

S - Social

Is the proposed mitigation action acceptable to the community?

Will the measure treat all individuals and groups equitably?

Will the measure result in an inadvertent negative treatment of one or more segments of the population?

T - Technical

Will the measure reduce losses in the long-term?

Is the measure a whole or partial solution to the problem?

Does the measure solve the problem instead of the symptoms?

A - Administrative

Do the agencies responsible for implementing the measure have the skill, experience, knowledge, ability, staffing, funding, and maintenance capability to do so?

P - Political

Does the measure have the support of elected officials, public or private agencies, and the general public?

L - Legal

Does the jurisdiction responsible for implementing the measure have the legal authority to do so?

Is there a legal basis (local code/ordinance, state law, or federal law) for the measure?

E - Economic

Do the measure's benefits exceed the costs?

Does the measure contribute to the overall economic goals of the community?

Are there current sources of funds to implement the measure?

Will the measure impose an increased burden on the tax base or the local economy?

E Environmental

How does the measure impact the natural environment?

Does the measure comply with local, state, and federal environmental laws?

Is the measure consistent with current environmental goals?

Table 6.4 - STAPLEE

Hazard Addressed	Mitigation Action	S	T	A	P	L	E	E	Total Score
		Social	Technical	Administrative	Political	Legal	Economic	Environmental	
7, 10, 11	Enforce Tree Trimming	+	0	+	0	0	0	+	+3
2, 3, 4, 6, 7, 9, 10, 11	Purchase Back Up Power Generators	+	0	+	+	0	-	+	+3
2, 4, 7, 9, 10, 11	Bury Utility Lines	+	+	0	+	0	-	+	+3
2, 3, 4, 6, 7, 9, 10, 11	Buy and Distribute NOAA Weather Radios	+	0	+	+	0	+	0	+4
1, 2, 3, 6, 9, 10, 11	Designate a Local Community Shelters	+	0	+	+	0	0	0	+3
7	Purchase Snow/Plowing Equipment	+	0	+	+	0	-	0	+2
2, 7, 9, 10, 11	Establishing a Good Neighbor Program to Check on Residents	+	0	+	+	0	0	0	+3
7, 9, 10, 11	Build a Safe Room	+	+	+	+	0	-	0	+3
4, 9, 10, 11	Build or Update Warning Sirens	+	+	+	+	0	+	0	+5
3, 6	Conduct a Watershed Study and Implement the findings	+	+	0	+	0	0	+	+4
3, 5, 6	Enforce Building and Zoning Codes	+	0	+	+	0	0	0	+3
9, 10, 11, 14	Continue you Fire Dept HAZMAT Training	+	0	+	+	0	+	0	+4
9, 10, 11, 14	Continue Fire Dept Training	+	0	+	+	0	+	0	+4
7	Enforce the Snow Removal Policy	+	0	+	+	0	0	0	+3
2, 3, 4, 7, 9, 10, 11	Develop a list of Storm Shelters and Distribute to Residents	+	0	0	+	0	0	0	+2
All	Develop Public Education/Awareness and Distribute	+	0	+	+	0	+	0	+4
4, 9, 10, 11	Maintain Outdoor Warning Sirens	+	+	+	+	0	0	0	+4
All	Update or Create Local Emergency Plans	+	0	+	+	0	0	0	+3
3, 9	Clean or Enlarge Sewage Lagoons	+	0	+	+	0	-	+	+3
3, 9	Construct Sewer Lift Station	+	0	+	+	0	-	0	+2
3, 6, 13	Replace and Rehab Sewer Lines	+	0	+	+	0	-	+	+3
3, 6	Monitor Storm Sewer	+	0	+	+	0	0	+	+4
12	Maintain Dams and Records of Maintenance	+	0	+	+	0	0	+	+4
3, 5, 6	Install Riprap	+	0	+	+	0	+	+	+5
3, 6	Continue with NFIP Participation	+	+	+	+	0	0	+	+5
10, 11, 14	Develop Alternative Fire Suppression	+	0	+	+	0	0	0	+3
3, 6, 9, 10, 11	Purchase Portable Pumps	+	0	+	+	0	-	0	+2
14	Purchase Fire Gear (PPE)	+	0	+	+	0	+	0	+4
2, 7, 9, 10	Develop a list of Elderly, Disabled or Medically Distressed and Furnish to Law Enforcement	+	0	+	+	0	0	0	+3

7, 9, 10, 11	Purchase Shelter Rations (Cots, Blankets, Water, etc.)	+	0	+	+	0	0	0	+3
2, 3, 4, 7, 9, 10, 11	Backup City Records	+	0	+	+	0	0	0	+3
4, 9, 10, 11	Establish a Technical Weather Warning System	+	+	+	+	0	0	0	+4
1, 14	Create Dry Hydrants	+	0	+	+	0	0	0	+3
1, 14	Enforce Burn Bans	+	0	+	+	0	0	+	+4
1, 14	Reaffirm Rural Water Connections	+	0	+	+	0	0	0	+3
3, 6	Purchase Sandbags	+	0	+	+	0	+	0	+4
3, 6	Determine Which Areas are Most Prone to Flood	+	+	+	+	0	0	+	+5
8	Soils Testing for Areas Prone to Sinkholes	+	+	0	+	0	-	+	+3
1, 2, 3, 4, 6, 9, 10, 11	Develop a Residential Weather Survey	+	0	+	+	0	0	0	+3
3, 6, 12, 13, 14	Develop a Better Connection with the Iowa DNR	+	0	+	+	0	0	0	+3
14	Reaffirm Mutual AID	+	0	+	+	0	0	0	+3
2, 9, 10, 11, 14	Purchase Paramedic Equipment	+	0	+	+	0	+	0	+4
7, 9, 10	Transportation for Critical Employees to Work	+	0	+	+	0	0	0	+3
7	EMT Snowmobile	+	0	+	+	0	0	0	+3
4, 9, 10, 11	Test Warning Sirens Monthly	+	0	+	+	0	+	0	+4
3, 4, 7, 9, 10, 11	Maintain and Expand Debris Removal Site	+	0	+	+	0	0	0	+3
13	Monitor Levees Closely	+	0	+	+	0	0	+	+4
13	Funding for Strengthening Levees	+	0	+	+	0	-	+	-3
3, 6	Look into Joining NFIP and Getting Mapped (updated also)	+	0	+	+	0	0	+	+4
3, 6	Enforce Floodplain Ordinance	+	0	+	+	0	0	+	+4
3, 6	Build Temporary Earth Dykes	+	0	+	+	0	-	+	+3
All	Review/Update Local Operations Plan	+	0	+	+	0	0	0	+3
4, 9, 10, 11	Build Safe Rooms for Critical Facilities	+	0	+	+	0	-	0	+2

6.3 Funding Sources and Average Cost of Mitigation Actions Responsible Entity & Funding Source:

Responsible Entity, Cost Estimates and Funding Sources for Mitigation Actions		
Funding Source	Cost Estimates	Responsible Party*
G- Grant B- Local Budget T- Local Time OS- Outside Source - other	Estimates were given by the Lyon County Hazard Mitigation Planning Team	LJ - Local Jurisdiction (Clerk, Mayor, Council, Public Works)
		FD- Volunteer Fire Department
	Unknown	ST- State of Iowa
		HUD- U.S. Dept. of Housing and Urban Development
		HLSEM- Iowa Homeland Security Emergency Management
		FEMA- Federal Emergency Management Agency
		Hazmat- Hazardous Materials Response Team from Sioux City
		IDOT- Iowa Department of Transportation
		NWS- National Weather Service
		EM- Lyon County Emergency Management
		UC- Utility Company
		PD- Police Department/Sheriff
	N/A-Little or No Known Additional Costs	

* For those responsible for implementing and administering the mitigation actions when it states Local Jurisdiction (LJ) it means that the communities are small and don't have the full personnel to designate the action to a single person and will have to be a group effort for the local jurisdiction. Therefore the broad category of LJ was used.

Table 6.5 – Cost, Funding Source, Responsibility

	Estimated Cost	Funding Source	Responsible Party
Enforce Tree Trimming	Varies	B, OS	UJ, UC
Purchase Back Up Power Generators	\$100-250K per unit	G, B	UJ, EM
Bury Utility Lines	Millions	G, B, OS	UJ, UC
Buy and Distribute NOAA Weather Radios	\$40 a unit	G	EM
Designate a Local Community Shelters	N/A	B	UJ, EM
Purchase Snow/Plowing Equipment	\$100-200k	G, B	UJ, IDOT
Establishing a Good Neighbor Program to Check on Residents	n/a	B, B	UJ, EM
Build a Safe Room	\$500,000-1 million	G, B	UJ, EM, FEMA
Build or Update Warning Sirens	\$10-20k per unit	G, B	UJ, EM
Conduct a Watershed Study and Implement the findings	\$1,000,000	G, OS	DNR, EM
Enforce Building and Zoning Codes	n/a	T	UJ
Continue you Fire Dept HAZMAT Training	\$5-10,000	B, G	FD, EM
Continue Fire Dept Training	\$5,000	B	FD, EM
Enforce the Snow Removal Policy	n/a	B, T	UJ, PD
Develop a list of Storm Shelters and Distribute to Residents	n/a	T	UJ, EM, PD
Develop Public Education/Awareness and Distribute	\$2,000	B, T	UJ
Maintain Outdoor Warning Sirens	Varies	B	UJ, EM
Update or Create Local Emergency Plans	\$5,000+	B, G	EM, UJ
Clean or Enlarge Sewage Lagoons	\$1,000,000	G, B	UJ, UC, DNR
Construct Sewer Lift Station	\$250,000+	G, B	UJ, UC, DNR
Replace and Rehab Sewer Lines	\$1,000,000+	G, B	UJ, UC

Monitor Storm Sewer	\$5,000+	B, G	UJ, UC
Maintain Dams and Records of Maintenance	\$20,000	G, B	FD, EM
Install Riprap	\$10,000	B	DNR, UJ, EM
Continue with NFIP Participation	n/a	B	UJ
Develop Alternative Fire Suppression	Varies	G, B	FD
Purchase Portable Pumps	\$20,000	G, B	FD, EM
Purchase Fire Gear (PPE)	\$5,000+	G, B	FD
Develop a list of Elderly, Disabled or Medically Distressed and Furnish to Law Enforcement	n/a	T	PD, RD, UJ
Purchase Shelter Rations (Cots, Blankets, Water, etc.)	\$5,000	G, B	EM, UJ
Backup City Records	\$5,000	B	UJ
Establish a Technical Weather Warning System	Varies	G, B	EM
Create Dry Hydrants	\$120,000	G, B	FD, UJ
Enforce Burn Bans	n/a	B, T	UJ
Reaffirm Rural Water Connections	n/a	T	UC, UJ
Purchase Sandbags	\$50,000	G, B	EM
Determine Which Areas are Most Prone to Flood	\$150,000	G, B, T	EM, DNR, UJ
Soils Testing for Areas Prone to Sinkholes	\$100,000	G, B, T	DNR
Develop a Residential Weather Survey	n/a	B, T	UJ, EM
Develop a Better Connection with the Iowa DNR	n/a	T	EM, UJ
Reaffirm Mutual AID	n/a	T	FD, PD, EM
Purchase Paramedic Equipment	\$10,000+	G, B	FD, EM
Transportation for Critical Employees to Work	\$15,000	B, G	UJ, PD, FD
EMT Snowmobile	n/a	T	UJ, FEMA, EM
Test Warning Sirens Monthly	\$500,000	G, B	UJ, EM
Maintain and Expand Debris Removal Site	n/a	T, B	UJ, EM
Monitor Levees Closely	\$100,000	G, B	UJ, EM
Funding for Strengthening Levees	\$100,000	G, B	UJ, DNR
Look into Joining NFIP and Getting Mapped (updated also)	n/a	B	UJ, DNR
Enforce Floodplain Ordinance	n/a	B	UJ, DNR, EM
Build Temporary Earth Dykes	\$100,000+	B, G	UJ, DNR, EM
Review/Update Local Operations Plan	n/a	B, T	UJ, EM
Build Safe Rooms for Critical Facilities	\$1,000,000+	B, G, OS	UJ, EM, FEMA

6.4 Priority of Mitigation Actions

Priority was established by each jurisdiction and displayed in the following table. The committees determined the level of priority into three groups of high, medium and low. They based this on the completed STAPLEE for each mitigation action, knowledge of future jurisdiction funds,

Priority Ranking

High (H) – Jurisdictions valued this as something that had the highest effect on helping the community and people survive severe weather events. Also the cost could be easily obtained or funding has already been set aside.

Medium (M) – These were valued at the jurisdictions as projects that were ranked in between the other two priority groups.

Low (L). These mitigation actions have the least effect on protecting human life from severe weather events and therefore have been given the lowest priority. Or the cost is too high at this point in time and makes it unlikely to be acted upon in present future.

Implementation Schedule for the mitigation activities, whether ongoing or considered, will be subject to the availability of Federal, State, and local funding.

Continuing (ON) = Ongoing (responsible entity regularly participates in or supports)

Short Term (ST) = 1-5 years to initiate or accomplish

Long Term (LT) = 5 or more years to initiate or accomplish

ACTION	CITY	Unincorporated Lyon CO	Alvord	Doon	George	Inwood	Larchwood	Lester	Little Rock	Rock Rapids
Enforce Tree Trimming		L O	L O	L O	L O	M O	M O	L O		
Purchase Back Up Power Generators		H S		L LT		H S	L L	M S	H S	H O
Bury Utility Lines				L LT	L L		L L	M LT		
Buy and Distribute NOAA Weather Radios		M S T		L O N	M S T			L S T		
Designate a Local Community Shelters					H O	H O	M O	M O	L O	H O
Purchase Snow/Plowing Equipment		H S T	H S T		M S T	H S T	L L T			
Establishing a Good Neighbor Program to Check on Residents				L O N			M O N	L O N	M S T	H O N
Build a Safe Room		H S				H S	H S	L LT		H ST
Build or Update Warning Sirens		H S	L S	L O	H S	M S	L L		M S	H ST
Conduct a Watershed Study and Implement the findings		L LT				L LT				
Enforce Building and Zoning Codes		M O		L O	L O	M O	M O		M O	
Continue you Fire Dept HAZMAT Training		H O N		M O N		M O N	M O N	M O N	H O N	H O N
Continue Fire Dept Training		H O	M O	M O	M O	M O	M O	M O	H O	
Enforce the Snow Removal Policy		H O	L O	L O	M O	M O	L O		M O	H O
Develop a list of Storm Shelters and							L O			L ST

Distribute to Residents									
Develop Public Education/Awareness and Distribute	L O N				M O N	M O N			
Maintain Outdoor Warning Sirens		L O	L O	H O	M O	H O		M O	
Update or Create Local Emergency Plans	H O N	M O N	L O N	M S T	M O N	M O N	L O N	M O N	M O N
Clean or Enlarge Sewage Lagoons			L LT		L LT	L L			H ST
Construct Sewer Lift Station		L L		H S	M S		M S		H ST
Replace and Rehab Sewer Lines			L O	H S	H S	L L	M LT		
Monitor Storm Sewer									H O
Maintain Dams and Records of Maintenance	L S T								LST
Install Riprap	H S			M S					
Continue with NFIP Participation	M O		L O	M O		M O	M O		H O
Develop Alternative Fire Suppression						L L			
Purchase Portable Pumps			L LT	H S	M S	M L		H S	
Purchase Fire Gear (PPE)	M S	M S	L LT	H S	M S	L S		H S	
Develop a list of Elderly, Disabled or Medically Distressed and Furnish to Law Enforcement		H S T				H S T			
Purchase Shelter Rations (Cots, Blankets, Water, etc.)						L L T			
Backup City Records			M S	M S		M O			
Establish a Technical Weather Warning System						M O N			
Create Dry Hydrants	L LT								
Enforce Burn Bans	H O			L O				M O	
Reaffirm Rural Water Connections	H O	L O	L O		M O	M O			
Purchase Sandbags	H S			M S					

Determine Which Areas are Most Prone to Flood				L L T					
Soils Testing for Areas Prone to Sinkholes	L LT								
Develop a Better Connection with the Iowa DNR						M O N		M O N	
Reaffirm Mutual AID		M O	H O	H O	M O	M O	H O		
Purchase Paramedic Equipment				H S		L S		H S	
Transportation for Critical Employees to Work				H S T		L S T			H O N
EMT Snowmobile				H S		L L			H O
Test Warning Sirens Monthly		L O	L O	M O	M O	H O		M O	H O
Maintain and Expand Debris Removal Site			L O	L O	L O	M O			M LT
Monitor Levees Closely									H O
Funding for Strengthening Levees									L LT
Look into Joining NFIP and Getting Mapped (Updated)		L S T	L S T		L S T			L S T	
Enforce Floodplain Ordinance				M O					
Build Temporary Earth Dykes	M S								M LT
Review/Update Local Operations Plan	H O			M O		M O		M O	
Build Safe Rooms for Critical Facilities	L LT	L L	L LT	L L	L LT	L L	L LT	L L	L LT

Section 7. National Flood Insurance Program (NFIP)

In 1968, Congress created the National Flood Insurance Program (NFIP) to help provide a means for property owners to financially protect themselves. The NFIP offers flood insurance to homeowners, renters, and business owners if their community participates in the NFIP. Participating communities agree to adopt and enforce ordinances that meet or exceed FEMA requirements to reduce the risk of flooding.

The National Flood Insurance Program (NFIP) is administered by the Federal Emergency Management Agency (FEMA), which works closely with nearly 90 private insurance companies to offer flood insurance to property owners and renters. In order to qualify for flood insurance, a community must join the NFIP and agree to enforce sound floodplain management standards.

NFIP is a federal program that offers flood insurance which can be purchased through property and casualty insurance agents. Rates are set and do not differ from company to company or agent to agent. These rates depend on many factors, which include the date and type of construction of your home, along with your buildings level of risk.

The NFIP does more than make flood insurance available; it also supports local communities in their efforts to reduce the risk and consequences of serious flooding. In order to participate in the NFIP, a community must agree to adopt and enforce sound floodplain management regulations and ordinances. In exchange for these practices, FEMA makes flood insurance available to homeowners, business owners and renters in these communities.

Congress mandated federally regulated or insured lenders to require flood insurance on properties that are located in areas at high risk of flooding. A lender can require flood insurance, even if it is not federally required. Insurance requirements for different flood risk areas include: residents of high-risk areas and residents of moderate-to-low risk areas.

Residents of High-Risk Areas: Homes and buildings in high-risk flood areas with mortgages from federally regulated or insured lenders are required to have flood insurance. These areas have a 1% or greater chance of flooding in any given year, which is equivalent to a 26% chance of flooding during a 30-year mortgage.

Residents of Moderate-to-Low Risk Areas: Homes and businesses located in moderate-to-low risk areas that have mortgages from federally regulated or insured lenders are typically not required to have flood insurance. However, flood insurance is highly recommended because anyone can be financially vulnerable to floods. People outside of high-risk areas file over 20% of NFIP claims and receive one-third of disaster assistance for flooding. When it's available, disaster assistance is typically a loan you must repay with interest.

Building versus Contents Coverage

Flood insurance protects two types of insurable property: building and contents. The first covers your building, the latter covers your possessions; neither covers the land they occupy.

Building coverage includes:

- The insured building and its foundation
- The electrical and plumbing system
- Central air conditioning equipment, furnaces, and water heaters
- Refrigerators, cooking stoves, and built-in appliances such as dishwashers
- Permanently installed carpeting over unfinished flooring

Contents coverage includes:

- Clothing, furniture, and electronic equipment
- Curtains
- Portable and window air conditioners
- Portable microwaves and dishwashers
- Carpeting that is not already included in property coverage
- Clothing washers and dryers

The two most common reimbursement methods for flood claims are: Replacement Cost Value (RCV) and Actual Cash Value (ACV). The RCV is the cost to replace damaged property. It is reimbursable to owners of single-family, primary residences insured to within 80% of the buildings replacement cost. All other buildings and personal property (i.e. contents) are valued at ACV. The ACV is the RCV at the time of loss minus physical depreciation. Personal property is always valued using the ACV.

What a community must do to join NFIP

- Complete the application for participation in the National Flood Insurance Program(FEMA 81-64)
 - This application includes information such as the community name, chief executive officer, person responsible for administering the community's floodplain management program, community repository for public inspection of flood maps and estimates of land area, population and number of structures in and out of the floodplain.
- Resolution of Intent
 - There must be a resolution of intent adopted, which indicates an explicit desire to participate in the NFIP and commitment to recognize flood hazards and carry out the objectives of the program.
- Floodplain Management Regulations
 - The community must adopt and submit floodplain management regulations that meet or exceed the minimum flood plain management requirements of the NFIP.

Below is a chart of the communities in Lyon County that are participating in the NFIP.

Table 7.1 NFIP Community Information

Community	Lyon County	Alvord	Doon	George	Inwood	Larchwood	Lester	Little Rock	Rock Rapids
CID	190886	190197	190446	190368	190598	190605	190198	190448	190199
Status	Participating	Suspended	Not Participating	Participating	Suspended	Participating	Participating	Suspended	Participating
Status Effective	5/31/78	6/3/88	9/19/75	8/1/86	8/1/87	6/30/80	9/4/86	9/18/85	8/1/86
Initial Firm	None	9/18/85	None	8/1/86	8/1/87	None	9/4/86	9/18/85	8/1/86
Initial FHBM	5/31/77	9/13/74	9/19/75	8/15/75	8/8/75	8/29/75	12/20/74	9/19/75	3/29/74
Study Underway	No	No	No	No	No	No	No	No	No
Policies In Force	1	0	0	4	0	0	1	0	33
Insurance In Force	\$35,000	\$0	\$0	\$325,000	\$0	\$0	\$280,000	\$0	\$1,812,700
# of Paid Losses	0	0	0	7	0	0	1	0	11
Total Losses Paid	\$0	\$0	\$0	\$37,946.91	\$0	\$0	\$2,501.01	\$0	\$57,692.70

In support of the NFIP, FEMA identifies flood hazard areas through the US and its territories by producing Flood Hazard Boundary Maps (FHNMs), Flood Insurance Maps (FIRMs) and Flood Boundary and Floodway Maps (FBNMs). Several areas of flood hazards are commonly identified on these maps. One of these areas is the Special Flood Hazard Area (SFHA) or high risk area defined as any land that would be inundated by a flood having a 1% chance of occurring any given year (also referred to as the base flood level).

Participation in the NFIP is completely voluntary (although some states require NFIP participation as part of their flood plain management program) by cities and participation is on a community rather than an individual basis. Participating in the program allows those who want to purchase flood insurance for their insurable property, whether it is a home or other property. Almost every type of walled and roofed building that is principally above ground and not entirely over water may be insured if it is in a participating community.

There are repetitive losses residential properties present in Lyon County at the time of development of this plan.

Table 7.2 - COMMUNITY: ROCK RAPIDS, CITY

	AE, AI-30, AO, AH, A	VE, VI-30, V	B, C, X	TOTAL
RL Buildings (Total)	1	0	0	1
RL Buildings (Insured)	1	0	0	1
RL Losses (Total)	2	0	0	2
RL Losses (Insured)	2	0		2
RL Payments (Total)	\$22,413.35	\$0.00	\$0.00	\$22,413.35
Building	\$22,413.35	\$0.00	\$0.00	\$22,413.35
Contents	\$0.00	\$0.00	\$0.00	\$0.00
RL Payments (Insured)	\$22,413.35	\$0.00	\$0.00	\$22,413.35
Building	\$22,413.35	\$0.00	\$0.00	\$22,413.35
Contents	\$0.00	\$0.00	\$0.00	\$0.00

Post - FIRM SFHA RL Buildings: 0

Insured Buildings with 4 or More Losses: 0

Insured Buildings with 2-3 Losses > Building Value: 0

Total Target RL Buildings: 0

Table 7.3 - COMMUNITY: GEORGE, CITY OF

	AE, A1-30, AO, AH, A	VE, V1-30, V	B, C, X	TOTAL
RL Buildings (Total)	1	0	0	2
RL Buildings (Insured)	0	0	0	0
RL Losses (Total)	2	0	0	4
RL Losses (Insured)	0	0		0
RL Payments (Total)	\$27,608.66	\$.00	\$.00	\$34,438.67
Building	\$22,308.66	\$.00	\$.00	\$29,138.67
Contents	\$5,300.00	\$.00	\$.00	\$5,300.00
RL Payments (Insured)	\$.00	\$.00	\$.00	\$.00
Building	\$.00	\$.00	\$.00	\$.00
Contents	\$.00	\$.00	\$.00	\$.00

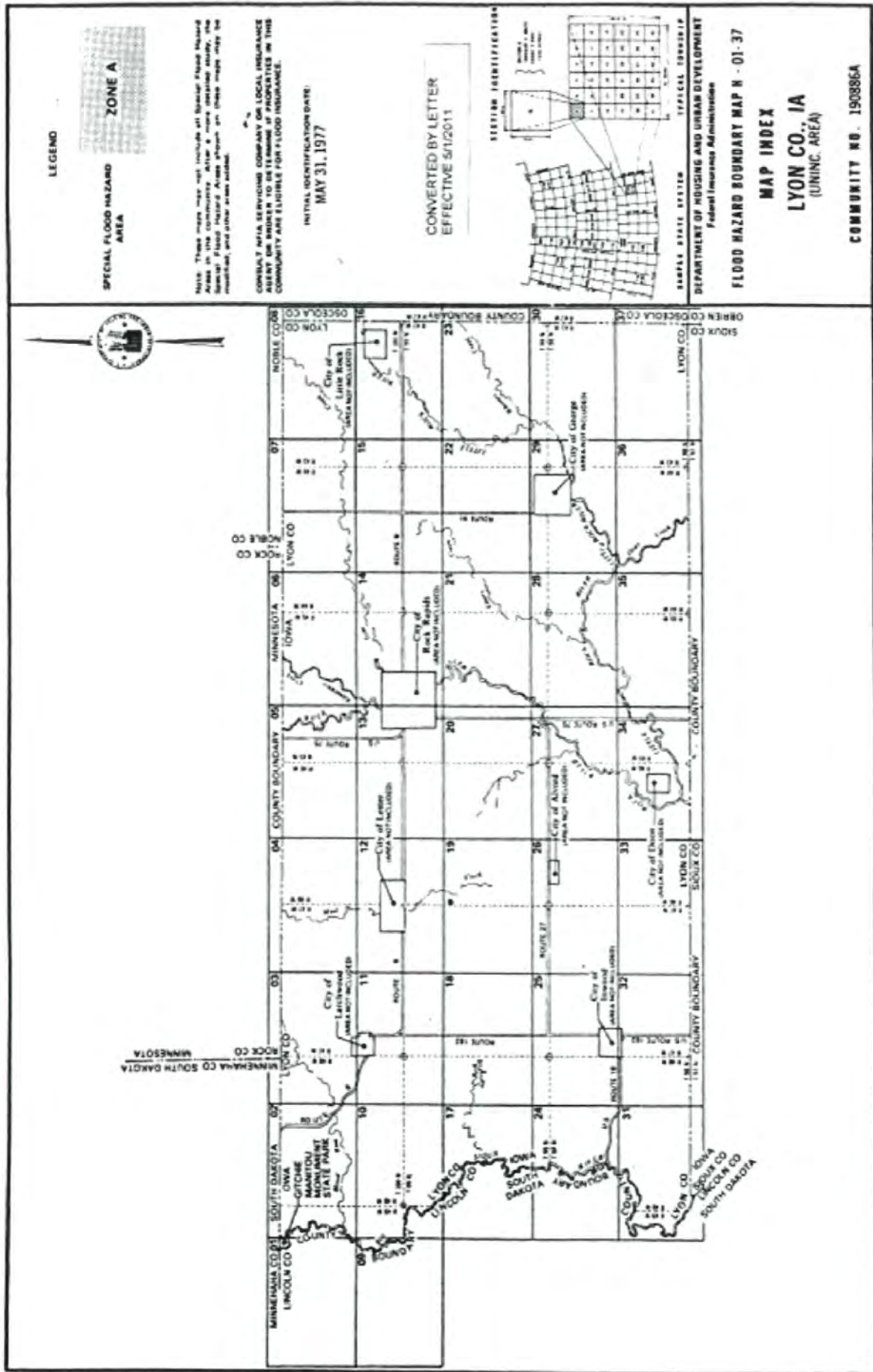
Post - FIRM SFHA RL Buildings: 0

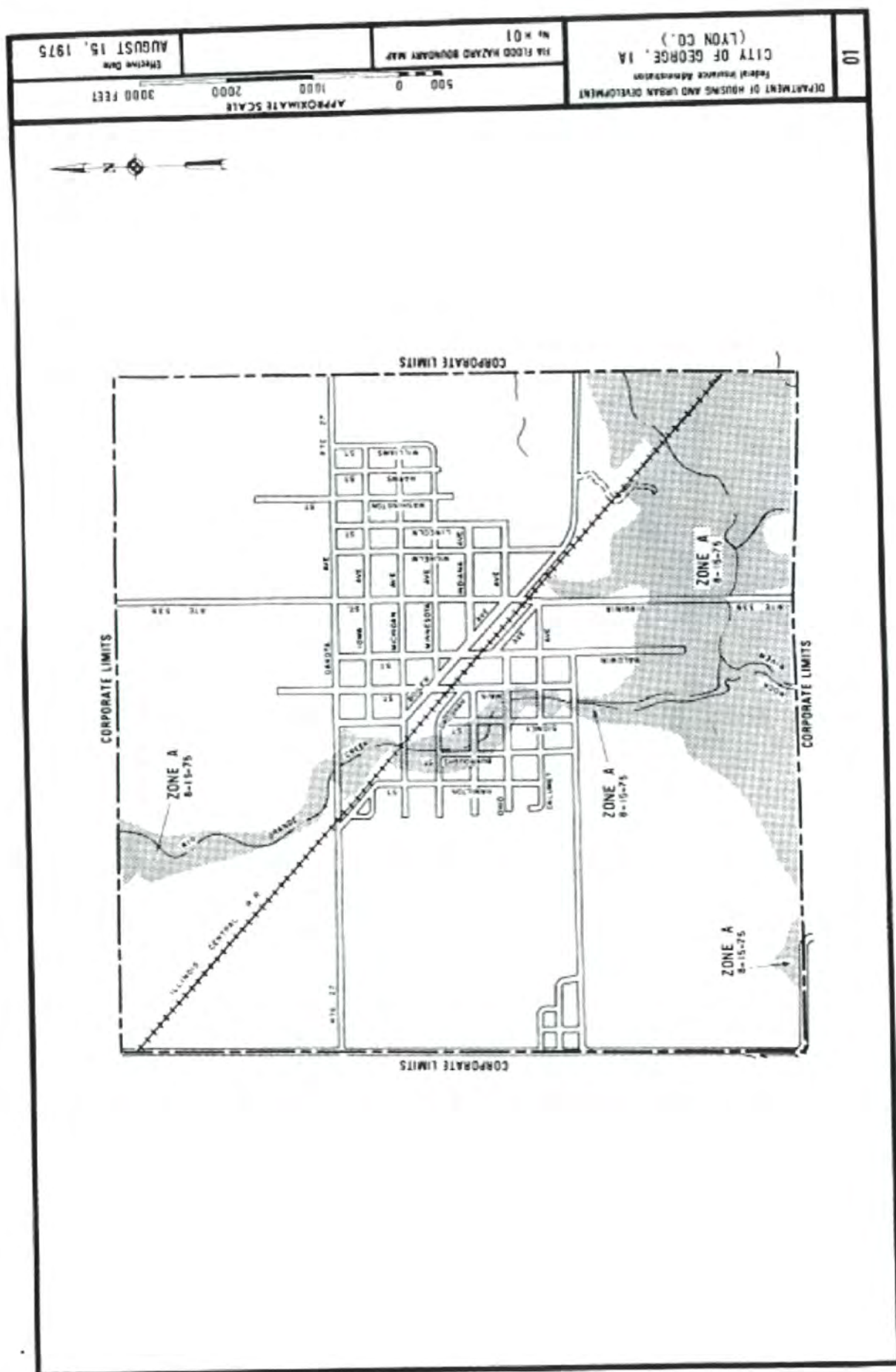
Insured Buildings with 4 or More Losses: 0

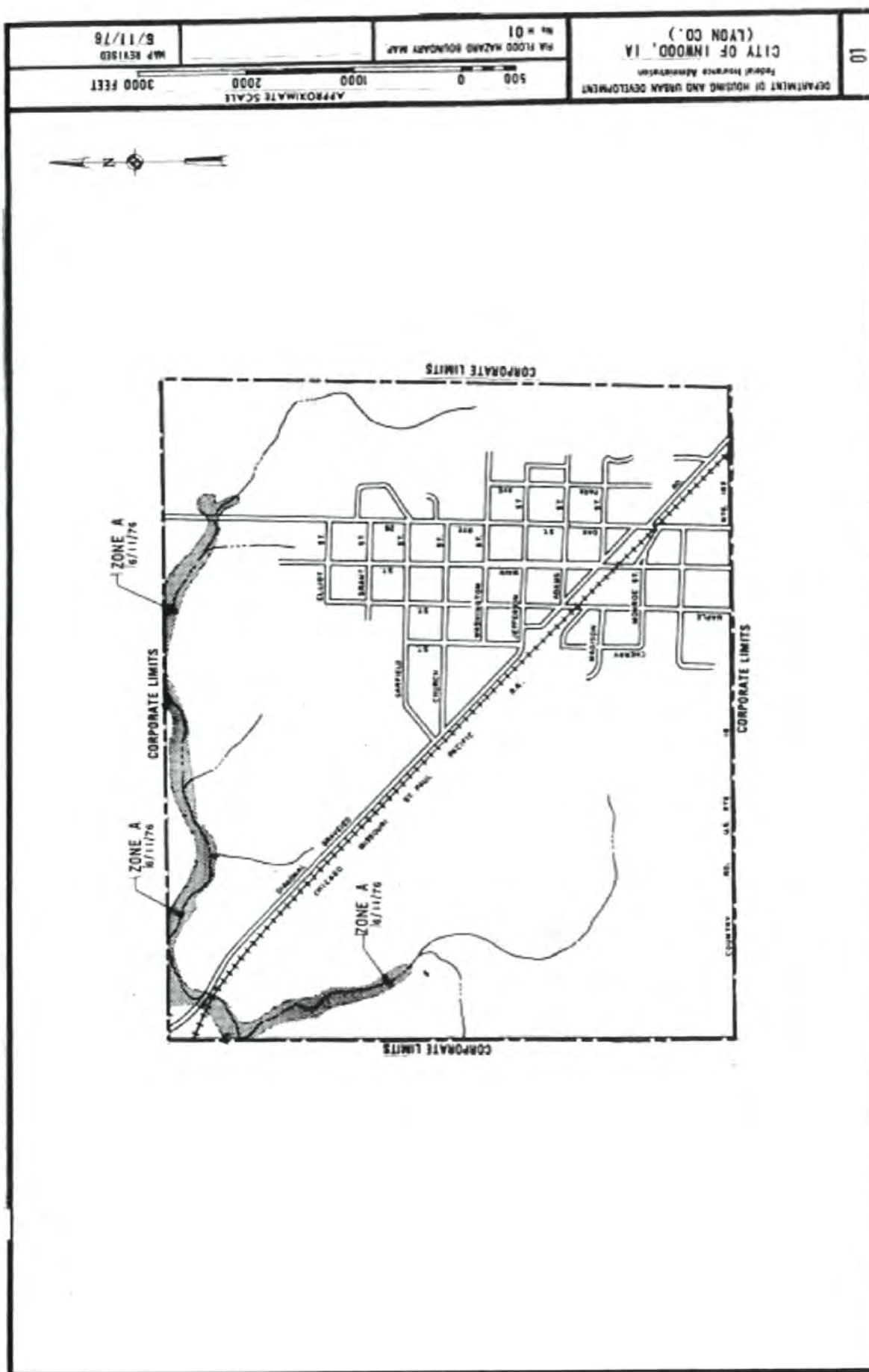
Insured Buildings with 2-3 Losses > Building Value: 0

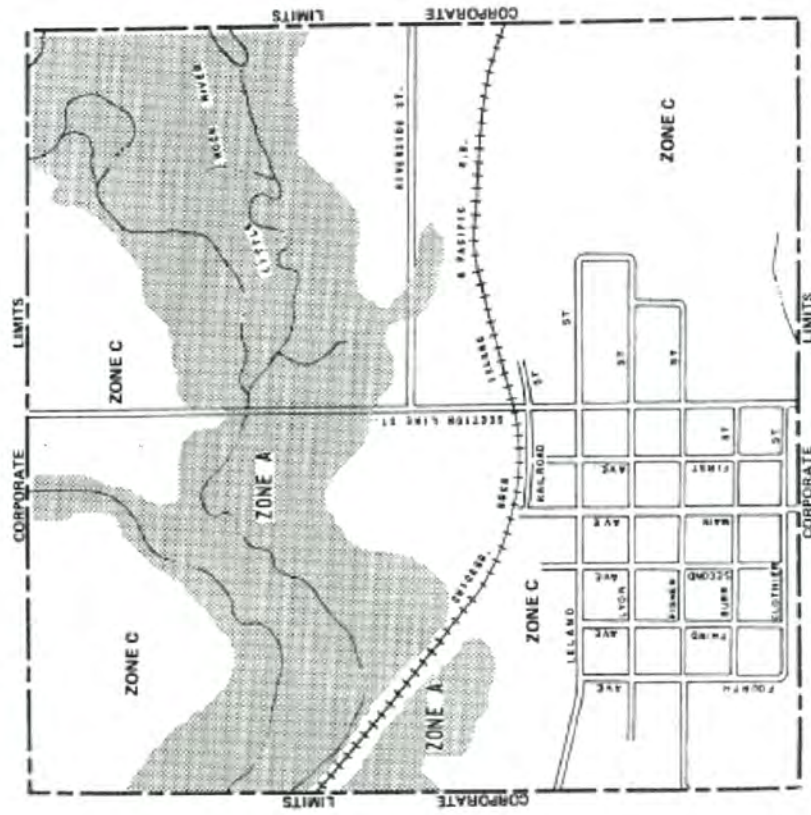
Total Target RL Buildings: 0

Flood Map Follows:









Section 8. Plan Maintenance and Continued Involvement

The Lyon County Multijurisdictional Hazard Mitigation Plan shall be evaluated and updated at a minimum once every five (5) years for potential changes and compliance with FEMA rules and regulations. At a minimum, the five year update of the Lyon County Multijurisdictional Hazard Mitigation Plan will be completed to reflect community changes and compliance with FEMA or Iowa Homeland Security regulations. Each participating planning committee, to be comprised of representatives from city staff, members of the public, local businesses, school district representatives, elected officials and the Lyon County Emergency Management Director will be the responsible party for ensuring the review and evaluation of the city's mitigation plan. This local hazard mitigation planning committee will utilize the following criteria in monitoring and evaluating the effectiveness of the plan.

- Request and generate reports specific to city departments or other organizations or businesses within the community that are either responsible for or can contribute valuable information necessary to the successful implementation of this plan. The participating planning committees will meet and evaluate on an annual basis (1 year increments) and make the determination of whether additional reports are needed and by which agency or local organization.
- The each community hazard mitigation planning committees, will at its discretion, conduct site visits to places, businesses or locations within the community to evaluate and monitor progress on mitigation actions or projects.
- Each participating jurisdiction hazard mitigation planning committee, upon request of the City Council, shall provide the council, no more than once per year, a summary report of evaluation and implementation of mitigation actions.
- On an ongoing basis, the each of jurisdictions lead point of contact shall be deemed the overseeing and responsible position for ensuring the local hazard mitigation planning committee is reconvened and each jurisdiction in the plan is monitored on at least an annual basis. At the jurisdictions discretion, the community may also rely upon and request the assistance of the Lyon County Emergency Management Coordinator and other outside planning consultants who may be able to provide professional and technical assistance in monitoring and evaluating the successful implementation of the Lyon County Multijurisdictional Hazard Mitigation Plan.

8.1 LYON COUNTY ANNUAL HAZARD MITIGATION PROGRESS MEETING

The Emergency Management Director, or other designee thereof, will invite the county and local hazard mitigation planning committee and additional members of the community to participate in future meetings regarding the update or amendment of the plan. Additionally, a public notice will be posted at Court House and City Halls inviting the general public to participate to review the plan and provide comments. Copies of the plan and the committee's review will be available at the Court House and City Halls. Following the planning committee's completion of the review process, the findings of the review and recommended changes, if applicable, will be presented during the City Council meeting. A public meeting will be held at that time. It is further recommended that the Rock Rapids hazard mitigation planning committee make every effort to review the goals and alternatives of this plan on an annual basis to determine their relevance (whether pertinent or current) to changing situations in the city as well as changes in state or federal policy. The progress of each alternative will be reported to the planning committee by the specific city department, business, organization or individuals responsible for implementation of the various mitigation actions. The progress report will include any difficulties or successes in meeting the alternative, how coordination efforts are proceeding, and which alternatives should be revised. Also, regular review of the plan will also allow the city to include new goals and objectives that may be identified after the initial adoption.

8.2 EVALUATION CRITERIA TO MEASURE EFFECTIVENESS OF THE PLAN

1. Do goals and objectives address current and expected conditions?
2. Have the nature, magnitude, and/or type of risks changed?
3. Are there implementation problems?
4. Are current resources available appropriate to implement the plan or parts of the plan?
5. Were the outcomes as expected?
6. Did the plan partners participate as originally planned?
7. Has the plan been reviewed and incorporated (entire document or essential parts) into other planning documents for the city.

Procedures and Techniques for Future Reviews and

Updates Step #1. Evaluate the effectiveness of the Planning Process.

1. Reconvene the planning team.
2. Review your planning process and items to discuss:
 - a. Building the planning team
 - b. Engaging the public
 - c. Data gathering and analysis
 - d. Coordinating with other agencies

Step #2. Evaluate the effectiveness of your actions.

1. What were the results of the implementation action? Did the results achieve the goals/objectives outlined in the plan? Did the actions have the intended results?
2. Were actions cost-effective? Did, or would, the project result in reduction of potential losses?
3. Document actions that were slow to start or not implemented.

Step #3. Determine why actions worked or did not work. Possible reasons are, but not limited to:

1. Lack of available resources.
2. The political or popular support for or against the action.
3. The availability of funds.
4. The workloads of the responsible parties.
5. The actual time necessary to implement the actions.

8.3 METHOD AND SCHEDULE FOR UPDATING THE PLAN

Each hazard mitigation planning committee will be reconvened at the will of the City Council or Board of supervisors, no more than once per year (annually) to review and update the plan. Each meeting should be posted prior to the meeting inviting the public to participate and to gain the most citizen input in the plan updates. Additionally, the council will reconvene the hazard mitigation planning committee along with the assistance of the Lyon County Emergency Management Director and outside planning consultants on a five (5) year basis to complete a comprehensive update to the Lyon County Hazard Mitigation Plan and the proposed mitigation actions. The county/city may at its discretion and will be encouraged to participate with a Lyon County multi-jurisdiction hazard mitigation plan at some point in time during the city's five-year period of compliance with FEMA. Future updates of the Lyon County Multijurisdictional Hazard Mitigation Plan will be incorporated into and become part of a multijurisdictional plan for all of Lyon County.

8.4. INCORPORATION OF THE LYON COUNTY MULTIJURISDICTIONAL HAZARD MITIGATION PLAN INTO OTHER JURISDICTIONAL PLANNING DOCUMENTS

Each of the hazard mitigation planning committees will be reconvened at the will of their City Council or Board of supervisors, no more than once per year (annually) to review and update the plan. Additionally, the council or board will reconvene the hazard mitigation planning committee along with the assistance of the Lyon County Emergency Management Director and outside planning consultants on a five (5) year basis to complete a comprehensive update to the Lyon Hazard Mitigation Plan and the proposed mitigation actions. If a city chooses to update plan they must inform the emergency management director to update the master copy.

Section 9. County/City Information

Section 9.1 Lyon County

Planning Committee Members:

Arden Kopischke Emergency Management
Steve Simons – Economic Development
Randy Bosch – Supervisor
Stewart Vander – Sheriff

County Contact:

Arden Kopischke, County Emergency Management 7124728330

Planning Process

Meetings were held throughout the planning process to collect information and share that information with the general public and the planning team. Notices for meetings were posted at city hall or the school where the meeting was being held. Agendas and minutes for meetings are included in the Appendix.

Utilities

The utilities that supply the county are represented in each of the city profiles that follow.

Future Plans and Mechanisms

The Lyon County planning committee stated they would try to incorporate the mitigation strategies developed in the plan in their community actions and other community planned documents if they occur. The committee also stated they would draw from other community mechanisms when applicable to add into the mitigation strategies and mitigation requirements of their hazard mitigation plan.

In preparation of this plan, existing plans and other technical information was considered. The purpose of this review was to give consideration to existing information before setting future mitigation goals.

Plan/Document	If yes last year updated	Plan/Document	If yes last year updated
Comprehensive/Landuse plan	Yes 2011	Capital Improvement Plan	No
Economic Development Plan	No	County Recovery Plan	Yes
School Mitigation Plan	Yes	County Mitigation Plan	Yes 2002
Building Code	Yes	Flood Ordinance or Plan	Yes 2009
Tree Trimming Ordinance	No	Zoning Ordinance	Yes 2011
Storm Water Ordinance	No	Subdivision	Yes
Well Protection	Yes 2004	Nuisance Ordinance	Yes

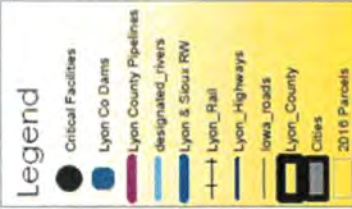
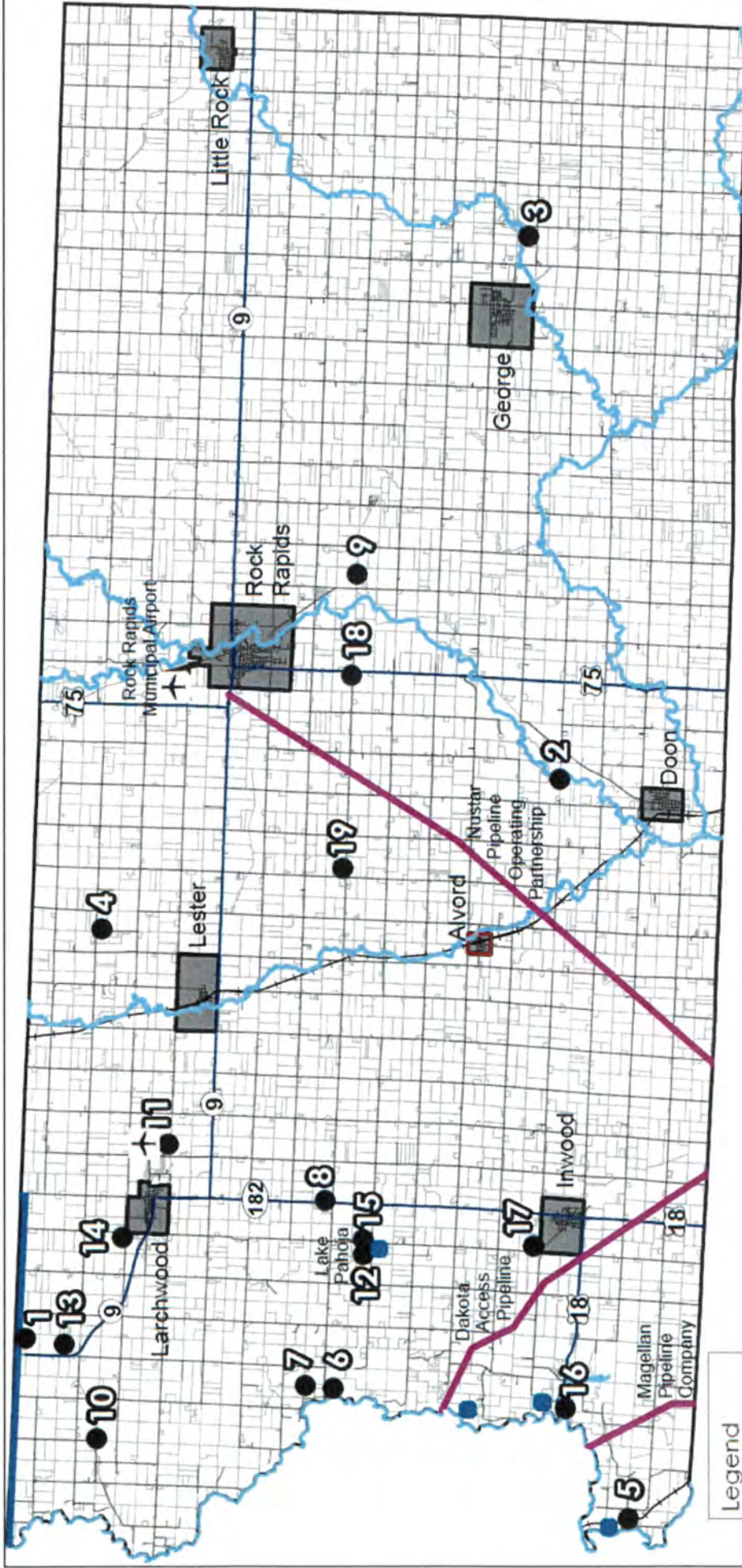
Emergency Services

Are represented in the following city profiles.

Critical Facilities

Critical Facility	Address	Value
Grand Falls Casino	1415 Grand Falls Blvd	\$61,494,000.00
4 Electrical substations	On map	Total \$120,000.00
West Lyon School	1787 Iowa 182	\$17,000,000.00
Vintage Airpark	East of Larchwood HWY 9	\$213,000.00
Rural Water Plant	North of Doon	\$3,500,000.00
Rural Water	North of Klondike	\$124,000.00
Lake Pahoja Recreation Area	North of Inwood	\$500,000.00
5 Electrical substations	Look at map	Total \$150,000.00
	Total	\$83,101,000.00

The dis-incorporated cities of Klondike, Beloit, Granite and Edna are added to the list of critical facilities just as population areas of concern during a natural hazard event. The committee wanted to put them in the plan to make sure those areas are continued to be looked at after an event. Emergency Management and the Sheriff's department currently looks after those areas after an event and will continue to in the future.



- LYON COUNTY
CRITICAL FACILITIES**
1. Grand Falls Casino & Resort
 2. Rural Water Treatment Plant (Doon)
 3. Rural Water Treatment Plant (George)
 4. Rural Water Pump House
 5. Unincorporated Village of Beloit
 6. Klondike Rercreational Area
 7. Rural Water Treatment Plant
 8. West Lyon Community School District
 9. Unincorporated Village of Edna
 10. Unincorporated Village of Granite
 11. Zanger Vintage Airport (Private Airport)
 12. Lake Pahoia Park and Campground
 13. Electrical Substation
 14. Electrical Substation
 15. Electrical Substation
 16. Electrical Substation
 17. Electrical Substation
 18. Electrical Substation
 19. Electrical Substation



Lyon County, Iowa Critical Facilities Map

Section 9.2 Alvord

Planning Committee Members:

Mark Nagel	Mayor
Joe Kramer	Citizen
Curt Nelson	Board of Supervisors, Citizen
Sam Metzger	Citizen

City Contact:

Diane Naatjes City Clerk – 712-473-2455

Planning Process

Meetings were held throughout the planning process to collect information and share that information with the general public and the planning team. Notices for meetings were posted at city hall or the school where the meeting was being held. Agendas and minutes for meetings are included in the Appendix.

Utilities

Water

Name:	Lyon Sioux Rural Water		
Location:	Alvord, Iowa (Lyon)		
Well Avg Depth (ft):	0	Peak Demand (mgd):	0.0223
Treated:	Yes	Cost/1000 Gal:	\$0.00
Rated Capacity (mgd):	0.3600	Storage Capacity (gal):	45,000
Temp Range (F):		Major Source:	
Avg Capacity (mgd):	0.1000	Hardness (ppm):	0.0
Connection Fee:	75.00		
Phone:		Web Address:	

Sewer

Name:	City of Alvord		
Location:	Alvord, Iowa (Lyon)		
Ownership Type:	Municipal	Average Daily Demand (mgd):	0.0220
Rated Capacity (mgd):	0.0300	Peak Demand (mgd):	0.0300
Cost/1000 Gal:	\$0.00	Connection Fee:	Unknown
Phone:		Web Address:	

Electric

Name:	MidAmerican Energy		
Location:	ALVORD, IA (Lyon)		
Ownership Type:	Private	Regulated:	Yes
Peak Demand (kW):	4,250	Generation Capacity (MW):	5,150
Customers Served	146	Customers Served (State):	630,938

(Local):			
Customers Served	719,635		
(System):			
Phone:	800-358-6265	Web Address:	www.midamericanenergy.com
Natural Gas			
Name:	MidAmerican Energy		
Location:	ALVORD, IA (Lyon)		
Customers Served (Local):	196	Customers Served (State):	548,336
Customers Served	700,829	Ownership Type:	Private
(System):			
Pipeline Source:	Private	Gas Transportation Available	Yes
Phone:	800-358-6265	Web Address:	www.midamericanenergy.com
Telecommunications			
Name:	Alliance		
Location:	Dell Rapids, South Dakota()	POP Location:	
Service Type:	telephone	DSL:	Yes
Customers Served (State):	0	Customers Served (System):	0
Fiber Optics:	Yes	Switch Services	

Infrastructure

Solid Waste and Recycling	NWSWA Sheldon
Curb and Gutter	No
Waste Water Treatment	Yes
How Many Cell Lagoon	3 Cell
Floodplain Ordinance	Yes
Floodplain Compliance Officer	(For assistance in the administration of the floodplain regulations, contact the Iowa Department of Natural Resources)

Future Plans and Mechanisms

The City of Alvord planning committee stated they would try to incorporate the mitigation strategies developed in the plan in their community actions and other community planned documents if they occur. The committee also stated they would draw from other community mechanisms when applicable to add into the mitigation strategies and mitigation requirements of their hazard mitigation plan.

In preparation of this plan, existing plans and other technical information was considered. The purpose of this review was to give consideration to existing information before setting future mitigation goals.

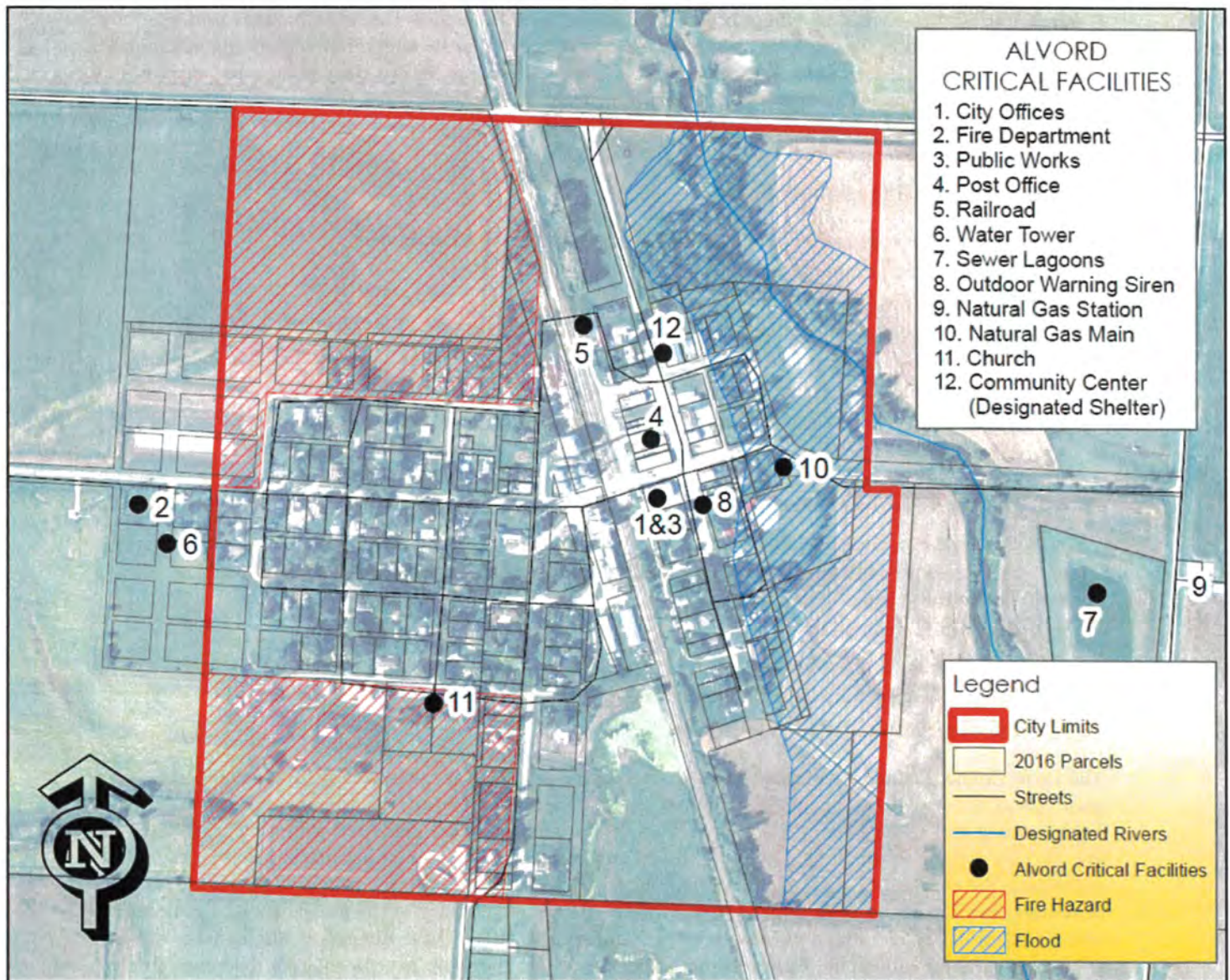
Plan/Document	If yes last year updated	Plan/Document	If yes last year updated
Comprehensive/Landuse plan	No	Capital Improvement Plan	No
Local Emergency Plan	No	Local Recovery Plan	No
Local Mitigation Plan	No	County Mitigation Plan	No
Economic Development Plan	No	Flood Ordinance or Plan	No
School Mitigation Plan	No	Zoning Ordinance	Yes
Building Code	No	Subdivision	Yes
Tree Trimming Ordinance	Yes	Nuisance Ordinance	Yes
Storm Water Ordinance	No		

Emergency Services

Fire Rescue Dept	19 Volt fire fighter trained at HazMat Awareness/Ops 19 Volt Firefighters trained at FF1 10 Volt Firefighters trained at FF2 19 Volt Firefighters trained at incident command level 1 Volt Emergency Rescue Technician (ERT) 1 Volt Emergency Medical Technician (EMTB) 0 Paramedics 0 EMTI 3 Nurse
Fire equipment at station	2 pumpers, 1 rescue truck, Equipment Truck, Grass Rig
Law Enforcement	28-E with Lyon County Sherriff
Emergency Warning System	Yes, 1 sirens
Flood fighting plan	No
Sandbagging plan	No
Evacuation/rescue plan	No

Critical Facilities and Assessed Values

Alvord	Address	Value
1 City Offices	302 Main	\$55,000
2 Fire Dept	312 Main	\$152,000
3 Public Works	302 Main	\$20,000
4 Post Office	217 Main	\$25,000
5 Railroad	n/a	
6 Water Tower	303 Becker	\$50,000
7 Sewer Lagoons	2125 Elmwood	\$380,000
8 Outdoor Warning Siren	312 Main	\$10,000
9 Natural Gas Station	2130 Elmwood	\$5,000
10 Natural Gas Main	n/a	
11 Church	401 1 st St	\$200,000
12 Designated Shelter Community Center	105 4 th St	\$220,000
Total		\$1,117,000



Hazard Risk Assessment

The Lyon County Hazard Mitigation Planning Committee determined the countywide hazard rankings. The city was also provided with information and statistics relevant to hazards affecting Alvord, including records of past events and damages. The city was asked to review the information from the countywide rankings and determine if highest risk hazards for the county applied to Alvord, and if not, how Alvord's situation differs from the county. Based on this discussion, prevalent hazards were determined for Alvord. Along with the information and statistics provided, the people present were asked to draw upon their knowledge and experiences of hazards affecting Alvord. After the discussion among the planning team, it was decided that the City of Alvord would re-prioritize the hazards of the countywide ranking for their jurisdictional portion of the plan. The city eliminated many of the hazards that were in the countywide ranking, such as: landslide, river flood, levee failure, dam failure, and sinkhole. The planning team decided that those hazards did not apply to Alvord.

It is recognized that Alford may be susceptible to other hazards, such as the other hazards in the State of Iowa Hazard Mitigation Plan, but those hazards are not considered to be a high risk and are not examined at this time. However, if it is later determined that a hazard affecting Alford does pose a higher risk than originally determined, it will be examined at that time or when the plan is updated.

Hazard Ranking-City of Alford

Iowa Identified Mitigation Actions

The following are the actions that were identified by the local planning committee:

- Enforce Tree Trimming
- Purchase Snow/Plowing Equipment
- Build or Update Warning Sirens
- Continue you Fire Dept HAZMAT Training
- Continue Fire Dept Training
- Enforce the Snow Removal Policy
- Maintain Outdoor Warning Sirens
- Update or Create Local Emergency Plans
- Construct Sewer Lift Station
- Purchase Fire Gear (PPE)
- Develop a list of Elderly, Disabled or Medically Distressed and Furnish to Law Enforcement
- Reaffirm Rural Water Connections
- Reaffirm Mutual AID
- Test Warning Sirens Monthly
- Maintain and Expand Debris Removal Site
- Build Safe Rooms for Critical Facilities

The Lyon County Planning Team and Lyon County are responsible for overseeing the implementation of this plan. Lyon County Emergency Management and other county and local agencies will assist with implementing and administering this plan. The mitigations actions were discussed with a high, medium and low priority ranking in mind. **High (H)** – Jurisdictions valued this as something that had the highest effect on helping the community and people survive severe weather events. Also the cost could be easily obtained or funding has already been set aside. **Medium (M)** – These were valued at the jurisdictions as projects that where ranked in between the other two priority groups. **Low (L)** – These mitigation actions have the least effect on protecting human life from severe weather events and therefore have been given the lowest priority. Or the cost is too high at this point in time and makes it unlikely to be acted upon in present future. Priorities for each mitigation action are discussed in the Mitigation Actions, Section 5. Another factor in the

implementation of the mitigation actions was their benefit versus how much the project would cost. Economics of implementing mitigation actions were considered when the planning team discussed the priority of projects. Cost estimates were given by the Lyon County Planning Committee to help display which actions were of a higher importance and fit in the economic goals of the county/cities/schools. Those estimates can be reference in Section 5. The Implementation Schedule for the mitigation activities, whether ongoing or considered, will be subject to the availability of Federal, State, and local funding. Continuing (ON) = Ongoing (responsible entity regularly participates in or supports); Short Term (ST) = 1-5 years to initiate or accomplish; and Long Term (LT) = 5 or more years to initiate or accomplish.

Once the plan is completed, approved, and adopted, local governments will be eligible for funding assistance from FEMA for mitigation strategies put forth in the plan. Potential funding resources include the FEMA Pre-Disaster Mitigation Program (PDM) and FEMA Hazard Mitigation Grant Program (HMGP). No timeframe was identified in implementing these mitigation actions will be acted upon as funding become available. It was discussed that additional mitigation actions would be examined during the update process. The mitigation actions that were discussed were what the Alvord Planning Committee wanted to have included in the hazard mitigation plan.

Plan Maintenance

Plan maintenance involves taking action to ensure that the plan stays current with information, priorities are still in order, and goals and objectives are maintained and updated. To accomplish this, the plan will be reviewed by the planning team annually and be incorporated into other city plans. Additionally, a comprehensive update is required at least once every 5 years and submitted to FEMA for certification. The revised plan will be adopted by the city council. To assist with the update, information is to be collected by the city annually to document efforts, hazard events, and other pertinent activities to mitigate hazards. Part of plan maintenance is maintaining the planning team. The planning team is composed of local elected officials, city employees and other interested parties. This is an important part of plan maintenance in order to reconvene the planning team when necessary.

Monitoring

The Alvord Planning Team and Lyon County Emergency Management are responsible for monitoring this portion of the plan. The plan will be monitored based on the mitigation strategies identified in the plan and the reported progress to accomplish the work. Projects that are complete will be monitored for effectiveness. Any strategies that are removed from the plan will be examined and documented. An annual reporting sheet is included in this plan for the city to keep track of the mitigation process.

Incorporation into Existing Plans

The city is responsible for reviewing its local plans, codes, and ordinances and amending documents as they see appropriate. As appropriate, information and actions from this plan will be incorporated into comprehensive or community builder plans during review and update processes. A worksheet is provided to record what information from this plan is incorporated to other plans.

Continued Public Participation

The public will be involved in the implementation of the plan at city council meetings and general public meetings. Mitigation actions and implementation strategies will be discussed at city council meetings and an opportunity for public input will be encouraged. This process will ensure opportunity for public awareness of hazards and threats faced by the community and actions planned to eliminate or reduce impacts. To promote continued public participation, meetings where the plan will be discussed will have public notice posted.

Incorporation into Other Plans

[illegible]

Plan Updates Concerning Alvord

When updating the plan please contact the Lyon County Emergency Management for assistance.

Date	<u>Page</u>	<u>Change</u>
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Section 9.3 Doon

Planning Committee Members:

Tim Mantel	Mayor
Marlo De Jager	Council
Kristi Baker	City Clerk

City Contact:

Kristi Baker – City Clerk 712-726-9303

Planning Process

Meetings were held throughout the planning process to collect information and share that information with the general public and the planning team. Notices for meetings were posted at city hall or the school where the meeting was being held. Agendas and minutes for meetings are included in the Appendix.

Utilities

Water

Name:	City of Doon		
Location:	Doon, Iowa (Lyon)		
Well Avg Depth (ft):	55	Peak Demand (mgd):	0.2500
Treated:	No	Cost/1000 Gal:	\$33.00
Rated Capacity (mgd):	0.3600	Storage Capacity (gal):	40,000
Temp Range (F):		Major Source:	2 Wells
Avg Capacity (mgd):	0.1000	Hardness (ppm):	0.0
Connection Fee:	Yes		
Phone:	712-726-3400	Web Address:	

Sewer

Name:	City of Doon		
Location:	Doon, Iowa (Lyon)		
Ownership Type:	Municipal	Average Daily Demand (mgd):	0.0440
Rated Capacity (mgd):	0.0600	Peak Demand (mgd):	0.0600
Cost:	\$10.00/month	Connection Fee:	No
Phone:	712-726-9303	Web Address:	

Electric

Name:	MidAmerican Energy		
Location:	DOON, IA (Lyon)		
Ownership Type:	Private	Regulated:	Yes
Peak Demand (kW):	5,150	Generation Capacity (MW):	5,500
Customers Served (Local):	307	Customers Served (State):	630,938
Customers Served (System):	719,635		
Phone:	888-427-5632	Web Address:	www.midamericanenergy.com

Natural Gas

Name: MidAmerican Energy

Location: DOON, IA(Lyon)

Customers Served (Local): 446

Customers Served (State): 548,336

Customers Served (System): 700,829

Ownership Type: Private

Pipeline Source: Private

Gas Transportation Available Yes

Phone: 888-427-5632

Web Address: www.midamericanenergy.com

Telecommunications

Name: Hickory Tech
Mankato, Minnesota(Blue

Location: Earth) Rock Valley

POP Location:

Service Type: Telephone and Cable Internet DSL:

Yes

Customers Served (State): 0

Customers Served (System): 0

Fiber Optics: Yes

Switch Services

Phone: 866-442-5679

Web Address: Hickorytech.com

Name: Premier Communications

Location: Sioux Center, Iowa(Sioux)

POP Location:

Service Type: Cable TV

DSL: Yes

Customers Served (State): 10,000

Customers Served (System): 10,000

Fiber Optics: Unknown

Switch Services

Phone: 800-741-8351

Web Address: Mypremieronline.com

Infrastructure

Solid Waste and Recycling

Herm's Sanitation and Denny's Sanitation

Curb and Gutter

Only Main St

Waste Water Treatment

No

How Many Cell Lagoon

2 Cell

Floodplain Ordinance

No

Floodplain Compliance Officer

(For assistance in the administration of the floodplain regulations, contact the Iowa Department of Natural Resources)

Future Plans and Mechanisms

The City of Doon planning committee stated they would try to incorporate the mitigation strategies developed in the plan in their community actions and other community planned documents if they occur. The committee also stated they would draw from other community mechanisms when applicable to add into the mitigation strategies and mitigation requirements of their hazard mitigation plan.

In preparation of this plan, existing plans and other technical information was considered. The purpose of this review was to give consideration to existing information before setting future mitigation goals.

Plan/Document	If yes last year updated	Plan/Document	If yes last year updated
Comprehensive/Landuse plan	No	Capital Improvement Plan	No
Local Emergency Plan	No	Local Recovery Plan	No
Local Mitigation Plan	Yes 2004	County Mitigation Plan	Yes
Economic Development Plan	No	Flood Ordinance or Plan	No
School Mitigation Plan	No	Zoning Ordinance	No
Building Code	Yes	Subdivision	No
Tree Trimming Ordinance	Yes	Nuisance Ordinance	Yes
Storm Water Ordinance	Yes		

Emergency Services

Fire Rescue Dept

15 Volt fire fighter trained at HazMat Awareness/Ops
 10 Volt Firefighters trained at FF1
 3 Volt Firefighters trained at FF2
 15 Volt Firefighters trained at incident command level
 8 Volt Emergency Rescue Technician (ERT)
 8 Volt Emergency Medical Technician (EMTB)
 0 Paramedics
 0 EMTI
 4 Nurse

Fire equipment at station

2 pumpers, 2 tankers, 1 grass rig, 1 rescue van, 1st responder vehicle, Ambulance

Law Enforcement

28-E with Lyon County Sherriff

Emergency Warning System

Yes

Flood fighting plan

No

Sandbagging plan

No

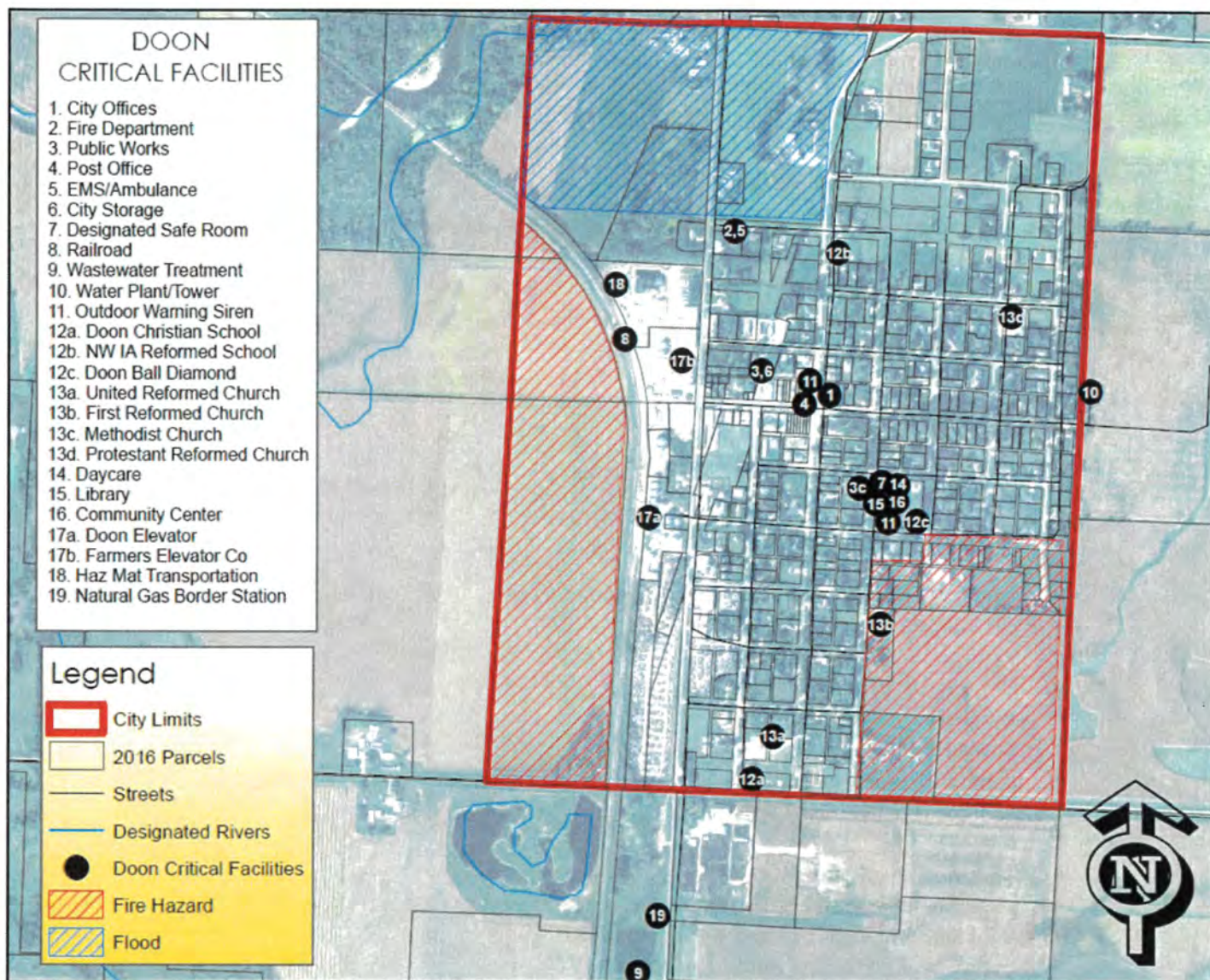
Evacuation/rescue plan

No

Critical Facilities and Assessed Values

Doon	Address	Value
1	City Offices	100 3rd Ave \$30,000
2	Fire Dept	103 3rd Ave \$77,684
3	Public Works	208 N 1st St \$180,000
4	Post Office	225 Main St \$116,790
5	EMS/Ambulance	Same as 2
6	City Storage	Same as 3
7	Designated Safe Room	Same as 16
8	Railroad	n/a
9	Wastewater Treatment Plant	2637 Garfield Ave \$100,000
10	Water Plant/Tower	705 Main St \$424,000
11	Outdoor Warning siren	103 3rd Ave \$3,000
12a	Doon Christian School	614 Rice Ave \$91,761
12b	NW IA Prot. Reformed School	302 N 3rd St \$179,118
12c	Doon Ball Diamond	207 Barton Ave \$50,000
13a	United Reformed Church	608 Rice Ave \$524,093
13b	First Reformed Church	406 Barton Ave \$151,223
13c	First United Methodist Church	201 Barton Ave \$61,310
13d	Protestant Reformed Church	408 6th Ave \$246,107
14	Daycare	Same as 16
15	Library	207 Barton Ave \$62,168
16	Community Center	207 Barton Ave \$145,372
17a	Doon Elevator	301 Gere Ave \$1,609,601
17b	Farmers Elevator Co	101 ast Ave \$1,649,269
18	Hazardous Materials Transported - Railroad	n/a
19	Natural Gas Border Station	2637 Garfield Ave \$5,000

Total \$5,706,496



Hazard Risk Assessment

The Lyon County Hazard Mitigation Planning Committee determined the countywide hazard rankings. The city was also provided with information and statistics relevant to hazards affecting Doon, including records of past events and damages. The city was asked to review the information from the countywide rankings and determine if highest risk hazards for the county applied to Doon, and if not, how Doon's situation differs from the county. Based on this discussion, prevalent hazards were determined for Doon. Along with the information and statistics provided, the people present were asked to draw upon their knowledge and experiences of hazards affecting Doon. After the discussion among the planning team, it was decided that the City of Doon would re-prioritize the hazards of the countywide ranking for their jurisdictional portion of the plan. The city eliminated many of the hazards that were in the countywide ranking, such as: landslide, river flood, dam failure, and sinkhole. The planning team decided that those hazards did not apply to Doon.

It is recognized that Doon may be susceptible to other hazards, such as the other hazards in the State of Iowa Hazard Mitigation Plan, but those hazards are not considered to be a high risk and are not examined at this time. However, if it is later determined that a hazard affecting Doon does pose a higher risk than originally determined, it will be examined at that time or when the plan is updated.

Iowa Identified Mitigation Actions

The following are the actions that were identified by the local planning committee:

- Enforce Tree Trimming
- Purchase Back Up Power Generators
- Bury Utility Lines
- Buy and Distribute NOAA Weather Radios
- Establishing a Good Neighbor Program to Check on Residents
- Build or Update Warning Sirens
- Enforce Building and Zoning Codes
- Continue you Fire Dept HAZMAT Training
- Continue Fire Dept Training
- Enforce the Snow Removal Policy
- Maintain Outdoor Warning Sirens
- Update or Create Local Emergency Plans
- Clean or Enlarge Sewage Lagoons
- Replace and Rehab Sewer Lines
- Continue with NFIP Participation
- Purchase Portable Pumps
- Purchase Fire Gear (PPE)
- Backup City Records
- Reaffirm Rural Water Connections
- Reaffirm Mutual AID
- Test Warning Sirens Monthly
- Maintain and Expand Debris Removal Site
- Look into Joining NFIP and Getting Mapped
- Build Safe Rooms for Critical Facilities

The Lyon County Planning Team and Lyon County are responsible for overseeing the implementation of this plan. Lyon County Emergency Management and other county and local agencies will assist with implementing and administering this plan. The mitigations actions were discussed with a high, medium and low priority ranking in mind. **High (H)** – Jurisdictions valued this as something that had the highest effect on helping the community and people survive severe weather events. Also the cost could be easily obtained or funding has already been set aside. **Medium (M)** – These were valued at the jurisdictions as projects that where ranked in between the other two priority groups. **Low (L)** – These mitigation actions have the least effect on protecting human life from severe weather events and therefore have been given the lowest priority. Or the cost is too high at this point in time and makes it unlikely to be acted upon in present future. Priorities for each mitigation action are discussed in the Mitigation Actions, Section 5. Another factor in the implementation of the mitigation actions was their benefit versus how much the project would cost. Economics of implementing mitigation actions were considered when the planning team discussed the priority of projects. Cost estimates were given by the Lyon County Planning Committee to help display which actions were of a higher importance and fit in the economic goals of the county/cities/schools. Those estimates can be reference in Section 5. The Implementation Schedule for the mitigation activities, whether ongoing or considered, will be subject to the availability of Federal, State, and local funding. Continuing (ON) = Ongoing (responsible entity regularly participates in or supports); Short Term (ST) = 1-5 years to initiate or accomplish; and Long Term (LT) = 5 or more years to initiate or accomplish.

Once the plan is completed, approved, and adopted, local governments will be eligible for funding assistance from FEMA for mitigation strategies put forth in the plan. Potential funding resources include the FEMA Pre-Disaster Mitigation Program (PDM) and FEMA Hazard Mitigation Grant Program (HMGP). No timeframe was identified in implementing these mitigation actions will be acted upon as funding become available. It was discussed that additional mitigation actions would be examined during the update process. The mitigation actions that were discussed were what the Doon Planning Committee wanted to have included in the hazard mitigation plan.

Plan Maintenance

Plan maintenance involves taking action to ensure that the plan stays current with information, priorities are still in order, and goals and objectives are maintained and updated. To accomplish this, the plan will be reviewed by the planning team annually and be incorporated into other city plans. Additionally, a comprehensive update is required at least once every 5 years and submitted to FEMA for certification. The revised plan will be adopted by the city council. To assist with the update, information is to be collected by the city annually to document efforts, hazard events, and other pertinent activities to mitigate hazards. Part of plan maintenance is maintaining the planning team. The planning team is composed of local elected officials, city employees and other interested parties. This is an important part of plan maintenance in order to reconvene the planning team when necessary.

Monitoring

The Doon Planning Team and Lyon County Emergency Management are responsible for monitoring this portion of the plan. The plan will be monitored based on the mitigation strategies identified in the plan and the reported progress to accomplish the work. Projects that are complete will be monitored for effectiveness. Any strategies that are removed from the plan will be examined and documented. An annual reporting sheet is included in this plan for the city to keep track of the mitigation process.

Incorporation into Existing Plans

The city is responsible for reviewing its local plans, codes, and ordinances and amending documents as they see appropriate. As appropriate, information and actions from this plan will be incorporated into

comprehensive or community builder plans during review and update processes. A worksheet is provided to record what information from this plan is incorporated to other plans.

Continued Public Participation

The public will be involved in the implementation of the plan at city council meetings and general public meetings. Mitigation actions and implementation strategies will be discussed at city council meetings and an opportunity for public input will be encouraged. This process will ensure opportunity for public awareness of hazards and threats faced by the community and actions planned to eliminate or reduce impacts. To promote continued public participation, meetings where the plan will be discussed will have public notice posted.

Incorporation into Other Plans

Date	Plan or Document	Information Incorporated into Plan or Document

Plan Updates Concerning Doon

When updating the plan please contact the Lyon County Emergency Management for assistance.

Date	Page	Change

Section 9.4 George

Planning Committee Members:

Laurie Koerlsman	City Clerk
Billy Sprock	Fire Chief
John Eyesly	School Admin
Todd Klein	Council

City Contact:

Laurie Koerselman – City Clerk 712-475-3612

Planning Process

Meetings were held throughout the planning process to collect information and share that information with the general public and the planning team. Notices for meetings were posted at city hall or the school where the meeting was being held. Agendas and minutes for meetings are included in the Appendix.

Utilities

Water

Name:	City of George		
Location:	George, Iowa (Lyon)		
Well Avg Depth (ft):	17	Peak Demand (mgd):	252,000.0000
Treated:	Yes	Cost/1000 Gal:	\$7.00
Rated Capacity (mgd):	216,000.0000	Storage Capacity (gal):	150,000
Temp Range (F):	42	Major Source:	Aquafir #1
Avg Capacity (mgd):	250,000.0000	Hardness (ppm):	22.5
Connection Fee:	Yes		
Phone:	712-475-3891	Web Address:	www.george-iowa.com

Sewer

Name:	City of George		
Location:	George, Iowa (Lyon)		
Ownership Type:	Municipal	Average Daily Demand (mgd):	120000.0000
Rated Capacity (mgd):	12.7000	Peak Demand (mgd):	350,000.0000
Cost/1000 Gal:	\$11.00	Connection Fee:	Yes
Phone:	712-475-3891	Web Address:	www.george-iowa.com

Electric

Name:	Alliant Utilities		
Location:	George, Iowa (Lyon)		
Ownership Type:	Investor-owned	Regulated:	Yes
Peak Demand (kW):	3,017,000	Generation Capacity (MW):	2,948
Customers Served (Local):	530	Customers Served (State):	0

Customers Served (System):	0	
Phone:	800-822-4398	Web Address: www.alliantenergy.com

Natural Gas	
Name:	Alliant Utilities
Location:	George, Iowa(Lyon)
Customers Served (Local):	0
Customers Served (System):	0
Pipeline Source:	NNG
Phone:	800-822-4398
Customers Served (State):	0
Ownership Type:	Investor-owned
Gas Transportation Available	Yes
Web Address:	www.alliantenergy.com

Telecommunications	
Name:	Premier Communications
Location:	George, Iowa(Lyon)
Service Type:	DMS-IU Digital
Customers Served (State):	52,000
Fiber Optics:	No
Phone:	1-800-570-6341
Name:	Premier Communications
Location:	George, Iowa(Lyon)
Service Type:	Cable; wireless internet; high speed internet
Customers Served (State):	450
Fiber Optics:	No
Phone:	712-722-3451
POP Location:	Sioux City, Iowa
DSL:	Yes
Customers Served (System):	2300000
Switch Services	
Web Address:	www.frontieronline.com
POP Location:	205 S. Sidney, George, IA 51237
DSL:	Yes
Customers Served (System):	450
Switch Services	
Web Address:	mypremieronline.com

Infrastructure

Solid Waste and Recycling	Denny's Sanitation
Curb and Gutter	80%
Waste Water Treatment	Yes
How Many Cell Lagoon	Four Cell
Floodplain Ordinance	No
Floodplain Compliance Officer	(For assistance in the administration of the floodplain regulations, contact the Iowa Department of Natural Resources)

Future Plans and Mechanisms

The City of George planning committee stated they would try to incorporate the mitigation strategies developed in the plan in their community actions and other community planned documents if they occur. The committee also stated they would draw from other community mechanisms when applicable to add into the mitigation strategies and mitigation requirements of their hazard mitigation plan.

In preparation of this plan, existing plans and other technical information was considered. The purpose of this review was to give consideration to existing information before setting future mitigation goals.

Plan/Document	If yes last year updated	Plan/Document	If yes last year updated
Comprehensive/Landuse plan	Yes 2006	Capital Improvement Plan	No
Local Emergency Plan	Yes 2010	Local Recovery Plan	No
Local Mitigation Plan	No	County Mitigation Plan	No
Economic Development Plan	Yes 2002	Flood Ordinance or Plan	Yes 2009
School Mitigation Plan	No	Zoning Ordinance	Yes 2009
Building Code	No	Subdivision	Yes 2009
Tree Trimming Ordinance	Yes 1998	Nuisance Ordinance	Yes 2009
Storm Water Ordinance	No		

Emergency Services

Fire Rescue Dept

20 Volt fire fighter trained at HazMat Awareness/Ops

20 Volt Firefighters trained at FF1

6 Volt Firefighters trained at FF2

20 Volt Firefighters trained at incident command level

10 Volt Emergency Rescue Technician (ERT)

12 Volt Emergency Medical Technician (EMTB)

0 Paramedics

0 EMTI

2 Nurse

Fire equipment at station

1 Ambulance, 2 pumpers, 1 Rescue Rig, 1 Equipment Van, Grass Rig, Tanker Truck, EMS Gator

28-E with Lyon County Sherriff

Law Enforcement

Yes, 2 sirens

Emergency Warning System

Yes

Flood fighting plan

Yes

Sandbagging plan

Yes

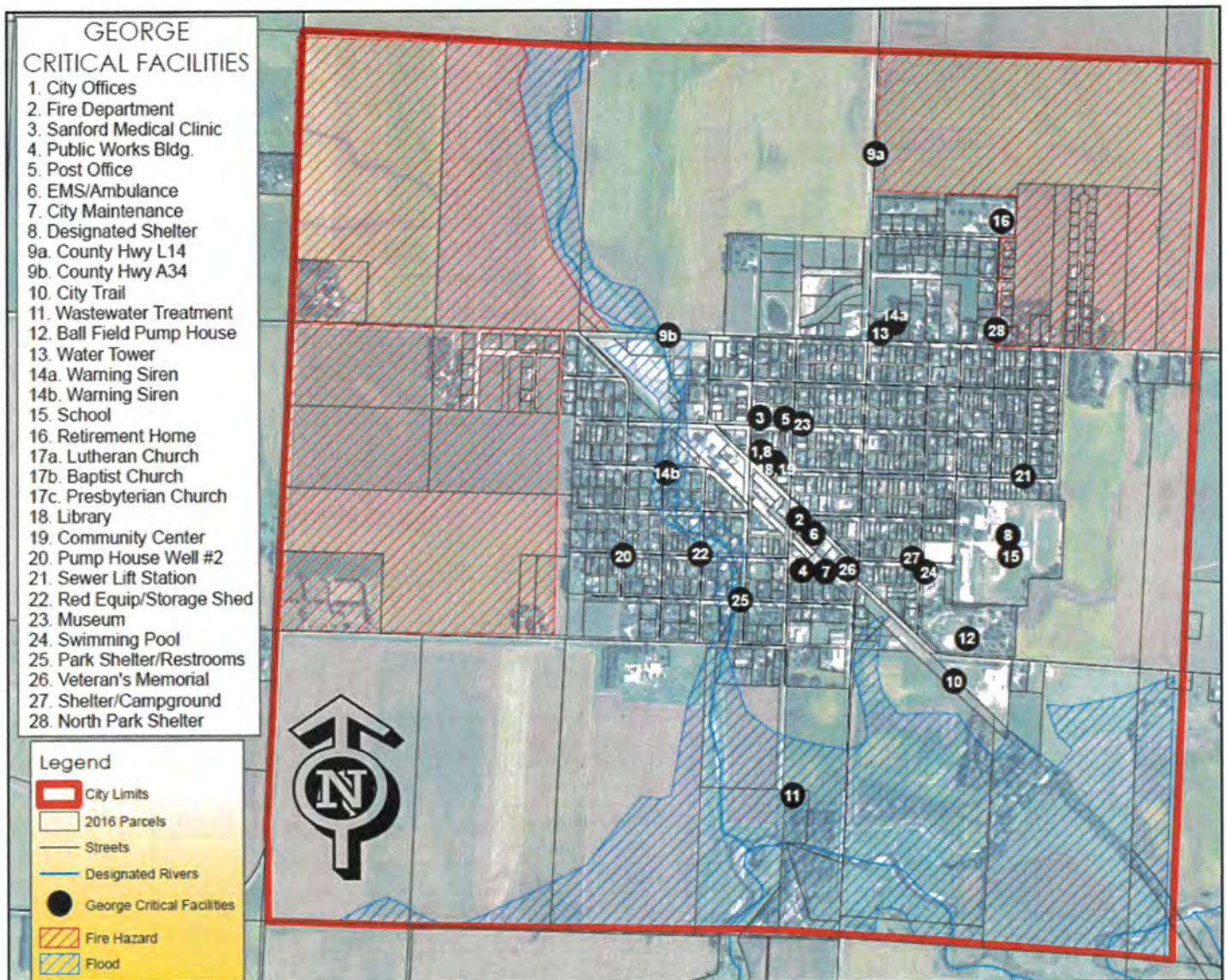
Evacuation/rescue plan

Yes

Critical Facilities and Assessed Values

George	Address	Value
1 City Offices	120 S Main St	\$164,396
2 Fire Dept	207 E Boiler Ave	\$881,816
3 Sanford Medical Clinic	101 N Main St	
4 Public Works Building	403 S Baldwin St	\$186,171
5 Post Office	120 E Michigan Ave	
6 EMS/Ambulance	Same as 2	
7 City Maintenance	200 E Ohio	\$165,894
8 Designated Shelter	115-117 S Main St	\$617,140
9a Highway L14	n/a	
9b Highway A34	n/a	
10 City Trails		
11 Wastewater Treatment	915 S Baldwin St	\$198,010
12 Ball field Pump House	400 S Wilhelm	\$42,230
13 Water Tower	302 N Virginia	\$266,208
14a Warning Sirens	E Dakota Ave & S Virginia St	\$16,830
14b Warning Sirens	W Minnesota & S Burroughs	\$16,830
15 School	500 E Indiana	
16 Retirement Home	324 1st Ave N	
17a Lutheran Church	400 E Iowa	
17b Baptist Church	206 E Indiana	
17c Presbyterian Church	300 E Iowa	
18 Library Church	119 S Main St	\$617,140
19 Community Center	Same as 8	
20 Pump House Well #2	403 S Hamilton	\$14,004
21 Sewer Lift Station	700 E Minnesota	\$20,812
22 Red Equip & Main Storage Shed	203 E Ohio	\$326,209
23 Museum	204 Michigan	\$53,031
24 Pool	317 E Ohio	
25 Old Park Shelter and Restrooms	100 E Calumet	\$42,668
26 Veteran's Memorial	SW Int. Virginia and Boiler	\$32,473
27 Park (Shelter, Campground)	409 S Wilhelm	\$95,262
28 North Park Shelter	315 N Washington	\$3,311

Total \$3,760,435



Hazard Risk Assessment

The Lyon County Hazard Mitigation Planning Committee determined the countywide hazard rankings. The city was also provided with information and statistics relevant to hazards affecting George, including records of past events and damages. The city was asked to review the information from the countywide rankings and determine if highest risk hazards for the county applied to George, and if not, how George's situation differs from the county. Based on this discussion, prevalent hazards were determined for George. Along with the information and statistics provided, the people present were asked to draw upon their knowledge and experiences of hazards affecting George. After the discussion among the planning team, it was decided that the City of George would re-prioritize the hazards of the countywide ranking for their jurisdictional portion of the plan. The city eliminated many of the hazards that were in the countywide ranking, such as: landslide, river flood, dam failure, and sinkhole. The planning team decided that those hazards did not apply to George.

It is recognized that George may be susceptible to other hazards, such as the other hazards in the State of Iowa Hazard Mitigation Plan, but those hazards are not considered to be a high risk and are not examined at this time. However, if it is later determined that a hazard affecting George does pose a higher risk than originally determined, it will be examined at that time or when the plan is updated.

Iowa Identified Mitigation Actions

The following are the actions that were identified by the local planning committee:

- Enforce Tree Trimming
- Bury Utility Lines
- Buy and Distribute NOAA Weather Radios
- Designate a Local Community Shelters
- Purchase Snow/Plowing Equipment
- Build a Safe Room
- Enforce Building and Zoning Codes
- Build or Update Warning Sirens
- Continue you Fire Dept HAZMAT Training
- Continue Fire Dept Training
- Enforce the Snow Removal Policy
- Maintain Outdoor Warning Sirens
- Update or Create Local Emergency Plans
- Construct Sewer Lift Station
- Replace and Rehab Sewer Lines
- Install Riprap
- Continue with NFIP Participation
- Purchase Portable Pumps
- Purchase Fire Gear (PPE)
- Backup City Records
- Enforce Burn Bans
- Purchase Sandbags
- Determine Which Areas are Most Prone to Flood
- Reaffirm Mutual AID
- Transportation for Critical Employees to Work
- EMT Snowmobile

• Test Warning Sirens Monthly

- Enforce Floodplain Ordinance
- Maintain and Expand Debris Removal Site
- Review/Update Local Operations Plan
- Build Safe Rooms for Critical Facilities

The Lyon County Planning Team and Lyon County are responsible for overseeing the implementation of this plan. Lyon County Emergency Management and other county and local agencies will assist with implementing and administering this plan. The mitigations actions were discussed with a high, medium and low priority ranking in mind. **High (H)** – Jurisdictions valued this as something that had the highest effect on helping the community and people survive severe weather events. Also the cost could be easily obtained or funding has already been set aside. **Medium (M)** – These were valued at the jurisdictions as projects that where ranked in between the other two priority groups. **Low (L)** – These mitigation actions have the least effect on protecting human life from severe weather events and therefore have been given the lowest priority. Or the cost is too high at this point in time and makes it unlikely to be acted upon in present future. Priorities for each mitigation action are discussed in the Mitigation Actions, Section 5. Another factor in the implementation of the mitigation actions was their benefit versus how much the project would cost. Economics of implementing mitigation actions were considered when the planning team discussed the priority of projects. Cost estimates were given by the Lyon County Planning Committee to help display which actions were of a higher importance and fit in the economic goals of the county/cities/schools. Those estimates can be reference in Section 5. The Implementation Schedule for the mitigation activities, whether ongoing or considered, will be subject to the availability of Federal, State, and local funding. Continuing (ON) = Ongoing (responsible entity regularly participates in or supports); Short Term (ST) = 1-5 years to initiate or accomplish; and Long Term (LT) = 5 or more years to initiate or accomplish.

Once the plan is completed, approved, and adopted, local governments will be eligible for funding assistance from FEMA for mitigation strategies put forth in the plan. Potential funding resources include the FEMA Pre-Disaster Mitigation Program (PDM) and FEMA Hazard Mitigation Grant Program (HMGP). No timeframe was identified in implementing these mitigation actions will be acted upon as funding become available. It was discussed that additional mitigation actions would be examined during the update process. The mitigation actions that were discussed were what the George Planning Committee wanted to have included in the hazard mitigation plan.

Plan Maintenance

Plan maintenance involves taking action to ensure that the plan stays current with information, priorities are still in order, and goals and objectives are maintained and updated. To accomplish this, the plan will be reviewed by the planning team annually and be incorporated into other city plans. Additionally, a comprehensive update is required at least once every 5 years and submitted to FEMA for certification. The revised plan will be adopted by the city council. To assist with the update, information is to be collected by the city annually to document efforts, hazard events, and other pertinent activities to mitigate hazards. Part of plan maintenance is maintaining the planning team. The planning team is composed of local elected officials, city employees and other interested parties. This is an important part of plan maintenance in order to reconvene the planning team when necessary.

Monitoring

The George Planning Team and Lyon County Emergency Management are responsible for monitoring this portion of the plan. The plan will be monitored based on the mitigation strategies identified in the plan and the reported progress to accomplish the work. Projects that are complete will be monitored for effectiveness.

Plan Updates Concerning George

When updating the plan please contact the Lyon County Emergency Management for assistance.

[illegible]

Section 9.5 Inwood

Planning Committee Members:

Carol Vander Kolk	City Clerk
Joe Lloyd	Council
Mike Knobloch	Council
Mark Timmerman	Council
Tim Altena	Council
Shirley Kollis	Council
Dan Moen	Mayor

City Contact:

Carol Vander Kolk – City Clerk 712-753-4833

Planning Process

Meetings were held throughout the planning process to collect information and share that information with the general public and the planning team. Notices for meetings were posted at city hall or the school where the meeting was being held. Agendas and minutes for meetings are included in the Appendix.

Utilities

Water

Name:	City of Inwood		
Location:	Inwood, Iowa (Lyon)		
Well Avg Depth (ft):	0	Peak Demand (mgd):	150,000.0000
Treated:	Yes	Cost/1000 Gal:	\$5.47
Rated Capacity (mgd):	150,000.0000	Storage Capacity (gal):	150,000
Temp Range (F):		Major Source:	Ground water
Avg Capacity (mgd):	95,000.0000	Hardness (ppm):	32.0
Connection Fee:	Yes		
Phone:	712-225-4833	Web Address:	cityofinwood@hotmail.com

Sewer

Name:	City of Inwood		
Location:	Inwood, Iowa (Lyon)		
Ownership Type:	Municipal	Average Daily Demand (mgd):	99999 9999
Rated Capacity (mgd):	350,000.0000	Peak Demand (mgd):	400,000.0000
Cost/1000 Gal:	\$16.72	Connection Fee:	Yes
Phone:	712-753-4833	Web Address:	cityofinwood@hotmail.com

Electric

Name:	MidAmerican Energy		
Location:	INWOOD, IA (Lyon)		
Ownership Type:	Private	Regulated:	Yes

Peak Demand (kW):	4,250	Generation Capacity (MW):	5,150
Customers Served (Local):	454	Customers Served (State):	630,938
Customers Served (System):	719,635		
Phone:	800-358-6265	Web Address:	www.midamericanenergy.com
Distributor Comments			
Natural Gas			
Name:	MidAmerican Energy		
Location:	INWOOD, IA(Lyon)		
Customers Served (Local):	758	Customers Served (State):	548,336
Customers Served (System):	700,829	Ownership Type:	Private
Pipeline Source:	Private	Gas Transportation Available	Yes
Phone:	800-358-6265	Web Address:	www.midamericanenergy.com
Telecommunications			
Name:	Alliance Communications		
Location:	Inwood, Iowa(Lyon)	POP Location:	
Service Type:	Cable TV, DSL Internet	DSL:	Yes
Customers Served (State):	0	Customers Served (System):	0
Fiber Optics:	Yes	Switch Services	
Phone:	800-701-4980	Web Address:	Alliance.com

Infrastructure

Solid Waste and Recycling	Harms Sanitation
Curb and Gutter	25% of City
Waste Water Treatment	Yes
How Many Cell Lagoon	Four
Floodplain Ordinance	No
Floodplain Compliance Officer	(For assistance in the administration of the floodplain regulations, contact the Iowa Department of Natural Resources)

Future Plans and Mechanisms

The City of Inwood planning committee stated they would try to incorporate the mitigation strategies developed in the plan in their community actions and other community planned documents if they occur. The committee also stated they would draw from other community mechanisms when applicable to add into the mitigation strategies and mitigation requirements of their hazard mitigation plan.

In preparation of this plan, existing plans and other technical information was considered. The purpose of this review was to give consideration to existing information before setting future mitigation goals.

Plan/Document	If yes last year updated	Plan/Document	If yes last year updated
Comprehensive/Landuse plan	Yes 2010	Capital Improvement Plan	No

Local Emergency Plan	Yes 2000	Local Recovery Plan	No
Local Mitigation Plan	Yes 2005	County Mitigation Plan	Yes 2011
Economic Development Plan	No	Flood Ordinance or Plan	No
School Mitigation Plan	No	Zoning Ordinance	Yes 2011
Building Code	No	Subdivision	Yes 2011
Tree Trimming Ordinance	No	Nuisance Ordinance	Yes 2011
Storm Water Ordinance	No		

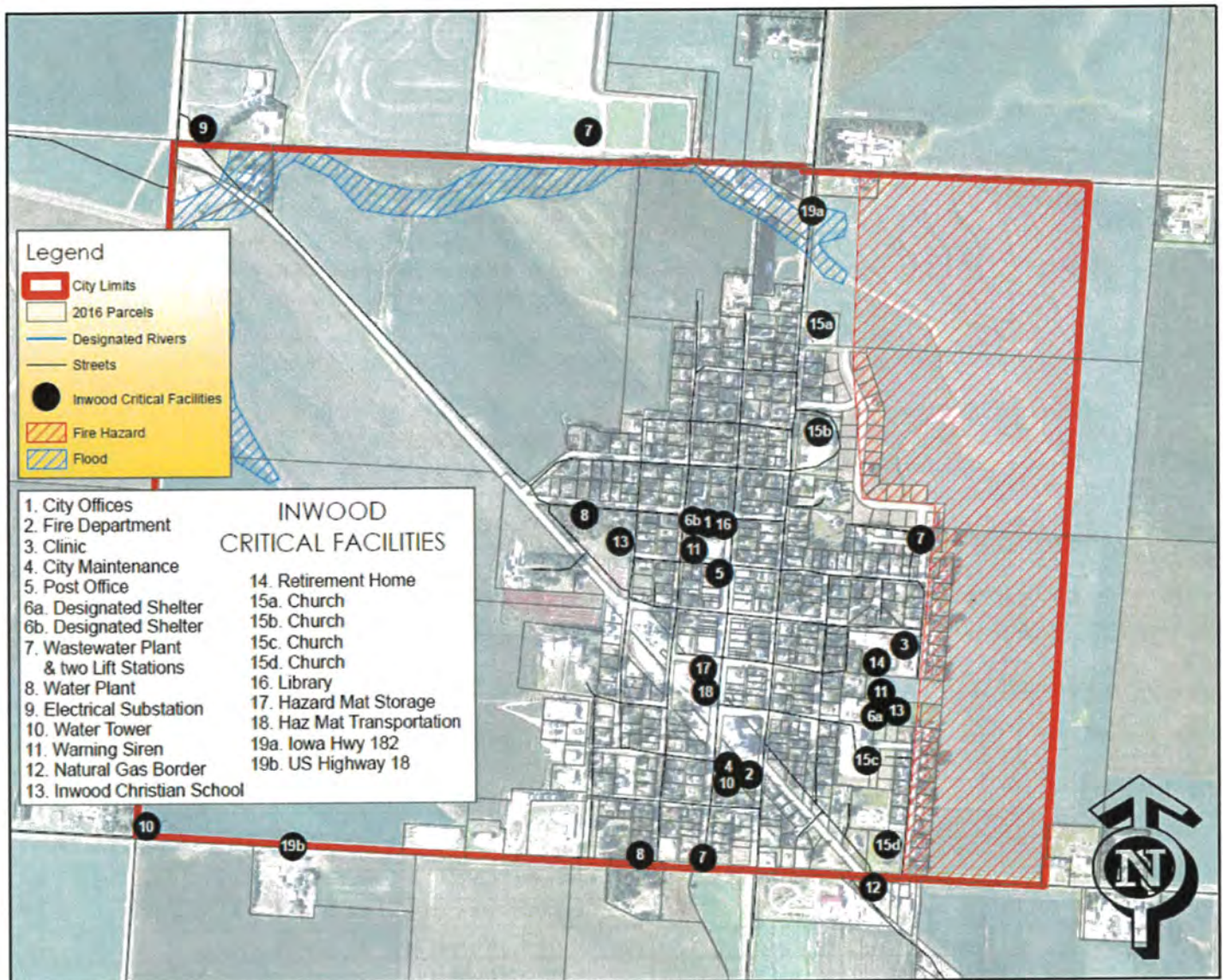
Emergency Services

Fire Rescue Dept	25 Volt fire fighter trained at HazMat Awareness/Ops 25 Volt Firefighters trained at FF1 13 Volt Firefighters trained at FF2 13 Volt Firefighters trained at incident command level 0 Volt Emergency Rescue Technician (ERT) 13 Volt Emergency Medical Technician (EMTB) 0 Paramedics 0 EMTI 4 Nurse
Fire equipment at station	2 tankers, 2 pumpers, 1 grass rig, 1 ambulance
Law Enforcement	28-E with Lyon County Sherriff
Emergency Warning System	Yes, 2 sirens
Flood fighting plan	No
Sandbagging plan	No
Evacuation/rescue plan	No

Critical Facilities and Assessed Values

Inwood	Address	Value
1 City Offices	103 S Main St	\$1,500,000
2 Police/Fire Dept	601 S Oak St	\$200,000
3 Clinic	303 E Jefferson St.	\$300,000
4 City Maintenance	600 S Main St	\$125,000
5 Post Office	201 S Main St	\$300,000
6a Designated Shelter	304 E Main St	\$1,500,000
6b Designated Shelter	same as 1	
7 Wastewater Treatment Plan/ 2 Lift stations	517 N Oak St	\$1,500,000
8 Water Plant	208 W HWY 18	\$120,000
9 Electrical Substation	698 W Jefferson St	
10 Water Tower	600 S Main St	\$150,000
11 Warning Siren	304 E Madison St	\$10,000
12 Natural Gas Border Station	1835 240th St	
13 Inwood Christian School	304 E Madison	\$1,500,000
14 Retirement Home	300 E Jefferson St	\$2,000,000
15a Church	414 N Oak St	\$2,000,000
15b Church	302 N Oak St	\$2,000,000
15c Church	305 E Madison St	\$2,000,000
15d Church	709 S Douglas St	\$2,000,000
16 Library	same as 1	
17 Hazardous material storage	407 S Main St	\$125,000

18	Hazardous Material Transportation	409 S Main St (price w/17)	
19a	Highway 182	n/a	
19b	Highway 18	n/a	
Total			\$17,330,000



Hazard Risk Assessment

The Lyon County Hazard Mitigation Planning Committee determined the countywide hazard rankings. The city was also provided with information and statistics relevant to hazards affecting Inwood, including records of past events and damages. The city was asked to review the information from the countywide rankings and determine if highest risk hazards for the county applied to Inwood, and if not, how Inwood's situation differs from the county. Based on this discussion, prevalent hazards were determined for Inwood. Along with the information and statistics provided, the people present were asked to draw upon their knowledge and

experiences of hazards affecting Alvord. After the discussion among the planning team, it was decided that the City of Inwood would re-prioritize the hazards of the countywide ranking for their jurisdictional portion of the plan. The city eliminated many of the hazards that were in the countywide ranking, such as: landslide, river flood, dam failure, and sinkhole. The planning team decided that those hazards did not apply to Inwood.

It is recognized that Inwood may be susceptible to other hazards, such as the other hazards in the State of Iowa Hazard Mitigation Plan, but those hazards are not considered to be a high risk and are not examined at this time. However, if it is later determined that a hazard affecting Inwood does pose a higher risk than originally determined, it will be examined at that time or when the plan is updated.

Iowa Identified Mitigation Actions

The following are the actions that were identified by the local planning committee:

- Enforce Tree Trimming
- Purchase Back Up Power Generators
- Designate a Local Community Shelters
- Purchase Snow/Plowing Equipment
- Build a Safe Room
- Build or Update Warning Sirens
- Conduct a Watershed Study and Implement the findings
- Enforce Building and Zoning Codes
- Continue you Fire Dept HAZMAT Training
- Continue Fire Dept Training
- Enforce the Snow Removal Policy
- Maintain Outdoor Warning Sirens
- Update or Create Local Emergency Plans
- Clean or Enlarge Sewage Lagoons
- Construct Sewer Lift Station
- Replace and Rehab Sewer Lines
- Purchase Portable Pumps
- Purchase Fire Gear (PPE)
- Reaffirm Rural Water Connections
- Reaffirm Mutual AID
- Test Warning Sirens Monthly
- Maintain and Expand Debris Removal Site

- Look into Joining NFIP and Getting Mapped
- Build Safe Rooms for Critical Facilities

The Lyon County Planning Team and Lyon County are responsible for overseeing the implementation of this plan. Lyon County Emergency Management and other county and local agencies will assist with implementing and administering this plan. The mitigations actions were discussed with a high, medium and low priority ranking in mind. **High (H)** – Jurisdictions valued this as something that had the highest effect on helping the community and people survive severe weather events. Also the cost could be easily obtained or funding has already been set aside. **Medium (M)** – These were valued at the jurisdictions as projects that were ranked in between the other two priority groups. **Low (L)** – These mitigation actions have the least effect on protecting human life from severe weather events and therefore have been given the lowest priority. Or the cost is too high at this point in time and makes it unlikely to be acted upon in present future. Priorities for each mitigation action are discussed in the Mitigation Actions, Section 5. Another factor in the implementation of the mitigation actions was their benefit versus how much the project would cost. Economics of implementing mitigation actions were considered when the planning team discussed the priority of projects. Cost estimates were given by the Lyon County Planning Committee to help display which actions were of a higher importance and fit in the economic goals of the county/cities/schools. Those estimates can be reference in Section 5. The Implementation Schedule for the mitigation activities, whether ongoing or considered, will be subject to the availability of Federal, State, and local funding. Continuing (ON) = Ongoing (responsible entity regularly participates in or supports); Short Term (ST) = 1-5 years to initiate or accomplish; and Long Term (LT) = 5 or more years to initiate or accomplish.

Once the plan is completed, approved, and adopted, local governments will be eligible for funding assistance from FEMA for mitigation strategies put forth in the plan. Potential funding resources include the FEMA Pre-Disaster Mitigation Program (PDM) and FEMA Hazard Mitigation Grant Program (HMGP). No timeframe was identified in implementing these mitigation actions will be acted upon as funding become available. It was discussed that additional mitigation actions would be examined during the update process. The mitigation actions that were discussed were what the Inwood Planning Committee wanted to have included in the hazard mitigation plan.

Plan Maintenance

Plan maintenance involves taking action to ensure that the plan stays current with information, priorities are still in order, and goals and objectives are maintained and updated. To accomplish this, the plan will be reviewed by the planning team annually and be incorporated into other city plans. Additionally, a comprehensive update is required at least once every 5 years and submitted to FEMA for certification. The revised plan will be adopted by the city council. To assist with the update, information is to be collected by the city annually to document efforts, hazard events, and other pertinent activities to mitigate hazards. Part of plan maintenance is maintaining the planning team. The planning team is composed of local elected officials, city employees and other interested parties. This is an important part of plan maintenance in order to reconvene the planning team when necessary.

Monitoring

The Inwood Planning Team and Lyon County Emergency Management are responsible for monitoring this portion of the plan. The plan will be monitored based on the mitigation strategies identified in the plan and the reported progress to accomplish the work. Projects that are complete will be monitored for effectiveness. Any strategies that are removed from the plan will be examined and documented. An annual reporting sheet is included in this plan for the city to keep track of the mitigation process.

Incorporation into Existing Plans

The city is responsible for reviewing its local plans, codes, and ordinances and amending documents as they see appropriate. As appropriate, information and actions from this plan will be incorporated into comprehensive or community builder plans during review and update processes. A worksheet is provided to record what information from this plan is incorporated to other plans.

Continued Public Participation

The public will be involved in the implementation of the plan at city council meetings and general public meetings. Mitigation actions and implementation strategies will be discussed at city council meetings and an opportunity for public input will be encouraged. This process will ensure opportunity for public awareness of hazards and threats faced by the community and actions planned to eliminate or reduce impacts. To promote continued public participation, meetings where the plan will be discussed will have public notice posted.

Incorporation into Other Plans

Date	Plan or Document	<u>Information Incorporated into Plan or Document</u>

Plan Updates Concerning Inwood

When updating the plan please contact the Lyon County Emergency Management for assistance.

[illegible]

Section 9.6 Larchwood Planning Committee Members:

Dean Synders	Mayor
Ted Underberg	Council
Brian Meffert	Council
Sandi DeSmet	City Clerk
Mike Metzger	Council
Damon Langenhorst	Fire Dept

City Contact:

Sandi DeSmet City Clerk – 712-477-2366

Planning Process

Meetings were held throughout the planning process to collect information and share that information with the general public and the planning team. Notices for meetings were posted at city hall or the school where the meeting was being held. Agendas and minutes for meetings are included in the Appendix.

Utilities

Water

Name:	City of Larchwood		
Location:	Larchwood, Iowa (Lyon)		
Well Avg Depth (ft):	0	Peak Demand (mgd):	0.1100
Treated:	Yes	Cost/1000 Gal:	\$2.00
Rated Capacity (mgd):	0.4320	Storage Capacity (gal):	300,000
Temp Range (F):		Major Source:	Contract with Lyon Sioux
Avg Capacity (mgd):	0.0930	Hardness (ppm):	0.0
Connection Fee:	Unknown		
Phone:	712-477-2366	Web Address:	www.larchwoodiowa.com

Sewer

Name:	City of Larchwood		
Location:	Larchwood, Iowa (Lyon)		
Ownership Type:	Municipal	Average Daily Demand (mgd):	0.1300
Rated Capacity (mgd):	0.1500	Peak Demand (mgd):	0.2730
Cost/1000 Gal:	\$18.00	Connection Fee:	Unknown
Phone:	712-477-2366	Web Address:	www.larchwoodiowa.com

Electric

Name:	City of Larchwood		
Location:	Larchwood, Iowa (Lyon)		
Ownership Type:	Municipal	Regulated:	Yes
Peak Demand (kW):	1,469	Generation Capacity (MW):	0

Customers Served (Local): 407

Customers Served (State): 0

Customers Served

0

(System):

Phone: 712-477-2366

Web Address: www.larchwoodiowa.com

Natural Gas

Name: Not available

Telecommunications

Name: Alliance Communications

Location: Larchwood, Iowa(Lyon)

POP Location: unknown

Service Type:

Local and long distance, cable,
internet

DSL: Yes

Customers Served (State): 0

Customers Served (System): 0

Fiber Optics: Yes

Switch Services

Phone: 605-594-3411

Web Address: www.alliancecom.net

Infrastructure

Solid Waste and Recycling
Curb and Gutter

Yes
Main St.

Waste Water Treatment

Yes

How Many Cell Lagoon

4 Cell

Floodplain Ordinance

No

Floodplain Compliance Officer

(For assistance in the administration of the floodplain regulations,
contact the Iowa Department of Natural Resources)

Future Plans and Mechanisms

The City of Larchwood planning committee stated they would try to incorporate the mitigation strategies developed in the plan in their community actions and other community planned documents if they occur. The committee also stated they would draw from other community mechanisms when applicable to add into the mitigation strategies and mitigation requirements of their hazard mitigation plan.

In preparation of this plan, existing plans and other technical information was considered. The purpose of this review was to give consideration to existing information before setting future mitigation goals.

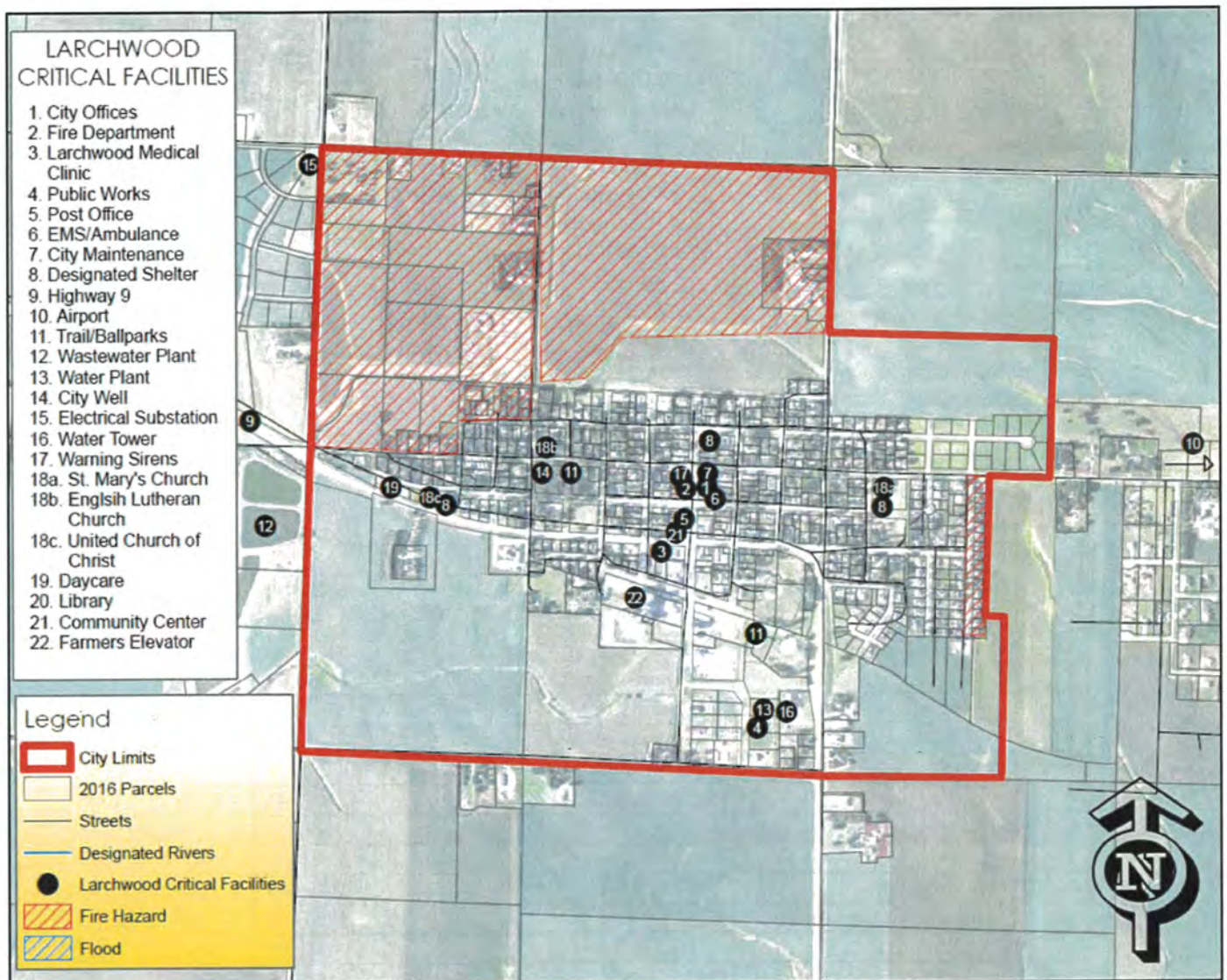
Plan/Document	If yes last year updated	Plan/Document	If yes last year updated
Comprehensive/Landuse plan	Yes 1995	Capital Improvement Plan	No
Local Emergency Plan	Yes 2011	Local Recovery Plan	No
Local Mitigation Plan	Yes 2004	County Mitigation Plan	No
Economic Development Plan	Yes 2003	Flood Ordinance or Plan	No
School Mitigation Plan	No	Zoning Ordinance	Yes 2011
Building Code	Yes 2011	Subdivision	Yes 2011
Tree Trimming Ordinance	Yes 2010	Nuisance Ordinance	Yes 2010
Storm Water Ordinance	No		

Emergency Services

Fire Rescue Dept	25 Volt fire fighter trained at HazMat Awareness/Ops 25 Volt Firefighters trained at FF1 2 Volt Firefighters trained at FF2 18 Volt Firefighters trained at incident command level 8 Volt Emergency Rescue Technician (ERT) 9 Volt Emergency Medical Technician (EMTB) 0 Paramedics 0 EMTI 1 Nurse
Fire equipment at station	1 equipment van, 2 pumpers, 2 grass rigs
Law Enforcement	28-E with Lyon County Sherriff
Emergency Warning System	Yes
Flood fighting plan	No
Sandbagging plan	No
Evacuation/rescue plan	Yes

Critical Facilities and Assessed Values

Larchwood	Address	Value
1 City Offices	909 Broadway	\$327,392
2 Fire Dept	525 Sports Loop Dr.	\$350,000
3 Larchwood Medical Clinic	916 Holder St	\$126,000
4 Public Works	524 Sports Loop Dr	\$132,098
5 Post Office	935 Broadway	\$60,000
6 EMS/Ambulance	1023 Broadway	\$115,000
7 City Maintenance	1038 Broadway	\$10,142
8 Designated Shelter	1038 Broadway	\$764,545
9 Highway 9	n/a	
10 Airport	1917 135th St	\$100,000
11 Trails/ballparks	Ball Diamonds	\$90,000
12 Wastewater Treatment Plant	Cherry Ave	\$200,000
13 Water Plant	534 Sports Loop Dr	\$1,047,000
14 City Well	Park	\$157,000
15 Electrical Sub-station	Cherry Ave	\$1,500,000
16 Water Tower	Sports loop Dr	\$480,000
17 Warning Sirens	Firestation	\$3,000
18a St. Marys Church	1030 Blaine Ave	\$1,642,000
18b English Lutheran Church	603 Fell St	\$89,000
18c United Church of Christ	935 Edwards St	\$1,079,624
19 Daycare	405 Holder St	\$325,000
20 Library	1020 Broadway St	\$217,249
21 Community Center	Same as 1	
22 Farmers Elevator	755 Broadway	\$7,025,000



Hazard Risk Assessment

The Lyon County Hazard Mitigation Planning Committee determined the countywide hazard rankings. The city was also provided with information and statistics relevant to hazards affecting Larchwood, including records of past events and damages. The city was asked to review the information from the countywide rankings and determine if highest risk hazards for the county applied to Larchwood, and if not, how Larchwood's situation differs from the county. Based on this discussion, prevalent hazards were determined for Larchwood. Along with the information and statistics provided, the people present were asked to draw upon their knowledge and experiences of hazards affecting Larchwood. After the discussion among the planning team, it was decided that the City of Larchwood would re-prioritize the hazards of the countywide ranking for their jurisdictional portion of the plan. The city eliminated many of the hazards that were in the countywide ranking, such as: landslide, river flood, dam failure, and sinkhole. The planning team decided that those hazards did not apply to Larchwood.

It is recognized that Larchwood may be susceptible to other hazards, such as the other hazards in the State of Iowa Hazard Mitigation Plan, but those hazards are not considered to be a high risk and are not examined at this time. However, if it is later determined that a hazard affecting Larchwood does pose a higher risk than originally determined, it will be examined at that time or when the plan is updated.

Iowa Identified Mitigation Actions

The following are the actions that were identified by the local planning committee:

- Enforce Tree Trimming
- Purchase Back Up Power Generators
- Bury Utility Lines
- Buy and Distribute NOAA Weather Radios
- Designate a Local Community Shelters
- Purchase Snow/Plowing Equipment
- Establishing a Good Neighbor Program to Check on Residents
- Build a Safe Room
- Build or Update Warning Sirens
- Enforce Building and Zoning Codes
- Continue you Fire Dept HAZMAT Training
- Continue Fire Dept Training
- Enforce the Snow Removal Policy
- Develop a list of Storm Shelters and Distribute to Residents
- Maintain Outdoor Warning Sirens
- Update or Create Local Emergency Plans
- Clean or Enlarge Sewage Lagoons
- Replace and Rehab Sewer Lines
- Continue with NFIP Participation
- Develop Alternative Fire Suppression
- Purchase Portable Pumps
- Purchase Fire Gear (PPE)
- Develop a list of Elderly, Disabled or Medically Distressed and Furnish to Law Enforcement
- Purchase Shelter Rations (Cots, Blankets, Water, etc.)
- Backup City Records
- Establish a Technical Weather Warning System
- Enforce Burn Bans

Reaffirm Rural Water Connections

- Reaffirm Mutual AID
- Purchase Paramedic Equipment
- Transportation for Critical Employees to Work
- EMT Snowmobile
- Develop a Better Connection with the Iowa DNR
- Test Warning Sirens Monthly
- Maintain and Expand Debris Removal Site
- Review/Update Local Operations Plan
- Build Safe Rooms for Critical Facilities

The Lyon County Planning Team and Lyon County are responsible for overseeing the implementation of this plan. Lyon County Emergency Management and other county and local agencies will assist with implementing and administering this plan. The mitigations actions were discussed with a high, medium and low priority ranking in mind. **High (H)** – Jurisdictions valued this as something that had the highest effect on helping the community and people survive severe weather events. Also the cost could be easily obtained or funding has already been set aside. **Medium (M)** – These were valued at the jurisdictions as projects that where ranked in between the other two priority groups. **Low (L)** – These mitigation actions have the least effect on protecting human life from severe weather events and therefore have been given the lowest priority. Or the cost is too high at this point in time and makes it unlikely to be acted upon in present future. Priorities for each mitigation action are discussed in the Mitigation Actions, Section 5. Another factor in the implementation of the mitigation actions was their benefit versus how much the project would cost. Economics of implementing mitigation actions were considered when the planning team discussed the priority of projects. Cost estimates were given by the Lyon County Planning Committee to help display which actions were of a higher importance and fit in the economic goals of the county/cities/schools. Those estimates can be reference in Section 5. The Implementation Schedule for the mitigation activities, whether ongoing or considered, will be subject to the availability of Federal, State, and local funding. Continuing (ON) = Ongoing (responsible entity regularly participates in or supports); Short Term (ST) = 1-5 years to initiate or accomplish; and Long Term (LT) = 5 or more years to initiate or accomplish.

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Plan Maintenance

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Monitoring



The Larchwood Planning Team and Lyon County Emergency Management are responsible for monitoring this portion of the plan. The plan will be monitored based on the mitigation strategies identified in the plan and the reported progress to accomplish the work. Projects that are complete will be monitored for effectiveness. Any strategies that are removed from the plan will be examined and documented. An annual reporting sheet is included in this plan for the city to keep track of the mitigation process.

Incorporation into Existing Plans

The city is responsible for reviewing its local plans, codes, and ordinances and amending documents as they see appropriate. As appropriate, information and actions from this plan will be incorporated into comprehensive or community builder plans during review and update processes. A worksheet is provided to record what information from this plan is incorporated to other plans.

Continued Public Participation

The public will be involved in the implementation of the plan at city council meetings and general public meetings. Mitigation actions and implementation strategies will be discussed at city council meetings and an opportunity for public input will be encouraged. This process will ensure opportunity for public awareness of hazards and threats faced by the community and actions planned to eliminate or reduce impacts. To promote continued public participation, meetings where the plan will be discussed will have public notice posted.

Incorporation into Other Plans

Date	Plan or Document	<u>Information Incorporated into Plan or Document</u>
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Plan Updates Concerning Larchwood

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When updating the plan please contact the Lyon County Emergency Management for assistance.

Date	Page	Change
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Section 9.7 Lester

Planning Committee Members:

Pam Hawf	Council
Henry Messner	Council
Harold Meester	City Clerk
Lance Book	Council
Wayne Jepsen	Emergency Management

City Contact:

Harold Meester City Clerk – 712-478-4416

Planning Process

Meetings were held throughout the planning process to collect information and share that information with the general public and the planning team. Notices for meetings were posted at city hall or the school where the meeting was being held. Agendas and minutes for meetings are included in the Appendix.

Utilities

Water

Name:	Lyon-Sioux Rural Water		
Location:	Rock Rapids, Iowa (Lyon)		
Well Avg Depth (ft):	0	Peak Demand (mgd):	0.0400
Treated:	Yes	Cost/1000 Gal:	15 + 2.50/1000
Rated Capacity (mgd):	0.1400	Storage Capacity (gal):	0
Temp Range (F):		Major Source:	Rural Water System
Avg Capacity (mgd):	0.0300	Hardness (ppm):	0.0
Connection Fee:	Yes 350		
Phone:		Web Address:	

Sewer

Name:	City of Lester		
Location:	Lester, Iowa (Lyon)		
Ownership Type:	Municipal	Average Daily Demand (mgd):	0.0270
Rated Capacity (mgd):	0.0370	Peak Demand (mgd):	0.0350
Cost/1000 Gal:	2.50 + \$25	Connection Fee:	Yes 350
Phone:		Web Address:	

Electric

Name:	Alliant Energy		
Location:	Madison, Wisconsin ()		
Ownership Type:	Private	Regulated:	Yes
Peak Demand (kW):	6	Generation Capacity (MW):	5,765
Customers Served (Local):	110	Customers Served (State):	479,308

Customers Served 965,953
(System):
Phone: 1-800-255-4268 **Web Address:**
Natural Gas
Name: No natural gas provider
Telecommunications
Name: Alliance Communications
Location: Garretson, SD() **POP Location:**
Service Type: Local and long distance; cable **DSL:** Yes
TV; DSL
Customers Served (State): 0 **Customers Served (System):** 0
Fiber Optics: Yes **Switch Services**
Phone: 1-800-533-0011 **Web Address:** www.alliancecom.net

Infrastructure

Solid Waste and Recycling Denny's Sanitation
Curb and Gutter Yes 15%
Waste Water Treatment Yes
How Many Cell Lagoon 3 Cell
Floodplain Ordinance Yes
Floodplain Compliance Officer (For assistance in the administration of the floodplain regulations, contact the Iowa Department of Natural Resources)

Future Plans and Mechanisms

The City of Lester planning committee stated they would try to incorporate the mitigation strategies developed in the plan in their community actions and other community planned documents if they occur. The committee also stated they would draw from other community mechanisms when applicable to add into the mitigation strategies and mitigation requirements of their hazard mitigation plan.

In preparation of this plan, existing plans and other technical information was considered. The purpose of this review was to give consideration to existing information before setting future mitigation goals.

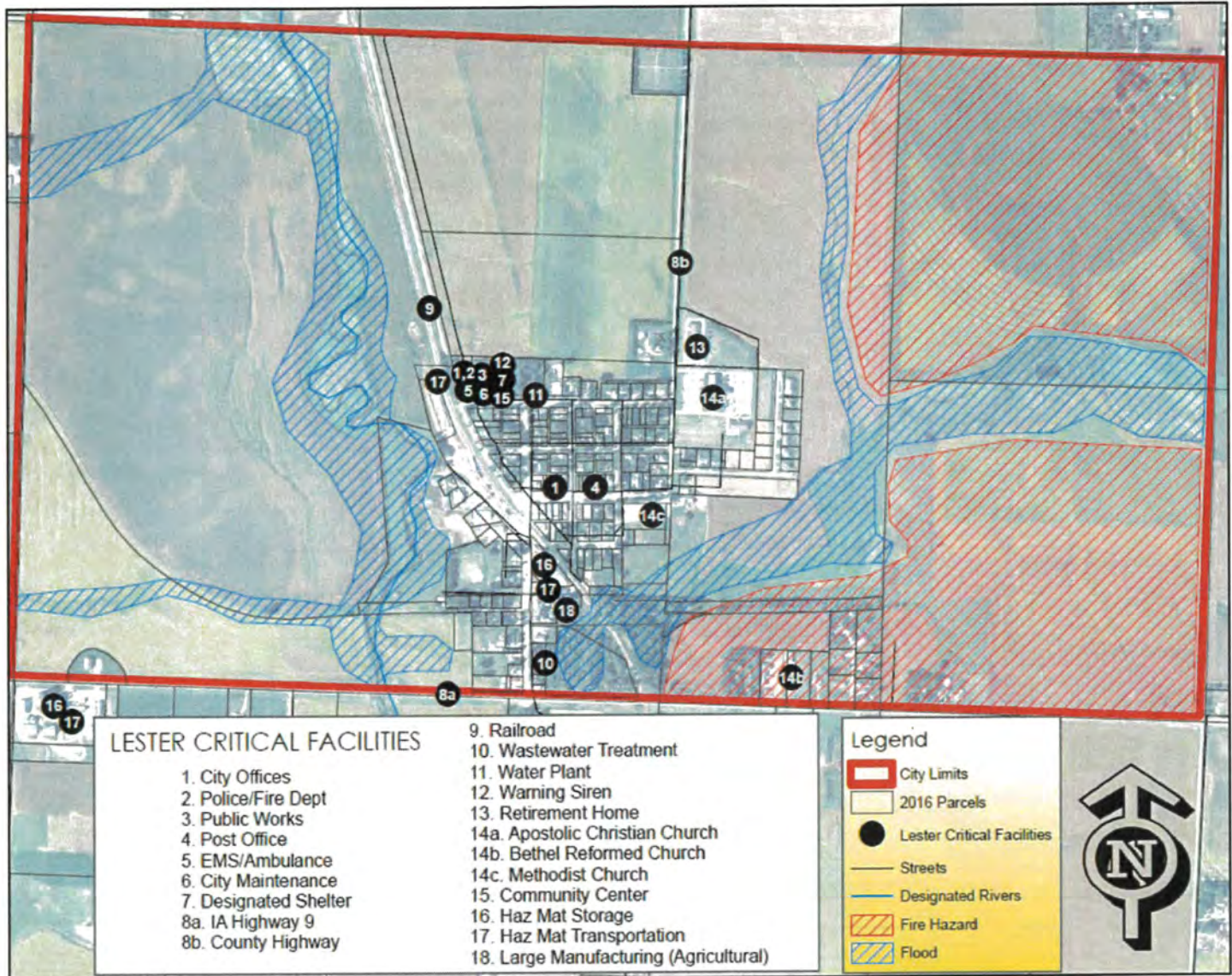
Plan/Document	If yes last year updated	Plan/Document	If yes last year updated
Comprehensive/Landuse plan	Yes 2008	Capital Improvement Plan	No
Local Emergency Plan	No	Local Recovery Plan	No
Local Mitigation Plan	Yes 2004	County Mitigation Plan	No
Economic Development Plan	No	Flood Ordinance or Plan	Yes
School Mitigation Plan	No	Zoning Ordinance	Yes 2008
Building Code	Yes 2008	Subdivision	Yes 2008
Tree Trimming Ordinance	Yes 2008	Nuisance Ordinance	Yes 2008
Storm Water Ordinance	No		

Emergency Services

Fire Rescue Dept	6 Volt fire fighter trained at HazMat Awareness/Ops 14 Volt Firefighters trained at FF1 1 Volt Firefighters trained at FF2 1 Volt Firefighters trained at incident command level 7 Volt Emergency Rescue Technician (ERT) 0 Volt Emergency Medical Technician (EMTB) 0 Paramedics 0 EMTI 2 Nurse
Fire equipment at station	Pumper, 2 Tankers, Equipment Truck, Grass Rig
Law Enforcement	28-E with Lyon County Sherriff
Emergency Warning System	Yes, 1 sirens
Flood fighting plan	No
Sandbagging plan	No
Evacuation/rescue plan	No

Critical Facilities and Assessed Values

Lester	Address	Value
1 City Offices	701 Hastings	\$130,000
2 Police/Fire Dept	Same as 1	
3 Public Works	Same as 1	
4 Post Office	311 Main St	\$15,000
5 EMS/Ambulance	704 Hastings	\$250,000
6 City Maintenance	107 5 th St	\$2,500
7 Designated Shelter	105 5th St	\$75,000
8a Highway	n/a	
8b Highway	n/a	
9 Railroad	n/a	
10 Wastewater Treatment Plant	104 1/2 Clinton	\$95,000
11 Water Plant	201 5th	\$17,000
12 Warning Siren	105 5th St	\$3,000
13 Retirement Home	802 Dove	\$1,600,000
14a Apostolic Christian Church	501 Dove	\$1,200,000
14b Bethel Reformed	2314 Iowa 9	\$650,000
14c Seeds of Faith Methodist	408 Main	\$575,000
15 Community Center	Same as 7	
16 Hazardous Materials Storage	2200 150 St/Clinton	\$500,000
17 Hazardous Materials Transportation	Same as 16	
18 Large Manufacturing (Soybean)	Same as 16	
Total		\$5,112,500



Hazard Risk Assessment

The Lyon County Hazard Mitigation Planning Committee determined the countywide hazard rankings. The city was also provided with information and statistics relevant to hazards affecting Lester, including records of past events and damages. The city was asked to review the information from the countywide rankings and determine if highest risk hazards for the county applied to Lester, and if not, how Lester's situation differs from the county. Based on this discussion, prevalent hazards were determined for Lester. Along with the information and statistics provided, the people present were asked to draw upon their knowledge and experiences of hazards affecting Lester. After the discussion among the planning team, it was decided that the City of Lester would re-prioritize the hazards of the countywide ranking for their jurisdictional portion of the plan. The city eliminated many of the hazards that were in the countywide ranking, such as: landslide, levee failure, dam failure, and sinkhole. The planning team decided that those hazards did not apply to Lester.

It is recognized that Lester may be susceptible to other hazards, such as the other hazards in the State of Iowa Hazard Mitigation Plan, but those hazards are not considered to be a high risk and are not examined at this time. However, if it is later determined that a hazard affecting Lester does pose a higher risk than originally determined, it will be examined at that time or when the plan is updated.

Iowa Identified Mitigation Actions

The following are the actions that were identified by the local planning committee:

- Enforce Tree Trimming
- Purchase Back Up Power Generators
- Bury Utility Lines
- Buy and Distribute NOAA Weather Radios
- Designate a Local Community Shelters
- Purchase Snow/Plowing Equipment
- Establishing a Good Neighbor Program to Check on Residents
- Build a Safe Room
- Continue you Fire Dept HAZMAT Training
- Continue Fire Dept Training
- Update or Create Local Emergency Plans
- Construct Sewer Lift Station
- Replace and Rehab Sewer Lines
- Continue with NFIP Participation
- Build Safe Rooms for Critical Facilities

The Lyon County Planning Team and Lyon County are responsible for overseeing the implementation of this plan. Lyon County Emergency Management and other county and local agencies will assist with implementing and administering this plan. The mitigations actions were discussed with a high, medium and low priority ranking in mind. **High (H)** – Jurisdictions valued this as something that had the highest effect on helping the community and people survive severe weather events. Also the cost could be easily obtained or funding has already been set aside. **Medium (M)** – These were valued at the jurisdictions as projects that where ranked in between the other two priority groups. **Low (L)** – These mitigation actions have the least effect on protecting human life from severe weather events and therefore have been given the lowest priority. Or the cost is too high at this point in time and makes it unlikely to be acted upon in present future. Priorities for each mitigation action are discussed in the Mitigation Actions, Section 5. Another factor in the implementation of the mitigation actions was their benefit versus how much the project would cost. Economics of implementing mitigation actions were considered when the planning team discussed the

priority of projects. Cost estimates were given by the Lyon County Planning Committee to help display which actions were of a higher importance and fit in the economic goals of the county/cities/schools. Those estimates can be reference in Section 5. The Implementation Schedule for the mitigation activities, whether ongoing or considered, will be subject to the availability of Federal, State, and local funding. Continuing (ON) = Ongoing (responsible entity regularly participates in or supports); Short Term (ST) = 1-5 years to initiate or accomplish; and Long Term (LT) = 5 or more years to initiate or accomplish.

Once the plan is completed, approved, and adopted, local governments will be eligible for funding assistance from FEMA for mitigation strategies put forth in the plan. Potential funding resources include the FEMA Pre-Disaster Mitigation Program (PDM) and FEMA Hazard Mitigation Grant Program (HMGP). No timeframe was identified in implementing these mitigation actions will be acted upon as funding become available. It was discussed that additional mitigation actions would be examined during the update process. The mitigation actions that were discussed were what the Lester Planning Committee wanted to have included in the hazard mitigation plan.

Plan Maintenance

Plan maintenance involves taking action to ensure that the plan stays current with information, priorities are still in order, and goals and objectives are maintained and updated. To accomplish this, the plan will be reviewed by the planning team annually and be incorporated into other city plans. Additionally, a comprehensive update is required at least once every 5 years and submitted to FEMA for certification. The revised plan will be adopted by the city council. To assist with the update, information is to be collected by the city annually to document efforts, hazard events, and other pertinent activities to mitigate hazards. Part of plan maintenance is maintaining the planning team. The planning team is composed of local elected officials, city employees and other interested parties. This is an important part of plan maintenance in order to reconvene the planning team when necessary.

Monitoring

The Lester Planning Team and Lyon County Emergency Management are responsible for monitoring this portion of the plan. The plan will be monitored based on the mitigation strategies identified in the plan and the reported progress to accomplish the work. Projects that are complete will be monitored for effectiveness. Any strategies that are removed from the plan will be examined and documented. An annual reporting sheet is included in this plan for the city to keep track of the mitigation process.

Incorporation into Existing Plans

The city is responsible for reviewing its local plans, codes, and ordinances and amending documents as they see appropriate. As appropriate, information and actions from this plan will be incorporated into comprehensive or community builder plans during review and update processes. A worksheet is provided to record what information from this plan is incorporated to other plans.

Continued Public Participation

The public will be involved in the implementation of the plan at city council meetings and general public meetings. Mitigation actions and implementation strategies will be discussed at city council meetings and an opportunity for public input will be encouraged. This process will ensure opportunity for public awareness of hazards and threats faced by the community and actions planned to eliminate or reduce impacts. To promote continued public participation, meetings where the plan will be discussed will have public notice posted.

Incorporation into Other Plans

Date	Plan or Document	Information Incorporated into Plan or Document

Plan Updates Concerning Lester

When updating the plan please contact the Lyon County Emergency Management for assistance.

Date	<u>Page</u>	<u>Change</u>
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Section 9.8 Little Rock

Planning Committee Members:

Shellie VerSteeg	City Clerk
Tom VerSteeg	Fire Department
Joe Schilling	Chief Fire Department
Amy Kruse	Council

City Contact:

Shellie VerSteeg City Clerk – 712-479-2852

Planning Process

Meetings were held throughout the planning process to collect information and share that information with the general public and the planning team. Notices for meetings were posted at city hall or the school where the meeting was being held. Agendas and minutes for meetings are included in the Appendix.

Utilities

Water

Name:	City of Little Rock		
Location:	Little Rock, Iowa (Lyon)		
Well Avg Depth (ft):	0	Peak Demand (mgd):	0.0400
Treated:	Yes	Cost/1000 Gal:	\$0.00
Rated Capacity (mgd):	0.1400	Storage Capacity (gal):	26,000
Temp Range (F):		Major Source:	Osceola County Rural Water
Avg Capacity (mgd):	0.0300	Hardness (ppm):	0.0
Connection Fee:	Unknown		
Phone:		Web Address:	

Sewer

Name:	City of Little Rock		
Location:	Little Rock, Iowa (Lyon)		
Ownership Type:	Municipal	Average Daily Demand (mgd):	0.0440
Rated Capacity (mgd):	0.0370	Peak Demand (mgd):	0.0600
Cost/1000 Gal:	\$4.66	Connection Fee:	Yes
Phone:	712-479-2852	Web Address:	

Electric

Name:	Alliant Energy		
Location:	Little Rock, Iowa (Lyon)		
Ownership Type:	Investor-Owned	Regulated:	Yes
Peak Demand (kW):	3,017,000	Generation Capacity (MW):	2,945
Customers Served (Local):	311	Customers Served (State):	479,411

Customers Served (System): 977,125
 Phone: 1-800-255-4268

Web Address: www.alliantenergy.com

Distributor Comments

Natural Gas

Name: Alliant Energy
 Location: Little Rock, Iowa(Lyon)
 Customers Served (Local): 149
 Customers Served (System): 412,853
 Pipeline Source: NNG
 Phone: 1-800-255-4268

Customers Served (State): 213,643
 Ownership Type: Investor-owned
 Gas Transportation Available: Yes
 Web Address: www.alliantenergy.com

Telecommunications

Name: Premiere Communications
 Location: Sioux Center, Iowa(Lyon)
 Service Type: Phone, cable
 Customers Served (State): 0
 Fiber Optics: Yes
 Phone:

POP Location:
 DSL: Yes
 Customers Served (System): 0
 Switch Services
 Web Address:

Infrastructure

Solid Waste and Recycling: Town and Country
 Curb and Gutter: No
 Waste Water Treatment: Yes
 How Many Cell Lagoon: 3
 Floodplain Ordinance: No
 Floodplain Compliance Officer: (For assistance in the administration of the floodplain regulations, contact the Iowa Department of Natural Resources)

Future Plans and Mechanisms

The City of Little Rock planning committee stated they would try to incorporate the mitigation strategies developed in the plan in their community actions and other community planned documents if they occur. The committee also stated they would draw from other community mechanisms when applicable to add into the mitigation strategies and mitigation requirements of their hazard mitigation plan.

In preparation of this plan, existing plans and other technical information was considered. The purpose of this review was to give consideration to existing information before setting future mitigation goals.

Plan/Document	If yes last year updated	Plan/Document	If yes last year updated
Comprehensive/Landuse plan	Yes	Capital Improvement Plan	No
Local Emergency Plan	No	Local Recovery Plan	No
Local Mitigation Plan	No	County Mitigation Plan	No
Economic Development Plan	No	Flood Ordinance or Plan	No
School Mitigation Plan	No	Zoning Ordinance	Yes
Building Code	Yes	Subdivision	No
Tree Trimming Ordinance	Yes	Nuisance Ordinance	Yes
Storm Water Ordinance	Yes		

Emergency Services

Fire Rescue Dept

23 Volt fire fighter trained at HazMat Awareness/Ops.

23 Volt Firefighters trained at FF1

10 Volt Firefighters trained at FF2

23 Volt Firefighters trained at incident command level

5 Volt Emergency Rescue Technician (ERT)

11 Volt Emergency Medical Technician (EMTB)

0 Paramedics

0 EMTI

3 Nurse

Fire equipment at station

2 pumpers, 1 rescue Truck, Tanker, Grass Rig, Ambulance

Law Enforcement

28-E with Lyon County Sherriff

Emergency Warning System

Yes, 1 sirens

Flood fighting plan

No

Sandbagging plan

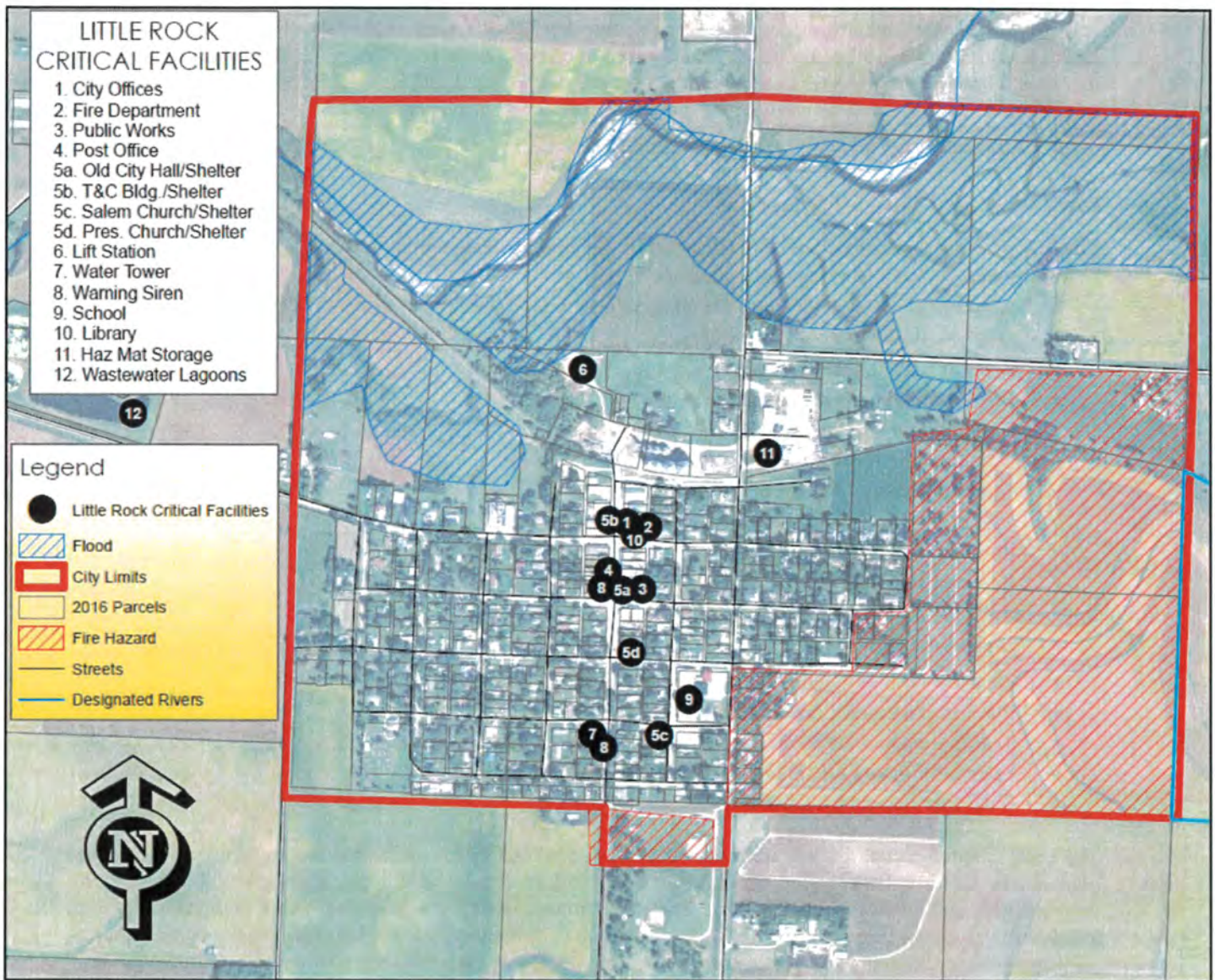
No

Evacuation/rescue plan

No

Critical Facilities and Assessed Values

Little Rock		Address	Value
1	City Offices	402 Main St	\$1,000,000
2	Fire	same as one	Same as one
3	Public Works	402 Fisher St	\$150,000
4	Post Office	319 Main st	\$25,000
5a	Old City hall/Shelter	3	Same as three
5b	T&C Building/Shelter	401 Main St	\$150,000
5c	Salem Reformed Church/Shelter	123 1st ave	\$1,600,000
5d	Presbyterian Church/Shelter	503 Fisher St.	\$1,600,000
6	Lift Station	595 Main St	\$100,000
7	Water Tower	175 Main St	\$450,000
8	Warning Siren	319 Main st	\$30,000
9	School	120 1st ave	
10	Library	1	
11	Hazardous Materials Storage	412 Co Hwy L26	\$3,000,000
12	Wastewater Lagoons		
Total			\$8,105,000



Hazard Risk Assessment

The Lyon County Hazard Mitigation Planning Committee determined the countywide hazard rankings. The city was also provided with information and statistics relevant to hazards affecting Little Rock, including records of past events and damages. The city was asked to review the information from the countywide rankings and determine if highest risk hazards for the county applied to Little Rock, and if not, how Little Rock's situation differs from the county. Based on this discussion, prevalent hazards were determined for Little Rock. Along with the information and statistics provided, the people present were asked to draw upon their knowledge and experiences of hazards affecting Little Rock. After the discussion among the planning team, it was decided that the City of Little Rock would re-prioritize the hazards of the countywide ranking for their jurisdictional portion of the plan. The city eliminated many of the hazards that were in the countywide ranking, such as: landslide, dam failure, and sinkhole. The planning team decided that those hazards did not apply to Little Rock.

It is recognized that Little Rock may be susceptible to other hazards, such as the other hazards in the State of Iowa Hazard Mitigation Plan, but those hazards are not considered to be a high risk and are not examined at this time. However, if it is later determined that a hazard affecting Little Rock does pose a higher risk than originally determined, it will be examined at that time or when the plan is updated.

Iowa Identified Mitigation Actions

The following are the actions that were identified by the local planning committee:

- Designate a Local Community Shelters
- Establishing a Good Neighbor Program to Check on Residents
- Purchase Back Up Power Generators
- Build or Update Warning Sirens
- Enforce Building and Zoning Codes
- Continue you Fire Dept HAZMAT Training
- Continue Fire Dept Training
- Enforce the Snow Removal Policy
- Update or Create Local Emergency Plans
- Purchase Fire Gear (PPE)
- Purchase Portable Pumps
- Purchase Fire Gear (PPE)
- Enforce Burn Bans
- Develop a Better Connection with the Iowa DNR
- Purchase Paramedic Equipment
- Test Warning Sirens Monthly
- Look into Joining NFIP and Getting Mapped
- Build Safe Rooms for Critical Facilities

The Lyon County Planning Team and Lyon County are responsible for overseeing the implementation of this plan. Lyon County Emergency Management and other county and local agencies will assist with implementing and administering this plan. The mitigations actions were discussed with a high, medium and low priority ranking in mind. **High (H)** – Jurisdictions valued this as something that had the highest effect on helping the community and people survive severe weather events. Also the cost could be easily obtained or funding has already been set aside. **Medium (M)** – These were valued at the jurisdictions as projects that where ranked in between the other two priority groups. **Low (L)** – These mitigation actions have the least

effect on protecting human life from severe weather events and therefore have been given the lowest priority. Or the cost is too high at this point in time and makes it unlikely to be acted upon in present future. Priorities for each mitigation action are discussed in the Mitigation Actions, Section 5. Another factor in the implementation of the mitigation actions was their benefit versus how much the project would cost. Economics of implementing mitigation actions were considered when the planning team discussed the priority of projects. Cost estimates were given by the Lyon County Planning Committee to help display which actions were of a higher importance and fit in the economic goals of the county/cities/schools. Those estimates can be reference in Section 5. The Implementation Schedule for the mitigation activities, whether ongoing or considered, will be subject to the availability of Federal, State, and local funding. Continuing (ON) = Ongoing (responsible entity regularly participates in or supports); Short Term (ST) = 1-5 years to initiate or accomplish; and Long Term (LT) = 5 or more years to initiate or accomplish.

Once the plan is completed, approved, and adopted, local governments will be eligible for funding assistance from FEMA for mitigation strategies put forth in the plan. Potential funding resources include the FEMA Pre-Disaster Mitigation Program (PDM) and FEMA Hazard Mitigation Grant Program (HMGP). No timeframe was identified in implementing these mitigation actions will be acted upon as funding become available. It was discussed that additional mitigation actions would be examined during the update process. The mitigation actions that were discussed were what the Little Rock Planning Committee wanted to have included in the hazard mitigation plan.

Plan Maintenance

Plan maintenance involves taking action to ensure that the plan stays current with information, priorities are still in order, and goals and objectives are maintained and updated. To accomplish this, the plan will be reviewed by the planning team annually and be incorporated into other city plans. Additionally, a comprehensive update is required at least once every 5 years and submitted to FEMA for certification. The revised plan will be adopted by the city council. To assist with the update, information is to be collected by the city annually to document efforts, hazard events, and other pertinent activities to mitigate hazards. Part of plan maintenance is maintaining the planning team. The planning team is composed of local elected officials, city employees and other interested parties. This is an important part of plan maintenance in order to reconvene the planning team when necessary.

Monitoring

The Little Rock Planning Team and Lyon County Emergency Management are responsible for monitoring this portion of the plan. The plan will be monitored based on the mitigation strategies identified in the plan and the reported progress to accomplish the work. Projects that are complete will be monitored for effectiveness. Any strategies that are removed from the plan will be examined and documented. An annual reporting sheet is included in this plan for the city to keep track of the mitigation process.

Incorporation into Existing Plans

The city is responsible for reviewing its local plans, codes, and ordinances and amending documents as they see appropriate. As appropriate, information and actions from this plan will be incorporated into comprehensive or community builder plans during review and update processes. A worksheet is provided to record what information from this plan is incorporated to other plans.

Continued Public Participation

The public will be involved in the implementation of the plan at city council meetings and general public meetings. Mitigation actions and implementation strategies will be discussed at city council meetings and an opportunity for public input will be encouraged. This process will ensure opportunity for public awareness of hazards and threats faced by the community and actions planned to eliminate or reduce impacts. To promote continued public participation, meetings where the plan will be discussed will have public notice posted.

Incorporation into Other Plans

Date	Plan or Document	<u>Information Incorporated into Plan or Document</u>

Plan Updates Concerning Little Rock

When updating the plan please contact the Lyon County Emergency Management for assistance.

Date	Page	Change

Section 9.9 Rock Rapids

Planning Committee Members:

Jordan Kordahl	City Administrator
Stewart Vander Stoep	Sheriff
Arden Kopischke	Lyon County EMA Coordinator
Ed Reck	Fire Chief
Jim Hoye	Rock Rapids Municipal Utilities
Jason Chase	Mayor

City Contact:

Jordan Kordahl City Administrator - 712-472-2553

Planning Process

Meetings were held throughout the planning process to collect information and share that information with the general public and the planning team. Notices for meetings were posted at city hall or the school where the meeting was being held. Agendas and minutes for meetings are included in the Appendix.

Utilities

Water

Name:	Rock Rapids Municipal Utilities		
Location:	Rock Rapids, Iowa (Lyon)		
Well Avg Depth (ft):	33	Peak Demand (mgd):	1.3300
Treated:	Yes	Cost/1000 Gal:	\$1.45
Rated Capacity (mgd):	1.2000	Storage Capacity (gal):	880,000
Temp Range (F):	40-60	Major Source:	wells
Avg Capacity (mgd):	0.6750	Hardness (ppm):	24.0
Connection Fee:	Unknown		
Phone:	712-472-2511 Web Address: jhoye@rockrapids.net		

Sewer

Name:	Rock Rapids Municipal Utilities		
Location:	Rock Rapids, Iowa (Lyon)		
Ownership Type:	Municipal	Average Daily Demand (mgd):	0.2500
Rated Capacity (mgd):	1.0000	Peak Demand (mgd):	0.7500
Cost/1000 Gal:	\$1.50	Connection Fee:	Unknown
Phone:	712-472-2511	Web Address:	

Electric

Name:	Rock Rapids Municipal Utilities		
Location:	Rock Rapids, Iowa (Lyon)		
Ownership Type:	Municipal	Regulated:	Yes
Peak Demand (kW):	6,670	Generating Capacity:	2,500 MW
Customers Served (Local):	1,378	Customers Served (State):	1,378

Customers Served (System): 1,378

Phone: 712-472-2511

Web Address:

Distributor Comments: Rock Rapids Municipal Utilities offers one of the lowest electric rates in the surrounding area and across the state. They also have an excellent safety record.

Natural Gas

Name: Rock Rapids Municipal Utilities

Location: Rock Rapids, Iowa(Lyon)

Customers Served (Local): 1,222

Customers Served (State): 1,222

Customers Served(System): 1,222

Ownership Type: Municipal

Pipeline Source: Municipal

Gas Transportation Available Yes

Phone: 712-472-2511

Web Address:

Telecommunications

Name: Premier Communications

Location: Sioux Center, Iowa(Sioux)

POP Location: 1302 S. Union Street, Rock Rapids, IA

Service Type: Telephone, data & wireless internet

DSL: Yes

Customers Served (State): 0

Customers Served (System): 0

Fiber Optics: No

Switch Services: Various

Phone: 800-741-8351

Web Address: www.mypremiereonline.com

Infrastructure

Solid Waste and Recycling
Curb and Gutter

Denny's Sanitation and Town & Country Sanitation
Yes

Waste Water Treatment

Yes

Floodplain Ordinance

Yes

Floodplain Compliance Officer

(For assistance in the administration of the floodplain regulations, contact the Iowa Department of Natural Resources)

Future Plans and Mechanisms

The City of Rock Rapids planning committee stated they would try to incorporate the mitigation strategies developed in the plan in their community actions and other community planned documents if they occur. The committee also stated they would draw from other community mechanisms when applicable to add into the mitigation strategies and mitigation requirements of their hazard mitigation plan.

In preparation of this plan, existing plans and other technical information was considered. The purpose of this review was to give consideration to existing information before setting future mitigation goals.

Plan/Document	If yes last year updated	Plan/Document	If yes last year updated
Comprehensive/Landuse plan	Yes 2004	Capital Improvement Plan	No
Local Emergency Plan	Yes	Local Recovery Plan	No
Local Mitigation Plan	Yes	County Mitigation Plan	Yes
Economic Development Plan	No	Flood Ordinance or Plan	No
School Mitigation Plan	No	Zoning Ordinance	Yes 2009
Building Code	No	Subdivision	Yes
Tree Trimming Ordinance	Yes	Nuisance Ordinance	Yes
Storm Water Ordinance	No		

Emergency Services

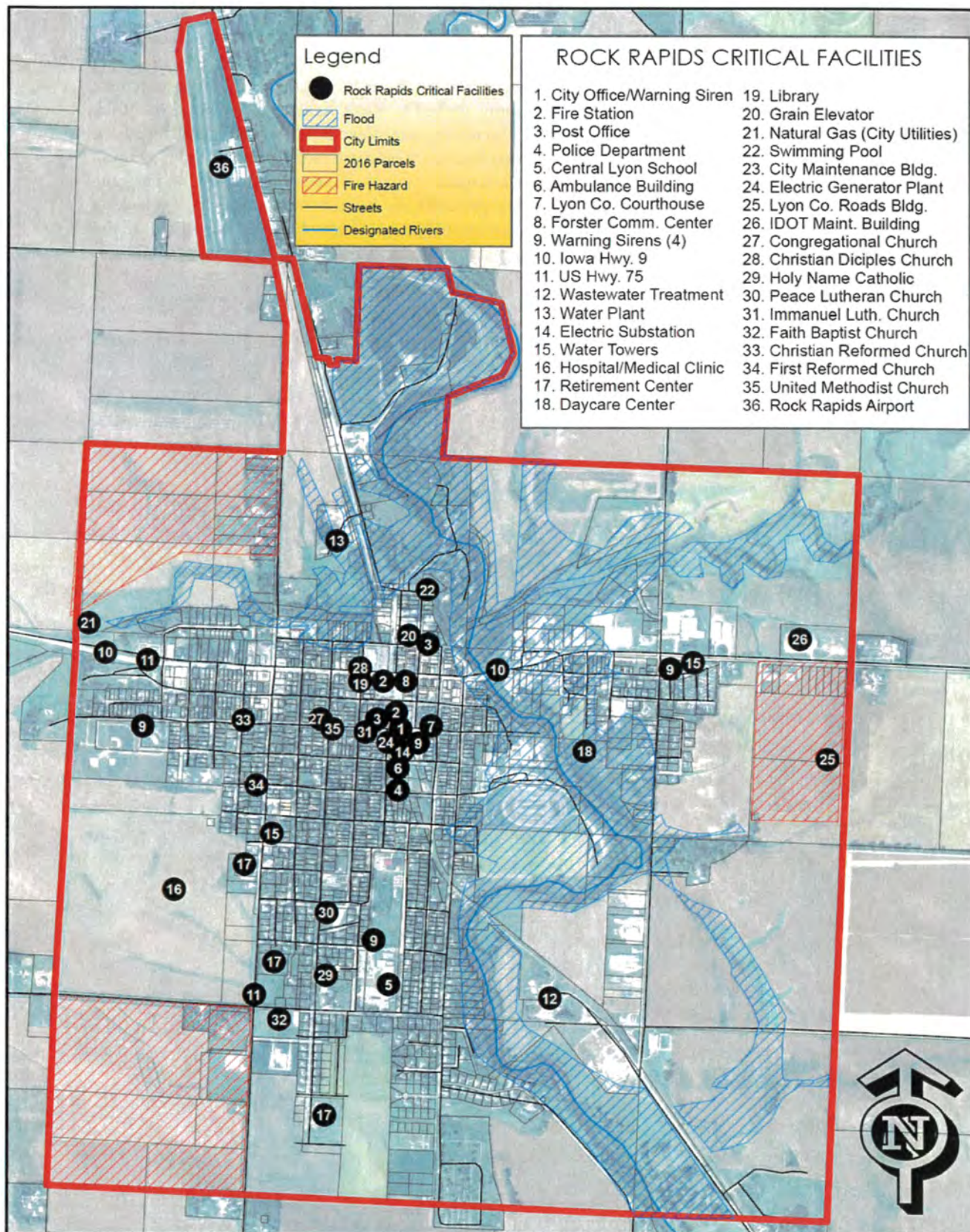
Fire Rescue Dept	25 Volt fire fighter trained at HazMat Awareness/Ops
	25 Volt Firefighters trained at FF1
	21 Volt Firefighters trained at FF2
	25 Volt Firefighters trained at incident command level
	16 Volt Emergency Rescue Technician (ERT)
	0 Volt Emergency Medical Technician (EMTB)
	0 Paramedics
	0 EMTI
	0 Nurse
Fire equipment at station	2 pumpers, 1 equipment/rescue truck, 2 tanker, 1 grass rig
Law Enforcement	28-E with Lyon County Sherriff
Emergency Warning System	Yes, 4 sirens
Flood fighting plan	Yes
Sandbagging plan	Yes
Evacuation/rescue plan	Yes

Critical Facilities and Assessed Values

	Address	Value
1. City Office/Warning Siren	303 S 3 rd Ave	\$1,768,516
2. Fire Station	106 N Greene St	\$613,583
3. Post Office	217 N 2 nd Ave	\$89,596
4. Police Department	410 S Boone St	\$3,548,030
5. Central Lyon School	1105 S Story St	\$14,908,720
6. Ambulance Building	412 S Boone St	\$280,160
7. Lyon County Courthouse	206 S 2 nd Ave	\$1,581,983
8. Forster Community Center	404 1 st Ave	\$1,958,060
9. Warning Siren (Total for 4)	Warning Siren #1 310 South 3 rd Ave Warning Siren #2 804 First Ave East Warning Siren #3 1400 South 3 rd Ave Warning Siren #4 1010 South Greene St	\$100,000

10. Iowa Highway 9	n/a	\$3,500,000
11. U.S. Highway 75	n/a	\$3,500,000
12. Wastewater Treatment Plant	1205 South East St	\$8,448,400
13. Water Plant	601 North Boone St	\$4,692,000
14. Electric Substation	310 South 3rd Avenue	\$9,964,915
15. Water Towers	804 First Ave East 610 South Union St	\$2,173,484
16. Hospital/Medical Clinic	801 S Greene St	\$3,774,826
17. Retirement/Aging Center	Lyon Manor 1010 South Union St Rock Rapids Health Center 703 South Union St Premier Estates 1510 South Carroll St	\$3,587,480
18. Daycare Center	309 N Story St	\$230,000
19. Rock Rapids Library	102 S Greene St	\$2,770,146
20. Grain Elevator (Farmers Coop Society)	315 S 2nd Ave	\$3,386,710
21. Natural Gas (Rock Rapids Utilities)	310 South 3rd Ave	\$1,000,285
22. Community Swimming Pool	401 N Story St	\$574,862
23. City Maintenance Building	401 S 3rd Ave	\$390,454
24. Electric Generator Plant	310 South 3rd Ave	\$2,335,390
25. Lyon County Roads Dept. Building	S 3rd Ave E and Mills St	\$403,172
26. IDOT Maintenance Building	1204 N 2nd Ave E	\$1,016,600
27. Congregational UCC		
28. Christian		
29. Holy Name Catholic		
30. Peace Lutheran		
31. Immanuel Lutheran		
32. Faith Baptist		
33. Christian Reformed		
34. First Reformed		
35. United Methodist		
Rock Rapids Airport		320,802.00
Total		\$76,918,174.00

Rock Rapids Critical Facilities - Churches		
Name of Church	Address	Value
Congregational UCC	610 South 3rd Ave	\$ 24,359
Christian (Disciples)	110 South Greene St	\$131,253
Holy Name Catholic	1108 South Carroll St	\$1,478,493
Peace Lutheran	902 South Carroll St	\$661,055
Immanuel Lutheran	409 South 3rd Ave	\$701,052
Faith Baptist	704 South 12th Ave	\$425,594
Christian Reformed	303 South Bradley St.	\$298,951
First Reformed	512 South Union St	\$3,502,527
United Methodist	302 South Carroll St.	\$380,899
TOTAL		\$7,604,183



Hazard Risk Assessment

The Lyon County Hazard Mitigation Planning Committee determined the countywide hazard rankings. The city was also provided with information and statistics relevant to hazards affecting Rock Rapids, including records of past events and damages. The city was asked to review the information from the countywide rankings and determine if highest risk hazards for the county applied to Rock Rapids, and if not, how Rock Rapids situation differs from the county. Based on this discussion, prevalent hazards were determined for Rock Rapids. Along with the information and statistics provided, the people present were asked to draw upon their knowledge and experiences of hazards affecting Rock Rapids. After the discussion among the planning team, it was decided that the City of Rock Rapids would re-prioritize the hazards of the countywide ranking for their jurisdictional portion of the plan. The city eliminated many of the hazards that were in the countywide ranking, such as: landslide and sinkhole. The planning team decided that those hazards did not apply to Rock Rapids.

It is recognized that Rock Rapids may be susceptible to other hazards, such as the other hazards in the State of Iowa Hazard Mitigation Plan, but those hazards are not considered to be a high risk and are not examined at this time. However, if it is later determined that a hazard affecting Rock Rapids does pose a higher risk than originally determined, it will be examined at that time or when the plan is updated.

Iowa Identified Mitigation Actions

The following are the actions that were identified by the local planning committee:

- Purchase Back Up Power Generators
- Designate a Local Community Shelters
- Establishing a Good Neighbor Program to Check on Residents
- Build a Safe Room
- Build or Update Warning Sirens
- Continue you Fire Dept HAZMAT Training
- Continue Fire Dept Training
- Develop a list of Storm Shelters and Distribute to Residents
- Clean or Enlarge Sewage Lagoons
- Construct Sewer Lift Station
- Monitor Storm Sewer
- Continue with NFIP Participation
- Enforce the Snow Removal Policy
- Maintain Outdoor Warning Sirens
- Update or Create Local Emergency Plans
- Construct Sewer Lift Station
- Purchase Fire Gear (PPE)
- Maintain Dams and Records of Maintenance
- Continue with NFIP Participation
- Test Warning Sirens Monthly
- Transportation for Critical Employees to Work
- EMT Snowmobile
- Maintain and Expand Debris Removal Site
- Monitor Levees Closely
- Funding for Strengthening Levees

- Build Temporary Earth Dykes
- Build Safe Rooms for Critical Facilities

The Lyon County Planning Team and Lyon County are responsible for overseeing the implementation of this plan. Lyon County Emergency Management and other county and local agencies will assist with implementing and administering this plan. The mitigations actions were discussed with a high, medium and low priority ranking in mind. **High (H)** – Jurisdictions valued this as something that had the highest effect on helping the community and people survive severe weather events. Also the cost could be easily obtained or funding has already been set aside. **Medium (M)** – These were valued at the jurisdictions as projects that where ranked in between the other two priority groups. **Low (L)** – These mitigation actions have the least effect on protecting human life from severe weather events and therefore have been given the lowest priority. Or the cost is too high at this point in time and makes it unlikely to be acted upon in present future. Priorities for each mitigation action are discussed in the Mitigation Actions, Section 5. Another factor in the implementation of the mitigation actions was their benefit versus how much the project would cost. Economics of implementing mitigation actions were considered when the planning team discussed the priority of projects. Cost estimates were given by the Lyon County Planning Committee to help display which actions were of a higher importance and fit in the economic goals of the county/cities/schools. Those estimates can be reference in Section 5. The Implementation Schedule for the mitigation activities, whether ongoing or considered, will be subject to the availability of Federal, State, and local funding. Continuing (ON) = Ongoing (responsible entity regularly participates in or supports); Short Term (ST) = 1-5 years to initiate or accomplish; and Long Term (LT) = 5 or more years to initiate or accomplish.

Once the plan is completed, approved, and adopted, local governments will be eligible for funding assistance from FEMA for mitigation strategies put forth in the plan. Potential funding resources include the FEMA Pre-Disaster Mitigation Program (PDM) and FEMA Hazard Mitigation Grant Program (HMGP). No timeframe was identified in implementing these mitigation actions will be acted upon as funding become available. It was discussed that additional mitigation actions would be examined during the update process. The mitigation actions that were discussed were what the Rock Rapids Planning Committee wanted to have included in the hazard mitigation plan.

Plan Maintenance

Plan maintenance involves taking action to ensure that the plan stays current with information, priorities are still in order, and goals and objectives are maintained and updated. To accomplish this, the plan will be reviewed by the planning team annually and be incorporated into other city plans. Additionally, a comprehensive update is required at least once every 5 years and submitted to FEMA for certification. The revised plan will be adopted by the city council. To assist with the update, information is to be collected by the city annually to document efforts, hazard events, and other pertinent activities to mitigate hazards. Part of plan maintenance is maintaining the planning team. The planning team is composed of local elected officials, city employees and other interested parties. This is an important part of plan maintenance in order to reconvene the planning team when necessary.

Monitoring

The Rock Rapids Planning Team and Lyon County Emergency Management are responsible for monitoring this portion of the plan. The plan will be monitored based on the mitigation strategies identified in the plan and the reported progress to accomplish the work. Projects that are complete will be monitored for effectiveness. Any strategies that are removed from the plan will be examined and documented. An annual reporting sheet is included in this plan for the city to keep track of the mitigation process.

Incorporation into Existing Plans

The city is responsible for reviewing its local plans, codes, and ordinances and amending documents as they see appropriate. As appropriate, information and actions from this plan will be incorporated into comprehensive or community builder plans during review and update processes. A worksheet is provided to record what information from this plan is incorporated to other plans.

Continued Public Participation

The public will be involved in the implementation of the plan at city council meetings and general public meetings. Mitigation actions and implementation strategies will be discussed at city council meetings and an opportunity for public input will be encouraged. This process will ensure opportunity for public awareness of hazards and threats faced by the community and actions planned to eliminate or reduce impacts. To promote continued public participation, meetings where the plan will be discussed will have public notice posted.

Incorporation into Other Plans

Date	Plan or Document	<u>Information Incorporated into Plan or Document</u>

Plan Updates Concerning Rock Rapids

When updating the plan please contact the Lyon County Emergency Management for assistance.

Date	<u>Page</u>	<u>Change</u>

Appendix

