Nobles County
All Hazard Mitigation Plan

March 2018

This multi-jurisdictional hazard mitigation plan includes Nobles County and the Cities of Adrian, Bigelow, Brewster, Dundee, Ellsworth, Kinbrae, Lismore, Round Lake, Rushmore, Wilmont, Worthington, and the unincorporated communities of Org, Reading, and St. Kilian. This project was supported by Grant Award awarded by the Federal Emergency Management Agency (FEMA).

Prepared by Southwest Regional Development Commission and Nobles County Emergency Management
Executive Summary

The purpose of the Nobles County All Hazard Mitigation Plan (AHMP) is to determine how to reduce property damage and loss of life resulting from natural and other hazards. The Nobles County AHMP includes resources and information to assist county residents, public and private sector organizations, and others interested in participating in planning for both natural and other hazards. This mitigation plan identifies hazards that pose a threat to Nobles County, as well as what is currently being done to mitigate their impacts. The plan also provides a list of actions and programs that may enable Nobles County to further reduce negative impacts caused by disasters. The implementation strategies address both natural and other hazards that include but are not limited to flooding, drought, severe summer and winter storms, fires, and tornadoes.

“The overall benefit-cost ratio for FEMA mitigation grants is about 4:1, though the ratio varies from 1.5 for earthquake mitigation to 5.1 for flood mitigation.”

The Nobles County AHMP Planning Team identified the following natural and other hazards as High Rank Hazards for Nobles County:

- Severe Summer Storms (including tornadoes and straight line winds)
- Severe Winter Storms (including blizzards and ice storms)
- Flooding (Flash, ravine, and dam/culvert failure)
- Hazardous Materials
- Public Health Emergencies
- Utility Failure
- Water Contamination

This planning process has been conducted by the Southwest Regional Development Commission (SRDC) and Nobles County Emergency Management in accordance with current guidance provided by the State of Minnesota Department of Homeland Security and Emergency Management (HSEM) and the US Federal Emergency Management Agency (FEMA). This hazard mitigation plan documents the multi-jurisdictional, multi-hazard mitigation planning process in Nobles County, Minnesota, which is intended to meet the requirements of the Federal Emergency Management Agency (FEMA) Regulation 44 CFR 201.6 Local Mitigation Plans.

All participating jurisdictions in Nobles County have agreed to a joint administration and operation of the AHMP to help mitigate the effects of natural and other hazards. The project was undertaken so that all

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local units of government in Nobles County, that wished to participate, could participate and remain eligible for FEMA funding.

The previous Nobles County AHMP was adopted in 2011. The current update reviewed and updated the original plan. The update utilized a great deal of data from many different sources and also relied on input and expertise from the Nobles County AHMP Planning Team. The plan resides with the Office of Emergency Management in Nobles County, who is responsible for maintenance and updates.

**Nobles County’s All Hazard Mitigation Mission:**

“To protect residents and infrastructure from natural and human caused hazards, while continuing to foster a healthy economy and environment by maintaining fiscal responsibility and quality services.”

**Participation in Plan Development**

The Nobles County All Hazard Mitigation Plan is a multiparty effort among Nobles County, Nobles County Emergency Management, Nobles County citizens, local public agencies, people in the private sector, and many people in regional and state organizations. Public participation plays a key role in the planning process. We also rely on the experience of elected and appointed volunteers. The Nobles County AHMP Planning Team (hereafter referred to as planning team) members comprised a broad representation of the county and their feedback was immensely useful in the development of the plan update.

**Nobles County AHMP Planning Team:**

- Joyce Jacobs – Nobles County: Emergency Management Director
- Justin Ahlers – Nobles County Commissioner
- Bob Demuth – Nobles County Commissioner
- Don Linssen – Nobles County Commissioner
- Tom Johnson – Nobles County Administrator
- Kathleen Kusz – Nobles County Attorney
- Val Ruesch – Nobles County Assessor
- Beth Van Hove – Nobles County Auditor/Treasurer
- Mark Koster – Nobles County Environmental Services Manager
- Katie Purdham – Nobles County GIS Coordinator
- Stephen Schnieder – Nobles County Public Works Director
- Cliff Altman – Nobles County Public Works – Maintenance Superintendent
- Kathy Henderschiedt – Nobles County Planning and Zoning Administrator
- Sheriff Kent Wilkening – Nobles County Sheriff’s Office
- Chris Dybevick – Nobles County Sheriff’s Office – Chief Deputy
- Jerry Vyskocil – Nobles County Finance Director
- Clint Wolthuizen – Nobles County Library Director
- Ben Puthoff – Nobles County Assessor’s Office – Property Appraiser
- Ted Buhner – Nobles County Assessor’s Office – Property Appraiser
- Sharon Heidebrink – Nobles County Assessor’s Office – Assessment Technician
- Lynn Wilson – Nobles County Recorder
- John Meyer – Nobles County Assessor’s Office – Property Appraiser
- Renee Schnurstein – Nobles County – Recorder’s Office
- Davi Bullerman – Nobles County Assessor’s Office - Property Appraiser/Assessment Technician
- Stacie Golombiecki – Bigelow Mayor & Nobles County Community Services Director
- Michelle Ebbers – Nobles County Community Services – Public Health Nurse
- Peter Ekadu – Nobles County Community Services – Public Health Specialist
- Angelo Torres – Nobles County Information Technology Director
- Bruce Heitkamp – Adrian City Administrator/City Clerk
- Brad Harberts – Nobles County Drainage System
- Dwayne Haffield – Worthington City Engineer
- Angela Thiner – City of Worthington Engineering & Community Development – Admin. Secretary
- Rick VanHoldt – Worthington Fire Department – Fire Chief
- Kevin Flynn – Worthington Police Department - Captain
- Nancy Veen – Worthington Police Department – Dispatch Supervisor
- Sherry Swanson – Nobles Coop Electric – Chief Financial Officer
- Brian Posta – Nobles Coop Electric
- Jeff Ahlslager - Nobles Coop Electric
- Reed Fricke – Sanford Worthington Regional Medical Center
- Lee Anne DeRuyth – Avera Medical Group – Worthington Surgical Center
- Melanie Wagner – Avera Medical Group- Worthington Clinic
- David McNab – Sanford Worthington Ambulance Manager
- Brenda Bullerman – Adrian Ambulance Director
- Dawn Huisman – Ellsworth City Clerk
- Coleen Gruis – Rushmore City Clerk and KLR
- Lori Fletcher – Dewald Township
- Becky DeJong – Indian Lake Township
- Alan Engelkes – Onley Township
- Randy Jacobs – Ransom Township Clerk
- Mary Brake - Wilmont Township Clerk
- Dan Livdahl – Okabena-Ocheda Watershed District
- John Shea – Nobles County Soil and Water Conservation District – District Manager
- Karen Boysen – Nobles County Soil and Water Conservation District – Soil Conservationist
- Tim Bertrand – Adrian Public Schools
- John Willey – Ellsworth Public Schools – Superintendent
- David Skog – Worthington Public Schools: Director of Management Services
- Ron McCarvel – USDA FSA – County Director
- Molly Schneider – New Fashion Pork – Safety and Loss Control Manager
- Kia Harries – U of M Extension - Regional Director
- Jerri Schettler - Client Community Services (Disability Community)
- Sam Quam – Parkview Manor – Ellsworth (Elderly Community/Long Term Care Facility)
- Scott Kessler – Crossroads Care Center/South Shore Care Center - LNHA
- Randy Thompson – Worthington Housing & Redevelopment Authority – Executive Director

Southwest Regional Development Commission:
- Judy Elling Przybilla, AHMP Planner
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Minnesota Division of Homeland Security and Emergency Management

Federal Emergency Management Agency
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Section 1 – Introduction

1.1 Mitigation Planning

Natural and other hazards present risks throughout Minnesota. Nobles County has to be ready at all times to respond to a number of natural and other disasters. Local units of government, first responders, and emergency managers have worked together to create the Nobles County All Hazard Mitigation Plan (AHMP). This plan helps Nobles County protect its population and infrastructure by planning for natural and other hazards before the disaster strikes.

What is Hazard Mitigation Planning? According to the U.S. Federal Emergency Management Agency (FEMA) State and Local Mitigation Planning Fact Sheet:

Hazard mitigation planning is the process State, local, and tribal governments use to identify risks and vulnerabilities associated with natural disasters, and develop long-term strategies for protecting people, resources, and property in future hazard events. This planning process involves Tribal members and other affected stakeholders, and results in a mitigation plan with a strategy for breaking the cycle of disaster damage, reconstruction, and repeated damage. The mitigation plan also identifies mitigation actions and projects to implement the mitigation strategy. Under the Disaster Mitigation Act of 2000 (Public Law 106-390), State, local and tribal governments are required to develop a hazard mitigation plan as a condition for receiving certain types of non-emergency disaster assistance and FEMA grants to implement mitigation projects.

A simpler description comes from James Schwab:

“Hazard mitigation essentially is the art and science of reducing risks of future losses.”

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1.2 Purpose

Save lives, reduce injuries, sustain public health
Identify properties that are in obvious need of protection and establish policies and practical actions that fortify these properties from the effects of natural and human caused hazards.

Reduce both economic and physical losses from repetitive damages caused from constant hazard events. Encourage county communities to participate in the National Flood Insurance Program (NFIP).

Improve hazard assessment information to make recommendations for discouraging new development and encouraging preventative measures for existing development in areas vulnerable to natural hazards.

Minimize social dislocation and stress
Where appropriate, develop and implement education and outreach programs to increase public awareness of the risks associated with natural hazards and the potential danger for human caused hazards.

Provide assistance in locating tools, partnership opportunities, and funding resources to assist in implementing mitigation activities.

Minimize agricultural losses
Balance land use planning and natural resource management with hazard mitigation in order to protect life, property, and natural environment.

Preserve, rehabilitate, and enhance the county’s natural infrastructure systems to serve hazard mitigation functions.

Protect critical infrastructure from damage
Establish policy through the planning process to ensure mitigation projects for critical facilities and services.

Strengthen emergency operations by increasing collaboration and coordination among public agencies, non-profit organizations, businesses, and industries.

Coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.
1.3 Justification & Legal Authority

The rising costs of natural and human-caused disasters at the end of the 20th century led many leaders to consider how to better protect people and their communities. Congress passed the Disaster Mitigation Act of 2000 (DMA2K) (PL 106-390) to establish a unified national hazard mitigation program. DMA2K amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 (Stafford Act), which in turn had amended the Disaster Relief Act of 1974. DMA2K placed new emphasis on hazard mitigation planning in state and local units of government, requiring adoption of mitigation plans as a prerequisite for certain assistance programs.

A multi-hazard approach to mitigation planning encompasses both natural and other hazards. Following the 2001 attacks on New York City and Washington, DC, and the subsequent reorganization of FEMA and the nation’s homeland security structure, many mitigation planning efforts explicitly incorporated technological hazards arising from human activities in the hazard mitigation plans. While local hazard mitigation plans are only required to address natural hazards, the All-Hazards approach considers a comprehensive array of both risks and potential mitigation actions.

FEMA has implemented hazard mitigation planning requirements through federal regulations (44 CFR 201.6). In Minnesota, the Homeland Security and Emergency Management (HSEM) division of the Department of Public Safety (DPS) works with FEMA to implement disaster mitigation efforts. The Minnesota Department of Natural Resources (DNR) is also involved with mitigation as the agency responsible for implementation of FEMA’s National Flood Insurance Program (NFIP) and floodplain management in the state.

Minnesota Governor’s Executive Order 07 – 14 assigns responsibility for the creation and maintenance of the Minnesota Emergency Operation Plan, the State All Hazard Mitigation Plan and such other duties as may be requested by the HSEM.3 The order also directs other state agencies to assist with the planning process.

Under 44 CFR 201.6, local governments must have a FEMA-approved Local All Hazard Mitigation Plan to be eligible for and receive project grants under the following hazard mitigation assistance programs: Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM), Flood Mitigation Assistance (FMA), and Severe Repetitive Loss (SRL).

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1.4 Mitigation Funding Programs
FEMA administers several different programs that provide hazard mitigation funding. Typically grants allow a cost-share of 75 to 90 percent federal funding for eligible projects. FEMA offers four hazard mitigation assistance programs and any projects funded by these programs must demonstrate a positive benefit-cost ratio. The four hazard mitigation assistance programs include: the Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM), Flood Mitigation Assistance (FMA), and Repetitive Flood Claims (RFC).

1.4.1 Hazard Mitigation Grant Program (HMGP)
HMGP provides funds in accordance with priorities identified in hazard mitigation plans to implement mitigation measures during disaster recovery. State and local governments, certain private non-profit organizations, and tribes are eligible sub-applicants through HSEM. Examples of eligible projects include:
- Acquiring and relocating structures from hazard-prone areas
- Retrofitting structures to protect them from floods, high winds, earthquakes, or other natural hazards
- Constructing certain types of minor and localized flood control projects
- Constructing safe rooms inside schools or other buildings in tornado-prone areas
- Hazard mitigation planning

1.4.2 Pre-Disaster Mitigation (PDM)
PDM provides funds for hazard mitigation planning and implementation prior to a disaster event. State-level agencies, tribes, local government, and public colleges are eligible sub-applicants through HSEM. Examples of eligible projects include:
- Voluntary acquisition of real property for open space
- Elevation of existing public or private structures
- Retrofitting existing structures to meet building codes
- Construction of safe rooms for public or private structures that meet certain FEMA requirements
- Hydrologic and hydraulic studies/analyses, engineering and drainage studies for project design and feasibility
- Vegetation management
- Protective measures for utilities, water, sewer, roads and bridges
- Storm water management to reduce/eliminate long-term flood risk

1.4.3 Flood Mitigation Assistance (FMA)
FMA implements cost-effective measures to reduce or eliminate long-term risks of flood damage to NFIP structures. State-level agencies, tribes, and local government are eligible sub-applicants through HSEM. Eligible projects include:
- Acquisition, structure demolition, or structure relocation with the property deed restricted for open space uses in perpetuity
- Elevation of structures
- Dry flood proofing of non-residential structures
- Minor structural flood control activities
1.4.4 Other Federal Disaster-related Funding Programs

FEMA is probably more well-known for providing response and recovery assistance. Other programs such as FEMA’s Public Assistance (PA) Grant Program provide assistance to State, Tribal and local governments, and certain Private-Nonprofit organizations, so that communities can quickly respond to and recover from major disasters or emergencies. Through the PA Program, FEMA provides supplemental Federal disaster grant assistance for debris removal, emergency protective measures, and the repair, replacement, or restoration of disaster-damaged, publicly owned facilities and the facilities of certain Private Non-Profit (PNP) organizations. The PA Program also encourages protection of these damaged facilities from future events by providing assistance for hazard mitigation measures during the recovery process.

1.5 FEMA Guidance

FEMA has created the Local Mitigation Planning Guidance (the “Blue Book”) to provide guidance to local governments to meet the requirements of 44 CFR §201.6 Local Mitigation Plans. There are three main objectives of the Blue Book. First, the Blue Book is intended to help local jurisdictions develop new mitigation plans or update existing plans in accordance with the requirements of the regulations. Second, the Blue Book is designed to help Federal and State Reviewers evaluate mitigation plans from local jurisdictions in a fair and consistent manner. Third, the Blue Book is designed to help jurisdictions conduct comprehensive reviews and prepare updates to their plans to meet the requirements of 44 CFR Part 201.6.

The Nobles County All Hazard Mitigation Plan is going to follow the planning process outlined in the Blue Book. The Nobles County plan will also use the Local Mitigation Planning Handbook, March 2013, to specify where in the plan and how the specific regulation requirements were met.

FEMA requires that ALL participating jurisdictions meet the requirements for mitigation planning in 44CFR§201.6. The Blue Book specifically requires that each participating jurisdiction address:

- Risks, where they differ from the county
- Mitigation actions (actions must be identified for each jurisdiction)
- Participation in the planning process (attending meetings, contributing research, data, or other information, commenting on drafts of the plan); and
- Adoption (each jurisdiction must formally adopt the plan).
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Section 2 – Public Planning Process

2.1 Description of the Planning Process

2.1.1 Preplanning
Since the previous Nobles County AHMP was approved and adopted in 2011, the Nobles County Emergency Manager and the Southwest Regional Development Commission (SRDC) have collected information on hazards that occurred in Nobles County. This information gathering helped in updating the risk assessment section of the plan. It also helped to initiate conversations during the planning process regarding strategies to mitigate the effects caused from hazards over the five year update cycle.

In the summer of 2017, the planning process began for the update of the Nobles County AHMP. Every five years the Nobles County AHMP has a planned update. “A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within five years in order to continue to be eligible for mitigation project grant funding.” The Nobles County Emergency Manager initiated the planning process by applying for a planning grant from FEMA and contacting the Southwest Regional Development Commission (SRDC) to assist with the grant and update to the plan.

The Nobles County AHMP Planning Team was reformed to assist with the update. The planning team consisted of a number of elected officials, county staff, city staff, and emergency personnel.

Nobles County AHMP Planning Team:

- Joyce Jacobs – Nobles County: Emergency Management Director
- Justin Ahlers – Nobles County Commissioner
- Bob Demuth – Nobles County Commissioner
- Don Linssen – Nobles County Commissioner
- Tom Johnson – Nobles County Administrator
- Kathleen Kusz – Nobles County Attorney
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- Ben Puthoff – Nobles County Assessor’s Office – Property Appraiser
- Ted Buhner – Nobles County Assessor’s Office – Property Appraiser
- Sharon Heidebrink – Nobles County Assessor’s Office – Assessment Technician
- Lynn Wilson – Nobles County Recorder
- John Meyer – Nobles County Assessor’s Office – Property Appraiser
- Renee Schnurstein – Nobles County – Recorder’s Office

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The SRDC and NCEM contacted all of the cities within Nobles County to notify them that the update to the Nobles County AHMP was taking place. This original outreach also asked the cities to participate in the planning process to update the plan. Outreach was also done to the townships in Nobles County and multiple planning team members also represent townships in Nobles County.

2.1.2 Planning Meeting
The first All Hazard Mitigation Plan (AHMP) meeting was held on November 2, 2017. The first meeting covered introduction to the planning process, hazard identification, reviewed HAZUS flood assessment, ranked the hazards using the Calculated Priority Risk Index (CPRI), and reviewed existing mitigation strategies from the last plan.
The SRDC presented on the AHMP planning process, the purpose of the plan, the benefits of having a plan, and the participation in the development of the plan. The planning process started with a review of the timeline and the information that needed to be gathered as part of the update and included in the plan. The Local Mitigation Planning Handbook, March 2013, was presented to the planning team as a master guide to the materials that are required to be included in the Nobles County AHMP.

The profile helped to outline existing plans and programs, gaps and deficiencies, and existing mitigation measures. The profile also included: locations affected by the hazard, extent of the hazard, previous occurrences of the hazard, and the probability of future events of this hazard. Planning team members were given the opportunity to revisit the list of identified hazards to make sure no hazards were overlooked. Planning team members were asked to complete the CPRI worksheets before the meeting, thus allowing planning team members to draw on personal expertise and the hazard profile that was discussed during the meeting.

The planning meeting helped to educate the planning team, local government representatives, and other meeting attendees. Profiling the hazards also helped to facilitate conversation regarding the hazards. The conversations helped to fill in gaps in the research related to the hazards. There was also a chance for meeting attendees to identify and discuss gaps that they identified.

The CPRI was also discussed during the presentation regarding the planning process. The CPRI worksheet was distributed to the planning team via email so they could complete it prior to meeting in order to expedite the process and gain input from others in their jurisdiction. The CPRI is an important part of the planning process and helps the planning team rank and quantify the natural and other hazards in Nobles County. Vulnerability is the critical component to the planning meetings. The planning team and city involvement is needed to help identify hazards and provide feedback in regard to potential frequency, spatial extent, potential severity, warning time, risk level, and hazard rank.

The CPRI outlined the natural and other hazards that were included in the original Nobles County AHMP. SRDC staff presented other hazards that are typical to Minnesota and were included in the Minnesota AHMP and other county AHMPs. After thoroughly discussing each statewide hazard, the planning team updated the list of hazards that will be included in the plan. The planning team identified the following hazards (not in a specific order):

Natural Hazards affecting the jurisdiction include:
- Agricultural Disease (animal or crop)
- Winter Storms, Blizzards, and Ice Storms
- Droughts
- Earthquakes
- Flooding
- Fire—Wildfire
- Severe Summer Storms, Lightning and Hail, Tornadoes and Straight-line Winds
- Extreme Heat
- Extreme Cold
- Sinkholes and Land Subsidence
Other hazards affecting the jurisdiction include:

- Civil Disturbance and Terrorism
- Dam Failure (combined with Flooding for analysis)
- Fire—Structure (combined with Wildfire for analysis)
- Hazardous Materials
- Public Health Emergencies
- Transportation Infrastructure
- Utility Failure (including informational technology)
- Water Supply Contamination

Certain statewide hazards were eliminated from the discussion since the planning team thought the risk of the hazard was minimal or non-existent in Nobles County. These hazards included:

- Coastal Erosion—Nobles County’s lakes and lakeshore are typically stable, so FEMA has not identified any significant 100-year floodplain areas around any of the county’s major lakes.
- Nuclear Generating Plants—there are not any located in or near Nobles County.

A summary of the existing Vision and Mitigation Goals outlined in the previous Nobles County AHMP were presented. The presentation highlighted the previously identified goals, objectives, and strategies. Strategies that were already accomplished were added to the list of existing mitigation actions and new goals, objectives, and strategies were added to address identified gaps and deficiencies that were identified.

Due to the FEMA/HSEM request for the this Plan to be expedited, there were a total of one main planning meetings, including the first meeting, to gather information, analyze the natural and other hazards that pose a risk in Nobles County, and outline mitigation strategies to mitigate the risk of the hazards that were identified. Public participation is a critical component in the development of the Nobles County MHMP. The planning team is critical in helping to engage the public and to garner feedback in regard to the plan. The planning team recognizes the importance of public involvement during the planning process. Participation in the development of the Nobles County MHMP came from county staff, township and city representatives, as well as the general public. Efforts were made to actively include these groups in the update of the Nobles County MHMP, including posting notices as well as draft copies of the plan on the Nobles County Emergency Management (NCEM) website.

Mitigation Strategies Sub Committee - Meeting #2

The planning team created a subcommittee to aid in the expedition of the update to the Hazard Mitigation Plan. The Mitigation Strategies Sub Committee meeting was held on November 30, 2017. A subcommittee meeting was held to further discuss the goals, objectives, and strategies that were identified by the Planning Team. The Mitigation Strategies Subcommittee referred to the Risk Assessment Section to confirm that the goals, objectives, and strategies addressed the needs outlined in the plan. By reviewing the Risk Assessment Section, the Mitigation Strategies Subcommittee was better able to finalize and prioritize mitigation goals, objectives, and strategies to address the specific natural and other hazards outlined in the plan update.
The Mitigation Strategies Subcommittee finalized and prioritized the goals, objectives, and strategies through the STAPLEE Process. STAPLEE stands for Social, Technical, Administrative, Political, Legal, Economic, and Environmental. The STAPLEE Process takes all seven criteria into consideration when finalizing and prioritizing the mitigation goals, objectives, and strategies.

A qualitative approach was used by the Mitigation Strategies Subcommittee. The qualitative approach judged and prioritized the mitigation goals, objectives, and strategies based on perceived costs and benefits. All of the goals, objectives, and strategies were discussed during this subcommittee meeting. Upon completion, the Planning Team reviewed and approved the draft of the goals and strategies electronically.

Mitigation Strategies Subcommittee:
- Joyce Jacobs - Nobles County Emergency Management Director
- Bruce Heitkamp - Adrian City Administrator/City Clerk
- Becky DeJong – Indian Lake Township
- Rick VanHoldt – Worthington Fire Department
- Stephen Schnieder – Nobles County Public Works Director
- Judy Elling Przybilla - SRDC Planner

Plan Review Meeting
The finished draft plan was sent to the Nobles County Emergency Management Director for review in December 2017. The Draft Plan was also disseminated to all of the Team Members for review in December 2017. The Nobles County AHMP Planning Team reviewed the entirety of the Nobles County AHMP. Modifications were made via email and phone to the SRDC.

Plan Review Subcommittee:
- Joyce Jacobs - Nobles County Emergency Management Director
- Sherry Swanson – Nobles Coop Electric
- Ron McCarvel – USDA FSA County Director
- Dan Livdahl – Okabena-Ocheda Watershed District
- Bruce Heitkamp - Adrian City Administrator/City Clerk
- Angela Thiner – City of Worthington
- Judy Elling Przybilla - SRDC Planner

The Public Review Meetings were held on January 16, 2018 in Worthington and Adrian. The events were intended as an opportunity for local residents as well as neighboring communities, agencies, businesses, academia, nonprofits, and other interested parties to be involved in the planning process. Attendees had the opportunity to ask questions and discuss specific goals with Planning Team members and SRDC staff. The Nobles County 2018 AHMP was available online on Nobles County’s website for 30 days which included a time period before and after the Public Review Meetings.

Interested entities could prepare feedback and recommendations before the public review meeting. Attendees were also able to come and go at their convenience, review the material sections of the plan, provide feedback, and make recommendations. A press release for the Public Review Meeting was advertised in the official Nobles County newspaper. A flyer was also provided to local units of government.
and a press release was distributed to other local media in the region. The open comment period provided a great opportunity for gathering feedback in regards to the Nobles County 2018 AHMP.

### 2.2 Public Involvement

Intergovernmental coordination was essential in the development of the Nobles County AHMP. The SRDC and Nobles County Emergency Manager provided information to all local units of government in the county regarding the Nobles County AHMP planning process and opportunities for participation. Meeting participation was solicited, but smaller local units of government opted for participating via phone, email, and mail. Public Notice of all planning team meetings was posted at various government offices in Nobles County. Email notices were also sent to local units of government, local organizations, and other entities involved in hazard mitigation. Subcommittee meetings were not publicized.

All local units of government in Nobles County were invited to review and comment on mitigation goals, objectives and strategies. Public and private entities were sent the mitigation strategies that their representing entity was listed in. Feedback and recommendations were requested regarding the mitigation goals, objectives, and strategies. Refer to Table #1 for more information regarding jurisdictions, emergency response departments, schools, and organizations that reviewed and approved the goals section of the Nobles County AHMP.

### 2.3 Other Opportunity for Involvement

Hazard mitigation has been a regional effort in Southwest Minnesota, with many opportunities for involvement provided for neighboring communities, agencies involved in hazard mitigation, and businesses, academia, and other relevant private and non-profit interests. SRDC has worked with the following Minnesota counties on their hazard mitigation plans:

- Cottonwood County (2011, update in progress)
- Jackson County (2008; updated 2016)
- Lincoln County (2010, update in progress)
- Lyon County (2010, updated 2017)
- Murray County (2005; updated 2012, update in progress)
- Nobles County (2005; updated 2011, update in progress)
- Pipestone County (2010, update in progress)
- Redwood County (2005; updated 2012, update in progress)
- Rock County (2007; updated 2014)

### 2.4 Existing Plans, Studies, Reports, and Technical Information

Many sources of local, state, federal, and private information were used during the AHMP update. Various plans, programs, and policies were reviewed by SRDC staff. The literature review was a critical step in updating the Nobles County AHMP. The coordinated use and consideration of these diverse data sources provided a sound basis for this plan and implementation activities. The following references were specifically consulted during the planning process.

- Nobles County Emergency Operations Plan
• Nobles County Comprehensive Plan
• The Nobles County Water Management Plan
• Nobles County Land Use Map
• Nobles County Zoning Ordinances
• Local Water Plans
• Minnesota Department of Health (MDH) regulations regarding water systems and routine inspection of public water systems
• The Minnesota Pollution Control Agency (MPCA) regulations regarding wastewater systems
• Minnesota Well Code
• NOAA Weather Radio All Hazards (NWR) weather broadcasts system
• The National Flood Insurance Program
• FIRM maps identifying flood hazard areas
• Fire District and Ambulance District Maps
• Mutual Aid Agreements between police forces, fire districts and ambulance districts
• Response Plans: HAZMAT
• MnDOT’s Towards Zero Deaths (TZD) Program
• Traffic safety publications: the National Cooperative Highway Research Program (NCHRP), MnDOT Road Design Manual, ADA Tool Kit, and Minnesota Manual on Uniform Traffic Control Devices
• The Minnesota DNR dam safety program
• The Minnesota DNR draft Emergency Action Plan
• City of Worthington Comprehensive Plan
• FEMA Planning Aids and Tools
• County All Hazard Mitigation Plans

All of the above documents are incorporated into this planning document by reference. The maps selected and included in this plan have been created by Nobles County and the SRDC utilizing data from Nobles County GIS and the State of Minnesota’s Land Management Information Center (LMIC).

The University of Minnesota Duluth Geospatial Analysis Center (GAC) performed a hazard risk assessment for 100-year floods using the HAZUS-MH GIS tool. In recognition of the importance of planning in mitigation activities, FEMA created Hazards USA Multi-Hazard (HAZUS-MH), a powerful geographic information system (GIS)-based disaster risk assessment tool. This tool enables communities of all sizes to predict estimated losses from floods, hurricanes, earthquakes, and other related phenomena and to measure the impact of various mitigation practices that might help reduce those losses. The Minnesota Homeland Security and Emergency Management (HSEM) office has determined that HAZUS-MH should play a critical role in Minnesota’s risk assessments, and therefore the 100-year flood event hazard analysis is introduced in this plan.

Public input was sought through meetings and direct conversations (see Appendix F: Public Meeting Notices and Meeting Notes).
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SECTION 3: PREREQUISITES

This Chapter covers prerequisites for eligibility to adopt this multi-hazard mitigation plan in multiple jurisdictions. Section II describes the plan adoption process. Section III describes participation provisions post-approval of the all hazard mitigation plan by HSEM and FEMA.

3.1 Jurisdictions Represented in this Plan

For the purpose of hazard mitigation, FEMA considers a Local Government having jurisdiction as “any county, municipality, city, town, township, public authority, school district, special district, intrastate district, council of governments, regional or interstate government entity, or agency or instrumentality of a local government.” (44CFR§201.2) Special considerations are given by FEMA for school districts, private nonprofit organizations, and multi-jurisdictional private nonprofit utilities (such as rural electric cooperatives).

Nobles County has the land use authority over the townships, so Nobles County will represent the townships in the All Hazard Mitigation Plan (AHMP). The Nobles County AHMP will cover all the townships in the county. Land use authority within city limits is controlled by the local jurisdiction. Representatives from the townships were asked to participate in the planning process. Nobles County and all of its cities previously passed resolutions of intent to participate in the hazard mitigation process and to be covered by the Nobles County All Hazard Mitigation plan. The Resolutions will be added after FEMA approval from the townships and the cities which can be found in Appendix C at the end of this plan.

Nobles County is a rural county. A number of resources and responsibilities are shared throughout the county. The Nobles County Sheriff’s Office provides law enforcement throughout the county. The Cities of Adrian and Worthington also have separate police departments. Additional resources and responsibilities are shared regionally. Nobles County is part of the Nobles County Community Services (NCCS) service area. A representative from the Nobles County Sheriff’s office and NCCS were members of the planning team. This ensured a regional prospective was taken when analyzing natural and other hazards.

Invitations were sent via email to representatives of all of the local jurisdictions to participate in the development of the plan either through filling out the worksheets, attendance at the meetings or participating in the plan review process. As in most rural areas, many of the participants wore multiple hats during the development process. For example, Stacie Golombiecki represented the City of Bigelow as Mayor as well as the Nobles County Community Services as the Director.
The table below shows the jurisdictions that participated in the risk assessment and mitigation action reviews.

<table>
<thead>
<tr>
<th>Participating Jurisdictions</th>
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<tr>
<td>Local Units of Government</td>
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<tr>
<td>Nobles County</td>
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<td>Bloom Township</td>
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<td>City of Adrian</td>
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<td>Dewald Township</td>
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<td>City of Bigelow</td>
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<td>Elk Township</td>
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<td>Indian Lake Township</td>
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<td>City of Dundee</td>
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<td>Larkin Township</td>
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<td>City of Ellsworth</td>
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<td>Little Rock Township</td>
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<td>City of Kinbrae</td>
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<td>Olney Township</td>
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<td>City of Lismore</td>
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<td>Ransom Township</td>
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<td>City of Round lake</td>
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<td>Seward Township</td>
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<tr>
<td>City of Worthington</td>
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<tr>
<td>Worthington Township</td>
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</tbody>
</table>

Other Participating Organizations

- Nobles Cooperative Electric
- Okabena – Ocheda Watershed District
- U of M Extension
- Adrian Public schools
- Parkview Manor Nursing Home
- Ellsworth Public Schools
- Client Community Services
- Worthington Public Schools
- Sanford Worthington Medical Center
- Avera Health

3.2 Adoption Procedure

Each jurisdiction participating in the plan must formally adopt the plan after FEMA provisionally approves the document (Section 1.B.1). This plan must be adopted within one year of provisional FEMA approval, or else be updated and re-submitted to FEMA again. Minnesota Statutes §375.51 Subd.1 requires that a “public hearing shall be held before the enactment of any ordinance adopting or amending a comprehensive plan or official control...”

Once the planning team finalized the draft All Hazard Mitigation Plan (AHMP), copies were made available to the public, local governments, and county departments for comment. The feedback period for the plan was 31 days. The planning team reviewed comments, modifications were made, and the draft was sent to the Nobles County Board of Commissioners for their review.
As part of the planning team’s review, a public hearing was held to obtain any additional comments that the public or others wished to make. These final public reviews were conducted on January 16, 2018 in Adrian (three members of the public attended) and January 16, 2018 in Worthington (eight members of the public attended). When satisfied with the plan, the planning team recommended the Nobles County Board of Commissioners forward the plan to the State of Minnesota Division of Homeland Security & Emergency Management (HSEM) for review. Federal rules require that this plan be submitted to HSEM for initial review and coordination, with the State then forwarding the plan to FEMA’s Regional Office in Chicago for formal review and approval. Upon approval by FEMA, the Nobles County Board of Commissioners will consider a Resolution for Adoption. After County approval, staff will work with each participating local unit of government to facilitate the local adoption of the plan.

Local jurisdictions with Comprehensive Plans and Land Use Plans are encouraged to incorporate applicable strategies, goals, and policies from the Nobles County MHMP into their local plans upon next adoption. Local jurisdictions should utilize applicable zoning, subdivision control, and other ordinances to enforce the policies described in this plan. The Nobles County Emergency Management Department will work with local jurisdiction to help incorporate the applicable strategies, goals, and policies from the Nobles County MHMP into their local plans. The SRDC sent all entities the goals, objectives, and strategies with which their entity was named in, giving them the opportunity to provide feedback and acknowledged the goals, objectives, and strategies that they were included in. Documentation of responses from those that responded can be found at the end of this plan.

3.3 Participation Provisions Post-Approval
FEMA guidance explains a process that jurisdictions can follow to become part of the planning process, or “join” the mitigation plan, after FEMA approval. Any jurisdiction wishing to join the plan at a later date should contact Nobles County Emergency Management.

3.4 Planning Committee Worksheets
All planning meeting agendas, notes, and attendance (sign in sheets, emails) can be found in Appendix F for the meetings stated in Table #2 below.

<table>
<thead>
<tr>
<th>Meeting Type</th>
<th>Date</th>
<th>Location</th>
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</thead>
<tbody>
<tr>
<td>1st Planning Team Meeting</td>
<td>11-2-2017</td>
<td>Worthington, MN</td>
</tr>
<tr>
<td>Mitigation Strategies Sub Committee Meeting</td>
<td>11-30-2017</td>
<td>Worthington, MN</td>
</tr>
<tr>
<td>Plan Review Sub Committee Meeting</td>
<td>Via email</td>
<td>County wide</td>
</tr>
<tr>
<td>Public Hearing #1</td>
<td>1-16-2018</td>
<td>Adrian, MN</td>
</tr>
<tr>
<td>Public Hearing #2</td>
<td>1-16-2018</td>
<td>Worthington, MN</td>
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</tbody>
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Section 4 – Nobles County Profile

This section offers a general overview of Nobles County to provide a basic understanding of the characteristics of the community, such as the physical environment, population, and the location and distribution of services.

4.1 Location and Area
Nobles County is located on the Buffalo Ridge of southwestern Minnesota, and has a land area of 723 square miles. Nobles County is bordered on the north by Murray County, on the south by Iowa’s Lyon and Osceola counties (located south of the state line), on the east by Rock County, and on the west by Jackson County.

Figure #1 Minnesota Counties & Region 8 Development Commission

Nobles County’s population in the 2010 U.S. Census was 21,378, with a density of 29 persons per square mile, and is considered a Micropolitan area by the U.S. Office of Management and Budget. There are 11 incorporated municipalities, and 20 townships in Nobles County. Cities within Nobles County include Adrian, Bigelow, Brewster, Dundee, Ellsworth, Kinbrae, Lismore, Round Lake, Rushmore, Wilmont, and Worthington.

The City of Worthington is the largest city in Nobles County and serves as the Nobles County seat. The city is along Interstate I-90, U.S. Highway 59, and Minnesota State Highway 60. U.S Highway 59, State Highway 91, 264, and 60, and Interstate I-90 provide thoroughfares into and out of the county from the north and south and east and west respectively.

Interstate 90 (I-90) runs east-west through the City of Worthington, connecting I-35 at Albert Lea and I-29 at Sioux Falls, South Dakota. US Highway 59 runs north-south through the county, connecting I-90 at Worthington to I-94 near Fergus Falls. MN Trunk Highway (TH) 60 runs on a diagonal through
Worthington, providing a major link between the Twin Cities and Sioux City, Iowa. TH 91 runs north-south through Adrian and Ellsworth. Minnesota State Highway 264 runs north-south through the county, connecting Dundee to Round Lake. Interstate I-90 crosses the county from west to east, connecting Sioux Falls, SD to Worthington, MN to LaCrosse, WI.

Two railroads serve Nobles County. The Union Pacific railroad operates two main corridors within Minnesota, constituting 724 miles of track. One of these runs from the Twin Cities through Nobles County and continues through Sioux City, IA, and Omaha, NE. This line primarily serves coal shipments and unit trains with agricultural commodities. The Nobles/Rock Short Line, formerly the Rock Railroad, was established in 1993 and is owned by the Buffalo Ridge Rail Authority. The railroad operates in southwestern Minnesota, having track that runs 41.5 miles from Org (located south of Worthington) to Manley, MN (located in Rock County). The main office for the railroad is located in Luverne, MN.

Worthington Regional Airport is a general aviation facility located north of I-90. There are two runways, the 5,500’ primary runway on a NW/SE alignment with instrument landing systems, and a 4,200’ north-south runway. The Airport has a terminal that provides a lounge area, weather computer, and restroom facilities. There is a 14,000 square foot hangar for larger and/or transient aircraft in addition to hangars for rent to local aircraft owners.
Figure #2  Minor Civil Divisions – Nobles County
4.2 History

Before Nobles County was formed, the area was occupied by Native Americans. Over the years, the land was home to many different Indian tribes. The Native American occupation kept European settlement to a minimum until 1842. It was at this time that a Joseph Nicolas Nicollet explored and mapped the area, naming the water bodies he came across.

He mapped two lakes and named them Lake Okabena and Lake Ocheyedan. He is also credited in naming the Kanaranzi River. It wasn’t until the mid-1800 that the Nobles County area actually began to see new settlements. During this time period, many Native Indian tribes still called the Nobles County area home. In addition to the lack of legal basis for Euro-American settlement, the Native American Indians and their willingness to defend their homelands, limited settlement. It wasn’t until the Traverse Des Sioux Treaty of 1851, when the Sisseton Sioux ceded the land, that the settlers gained the legal right to settle Nobles County.

Northeastern Nobles County was the first to be developed as a new settlement began in the vicinity of the Graham Lakes. It wasn’t until the mid-1860’s that this first permanent development was established. At this time, townships began forming along the Iowa border with Grand Prairie, Little Rock, Ransom, Bigelow and Indian Lake Townships.

The Minnesota territory was organized in 1849 and by 1856, many settlers had come and established new development. However, this time for development came to a halt during 1857. Settlement was discouraged due to conflicts between the Native Americans and settlers. A conflict arose during that year when a band of Sioux Indians killed settlers in Spirit Lake, Iowa. The few whites that were still living in the area after this event decided not to stay. Nobles County was established May 23, 1857, and organized October 27, 1870.

The area’s first mail route began during the Summer of 1867. It ran from Blue Earth through the Graham Lakes settlement and then on to Yankton, South Dakota. This event encouraged development and by the Spring of 1870, the population in Nobles County doubled from 117 to 234. It was at this time in 1870 that the actual County government began. A year later in 1871, the first railroad went through the area. This stretch of railroad began in Mankato, ran through Worthington, and ended up in Le Mars, Iowa.

In 1877-1878, Bishop Ireland of Saint Paul and several priests forwarded the development of the western third of the County using Adrian, the newly established rail port as their center. The area filled with German and Irish Catholics changing both the religious and political balance of the County from Protestant/Republican to Catholic/Democrat.

Meanwhile, in the northeast corner of the County, the Sioux City and St. Paul Railroads were competing for the farm market. This resulted in the establishment of rival towns separated by only a mile and destined to remain small. The railroads played a major role in the establishment of all but two towns in the county. The exceptions are Leota and St. Kilian, both of which were church sites.

In 1861, 35 people made up 11 total families in Nobles County. Just 19 years later in 1880, the population was 4,435. Over the years, the population continued to grow at a steady pace and in 1895 there were
11,905 residents. This number doubled by 1970 when the census reported 22,959 residents. By 1990, however, that number had fallen to 20,098 and is estimated to have fallen to 19,920 in 1999.\(^5\)

4.3 Physical Features

Nobles County has a total area of 723 square miles, of which 715 square miles is land and 7.5 square miles (1.0%) is water. Land in Nobles County is typical of a prairie environment and has a significant variation in land elevation. The highest elevation occurs in the northwestern portion of the County and is just over 1,800 feet above sea level. The lowest elevations occur in the northeastern and southwestern sections of the County and are somewhat below 1,450 feet.

Nobles County sits atop a geologic structure known as the Buffalo Ridge, a large expanse of rolling hills in southwestern Minnesota reaching a height of 1,995 feet (608 m) above sea level. The Buffalo Ridge extends 60 miles through Lincoln, Lyon, Pipestone, Murray, Rock, and Nobles counties. It is a drainage divide separating the watersheds of the Mississippi and Missouri Rivers. Because of its high altitude and high average wind speed, the Buffalo Ridge has become a major site for wind energy.

The Buffalo Ridge marks the last major advance of glaciers in southern Minnesota. This feature also represents a natural divide in Nobles County. To the east, the landscape contains more lakes and wetlands. To the west, the landscape is more characterized by deeper and more extensive streams and rivers. These differences continue to define natural resource patterns on the land. In the west, steeper and deeper channels and valleys are inherently difficult to farm, and in many places were never likely plowed. Relatively large tracts of grassland tend to follow linear riparian corridors. However, these areas have historically been used for intensive pasturing of cattle and few people know about the native plant communities existing in these areas. To the east, wetlands and shallow lakes were the principal obstacle to crop production.

The Buffalo Ridge is part of the inner coteau and is the highest point of the Coteau des Prairies in Minnesota. Its bedrock is formed of Cretaceous shale, sandstone and clay that lie above the pinkish-red Upper Precambrian Sioux Quartzite. These units are covered in most areas by thick deposits of glacial drift, which consist of up to 800 feet (244 m) of pre-Wisconsin age glacial till left after the glaciers receded. The inner coteau is made up of extremely stream-eroded glacial deposits of pre-Wisconsin glacial drift, which is then covered by a 6 to 15 foot (1.8 to 4.6 m) thick deposit of a wind-blown silt called loess. This covering results in the creation of an area with long, gently sloping hills. Loess is an easily eroded material, and because of this there are few lakes and wetlands in the inner coteau area. Loess however promotes well established dendritic drainage networks, the majority of which flow into the Missouri River and Minnesota River systems.

During the period of initial settlement by Euro-American civilization, Nobles County was primarily covered by tallgrass prairie. The prairie land was originally diverse and full of lush plant growth that enabled it to support many different types of animals. Although 90% of the Nobles County prairie has been plowed, the County has retained some of this grassland along railroad rights-of-way and along riparian corridors. Riparian corridors, located along Kanaranzi Creek, Champepadan Creek, and Little Rock River, are some of the most notable tracts of grassland. The railroad rights-of-way are home to some of the last known true prairie in the County. Within these rights-of-way are assortments of rare plant communities that are
not only native to the County, but that have been home to various forms of wildlife for many years. Sunrise County Park and Compass Prairie Scientific and Natural Area, each contain small natural prairie remnants.⁶

A study by the University of Minnesota’s Remote Sensing and Geospatial Analysis Laboratory found that about 84.6% of the land area in Nobles County was cultivated, with 6% urban, 7% in grass/shrub/wetlands, 2% forest, and 1% covered by water in the year 2000. There were almost 7,800 acres considered impervious area, or almost 2% of the county overall. The future land use in Nobles County will likely remain predominately in agriculture production.

4.3.1 Open Water Sources
There are approximately 5,000 acres of open water in Nobles County. The open water is characterized in three categories: lakes, marshes, and rivers and streams.⁷

Lakes
Nobles County has several lakes that provide recreational and natural resources. The Six Lakes include: East and West Graham, Okabena, Ocheda, Bella and Indian Lake, all provide sufficient opportunities for catching game fish.

These lakes are generally shallow. Okabena is considered the deepest as its maximum depth is 13.9 feet and its mean depth is 6.9 feet. Lake Ocheda is the shallowest with average depths at only five feet. By using such techniques as fish stocking, reclamation and Nobles County Community Based Plan Conservation, Parks and Recreation aeration systems (needed to reduce the occurrence of winter kill), sport fishing is available on local lakes.⁸

Rivers
Nobles County has one river, the Little Rock River. The Little Rock and Ocheyedan rivers originate in Nobles County and flow south into Iowa. There are several streams and creeks in the County, including: Champepadan, Elk, Jack, Kanaranzi, Little Rock, Okabena, and Norwegian creeks.

Watersheds
Nobles County is divided between the Des Moines-Mississippi River and Missouri River basins. The West Fork Des Moines watershed flows east primarily into the Heron Lake system and eventually through Iowa to the Mississippi River. The Little Sioux River major watershed drains the southeast portion of the county through Iowa to the Missouri. The City of Worthington is split between the Des Moines and Little Sioux watersheds. The western half of Nobles County is primarily in the Rock River major watershed, draining through Iowa to the Missouri River.

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Figure #3  Shoreland, Lakes & Streams – Nobles County
**Wetlands**

In and around these watersheds are wetlands. Wetlands refer to the low depressions in the landscape that are saturated with water either permanently or seasonally. The Prairie Pothole Region of the Northern Tallgrass Prairie is a large grass and wetland complex which includes Southwestern Minnesota. The county’s remaining wetlands act as natural filters, purifying water by recycling nutrients and reducing siltation, controlling erosion, recharging groundwater and storing carbon. Wetlands in Nobles County not only serve as a water drainage system, they also provide immediate benefits to ecosystems that surround them. Wetlands store runoff and allow for a natural filtration of the water before it enters the groundwater. The benefits of a healthy wetland vary from improved water quality to economic development generated from increased hunting, fishing, and recreation spending.

These interrelated prairie potholes and wetland complexes provide habitat to a variety of plants and animals. Wetlands also reduce the size and scope of storm events and snowmelt flooding. Overall, wetlands provide many benefits to humans including the reduction of flooding by means of storage during high flows, filtration of pollutants and sediment, groundwater and aquifer recharge, wildlife habitat and aesthetic appeal.

In addition, the wetlands in Nobles County provide the following benefits:

- Floodwater Storage and Detention
- Nutrient Assimilation
- Sediment Entrapment
- Groundwater Recharge and Discharge
- Low-Flow Augmentation
- Aesthetics and Recreation
- Shoreland Anchoring and Erosion Control
- Wildlife Habitat
- Fisheries Habitat

As the landscape Nobles County has changed over the years due to increased agricultural activities, most of the wetlands were drained. Wetland drainage was accomplished by ditching and tiling. The exact acreage of wetlands drained in Nobles County since increased agricultural activities is unknown. The majority of the remaining wetlands in Nobles County have been identified in the National Wetlands Inventory. The inventory classifies all wetlands into eight different wetland types based on the depth of water and type of vegetation. Identifying and classifying wetlands along with regulations protecting wetlands help to preserve our wetlands into the future.

Land use and management practices that have occurred in Nobles County have caused water quality degradation in the lakes. Due to the increase of nutrients, the county’s lakes have seen an increase in algae blooms and suspended sediment. With this decrease in water clarity, sunlight is not able to reach lake bottoms restricting aquatic plant growth. This not only eliminates a food supply for many game fish, but it also favors the growth of less desirable species like carp and black bullhead. These rough fish then cause greater destruction to the lakes by uprooting the remaining vegetation and sending more sediment and nutrients into the water column.
Figure #4  Watersheds Map – Nobles County
4.3.2 Surficial Geology

The surface of Nobles County is underlain by Quaternary glacial drift of Pleistocene age and some alluvial deposits of recent age, generally 100 to 600 feet thick. Cretaceous rocks composed of sandstone, shale and siltstone underlie the glacial drift for most of the county. Precambrian formation of Sioux Quartzite and granite lie generally about 200-400 feet below the cretaceous formations. Glacial drift aquifers are the most common source of drinking water in Nobles County.

The surface of Nobles County is underlain by glacial drift of Pleistocene age and by some alluvial deposits of recent age. The recent deposits are thin, patchy accumulations of silt and sand which are restricted to stream channels, flood plains, and lake basins. The drift includes till and outwash and is covered in places by windblown silt (loess). Till is a heterogeneous mixture of rock fragments ranging in size from clay to boulders which has received little or no sorting after its deposition from the glacial ice. Outwash is dominantly an assorted deposit, which is generally made up of sand and gravel but which may contain fragments ranging in size from clay to boulders. In Nobles County, melt-water channels were formed by streams emanating from the glacier fronts. They were filled with alluvium consisting of glacial outwash and an overlying layer of silt or clay.

The major alluvial areas and some minor areas of very little significance are outlined on the map. Deposits laid down in former lake basins are not shown, except where the lakes may have occurred within an alluvial channel. (Surficial lake deposits, in this area, are very fine grained and probably have little water-bearing potential.) The width of the alluvial deposits ranges from a few feet in the narrow tributaries to about a mile in the Kanaranzi Creek valley southwest of Adrian and in the Champepedan Creek valley at the west border of the county.

The alluvium differs in thickness from one stream channel to another and across the same stream channel. Its maximum thickness is dependent upon the depth of scour of the streams that occupied the valleys during periods of abundant melt water. The alluvium ranges from 4.5 to 61 feet in thickness. Owing to low permeability the more compact material (silty clay or clayey silt) penetrated at the bottoms of some holes was not included as part of the alluvial thicknesses. However, it is probably of alluvial origin, and coarser material may underlie it at depth.9

It is expected that along local stream segments the maximum thickness of alluvium is approximately the same. That is, if 40 feet of alluvium is penetrated in a stream channel, another section of alluvium about 40 feet thick will occur elsewhere in the same channel, possibly as much as a mile up or down stream.

The variable thickness of alluvium across a stream channel is a generalized cross section based on auger-hole data for the Little Rock River valley. The thickest sand and gravel section was penetrated in a hole drilled on the upper terrace. The cross section shows that the deepest channel was cut east of the present-day stream. It would be coincidence if the present-day stream were flowing above the thickest section of channel alluvium. Probably the simplest and most positive means of determining the location of the thickest section of alluvium is to drill a line of holes across the stream valley. Electrical resistivity and

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seismic methods might be employed to good advantage as a supplement to test holes if the contrast in
electrical and physical characteristics between the outwash and underlying till were sufficient.

4.3.3 Bedrock Geology
The bedrock within Nobles County is formed of Cretaceous shale, sandstone and clay that lie above the
pinkish-red Upper Precambrian Sioux Quartzite. These units are covered in most areas by thick deposits
of glacial drift, which consist of up to 800 feet of pre-Wisconsin age glacial till left after the glaciers
receded. Sedimentary material is found covering the bedrock from former inland seas. Glacial material
also covers the county’s bedrock. There are no known outcrops of bedrock in Nobles County. The glacial
deposits are underlain by interbedded sandstone and shale of Cretaceous age which in turn are underlain
by Precambrian crystalline rocks. In a few localities crystalline rocks lie directly beneath the drift. 10

4.3.4 Soils
There are seven soil associations within Nobles County according to the Soil Survey of Nobles County.
Three of the soil associations make up about 80 percent of the county. The first, Webster-Clarion-Nicollet
Association, which is poorly drained, well drained, and moderately well drained, nearly level to rolling clay
loam soils, makes up 33 percent of the county. The second, Everly-Sac-Rushmore Association, which is
nearly level to strongly sloping and well and poorly drained, makes up 29 percent of the county. The third,
Webster-Nicollet Association, which is poorly drained to moderately well-drained and nearly level clay
loam soils, makes up about 20 percent of the county. The four remaining associations are Fairhaven-
Kanaranzi-Wadena Association, Comfrey-Millington-Spillville Association, Everly-Storden Association, and
Dickman-Fairhaven Association. 11

Figure #5  General Soils Map - Nobles County
Figure #6  
Zoning Map – Nobles County around Worthington
4.4 Climate
Southwest Minnesota has a humid, mid-continental climate. Winters are characterized by cold, dry continental polar air. Summers are characterized by hot, dry tropical air masses from the Southwest meeting warm, moist maritime air masses from the Gulf of Mexico in the summer.

The weather is extremely variable during the year. During the winter months, precipitation is in the form of snowstorms, some of which may be severe. During the summer months, precipitation is in the form of showers (occasionally heavy) when warm moist air leaves the Gulf region and meets cooler air over Nobles County. Weather patterns circulate counter-clockwise and generally enter Nobles County from the west to southwest and sometimes from the south.

4.4.1 Precipitation
Nobles County had annual precipitation of 39.31 inches in 2016 (Minnesota’s state-wide average is 27.01 inches). All precipitation and snowfall measurements are taken in Worthington. Average annual precipitation can vary from 19 inches (1999) to over 43 inches (1993). From 1981 to 2016, the average seasonal snowfall in the City of Worthington, which is the county seat of Nobles County, was 41.8 inches. 2011-2017 the average seasonal snowfall for City of Worthington was 44.1 inches.

Table #3

Precipitation: Averages since 1981 - Worthington

<table>
<thead>
<tr>
<th>Month</th>
<th>Precipitation in Inches</th>
<th>Snowfall in Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>0.67</td>
<td>7.94</td>
</tr>
<tr>
<td>February</td>
<td>0.70</td>
<td>7.72</td>
</tr>
<tr>
<td>March</td>
<td>1.55</td>
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<tr>
<td>April</td>
<td>3.08</td>
<td>4.67</td>
</tr>
<tr>
<td>May</td>
<td>3.97</td>
<td>0.20</td>
</tr>
<tr>
<td>June</td>
<td>4.93</td>
<td>0.00</td>
</tr>
<tr>
<td>July</td>
<td>3.39</td>
<td>0.00</td>
</tr>
<tr>
<td>August</td>
<td>3.62</td>
<td>0.00</td>
</tr>
<tr>
<td>September</td>
<td>3.10</td>
<td>0.00</td>
</tr>
<tr>
<td>October</td>
<td>2.03</td>
<td>1.01</td>
</tr>
<tr>
<td>November</td>
<td>1.42</td>
<td>6.41</td>
</tr>
<tr>
<td>December</td>
<td>0.87</td>
<td>9.50</td>
</tr>
<tr>
<td><strong>Annual Average</strong></td>
<td><strong>29.17</strong></td>
<td><strong>41.84</strong></td>
</tr>
</tbody>
</table>

Source: State Climatology Office DNR Waters at http://climate.umn.edu/

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12 State Climatology Office DNR Waters at http://climate.umn.edu/
4.4.2 Temperature

Average daily temperature in Nobles County from 1981 to 2016 was 44.5 degrees Fahrenheit. The hottest month on average in Nobles County is July with an annual average temperature of 71.6°F. The coolest month on average is January with an annual average temperature of 14.3°F. Temperatures were taken in the City of Worthington.

Table #4

<table>
<thead>
<tr>
<th>Month</th>
<th>Average Daily Temp. °F</th>
<th>Average Daily Max °F</th>
<th>Average Daily Min °F</th>
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<tbody>
<tr>
<td>January</td>
<td>14.3</td>
<td>27.5</td>
<td>2.2</td>
</tr>
<tr>
<td>February</td>
<td>18.8</td>
<td>31.1</td>
<td>8.7</td>
</tr>
<tr>
<td>March</td>
<td>30.9</td>
<td>45.7</td>
<td>20.9</td>
</tr>
<tr>
<td>April</td>
<td>44.6</td>
<td>51.6</td>
<td>35.5</td>
</tr>
<tr>
<td>May</td>
<td>57.0</td>
<td>63.4</td>
<td>51.3</td>
</tr>
<tr>
<td>June</td>
<td>67.4</td>
<td>72.2</td>
<td>61.3</td>
</tr>
<tr>
<td>July</td>
<td>71.6</td>
<td>78.1</td>
<td>64.1</td>
</tr>
<tr>
<td>August</td>
<td>68.6</td>
<td>74.8</td>
<td>63.2</td>
</tr>
<tr>
<td>September</td>
<td>60.5</td>
<td>65.8</td>
<td>54.4</td>
</tr>
<tr>
<td>October</td>
<td>47.7</td>
<td>52.5</td>
<td>40.0</td>
</tr>
<tr>
<td>November</td>
<td>32.2</td>
<td>45.3</td>
<td>20.1</td>
</tr>
<tr>
<td>December</td>
<td>18.5</td>
<td>26.7</td>
<td>0.2</td>
</tr>
<tr>
<td>Annual Average</td>
<td>44.5</td>
<td>48.3</td>
<td>41.2</td>
</tr>
</tbody>
</table>

Source: National Climatic Data Center (http://ggweather.com/normals/)

Figure #7

Average Temperature: 1981 – 2016 – Worthington
4.5 Population

Nobles County is the 47th most populous county in the State of Minnesota (out of 87). Population growth trends have an effect on the needs and demands of services such as transportation, law enforcement, and emergency response personnel. It is important to analyze past population trends to attempt to make valid projections. However, it should be recognized that population projections are dependent upon a number of factors, a number of which are beyond county control.

4.5.1 Population Trends

The 2010 Census shows that Nobles County has a population of 25,857 and the MN State Demographer’s Office estimated its population to be 21,825 in 2016. The two largest communities are Worthington with a population of 12,764 in 2010 and Adrian with a population of 1,209 in 2010. The MN State Demographer’s Office estimated Worthington’s population to be 13,288 in 2016 and Adrian’s to be 1,237 in 2016. From 2000 to 2010, Worthington’s population increased by 13.1 percent but Adrian’s population decreased by 2.0 percent. As a whole, Nobles County experienced a growth in population of 2.6 percent from 2000 to 2010. Nobles County shares many of the opportunities and challenges common in rural Minnesota and the Midwest overall. While population in Southwest Minnesota has been generally declining for several decades, Nobles County’s population has shown growth since the 1980 census.

Table #5 Population Trends – Region 8

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cottonwood</td>
<td>14,887</td>
<td>14,854</td>
<td>12,694</td>
<td>12,167</td>
<td>11,687</td>
<td>11,465</td>
</tr>
<tr>
<td>Jackson</td>
<td>14,352</td>
<td>13,690</td>
<td>11,677</td>
<td>11,266</td>
<td>10,266</td>
<td>9,978</td>
</tr>
<tr>
<td>Lincoln</td>
<td>8,143</td>
<td>8,207</td>
<td>6,890</td>
<td>6,429</td>
<td>5,896</td>
<td>5,766</td>
</tr>
<tr>
<td>Lyon</td>
<td>24,273</td>
<td>25,207</td>
<td>24,789</td>
<td>25,425</td>
<td>25,857</td>
<td>25,684</td>
</tr>
<tr>
<td>Murray</td>
<td>12,508</td>
<td>11,507</td>
<td>9,660</td>
<td>9,165</td>
<td>8,257</td>
<td>8,332</td>
</tr>
<tr>
<td>Nobles</td>
<td>23,208</td>
<td>21,840</td>
<td>20,098</td>
<td>20,832</td>
<td>21,378</td>
<td>21,825</td>
</tr>
<tr>
<td>Pipestone</td>
<td>12,791</td>
<td>11,690</td>
<td>10,491</td>
<td>9,895</td>
<td>9,596</td>
<td>9,211</td>
</tr>
<tr>
<td>Redwood</td>
<td>20,024</td>
<td>19,341</td>
<td>17,254</td>
<td>16,815</td>
<td>16,059</td>
<td>15,275</td>
</tr>
<tr>
<td>Rock</td>
<td>11,136</td>
<td>10,703</td>
<td>9,806</td>
<td>9,721</td>
<td>9,687</td>
<td>9,484</td>
</tr>
<tr>
<td>Region 8</td>
<td>141,532</td>
<td>137,039</td>
<td>123,359</td>
<td>121,717</td>
<td>119,151</td>
<td>117,020</td>
</tr>
</tbody>
</table>


Table #6 Distribution of Population – Nobles County

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cities</td>
<td>14,708</td>
<td>17,030</td>
<td>15,283</td>
<td>16,508</td>
<td>17,078</td>
</tr>
<tr>
<td>Townships</td>
<td>7,132</td>
<td>6,068</td>
<td>5,549</td>
<td>4,870</td>
<td>4,747</td>
</tr>
<tr>
<td>Nobles County</td>
<td>21,840</td>
<td>20,098</td>
<td>20,832</td>
<td>21,378</td>
<td>21,825</td>
</tr>
</tbody>
</table>


While 45.4 percent of the county’s population lived in the rural areas in 1950, only 22.8 percent lived in townships in 2010. The loss in population numbers from the rural areas and increasing urban population is not unique to Nobles County, which is seen in the decline of the number of farmers. Populations in rural farming communities, like Nobles County, are interconnected to the agricultural economy.

The agricultural economy is a competitive industry and is often used in economics as an example of a perfectly competitive market. Competition in the agriculture industry has lead agricultural businesses to specialize and exploit economies of scale to stay competitive in the market place. Innovation, specialization, and economies of scale have resulted in an agriculture industry that has been able to supply agriculture demand with fewer workers. In addition, the migration of young people from the rural areas to more urban areas, and the elderly persons moving to warming states have contributed to the decline of the rural population and the growth of urban centers.

Population by County Subdivision
The overwhelming majority of county subdivision saw a decline in population from 2000 to 2010. The five county subdivisions that did not see a population decline from 2000 to 2010 was the city of Worthington (13.1 percent), Lorain township (6.8 percent), the Worthington township (3.8 percent), the city of Wilmont (2.1 percent), and the city of Bigelow (1.7 percent). The two largest population declines were in the city of Kinbrae with a (-42.9) percent decrease and the city of Dundee with a (-33.3) percent decrease.
Table #7  Distribution of Population by County Subdivision – Nobles County

<table>
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<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Adrian city</td>
<td>1,234</td>
<td>1,209</td>
<td>-2.0%</td>
<td>1,237</td>
</tr>
<tr>
<td>Bigelow city</td>
<td>231</td>
<td>235</td>
<td>1.7%</td>
<td>235</td>
</tr>
<tr>
<td>Bigelow township</td>
<td>384</td>
<td>373</td>
<td>-2.9%</td>
<td>368</td>
</tr>
<tr>
<td>Bloom township</td>
<td>213</td>
<td>158</td>
<td>-25.8%</td>
<td>156</td>
</tr>
<tr>
<td>Brewster city</td>
<td>502</td>
<td>473</td>
<td>-5.8%</td>
<td>484</td>
</tr>
<tr>
<td>Dewald township</td>
<td>291</td>
<td>254</td>
<td>-12.7%</td>
<td>241</td>
</tr>
<tr>
<td>Dundee city</td>
<td>102</td>
<td>68</td>
<td>-33.3%</td>
<td>65</td>
</tr>
<tr>
<td>Elk township</td>
<td>284</td>
<td>253</td>
<td>-10.9%</td>
<td>241</td>
</tr>
<tr>
<td>Ellsworth city</td>
<td>540</td>
<td>463</td>
<td>-14.3%</td>
<td>462</td>
</tr>
<tr>
<td>Graham Lakes township</td>
<td>251</td>
<td>218</td>
<td>-13.1%</td>
<td>230</td>
</tr>
<tr>
<td>Grand Prairie township</td>
<td>227</td>
<td>206</td>
<td>-9.3%</td>
<td>202</td>
</tr>
<tr>
<td>Hersey township</td>
<td>257</td>
<td>219</td>
<td>-14.8%</td>
<td>208</td>
</tr>
<tr>
<td>Indian Lake township</td>
<td>259</td>
<td>232</td>
<td>-10.4%</td>
<td>221</td>
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<tr>
<td>Kinbrae city</td>
<td>21</td>
<td>12</td>
<td>-42.9%</td>
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</tr>
<tr>
<td>Larkin township</td>
<td>218</td>
<td>188</td>
<td>-13.8%</td>
<td>176</td>
</tr>
<tr>
<td>Leota township</td>
<td>463</td>
<td>390</td>
<td>-15.8%</td>
<td>384</td>
</tr>
<tr>
<td>Lismore city</td>
<td>238</td>
<td>227</td>
<td>-4.6%</td>
<td>231</td>
</tr>
<tr>
<td>Lismore township</td>
<td>232</td>
<td>175</td>
<td>-24.6%</td>
<td>169</td>
</tr>
<tr>
<td>Little Rock township</td>
<td>260</td>
<td>211</td>
<td>-18.8%</td>
<td>194</td>
</tr>
<tr>
<td>Lorain township</td>
<td>278</td>
<td>297</td>
<td>6.8%</td>
<td>301</td>
</tr>
<tr>
<td>Olney township</td>
<td>232</td>
<td>205</td>
<td>-11.6%</td>
<td>194</td>
</tr>
<tr>
<td>Ransom township</td>
<td>271</td>
<td>230</td>
<td>-15.1%</td>
<td>219</td>
</tr>
<tr>
<td>Round Lake city</td>
<td>424</td>
<td>376</td>
<td>-11.3%</td>
<td>379</td>
</tr>
<tr>
<td>Rushmore city</td>
<td>376</td>
<td>342</td>
<td>-9.0%</td>
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</tr>
<tr>
<td>Seward township</td>
<td>259</td>
<td>208</td>
<td>-19.7%</td>
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</tr>
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<td>Summit Lake township</td>
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</tr>
<tr>
<td>Westside township</td>
<td>258</td>
<td>218</td>
<td>-15.5%</td>
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</tr>
<tr>
<td>Wilmont city</td>
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<td>339</td>
<td>2.1%</td>
<td>344</td>
</tr>
<tr>
<td>Wilmont township</td>
<td>228</td>
<td>184</td>
<td>-19.3%</td>
<td>176</td>
</tr>
<tr>
<td>Worthington city</td>
<td>11,283</td>
<td>12,764</td>
<td>13.1%</td>
<td>13,288</td>
</tr>
<tr>
<td>Worthington township</td>
<td>316</td>
<td>328</td>
<td>3.8%</td>
<td>322</td>
</tr>
<tr>
<td>Total</td>
<td>25,425</td>
<td>25,857</td>
<td>1.7%</td>
<td>21,825</td>
</tr>
</tbody>
</table>

**Population by Age Cohort**

Population by age cohort can help planners identify trends and make predictions based on these trends. Changes in age cohorts can also help government plan for changes in demand for services. If the childbearing cohorts decline, government can make predictions that student enrollments may decline in the near future. The largest gain in population by age cohort was the age group 55 to 64 with 31.3 percent. The largest loss in population by age cohort was 35 to 44 with (–18.6) percent.

<table>
<thead>
<tr>
<th>Age Group</th>
<th>2000</th>
<th>Percent of Total</th>
<th>2010</th>
<th>Percent of Total</th>
<th>Percent Change 2000 - 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-9</td>
<td>2937</td>
<td>14.1%</td>
<td>3155</td>
<td>1437%</td>
<td>7.4%</td>
</tr>
<tr>
<td>10-19</td>
<td>3165</td>
<td>15.2%</td>
<td>2904</td>
<td>13.6%</td>
<td>-8.2%</td>
</tr>
<tr>
<td>20-24</td>
<td>1133</td>
<td>5.4%</td>
<td>1358</td>
<td>6.4%</td>
<td>19.9%</td>
</tr>
<tr>
<td>25-34</td>
<td>2468</td>
<td>11.8%</td>
<td>2668</td>
<td>12.5%</td>
<td>8.1%</td>
</tr>
<tr>
<td>35-44</td>
<td>3076</td>
<td>14.8%</td>
<td>2504</td>
<td>11.7%</td>
<td>-18.6%</td>
</tr>
<tr>
<td>45-54</td>
<td>2585</td>
<td>12.4%</td>
<td>2948</td>
<td>13.8%</td>
<td>14.0%</td>
</tr>
<tr>
<td>55-64</td>
<td>1844</td>
<td>8.9%</td>
<td>2421</td>
<td>9.0%</td>
<td>31.3%</td>
</tr>
<tr>
<td>65-74</td>
<td>1678</td>
<td>8.1%</td>
<td>1562</td>
<td>7.3%</td>
<td>-6.9%</td>
</tr>
<tr>
<td>75-84</td>
<td>1329</td>
<td>6.4%</td>
<td>1189</td>
<td>5.5%</td>
<td>-10.5%</td>
</tr>
<tr>
<td>85+</td>
<td>617</td>
<td>3.0%</td>
<td>669</td>
<td>3.1%</td>
<td>8.4%</td>
</tr>
</tbody>
</table>

Source: U.S. Census 2000, 2010

**Median Age**

Cities in Nobles County had a small change in median age from 2000 to 2010, which was about a 12.0 percent increase. The largest two increases in the median age were in the City of Kinbrae with 32.5 percent, and in the City of Round Lake with 22.7 percent. The largest decrease in the median age was in the City of Worthington, with a decrease of (-7.5) percent. The City of Wilmont had the smallest change in median age, which was a (-3.7) percent decrease.

<table>
<thead>
<tr>
<th>City</th>
<th>2000</th>
<th>2010</th>
<th>Percent Change 2000-2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adrian</td>
<td>39.9</td>
<td>42.6</td>
<td>6.8%</td>
</tr>
<tr>
<td>Bigelow</td>
<td>32.3</td>
<td>34.5</td>
<td>6.8%</td>
</tr>
<tr>
<td>Brewster</td>
<td>35.2</td>
<td>39.5</td>
<td>12.2%</td>
</tr>
<tr>
<td>Dundee</td>
<td>43</td>
<td>50.7</td>
<td>17.9%</td>
</tr>
<tr>
<td>Ellsworth</td>
<td>44</td>
<td>51.7</td>
<td>17.5%</td>
</tr>
<tr>
<td>Kinbrae</td>
<td>41.5</td>
<td>55</td>
<td>32.5%</td>
</tr>
<tr>
<td>Lismore</td>
<td>39.1</td>
<td>44.1</td>
<td>12.8%</td>
</tr>
<tr>
<td>Round Lake</td>
<td>37.5</td>
<td>46</td>
<td>22.7%</td>
</tr>
<tr>
<td>Rushmore</td>
<td>37.8</td>
<td>41.5</td>
<td>9.8%</td>
</tr>
<tr>
<td>Wilmont</td>
<td>38.3</td>
<td>36.9</td>
<td>-3.7%</td>
</tr>
<tr>
<td>Worthington</td>
<td>36.2</td>
<td>33.5</td>
<td>-7.5%</td>
</tr>
</tbody>
</table>

Source: U.S. Census 2000, 2010
In townships in Nobles County the median age increased by 15.2 percent from 2000 to 2010. The largest increase in the median age was in Bloom Township, and the increase was 37.6 percent. The only decrease in the median age was in Worthington Township, with (-3.3) percent decrease.

Table #10  Median Age by Township – Nobles County

<table>
<thead>
<tr>
<th>Township</th>
<th>2000</th>
<th>2010</th>
<th>Percent Change 2000 - 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bigelow</td>
<td>39.6</td>
<td>41.4</td>
<td>4.5%</td>
</tr>
<tr>
<td>Bloom</td>
<td>33.8</td>
<td>46.5</td>
<td>37.6%</td>
</tr>
<tr>
<td>Dewald</td>
<td>39.5</td>
<td>48.6</td>
<td>23.0%</td>
</tr>
<tr>
<td>Elk</td>
<td>40</td>
<td>47.1</td>
<td>17.8%</td>
</tr>
<tr>
<td>Grand Prairie</td>
<td>38.9</td>
<td>43.8</td>
<td>12.6%</td>
</tr>
<tr>
<td>Graham Lakes</td>
<td>38.2</td>
<td>43.6</td>
<td>14.1%</td>
</tr>
<tr>
<td>Hersey</td>
<td>35.8</td>
<td>41.9</td>
<td>17.0%</td>
</tr>
<tr>
<td>Indian Lake</td>
<td>41.2</td>
<td>44.4</td>
<td>7.8%</td>
</tr>
<tr>
<td>Larkin</td>
<td>35.3</td>
<td>39.8</td>
<td>12.7%</td>
</tr>
<tr>
<td>Leota</td>
<td>44.3</td>
<td>50.8</td>
<td>14.7%</td>
</tr>
<tr>
<td>Little Rock</td>
<td>33.3</td>
<td>41.9</td>
<td>25.8%</td>
</tr>
<tr>
<td>Lismore</td>
<td>33.7</td>
<td>43.2</td>
<td>28.2%</td>
</tr>
<tr>
<td>Lorain</td>
<td>44</td>
<td>45.9</td>
<td>4.3%</td>
</tr>
<tr>
<td>Olney</td>
<td>33.3</td>
<td>41.5</td>
<td>24.6%</td>
</tr>
<tr>
<td>Ransom</td>
<td>39.5</td>
<td>47.2</td>
<td>19.5%</td>
</tr>
<tr>
<td>Seward</td>
<td>40.6</td>
<td>46.5</td>
<td>14.5%</td>
</tr>
<tr>
<td>Summit Lake</td>
<td>36.1</td>
<td>41.1</td>
<td>13.9%</td>
</tr>
<tr>
<td>Westside</td>
<td>34.2</td>
<td>37.2</td>
<td>8.8%</td>
</tr>
<tr>
<td>Wilmont</td>
<td>40.4</td>
<td>47.8</td>
<td>18.3%</td>
</tr>
<tr>
<td>Worthington</td>
<td>45.8</td>
<td>44.3</td>
<td>-3.3%</td>
</tr>
</tbody>
</table>

Source: U.S. Census 2000, 2010

In Nobles County the median age remained unchanged from 2000 to 2010. The median age in Nobles County is 3.0 years lower than Region 8 and is 0.1 year higher than the State of Minnesota, while Region 8 has a median age that is 3.1 years higher than the State of Minnesota.

Table #11  Median Age by County/Region/State

<table>
<thead>
<tr>
<th></th>
<th>2000</th>
<th>2010</th>
<th>Percent Change 2000 - 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nobles County</td>
<td>37.5</td>
<td>37.5</td>
<td>0.0%</td>
</tr>
<tr>
<td>Region 8</td>
<td>38.7</td>
<td>40.5</td>
<td>4.6%</td>
</tr>
<tr>
<td>Minnesota</td>
<td>35.4</td>
<td>37.4</td>
<td>5.6%</td>
</tr>
</tbody>
</table>

Source: U.S. Census 2000, 2010
**Population by Race**

From the 1990’s, the Caucasian population of Nobles County continued to decline while the majority of the minority groups increased by significant percentages. The population for each non-white race in 2010 had significantly increased in number since the 2000 census. This growth has led to the 2.6 percent increase in total population for one race. Nobles County has 4,820 residents who identified as Hispanic/Latino in 2010 US Census (22.5% of the population). In 2000, the Hispanic/Latino population in the county was 2,325 or 11.2%. The increases are consistent with population trends which indicate the minority populations in the county will continue to increase over the next few decades.

**Table #12**

<table>
<thead>
<tr>
<th>Population by One Race – Nobles County</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000 Number</td>
</tr>
<tr>
<td>White</td>
</tr>
<tr>
<td>Black or African American</td>
</tr>
<tr>
<td>American Indian and Alaska Native</td>
</tr>
<tr>
<td>Asian</td>
</tr>
<tr>
<td>Native Hawaiian / other Pacific Islander</td>
</tr>
<tr>
<td>Some Other Race</td>
</tr>
<tr>
<td>Two or More Races</td>
</tr>
<tr>
<td>Total Population</td>
</tr>
</tbody>
</table>

Source: U.S. Census 2000, 2010

Diversity in Nobles County influences the number of spoken languages. Roughly 72 percent of residents in Nobles County only speak English. There are a number of other languages that are spoken in Nobles County, that include: Spanish or Spanish Creole, other Indo-European, Russian, Somali, Asian and Pacific Island languages.

**Table #13**

<table>
<thead>
<tr>
<th>Language Spoken At Home – Nobles County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject</td>
</tr>
<tr>
<td>Speak only English</td>
</tr>
<tr>
<td>Speak a language other than English</td>
</tr>
<tr>
<td>Spanish or Spanish Creole</td>
</tr>
<tr>
<td>Other Indo-European</td>
</tr>
<tr>
<td>Asian and Pacific Island Languages</td>
</tr>
<tr>
<td>Other Language</td>
</tr>
</tbody>
</table>

Source: 2015 American Community Survey 5-Year Estimates
4.5.2 Population Projections

Population projections from the MN Department of Administration’s State Demographic Office show that the population in Nobles County is projected to increase by only 0.9 percent from 2015 to 2050. The projections show a dramatic 33 percent increase in the age cohorts 70+ from 2015 to 2050. The population for the age cohorts 10 - 24 and 35 – 49 are also projected to increase by percentages ranging from 2.0 to 15.8. The other population cohorts are expected have decreases during the same time period and the age cohort with the greatest decrease in population is ages 50 – 64 population. Nobles County communities will undoubtedly be impacted by the changing age structure of their communities. The county must ensure that services and needs are met as the population gradually becomes older and the demands for public services change. In the next three decades, local governments throughout the State will find themselves dealing with an aging population and attempting to improve the safety and welfare of an older and a more diverse community.
### Table #14: Population Projections – Nobles County

<table>
<thead>
<tr>
<th>Age Group</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
<th>2035</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Male</td>
<td>Female</td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td>0 to 4</td>
<td>884</td>
<td>772</td>
<td>705</td>
<td>694</td>
<td>778</td>
</tr>
<tr>
<td>5 to 9</td>
<td>828</td>
<td>831</td>
<td>802</td>
<td>696</td>
<td>711</td>
</tr>
<tr>
<td>10 to 14</td>
<td>792</td>
<td>831</td>
<td>740</td>
<td>740</td>
<td>721</td>
</tr>
<tr>
<td>15 to 19</td>
<td>760</td>
<td>816</td>
<td>740</td>
<td>769</td>
<td>846</td>
</tr>
<tr>
<td>20 to 24</td>
<td>772</td>
<td>828</td>
<td>758</td>
<td>801</td>
<td>903</td>
</tr>
<tr>
<td>25 to 29</td>
<td>758</td>
<td>679</td>
<td>526</td>
<td>573</td>
<td>794</td>
</tr>
<tr>
<td>30 to 34</td>
<td>739</td>
<td>660</td>
<td>677</td>
<td>606</td>
<td>606</td>
</tr>
<tr>
<td>35 to 39</td>
<td>637</td>
<td>708</td>
<td>681</td>
<td>649</td>
<td>581</td>
</tr>
<tr>
<td>40 to 44</td>
<td>651</td>
<td>640</td>
<td>539</td>
<td>577</td>
<td>651</td>
</tr>
<tr>
<td>45 to 49</td>
<td>659</td>
<td>613</td>
<td>543</td>
<td>533</td>
<td>668</td>
</tr>
<tr>
<td>50 to 54</td>
<td>712</td>
<td>593</td>
<td>527</td>
<td>487</td>
<td>539</td>
</tr>
<tr>
<td>55 to 59</td>
<td>750</td>
<td>670</td>
<td>621</td>
<td>516</td>
<td>515</td>
</tr>
<tr>
<td>60 to 64</td>
<td>662</td>
<td>730</td>
<td>655</td>
<td>583</td>
<td>540</td>
</tr>
<tr>
<td>65 to 69</td>
<td>493</td>
<td>601</td>
<td>659</td>
<td>659</td>
<td>588</td>
</tr>
<tr>
<td>70 to 74</td>
<td>378</td>
<td>463</td>
<td>474</td>
<td>563</td>
<td>618</td>
</tr>
<tr>
<td>75 to 79</td>
<td>279</td>
<td>326</td>
<td>392</td>
<td>480</td>
<td>485</td>
</tr>
<tr>
<td>80 to 84</td>
<td>211</td>
<td>299</td>
<td>251</td>
<td>349</td>
<td>308</td>
</tr>
<tr>
<td>85+</td>
<td>201</td>
<td>164</td>
<td>156</td>
<td>321</td>
<td>166</td>
</tr>
<tr>
<td>Gender totals</td>
<td>11,166</td>
<td>10,542</td>
<td>11,158</td>
<td>10,553</td>
<td>11,125</td>
</tr>
<tr>
<td>Total Population</td>
<td>21,708</td>
<td>21,711</td>
<td>21,664</td>
<td>21,617</td>
<td>21,627</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age Group</th>
<th>2040</th>
<th>2045</th>
<th>2050</th>
<th>Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 4</td>
<td>844</td>
<td>840</td>
<td>822</td>
<td>-7.0%</td>
</tr>
<tr>
<td>5 to 9</td>
<td>771</td>
<td>803</td>
<td>803</td>
<td>-3.1%</td>
</tr>
<tr>
<td>10 to 14</td>
<td>739</td>
<td>784</td>
<td>821</td>
<td>3.7%</td>
</tr>
<tr>
<td>15 to 19</td>
<td>736</td>
<td>764</td>
<td>813</td>
<td>7.0%</td>
</tr>
<tr>
<td>20 to 24</td>
<td>801</td>
<td>800</td>
<td>831</td>
<td>7.7%</td>
</tr>
<tr>
<td>25 to 29</td>
<td>836</td>
<td>740</td>
<td>745</td>
<td>1.6%</td>
</tr>
<tr>
<td>30 to 34</td>
<td>748</td>
<td>759</td>
<td>676</td>
<td>-8.4%</td>
</tr>
<tr>
<td>35 to 39</td>
<td>684</td>
<td>723</td>
<td>738</td>
<td>15.8%</td>
</tr>
<tr>
<td>40 to 44</td>
<td>641</td>
<td>700</td>
<td>745</td>
<td>14.5%</td>
</tr>
<tr>
<td>45 to 49</td>
<td>553</td>
<td>612</td>
<td>672</td>
<td>2.0%</td>
</tr>
<tr>
<td>50 to 54</td>
<td>558</td>
<td>504</td>
<td>567</td>
<td>-20.4%</td>
</tr>
<tr>
<td>55 to 59</td>
<td>574</td>
<td>532</td>
<td>485</td>
<td>-35.4%</td>
</tr>
<tr>
<td>60 to 64</td>
<td>497</td>
<td>566</td>
<td>528</td>
<td>-20.3%</td>
</tr>
<tr>
<td>65 to 69</td>
<td>457</td>
<td>456</td>
<td>524</td>
<td>6.3%</td>
</tr>
<tr>
<td>70 to 74</td>
<td>463</td>
<td>435</td>
<td>437</td>
<td>15.7%</td>
</tr>
<tr>
<td>75 to 79</td>
<td>480</td>
<td>487</td>
<td>384</td>
<td>37.5%</td>
</tr>
<tr>
<td>80 to 84</td>
<td>416</td>
<td>376</td>
<td>320</td>
<td>51.7%</td>
</tr>
<tr>
<td>85+</td>
<td>238</td>
<td>275</td>
<td>271</td>
<td>34.6%</td>
</tr>
<tr>
<td>Gender totals</td>
<td>11,036</td>
<td>10,626</td>
<td>11,075</td>
<td>10,666</td>
</tr>
<tr>
<td>Total Population</td>
<td>21,662</td>
<td>21,741</td>
<td>21,911</td>
<td>0.9%</td>
</tr>
</tbody>
</table>

Source: Minnesota Department of Administration
4.6 Housing

Household characteristics have a direct impact on land use, demand for housing, government services, and public education. Changes in demographics are part of the driving forces that contribute to changes in housing characteristics and demand for housing. Planning and consideration needs to take place at the local levels to ensure the supply of housing is adequate to meet the demand.

The age cohorts that include 60 through 85+ are projected to increase by over 13 percent from 2015 to 2050. This aging population change requires different housing needs than younger cohorts. Assisted living facilities and nursing homes are two types of facilities that will help to accommodate this population change. The 60 plus age population also have to be considered in emergency planning, since a number of persons in this age range may have trouble evacuating a building and performing other safety protocol. This cohort and youth cohorts have to have special considerations when it comes to emergency planning.

There are a number of other considerations that have to be made when it comes to emergency planning. The age of a structure is one variable that impacts how well a structure will withstand a disaster. The age of a structure also impacts the ability to repair a structure after a disaster. The building materials used to construct the structure and the maintenance of the structure are two other variables in whether a structure can withstand a disaster. There are a number of other variables that impact the ability of a structure to withstand the stresses of a disaster.
4.6.1 Housing Units
According to the U.S. Census Bureau, in Nobles County 27.1 percent of housing units were built in 1939 or earlier. Almost 40 percent of the housing units in Nobles County were built in 1970 to 2013, while 47.8 percent of housing units were built before 1950. Nobles County still has an older housing stock which impacts the county’s ability to withstand a disaster.

Table #15  
**Build Year of Housing Units – Nobles County**

<table>
<thead>
<tr>
<th>Year Built</th>
<th>Housing Units</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Built 2014 to 2015</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Built 2010 to 2013</td>
<td>54</td>
<td>0.6%</td>
</tr>
<tr>
<td>Built 2000 to 2009</td>
<td>620</td>
<td>7.2%</td>
</tr>
<tr>
<td>Built 1990 to 1999</td>
<td>656</td>
<td>7.7%</td>
</tr>
<tr>
<td>Built 1980 to 1989</td>
<td>705</td>
<td>8.2%</td>
</tr>
<tr>
<td>Built 1970 to 1979</td>
<td>1318</td>
<td>15.4%</td>
</tr>
<tr>
<td>Built 1960 to 1969</td>
<td>1118</td>
<td>13.0%</td>
</tr>
<tr>
<td>Built 1950 to 1959</td>
<td>1,073</td>
<td>12.5%</td>
</tr>
<tr>
<td>Built 1940 to 1949</td>
<td>701</td>
<td>8.2%</td>
</tr>
<tr>
<td>Built 1939 or earlier</td>
<td>2,324</td>
<td>27.1%</td>
</tr>
<tr>
<td><strong>Total Housing Units</strong></td>
<td><strong>8,569</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: U.S. Census Bureau, 2015 ACS

Figure #8  
**Building Year of Housing Units – Nobles County**
There were a total of 46,762 housing units in Region 8 in 1970. Region 8 experienced a 12.98 percent increase in housing units from 1970 to 1980. From 1970 to 2000, there was a 12.13 percent increase in housing units for Region 8. From 2000 to 2010, there was a 1.73 percent increasing in housing units for Region 8. In total, there was a 14.9 percent increase in housing units from 1970 through 2010.

For Nobles County, the total number of housing units fluctuated from 1970, with a 10.1 percent (826 actual units) increase from 1970 to 1980, then declined by a (-1.5) percent (-118 actual units) decrease from 1980 to 1990, a 4.4 percent (371 actual units) increase from 1990 to 2000, and a 0.8 percent (70 actual units) increase from 2000 to 2010. Nobles County saw the third largest housing units’ growth among Region 8 counties, with a 15.6 percent (1,149 actual units) increase from 1970 to 2010 overall.

### Table #16  
**Housing Unit Trends – Region 8**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cottonwood</td>
<td>5,130</td>
<td>5,804</td>
<td>5,495</td>
<td>5,376</td>
<td>5,419</td>
<td>5.6%</td>
</tr>
<tr>
<td>Jackson</td>
<td>4,918</td>
<td>5,525</td>
<td>5,121</td>
<td>5,092</td>
<td>4,990</td>
<td>1.5%</td>
</tr>
<tr>
<td>Lincoln</td>
<td>2,882</td>
<td>3,298</td>
<td>3,050</td>
<td>3,043</td>
<td>3,108</td>
<td>7.8%</td>
</tr>
<tr>
<td>Lyon</td>
<td>7,526</td>
<td>9,196</td>
<td>9,675</td>
<td>10,298</td>
<td>11,098</td>
<td>47.5%</td>
</tr>
<tr>
<td>Murray</td>
<td>4,236</td>
<td>4,679</td>
<td>4,611</td>
<td>4,357</td>
<td>4,556</td>
<td>7.6%</td>
</tr>
<tr>
<td>Nobles</td>
<td>7,386</td>
<td>8,212</td>
<td>8,094</td>
<td>8,465</td>
<td>8,535</td>
<td>15.6%</td>
</tr>
<tr>
<td>Pipestone</td>
<td>4,286</td>
<td>4,636</td>
<td>4,387</td>
<td>4,434</td>
<td>4,483</td>
<td>4.6%</td>
</tr>
<tr>
<td>Redwood</td>
<td>6,718</td>
<td>7,388</td>
<td>7,144</td>
<td>7,230</td>
<td>7,272</td>
<td>8.2%</td>
</tr>
<tr>
<td>Rock</td>
<td>3,680</td>
<td>4,095</td>
<td>3,963</td>
<td>4,137</td>
<td>4,262</td>
<td>15.8%</td>
</tr>
<tr>
<td>Region 8</td>
<td>46,762</td>
<td>52,833</td>
<td>51,540</td>
<td>52,432</td>
<td>53,723</td>
<td>14.9%</td>
</tr>
</tbody>
</table>


### Population by Household

Nobles County’s population in households remained virtually the same until the 2010 census, with a decrease of (-14.4) percent from 1990 to 2010, mostly from a decline in the 2010 census. The U.S. Census defines households as the total number of occupied housing units, and household units as the total number of livable dwellings that are available. This population trend of households was not the trend of the number of housing units, which had an increase, by 15.6 percent from 1990 to 2010.

As the result of the decreasing populations in households, the persons per household increased from 2.2 in 1990 to 2.64 in 2010. The increase over that time period was 20.0 percent. The Minnesota State Demographer estimates persons per household to be 2.67 in 2016. This is partially due to the number of elderly living alone, which poses a number of concerns in regards to emergency preparedness.

The Housing Summary Table shows the number of householders living alone and the number of householders 65 years and over living alone. There are 2,121 householders living alone and 1,001 householders 65 years and over living alone.
Table #17  
**Population by Household – Nobles County**

<table>
<thead>
<tr>
<th></th>
<th>1990</th>
<th>2000</th>
<th>2010</th>
<th>Percent Change</th>
<th>2016 Estimate*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Households</strong></td>
<td>7,683</td>
<td>7,939</td>
<td>6,580</td>
<td>16.8%</td>
<td>8,031</td>
</tr>
<tr>
<td><strong>Housing Units</strong></td>
<td>8,094</td>
<td>8,465</td>
<td>8,535</td>
<td>15.6%</td>
<td>NA</td>
</tr>
<tr>
<td><strong>Average household Size</strong></td>
<td>2.2</td>
<td>2.39</td>
<td>2.64</td>
<td>20.0%</td>
<td>2.67</td>
</tr>
</tbody>
</table>


In Nobles County 72.8 percent of occupied housing units are owner-occupied. In Region 8, 74.9 percent of occupied housing units are owner-occupied. Nobles County has seen continued fluctuation in the number of owner-occupied housing units over the past four decades. From 1970 to 2010, Nobles County has seen a 12.1 percent increase in owner-occupied housing units, which has been the third greatest increase in Region 8. During that same time period, Region 8 saw a 4.6 percent decrease in owner-occupied housing units.

Table #18  
**Housing Occupancy – Region 8**

<table>
<thead>
<tr>
<th>County</th>
<th>Total Occupied 2010</th>
<th>Owner-Occupied 2010 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cottonwood</td>
<td>4,912</td>
<td>79.6%</td>
</tr>
<tr>
<td>Jackson</td>
<td>4,429</td>
<td>78.3%</td>
</tr>
<tr>
<td>Lincoln</td>
<td>2,574</td>
<td>80.2%</td>
</tr>
<tr>
<td>Lyon</td>
<td>10,227</td>
<td>66.5%</td>
</tr>
<tr>
<td>Murray</td>
<td>3,717</td>
<td>82.6%</td>
</tr>
<tr>
<td>Nobles</td>
<td>7,946</td>
<td>72.8%</td>
</tr>
<tr>
<td>Pipestone</td>
<td>4,054</td>
<td>74.9%</td>
</tr>
<tr>
<td>Redwood</td>
<td>6,580</td>
<td>78.0%</td>
</tr>
<tr>
<td>Rock</td>
<td>3,918</td>
<td>77.4%</td>
</tr>
<tr>
<td>Region 8</td>
<td>48,357</td>
<td>74.9%</td>
</tr>
</tbody>
</table>

Source: U.S. Census 2010

Table #19  
**Owner-Occupied Housing Occupancy – Region 8**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cottonwood</td>
<td>3,760</td>
<td>4,243</td>
<td>3,925</td>
<td>3,955</td>
<td>3,757</td>
<td>-0.1%</td>
</tr>
<tr>
<td>Jackson</td>
<td>3,356</td>
<td>3,781</td>
<td>3,477</td>
<td>3,601</td>
<td>3,466</td>
<td>3.3%</td>
</tr>
<tr>
<td>Lincoln</td>
<td>2,131</td>
<td>2,323</td>
<td>2,161</td>
<td>2,130</td>
<td>2,063</td>
<td>-3.2%</td>
</tr>
<tr>
<td>Lyon</td>
<td>5,107</td>
<td>6,203</td>
<td>6,207</td>
<td>6,643</td>
<td>6,799</td>
<td>33.1%</td>
</tr>
<tr>
<td>Murray</td>
<td>2,821</td>
<td>3,181</td>
<td>2,982</td>
<td>3,135</td>
<td>3,070</td>
<td>8.8%</td>
</tr>
<tr>
<td>Nobles</td>
<td>5,161</td>
<td>5,928</td>
<td>5,791</td>
<td>5,955</td>
<td>5,783</td>
<td>12.1%</td>
</tr>
<tr>
<td>Pipestone</td>
<td>3,066</td>
<td>3,358</td>
<td>3,129</td>
<td>3,173</td>
<td>3,035</td>
<td>-1.0%</td>
</tr>
<tr>
<td>Redwood</td>
<td>4,587</td>
<td>5,252</td>
<td>5,055</td>
<td>5,328</td>
<td>5,135</td>
<td>11.9%</td>
</tr>
<tr>
<td>Rock</td>
<td>2,519</td>
<td>2,868</td>
<td>2,826</td>
<td>2,994</td>
<td>3,031</td>
<td>20.3%</td>
</tr>
<tr>
<td>Region 8</td>
<td>32,508</td>
<td>37,137</td>
<td>35,553</td>
<td>36,914</td>
<td>31,009</td>
<td>-4.6%</td>
</tr>
</tbody>
</table>


The trend of renter-occupied units in Nobles County was similar with the owner-occupied units, which had a continued increase over the past four decades. From 1970 to 2010, the percentage change in
renter-occupied housing units increased by 16.0 percent (299 actual units). The demand for renter-occupied housing units may increase as the population ages and moves from owner-occupied housing units to assisted living facilities and other rental facilities, and the overall growing population in Nobles County.

Table #20  
**Renter – Occupied Housing Occupancy – Region 8**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cottonwood</td>
<td>1,053</td>
<td>1,233</td>
<td>1,134</td>
<td>962</td>
<td>1,003</td>
<td>-4.7%</td>
</tr>
<tr>
<td>Jackson</td>
<td>1,193</td>
<td>1,207</td>
<td>1,083</td>
<td>955</td>
<td>963</td>
<td>-19.3%</td>
</tr>
<tr>
<td>Lincoln</td>
<td>448</td>
<td>605</td>
<td>543</td>
<td>523</td>
<td>511</td>
<td>14.1%</td>
</tr>
<tr>
<td>Lyon</td>
<td>1,930</td>
<td>2,476</td>
<td>2,866</td>
<td>3,072</td>
<td>3,428</td>
<td>77.6%</td>
</tr>
<tr>
<td>Murray</td>
<td>897</td>
<td>855</td>
<td>776</td>
<td>587</td>
<td>647</td>
<td>-27.9%</td>
</tr>
<tr>
<td>Nobles</td>
<td>1,864</td>
<td>1,886</td>
<td>1,892</td>
<td>1,984</td>
<td>2,163</td>
<td>16.0%</td>
</tr>
<tr>
<td>Pipestone</td>
<td>996</td>
<td>999</td>
<td>949</td>
<td>896</td>
<td>1,019</td>
<td>2.3%</td>
</tr>
<tr>
<td>Redwood</td>
<td>1,579</td>
<td>1,600</td>
<td>1,499</td>
<td>1,346</td>
<td>1,445</td>
<td>-8.5%</td>
</tr>
<tr>
<td>Rock</td>
<td>975</td>
<td>987</td>
<td>928</td>
<td>849</td>
<td>887</td>
<td>-9.0%</td>
</tr>
<tr>
<td>Region 8</td>
<td>10,935</td>
<td>11,848</td>
<td>11,670</td>
<td>11,174</td>
<td>10,622</td>
<td>-2.9%</td>
</tr>
</tbody>
</table>


4.6.2 Vacant Housing Units

The 1970 U.S. Census reported that Nobles County had 350 vacant housing units. This number increased by 33, to 383 units from 1970 to 1980. The number of vacant housing units increased again from 1980 to 1990 by 28 units to 411. The number of vacant housing drastically increased by 115 units between 1990 and 2000. Between 2000 and 2010, the number rose again by 63 units to 589.

In 1990, the Census Bureau began to separate owner and renter vacant housing units. The combined percentages of the new data are higher than the actual vacant units year round. The numbers include unoccupied units for sale and housing used for seasonal, recreational, or occasional use. The rise of vacant housing units from 1970 to 1990 is mainly contributed to the overall decrease in rural population partially due to outmigration in Nobles County and other rural counties.

Table #21  
**Vacant Housing – Region 8**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cottonwood</td>
<td>317</td>
<td>318</td>
<td>435</td>
<td>459</td>
<td>507</td>
<td>59.9%</td>
</tr>
<tr>
<td>Jackson</td>
<td>322</td>
<td>379</td>
<td>561</td>
<td>536</td>
<td>561</td>
<td>74.2%</td>
</tr>
<tr>
<td>Lincoln</td>
<td>280</td>
<td>324</td>
<td>346</td>
<td>390</td>
<td>534</td>
<td>90.7%</td>
</tr>
<tr>
<td>Lyon</td>
<td>484</td>
<td>512</td>
<td>602</td>
<td>583</td>
<td>871</td>
<td>80.0%</td>
</tr>
<tr>
<td>Murray</td>
<td>463</td>
<td>445</td>
<td>853</td>
<td>635</td>
<td>839</td>
<td>81.2%</td>
</tr>
<tr>
<td>Nobles</td>
<td>350</td>
<td>383</td>
<td>411</td>
<td>526</td>
<td>589</td>
<td>68.3%</td>
</tr>
<tr>
<td>Pipestone</td>
<td>224</td>
<td>278</td>
<td>309</td>
<td>365</td>
<td>429</td>
<td>91.5%</td>
</tr>
<tr>
<td>Redwood</td>
<td>520</td>
<td>523</td>
<td>590</td>
<td>556</td>
<td>692</td>
<td>33.1%</td>
</tr>
<tr>
<td>Rock</td>
<td>182</td>
<td>239</td>
<td>209</td>
<td>294</td>
<td>344</td>
<td>89.0%</td>
</tr>
<tr>
<td>Region 8</td>
<td>3,142</td>
<td>3,401</td>
<td>4,316</td>
<td>4,344</td>
<td>5,366</td>
<td>70.8%</td>
</tr>
</tbody>
</table>

In 2010, 6.9 percent of the housing units in Nobles County were vacant, which was below the 9.7 percent in Region 8. The percentage of a county’s housing units being vacant adversely affects preparing for and cleaning up after a disaster.

Table #22

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cottonwood</td>
<td>6.6%</td>
<td>5.8%</td>
<td>8.6%</td>
<td>8.5%</td>
<td>9.4%</td>
</tr>
<tr>
<td>Jackson</td>
<td>7.1%</td>
<td>7.6%</td>
<td>12.3%</td>
<td>10.5%</td>
<td>11.2%</td>
</tr>
<tr>
<td>Lincoln</td>
<td>10.9%</td>
<td>11.1%</td>
<td>12.8%</td>
<td>12.8%</td>
<td>17.2%</td>
</tr>
<tr>
<td>Lyon</td>
<td>6.9%</td>
<td>5.9%</td>
<td>6.6%</td>
<td>5.7%</td>
<td>7.8%</td>
</tr>
<tr>
<td>Murray</td>
<td>12.5%</td>
<td>11.0%</td>
<td>22.7%</td>
<td>14.6%</td>
<td>18.4%</td>
</tr>
<tr>
<td>Nobles</td>
<td>5.0%</td>
<td>4.9%</td>
<td>5.3%</td>
<td>6.2%</td>
<td>6.9%</td>
</tr>
<tr>
<td>Pipestone</td>
<td>5.5%</td>
<td>6.4%</td>
<td>7.6%</td>
<td>8.2%</td>
<td>9.6%</td>
</tr>
<tr>
<td>Redwood</td>
<td>8.4%</td>
<td>7.6%</td>
<td>9.0%</td>
<td>7.7%</td>
<td>9.5%</td>
</tr>
<tr>
<td>Rock</td>
<td>5.2%</td>
<td>6.2%</td>
<td>5.6%</td>
<td>7.1%</td>
<td>8.1%</td>
</tr>
<tr>
<td>Region 8</td>
<td>7.1%</td>
<td>6.8%</td>
<td>8.9%</td>
<td>8.1%</td>
<td>9.7%</td>
</tr>
</tbody>
</table>


**Housing Unit Value**

Nobles County has the fourth highest median housing unit value in Region 8 and higher median rent than the Region 8 average. The median rent is 16 dollars more than the Region 8 average. The cost of a disaster is potentially higher in Nobles County when compared to Region 8 averages.

Table #23

<table>
<thead>
<tr>
<th>County</th>
<th>Median Housing Unit Value</th>
<th>Median Rent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cottonwood</td>
<td>$81,800</td>
<td>$454</td>
</tr>
<tr>
<td>Jackson</td>
<td>$100,300</td>
<td>$543</td>
</tr>
<tr>
<td>Lincoln</td>
<td>$76,300</td>
<td>$477</td>
</tr>
<tr>
<td>Lyon</td>
<td>$136,300</td>
<td>$543</td>
</tr>
<tr>
<td>Murray</td>
<td>$90,000</td>
<td>$521</td>
</tr>
<tr>
<td>Nobles</td>
<td>$97,200</td>
<td>$554</td>
</tr>
<tr>
<td>Pipestone</td>
<td>$85,100</td>
<td>$576</td>
</tr>
<tr>
<td>Redwood</td>
<td>$88,300</td>
<td>$557</td>
</tr>
<tr>
<td>Rock</td>
<td>$99,200</td>
<td>$567</td>
</tr>
<tr>
<td>Region 8</td>
<td>$100,904</td>
<td>$538</td>
</tr>
</tbody>
</table>

Source: U.S. Census 2010
### Table #24  
**Housing Summary: 2015 – Nobles County**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Population</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In Households</td>
<td>6,580</td>
<td>100%</td>
</tr>
<tr>
<td>In Group Quarters</td>
<td>430*</td>
<td>6.5%</td>
</tr>
<tr>
<td><strong>Total Households</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family Households</td>
<td>5,431</td>
<td>68.3%</td>
</tr>
<tr>
<td>Non Family Households</td>
<td>2,515</td>
<td>31.7%</td>
</tr>
<tr>
<td>Householder Living Alone</td>
<td>2,121</td>
<td>26.7%</td>
</tr>
<tr>
<td>Households 65 years and over living Alone</td>
<td>1,001</td>
<td>12.6%</td>
</tr>
<tr>
<td>Households with Individuals under 18</td>
<td>2,572</td>
<td>32.4%</td>
</tr>
<tr>
<td>Households with Individuals 65 and over</td>
<td>2,293</td>
<td>28.9%</td>
</tr>
<tr>
<td>Average Household Size</td>
<td>2.64</td>
<td>(X)</td>
</tr>
<tr>
<td><strong>Units in Structure</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 unit, detached</td>
<td>6,242</td>
<td>79.6%</td>
</tr>
<tr>
<td>1 unit, attached</td>
<td>259</td>
<td>3.3%</td>
</tr>
<tr>
<td>2 units/apartments</td>
<td>110</td>
<td>1.4%</td>
</tr>
<tr>
<td>3 or 4 units / apartments</td>
<td>243</td>
<td>3.1%</td>
</tr>
<tr>
<td>5 to 9 units / apartments</td>
<td>149</td>
<td>1.9%</td>
</tr>
<tr>
<td>10 or more units / apartments</td>
<td>753</td>
<td>9.6%</td>
</tr>
<tr>
<td>Mobile Home</td>
<td>86</td>
<td>1.1%</td>
</tr>
<tr>
<td><strong>Vehicles Available</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>455</td>
<td>5.8%</td>
</tr>
<tr>
<td>1 Vehicle</td>
<td>2,409</td>
<td>30.7%</td>
</tr>
<tr>
<td>2 Vehicles</td>
<td>2,942</td>
<td>37.5%</td>
</tr>
<tr>
<td>3 or more</td>
<td>2,036</td>
<td>26.0%</td>
</tr>
<tr>
<td><strong>House Heating Fuel</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Utility Gas</td>
<td>3427</td>
<td>43.7%</td>
</tr>
<tr>
<td>Bottled, tank, or LP gas</td>
<td>2,455</td>
<td>31.3%</td>
</tr>
<tr>
<td>Electricity</td>
<td>1,372</td>
<td>17.5%</td>
</tr>
<tr>
<td>Fuel oil, kerosene, etc.</td>
<td>369</td>
<td>4.7%</td>
</tr>
<tr>
<td>Coal or coke</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>All other fuel</td>
<td>173</td>
<td>2.2%</td>
</tr>
<tr>
<td>No fuel used</td>
<td>47</td>
<td>0.6%</td>
</tr>
<tr>
<td><strong>Selected Characteristics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lacking complete plumbing facilities</td>
<td>44</td>
<td>0.6%</td>
</tr>
<tr>
<td>Lacking complete kitchen facilities</td>
<td>1,103</td>
<td>1.4%</td>
</tr>
<tr>
<td>No telephone service</td>
<td>212</td>
<td>2.7%</td>
</tr>
</tbody>
</table>

Source: U.S. Census 2015 ACS, 2016 ACS*
4.7 Employment

Nobles County had an estimated employment of 10,360 persons in 2016, including 8,893 employments by private ownership and 1,467 employments by government ownership. The two largest employers by industry were the Manufacturing Industry and Trade, Transportation and Utilities Industry, followed by the Education and Health Services Industry. The industry cohort Natural Resources and Mining including Agricultural, Forestry, Fishing, Hunting and Mining, is estimated to be higher, but self-employed farms workers are not reported in Department of Employment and Economic Development figures.

Table #25 Employment by Industry – Nobles County

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Resources and Mining</td>
<td>92</td>
<td>250</td>
<td>321</td>
</tr>
<tr>
<td>Construction</td>
<td>308</td>
<td>255</td>
<td>248</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>2,362</td>
<td>2,774</td>
<td>2,831</td>
</tr>
<tr>
<td>Trade, Transportation and Utilities</td>
<td>2,700</td>
<td>2,426</td>
<td>2,183</td>
</tr>
<tr>
<td>Information</td>
<td>153</td>
<td>133</td>
<td>128</td>
</tr>
<tr>
<td>Financial Activities</td>
<td>348</td>
<td>287</td>
<td>450</td>
</tr>
<tr>
<td>Professional and Business Services</td>
<td>337</td>
<td>491</td>
<td>659</td>
</tr>
<tr>
<td>Education and Health Services</td>
<td>1,926</td>
<td>1,995</td>
<td>2,145</td>
</tr>
<tr>
<td>Leisure and Hospitality</td>
<td>864</td>
<td>829</td>
<td>623</td>
</tr>
<tr>
<td>Other Services</td>
<td>391</td>
<td>412</td>
<td>398</td>
</tr>
<tr>
<td>Public Administration</td>
<td>417</td>
<td>383</td>
<td>371</td>
</tr>
<tr>
<td><strong>All Industries</strong></td>
<td><strong>9,898</strong></td>
<td><strong>10,236</strong></td>
<td><strong>10,360</strong></td>
</tr>
</tbody>
</table>

Source: Department of Employment and Economic Development

Agriculture is a significant driving force in Nobles County. The USDA 2007 Census of Agriculture showed that there were 995 farms in Nobles County in 2012, (-9.0) percent decrease from 2007. In 2012, the average farm size was 382 acres, a (-1.0) percent decrease from 2007. The average farm reported sales of $480,017, a 34.5 percent increase from 2007. There were 380,579 acres of farmland in production in Nobles County, a (-11.0) percent decrease from 2007. In 2012, the market value of agricultural products sold in Nobles County was $477,617,000, sharp 28.0 percent increase from 2007. Since 2007, the prices for agricultural products have been favorable, and it is expected that the upcoming USDA Census of Agriculture will show a marked increase in the market value of agricultural products sold in Nobles County as compared to 2012.

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4.7.1 Unemployment Trends

The unemployment rate in Nobles County was 3.8 percent in 2016, while the State of Minnesota had an unemployment rate of 3.9 percent. From 2012 through 2016, the average unemployment rate was 3.7 percent for Nobles County, 4.2 percent for Region 8, 4.5 percent for Minnesota, and 6.4 percent for the United States. The average unemployment rate for Nobles County was consistently lower than Region 8, State and national rates.

During the economic recession (2008-2012), the average unemployment rate was 4.9 percent for Nobles County, 5.3 percent for Region 8, 6.5 percent for the State of Minnesota, and 8.3 percent for the United States. Nobles County fared significantly better during the economic recession than Region 8, the State of Minnesota, and the United States.

Table #26 Unemployment Trends- Nobles County

<table>
<thead>
<tr>
<th>Year</th>
<th>Nobles County</th>
<th>Region 8</th>
<th>Minnesota</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>3.8</td>
<td>4.1</td>
<td>3.9</td>
<td>4.8</td>
</tr>
<tr>
<td>2015</td>
<td>3.2</td>
<td>3.6</td>
<td>3.7</td>
<td>5.3</td>
</tr>
<tr>
<td>2014</td>
<td>3.4</td>
<td>3.9</td>
<td>4.2</td>
<td>6.2</td>
</tr>
<tr>
<td>2013</td>
<td>4.0</td>
<td>4.5</td>
<td>5.0</td>
<td>7.4</td>
</tr>
<tr>
<td>2012</td>
<td>4.3</td>
<td>4.8</td>
<td>5.6</td>
<td>8.1</td>
</tr>
<tr>
<td>2011</td>
<td>5.3</td>
<td>5.5</td>
<td>6.5</td>
<td>8.9</td>
</tr>
<tr>
<td>2010</td>
<td>5.6</td>
<td>6.0</td>
<td>7.4</td>
<td>9.6</td>
</tr>
<tr>
<td>2009</td>
<td>5.2</td>
<td>5.8</td>
<td>7.8</td>
<td>9.3</td>
</tr>
<tr>
<td>2008</td>
<td>4.2</td>
<td>4.6</td>
<td>5.4</td>
<td>5.8</td>
</tr>
<tr>
<td>2007</td>
<td>3.5</td>
<td>3.9</td>
<td>4.6</td>
<td>4.6</td>
</tr>
<tr>
<td>2006</td>
<td>3.1</td>
<td>3.6</td>
<td>4.0</td>
<td>4.6</td>
</tr>
<tr>
<td>2005</td>
<td>3.3</td>
<td>3.6</td>
<td>4.1</td>
<td>5.1</td>
</tr>
<tr>
<td>2004</td>
<td>3.9</td>
<td>4.1</td>
<td>4.7</td>
<td>5.5</td>
</tr>
<tr>
<td>2003</td>
<td>3.8</td>
<td>4.2</td>
<td>4.9</td>
<td>6.0</td>
</tr>
<tr>
<td>2002</td>
<td>3.3</td>
<td>3.0</td>
<td>4.5</td>
<td>5.8</td>
</tr>
<tr>
<td>2001</td>
<td>3.4</td>
<td>3.5</td>
<td>3.8</td>
<td>4.7</td>
</tr>
<tr>
<td>2000</td>
<td>3.1</td>
<td>3.3</td>
<td>3.2</td>
<td>4.0</td>
</tr>
</tbody>
</table>


One explanation for Nobles County seeing significantly lower unemployment rates was the strong manufacturing sector and agriculture industry. Nobles County is part of a strong agricultural region in Southwest Minnesota. About 60 percent of farmers list farming as their primary occupation. Nobles County has a significant amount of livestock, including turkeys, hogs and pigs, cattle, and sheep. Moreover, there is a large employer in the county, JBS, Inc., a global pork manufacturing and sales company located in the city of Worthington, and other considerable scale employers such as the Bedford Industries, Hy-Vee Foods, Walmart Supercenter, MN West Community & Technical College, Sanford Worthington Regional Medical Center, Merck Animal Health (formerly Intervet), Champion Home Builders (formerly Highland Manufacturing), Worthington Public Schools, Newport Labs and others.
4.7.2 Household Income Levels

Changes in income are an indicator of the county’s economic condition. Per Capita income is the mean income computed for every person in a specified geographic area. For household income, the median is based on the distribution of the total number of housing units, including those occupants with no income. According to the 2010 Census information, the median household income for Nobles County was $43,040, while the Region 8 average was $44,361. Per capita income in Nobles County was $20,953, while Region 8 was $23,192. The median family income was $52,356, while Region 8 was $57,072. In all three income examples, Nobles County ranked lower than the Region 8 average.

Table #27 Comparative County Income Levels – Region 8

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cottonwood</td>
<td>31,943</td>
<td>40,292</td>
<td>16,647</td>
<td>23,162</td>
<td>40,237</td>
<td>51,705</td>
</tr>
<tr>
<td>Jackson</td>
<td>36,746</td>
<td>46,869</td>
<td>17,499</td>
<td>25,144</td>
<td>43,426</td>
<td>59,238</td>
</tr>
<tr>
<td>Lincoln</td>
<td>31,607</td>
<td>44,672</td>
<td>16,009</td>
<td>24,922</td>
<td>38,605</td>
<td>58,953</td>
</tr>
<tr>
<td>Lyon</td>
<td>38,996</td>
<td>46,872</td>
<td>18,013</td>
<td>23,755</td>
<td>48,512</td>
<td>63,793</td>
</tr>
<tr>
<td>Murray</td>
<td>34,966</td>
<td>45,657</td>
<td>17,936</td>
<td>24,045</td>
<td>40,893</td>
<td>54,647</td>
</tr>
<tr>
<td>Nobles</td>
<td>35,684</td>
<td>43,040</td>
<td>16,987</td>
<td>20,953</td>
<td>43,076</td>
<td>52,356</td>
</tr>
<tr>
<td>Pipestone</td>
<td>31,909</td>
<td>40,589</td>
<td>16,450</td>
<td>22,289</td>
<td>40,133</td>
<td>55,609</td>
</tr>
<tr>
<td>Redwood</td>
<td>37,352</td>
<td>44,181</td>
<td>18,903</td>
<td>23,548</td>
<td>46,250</td>
<td>55,829</td>
</tr>
<tr>
<td>Rock</td>
<td>38,102</td>
<td>45,411</td>
<td>17,411</td>
<td>23,079</td>
<td>44,296</td>
<td>58,147</td>
</tr>
<tr>
<td>Region 8</td>
<td>35,998</td>
<td>44,361</td>
<td>17,493</td>
<td>23,192</td>
<td>43,923</td>
<td>57,072</td>
</tr>
</tbody>
</table>

Source: U.S. Census 2000, 2010
4.8 EMERGENCY RESPONSE PROFILE

4.8.1 Introduction
A county’s ability to respond to an emergency situation is based on service areas, facilities, equipment, and staff. An understanding of response times and abilities is critical for providing protection to Nobles County residents. The existing facilities, equipment, and staff in Nobles County are here to respond to local hazard events and provide regional support. These investments are critical in mitigating the effects of natural and other hazards and protecting lives, property, and other assets. Nobles County is considered a mutual aid county because they provide and receive support from neighboring counties.

The following summary and description serves as an inventory of the response facilities for Nobles County. This Chapter profiles the emergency response capabilities of Nobles County. Facilities included in the profile include:

- Law Enforcement
- Ambulance Service
- Fire Department
- Medical Facilities
- Red Cross Shelters
- Sirens and other Emergency Notification Devices

4.8.2 Nobles County Emergency Management
The Nobles County Emergency Management Director administers the county-wide emergency management program in Nobles County. The Director coordinates the emergency management functions of county and city governmental units assigned to various emergency management responsibilities. The Director’s duties also include the following:

- Coordinates response to actual disasters/emergencies, the logistics of federal field and survey teams, mitigation requests and disaster assistance centers
- Coordinates meetings of the Nobles County Emergency Management Planning Advisory Committee (EMPAC)
- Works with the EMPAC to develop and maintain the Nobles County Emergency Operation Plan (EOP) and test this plan through exercises
- Maintains an inventory and utilization record of county equipment secured through emergency management sources
- Maintains liaison with county and state regional offices
- Prepares informational materials for dissemination to the public and meets with interested groups to explain emergency management programs
- Meets with interested groups to explain the emergency management program and to enlist their support and cooperation
4.9 Profiling Emergency Response Capabilities

Nobles County Emergency Management is located in the Nobles County Government Center in downtown Worthington and is a county-wide emergency management program in those areas of the county that do not have a local emergency management organization. In addition, the department coordinates the activities of those local jurisdictions that do have emergency management organizations.

4.9.1 Local Law Enforcement

In Nobles County, the Cities of Adrian and Worthington have an independent police departments. The rest of the county is served by the Nobles County Sheriff’s Office. Law enforcement agencies in Nobles County are supported by state and federal law enforcement agencies. Law enforcement can contact the MN Bureau of Criminal Apprehension (BCA) for felony crimes that have occurred in the county or for internal investigations. There are a number of other specialized law enforcement agencies that can provide assistance to Nobles County.

Nobles County Sheriff’s Office

The Nobles County Sheriff’s Office provides contracted police services to the following communities in Nobles County: Bigelow, Brewster, Ellsworth, Round Lake, Rushmore and Wilmont. The Sheriff’s office provides a minimum of 4 hours per week of patrol. They also enforce city ordinances and state statutes and average 8 to 12 hours per week between patrolling and taking calls. The department also provides Civil Process Services, Emergency Management Services, and operates the jail for all of Nobles County.

The Sheriff’s deputies patrol approximately 723 square miles. The Nobles County Sheriff’s Office is affiliated with and has one deputy assigned to the Buffalo Ridge Drug Task Force as Emergency Response Unit and Liaison member. In 2017, the Nobles County Sheriff’s Office had 13 full-time licensed Deputy Sheriffs (one of which is a K-9 officer) and two part-time licensed Deputy Sheriffs assigned to the Patrol Division. The patrol deputies provide law enforcement and other sheriff’s services to the citizens of Nobles County.

The Nobles County Public Safety Answering Point (PSAP) is staffed by the Worthington Police Department. The PSAP is a 911 Emergency Dispatch and Communications Center which is comprised of six dedicated dispatchers who work 7 days a week, 24 hours a day, on a variety of shifts and are responsible for the dispatching of Law Enforcement, Fire, and EMS countywide through the use of the ARMER 800 MHz Radio System that is administered by the Nobles County Sheriff.

Nobles County Sheriff’s Office also operates a county jail system. The Nobles County jail is located in the Prairie Justice Center in Worthington. The jail operates 24 hours a day and 7 days a week. The designed maximum capacity for the facility is 80 beds. The Nobles County jail provides for the safe, secure, and humane detention of offenders in Nobles County.

Worthington Police Department

The Worthington Police Department’s Mission is to serve Worthington with honor and integrity by working WITH the community to provide exceptional public safety. The Worthington Police Department will be a united, community-minded organization dedicated to professionalism and committed to responsible and equitable public service through values reflecting our vigilance for the safety and well-being of our community. The Worthington Police Department is located in the Prairie Justice Center and
consists of 24 sworn officers including the Chief of Police, a Captain, three Patrol Sergeants, one Detective Sergeant, two Narcotics Investigators, two Detectives, one School Resource Officer, 2 K-9 Officers, 12 Patrol Officers and a Community Services Officer. The department also has an Administrative Assistant, two Records Personnel, five full time Dispatchers and one Dispatch Supervisor.

Adrian Police Department
The Mission of the Adrian Police Department is in partnership with our community, provides professional police services to promote a peaceful and safe environment. The Adrian Police Department will be a community-oriented organization that provides service and enforces laws in a fair and equitable manner to all. The Adrian Police Department consists of three sworn officers which includes the Chief of Police, Patrol Officer, and a part-time officer.

4.9.2 Public Health
Nobles County is serviced by Nobles County Community Services (NCCS) which is a combined public health and human services agency that is committed to strengthening individuals, families and communities by providing quality services in a respectful, caring and cost effective manner. NCCS provides a number of services in regards to public health and welfare to protect the health, safety and well-being of all families in our community. Services offered include:

- **Social Services**: adoption, adult and children’s mental health, adult and child protection, chemical health assessment, foster care, child care assistance, support for individuals with disabilities/chronic illness, licensing of foster and child care providers, assessments for the aging and disabled populations and case management services to people of all ages.

- **Child support services**: assisting in establishing parentage, establishing court orders for child support, enforcing those orders, providing medical, dental and child care support, collecting and processing payments, and modifying court orders when indicated.

- **Financial assistance services**: determining eligibility for services ranging from cash assistance, food support, health care, child care, and emergency assistance.

- **Public Health Services**: Monitor health status to identify community health problems, diagnose and investigate health problems and hazards in the community, inform, educate and empower people about health issues, mobilize community partnerships to identify and solve health problems, develop policies and plans that support individual and community efforts, enforce laws and regulations that protect and ensure safety, link people to needed personal health services and assure that the provision of health care when otherwise unavailable, assure a competent public health workforce, evaluate effectiveness, accessibility and quality of personal and population based health services, and research for new insights and innovative solutions to health problems.
4.9.3 Medical Facilities
Medical facilities inventoried in Nobles County consist of one hospital, three medical clinics, three nursing homes, five assisted living facilities, and five chiropractic clinics.

Hospitals
There is one hospital in Nobles County: Sanford Worthington Medical Center. The Sanford Worthington Medical Center is a Level III Trauma Center and is part of the Sanford Health Network. The medical center is a 48-bed full service hospital, an emergency care center, specialty physician clinics, imaging center, and an outpatient services center.

Patients in Nobles County needing a higher level of care may be transferred to Sanford USD Medical Center or Avera Health both in Sioux Falls, South Dakota. Both hospitals are Level II Trauma Centers. Other hospitals in the region include: Sanford Luverne Medical Center, Windom Area Hospital, and Murray County Medical Center. These are critical access hospitals providing Level IV Trauma Services.

Clinics
There are three health clinics within Nobles County. The health clinics in Nobles County include: Sanford Health Adrian Clinic, Sanford Worthington Clinic, and Access Family Medical Clinic. In Nobles County all of these clinics are classified as Medicare Certified Rural Health Clinics.15

Nursing Homes
There are three nursing homes in Nobles County. The nursing homes in Nobles County include: Crossroads Care Center, Parkview Manor, and South Shore Care Center.

- Crossroads Care Center in Worthington is a 50 bed facility dual Medicare/Medicaid skilled health care facility that provides 24-hour nursing care and 7 days per week rehabilitative services.
- Parkview Manor in Ellsworth is a 37 bed dual Medicare/Medicaid non-profit skilled health care facility that provides 24-hour nursing care and 7 days per week rehabilitative services.
- South Shore Care Center in Worthington is a 54 bed dual Medicare/Medicaid certified 24-hour skilled nursing home facility offering a wide range of services.

Assisted Living Facilities
There are five assisted living facilities in Nobles County. The assisted living facilities in Nobles County include four in Worthington: Buffalo Ridge Apartments, Ecumen Meadows, Golden Horizons, Prairie House Supportive, and one in Adrian: Sunrise Assisted Living.

Chiropractic Clinics
There are five chiropractic clinics in Nobles County with most in Worthington. The chiropractic clinics in Nobles County include: Southwest Chiropractic Clinic, Worthington Chiropractic Clinic, Dr. Patrick Herbst, DC, Dr. Lonnie R. Haken, DC, and Gravon’s Natural Chiropractic Center all in Worthington. There may be other Chiropractic Clinics, but they were not searchable online.

4.9.4 Ambulance Service
There are four primary Ambulance Districts in Nobles County. The primary Ambulance Districts include: Adrian Ambulance Service, Worthington Ambulance District, Fulda Ambulance District, and Edgerton Ambulance District. Additional ambulances can be called from neighboring counties. Secondary Ambulance Districts include: Murray County Ambulance District, Pipestone Ambulance District, Rock County Ambulance District, Lakefield Ambulance District, and Heron Lake Ambulance District.

Figure #10  Ambulance Districts – Nobles County (2017)

Sanford Worthington Ambulance Service (Worthington EMS)
The Sanford Worthington Ambulance Service covers the Cities of Worthington, Bigelow, Brewster, Rushmore, Round Lake, and Wilmont, as well as surrounding rural areas. The Ambulance Service has 18 people on staff including: 11 EMTs (5 full time and 6 casual PRN), 7 paramedics (5 full time and 2 casual PRN). The Sanford Worthington Ambulance Service went on approximately 1,850 to 1,900 calls in 2015 and 2016. The majority of the calls were within the city limits of Worthington and Nobles County, and were calls to transport patients to the Sanford Worthington Medical Center and from SWMC to other specialty care centers (tertiary).
For assistance the Sanford Worthington Ambulance Service calls upon neighboring ambulance services including: Lakefield Ambulance, Jackson Ambulance, Heron Lake Ambulance, Adrian Ambulance, Fulda Ambulance, Slayton Ambulance, Windom Ambulance, and Luverne Ambulance. The Sanford Worthington Ambulance Service does have mutual aid agreements with these neighboring ambulance services. The Sanford Worthington Ambulance Service has five operational ambulances in Worthington.

Adrian Ambulance Service (Adrian EMS)
The Adrian Ambulance Service covers the City of Adrian, as well as surrounding rural areas. The Ambulance Service is headed by the President of the service and staffs 13 volunteer Emergency Medical Technicians (EMTs) and 11 volunteer Emergency Medical Responders (EMs) who provide 24 hour service seven days a week. The Ambulance Service went on approximately 135 calls in 2016. The majority of the calls were within the city limits of Adrian and the surrounding communities, and were calls to transport patients to the Sanford Medical Centers in Luverne and Worthington.

For assistance the Adrian Ambulance Service calls upon neighboring ambulance services including: Luverne Ambulance, and Worthington Ambulance. The Adrian Ambulance Service does have mutual aid agreements with these neighboring ambulance services. The Adrian Ambulance Service has one operational ambulance in Adrian.

Edgerton Ambulance Service (Edgerton EMS)
The Edgerton Volunteer Ambulance Service covers the City of Edgerton, as well as surrounding rural areas in four Minnesota counties. The Ambulance Service is headed by the President of the service and staffs 20 volunteer Emergency Medical Technicians (EMTs) and six volunteer drivers. The Ambulance Service operates 24 hours a day, seven days a week and went on approximately six calls in Nobles County in 2016. The calls were in Leota and Lismore.

For assistance the Edgerton Ambulance Service calls upon neighboring ambulance services in Pipestone and Rock counties. The Edgerton Ambulance Service does have mutual aid agreements with these neighboring ambulance services. The Edgerton Ambulance Service has one operational ambulance. Patients are transported to Pipestone County Medical Center, Sanford Luverne and Murray County Medical Center unless a doctor gives a direct order to transport to Sioux Falls.

Fulda Ambulance Service (Fulda EMS)
The Fulda Ambulance Service is based in Murray County but covers surrounding rural areas in Nobles County. The Ambulance Service is headed by a Director of the service and staffs 18 volunteer Emergency Medical Technicians (EMTs) and 2 volunteer drivers. The Ambulance Service operates 24 hours a day seven days a week and had 12 calls in Nobles County in 2016.

For assistance the Fulda Ambulance Service calls upon neighboring ambulance services in Slayton and Worthington. The Edgerton Ambulance Service does have mutual aid agreements with these neighboring ambulance services. The Fulda Ambulance Service has one operational ambulance.
4.9.5 Fire/Emergency Services

There are twelve primary fire districts in Nobles County. The nine primary fire districts based in Nobles County include: Adrian, Bigelow, Brewster, Ellsworth, Lismore, Round Lake, Rushmore, Wilmont and Worthington. The Edgerton Fire District (Pipestone County), Fulda Fire District (Murray County) and Little Rock Fire District (Iowa) also cover several townships in Nobles County. There are no full time fire departments within Nobles County. All fire departments are volunteer based with responsibilities being divided between the fire districts.

4.9.6 Primary Fire Districts

**Adrian Fire Department (Adrian Fire District)**

The Adrian Fire Department service covers the City of Adrian and surrounding townships including: Westside, and parts of Lismore, Larkin, Olney and Little Rock Townships. The Adrian Fire Department consists of 24 volunteer fire fighters. The Adrian Fire Department went out on 74 calls in 2015 and 92 calls in 2016. The Adrian Fire Department is part of a Mutual Aid Agreement that includes all Fire Departments/Fire Districts in Nobles County.

**Needs:** Pumper Truck (current Pumper Truck is 17 years old)

**Bigelow Fire Department (Bigelow Fire District)**

The Bigelow Fire Department service covers the City of Bigelow and surrounding townships including: Bigelow Township and parts of Ransom, Viola (IA), Wilson (IA) and Horton (IA) Townships. The Bigelow Fire Department consists of 22 volunteer fire fighters. The Bigelow Fire Department went out on 14 calls in 2015 and 18 calls in 2016. The Bigelow Fire Department is part of a Mutual Aid Agreement that includes all Fire Departments/Fire Districts in Nobles County. It also has mutual aid agreements with neighboring fire departments in Osceola County Iowa.

**Needs:** 12 SVCA Masks

**Brewster Fire Department (Brewster Fire District)**

The Brewster Fire Department service covers the City of Brewster and surrounding townships including: Hersey, and parts of Graham Lakes, Elk, Lorain, Alba (Jackson Co.) and Ewington (Jackson Co ) Townships. The Brewster Fire Department consists of 25 volunteer fire fighters. The Brewster Fire Department went out on 32 calls in 2015 and 42 calls in 2016. The Brewster Fire Department is part of a Mutual Aid Agreement that includes all Fire Departments/Fire Districts in Nobles County. They also have mutual aid agreements with the Southwest and West Central Region Fire Departments.

**Needs:** Turn out Gear and SCBA (due to age)

**Ellsworth Fire Department (Ellsworth Fire District)**

The Ellsworth Fire Department service covers the City of Ellsworth and surrounding townships including: Grand Prairie and parts of Little Rock, Kanaranzi (Rock Co.) and Midland (IA) Townships. The Ellsworth Fire Department consists of 25 volunteer fire fighters. The Ellsworth Fire Department went out on 21 calls in 2015 and 28 calls in 2016. The Ellsworth Fire Department is part of a Mutual Aid Agreement that includes all Fire Departments/Fire Districts in Nobles County. They also have verbal agreements with Lyon County Iowa and Rock County MN fire departments.

**Needs:** Generator for the Fire Station
**Lismore Fire Department (Lismore Fire District)**
The Lismore Fire Department service covers the City of Lismore and surrounding townships including parts of: Leota, Wilmont, Larkin and Vienna (Rock Co.) Townships. The Lismore Fire Department consists of 25 volunteer fire fighters. The Lismore Fire Department went out on 10 calls in 2015 and 17 calls in 2016. The Lismore Fire Department is part of a Mutual Aid Agreement that includes all Fire Departments/Fire Districts in Nobles County.

*Needs:* New Tanker/Pumper

**Round Lake Fire Department (Round Lake Fire District)**
The Round Lake Fire Department service covers the City of Round Lake and surrounding townships including: Indian Lake, and parts of Lorain, Ewington (Jackson Co.) and Round Lake (Jackson Co.) Townships. The Round Lake Fire Department consists of 20 volunteer fire fighters. The Round Lake Fire Department went out on 15 calls in 2015 and 18 calls in 2016. The Round Lake Fire Department is part of a Mutual Aid Agreement that includes all Fire Departments/Fire Districts in Nobles County.

**Rushmore Fire Department (Rushmore Fire District)**
The Rushmore Fire Department service covers the City of Rushmore and surrounding townships including: Dewald, and parts of Olney, Little Rock, and Ransom Townships. The Rushmore Fire Department consists of 20 volunteer fire fighters. The Rushmore Fire Department went out on 26 calls in 2015 and 40 calls in 2016. The Rushmore Fire Department is part of a Mutual Aid Agreement that includes all Fire Departments/Fire Districts in Nobles County.

*Needs:* Generator for Fire Hall, Generator for School for sheltering, New Pumper (current Pumper Tender is a 1967), New Turnout Gear and New SCBA's.

**Wilmont Fire Department (Wilmont Fire District)**
The Wilmont Fire Department service covers the City of Wilmont and surrounding townships including: Summit Lake, and parts of Wilmont, Bloom, Larkin, Elk and Fenton (Murray Co.) Townships. The Wilmont Fire Department consists of 23 volunteer fire fighters. The Wilmont Fire Department went out on 24 calls in 2015 and 34 calls in 2016. The Wilmont Fire Department is part of a Mutual Aid Agreement that includes all Fire Departments/Fire Districts in Nobles County.

*Needs:* Quick Response Vehicle (to replace 1986 model), Generator for Fire Hall, Generator for City Hall.

**Worthington Fire Department (Worthington Fire District)**
The Worthington Fire Department service covers the City of Worthington and surrounding townships including: Worthington and parts of Lorain Township. The Worthington Fire Department consists of 37 volunteer fire fighters. The Worthington Fire Department went out on 93 calls in 2015 and 72 calls in 2016. The Worthington Fire Department is part of a Mutual Aid Agreement that includes all Fire Departments/Fire Districts in Nobles County.

*Needs:* Turn out gear is at the end of life expectancy and SCBA Tanks as alarms systems on air packs need updating.
Figure #11  Fire District Map – Nobles County (2017)
**Edgerton Fire Department (Edgerton Fire District)**
The Edgerton Fire Department (based in Pipestone County) covers parts of Leota Township in Nobles County.

**Fulda Fire Department (Fulda Fire District)**
The Fulda Fire Department (based in Murray County) covers Seward Township and parts of Bloom and Graham Lakes Townships in Nobles County.

**Little Rock Fire Department (Little Rock Fire District)**
The Little Rock Fire Department (based in IA) covers parts of Little Rock Township in Nobles County.
4.10 Red Cross Shelters

American Red Cross Southwest Minnesota Chapter serves communities across Yellow Medicine, Lincoln, Lyon, Redwood, Renville, McLeod, Sibley, Nicollet, Blue Earth, Watonwan, Brown, Cottonwood, Murray, Pipestone, Rock, Nobles, Lyon, Martin and Faribault counties in Southwest Minnesota. There are three shelter trailers; one is in Marshall, one is in Worthington and one is in Pipestone. The American Red Cross Southwest Minnesota Chapter is an Emergency Support Function (ESF) #6 and #15.

ESF #6 is responsible for Mass Care, Emergency Assistance, Housing, and Human Services. ESF #6 coordinates the delivery of federal mass care, emergency assistance, housing, and human services when local, tribal, and state response and recovery needs exceed their capabilities.16

- **Mass Care** - Includes sheltering, feeding operations, emergency first aid, bulk distribution of emergency items, and collecting and providing information on victims to family members.

- **Emergency Assistance**: Assistance required by individuals, families, and their communities to ensure that immediate needs beyond the scope of the traditional “mass care” services provided at the local level are addressed. These services include: support to evacuations (including registration and tracking of evacuees); reunification of families; provision of aid and services to special needs populations; evacuation, sheltering, and other emergency services for household pets and service animals; support to specialized shelters; support to medical shelters; nonconventional shelter management; coordination of donated goods and services; and coordination of voluntary agency assistance.

- **Housing** - Includes housing options such as rental assistance, repair, loan assistance, replacement, factory-built housing, semi-permanent and permanent construction, referrals, identification and provision of accessible housing, and access to other sources of housing assistance. This assistance is guided by the National Disaster Housing Strategy.

- **Human Services** - Includes the implementation of disaster assistance programs to help disaster victims recover their non-housing losses, including programs to replace destroyed personal property, and help to obtain disaster loans, food stamps, crisis counseling, disaster unemployment, disaster legal services, support and services for special needs populations, and other Federal and State benefits.

Emergency Support Function (ESF) #15 ensures that sufficient federal assets are deployed to the field during incidents requiring a coordinated federal response to provide accurate, coordinated, timely, and accessible information to affected audiences, including governments, media, the private sector, and the local populace, including the special needs population. ESF #15 provides the resource support and mechanisms to implement the National Response Framework (NRF) Incident Communications Emergency Policy and Procedures (ICEPP) described in the Public Affairs Support Annex.17

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4.11 Sirens and other Emergency Notification Devices

Outdoor warning sirens provide coverage in cities and other more densely populated areas within Nobles County. The emergency sirens can be activated by the Nobles County PSAP (Public Safety Answering Point) Dispatchers or city officials to warn residents in the event of severe weather. Nobles County is a rural county, so large portions of the county are outside the range of severe weather warning sirens. Refer to Table #62 for outdoor warning siren coverage and needs in Nobles County.

Since Nobles County is a rural county, additional measures are in place to expand the notification system. Emergency warnings over the radio are still an effective medium to reach wide audiences. NOAA Weather Radio is used for broadcasting severe weather warnings. NOAA Weather Transmitters are located in Fulda (WNG702), Jeffers (KX131), Russell (KX150), and Sioux Falls (WXM28).

Nobles County selected Nixle Community Notification System as their emergency response system. Nixle is an emergency notification service that allows emergency officials to notify residents and businesses by telephone, cell phone, text message, email and social media regarding time-sensitive general and emergency notifications.

Worthington Public School District, Worthington Christian School, and St Mary’s Catholic School use Shout Point, a district call-out system with the capacity for phone calls only. The Adrian Public Schools uses Infinite Campus Phone Messaging system as the primary communication tool for any weather related or emergency message communications between school and home. Ellsworth Public Schools has a mass notification system for students, staff and families, using JMC Phone Messaging system as the primary communication tool for any weather related or emergency message communications between school and home. Round Lake-Brewster Public Schools uses Honeywell Instant Alert System, an instant alert system which includes text, email and voice mail.

Figure #12 Public School Districts in Nobles County
Section 5 – Risk Assessment

The goal of mitigation is to reduce the future impacts of a hazard including loss of life, property damage, disruption to local and regional economies, and the expenditure of public and private funds for recovery. Sound mitigation practices must be based on sound risk assessment. A risk assessment involves quantifying the potential loss resulting from a disaster by assessing the vulnerability of buildings, infrastructure, and people.

Basing risk assessments on the best information available is important in developing effective mitigation actions that benefit communities. Geographic Information System (GIS) tools are not only helpful in producing maps, but they also show structures at risk and may determine damage estimates for potential hazard scenarios. MN Homeland Security and Emergency Management (HSEM) mitigation staff encourages the use of GIS tools in risk assessments because they produce good information to be used in the risk assessment process. In recognition of the importance of planning in mitigation activities, FEMA created Hazards USA Multi-Hazard (HAZUS-MH), a powerful GIS-based disaster risk assessment tool. This tool enables communities to predict estimated losses from floods, hurricanes, and other related phenomena and to measure the impact of various mitigation practices that might help reduce those losses. HAZUS-MH was used by University of Minnesota Duluth Geospatial Analysis Center staff in the flood hazard risk assessment.

This assessment identifies the characteristics and potential consequences of a disaster, how much of the community could be affected by a disaster, and the impact on community assets. A risk assessment consists of 3 components — hazard identification, risk profile, and vulnerability profile. The last step is the risk ranking for each jurisdiction.
5.1 Hazard Identification/Profile

5.1.1 Hazard Identification

The cornerstone of the risk assessment is identification of the hazards that affect jurisdictions. To facilitate the planning process, several sources were employed to ensure that the natural hazards are identified prior to assessment.

The County maintenance of the plan includes continual updates of the hazards identified in the initial plan. The mitigation planning team decided to compare the hazards in the initial plan to the current publications to determine if new hazards should be considered or if some should be deleted.

Natural hazards are identified in the FEMA publication “Multi-Hazard Identification and Risk Assessment – A Cornerstone of the National Mitigation Strategy,” also known as MHIRA. FEMA Region V developed a list based on state mitigation plans in the region. The list was divided into natural (Table #28) and other hazards (Table #29) as was done in the 2014 Minnesota State Hazard Mitigation Plan.

Table #28. FEMA MHIRA Natural Hazards in the 2014 Minnesota State Hazard Mitigation Plan

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Hazard</th>
<th>Hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flooding</td>
<td>Hail</td>
<td>Drought</td>
</tr>
<tr>
<td>Dam/Levee Failure</td>
<td>Lightning</td>
<td>Extreme Heat</td>
</tr>
<tr>
<td>Wildfire*</td>
<td>Winter Storms</td>
<td>Extreme Cold</td>
</tr>
<tr>
<td>Windstorms</td>
<td>Erosion</td>
<td>Earthquakes</td>
</tr>
<tr>
<td>Tornadoes</td>
<td>Land Subsidence (Sinkholes &amp; Karst)</td>
<td></td>
</tr>
</tbody>
</table>

*Addressed in the State Mitigation Plan because Minnesota is a heavily forested state compared to other states in Region V.

For the purpose of this plan, FEMA defines other hazards or “man-made hazards” as technological hazards and terrorism. These are distinct from natural hazards primarily in that they originate from human activity. In contrast, while the risks presented by natural hazards may be increased or decreased as a result of human activity, they are not inherently human-induced. The term “technological hazards” refers to the origins of incidents that can arise from human activities such as the manufacture, transportation, storage, and use of hazardous materials. For the sake of simplicity, this guide assumes that technological emergencies are accidental and that their consequences are unintended. The term “terrorism” refers to intentional, criminal, and malicious acts. There is no single, universally accepted definition of terrorism, and it can be interpreted in many ways. For the purposes of this plan, FEMA refers to “terrorism” as the use of Weapons of Mass Destruction (WMD), including biological, chemical, nuclear, and radiological weapons; arson, incendiary, explosive, and armed attacks; industrial sabotage and intentional hazardous materials releases; and “cyber terrorism.”

Table #29. FEMA MHIRA Other Hazards in the 2014 Minnesota State Hazard Mitigation Plan

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Hazard</th>
<th>Hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terrorism</td>
<td>Nuclear Generating Plant Incidents</td>
<td>Ground and Surface Water Supply Contamination*</td>
</tr>
<tr>
<td>Infectious Disease Outbreak</td>
<td>Hazardous Materials Incidents</td>
<td></td>
</tr>
<tr>
<td>Fires (Structures and Vehicles)</td>
<td>Transportation Incidents</td>
<td></td>
</tr>
</tbody>
</table>

*Addressed in the State Hazard Mitigation Plan because Minnesota has made a high investment in its prized resource, water.
5.1.2 Vulnerability Assessment by Jurisdiction

The planning team met to review and update the hazards faced by residents of Nobles County, update the existing mitigation actions published in the 2011 All Hazard Mitigation Plan, and propose new mitigation actions.

To engage in this process the planning team drew on a number of data sources. First, the planning team examined the hazards identified in the 2011 Nobles County All Hazard Mitigation Plan (Table #30). The existing mitigation actions were discussed and adjusted to reflect the definitions of natural hazards used in the State of Minnesota 2014 Multi-Hazard Identification and Risk Assessment list of natural hazards. This was done in order to assure that the risks faced by Nobles County were categorized the same way as the priority hazards established by the State of Minnesota.

Table #30 Hazards identified in the 2011 Nobles County All Hazard Mitigation Plan

<table>
<thead>
<tr>
<th>Natural Hazards</th>
<th>Technological Hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Disease (animal &amp; crop)</td>
<td>Fire - Structure &amp; Vehicle Fires (combined with wildfire for analysis)</td>
</tr>
<tr>
<td>Blizzards and Winter Storms</td>
<td>Hazardous Materials</td>
</tr>
<tr>
<td>Severe Summer storms (including Lightning)</td>
<td>Dam Failure (combined with flooding for analysis)</td>
</tr>
<tr>
<td>Fire - Wildfire</td>
<td>Public Health and Infectious Diseases</td>
</tr>
<tr>
<td>Extreme Temperatures</td>
<td>Dam Failure</td>
</tr>
<tr>
<td>Flooding</td>
<td>Civil Unrest and Terrorism</td>
</tr>
<tr>
<td>Drought</td>
<td></td>
</tr>
<tr>
<td>Tornado and Straight-line Winds</td>
<td></td>
</tr>
</tbody>
</table>

While the AHMP mainly deals with natural hazards, this planning took place with the understanding that many non-natural hazards could occur as a result of natural disasters (i.e. disruption in electrical service due to freezing rain causing problems for both utility corporations and vulnerable populations dependent on electricity for heat).

This plan draws on a variety of data sources including the State of Minnesota and the Homeland Security Emergency Management Critical Infrastructure Strategy for the State of Minnesota (2010), FEMA’s Local Mitigation Planning How-to Guide Integrating Manmade Hazards into Mitigation Planning (2003), and the State of Minnesota All Hazards Identification Risk Assessment.
Based on the planning team’s comparison of these two sets of hazards, the planning team developed a list of hazards faced by Nobles County to address in the 2018 plan update (Table #31).

<table>
<thead>
<tr>
<th>Natural Hazards</th>
<th>Other Hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flooding (includes Dam Failure)</td>
<td>Transportation Infrastructure</td>
</tr>
<tr>
<td></td>
<td>Hazardous Materials</td>
</tr>
<tr>
<td>Severe Summer Storms (Lightning, Tornadoes, Thunderstorms, Windstorms, &amp; Hail)</td>
<td>Public Health and Infectious Diseases</td>
</tr>
<tr>
<td>Severe Winter Storms (Blizzards, Ice Storms)</td>
<td>Civil Disturbances and Terrorism</td>
</tr>
<tr>
<td></td>
<td>Water Supply Contamination</td>
</tr>
<tr>
<td></td>
<td>Utility failure (includes Technology Failure)</td>
</tr>
<tr>
<td>Fire - Wildfire</td>
<td>Extreme Heat</td>
</tr>
<tr>
<td></td>
<td>Extreme Cold</td>
</tr>
<tr>
<td>Drought</td>
<td>Agriculture Disease (Animal &amp; Crop)</td>
</tr>
<tr>
<td></td>
<td>Earthquakes</td>
</tr>
<tr>
<td>Landslides, Erosion, and Substances</td>
<td></td>
</tr>
</tbody>
</table>

The committee drew on the 2017 Nobles County Calculated Priority Risk Index (CPRI) rankings to prioritize each hazard for inclusion in the plan. The methodology of the CPRI is outlined below.
5.1.3 Calculated Priority Risk Index
The vulnerability assessment builds upon the previously developed hazard information by identifying the community assets and development trends and intersecting them with the hazard profiles to assess the potential amount of damage that could be caused by each hazard event. This concept is generally illustrated in Figure #13. A summary of Calculated Priority Risk Index (CPRI) Categories and Risk Levels is shown in Table #32.

Figure #13 Conceptual Depiction of a Vulnerability Analysis

Definitions of CPRI Categories in Table #33

*Probability* – a guide to predict how often a random event will occur. Annual probabilities are expressed between 0.001 or less (low) up to 1 (high). An annual probability of 1 predicts that a natural hazard will occur at least once per year.

*Magnitude/Severity* – indicates the impact to a community through potential fatalities, injuries, property losses, and/or losses of services. The vulnerability assessment gives information that is helpful in making this determination for each community.

*Warning Time* – plays a factor in the ability to prepare for a potential disaster and to warn the public. The assumption is that more warning time allows for more emergency preparations and public information.

*Duration* – relates to the span of time local, state, and/or federal assistance will be necessary to prepare, respond, and recover from a potential disaster event.
## Table #32  Summary of Calculated Priority Risk Index (CPRI) Categories and Risk Levels

<table>
<thead>
<tr>
<th>CPRI Category</th>
<th>Level ID</th>
<th>DEGREE OF RISK</th>
<th>Description</th>
<th>Index Value</th>
<th>Assigned Weighting Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Probability</strong></td>
<td>Unlikely</td>
<td>Extremely rare with no documented history of occurrences or events. Annual probability of less than 0.001</td>
<td></td>
<td>1</td>
<td>45%</td>
</tr>
<tr>
<td></td>
<td>Possible</td>
<td>Rare occurrences with at least one documented or anecdotal historic event. Annual probability that is between 0.01 and 0.001.</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Likely</td>
<td>Occasional occurrences with at least two or more documented historic events. Annual probability that is between 0.1 and 0.01.</td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Highly Likely</td>
<td>Frequent events with a well-documented history of occurrence. Annual probability that is greater than 0.1.</td>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td><strong>Magnitude/Severity</strong></td>
<td>Negligible</td>
<td>Negligible property damages (less than 5% of critical and non-critical facilities and infrastructure). Injuries or illnesses are treatable with first aid and there are no deaths. Negligible quality of life lost. Shutdown of critical facilities for less than 24 hours.</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Limited</td>
<td>Slight property damages (greater than 5% and less than 25% of critical and non-critical facilities and infrastructure). Injuries or illnesses do not result in permanent disability and there are no deaths. Moderate quality of life lost. Shut down of critical facilities for more than 1 day and less than 1 week.</td>
<td></td>
<td>2</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>Critical</td>
<td>Moderate property damages (greater than 25% and less than 50% of critical and non-critical facilities and infrastructure). Injuries or illnesses result in permanent disability and at least one death. Shut down of critical facilities for more than 1 week and less than 1 month.</td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Catastrophic</td>
<td>Severe property damages (greater than 50% of critical and non-critical facilities and infrastructure). Injuries or illnesses result in permanent disability and multiple deaths. Shut down of critical facilities for more than 1 month.</td>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td><strong>Warning Time</strong></td>
<td>Less than 6 hours</td>
<td>Self-explanatory.</td>
<td></td>
<td>4</td>
<td>15%</td>
</tr>
<tr>
<td></td>
<td>6 to 12 hours</td>
<td>Self-explanatory.</td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12 to 24 hours</td>
<td>Self-explanatory.</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>More than 24 hours</td>
<td>Self-explanatory.</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>Duration</strong></td>
<td>Less than 6 hours</td>
<td>Self-explanatory.</td>
<td></td>
<td>1</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>Less than 24 hours</td>
<td>Self-explanatory.</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Less than one week</td>
<td>Self-explanatory.</td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>More than one week</td>
<td>Self-explanatory</td>
<td></td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>
The prioritized list of hazards is presented in Table #33 and is based on the ranking of hazards in the 2017 Nobles County CPRI and the Planning teams’ determination at the Planning Team Meeting.

Table #33 Nobles County CPRI Hazard Ranking and Risk Levels

<table>
<thead>
<tr>
<th>Natural Hazards (Ranked by CPRI)</th>
<th>Probability</th>
<th>Magnitude / Severity</th>
<th>Warning Time</th>
<th>Duration</th>
<th>Risk Index</th>
<th>Risk Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tornado</td>
<td>3.14</td>
<td>3.10</td>
<td>3.66</td>
<td>2.46</td>
<td>3.14</td>
<td>High</td>
</tr>
<tr>
<td>Winter Storm</td>
<td>3.66</td>
<td>2.54</td>
<td>2.31</td>
<td>2.83</td>
<td>3.04</td>
<td>High</td>
</tr>
<tr>
<td>Hail</td>
<td>3.43</td>
<td>1.86</td>
<td>3.14</td>
<td>1.40</td>
<td>2.71</td>
<td>Medium</td>
</tr>
<tr>
<td>Windstorm</td>
<td>3.03</td>
<td>2.37</td>
<td>2.77</td>
<td>2.20</td>
<td>2.71</td>
<td>Medium</td>
</tr>
<tr>
<td>Extreme Cold</td>
<td>3.17</td>
<td>1.94</td>
<td>2.00</td>
<td>3.11</td>
<td>2.62</td>
<td>Medium</td>
</tr>
<tr>
<td>Lightning</td>
<td>3.37</td>
<td>1.63</td>
<td>2.71</td>
<td>1.60</td>
<td>2.57</td>
<td>Medium</td>
</tr>
<tr>
<td>Drought</td>
<td>2.43</td>
<td>1.77</td>
<td>1.97</td>
<td>3.54</td>
<td>2.27</td>
<td>Medium</td>
</tr>
<tr>
<td>Flash Flood</td>
<td>2.29</td>
<td>2.00</td>
<td>2.65</td>
<td>2.23</td>
<td>2.25</td>
<td>Medium</td>
</tr>
<tr>
<td>Extreme Heat</td>
<td>2.57</td>
<td>1.57</td>
<td>1.86</td>
<td>2.89</td>
<td>2.20</td>
<td>Medium</td>
</tr>
<tr>
<td>Flood (Riverine)</td>
<td>1.79</td>
<td>1.76</td>
<td>1.85</td>
<td>2.18</td>
<td>1.83</td>
<td>Low</td>
</tr>
<tr>
<td>Erosion</td>
<td>2.06</td>
<td>1.26</td>
<td>1.89</td>
<td>2.09</td>
<td>1.79</td>
<td>Low</td>
</tr>
<tr>
<td>Wildfire</td>
<td>1.31</td>
<td>1.46</td>
<td>2.00</td>
<td>1.57</td>
<td>1.49</td>
<td>Low</td>
</tr>
<tr>
<td>Subsidence</td>
<td>1.15</td>
<td>1.39</td>
<td>2.19</td>
<td>1.97</td>
<td>1.46</td>
<td>Low</td>
</tr>
<tr>
<td>Earthquake</td>
<td>0.89</td>
<td>1.43</td>
<td>1.77</td>
<td>1.29</td>
<td>1.22</td>
<td>Low</td>
</tr>
<tr>
<td>Dam Failure</td>
<td>0.91</td>
<td>1.06</td>
<td>1.69</td>
<td>1.35</td>
<td>1.12</td>
<td>Low</td>
</tr>
<tr>
<td>Landslide/Mudslide</td>
<td>0.89</td>
<td>1.03</td>
<td>1.54</td>
<td>1.26</td>
<td>1.06</td>
<td>Low</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other Hazards (Ranking defined by Planning Team)</th>
<th>Risk Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utility Failure</td>
<td>High</td>
</tr>
<tr>
<td>Hazardous Materials</td>
<td>High</td>
</tr>
<tr>
<td>Public Health and Infectious Diseases</td>
<td>High</td>
</tr>
<tr>
<td>Water Contamination</td>
<td>High</td>
</tr>
<tr>
<td>Transportation Infrastructure</td>
<td>Low</td>
</tr>
<tr>
<td>Civil Unrest and Terrorism</td>
<td>Low</td>
</tr>
</tbody>
</table>

Hazard Profiling Concept of Planning

The risk assessments identify the characteristics and potential consequences of a disaster, how much of the community could be affected by a disaster, and the impact on community assets. A risk assessment consists of 3 components—hazard identification, risk profile, and vulnerability profile. The last step is the risk ranking for each jurisdiction.
5.1.4 GIS and HAZUS-MH

The risk analysis step in this assessment quantifies the risk to the population, infrastructure, and economy of the community. Hazards that can be geographically identified (wildland fires, windstorms, tornadoes, hail, and floods) were mapped.

HAZUS-MH was used to estimate the damages incurred for a 100-year flood event and for general asset assessment. HAZUS-MH also generates a combination of site-specific and aggregated loss estimates for the entire county due to a 100-year flood event. Aggregate inventory loss estimates, which include building stock analyses, are based upon the assumption that building stock is evenly distributed across each census block. Therefore, it is possible that overestimates of damage will occur in some parts of areas while underestimates will occur in other areas. With this in mind, total loss estimates tend to be more reliable over larger geographic areas (groups of many blocks) than for individual census blocks. It is important to note that HAZUS-MH is not intended to be a substitute for detailed engineering studies. Rather, it is intended to serve as a planning aid for communities interested in assessing their risk to flood-, earthquake-, and hurricane-related hazards. This documentation does not provide full details on the processes and procedures completed in the development of this project. It is only intended to highlight the major steps that were followed during the project.

Site-specific analysis is based upon loss estimations for individual structures. For flooding, analysis of site-specific structures takes into account the depth of water in relation to the structure. HAZUS-MH also takes into account the actual dollar exposure to the structure for the costs of building reconstruction, content, and inventory. However, damages are based upon the assumption that each structure will fall into a structural class, and structures in each class will respond in a similar fashion to a specific depth of flooding. Site-specific analysis is also based upon a point location rather than a polygon, therefore the model does not account for the percentage of a building that is inundated. These assumptions suggest that the loss estimates for site-specific structures as well as for aggregate structural losses need to be viewed as approximations of losses that are subject to considerable variability rather than as exact engineering estimates of losses to individual structures.
5.1.5 National Climatic Data Center (NCDC) Records

Historical storm event data was compiled from the National Climatic Data Center (NCDC). NCDC records are estimates of damage reported to the National Weather Service (NWS) from various local, state, and federal sources. However, these estimates are often preliminary in nature and may not match the final assessment of economic and property losses related to given weather events.

The NCDC data included 386 reported events in Nobles County between 1955 and November of 2017. However, some weather event categories only had available data going back as recent as 1996. No records before 1955 were available. A summary table of events related to each hazard type is included in the hazard profile sections that follow. A full table listing all events, including additional details, is included in Appendix C. NCDC hazard categories used in this plan are listed in Table #34.

Table #34 National Climatic Data Center Historical Hazards

<table>
<thead>
<tr>
<th>Hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tornado</td>
</tr>
<tr>
<td>Hail Storm</td>
</tr>
<tr>
<td>Thunderstorm Wind</td>
</tr>
<tr>
<td>Flood/Flash Flood</td>
</tr>
<tr>
<td>Severe Snow Events</td>
</tr>
<tr>
<td>Ice Storms</td>
</tr>
<tr>
<td>Extreme Cold/Wind Chill</td>
</tr>
<tr>
<td>Excessive Heat</td>
</tr>
<tr>
<td>Wildfire</td>
</tr>
<tr>
<td>Drought</td>
</tr>
</tbody>
</table>
5.1.6 FEMA Declared Disasters
There are many natural and other hazards that put Minnesota at risk. A “major disaster” is an event which the President of the United States determines warrants federal aid to supplement state and local recovery efforts. According to FEMA, the state of Minnesota was included in Presidential Disaster Declarations 60 times between 1953 and 2016, of which 25 involved flooding (Figure #14).\(^{18}\)

\textbf{Figure #14}  \hspace{1cm} FEMA-Declared Disasters in Minnesota

In Nobles County, twelve FEMA disaster declarations have been made between 1965 and 2016. Table #35 and Table #36 show the details of the disasters including payments for Public Assistance (PA) and Individual Assistance (IA), listed under the flooding and severe storms profiles. No declarations were made for the other storms listed in the NCDC database. Reviewing the federal payments for damages from the declared disasters is a way of correlating the impact from the NCDC report.

### Table #35

#### FEMA-Declared Major Disasters in Nobles County (1965-2016)

<table>
<thead>
<tr>
<th>Incident</th>
<th>Declaration Date and Disaster Number</th>
<th>Incident Period</th>
<th>Total PA Obligated by FEMA for Disaster in Minnesota</th>
<th>Total PA Obligated by FEMA for Disaster in Nobles County</th>
<th>Individual Assistance in Minnesota</th>
<th>Individual Assistance in Nobles County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe Storms and Flooding</td>
<td>DR-1941 10/13/2010</td>
<td>9/22/2010–10/14/2010</td>
<td>$25,963,422</td>
<td>$118,587</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Unknown</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$ Unknown</td>
<td>$ Unknown</td>
<td>$ Unknown</td>
<td>$ Unknown</td>
</tr>
<tr>
<td>Severe Winter Storms</td>
<td>DR-1158 1/16/1997</td>
<td>1/3/1997–2/3/1997</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$ Unknown</td>
<td>$ Unknown</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Severe Winter Storm</td>
<td>DR-1151 1/7/1997</td>
<td>11/14/1996–11/30/1996</td>
<td>Unknown</td>
<td>Unknown</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Unknown</td>
<td>Unknown</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Unknown</td>
<td>Unknown</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Unknown</td>
<td>Unknown</td>
</tr>
<tr>
<td>Flooding</td>
<td>DR-255 4/18/1969</td>
<td>4/18/1969</td>
<td>Unknown</td>
<td>Yes</td>
<td>Unknown</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Data provided by FEMA: [https://www.fema.gov/media-library/assets/documents/28318](https://www.fema.gov/media-library/assets/documents/28318) accessed on July 26, 2017. Values are estimates collected at the time of the disaster.
Table #36  
FEMA-Declared Emergencies in Nobles County (1976-2016)

<table>
<thead>
<tr>
<th>Incident</th>
<th>Declaration Date and Disaster Number</th>
<th>Incident Period</th>
<th>Individual Assistance in Minnesota</th>
<th>Public Assistance (all affected areas)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hurricane Katrina Evacuation</td>
<td>EM-3242 09/13/2005</td>
<td>08/29/2005 to 10/1/2005</td>
<td>No</td>
<td>$2,391,613</td>
</tr>
<tr>
<td>Drought</td>
<td>EM-3013 06/17/1976</td>
<td>06/17/1976</td>
<td>No</td>
<td>Yes $ Unknown</td>
</tr>
</tbody>
</table>

Note the Public Assistance totals are estimates collected at the time of the disaster. Data provided by FEMA: [https://www.fema.gov/media-library/assets/documents/28318](https://www.fema.gov/media-library/assets/documents/28318) and [https://www.fema.gov/media-library/assets/documents/28344](https://www.fema.gov/media-library/assets/documents/28344) Accessed on July 26, 2017.

Table #37 depicts the historical projects in Nobles County resulting from hazard mitigation funding.

Table #37  
Historical Hazard Mitigation Funding in Nobles County

<table>
<thead>
<tr>
<th>Year</th>
<th>Project Description</th>
<th>Sub-Grantee</th>
<th>Federal Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>Adrian - Acquisition of Flood Prone Structures: acquire one structure which includes a single family home and two businesses</td>
<td>City of Adrian</td>
<td>$59,160</td>
</tr>
<tr>
<td>1997</td>
<td>Power Line Rebuild Project: The city public utilities propose to convert overhead conductor to underground, replace existing overhead with T-2, and intersect poles.</td>
<td>City of Adrian</td>
<td>$118,500</td>
</tr>
<tr>
<td>1997</td>
<td>Overhead to Underground Conversions: Conversion of 36.5 miles of overhead to underground lines</td>
<td>Nobles Cooperative Electric</td>
<td>$555,971</td>
</tr>
<tr>
<td>1999</td>
<td>Nobles Electric Cooperative - underground line to replace overhead lines.</td>
<td>Nobles Cooperative Electric</td>
<td>$190,194</td>
</tr>
<tr>
<td>2007</td>
<td>Nobles County All Hazard Mitigation Plan Update</td>
<td>Southwest Regional Development Commission</td>
<td>$16,982</td>
</tr>
<tr>
<td>2013</td>
<td>Adrian Wellfield Generator 5% Initiative: The objective of this funding it to provide continuous electric power to the pumps in Adrian's Wellfield to provide drinking water to the City of Adrian.</td>
<td>City of Adrian</td>
<td>$18,402</td>
</tr>
<tr>
<td>2014</td>
<td>Worthington MN-County Ditch 12 Storm water Mitigation: This project is intended to mitigate damages to flooding due to an undersized storm water system identified as County Ditch 12. A basin will be constructed to capture excess flooding and the Oxford Street and Oslo Street culverts will be upsized to allow more flow so that water does not damage structures. Phase 1 funding for the Benefit Cost Analysis, design and Environmental Assessment associated with these improvements has been awarded. Funding for the final engineering and construction has not yet been awarded. Additional improvements are also to be completed subsequent to these initial improvements. The additional improvements include extending the enlarged Oslo Street culvert through McMillan Street and providing additional flood storage and increasing the CD12 channel capacity upstream of McMillan Street.</td>
<td>City of Worthington</td>
<td>$392,595</td>
</tr>
</tbody>
</table>

5.2 Vulnerability Assessment

5.2.1 Asset Inventory

The HAZUS-MH defaults, critical facilities, and essential facilities have been updated based on the most recent available data sources. The essential facility updates (schools, medical care facilities, fire stations, and police stations) were integrated into the HAZUS-MH input database. Other critical facilities identified by the county were geocoded and overlaid with the HAZUS-MH flood model output. Critical facilities are defined by the Department of Homeland Security in the Automated Critical Asset Management System (ACAMS).

HAZUS 4.0 in ArcGIS 10.4 was used to estimate the damages incurred for a 100-year flood event in Nobles County using a DFIRM. The Conditional Letter of Map Revision (CLOMR) for the City of Worthington (project number is M13.107846 submitted March 2016) depth grid data was used to create the updated floodplain for that section. A 10-meter DEM (digital elevation model) was used to create a flood depth grid.

Nobles County specific building data was sourced from the parcel tax and spatial databases to include building valuations, occupancy class, square footage, year built, and number of stories. A shapefile named Parcels.shp was obtained from the GIS Coordinator at Nobles County. Files UMD Nobles Co. Data 10217 (structure value and occupancy class), was queried by Computer Professionals Unlimited, Inc. and provided for the County for a fee. resbldg.dbf and commbldg.dbf (number stories, year built, square footage) date was obtained from the Vanguard Appraisals, Inc.- and provided for the County for a fee. The resulting spatial dataset included 8,826 records.

In cases where building value, square footage, year built, or number of stories were missing, values were assigned based on best practices from values in the other 4 fields. The data was then assigned to one parcel centroid, which served as a surrogate for the each parcel’s buildings to aggregate to the associated census block for use in the HAZUS model.

5.2.2 Facility Replacement Costs

According to the Nobles County general building stock [updated with the parcel data], the HAZUS model estimates there are 8,829 parcels with buildings in the region with a total replacement value (excluding contents) of $1.14 billion (2010 dollars). Approximately 71% of the buildings (and 54% of the building value) are associated with residential housing. The HAZUS model estimated 142 buildings will be at least moderately damaged. There are an estimated 0 buildings that would be completely destroyed. There are an estimated 142 buildings that will be at least moderately damaged. There are an estimated 0 buildings that would be completely destroyed. There are an estimated 0 buildings that would be completely destroyed.

The total economic loss estimated for the flood is $22.93 million dollars, which represents 5% of the total replacement value of the scenario buildings. Building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood. The total building-related losses were $17.64 million dollars. Twenty three percent of the estimated losses were related to the business interruption of the region. Residential occupancies made up 27% of the total loss.
The reported building counts should be interpreted as degrees of loss rather than an exact number of buildings exposed to flooding. These numbers were derived from aggregate building inventories which are assumed to be dispersed evenly across census blocks. HAZUS requires that a predetermined amount of square footage of a typical building sustain damage in order to produce a damaged building count. If only a minimal amount of damage to buildings is predicted, it is possible to see zero damaged building counts while also seeing economic losses.

The total estimated number of damaged buildings, total building losses, and estimated total economic losses for the countywide 100-year flood are shown in Table #38, which also includes the estimated number of buildings within each occupancy class as calculated by HAZUS general building stock.

<table>
<thead>
<tr>
<th>General Occupancy</th>
<th>Estimated Total Buildings</th>
<th>Total Damaged Buildings</th>
<th>Total Building Exposure (in $1000s)</th>
<th>Total Economic Loss (in $1000s)</th>
<th>Building Loss (in $1000s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural</td>
<td>1474</td>
<td>0</td>
<td>$219,823</td>
<td>$3,557</td>
<td>$673</td>
</tr>
<tr>
<td>Commercial</td>
<td>653</td>
<td>10</td>
<td>$118,296</td>
<td>$4,442</td>
<td>$826</td>
</tr>
<tr>
<td>Education</td>
<td>24</td>
<td>0</td>
<td>$51,634</td>
<td>$968</td>
<td>$102</td>
</tr>
<tr>
<td>Government</td>
<td>174</td>
<td>0</td>
<td>$41,643</td>
<td>$5,838</td>
<td>$163</td>
</tr>
<tr>
<td>Industrial</td>
<td>82</td>
<td>0</td>
<td>$58,559</td>
<td>$1,394</td>
<td>$260</td>
</tr>
<tr>
<td>Religious/Non-Profit</td>
<td>144</td>
<td>2</td>
<td>$35,945</td>
<td>$631</td>
<td>$75</td>
</tr>
<tr>
<td>Residential</td>
<td>6,275</td>
<td>288</td>
<td>$610,242</td>
<td>$6,104</td>
<td>$4,249</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>8,826</strong></td>
<td><strong>300</strong></td>
<td><strong>$1,136,142</strong></td>
<td><strong>$22,934</strong></td>
<td><strong>$6,348</strong></td>
</tr>
</tbody>
</table>

*Source: Flood hazard Analysis for Nobles County, October 30, 2017, Geospatial Analysis Center, Swenson College of Science and Engineering*

Census blocks of concern should be reviewed in more detail to determine the actual percentage of facilities that fall within the flood hazard areas. The aggregate losses reported in this study may be overstated because values are distributed evenly in a census block. The 4 census blocks showing the highest estimated loss values, and another in the top 10 with a high percentage of buildings in the loss area, are shown in Table #39. These potentially high loss census blocks used for the loss estimation and the HAZUS-MH output floodplain are shown in Appendix: A. In some cases, the assets of value may not fall in the floodplain in the same proportion that the floodplain covers the entire census block. For this reason, some potential losses may be over-stated.
Table #39  Nobles County Census Blocks with the Greatest Estimated Losses in the 100-Year Floodplain

<table>
<thead>
<tr>
<th>Census Block Number</th>
<th>Description</th>
<th>Total Estimated Loss</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>271051054004010</td>
<td></td>
<td>$4,519,000</td>
<td>Worthington</td>
</tr>
<tr>
<td>271051054001078</td>
<td></td>
<td>$1,570,000</td>
<td>Worthington</td>
</tr>
<tr>
<td>271051054001073</td>
<td></td>
<td>$1,168,000</td>
<td>Worthington</td>
</tr>
<tr>
<td>271051054003003</td>
<td></td>
<td>$962,000</td>
<td>Worthington</td>
</tr>
<tr>
<td>271051054003010</td>
<td></td>
<td>$874,000</td>
<td>Worthington</td>
</tr>
</tbody>
</table>

Another analysis was performed by selecting the parcels with the highest values (building plus contents) that fell within the 100-year floodplain. The results of this analysis (and total building values) are shown in Table #40.

Table #40  Nobles County Properties with Highest Building/Contents Value Intersecting 100-Year Floodplain

<table>
<thead>
<tr>
<th>Parcel ID</th>
<th>Parcel Building + Contents Total Value</th>
<th>Class Description</th>
<th>Building Area (ft²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>31-3821-500</td>
<td>$3,257,800</td>
<td>Government General Services</td>
<td>8,150</td>
</tr>
<tr>
<td>31-0450-500</td>
<td>$1,868,500</td>
<td>Government Emergency Response</td>
<td>238,917</td>
</tr>
<tr>
<td>31-2903-000</td>
<td>$1,531,000</td>
<td>Religion/Organization</td>
<td>26,544</td>
</tr>
<tr>
<td>31-0957-500</td>
<td>$1,463,000</td>
<td>Government General Services</td>
<td>33,252</td>
</tr>
<tr>
<td>14-0038-000</td>
<td>$1,007,000</td>
<td>Agriculture</td>
<td>6,114</td>
</tr>
<tr>
<td>13-0213-500</td>
<td>$935,800</td>
<td>Agriculture</td>
<td>5,682</td>
</tr>
<tr>
<td>06-0179-500</td>
<td>$591,600</td>
<td>Agriculture</td>
<td>3,592</td>
</tr>
<tr>
<td>31-0865-000</td>
<td>$579,300</td>
<td>Residential, Multi-Dwellings</td>
<td>7,200</td>
</tr>
<tr>
<td>09-0187-000</td>
<td>$571,000</td>
<td>Agriculture</td>
<td>2,284</td>
</tr>
<tr>
<td>01-0097-000</td>
<td>$546,000</td>
<td>Agriculture</td>
<td>3,315</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$12,351,000</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

HAZUS-MH Essential Facility Loss Analysis

Essential facilities encounter the same impacts as other buildings within the flood boundary: structural failure, extensive water damage to the facility, and loss of facility functionality (i.e. a damaged police station that will no longer be able to serve the community). Three essential facilities (care facilities, fire stations, police stations, or schools) included in the HAZUS-MH analysis fall within the flood boundary. They were all school buildings (Worthington HS, Worthington ALC, and School District Office).

HAZUS-MH Shelter Requirement Analysis

HAZUS-MH estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. HAZUS-MH also estimates those displaced people that may require accommodations in temporary public shelters. The countywide 100-year flood model estimates 559 households may be displaced due to the flood. Displacement includes households
evacuated from within or very near to the inundated area. Of these, the model estimates 1,270 people (out of 21,378) may seek temporary shelter in public shelters.

HAZUS-MH Debris Generation Analysis
HAZUS estimates the amount of debris that may be generated by the flood. The countywide 100-year flood model breaks debris into 3 general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 1,796 tons of debris may be generated. Of the total amount, Finishes composes 77% of the total and Structure composes 14% of the total. If the debris tonnage is converted into an estimated number of truckloads, it will require 72 truckloads (@25 tons/truck) to remove the debris generated by the flood.
5.3 Future Development

Because Nobles County is vulnerable to a variety of natural and other hazards, the county government—in partnership with state government—must make a commitment to prepare for the management of these types of events. Nobles County is committed to ensuring that county elected and appointed officials become informed leaders regarding community hazards so that they are better prepared to set and direct policies for emergency management and county response.

During the past 5 years, some housing development has occurred in the county, but all development has abided by the rules and regulations of the zoning committee. New houses must be a certain distance from the water and a certain elevation above the water.

The Nobles County Emergency Management Director will work to keep the jurisdictions covered by the AHMP engaged and informed during the plan’s 5-year planning cycle. By keeping jurisdictional leaders actively involved in the monitoring, evaluation, and update of the AHMP, they will keep their local governments aware of the hazards that face their communities and how to mitigate those hazards through planning and project implementation. Each jurisdiction has identified mitigation strategies that they will seek to implement in their communities. Jurisdictions will include considerations for hazard mitigation in relation to future development when updating local comprehensive plans or other plans that may influence such development.
5.4 Hazard Profiles

Hazards were ranked by the planning team as stated in Section 5.1.3 Calculated Priority Risk Index and are listed in this section from high to low priority (see Table #41).

Table #41 Ranking of Hazards in Nobles County 2018 AHMP - UPDATE

<table>
<thead>
<tr>
<th>Natural Hazards</th>
<th>Risk Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flooding</td>
<td>High</td>
</tr>
<tr>
<td>Severe Winter Storms (Blizzards, Ice Storms)</td>
<td>High</td>
</tr>
<tr>
<td>Severe Summer Storms (Thunder Storms, Tornadoes, Hail, Lightning, &amp; Windstorms)</td>
<td>High</td>
</tr>
<tr>
<td>Hail</td>
<td>Medium</td>
</tr>
<tr>
<td>Severe Winter Storms</td>
<td>Medium</td>
</tr>
<tr>
<td>Extreme Cold / Extreme heat</td>
<td>Medium</td>
</tr>
<tr>
<td>Drought</td>
<td>Medium</td>
</tr>
<tr>
<td>Landslides, Erosion, Substance</td>
<td>Low</td>
</tr>
<tr>
<td>Agricultural Disease</td>
<td>Low</td>
</tr>
<tr>
<td>Fire - Wildfire</td>
<td>Low</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other Hazards</th>
<th>Risk Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazardous Materials</td>
<td>High</td>
</tr>
<tr>
<td>Public Health and Infectious Disease</td>
<td>High</td>
</tr>
<tr>
<td>Utility Failure</td>
<td>High</td>
</tr>
<tr>
<td>Water Supply Contamination</td>
<td>High</td>
</tr>
<tr>
<td>Transportation Infrastructure</td>
<td>Low</td>
</tr>
<tr>
<td>Civil Disturbance and Terrorism</td>
<td>Low</td>
</tr>
</tbody>
</table>
5.4.1 Agricultural Disease (animal or crop)
Agriculture is a major economic driver in Nobles County and Southwest Minnesota. Animal and crop related diseases have the potential to inflict both large economic losses and logistical hazards on the community. Agricultural disease is often difficult to contain. The majority of incidents related to agricultural disease are likely to occur countywide rather than in localized areas, given the limited feed suppliers/delivery and close proximity of livestock operations in the county. Primary highways such as interstate 90, Minnesota 60 and US Highway 59 crisscrossing the county through high livestock populated areas make it difficult to contain a disease.

The majority of the land in Nobles County is used for agriculture. An agricultural disease causing crop failure could cause millions of dollars in lost production. Nobles County is ranked 10 in crop production and 4 in livestock production among counties in Minnesota with a total of $541,245,000 in 2011. Animal transmitted diseases pose the greatest threat to animal confinement buildings, feeding lots, and pastures. Insects and pests pose the largest risk to agriculture crops.

<table>
<thead>
<tr>
<th>Table #42</th>
<th>Farm Summary – Nobles County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land in Farms</td>
<td>413,816</td>
</tr>
<tr>
<td>Number of Farms</td>
<td>1,269</td>
</tr>
<tr>
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</tr>
<tr>
<td>Harvested Crops</td>
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</tr>
<tr>
<td>Corn</td>
<td>135,282</td>
</tr>
<tr>
<td>Soybean</td>
<td>152,025</td>
</tr>
</tbody>
</table>


Figure #15
Land in Farms – Nobles County 2012
One of the most current threats is Goss’s Wilt. Goss’s wilt is a bacterial disease that may cause systemic infection and wilting of corn plants, as well as severe leaf blighting. The leaf blight phase is generally more prevalent and more damaging to the corn crop. Higher levels of corn residue from corn-after-corn production and reduced tillage are likely contributing factors in the spread of this disease. In addition, the prevalence of summer storms (hail, wind and rainstorms) that damaged corn leaves have a large impact on the severity of infection and yield loss in a given growing season. It has been difficult to contain this threat, and there are a number of other similar examples of how it is difficult to contain an agricultural disease. The decision to relate agricultural disease to a countywide area instead of a localized area is also based on the planning teams experience within the county, the prevalence of crop agriculture, and the relative ease with which plant diseases spread. It is likely that any outbreak will likely affect all crops, and animal agriculture within the county.

**Animal Transmitted Diseases**

Avian Influenza (HPAI) is a disease caused by infection with avian influenza and Type A viruses. These viruses occur naturally among wild aquatic birds worldwide and can infect wild and domestic poultry and other bird and animal species. Avian Influenza viruses do not normally infect humans. However, sporadic human infections with Avian Influenza viruses have occurred.20

“Influenza in poultry falls into two groups: Low Pathogenic Avian Influenza (LPAI), or Highly Pathogenic Avian Influenza (HPAI). Similar to influenza symptoms in people, birds infected with LPAI usually experience only mild signs if any, including respiratory signs such as conjunctivitis and nasal discharge, ruffled feathers or a drop in egg production. Unlike LPAI, the first indication of HPAI in poultry is sudden death, often without signs of illness. In the last 40 years, there have been introductions of LPAI in Minnesota poultry all of which have been successfully eliminated.”21

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The threat of bovine tuberculosis (TB) has historically impacted agriculture in Minnesota. In April 2008, USDA downgraded Minnesota’s status, requiring Minnesota cattle producers to do additional testing when shipping animals out of state. According to the Board of Animal Health website, bovine TB can be difficult to diagnose, invested animals can be infected for a long period of time before showing any outward signs of TB.²²

The United States has been free of Hoof and Mouth Disease Bovine Spongiform Encephalopathy (BSE-Mad Cow Disease) since 1929.²³ This was possible through effective collaborative prevention programs between private producers, veterinarians, researchers, and government organizations. Education and early symptom identification were critical in the success. When an infection of foot and mouth disease or BSE is confirmed, the only effective way to control the disease is isolation and culling of an entire herd.

Early detection can be difficult since symptoms can be the same for multiple diseases. Later detection can result in a large percentage of a herd having the disease. Having to dispose of a large percentage of a herd would result in substantial financial loss to the producer.

Animals are also susceptible to the flu and common colds. “Respiratory diseases are common and costly to livestock producers.”²⁴ The common cold along with other animal diseases like avian Influenza (bird

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flu), Chronic Wasting Disease, and Lyme Disease, just to name a few, pose risks to producers and cost thousands of dollars to producers to treat annually.

**Plant Pests and Diseases**

Some of the more notable pests infest corn fields. Corn rootworm and European corn borer are two major pests that pose serious potential loss of income to farmers. Goss’s Bacterial Wilt and Leaf Blight are two other damaging diseases that have caused problems over the past few growing seasons in Minnesota. In 2010, Wilt and Leaf Blight developed in many fields across southern Minnesota. Wilt and Leaf Blight can be a significant disease problem, with yield losses reported as high as 70 to 80 bushels per acre in Minnesota.25

In the past few decades technological progress has been made, and seed companies have been able to genetically enhance corn varieties to provide a higher level of protection against pests and diseases. Advances in Soybean seed modifications have also been able to overcome a number of plant pests and diseases that include soybean cyst nematode and soybean aphids. These hybrids have resistance to certain types of cyst nematode, but not all. Soybean aphids can be addressed with commercial spray, but Mother Nature is often one step ahead. Other plant diseases include: Asian Soybean Rust, European Corn Borer, and a number of insects.

**Relationship to Other Hazards—Cascading Effects**

- **Public Health.** Agricultural disease can have a major impact on public health. A shortage of food can cause poor development among youth that will have lifelong consequences.
- **Civil Disturbance.** A shortage of food could also result in civil disturbance. When the supply of a necessity becomes drastically low, distress can take over and cause civil unrest.

**Animal Disease history in Nobles County**

There have been limited large scale occurrences of agricultural disease in Nobles County. In April 2015 the USDA’s Animal and Plant Health Inspection Service (APHIS) confirmed the presence of highly pathogenic H5N2 avian influenza (HPAI) in a commercial turkey flock in Nobles County, Minnesota.26 This was the fourth confirmation in a commercial flock in Minnesota.

Having limited large scale occurrences of agricultural disease is largely due to the economic incentives farmers have to stay ahead of new diseases and taking precautionary actions. Large operations have specialized staff to monitor livestock and enforce sterilization of equipment and employees before entering facilities. Ag businesses also work with Minnesota Department of Agriculture (MDA) and University of Minnesota Extension Service to stay ahead of and combat agricultural disease.

Minnesota Department of Agriculture (MDA) and University of Minnesota Extension Service provide information on a variety of insects and pests that help prevent occurrences of agricultural disease. Seed producers and other agricultural businesses use this information to modify crops to be resistant to more pests and diseases. The agricultural sector studies past seed modifications and make adjustments to

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combat the next year’s hazards. It is important to study past plant pests and diseases, so we can prepare for future hazards. Understanding the past is an important variable in mitigating future hazard events.

During the spring and summer of 2015, Highly Pathogenic Avian Influenza hit turkey and chicken farmers in Minnesota and neighboring states. As of June 5, 2015, 9 million birds were affected and humanely put down in Minnesota. Losses in poultry production and related businesses due to avian influenza are estimated at $309.9 million in Greater Minnesota, according to University of Minnesota Extension. “Using economic modeling, analysts determined that for every million dollars in direct losses, the estimated ripple effect leads to $1.8 million in overall economic losses, including $450,000 in wages. Ripple effect losses stem from factors including reduced wage-earner and business-to-business spending.”

**Vulnerability**

Agricultural disease is difficult to contain and can spread quickly. Large scale animal outbreaks are rare. The Minnesota Board of Animal Health works with producers to educate, monitor, report, and respond to outbreaks. This coordinated effort has worked to reduce the frequency and scale of occurrences. Some occurrence of crop pests and diseases happens each year. Researchers try to stay ahead of the hazards by giving livestock vaccinations and supplements and by genetically modifying crops.

Emerald Ash Borer (EAB) is one pest that has the potential for a large amount of damage in Nobles County. There are statewide efforts being made to slow the spread, but the outcome is unknown at this time. According to a story in Planning Magazine (“Diversifying the Urban Forest, February 2010), Minnesota could lose all of its ash trees within 10 years.

Ash trees became a preferred quick-growing street tree and shade tree across the USA after elm trees succumbed to Dutch Elm Disease. According to the MDA, the EBA is an insect that attacks and kills ash trees. The adults are small, iridescent green beetles that live outside of trees during the summer months. The larvae are grub or worm-like and live underneath the bark of ash trees. Trees are killed by the tunneling of the larvae under the tree’s bark.

“One on May 14, 2009, emerald ash borer was confirmed as present in the South Saint Anthony Park neighborhood in St. Paul. EAB is a serious invasive tree pest. Quarantine has been placed on Ramsey, Hennepin, Houston, and Winona counties to help slow the spread of Emerald Ash Borer to other areas.”

Emerald Ash Borer is an example of how a plant disease can spread and how it is difficult to contain. The City of Minneapolis has removed 879 unhealthy ash trees in 2012. It is recommended by the Minneapolis Tree Advisory Commission to remove and replace another 5,000 ash trees in 2013 to help prevent the widespread infestation of the bug.

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The Minnesota Pollution Control Agency (MPCA) regulates collection, transportation, storage, processing and disposal of animal manure. As of 2014, there were 452 registered feedlots within Nobles County.\(^\text{31}\) Management of feedlots and manure is a priority for Soil and Water Conservation Districts in southwest Minnesota.

Figure #17  Feedlot Map – Nobles County

Plans and Programs
- Combined mitigation approach – Department of Agriculture, Minnesota Board of Animal Health, Minnesota Department of Health, University of Minnesota Extension Service, and Homeland Security
and Emergency Management (HSEM) are working with local agencies and farmers to effectively mitigate any and all effects of hazards on animal agriculture and plant agriculture.

- **Emergency Operations Plan** – The Nobles County Emergency Operations Plan outlines procedures for county and local governments for contacting appropriate state and federal agencies and provides guidelines and strategies for dealing with animal and plant diseases.

- The Minnesota Board of Animal Health continues to work together with agricultural industries and other state and federal agencies to prepare for and respond to introductions of animal disease outbreaks. The state’s voluntary cooperative control plan includes education, monitoring, reporting, and response. For the Avian Influenza outbreak, testing for influenza in poultry was conducted at the Minnesota Poultry Testing Laboratory in Willmar. Commercial and non-commercial poultry flocks are routinely monitored for influenza. Livestock and other agricultural operations are also monitored for animal disease outbreaks.

- **Catastrophic animal loss** – In the event of a catastrophic animal loss the Minnesota State Duty Officer, the Board of Animal Health (BAH), the Department of Agriculture, the local feedlot officer should be contacted.\(^{32}\) The primary responsibility for regulating carcass disposal in Minnesota lies with the BAH. The 7020 feedlot rule addresses site selection for composting animal carcasses.\(^{33}\) MPCA is in charge of carcass disposal in Minnesota.

- **Catastrophic animal loss preparation** – the Board of Animal Health conducted a catastrophic animal loss training exercise that helped dramatically with the response to Avian Influenza. Foaming and composting was part of the training, which was used during the response to Avian Influenza.

- The private sector has done a good job of policing itself in regards to animal disease outbreaks and the spread of plant diseases. Private agricultural businesses have an economic interest in maintaining a healthy field and healthy animal stock. Research and development plays a big role in trying to stay ahead of the animal and plants diseases and pests.

- **Private / public partnerships** – Press releases from the Minnesota Board of Animal Health were a critical part of getting the word out regarding Avian Influenza. Nobles County has promoted private and public partnership to help educate the agricultural community regarding potential insects/pests and diseases. Creating private and public partnerships is important in mitigating the effects of agricultural disease. A number of issues impact geographical areas, so combining resources and taking advantage of economies of scale can help to make the mitigation efforts more effective.

**Gaps and Deficiencies**

- **Livestock / Poultry Disposal** – Disposal of dead livestock and poultry was an issue identified in many rural counties since the 2015 Avian Influenza Outbreak. This is in regards to catastrophic animal loss. The catastrophic animal loss issue pertains to on the farm animal loss and while the livestock or poultry is being transported.

- **Identifying backyard flocks** – During the Avian Influenza outbreak there were challenges identifying backyard flocks as there are no requirements for identifying backyard flocks in Nobles County. Nobles


County Emergency Management and the Nobles County Feedlot Officer had to rely on information from 4-H Clubs and other informal means of identifying backyard flocks.

- **Animal Disease Containment** – Isolation and containment was and is a concern regarding Avian Influenza. It is difficult to quickly identify infected flocks. Once an infected flock is identified containment protocols can be established.

- **Manure Plans and Disposal** – During the Avian Influenza outbreak in 2015, manure from infested farms from Iowa was being transported to Lyon County which may have went through Nobles County. Feed was then taken back to Iowa. There is an economic incentive for truckers to have loads both ways, but this should have been caught earlier. Wash sites and decontamination for trucks need to be more accessible.

- **Avian Influenza Cause** – Officials are unsure why Avian Influenza occurred and other questions related to how it was transmitted remain unanswered.

- **Local Coordination** – There is a good relationship between Emergency Management, and local veterinarians in Nobles County, but Nobles County Community Services (NCCS) will also need to be involved if there was a public health threat with an actual animal disease outbreak.

- **Lag in Response** – The response for Foreign Disease Outbreak is controlled at the State level. There may be a lag in response, since organizations have to be informed about the outbreak before a response is coordinated. Time is critical in responding to an outbreak, so additional local assets may be needed. Additional training between local assets and state level staff could also help to decrease response times.

- **Coordination with State and Federal Agencies** – Coordination with local emergency managers was not effective during the Avian Influenza outbreak. The Minnesota response to Avian Influenza on the Minnesota Board of Animal Health’s website has a section titled Collaborative Effect. They identified that one key partner (Emergency Management) was overlooked and was not utilized to the full extent. Communication did not go through the normal channels so local emergency managers were not asked to be heavily involved. Local resources could have been better utilized if local emergency managers were more involved.

- **Aquatic Invasive Species** – It is a good thing to slow and prevent the spread of aquatic invasive species, but the Minnesota Department of Natural Resources (DNR) needs to take a more visible approach. The “DNR recommends that boaters either: spray boat with high-pressure water; rinse boat with hot water (120 degrees for two minutes, or 140 degrees for 10 seconds); or dry boat and equipment for at least five days.”

- **Disposal of contaminated materials** – During the Avian Influenza there was a lack of coordination regarding the transportation and disposal of contaminated supplies and equipment. Wash in and wash out was used for larger equipment, but disposal of contaminated supplies and equipment needed additional coordination.

- **Availability of PPE suits (Personal Protection Equipment – Contamination Suits)** – Contamination suits were not always available for workers when entering a contaminated site during the Avian Influenza outbreak.

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5.4.2 Fire (Wildfires and Structure Fires)

According to FEMA, each year in the United States more than 2,500 people die and 12,600 are injured in home fires, many of which could have been prevented.\(^{35}\) A home fire is reported every 85 seconds in the United States.\(^{36}\) Fires can occur in any community and pose a year-round threat. All locations in Nobles County are at risk to be exposed to this hazard.

**Wildfire**

Incidents of wildfire tend to be localized in southwest Minnesota due to the low burning index in this area. “Burning Index relates the potential amount of effort needed to contain a single fire in a particular fuel type.”\(^{37}\) Wildfires can start in grasslands or in crops if the conditions are dry.

Wildfire occurs when an uncontrolled fire spreads through vegetation, posing danger and destruction of property. Wildfires often begin unnoticed, spread quickly, and can be highly unpredictable. Prairie fires are less common than forest fires, but prairie fires can pose a serious threat. The State hazard plan categorizes wildfires into three types:

- Wild land fires in grasslands, brush and forests;
- Interface fires where natural landscapes meet urbanized areas
- Prescribed burns, intentionally set or natural fires that are allowed to burn for beneficial purposes

Factors such as topography, fuel and weather affect wildfire behavior. Fire intensity tends to increase during daytime heating. Large parcels of land left fallow in conservation and natural areas may be susceptible to grass fire even when properly managed. Gusty winds and low relative humidity create conditions for wildfire to spread rapidly in dry grasses and crops. Farm fields with row crops, ditches, and rights-of-way along railroad tracks are also vulnerable, in particular to the errant spark or carelessly discarded cigarette. Prolonged periods of high temperatures and/or high winds increase the risk of wildfires. The potential severity of a wildfire is minor according to the planning team.

Approximately 1,300 wildfires occur in Minnesota each year.\(^{38}\) However, according to data from the National Centers for Environmental Information, Minnesota experienced fourteen reportable wildfires between 2003 and 2017. Wildfires occur throughout the spring, summer and fall; however, most wildfires in Minnesota take place in March, April, and May. During this period, much of the existing vegetation has been killed due to winter temperatures and is dead, brown and combustible. Also, there is little green vegetation to serve as a barrier for a moving wildfire.

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Wildfires in western Minnesota most often occur in grasslands. Grasslands typically include lands in conservation programs such as Reinvest In Minnesota (RIM), Conservation Reserve Program (CRP), Wetland Reserve Program (WRP) and Conservation Reserve Enhancement Program (CREP); “rough ground” that has been hayed, pastured or left wild; and public lands (such as wildlife management areas (WMAs), state parks, waterfowl production areas (WPAs), etc.). Fire danger grows when cedar trees encroach into grasslands. These trees can add a considerable amount of fuel load.

There were zero reportable wildfires in Nobles County from January 2000 through July 2014. The National Weather Service issues Grassland Fire Danger statements from April 1st to November 15th each year. The DNR is the lead state agency for wildfire response and prevention across the state, and offers

training and other resources for local fire departments. DNR conducts controlled burns annually to help manage grasslands.

**Structure Fires**

Incidents of structure fires tend to be contained to one or two buildings, rather than spreading widely. Isolated rural structures can be at risk due to long response times and limited water supplies. The planning team identified the spatial extent of a structure fire as local. However, there are many risks in town, such as one structure fire spreading to adjacent properties.

Structure fires are classified into three categories:

- Residential Structures
- Public and Mercantile Structures
- Industrial Structures

In Minnesota, there was over 119 million dollars in losses due to residential structure fires in 2014. Almost half of structure fires are caused by cooking accidents (mostly from unattended cooking equipment), 14 percent by other causes, and 10 percent by heating sources. Refer to Figure #19 for a complete breakdown of structure fire causes.

**Figure #19**  
Structure Fire Causes – Minnesota (2015)

```
6% Heating
7% Open Flame
8% Appliance
16% Other
8% Electrical
5% Incendiary

“While careless smoking accounts for only two percent of structure fires, it caused 35 percent of known fire fatalities and 27 percent of residential fire deaths.”
```


night when people are sleeping. There have been 7 civilian deaths related to fires in Nobles County, since 1990.42

The State Fire Marshall reports that there was $1,393,150 in fire related losses reported in Nobles County in 2015. From 2011 to 2014, there was an average of $1,125,618 in fire-related losses reported in Nobles County per year.

Figure #20 Structure & Vehicle Incendiary Fires – Minnesota

Relationship to Other Hazards—Cascading Effects

- **Flooding and erosion.** Major wildfires can completely destroy ground cover, which causes heavy erosion and vegetation loss. If heavy rains follow a major fire, flash floods, landslides, and mudflows might occur since vegetation is essential in deterring flooding during heavy rainfalls or spring runoff.

- **Hazardous Material.** The potential for hazardous materials to catch on fire is an added risk to wildfires. Any leaking or explosion of hazardous materials adds to the potential destruction caused by a wildfire.

- **Service disruptions.** Major fires can completely destroy structures, utility infrastructure, and essential public facilities that provide basic services to the community.

- **Health risks.** Destruction or damage to essential infrastructure like water or wastewater facilities might cause public health risk.

- **Hazardous materials.** If certain buildings or storage areas are ruptured or caused to explode because of fire, dangerous hazardous materials could be unleashed into surrounding areas. For example, many farms have anhydrous ammonia and other agricultural chemicals, which can cause serious difficulties for emergency response.

- **Public Health - Air quality is adversely affected by wildfires

Wildfire and Structure Fire History in Nobles County

Structure Fires occur periodically throughout Nobles County. In 2015, there were 22 structure fires and in 2016 there were 28 structure fires in Nobles County. From 1990 through 2014, there were 7 civilian deaths related to fires in Nobles County.

Figure #21  Civilian Fire Deaths by County: 1990 – 2015

![Figure #21 Civilian Fire Deaths by County: 1990 – 2015](image)

Table #43  Runs & Dollar Losses by County – 2015

<table>
<thead>
<tr>
<th>County</th>
<th>Fire Runs</th>
<th>Other Runs</th>
<th>Total County Dollar Loss</th>
<th>Fire Rate</th>
<th>Avg. Dollar Loss/Fire</th>
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<td>$6,521</td>
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</tbody>
</table>

Wildfire and Climate Change

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43 Nobles County EMD. Data Request. Requested data. Received12/2017
Temperatures are predicted to rise in the state, which could lead to more extreme heat events and associated wildfire risks. As Minnesota’s climate changes, weather fluctuations between drought and extreme rain events and increasing temperatures will result in changes to forest composition and/or distribution. These fluctuations can lead to dry conditions that may cause increased fire risk in both grassland and forest environments.

**Vulnerability**

Fire is a serious risk that is not always understood. There are structure fires every year and wildfires in Nobles County are rare. But they can occur under the right conditions and can spread very quickly. It only takes 30 seconds for a small flame to get completely out of control.\(^47\) There is often only enough time to get out of the house safety, before the entire house is engulfed with smoke and flames.

**Plans and Programs**

- **Local fire departments** – Local fire departments within the districts extinguish structure fires. Each department is responsible for fires within their boundaries. However, they often work together on larger fires through mutual aid agreements.
- **State training** – Local firefighters participate in mandatory firefighting training classes offered by the state. Firefighters are also offered the opportunity to participate in wildfire training classes offered by the Minnesota Department of Natural Resources-Forestry Department.
- **Zoning** – The Nobles County Land Use Ordinance controls development of new construction, including the enforcement of safety restrictions like setbacks, coverage, depth, structure height requirements, Shoreland and feedlot development. The county Environmental Services Department issues land use permits for all new construction in the county outside incorporated municipalities.
- **Burning Bans** – Currently, in times of extreme heat and drought, the county will enact burning bans. Residents are alerted through the media when a burning ban is enacted.
- **Burn Permits** – The Nobles County Sheriff’s Office issues burn permits free of charge. Burning permits are good for two years. Residents with burning permits are required to call the number on their burning permit before and after their planned burn so emergency responders are not dispatched when not needed.
- **Burn barrels** – “In Minnesota, open burning of household garbage is banned, with the exception of farms where regularly scheduled pick up of waste is not “reasonably available to the resident” (Minn. Stat. §§ 17.135 and 88.171). However, 28 of Minnesota’s 87 counties have passed no-burn/bury resolutions to close this exemption.”\(^48\)
- **Property management** – Many properties that are owned by Nobles County are used for recreation or conservation. Management plans providing maintenance of these properties (including cutting tall grass, thinning trees, prescribed burning, and removal of low-hanging branches around structures) are in place.
- **Wind tower fires** – Plans are in place for fires involving wind towers. Firefighters are instructed to contain the fire from a distance and let the turbine burn.

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• Electrical fires – The state electrical inspectors inspect commercial structures for potential fire hazards.
• Prescribed burns – The DNR conducts prescribed (or controlled) burns annually in Nobles County. Controlled burns help to reduce fuel load, while also benefiting native prairie restoration. Controlled burns have to be conducted in the right locations and in the right weather conditions. Coordination between the DNR and local fire departments is done to ensure the controlled burns are contained.
• Ditch maintenance – Road ditches are maintained to help decrease the chance of a wildfire spreading. MN Stat. 160.232 states: “To provide enhanced roadside habitat for nesting birds and other small wildlife, road authorities may not mow or till the right-of-way of a highway. Exception is from July 31 to August 31, where the entire right of way may be mowed. Statute also states “When feasible, road authorities are encouraged to utilize low maintenance, native vegetation that reduces the need to mow, provides wildlife habitat, and maintains public safety.”
• Fire departments in Nobles County keep up to date on road closures so efficient routes can be used to reduce response times. Fire Chiefs receive road closure information from Nobles County Public Works, Nobles County Law Enforcement, Nobles County Dispatch and MnDOT.
• Access Roads – Access roads shall be constructed so as to permit access for all emergency vehicles.
• Mutual Aid Agreements – Mutual Aid Agreements are in place between law enforcement, fire districts and ambulance districts to ensure adequate emergency services in Nobles County. Mutual Aid Agreements create agreement among emergency responders to lend assistance across jurisdictional boundaries.
• The Nobles County Mutual Aid Association was organized in 2007 and meets six times a year. The association is comprised of the fire chief (or their appointee) from each fire district and the Nobles County Emergency Management Director. A representative from Law Enforcement, Dispatch and Ambulance Service meets with them on a regular basis. The purpose of the group is to promote public safety and establish a partnership for use of fire personnel and equipment via a mutual aid agreement which all fire departments/districts have
• Right-of-way maintenance – Road Authorities maintain the right-of-way of roadways in Nobles County. This helps to limit tree growth and farm fields from approaching onto public right-of-way of roadways.
• Ordinances – Snow removal ordinances are in place to keep fire hydrants accessible.
• Building codes – Public buildings are constructed to include fire/smoke alarms and sprinkler systems.

Gaps and Deficiencies
• Lack of fire breaks – Nobles County needs a program that places fire breaks in between the continuous CRP (Conservation Reserve Program) tracts of land or other state wildlife areas during times of severe drought.
• Wildfire risk assessment – Nobles County does not undertake a systematic assessment of wildfire risk and associated prevention measures.
• Countywide fire department – With a number of smaller fire departments, Nobles County could benefit from exploring the creation of a countywide fire department. A countywide department could help with coordination, fire inspections, education, and regulations regarding compliance. A countywide department could also help with sharing of resources and decreasing operating costs.
• Fire department/EMS equipment – Regulations, compliance, and training issues are costing rural fire departments more and more. This is causing deficiencies in equipment availability. Not having proper and/or up-to-date equipment and training is a safety concern.
• Specialized training classes could be offered to residents to help them maintain a safe/clean chimney and fireplace.

• Evacuation plans – All cities in Nobles County have evacuation plans detailing the routes residents should take in the event of a large fire.

• Street capacity – Currently, some local streets and alleys are not adequate to handle fire trucks. Those roads should be identified and widened in the future to provide adequate protection.

• Property maintenance – An increasing number of properties are used for recreation or conservation. These properties may not be monitored frequently, which can result in overgrowth and an increased fire risk. Managing properties effectively can reduce the risk of structure and wildfires. Effective property maintenance can include cutting tall grass, thinning trees, prescribed burning, and removal of low-hanging branches around structures as needed.

• Emergency response staffing levels – Keeping local fire departments staffed is becoming an issue. Local fire departments are getting older, and there are less young residents volunteering for the departments. Availability is also a concern for the local fire departments as many firefighters work outside their jurisdiction so daytime availability is an issue.

• Burn barrel compliance – Compliance with burn barrel regulation is an issue. An educational campaign may be necessary to increase compliance.

• Water availability – Nobles County is a rural county, so water availability during a rural fire can be an issue. Barn fires require between 5 and 15 tankers of water, each 2,000 gallons. This requires firefighters to pull water from multiple locations depending on the location of the fire. Pulling water from multiple sources affects response times and the ability to contain the fire.

• Transformer and meter fires – Corn dryers and other heavy equipment can overload and overheat a transformer or meter. This is a concern in the fall during harvest.

• Household electrical fires – Electrical improvements in homes in greater Minnesota are often not inspected. The homeowner has an incentive to ensure the work is done properly, but some people may not be able to ensure proper electrical work.

• Rural fire hydrants – There are no fire hydrants located by water storage towers in rural Nobles County.
5.4.3 Severe Winter Storms – Blizzards, Ice Storms

Minnesota experiences winter weather from mid-autumn through the winter season into spring. Heavy snowfall can immobilize large regions at the same time. All types of winter storms can also be accompanied by extreme cold—both absolute temperatures and wind chill.

Between the years of 1975 and 1991, there were 49 deaths associated with blizzards statewide, or an average of 3 deaths per year. Deaths attributable to blizzards have dropped in recent years (seven since 1992), primarily due to increased weather awareness and warning capabilities across the state. The economic costs of winter storms since 1992 has resulted in property damage of over $26,000,000.

Ice storms are described as occasions when damaging accumulations of ice occur due to freezing rain. The terms freezing rain and freezing drizzle warn the public that a coating of ice is expected on the ground and on other exposed surfaces. Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers.

All locations in Nobles County are equally likely to be exposed to this hazard. Rural areas are more likely to be severely impacted by the hazard. Rural homes and farms face the threat of isolation and utility failure during winter storms. Roads throughout the county are at risk from ice or blowing and drifting snow. Roads closed due to hazardous winter weather also make it difficult for emergency responders to access individuals located in remote rural areas. Given the rural nature of Nobles County, residents of smaller communities may face similar isolation issues as rural residents. City residents are also at risk. Attempting to travel between communities would expose city dwellers to higher levels of risk corresponding with their rural counterparts.

There are several types of winter storm events that are typical for this area including: heavy snow events, ice storms, and blizzards. The potential severity of blizzards and winter storm events is major according to the planning team. Heavy snow events in Minnesota are considered to be 6 or more inches of snow in a 12-hour period, or 8 or more inches in a 24-hour period. Snow is considered heavy when visibilities drop below one-quarter mile regardless of wind speed. Heavy snows can lead to building collapse as well as creating a hazard to residents and travelers.

Ice storms include freezing rain, freezing drizzle and sleet. Freezing rain, probably the most serious of the ice storms, occurs during a precipitation event when warm air aloft exceeds 32 degrees Fahrenheit while the surface remains below the freezing point. When precipitation originating as rain or drizzle contacts physical structures on the surface, ice forms on all surfaces creating problems for traffic, utility lines, and tree limbs.

Sleet forms when precipitation originating as rain falls through a rather large layer of the atmosphere with below freezing temperatures allowing the raindrops to freeze before reaching the ground. Sleet is also referred to as ice pellets. Freezing rain freezes when it hits the ground, creating a coating of ice on roads, trees and power lines. Sleet storms are usually of shorter duration than freezing rain and generally create fewer problems.

Ice storms combined with high winds often threaten the electrical power grid. Typical power outages due to localized storm events are usually restored within a few hours and would create short term problems and inconveniences, but a complete power outage has the potential to be a catastrophic event, due to
the extensive systems that rely on power generation. Water and sewer service rely on electrical pumping stations. Individual home furnaces may be able to run on natural gas or propane, but usually need electricity to circulate warm air or hot water throughout a building.

Blizzards are the most violent type of winter storm. A blizzard occurs with sustained or frequent gusts to 35 miles per hour or greater and considerable amounts of falling and/or blowing snow (reducing visibility to less than a quarter mile) for three hours or longer. While blizzards in Nobles County can occur from October through April, they are most likely from November through the end of March. Temperature is not taken into consideration when the National Weather Service issues a Blizzard Warning; however, the nature of these storms typically leads to extreme cold.

Relationship to Other Hazards—Cascading Effects

- **Flooding.** Heavy snows and rapid snow melt are primary contributors to seasonal spring flooding. Areas along rivers and stream in Nobles County can be impacted by spring flooding.
- **Transportation Crashes.** Winter storms often lead to hazardous conditions for transportation infrastructure. Icy roads can make travel difficult and poorly designed roads can result in large drifts that make travel impossible. Poor driving conditions and poorly designed transportation infrastructure can contribute to motor vehicle crashes.
- **Utility Failure.** Winter storms can impact the power grid. Utility interruption can be severe in Nobles County due to the rural nature of the county. A winter storm can isolate rural residents and can leave them without power for extended periods of time. These residents are at risk of hypothermia or even death.
- **Wildland or Structural Fire** - Heavy storms that result in large amounts of downed timber can result in an increase of dead or dying trees left standing, thus providing an increased fuel load for a wildfire. There is an additional risk of increased frequency of structural fires during heavy snow events, primarily due to utility disruptions and the use of alternative heating methods by residents.
- **Public Safety** - Drivers stranded in snowstorms may make uninformed decisions that can put them at risk; residents who are unprepared or vulnerable may not be able to obtain goods or reach their destinations. EMS providers may be slowed by road conditions while responding to emergencies. Ice storms may result in power outages due to downed power lines, putting people at risk for cold temperature exposure and reducing the ability to spread emergency messages to the public via television, radio or computer.

**History of Severe Winter Storms in Nobles County**

From January 2000 through May 2017, there have been 30 documented winter storms in Nobles County. These winter storms are often not confined to Nobles County but affect all of southwest Minnesota. In the table below are winter storm occurrences from January 2011 through May 2017.
<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Event Narrative</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/20/2011</td>
<td>Nobles, Jackson, Cottonwood, Rock, Murray, Pipestone, Lyon, Lincoln</td>
<td>Freezing rain and sleet changed to snow. The freezing rain and sleet caused icy travel and walking surfaces. Light glazing was reported from the freezing rain, as well as sleet accumulations up to one inch. Snowfall varied from 2 inches along the southern edge of the county up to 7 inches in the central and north, including 7 inches at Worthington. Winds averaging 20 to 30 mph caused drifting and some areas of blowing snow.</td>
</tr>
<tr>
<td>4/9/2013</td>
<td>Nobles, Jackson, Cottonwood, Rock, Murray, Pipestone, Lyon, Lincoln</td>
<td>An extended period of precipitation began with freezing rain and freezing drizzle producing light ice accumulations, then changing to sleet and then snow, with sleet and snow accumulations reaching 14.5 inches near Marshall. The winter precipitation made travel very difficult, resulting in schools and businesses being forced to close.</td>
</tr>
<tr>
<td>4/18/2013</td>
<td>Jackson, Murray, Nobles, Lincoln, Cottonwood, Pipestone, Lyon, Lincoln</td>
<td>Wet snow accumulated 5 to 8 inches, including 6 inches at Marshall. There were areas of blowing snow in wind gusts up to 40 mph while the snow was falling.</td>
</tr>
<tr>
<td>1/5/2015</td>
<td>Lyon, Lincoln, Rock, Pipestone, Nobles, Cottonwood, Murray, Jackson</td>
<td>Snow accumulated 3 to 6 inches. The snow was accompanied by southeast winds gusting to over 30 mph, reducing visibility to a quarter mile or less in a few areas. The storm forced some schools to close early for the day.</td>
</tr>
<tr>
<td>1/31/2015</td>
<td>Nobles, Jackson, Cottonwood, Rock, Murray, Pipestone, Lyon, Lincoln</td>
<td>Snow accumulated 3 to 6 inches, including 4.4 inches at Worthington. The snow was accompanied by southeast winds gusting to over 30 mph, reducing visibility to a quarter mile or less in a few areas. The storm forced some schools to close early for the day.</td>
</tr>
<tr>
<td>2/1/2015</td>
<td>Nobles, Jackson, Cottonwood, Rock, Murray, Pipestone</td>
<td>Snow accumulated 4 to 7 inches, including 5.5 inches at Worthington. Accompanying northwest winds gusting to 35 mph caused areas of blowing snow, reducing visibility to 1/4 mile at a few places.</td>
</tr>
<tr>
<td>11/30/2015</td>
<td>Nobles, Jackson, Cottonwood, Rock, Murray, Pipestone, Lyon, Lincoln</td>
<td>Freezing drizzle was quickly followed by snow. The snow accumulated 5 to 9 inches over a 24 to 30 hour period, including 8.0 inches at Rushmore. The storm resulted in cancellations or cutbacks of school classes.</td>
</tr>
<tr>
<td>12/1/2015</td>
<td>Nobles, Jackson, Cottonwood, Rock, Murray, Pipestone, Lyon, Lincoln</td>
<td>Freezing drizzle was quickly followed by snow. The snow accumulated 5 to 9 inches over a 24 to 30 hour period that began on November 30th, including 8.0 inches at Rushmore. The storm resulted in cancellations or cutbacks of school classes.</td>
</tr>
<tr>
<td>12/25/2015</td>
<td>Nobles, Jackson, Cottonwood, Rock, Murray, Pipestone, Lyon, Lincoln</td>
<td>Snow accumulated 4 to 7 inches, including 6.0 inches at Worthington. North to northwest winds gusted to around 30 mph on December 26th, causing areas of blowing snow with visibilities below a half mile in places. The storm affected mainly Christmas weekend travel.</td>
</tr>
</tbody>
</table>
From January 2000 through May 2017, there have been 14 documented Blizzards in Nobles County. In the table below are blizzard occurrences that occurred from December 2012 through May 2017.

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Event Narrative</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/18/2016</td>
<td>Nobles, Jackson, Cottonwood, Rock, Murray, Pipestone, Lyon, Lincoln</td>
<td>Wet snow accumulated 2 to 5 inches, including 4 inches northwest of Worthington. The snow was accompanied by northwest winds gusting to 55 mph, which combined with the falling snow to produce visibilities less than a quarter mile at times. Travel was difficult because of the low visibility and slippery surfaces. Wind chills were driven down into the teens after an immediately preceding period of much above normal temperatures. Classes were delayed or cancelled at many schools.</td>
</tr>
<tr>
<td>12/16/2016</td>
<td>Nobles, Jackson, Cottonwood, Rock, Murray, Pipestone, Lyon, Lincoln</td>
<td>Snow accumulated 5 to 8 inches, including 7.3 inches at Rushmore. Northerly winds increased to around 20 mph sustained with gusts around 30 mph, causing drifting snow and areas of blowing snow. The winds and falling temperatures caused wind chills to drop to around 20 below zero during the storm. Some schools were dismissed early on December 16th.</td>
</tr>
<tr>
<td>1/24/2017</td>
<td>Nobles, Jackson, Cottonwood, Rock, Murray, Pipestone, Lyon, Lincoln</td>
<td>Snow accumulated 4 to 7 inches, including 6 inches near Round Lake. Winds of 20 to 30 mph caused significant blowing and drifting snow, closing several roads and causing school and business closings. The blowing and drifting continued to cause problems after snow accumulations had ended.</td>
</tr>
</tbody>
</table>

National Climatic Data Center (NCDC / NOAA) Storm Events database

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Event Narrative</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/10/2013</td>
<td>Nobles, Rock, Pipestone, Lincoln, Lyon, Cottonwood, Jackson, Murray</td>
<td>Snowfall of 2 to 4 inches was accompanied by northwest winds gusting to 45 mph, producing blizzard conditions with widespread visibilities below a quarter mile. The low visibilities and drifting snow closed several roads, some businesses, and forced school closings on Monday February 11th.</td>
</tr>
<tr>
<td>1/16/2014</td>
<td>Nobles, Pipestone, Lyon, Rock, Lincoln, Murray, Jackson, Cottonwood</td>
<td>Northwest winds gusting to over 50 mph combined with existing snow cover and new snowfall of up to 2 inches to cause widespread frequent visibilities below a quarter mile in blowing snow. Schools and some businesses closed as travel temporarily became difficult to impossible.</td>
</tr>
<tr>
<td>1/3/2015</td>
<td>Nobles, Jackson, Cottonwood</td>
<td>Snowfall of 1 to 3 inches while winds were gusting to over 40 mph caused widespread near zero visibilities over the southern and eastern parts of Nobles County during much of the evening of January 3rd. Travel in open areas was temporarily brought to a halt.</td>
</tr>
<tr>
<td>Date</td>
<td>Location</td>
<td>Event Narrative</td>
</tr>
<tr>
<td>---------</td>
<td>-----------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1/8/2015</td>
<td>Lyon, Lincoln, Murray, Cottonwood, Nobles, Jackson, Pipestone</td>
<td>Northwest winds gusting up to 50 mph combined with existing snow cover to cause blowing snow, reducing visibilities to a quarter mile or less over much of the area. Some schools ended classes early.</td>
</tr>
<tr>
<td>2/2/2016</td>
<td>Nobles, Pipestone, Lyon, Rock, Lincoln, Murray, Jackson, Cottonwood</td>
<td>Heavy snow combined with north to northwest winds 20 to 35 mph, with gusts over 40 mph, to produce near zero visibilities in falling and blowing snow. Accumulations ranged from 7 to 10 inches with 7.5 inches reported at Worthington. Travel was brought to a halt and numerous vehicles slid off roads due to the combination of snowy roads and low visibility. Schools and numerous businesses were closed.</td>
</tr>
<tr>
<td>2/7/2016</td>
<td>Nobles, Pipestone, Lyon, Rock, Lincoln, Murray, Jackson, Cottonwood</td>
<td>Northerly winds gusting to over 50 mph combined with existing heavy snow cover and around one inch of new snowfall to produce widespread blizzard conditions, with visibilities lowering to below a quarter mile in blowing snow. Some vehicles became stuck or drove off roads in zero visibilities. Some schools and businesses closed on Monday February 8th.</td>
</tr>
<tr>
<td>2/23/2017</td>
<td>Nobles, Pipestone, Rock, Murray, Jackson, Cottonwood</td>
<td>Snowfall of 2 to 5 inches combined with strong winds of 40 to 45 mph created blizzard conditions with widespread visibilities below a half mile. The worst of the conditions existed in the southern portion of the county.</td>
</tr>
</tbody>
</table>

National Climatic Data Center (NCDC / NOAA) Storm Events database

**Severe Winter Storms and Climate Change**

Historically, winter storms have had a large impact on public safety in Minnesota. This will continue, with a possible increase in snowstorm frequency and annual total snowfall. Winter weather is often a cause of power outages. Pressures on energy use, reduced reliability of services, potential outages and potential rise in household costs for energy are major climate change risks to public health.

The number of heavy snowfall years for the Midwest has fluctuated throughout the 1900-2006 time period. The periods of 1900-1920 and 1960-1985 had numerous years with snowfall totals over the 90th percentile. In the recent 3 decades, the number of heavy seasonal snowfall totals has been much lower. Despite these generally lower seasonal snowfall totals, some areas of the Midwest have still experienced significant snow totals in the most recent decade. The 100-year linear trends based on decadal values show that the upper Midwest had statistically significant (1% level) upward linear trends in snowstorm frequency from 1901 to 2000.49

**Vulnerability**

Winter storms are highly likely in the area, occurring annually and having major impacts on local communities. The effects of a winter storm can include: closures, snow and ice removal from public streets, recovery from utility failure, providing emergency shelters for travelers and dislocated residents,

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49 Kunkel, et al., Regional Climate Trends and Scenarios for the U.S. National Climate Assessment., 2013
and potential injuries and death. Winter storms can also cause lost productivity and disruptions in the local workforce, with public and private employees unable to work regular hours.

A number of facilities in Nobles County do have emergency generators that help keep emergency services available during a winter storm.

Table #46  Locations with Emergency Generators, Nobles County

<table>
<thead>
<tr>
<th>City</th>
<th>Location / Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adrian</td>
<td>2mw diesel generator for stand-by operation, 60 kw propane generator at the well field for pumping water to the water tower. City has generator power for entire city.</td>
</tr>
<tr>
<td>Bigelow</td>
<td>Generator for sewer system</td>
</tr>
<tr>
<td>Brewster</td>
<td>Permanently mounted at city sewage lift station at 622 9th St to prevent sewage backup in to homes</td>
</tr>
<tr>
<td>Dundee</td>
<td></td>
</tr>
<tr>
<td>Ellsworth</td>
<td>Parkview Manor Nursing Home has a backup generator</td>
</tr>
<tr>
<td>Kinbrae</td>
<td></td>
</tr>
<tr>
<td>Lismore</td>
<td>Two small generators to run small equipment</td>
</tr>
<tr>
<td>Round Lake</td>
<td>23KW gas powered</td>
</tr>
<tr>
<td>Rushmore</td>
<td>W150KvK Diesel powered generator permanent at city lift station. 100 kvk generator at the city water pump house.</td>
</tr>
<tr>
<td>Wilmont</td>
<td>Portable diesel generator that runs lift station.</td>
</tr>
<tr>
<td>Worthington</td>
<td>The City of Worthington has generator power to provide rolling power to portions of the city on a rotating basis (as was done during the ice storm in April of 2013). The generator located at WPU has 14MW of generating capacity. The city has identified critical facilities that remain on full generator power during a power outage. Sanford Hospital has their own generator to keep them powered during an outage so they do not rely on the city’s generator. Avera Clinic and Surgical Center also have backup generators. Prairie Elementary has a small generator for emergency lights.</td>
</tr>
<tr>
<td>Nobles County</td>
<td>The Prairie Justice Center has a generator for the entire building. The Government Center has a generator to power priority areas in the building including the Emergency Operations Center. We have approved a generator to power the vehicle fueling system at the Public Works building, expect install within 8 to 12 weeks.</td>
</tr>
</tbody>
</table>

Source: Information request to city and county representatives from NCEM. December 2017.

The accumulated effects of winter storms and blizzard conditions also pose a risk to structures from snow loads on roofs. Vulnerable structures can easily collapse under the weight of heavy snow and/or high winds. The Minnesota building code has requirements for snow loads.
Analysis of specific infrastructure and structure dollar-cost vulnerability is not possible since winter storms can (and do) impact large portions of the study area. Based on current available data, modeling future losses would only be possible for total losses with excessive margins of error. Future storm events could be tracked specifically as they occur and could be used to model local vulnerability to winter storms in future updates.
Plans and Programs

- Real-time weather monitoring – The City of Worthington has a real-time weather monitoring station at the Worthington Municipal Airport that provides current temperatures, dew point, wind speed, wind direction, and barometric pressure.

- Travel Assistance – “511 is a public service of the Minnesota Department of Transportation (MnDOT) to help traveler’s access information about road conditions, traffic incidents, commercial vehicle restrictions, and weather information via the phone or the Web, 24 hours a day, seven days a week.”  

- Regional Forecasts – Nobles County is in the Sioux Falls broadcasting region. Weather forecasts in the Sioux Falls region tend to be a good predictor of weather in Nobles County. Nobles County uses this information in regards to school closures and other weather related announcements.

- School closings – Nobles County’s school districts have a policy of closing schools when wind chills exceed certain thresholds, low visibilities create unsafe driving conditions, or when heavy snow has fallen making travel difficult. Local radio stations partner with the school districts to make sure the announcements are out by 6:00 am or earlier if possible.

- Snow Fences – Nobles County has in the past promoted natural and manmade snow fences to protect highways against drifting snow.

- Road closures – Nobles County Public Works and local cities are working closely with MnDOT to improve transportation safety in all weather conditions. Road closures are enacted when conditions become too hazardous. MnDOT uses the 511MN.org, or 511 for mobile phones. This system does not send out alerts, but posts weather related road information online for public access.

- Emergency generators – Emergency generators help keep emergency services available during winter storms. Refer to Table #46 for public entities with emergency generators in Nobles County. A number of private residents also have backup generators.

- City Policies – Cities have snow removal and winter parking policies in place to ensure access throughout the city.

- Hardening of the electrical grid – Much work has already been completed to harden electric utilities against winter storms. Redundancies in utility systems can further reduce outages resulting from storms.

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Gaps and Deficiencies

- Automated weather stations at schools – Automated weather stations at schools throughout Nobles County would provide more current information and quicker response to dangerous and changing weather conditions.

- 511 System – The 511 system does not incorporate local knowledge as well as it could. County staff has little involvement in providing updates to the 511 system. Including snowplow drivers and other county staff could help to improve the accuracy of the system. County staff has local knowledge regarding the road network and can provide accurate information into the system.

- Road Closures Coordination – MnDOT closes state highways and does not talk to local emergency managers. There needs to be a direct line of communications between MnDOT and local emergency managers. This is an issue for emergency response and mass sheltering.

- Warning systems – The effective range of warning systems is limited. Travelers may be unaware of an upcoming storm. Residents or travelers who listen to satellite radio/television may not be receiving weather warnings or be aware of forecasts and changing conditions. The use of Nixle to receive local alerts should be promoted along with NOAA weather radios.

- Hardening of the electrical grid – Nobles Cooperative Electric (NCE) suffers from storm damage and interruptions mainly from ice, wind, and severe weather on its overhead lines. In order to lower the effects from extreme weather on overhead lines, NCE builds and maintains its distribution system to specifications that try to limit damage during extreme weather conditions. Some of the techniques that are used include: use of heavier conductors; spans for all conductors between overhead poles shall be 250 feet; conductor tensions are calculated to NESC heavy conditions; using larger class of poles; the relocation of overhead lines to underground; and tree maintenance, which helps to increase the reliability of the utility grid. NCE works with its engineering company to determine areas where overhead facilities should be replaced with underground facilities, to locate tie lines and to loop feeds to pick up member electrical load if one substation fails. If/when available, NCE would use FEMA mitigation dollars for site specific projects to harden its distribution system and would pursue additional non-site specific projects if additional FEMA dollars become available.

- Building Codes – Certified inspectors increase the cost of building. This increase in costs could result in less development. Cities in Nobles County have thought it is the responsibility of the property owner to ensure the building meets standards outlined in the Minnesota Building Code.

- Lack of rental ordinances – The City of Worthington has a rental ordinance to help identify and correct deficient rental housing units within the city. Other cities in Nobles County do not have a similar ordinance.

- Snow removal ordinance – Snow removal along sidewalks and at intersections can be an issue in Nobles County. Most cities in Nobles County have an ordinance regarding snow removal. Snow should be removed from sidewalks within 24 hours of a snow event, but this policy is often not enforced. City ordinances and enforcement should be used to prohibit snow piles from interfering with pedestrian traffic and visibility, especially around schools and fire hydrants.

- Commuting time – Commuting times have increased. In Nobles County a number of residents commute long distances to work, which increases their exposure to winter weather hazards. Population in Worthington doubles during the work day.

- Road design – Transportation engineers use road design to substantially reduce hazards from blowing and drifting snow. Living snow fences have been used to mitigate the effects of blowing and drifting snow.
snow, which affect road conditions. Living snow fences are designed plantings of trees and/or shrubs and native grasses located along roads or around buildings, which create a vegetative trap to control blowing and drifting snow.

- Lack of snow fences – As prices for farmland and crops went up, a number of trees and windbreaks have been taken out. Snowstorms and blizzards in Nobles County create extensive snow drifting on roadways when the land along the road is higher than the road surface. These drifts close the road to traffic and can be difficult to open and are a recurring problem when the wind blows the loose snow around after the blizzard is over. Living snow fence (vegetation planted on private property) has had very little acceptance since it either requires the purchase or long term lease of the land, as well as hay disrupting farming operations. Snow fences are located on private property and take land out of crop production and obstruct farming operations. Land owners have been more receptive to road design measures such as minor grading to remove the dirt, lowering the elevation of the ground adjacent to the roadway which eliminates the problem that creates the snow drift. The cost of road design is a little higher to lease the ground, remove the dirt and restore the soil for farming, but the land owners have been more receptive to this type of operation to eliminate the snow drift. This also only needs to be done once and the problem is gone and there are no ongoing recurring costs in the future.
Figure #22  
Snow Removal Problem Areas – Nobles County

Note: “X” = snow removal problem areas.
- Backup generators – It is expensive to install back-up generators. Due to limited funding sources, redundant electrical supply back-up may not be available in all essential locations in Nobles County. The table below identifies essential locations that should have back-up generators.

<table>
<thead>
<tr>
<th>Table #47</th>
<th>Facilities that Need Emergency Generators – Nobles County</th>
</tr>
</thead>
<tbody>
<tr>
<td>City</td>
<td>Location</td>
</tr>
<tr>
<td>Adrian</td>
<td>Public Works Department</td>
</tr>
<tr>
<td>Bigelow</td>
<td>Community Center</td>
</tr>
<tr>
<td>Brewster</td>
<td>Fire Department, City Hall and Trailer Court Shelter</td>
</tr>
<tr>
<td>Dundee</td>
<td>Fire Department</td>
</tr>
<tr>
<td>Ellsworth</td>
<td>Fire Department</td>
</tr>
<tr>
<td>Kinbrae</td>
<td>City Hall Fire Department</td>
</tr>
<tr>
<td>Lismore</td>
<td>City Hall Fire Department</td>
</tr>
<tr>
<td>Round Lake</td>
<td>City Hall/Shop, Fire Hall and Lift Station</td>
</tr>
<tr>
<td>Rushmore</td>
<td>Community Room in School Building, Fire Department, City Hall and PW Garage</td>
</tr>
<tr>
<td>Wilmont</td>
<td>Fire Hall, City Hall, and Storm Shelter</td>
</tr>
<tr>
<td>Worthington</td>
<td></td>
</tr>
</tbody>
</table>

Source: Information request to city and county representatives from NCEM. December 2017.
• Coordination with rural electric cooperatives – When power outages occur, it can be difficult for rural electric trucks to get into areas with drifting snow. Increased coordination is needed with county and township staff to open routes to the source of a power outage.

• Language barriers – Language barriers can be an issue regarding severe weather warnings. There are a number of nationalities and languages spoken in Nobles County. This makes it difficult to send out emergency broadcast. Having to translate emergency broadcasts into multiple languages takes time and money.

• Generator connectivity - The Nobles County Government Center and Prairie Justice Center both have a generator that automatically connects when the power fails. A quick connect is not available if a back-up generator is needed to assist. All critical government infrastructure should be built with a quick connect generator system.

• Looping/tying substation feeds together so if one substation fails, the load can be picked up by other substations.

• Putting ties between substations underground.

• Replacing overhead lines with underground lines for key member loads. These loads would include rural water pumping stations and other emergency loads that rely on electricity to maintain service.

• Tree Maintenance – Cities help to increase the reliability of the utility grid by cutting down and maintaining trees that are close to power lines and in the public right-of-way.
5.4.4 Flooding

Flooding is one of the most common hazards across the United States and “floods are among the most frequent and costly natural disasters.”\(^{51}\) Flooding can occur anytime, anywhere. Seemingly benign streams can overflow their banks from a sudden rainstorm, quick snowmelt, or blockage of a channel. Lakes or reservoirs can retain water and quietly creep up the shorelines. City sewers can back up and pour into private basements and onto public streets. Dams can break causing flooding down river.

The National Flood Insurance Program (NFIP) was created by Congress to help property owners to protect themselves financially. NFIP offers flood insurance in communities that agree to adopt and enforce ordinances to reduce the risk of flooding. In Minnesota, the DNR administers floodplain management programs.\(^{52}\)

There is 1 flood insurance policy (FIP) in force in Nobles County, 1 FIP in force in the City of Adrian, and 132 FIPs in force in the city of Worthington.\(^{53}\) Each policy covers a single building, but all single family home policies include detached garages. The table below outlines that number of policies in each city and the county.

<table>
<thead>
<tr>
<th>County / City</th>
<th>Number of NFIP Policies in Force</th>
<th>Insurance in Force – Whole Dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>City of Adrian</td>
<td>1</td>
<td>$90,700</td>
</tr>
<tr>
<td>City of Worthington</td>
<td>132</td>
<td>$13,687,600</td>
</tr>
<tr>
<td>Nobles County (unincorporated areas of county only)</td>
<td>1</td>
<td>$70,000</td>
</tr>
<tr>
<td>State of MN</td>
<td>9,541</td>
<td>$2,230,873,300</td>
</tr>
</tbody>
</table>


The Federal Emergency Management Agency (FEMA) has mapped the probability of flood waters inundating floodplains. FEMA works with local communities to map the Special Flood Hazard Area (SFHA), commonly known as the 100-year floodplain (one percent floodplain), where they calculate a one percent chance of a flood event any given year. Within the SFHA lie the floodway, in which water can be expected at any time, and the flood fringe which is vulnerable to flood events.

FEMA has developed Flood Insurance Rate Maps (FIRMs) for many communities across the United States. FEMA now posts these online, along with “FIRMettes” — a “full-scale portion of a FEMA Flood Insurance Rate Map (FIRM) that you create yourself online by selecting the desired area from an image of a Flood Insurance Rate Map.”

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Locations Affected by the Hazard

Flooding can occur anytime, anywhere. The majority of Nobles County is classified as Zone C, which is defined as an area of minimal flooding. The areas of minimal flooding include most of the intermittent streams throughout the county. These streams contain surface water runoff at various times throughout the year and high water levels may extend beyond the established drainage channel and onto adjacent lands.

Flash flooding events tend to be localized, not countywide, but the risk is countywide. Flash flooding can occur rapidly and cause substantial damage. Flash flooding can cause a rapid rise in the water level of a stream or creek above a predetermined flood level.

One percent floodplain areas do exist in Nobles County. There are mapped floodplains in every township in Nobles County. Many areas are narrow, following streams and creeks. Other areas are broader, encompassing lake shores and historic wetland areas. These areas tend to follow the Kanaranzi Creek around Adrian and Lismore; Lake Okabena and County Ditch 12 in Worthington; Little Rock River in south central Nobles County; Jack Creek south of Kinbrae; Okabena Creek south of Brewster; and numerous creeks north of Ellsworth.

Flood Insurance Rate Maps (FIRMs) are available for the Cities of Adrian and Worthington and a number of townships. Check with your insurance agent for rates.
Figure #24  Flood Plain Map – Nobles County

Source: HAZUS Flood Hazard Analysis for Nobles County, 2017, Geospatial Analysis Center

City of Adrian

The mapped floodplain follows I-90 on Kanaranzi Creek along the north side of Adrian, and an unnamed tributary on the east side of town. There is also a 500-year floodplain area mapped on an historic drainage along Indiana Ave. As the Nobles Local Water Management Plan (2009) relates:

The City of Adrian experiences annual high water flow problems from up-slope drainage areas during spring snowmelts or heavy rainfall events. Natural drainage was further restricted by construction of Interstate 90 on the north side of the city. The City has accommodated this natural flooding by development restrictions (such as the Sixth Street W. berm), easements, and zoning flood-prone areas for appropriate land uses such as parks. However, conflicts still occur.

Inadequate culverts under Interstate 90 severely restrict high-water flow into Kanaranzi Creek on the north side of Adrian. The initial Nobles County AHMP estimated 0.07 square miles within the flood zone.
GIS analysis of the draft dFIRM indicates 83 acres in the A Zone 100 year floodplain, or about 12% of the area of the city of Adrian.

City of Ellsworth
Currently, the City of Ellsworth is not listed in the NFIP Community Status Book; however, the initial Nobles County AHMP estimated 0.02 square miles with no structures within the flood zone. The draft dFIRM includes mapped floodplain in a small area on either side of TH91 on the north side of town with one structure. This area encompasses about 57 acres or 15% of the community.

City of Worthington
Mapped floodplains extend through the city of Worthington.

- Lake Okabena is mapped as floodplain, however there are few problems with lakeshore flooding. Most of the shore line is developed.
- Southeast: There is a drained wetland along TH60/US59 route east of Lake Okabena. The City has identified this area as inappropriate for future development.
- Northeast: There is mapped floodplain along the county ditches on either side of I-90. New regional storm water detention facilities are being designed as the area builds out with commercial and industrial development.
- County Ditch 12: Also known as Okabena Creek, runs through mainly residential neighborhoods with school and commercial facilities and floods during winter snow melt and moderate to heavy rainfall events. NOAA listed 100 year flood events in 1969, 1994, 1997, and 2001. There are several blocks in developed residential neighborhoods mapped in the 100-year and 500-year floodplain.

There are several areas where the City of Worthington has raised issues with the detail of the draft dFIRMs. The initial Nobles County AHMP estimated 8.6 square miles within the flood zone including the area of Lake Okabena. Excluding the main body of Lake Okabena, the draft dFIRM includes about 396 acres in Zone A, or about 7% of the city.

Dams
An Emergency Action Plan (EAP) is required for all High Hazard dams, implemented in the County Emergency Operations Plan (EOP). Currently there are no High Hazard or Significant rated dams in Nobles County. Several small structures have been built and maintained by the Okabena-Ocheda Watershed District for flood protection and other purposes.

Highly erodible soils can result in landslides and sinkholes. Both of these phenomena can occur in Nobles County but are rare as the county’s soil loss rates are only 5 T/ac.54 The Erodibility Index (EI) is a numerical expression of the potential of a soil to erode, considering climatic factors and the physical and chemical properties of the soil – the higher the index, the greater is the investment needed to maintain the sustainability of the soil resource base if intensively cropped. Highly Erodible Land (HEL) in Southwest Minnesota is defined to have an EI of at least 5.55 The soil loss tolerance rate (T) is the maximum rate of annual soil loss that will permit crop productivity to be sustained economically and indefinitely on a given

soil. Erosion is considered to be greater than T if either the water (sheet & rill) erosion or the wind erosion rate exceeds the soil loss tolerance rate.

Figure #25  Highly Erodible Land – Nobles County

Critical Facilities
There are a limited number of critical facilities in Nobles County that are within the one percent floodplain. Worthington does have critical facilities that are located in the one percent floodplain.

Effect on Housing
The majority of Nobles County’s population lives safe from flooding, although some housing units have been identified within the one percent floodplain and flooding can occur anywhere. County staff has identified residential and commercial structures within the floodplain using GIS, FIRM Maps, and the State of Minnesota DOQ flyovers.
Development has occurred along and near waterways in Nobles County due to the aesthetics they create. The median housing unit value in Nobles County was $106,900 in 2015. According to the Nobles County general building stock [updated with these parcel data], the HAZUS model estimates there are 8,829 parcels with buildings in the region with a total replacement value (excluding contents) of $1.14 billion (2010 dollars). Approximately 71% of the buildings (and 54% of the building value) are associated with residential housing. This is just the value of the residential structures. Since flooding could occur in any of the communities within Nobles County and in the rural areas, the potential damage of a flood could be relatively high.

**Commercial Structures**

There are some commercial structures currently located within the one percent floodplain in Nobles County, but past damages that have occurred were minimal. Future construction of commercial buildings in the floodplain has been prohibited under Nobles County’s zoning regulations.

As stated earlier, County Ditch 12 which runs through mainly residential neighborhoods with school and commercial facilities, floods during winter snow melt and moderate to heavy rainfall events. There are also several blocks in developed residential neighborhoods mapped in the 100-year and 500-year floodplain.

**Public Infrastructure**

Within Nobles County there are some roads that are prone to flooding or washing out during a hazard event. Those most noted are roads in low-lying areas that are vulnerable to intermittent flooding from spring thaws or large rain falls. Along with flooding or washing out of roads, the County has had a problem with debris being left on roads as a result of water running over the roadway. Debris removal is often limited, but cleanup is a cost that is incurred.

There are 406 bridges on county, municipal, and township roadways within Nobles County. Most are made of steel or steel reinforced concrete, which can withstand annual spring flooding. To date, none of the bridges within Nobles County have been destroyed as a result of flooding.

The majority of damages from flooding occur on township roads and county roads. Many other locations can experience damage from flooding depending on the location, amount, and duration of the rainfall event. A one percent flood event would result in a number of roadways sustaining damage and wider spread road closures.

Worthington has a wastewater treatment plant close to the one percent floodplain. To date, extensive damage to wastewater treatment ponds within the county due to flooding has not occurred.

Roads, bridges, and culverts are susceptible to damage from flooding. The figure below identifies areas where drainage is an issue. This may be the result of an undersized culvert, poor drainage, inadequate

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holding basin, or other issues. For more information regarding specific locations identified in the figure below, please contact the Nobles County Public Works Office.

**County Ditch 12**

The upper watershed of Okabena Creek serves over 9,000 acres of agricultural land to the northwest of the City of Worthington. The drainage area was rerouted to the south into Lake Okabena in the early 1900’s when Whiskey Ditch was constructed. During extreme flooding conditions, a portion of the Okabena Creek flows can be directed away from Whiskey Ditch into County Ditch (CD) 12 (originally Okabena Creek) through a diversion structure in the northeast quadrant of the Diagonal Road and Oxford Street intersection. The recently accepted DFIRM map of the area assumes that the gates at the diversion structure are open allowing 480 cubic feet per second of flow into the CD 12 system for the 1% event.

Because of this unique configuration, the 9,232-acre watershed upstream of the diversion structure is limited to contributing a peak flow of 480 cfs to the CD 12 system for the 100-year event while the remaining 967-acre watershed between the diversion structure and I-90 contributes 432 cfs. Hence, the larger watershed upstream of the diversion has a comparative effective area that is closer to 1,100 acres. Because the flowrates through the diversion structure are smaller than normally expected from a 9,232-acre watershed, the proposed detention storage alternative is competitively economical.

County Ditch 12 in Worthington has a culvert that crosses Interstate 90 which restricts flow due to its limited size and causes flooding upstream. This culvert cannot be enlarged since its strategic transportation location makes culvert replacement cost prohibitive. Flood waters also back up further upstream at the culverts passing under Oxford Street and Oslo Street. See Figure #27 for a map from the CLOMR dated 3-31-2016. Flood mitigation improvements are to be completed in two or more phases. (note the use of phase here is not the phasing used in the application which refers to a two phase grant to undertake what is identified as the current improvements to be completed below). These improvements complement and build upon the flood storage provided along and with CD 12 between Interstate 90 and TH 59.

Improvements currently being developed for construction:

1) Provide flood storage immediately upstream of I-90 through construction of a 77 acre-foot basin. This basin will mitigate the increase in flow resulting from upstream improvements.

2) Replace existing 8.3’ x 10’ box culvert on CD 12 under Oxford Street with 14’ x 10’ box culvert.

3) Replace existing 84” culvert on CD 12 under Oslo Street with 10’ x 10’ box culvert.

Improvements needed subsequent to currently proposed improvements:

1) Extend 10’ x 10’ box culvert under Oslo Street through McMillan Street to replace open ditch and 90” culvert on CD 12 under McMillan Street.

2) Widen channel and provide additional flood storage upstream of McMillan Street.

All of these improvements are identified in the May 24, 2013 Flood Mitigation Study prepared by Bolton & Menk, Inc. for the City of Worthington as may have been or may be revised in detailed project design.
Figure #26  County Ditch 12 Phase 2 Project Floodplain Map – 12 CLOMR
Relationship to Other Hazards—Cascading Effects

- Numerous. Flooding can have a number of secondary effects that can create additional hazards related to fire, public health, utility failure, insect and pest infestation, and infrastructure damage. Flooding can interfere with emergency response to fires, as seen in Grand Forks, North Dakota, during the Red River Flood of 1997. The after effects of a flood can be a contaminated water supply and mold which affect public health. It can take up to a week or two to get the power back on after a flood. Not having reliable power makes daily life more difficult. Insect and pest infestation can take place after the flood has receded. Damage to infrastructure can takes weeks to repair. This can cause increase emergency response times and put residents at risk.

Flood History in Nobles Hazard

Severe flood events are uncommon in Nobles County. There are no official stream gauges in the county. From January 2000 through May 2017, there have been 4 documented floods and 20 documented flash floods in Nobles County.

National Oceanic and Atmospheric Administration (NOAA) defines a flood as “an overflow of water onto normally dry land. The inundation of a normally dry area caused by rising water in an existing waterway, such as a river, stream, or drainage ditch. Ponding of water at or near the point where the rain fell. Flooding is a longer term event than flash flooding: it may last days or weeks.”  

Table #49

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Event Narrative</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/16/2011</td>
<td>Leota and 7 surrounding communities</td>
<td>Melting of a heavy winter snow cover caused flooding of lowlands, lakes, and streams. There was considerable flooding of farmland. Numerous roads in the county were flooded. Some of the roads were closed, and some were washed out in spots. The flooding onset was rapid for a snow melt flood due to high water and groundwater levels from record precipitation in the year 2010.</td>
</tr>
<tr>
<td>4/1/2011</td>
<td>Leota and 7 surrounding communities</td>
<td>Flooding of lakes, streams and lowlands, including some farmland, continued in the county through April. Lake and lowland flooding continued with very slow improvement. Several roads remained flooded. High water and groundwater levels resulting from record precipitation in the previous year was the main reason that the flooding either grew worse or improved so slowly.</td>
</tr>
<tr>
<td>6/15/2014</td>
<td>Leota and 6 surrounding communities</td>
<td>Thunderstorms produced heavy rain, flash flooding, and longer term areal flooding over the southwestern corner of Minnesota from the late evening of June 14th into the daytime hours of June 15th. Persistent moderate to heavy rain caused flooding of some fields and other lowlands, including several roads. This flooding lasted well into the daytime hours after the rain subsided.</td>
</tr>
</tbody>
</table>

Thunderstorms produced numerous events of large hail, damaging winds, flash flooding, and areal flooding across most of southwest Minnesota during the afternoon and evening of June 16th. The areal flooding was a longer term event and persisted through much of June 18th. Persistent moderate to heavy rain caused flooding of fields and other lowlands, including several roads, homes, and businesses. This flooding lasted for two days, and was aggravated locally by additional storms during that time. Some roads were damaged or washed out.

Table #50  
**Flash Floods – Nobles County**

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Event Narrative</th>
</tr>
</thead>
<tbody>
<tr>
<td>6/16/2014</td>
<td>Leota, Rushmore, Wilmont, Pfingsten, and 20 surrounding communities</td>
<td>Thunderstorms produced numerous events of large hail, damaging winds, flash flooding, and areal flooding across most of southwest Minnesota during the afternoon and evening of June 16th. The areal flooding was a longer term event and persisted through much of June 18th. Persistent moderate to heavy rain caused flooding of fields and other lowlands, including several roads, homes, and businesses. This flooding lasted for two days, and was aggravated locally by additional storms during that time. Some roads were damaged or washed out.</td>
</tr>
<tr>
<td>6/12/2001</td>
<td>Worthington</td>
<td>Flash flooding resulting from very heavy rain flooded streets, small streams, culverts, and other low places. Some flooding of basements also occurred.</td>
</tr>
<tr>
<td>7/24/2001</td>
<td>Kinbrae</td>
<td>Heavy rainfall caused flooding of gravel roads near East Graham Lake, closing the roads.</td>
</tr>
<tr>
<td>7/5/2004</td>
<td>Nobles County</td>
<td>Rainfall of up to four and a half inches on saturated ground caused widespread flooding of streets, roads, and other low areas including farmland. Towns affected included Rushmore, Worthington and Brewster, with numerous basements flooded. The amount of damage was not known.</td>
</tr>
<tr>
<td>7/31/2004</td>
<td>Adrian</td>
<td>Very heavy rain caused flooding of several roads, fields, and other low areas. Several dirt roads were washed out.</td>
</tr>
<tr>
<td>8/3/2004</td>
<td>Worthington</td>
<td>Heavy rain caused flooding of streets and other low areas with roads up to three feet under water.</td>
</tr>
<tr>
<td>6/13/2005</td>
<td>Ellsworth</td>
<td>Heavy rain caused flooding of low areas, including fields and roads.</td>
</tr>
<tr>
<td>6/20/2005</td>
<td>Worthington</td>
<td>Heavy rain caused flooding of several streets, with water 3 feet deep at one intersection.</td>
</tr>
<tr>
<td>9/24/2005</td>
<td>Worthington</td>
<td>Heavy rain caused widespread street flooding, with basement flooding also reported. Water was two to three feet deep on some roads, and numerous vehicles stalled.</td>
</tr>
</tbody>
</table>

NOAA defines a flash flood as “a flood caused by heavy or excessive rainfall in a short period of time, generally less than 6 hours. Flash floods are usually characterized by raging torrents after heavy rains that rip through river beds, urban streets, or mountain canyons sweeping everything before them. They can occur within minutes or a few hours of excessive rainfall. They can also occur even if no rain has fallen, for instance after a levee or dam has failed, or after a sudden release of water by a debris or ice jam.”

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Event Narrative</th>
</tr>
</thead>
<tbody>
<tr>
<td>4/7/2006</td>
<td>Worthington</td>
<td>Heavy rainfall of 2 to 4 inches caused flooding of roads, basements, and other low areas as storm sewers backed up. Several vehicles stalled on flooded roads.</td>
</tr>
<tr>
<td>8/20/2007</td>
<td>Bigelow, Worthington</td>
<td>Heavy rainfall of 3 to 5 inches in a short time caused flash flooding of streets in the towns of Bigelow and Worthington, as well as flooding of rural roads and fields. Streets in downtown Worthington were especially affected.</td>
</tr>
<tr>
<td>6/5/2008</td>
<td>Rushmore, Ellsworth, Adrian, Wilmont</td>
<td>Thunderstorms produced numerous large hail reports, as well as some flash flooding and damaging winds, in southwest Minnesota during the early afternoon of June 5th. Heavy rain caused flash flooding of Kanaranzi Creek.</td>
</tr>
<tr>
<td>7/9/2009</td>
<td>Ellsworth, Worthington, Reading, Org, Kinbrae, Dundee</td>
<td>Thunderstorms produced large hail and heavy rain resulting in flash flooding in Nobles and Jackson Counties of southwest Minnesota during the evening of July 9th. There were also two reports of damaging winds with the storms. Heavy rain caused flooding of streets in and near Worthington, including the intersection of 10th Street and 8th Avenue, and the Highway 59/60 underpass.</td>
</tr>
<tr>
<td>6/25/2010</td>
<td>Worthington Airport, Dundee</td>
<td>Thunderstorms produced numerous reports of large hail, along with some damaging winds, a tornado, and flash flooding, in southwest Minnesota, during the late afternoon and evening of June 25th. Heavy rain caused flash flooding of roads in Worthington. With water rising above the bottom of car doors in at least one location.</td>
</tr>
<tr>
<td>6/26/2010</td>
<td>Ellsworth, Worthington</td>
<td>Thunderstorms produced numerous reports of damaging winds, along with several reports of flash flooding and one large hail report, across southwest Minnesota during the late afternoon and early evening of June 26th. Heavy rain caused flash flooding of several gravel and paved rural roads.</td>
</tr>
<tr>
<td>6/26/2010</td>
<td>Worthington, Ellsworth</td>
<td>Thunderstorms produced numerous reports of damaging winds, along with several reports of flash flooding and one large hail report, across southwest Minnesota during the late afternoon and early evening of June 26th. Heavy rain caused flash flooding of several streets in the city of Worthington.</td>
</tr>
<tr>
<td>9/22/2010</td>
<td>Org</td>
<td>Persistent thunderstorms produced large hail, damaging winds, and numerous reports of flash flooding in much of southwest Minnesota during the late afternoon and evening of September 22nd. Heavy rain caused flash flooding of several streets and other low areas.</td>
</tr>
<tr>
<td>6/14/2011</td>
<td>Leota</td>
<td>Thunderstorms produced flash flooding at several locations in southwest Minnesota during the late morning and afternoon of June 14th. There was also a report of large hail and one of lightning damage. Heavy rain caused flash flooding of Champepadan Creek.</td>
</tr>
</tbody>
</table>
### Date | Location | Event Narrative
--- | --- | ---
7/11/2011 | Round Lake | Thunderstorms produced damaging winds in Jackson County and flash flooding in Nobles County in southwest Minnesota before daybreak on July 11th. Heavy rain of 5.9 inches caused flash flooding of some roads and yards.
5/27/2012 | Adrian, Org | Thunderstorms produced damaging winds, large hail, and flash flooding in Nobles and Jackson Counties in southwest Minnesota on the evening of May 27th. Heavy rain caused flash flooding of a small creek which flooded a campground. Some roads were also flooded.

**National Climatic Data Center (NCDC / NOAA) Storm Events database**

**Dam / Levee Failure (Floodings)**

Dams and levees are an important part of the infrastructure of Minnesota. Dams maintain lake levels and impound water for flood control, power production and water supply. Levees are used to increase cultivation in agriculture and to protect population and structures from floods. Both structures are artificial barriers that have the ability to impound water, wastewater, or any liquid borne material for the purpose of storage or the control of water. The concern of profiling dams and levees as part of the flooding section is the damage that may result due to a failed structure or overtopping. There are many factors that affect the impact of a failure such as how much liquid is being impounded, location of structures and critical facilities, intended purpose and type of construction of the dam or levee.

**Dams**

Dams and impoundments maintain lake levels and help control flooding and the destructive power of water. Dams and impoundments are a critical part in minimizing erosion. “There are more than 1,250 dams in Minnesota; 800 are public dams, and the state owns over 430 of the public dams. Most of the public dams are more than 50 years old and require ongoing emergency repairs and reconstruction to maintain their structural integrity.”⁶⁶ Dam failure is defined as a collapse or failure of an impoundment resulting in downstream flooding.

Failure may occur for one or a combination of the following reasons:

- Prolonged periods of rainfall and flooding;
- Inadequate spillway capacity, resulting in excess overtopping flows;
- Internal erosion caused by embankment or foundation leakage or piping;
- Improper maintenance, including failure to remove trees, repair internal seepage problems, replace lost material from the cross section of the dam and abutments, or maintain gates, valves, and other operational components;
- Improper design, including the use of improper construction materials and construction practices;
- Improper operation, including the failure to remove or open gates or valves during high flow periods;
- Failure of upstream dams on the same waterway that release water to a downstream dam;

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Earthquakes, which typically cause longitudinal cracks at the tops of the embankments that can weaken entire structures.

The Department of Natural Resources (DNR) has a dam safety program that inspect the structural integrity of dams and impoundments. The DNR classifies dam structures in three categories:

- **Class 1; High Hazard**: any loss of life or serious hazard to public;
- **Class 2; Significant Hazard**: possible health hazard or probable loss of high-value property;
- **Class 3; Low Hazard**: property loss restricted to rural outbuildings and local roads.

Nobles county has six dams affecting or in Nobles County. One dam is a Class 2 and five dams are a Class 3, which are the lowest risk. There are no Class 1 dams. Below is a dam inventory table for Nobles County.

**Table #51**  
**Dam Inventory – Nobles County**

<table>
<thead>
<tr>
<th>Dam Name</th>
<th>ID</th>
<th>Next Inspection Year</th>
<th>Last Inspection Date</th>
<th>Dam Class</th>
<th>City</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herlein-Boote WMA</td>
<td>MN01658</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>Worthington</td>
<td>6</td>
</tr>
<tr>
<td>Okabena Lake</td>
<td>MN00103</td>
<td>2014</td>
<td>7/28/2010</td>
<td>2</td>
<td>Worthington</td>
<td>0</td>
</tr>
<tr>
<td>Desiltation Project 73-2</td>
<td>MN00732</td>
<td>2018</td>
<td>4/23/2010</td>
<td>3</td>
<td>Heron Lake</td>
<td>28</td>
</tr>
<tr>
<td>Kremer-Leinen Goedtke Pond</td>
<td>MN00731</td>
<td>2019</td>
<td>7/26/2011</td>
<td>3</td>
<td>Heron Lake</td>
<td>-</td>
</tr>
<tr>
<td>W9 Water Quality</td>
<td>MN01358</td>
<td>2018</td>
<td>4/30/2010</td>
<td>3</td>
<td>Worthington</td>
<td>2</td>
</tr>
<tr>
<td>Stateline Pond</td>
<td>MN00316</td>
<td>2020</td>
<td>7/25/2012</td>
<td>3</td>
<td>Worthington</td>
<td>9</td>
</tr>
</tbody>
</table>

DNR Dam Safety Engineer

**Levees**

A levee is any artificial barrier that will divert or restrain the flow of a stream or other body of water for the purpose of protecting an area from inundation by flood waters. The National Flood Insurance Program (NFIP) is responsible for identifying flood risks behind levees through flood analysis and mapping projects. FEMA has criteria for recognizing levees as providing protection against the one-percent-annual-chance flood. The three types of levees are Accredited Levees, Provisionally Accredited Levees and Emergency Levees. Levees for agricultural purposes are permitted by watershed districts or county soil and water conservation districts administered by the Board of Soil and Water Resources (BWSR). The number of levees for agriculture is not known at the time of the plan update. Agricultural levees funded by the U.S. Natural Resources Conservation Service are not regulated by the state and are handed over to the property owners after construction is complete.

The concern with levees is that they may fail when exposed to floodwaters for an unusually long period of time. The prolonged hydraulic forces may weaken the structure to the point of failure unless monitoring and reinforcement measures are being taken. Generally, a levee is subjected to water loading during a
A levee breach results when:

- A portion of the levee breaks away, providing an opening for water to flood the landward side of the structure. Such breaches can be caused by surface erosion due to water velocities, or they can be the result of subsurface actions.
- Subsurface actions usually involve sand boils whereby the upward pressure of water flowing through porous soil under the levee exceeds the static pressure of the soil weight above it (i.e., under seepage). These boils can indicate instability of the levee foundation given the liquefied substrate below it, leading way to breaching.
- Overtopping is similar to dam overtopping in that the flood waters simply exceed the design capacity of the structure, thus flowing over the lowest crest of the system. Such overtopping can lead to erosion on the landward side which may then lead to breaching. In order to prevent this type landward erosion, many levees are reinforced or armored with rocks or concrete.

Select areas along other streams and waterways in Nobles County where impoundments were constructed to hold back water are also susceptible to flooding from impoundments washing out or dam failure upriver. Dam or levee failure, although the risk is minimal, has the potential to be devastating to the areas within the floodplain and around the streams directly below impoundments and dams. Dam or levee failure may result in flash flooding, extensive property damage, erosion, destruction of infrastructure including road and culvert, and loss of life. A failure of an impoundment or culvert has a potential of devastating downstream property damage, erosion, and destruction of infrastructure, including roads and other culverts.

Nobles County has one non permitted levee within the City of Worthington. County Ditch No. 6, County Ditch No. 12, and Whisky Ditch were constructed around 1915 as part of a statewide drainage program. Generally, the ditches have been well-maintained. In 1954, the U.S. Army Corps of Engineers (USACE), Rock Island District, improved County Ditch No. 12 by cleaning and straightening the channel upstream and downstream of the diversion structures in the northwest corner of the City of Worthington, constructing 900 feet of levee along the left bank of Okabena Creek upstream of the diversion structure, and installing three 42-inch corrugated metal pipe culverts leading to County Ditch No. 12 at the confluence of Whiskey Ditch and County Ditch No. 12.

These culverts were later equipped with 6 sluice gates by the City of Worthington. The entrance to Whiskey Creek at the confluence consists of a box culvert having three sections, each eight feet wide and approximately eight feet deep. There are several culverts along County Ditch No. 12. The Okabena Lake outlet is controlled by an ogee overflow spillway with ten bays, each five feet in width, equipped with stoplogs. Just downstream of the spillway, the flow in County Ditch No. 6 is conducted through an industrial district through two 42-inch reinforced concrete pipe culverts which are 540 feet long. Overbank flow from Okabena Lake has occurred in the northeast corner of Okabena Lake. These waters flow into County Ditch No. 12 via storm sewers.

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Figure #27  Rock Island Non Permitted Levee – Nobles County (Worthington – Whiskey Ditch)

**Dam Failure History in Nobles County**

Levees garnered attention after the devastation in New Orleans as a result of Hurricane Katrina in 2005. There is no official historical source for failed levees in Minnesota. Nobles County has not experienced a major dam failure, however there have been impoundment and culvert failures.

**Vulnerability**

Flooding is highly likely to occur each year and forecasting technology and models can help predict yearly spring flooding. Even with weather forecasting technology floods can occur rapidly and poses a risk throughout the county. Flooding can occur anytime anywhere, so the potential damage of a flood could be higher than the total value of residential structures within the floodplain. The value of residential structures does not take into consideration outbuildings, machine sheds, and agricultural production. The potential damage of a flood could be relatively high. Flash flooding could result in sewer systems being overloaded and flooding to occur in basements. Basement flooding could be isolated to low lying areas, or could be citywide in an event of an extreme rain event.

Free flowing water has tremendous power. It can move boulders, carve out rock, and erode an impoundment or dam. It is important to slow the runoff of water, so groundwater supplies can be replenished and the volume of free flowing water in streams and rivers is reduced. Reducing the free flowing water in streams and rivers will help to preserve impoundments and dams, but overtime impoundments and dams will require maintenance and replacement.

There are six dams in Nobles County. All of the dams are classified a Class 2 or Class 3, which are the lowest two risk classification. Erosion would be the biggest risk if a dam failed in Nobles County. If an impoundment or culvert failed, Worthington and Adrian in Nobles County could be vulnerable.

**Plans and Programs**

Improvements have been made along the flood plain. Pumps have been purchased by cities to assist with bypassing the sewer system during an extreme rain event.

- **Zoning** – The floodplain section of the Nobles County Development Code addresses the placement of structures within the floodplain. Nobles County’s zoning regulations prohibits any further development within the floodplains. Existing structures may continue to exist as “grandfathered” structures, but the county anticipates the number of these structures will be reduced over time.
- The Nobles Soil and Water Conservation District (NSWCD) ten-year strategic plan includes goals to reduce flooding and documenting the effectiveness of flood reduction measures, as well as working on water quality issues.
- County flood area maps – Nobles County has FIRM maps identifying the 100-year. The county zoning ordinance controls permitted land uses in these areas, what can be built, and how.
- City flood area maps – Cities in Nobles County have official FIRM maps identifying the 100-year flooding plain. All cities addressed flood risks in their planning and zoning documents.
- Nobles County Emergency Operations Plan – A response plan to a flood emergency has been developed and includes evacuation routes.

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• National Flood Insurance Program (NFIP) – Nobles County and the following cities participate in the NFIP: Adrian and Worthington. The NFIP has three basic aspects that include: floodplain identification and mapping, floodplain management, and flood insurance. The Cities of Bigelow, Brewster, Dundee, Ellsworth, Kinbrae, Lismore, Round Lake, Rushmore, and Wilmont have not participated in the NFIP.
• Zoning restrictions – The Cities of Adrian and Worthington and Nobles County have zoning restrictions that limit new structures and land uses within the Floodway, Flood Fringe, and General Flood Plain District.
• Local Water Management Plan – The water plan identifies priorities regarding drainage, which includes flooding.
• Emergency response planning – Road closures are taken into account in planning and training. Local fire departments, emergency medical services, and other emergency responders are aware of areas that are prone to flooding and have alternative routes planned.
• Ditch system / drainage – Nobles County continues to make improvements to the ditch system. With increased tiling, it is important to reevaluate the ditch system and drainage.
• Sediment ponds – The Nobles County Highway Departments works with the DNR and other organizations to increase the number of sedimentation ponds along roadways in Nobles County. Sedimentation ponds hold back water, which helps to control flooding. Nobles County Zoning references erosion control and drainage in our subdivision ordinance, but the county does not distinctly call out requirements for sedimentation ponds or their required size. Nobles County follows state recommendations on storm water management for bare land development and other applicable projects.
• Road mitigation projects – Road retention projects were pursued to reduce the impact of flooding along roadways. These projects included: analyzing runoff and the capacity of county ditches, the installation of smaller culverts, and adding water retention ponds. Downsizing culverts is a reversal in the trend of replacing culverts with larger sized culverts, which only transfer additional water downstream. Nobles County has been proactive in culvert replacement.
• Minnesota Dam Safety Program – The Minnesota Department of Natural Resources (DNR) regulates nearly 900 dams in the State of Minnesota. The DNR and U.S. Army Corps of Engineers regularly inspect dam and reservoir capabilities for flooding and dam failure. The Minnesota DNR dam safety program inspects the structural integrity of dams and impoundments in Nobles County. The classification of the dam depends on how often the dam is inspected. A dam classified as High Hazard is inspected annually. A dam classified as Significant Hazard is inspected every three to four years. A dam classified as Low Hazard is inspected every eight years.
• Dam Emergency Action Plan – The Minnesota DNR drafts an Emergency Action Plan (EAP) for all High Hazard dams and strongly recommends that Significant Hazard dams be included as well. An EAP is a formal document that identifies potential emergency conditions at a dam and specifies preplanned actions to be followed in order to minimize property damage and loss of life in the event of a dam failure.

• Emergency Operations Plan – Explains the standard operating guidelines for countywide notification in the event of an emergency and the procedures of evacuation during an emergency.

• Impoundment dams and other water control systems.

• U.S. Army Corps of Engineers - The U.S. Army Corps of Engineers has plans in place for terroristic acts against the dams and flood control projects in the county.

Gaps and Deficiencies

• Wastewater treatment vulnerability to flooding – Wastewater treatment plants are vulnerable to flooding. Pumps may not be capable to keep up with flood events. This would result in sewer water being combined with clean water and entering the various watersheds. Pond systems are the most vulnerable.

• Grandfathered in structures in the floodplain – At-risk uses and structures remain in identified 100-year floodplains, because they are “grandfathered” in.

• Severe flooding – Local resources are not adequate for a severe and prolonged flood. State and federal resources are required when responding to severe flooding. There may be a time delay to receive assistance.

• Development in the floodplain – Some residents are resistant to leaving their property, even if it is located in a designated floodplain. The area may be seen as scenic, so the resident may want to continue living in the floodplain.

• Local assistance – Local match for mitigation projects (such as acquisition of property) is often difficult to acquire, due to limited local budgets.

• Local resources – Local resources are not adequate for a severe or prolonged flood. Additional assistance would be needed.

• Limitations of models – Models are increasingly being used by engineers and scientists in flood management. Models are only as accurate as the data that is used in the analysis. Outdated maps and not including all the impacting variables can cause forecasting errors to occur. Ground saturation is one variable that is not included in the models for estimating yearly flood levels. Ground saturation affects the amount of moisture that can be soaked in during a precipitation event. Forecasters are working on ways to include ground saturation into their flood models.

• Critical facilities in the flood plain – Worthington does have critical facilities located in the one percent flood plain.

• County Ditch 12: Also known as Okabena Creek, runs through mainly residential neighborhoods with school and commercial facilities and floods during winter snow melt and moderate to heavy rainfall events. NOAA listed 100 year flood events in 1969, 1994, 1997, and 2001. There are several blocks in developed residential neighborhoods mapped in the 100-year and 500-year floodplain.

• Pumps – There are always a number of requests for pumps and generators when there are flood events. The MN Warn System helps to coordinate the supply of pumps, generators, and other equipment to affected communities. Through the MN Warn System communities can share local and regional assets.

• Aging drainage systems – Public drainage systems are aging and maintenance costs are increasing. Culverts are rusting out and replacement costs are substantial. Townships and local units of government need outside funding to help update public drainage systems. Not updating the system will lead to culvert failures, roads washing out, and erosion.
• Registry of dams – Not all dams and impoundments are identified by the DNR. If the dam is not on the registry, the dam does not get inspected by the DNR. Non-identified dams could be at risk of failing, since they are not inspected.

• Infrequency of dam inspection – Five of the six dams in Nobles County that are all classified by the Minnesota DNR as Low Hazard dams and therefore only get inspected every eight years. The infrequency of inspection may result in maintenance being deferred for a number of years or structural deficiencies not being identified. Inadequate maintenance could result in dam failure.
5.4.5 Severe Summer Storms (Severe Thunderstorms, Lightning, and Hail)
During the spring, summer and autumn, severe thunderstorms, lightning, and hail can occur. (Windstorm and tornado events are addressed in the next section.) All locations in Nobles County are at risk to be affected by this hazard. Severe summer storm events will be more widespread. These weather events can generate lightning and hail that tend to be more isolated.

Thunderstorms, which occur most frequently from mid-May through mid-July, are the most common type of severe summer storm. Thunderstorms are usually localized, produced by cumulonimbus clouds, accompanied by lightning, and have strong wind gusts, heavy rains, and sometimes hail or tornadoes. Thunderstorms are produced by air masses that become unstable and that overturn violently. Unstable air masses are usually the result of warm humid air at lower elevations and colder air at higher elevations.

Lighting is often associated with thunderstorms and can be deadly. Lightning occurs to balance the difference between positive and negative discharges within a cloud, between two clouds, and between the cloud and ground. For example, a negative charge at the base of the cloud is attracted to a positive charge on the ground. A lightning bolt happens when the difference between the charges is great enough. The charge is usually strongest on tall buildings, trees, and other objects protruding from the surface. Consequently, these objects are more likely to be struck than lower objects.

While cloud-to-ground lightning poses the greatest threat to people and objects on the ground, it accounts for only 20 percent of all lightning strikes. The remaining lightning occurs within the cloud, from cloud to cloud, or from the ground to the cloud. The most common type of lightning is lightning occurring within a cloud.

Hail is an ice product produced in severe thunderstorms. It is formed when strong updrafts within the cumulonimbus cloud carry water droplets above the freezing level or when ice pellets in the cloud collide with water droplets. The water droplets freeze or attach themselves to the ice pellets and begin to freeze as strong updraft winds toss the pellets and droplets back up into colder regions of the cloud. Both gravity and downdrafts in the cloud pull the pellets down, where they encounter more droplets that attach and freeze and are tossed once again to higher levels in the cloud. This process continues until the hail becomes too heavy to be supported by the updrafts and falls to the ground.
Table #52

<table>
<thead>
<tr>
<th>Description</th>
<th>Diameter (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pea</td>
<td>0.25</td>
</tr>
<tr>
<td>Plain M&amp;M</td>
<td>0.5</td>
</tr>
<tr>
<td>Penny</td>
<td>0.75</td>
</tr>
<tr>
<td>Nickel</td>
<td>0.88</td>
</tr>
<tr>
<td>Quarter</td>
<td>1</td>
</tr>
<tr>
<td>Half Dollar</td>
<td>1.25</td>
</tr>
<tr>
<td>Walnut or Ping Pong Ball</td>
<td>1.5</td>
</tr>
<tr>
<td>Golf ball</td>
<td>1.75</td>
</tr>
<tr>
<td>Hen’s Egg or Lime</td>
<td>2</td>
</tr>
<tr>
<td>Tennis Ball</td>
<td>2.5</td>
</tr>
<tr>
<td>Baseball</td>
<td>2.75</td>
</tr>
<tr>
<td>Tea Cup</td>
<td>3</td>
</tr>
<tr>
<td>Grapefruit</td>
<td>4</td>
</tr>
<tr>
<td>Softball</td>
<td>4.5</td>
</tr>
<tr>
<td>CD-DVD</td>
<td>4.75 – 5</td>
</tr>
</tbody>
</table>

National Weather Service (NWS)

In Minnesota, most hail ranges in size from pea-size (1/4 inch) to golf-ball size (1-3/4 inch). Larger hailstones have been reported, but occur less frequently. Strong updrafts are necessary within the cloud to form hail, and are usually associated with severe thunderstorms. Coverage areas for individual hailstorms are highly variable and spotty due to the changing nature of the cumulonimbus cloud.

Given the rural agricultural nature of the county, the likelihood is greatest that crops would experience the most damage from a hail event; however, hail can also do a great amount of damage to vehicles and roofs of individual structures. The chance of significant building damage is likely to be higher within the cities as there are simply more buildings clustered in a small area to be potentially damaged.

**Relationship to Other Hazards—Cascading Effects**

- **Utility Failure.** Extreme heat can lead to the power grid being overloaded and can in turn cause blackouts.
- **Transportation Infrastructure.** Heavy rain can cause flash flood events, and may threaten transportation infrastructure.
- **Fire.** Lightning can cause both structure fires and wildfires.
- **Agricultural Disease.** Extreme Heat can have a major effect on the county’s crops and livestock. During prolonged heat events, crops grow weak and are more susceptible to plant pests and diseases. In times of extreme heat, it is important that confinement buildings are properly ventilated and outside livestock are provided with places to get into the shade. Heat stroke can pose a serious threat to livestock.
Severe Summer Storms History in Nobles County

Thunderstorms are not documented by the NOAA as a separate event. There were three documented lightning events in Nobles County from January 2000 through May 2017. There were most likely a number of other lighting events, but they went unreported. "Tall objects such as trees and skyscrapers are commonly struck by lightning... Lightning can strike the ground in an open field even if the tree line is close by."

Table #53 Lightning Events – Nobles County

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Event Narrative</th>
</tr>
</thead>
<tbody>
<tr>
<td>6/5/2001</td>
<td>Adrian</td>
<td>Lightning struck a large tree, splitting the tree, and scattering debris up to a half block away.</td>
</tr>
<tr>
<td>7/2/2001</td>
<td>Worthington</td>
<td>Lightning struck and split a large tree. Most of the tree fell and damaged siding on a house, but just missed a parked car.</td>
</tr>
<tr>
<td>5/9/2003</td>
<td>Worthington</td>
<td>Lightning struck a large tree, destroying the tree. The lightning also damaged appliances in at least two homes, and caused a power outage over a small area.</td>
</tr>
</tbody>
</table>

National Climatic Data Center (NCDC / NOAA) Storm Events database

The lightning activity level (LAL) is a common parameter that is part of fire weather forecasts nationwide. LAL is a measure of the amount of lightning activity using values 1 to 6 where:

Table #54 Lightning Activity Level

<table>
<thead>
<tr>
<th>LAL</th>
<th>Cloud &amp; Storm Development</th>
<th>Lightning Strikes / 15 min</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No thunderstorms.</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>Cumulus clouds are common but only a few reach the towering cumulus stage. A single thunderstorm must be confirmed in the observation area. The clouds produce mainly virga, but light rain will occasionally reach the ground. Lightning is very infrequent.</td>
<td>1-8</td>
</tr>
<tr>
<td>3</td>
<td>Towering cumulus covers less than two-tenths of the sky. Thunderstorms are few, but two to three must occur within the observation area. Light to moderate rain will reach the ground, and lightning is infrequent.</td>
<td>9-15</td>
</tr>
<tr>
<td>4</td>
<td>Towering cumulus covers two to three-tenths of the sky. Thunderstorms are scattered and more than three must occur within the observation area. Moderate rain is common and lightning is frequent.</td>
<td>16-25</td>
</tr>
<tr>
<td>5</td>
<td>Towering cumulus and thunderstorms are numerous. They cover more than three-tenths and occasionally obscure the sky. Rain is moderate to heavy and lightning is frequent and intense.</td>
<td>&gt;25</td>
</tr>
<tr>
<td>6</td>
<td>Similar to LAL 3 except thunderstorms are dry.</td>
<td></td>
</tr>
</tbody>
</table>

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### Table #55  Lightning Detector Needs – Nobles County Schools

<table>
<thead>
<tr>
<th>Location</th>
<th>Lightning Detectors</th>
<th>Need for Lightning Detectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adrian Public School</td>
<td>None</td>
<td>Football field, Elementary Play Ground, City owned Baseball/Softball fields.</td>
</tr>
<tr>
<td>Ellsworth Public School</td>
<td>None</td>
<td>Play Ground Football field/outdoor Physical Education area</td>
</tr>
<tr>
<td>Round Lake / Brewster Public Schools</td>
<td>None</td>
<td>In front of building/park across street Back of building for softball/football/PE Field</td>
</tr>
<tr>
<td>St Mary’s Catholic School</td>
<td>None</td>
<td>Play Ground</td>
</tr>
<tr>
<td>Worthington Christian School</td>
<td>None</td>
<td>Playground/Soccer Field</td>
</tr>
<tr>
<td>Worthington School District</td>
<td>Mobile Lightning Detector Some coaches use phone apps</td>
<td>ALC – Softball Field HS – Football/Soccer Field MS – Tennis/Baseball Field Prairie Elementary – Soccer Field/Playground</td>
</tr>
</tbody>
</table>

### Table #56  Lightning Detector Needs – Cities (Public Facilities)

<table>
<thead>
<tr>
<th>Location</th>
<th>Lightning Detectors</th>
<th>Need for Lightning Detectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adrian</td>
<td>Remote Unit at Pool – old so Lifeguards use phone apps</td>
<td>Replace Pool Unit</td>
</tr>
<tr>
<td>Bigelow</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Brewster</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Dundee</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ellsworth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kinbrae</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lismore</td>
<td>None</td>
<td>City owned Ball Fields</td>
</tr>
<tr>
<td>Round Lake</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Rushmore</td>
<td>None</td>
<td>School Park and City Ballfields</td>
</tr>
<tr>
<td>Wilmont</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Worthington</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hail events are separate events recorded by NOAA. Hail is often part of a thunderstorm and is not always reported due to the varying size and the rural nature of Nobles County. From January 2000 through May 2017, there have been 13 documented hail events in Nobles County. Some of these hail events are only minutes apart, but a hail event is a separate event if the storm stops hailing and starts hailing a few minutes later.
<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Size</th>
<th>Event Narrative</th>
</tr>
</thead>
<tbody>
<tr>
<td>4/12/2010</td>
<td>Reading</td>
<td>0.88”</td>
<td>Thunderstorms produced marginally large hail in Rock and Nobles County of southwest Minnesota on the morning of April 12th.</td>
</tr>
<tr>
<td>6/25/2010</td>
<td>Dundee</td>
<td>0.88”</td>
<td>Thunderstorms produced numerous reports of large hail, along with some damaging winds, a tornado, and flash flooding, in southwest Minnesota, during the late afternoon and evening of June 25th.</td>
</tr>
<tr>
<td>7/1/2011</td>
<td>Kinbrae</td>
<td>1.00”–1.75”</td>
<td>Thunderstorms produced damaging winds, two tornadoes, large hail and flash flooding over southwest Minnesota during the afternoon and very early evening of July 1st.</td>
</tr>
<tr>
<td>7/25/2011</td>
<td>Kinbrae, Worthington</td>
<td>1.00”–1.50”</td>
<td>Thunderstorms produced large hail at several locations in southwest Minnesota during the late afternoon and early evening of July 25th.</td>
</tr>
<tr>
<td>5/4/2012</td>
<td>Worthington</td>
<td>1.00”</td>
<td>Thunderstorms produced a variety of large hail, damaging winds, and brief tornadoes in southwest Minnesota on the afternoon of May 4th. There was also a report of flash flooding.</td>
</tr>
<tr>
<td>5/5/2012</td>
<td>Adrian, Rushmore</td>
<td>1.00”–1.25”</td>
<td>Thunderstorms produced large hail in Rock and Nobles Counties in southwest Minnesota during the late morning of May 5th.</td>
</tr>
<tr>
<td>5/23/2012</td>
<td>Bigelow, Brewster, Round Lake</td>
<td>0.75”–1.00”</td>
<td>Thunderstorms produced large hail in three counties of southwest Minnesota during the late afternoon and early evening of May 23rd.</td>
</tr>
<tr>
<td>7/25/2013</td>
<td>Brewster</td>
<td>1.75”</td>
<td>Thunderstorms produced a funnel cloud in Rock County and large hail in Nobles County in southwest Minnesota on the afternoon of July 25th. Large hail caused an unknown amount of damage to vehicles.</td>
</tr>
<tr>
<td>8/31/2013</td>
<td>Lismore</td>
<td>1.75”</td>
<td>Thunderstorms produced large hail at scattered locations in southwest Minnesota during the late afternoon and evening of August 31st. Large hail caused an unknown amount of damage to vehicles.</td>
</tr>
<tr>
<td>10/2/2013</td>
<td>Round Lake, Worthington</td>
<td>0.88”–1.75”</td>
<td>Thunderstorms produced large hail in Nobles and Jackson Counties in southwest Minnesota on the afternoon and early evening of October 2nd. Large hail damaged vehicles. The amount of damage was not known.</td>
</tr>
<tr>
<td>5/30/2014</td>
<td>Rushmore</td>
<td>0.75”</td>
<td>A thunderstorm produced penny size hail near Rushmore in Nobles County in southwest Minnesota on the afternoon of May 30th.</td>
</tr>
<tr>
<td>6/16/2014</td>
<td>Wilmont</td>
<td>0.88”</td>
<td>Thunderstorms produced numerous events of large hail, damaging winds, flash flooding, and areal flooding across most of southwest Minnesota during the afternoon and evening of June 16th. The areal flooding was a longer term event and persisted through much of June 18th.</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Size</th>
<th>Event Narrative</th>
</tr>
</thead>
<tbody>
<tr>
<td>4/12/2015</td>
<td>Wilmont</td>
<td>0.75”</td>
<td>Thunderstorms produced penny size hail in Rock and Nobles Counties of southwest Minnesota during the late afternoon of April 12th.</td>
</tr>
<tr>
<td>5/25/2015</td>
<td>Ellsworth</td>
<td>1.00”</td>
<td>A thunderstorm produced quarter size hail near Ellsworth in Nobles County of southwest Minnesota on the late afternoon of May 25th.</td>
</tr>
<tr>
<td>6/19/2015</td>
<td>Ellsworth</td>
<td>1.75”</td>
<td>Thunderstorms produced large hail in Rock and Nobles Counties in southwest Minnesota during the early evening of June 19th.</td>
</tr>
<tr>
<td>9/9/2015</td>
<td>Worthington</td>
<td>1.25”</td>
<td>Thunderstorms produced large hail at one location, with penny size hail reported at two other places in southwest Minnesota during the late afternoon and early evening of September 9th.</td>
</tr>
<tr>
<td>6/15/2016</td>
<td>Brewster</td>
<td>0.88”</td>
<td>A thunderstorm produced nickel size hail in Brewster, in Nobles County in southwest Minnesota, a little after midnight on June 15th. A truck driver reported nickel size hail, strong winds, and heavy rain.</td>
</tr>
</tbody>
</table>

National Climatic Data Center (NCDC / NOAA) Storm Events database

**Hail and Climate Change**

According to the Federal Advisory Committee Draft National Climate Assessment (NCA), winter storms have increased slightly in frequency and intensity, and their tracks have shifted northward over the U.S. Other trends in severe storms, including the numbers of hurricanes and the intensity and frequency of tornadoes, hail, and damaging thunderstorm winds are uncertain. Since the impact of more frequent or intense storms can be larger than the impact of average temperature, climate scientists are actively researching the connections between climate change and severe storms (National Climate Assessment Development Advisory Committee, 2013).

The occurrence of very heavy precipitation has increased in Minnesota in recent decades and future projections also indicate this will continue (International Climate Adaptation Team, 2013). While it is unknown if this precipitation will occur during severe storms that produce hail, the possibility has not been ruled out.

**Vulnerability**

People do not always recognize their limitations. Summer storms can pose a serious risk to all populations, especially the young and elderly population. Informing the public about summer storms is important in preventing accidents.

**Plans and Programs**

- Emergency alert system – Nobles County has the Nixle emergency notification system. Nixle allows emergency officials to notify residents and businesses by telephone, cell phone, text message, email and social media regarding time-sensitive general and emergency notifications.
- Lightning detectors – “Lightning hazards can be mitigated by advanced planning. One part of this safety program should include an early detection and warning alarm package. Lightning detectors can give notice to shut down dangerous operations before the arrival of lightning. (Note: there is no defense
from a "first strike" situation.) Detectors also may signal ‘all clear’ conditions after the lightning threat has passed.”

Lightning detectors would improve safety at outdoor sporting events. Refer to **Table #55** for an inventory and need for lightning detectors for schools in Nobles County and **Table #56** for an inventory and need for lightning detectors for cities in Nobles County.

- **Storm Ready Community** – StormReady is a community preparedness program that encourages government entities and commercial gathering sites to prepare for severe storms. Storm Ready Communities are about building resilient communities in the face of increasing vulnerabilities to extreme weather events.

- **Weather Ready Nation Ambassador** – Nobles County Emergency Management is a Weather Ready Nation Ambassador. “The Weather-Ready Nation Ambassador™ initiative is the National Oceanic and Atmospheric Administration’s (NOAA) effort to formally recognize NOAA partners who are improving the nation’s readiness, responsiveness, and overall resilience against extreme weather, water, and climate events. As a WRN Ambassador, partners commit to working with NOAA and other Ambassadors to strengthen national resilience against extreme weather.”

- **Severe Weather Awareness** – Each spring, Nobles County Emergency Management personnel share information on the importance of participating in “Severe Weather Awareness Week”. All schools, facilities, organizations, businesses and families will be encouraged to participate in Tornado Drill Day activities.

- **Local media** – Severe weather warnings are broadcasted via local media. Public service announcements are one of the ways to warn the public of severe weather.

- **Severe weather spotter training** – an annual training is provided in Nobles County. The National Weather Service conducts the training.

### Gaps and Deficiencies

- **Public education** – The public may not be aware of the real risks associated with heat exhaustion, extreme heat events, and other severe summer storms.

- **Lightning detectors** – Lightning detectors detect lightning produced by thunderstorms. Lightning detectors would improve safety at outdoor sporting events by providing better information when delaying or cancelling a sporting event. Not all outdoor sporting events have a lightning detector. Currently, the National Federation of State High School Associations (NFHS) “30-30 Rule” is used. The 30-30 Rule states that when you see lightning, count the time until you hear thunder. If this time is 30 seconds or less, go immediately to a safer place. Some smart phones are able to download a lightning detector app but is dependent on the user turning on the location feature on their device. Refer to **Table #55** for an inventory and need for lightning detectors for schools in Nobles County and **Table #56** for an inventory and need for lightning detectors for cities in Nobles County.

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5.4.6 Tornado & Straight-line Wind Events

Tornadoes are the most violent of all storm types experienced in Minnesota.68 A tornado is a rapidly rotating column of air that is spawned from a cumulonimbus cloud. When it drops to the ground, it can create significant property damage and loss of life.

Straight-line winds are also damaging but not to the extent of more powerful tornadoes. Straight-line winds can and do produce substantial damage over wider areas at one time. NOAA documents straight-line wind events as thunderstorm wind events and defines them as winds equal to or greater than 40 mph (35 knots). All of Nobles County is at risk of a tornado. FEMA places Southern Minnesota in Wind Zone IV, subject to winds of up to 250 mph.69

Minnesota lies along the north edge of the region of maximum tornado occurrence in the United States, known as tornado alley. Tornado Alley encompasses part of the central United States that extends across parts of Texas, Oklahoma, Kansas, Missouri, East Nebraska, and West Iowa. Tornadoes have been reported in Minnesota in every month from March through November.70

The severity of tornado damage is measured by the Fujita Tornado Scale, with a sliding scale from F0 to F5 depending on wind speed. A tornado’s path typically ranges from 250 feet to a quarter of a mile in width. The speed a tornado travels varies but commonly is between 20 mph and 30 mph. Most tornadoes stay on the ground for less than five minutes. Tornadoes frequently move from southwest to northeast but this also varies and cannot be counted on in all instances.71

Tornado damage can vary from limited damage to trees and building to complete destruction of a community. Along with monetary damages, loss of life is a real concern. However, due to the rural nature of Nobles County, many funnel clouds have only caused damages to crops and unpopulated area.

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Table #58
Enhanced F-Scale for Tornado Damage

<table>
<thead>
<tr>
<th>Scale</th>
<th>Wind Estimate</th>
<th>Typical Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>EF0</td>
<td>65-85 mph</td>
<td>Light damage. Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.</td>
</tr>
<tr>
<td>EF1</td>
<td>86-109 mph</td>
<td>Moderate damage. Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.</td>
</tr>
<tr>
<td>EF2</td>
<td>110-137 mph</td>
<td>Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.</td>
</tr>
<tr>
<td>EF3</td>
<td>138-167 mph</td>
<td>Severe damage. Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.</td>
</tr>
<tr>
<td>EF4</td>
<td>168-199 mph</td>
<td>Devastating damage. Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated.</td>
</tr>
<tr>
<td>EF5</td>
<td>200-234 mph</td>
<td>Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yards); trees debarked; incredible phenomena will occur.</td>
</tr>
</tbody>
</table>

National Climatic Data Center (NCDC / NOAA) Storm Events database

Table #59
Straight-line Wind Damage Estimates

<table>
<thead>
<tr>
<th>Wind Speed</th>
<th>Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 – 31 mph</td>
<td>Large branches in motion, whistling in telephone wires</td>
</tr>
<tr>
<td>32 – 38 mph</td>
<td>Whole trees in motion</td>
</tr>
<tr>
<td>39 – 54 mph</td>
<td>Twigs break off of trees, wind impedes walking</td>
</tr>
<tr>
<td>55 – 72 mph</td>
<td>Damage to chimneys and TV antennas, pushes over shallow rooted trees</td>
</tr>
<tr>
<td>73 – 112 mph</td>
<td>Peels surface off roofs, windows broken, trailer houses overturned</td>
</tr>
<tr>
<td>113+ mph</td>
<td>Roofs torn off houses, weak buildings and trailer houses destroyed, large trees uprooted</td>
</tr>
</tbody>
</table>

The National Weather Service

The most severe windstorms usually occur (and do the most damage) during severe thunderstorms in the spring and summer months. These include tornadoes, downbursts, or straight line winds. Straight-line winds have similar effects to tornadoes without the rotational damage pattern.

Downbursts are created by a column of sinking air, capable of producing straight-line winds in excess of 150 mph. Winds of greater than 60 mph are also associated with intense spring and fall low-pressure systems. These winds can inflict damage to buildings and overturn high profile vehicles.

The Minnesota AHMP calculated an annual probability of 1.42 of a windstorm event with 868,473,000 in building exposure. The Minnesota AHMP places Nobles County as a medium level risk (a moderate
vulnerability based less than two wind events per year and compared to building exposure.).

According to the National Climatic Data Center, there have been 8,961 high wind events in Minnesota between 1/1/1955 to 8/31/2013. This number is misleading because the same storm data may have been reported at multiple locations. However, due to these events there were 10 deaths and approximately $881 million dollars in property damages.

Figure #28 Reported sustained winds or wind gusts 65+ knots, 1955-2012

---


**Relationship to Other Hazards—Cascading Effects**

- **Numerous.** A tornado or straight-line wind storm, can lead to total destruction of buildings and wide-scale casualties. There can be fires, disruptions to transportation infrastructure and other infrastructure, and potential public health emergencies. Catastrophic events such as these may also create the potential for civil unrest.

- **Emergency Response.** Emergency response times can also be affected by infrastructure being damaged. Cell phone towers and telephone lines can be downed delaying calls for help.

**Tornado & Straight-line Wind Events History in Nobles County**

There were 15 documented tornadoes in Nobles County from January 2000 through May 2017. There were 69 thunderstorm wind events documented during this same time period. Straight-line winds are classified by NOAA as thunderstorm wind events and can cause property damage, but there is less risk of loss of life associated with straight-line winds. Tornadoes and straight-line winds can be most devastating to those living in mobile homes, boats, or RV's. The 2015 American Community Survey conducted by the US Census identified 105 mobile home units (1.2% of the 8,569 available housing units) in Nobles County.  

Table #60  
**Tornadoes – Nobles County**

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Scale</th>
<th>Event Narrative</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/25/2000</td>
<td>Adrian</td>
<td>F-2</td>
<td>A tornado damaged buildings, vehicles, and trees on a farm. The tornado destroyed the west side of the house, blew three grain bins away and wrapped them around trees. The tornado also blew the top of a barn off, killing at least 4 calves inside.</td>
</tr>
<tr>
<td>7/25/2000</td>
<td>Adrian</td>
<td>F-0</td>
<td>A brief tornado caused no reported damage.</td>
</tr>
<tr>
<td>7/25/2000</td>
<td>Rushmore</td>
<td>F-0</td>
<td>A brief tornado caused no reported damage.</td>
</tr>
<tr>
<td>7/25/2000</td>
<td>Rushmore</td>
<td>F-0</td>
<td>A brief tornado caused no reported damage.</td>
</tr>
<tr>
<td>7/25/2000</td>
<td>Adrian</td>
<td>F-0</td>
<td>A brief tornado caused no reported damage.</td>
</tr>
<tr>
<td>6/12/2001</td>
<td>Bigelow</td>
<td>F-0</td>
<td>A brief tornado caused no reported damage or injuries.</td>
</tr>
<tr>
<td>4/18/2004</td>
<td>Adrian</td>
<td>F-1</td>
<td>A tornado destroyed a barn and blew the walls of a garage off its foundation. The garage was attached to a house which received no apparent damage.</td>
</tr>
<tr>
<td>5/9/2004</td>
<td>Ellsworth</td>
<td>F-0</td>
<td>A brief tornado caused no reported damage.</td>
</tr>
<tr>
<td>7/31/2004</td>
<td>Adrian</td>
<td>F-1</td>
<td>A tornado damaged trees and destroyed outbuildings.</td>
</tr>
<tr>
<td>7/31/2004</td>
<td>Ellsworth</td>
<td>F-0</td>
<td>A brief tornado caused minor tree damage.</td>
</tr>
<tr>
<td>6/11/2008</td>
<td>Pfingsten</td>
<td>EF-1</td>
<td>A tornado damaged the top of a silo, blew the roof off a shed, and caused tree damage at a farmstead, before crossing into Murray County.</td>
</tr>
<tr>
<td>7/6/2008</td>
<td>Round Lake</td>
<td>EF-0</td>
<td>A brief tornado caused no reported damage.</td>
</tr>
<tr>
<td>5/4/2012</td>
<td>Rushmore</td>
<td>EF-0</td>
<td>A brief tornado caused no reported damage.</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Scale</th>
<th>Event Narrative</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/4/2012</td>
<td>Worthington</td>
<td>EF-0</td>
<td>A brief tornado caused no reported damage.</td>
</tr>
<tr>
<td>5/4/2012</td>
<td>Round Lake</td>
<td>EF-0</td>
<td>A brief tornado caused no reported damage.</td>
</tr>
</tbody>
</table>

National Climatic Data Center (NCDC / NOAA) Storm Events database

Table #61  Thunderstorm Wind Event (60+ knots) – Nobles County

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Wind Speed</th>
<th>Event Narrative</th>
</tr>
</thead>
<tbody>
<tr>
<td>6/12/2001</td>
<td>Ellsworth</td>
<td>61 - 69 kts MG</td>
<td>Thunderstorm winds caused severe damage to at least two farms. Barns at both farms were completely destroyed, as were two vehicles in one of the barns. There was also damage to houses, equipment, and trees on the farms. Thunderstorm winds blew down numerous trees.</td>
</tr>
<tr>
<td>6/13/2001</td>
<td>Worthington</td>
<td>61 - 69 kts MG</td>
<td>Thunderstorm winds tore the roof and most of the outside walls off a 40 by 108 foot feeder pig barn. Thunderstorm winds caused tree damage.</td>
</tr>
<tr>
<td>4/16/2002</td>
<td>Dundee, Reading</td>
<td>74 kts MG</td>
<td>Thunderstorm winds blew the roof off a building, severely buckled an elevator bin, and caused tree damage.</td>
</tr>
<tr>
<td>6/7/2002</td>
<td>Wilmont</td>
<td>61 kts MG</td>
<td>No narrative</td>
</tr>
<tr>
<td>7/3/2003</td>
<td>Lismore</td>
<td>61 kts MG</td>
<td>Thunderstorm winds caused tree damage, including large trees down.</td>
</tr>
<tr>
<td>8/18/2003</td>
<td>Brewster</td>
<td>61 kts MG</td>
<td>Thunderstorm winds caused widespread tree damage. Several houses were damaged by falling trees and wind-blown tree debris. A roof was blown off a home northwest of Brewster.</td>
</tr>
<tr>
<td>5/29/2004</td>
<td>Adrian, Ellsworth, Lismore</td>
<td>61 – 78 kts MG</td>
<td>Thunderstorm winds caused widespread tree damage in Adrian. Trees as large as a foot and a half in diameter were blown down, along with numerous limbs and branches. Several roads were blocked by tree debris. The winds also caused damage to power lines. Thunderstorm winds destroyed a small building in Ellsworth. While in Lismore, thunderstorm winds destroyed two hog barns and a feed mill, and damaged a grain bin. One thousand hogs died of suffocation as a result of the damage. The owner’s house on the other side of a nearby road was undamaged.</td>
</tr>
<tr>
<td>Date</td>
<td>Location</td>
<td>Wind Speed</td>
<td>Event Narrative</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------------------------------</td>
<td>------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>8/3/2004</td>
<td>Worthington, Adrian, Reading, Rushmore, Round Lake,</td>
<td>61 – 69 kts MG</td>
<td>In Worthington, thunderstorm winds caused tree damage, including several trees blown down. One tree fell through the roof and top two floors of a home. In Adrian, thunderstorm winds destroyed a grain elevator and several grain bins. The winds also damaged roofs and siding on several homes and businesses. There was widespread tree damage including several trees blown down. Homes, businesses, and vehicles sustained additional damage from falling or flying tree debris, and debris blocked several roads. Power lines were blown down, resulting in power outages. The winds caused severe crop damage in the area, but the amount of crop damage could not be determined. In Reading, thunderstorm winds destroyed at least two silos, blowing one of them halfway across a field. The winds damaged and moved another silo, larger than the others, off its foundation. The winds also caused tree damage, including several trees blown down. Tree debris broke a window in a mobile home. The winds damaged crops, especially corn, but the amount of crop damage could not be determined. In Rushmore, thunderstorm winds blew the doors of a barn and caused tree damage and in Round Lake, thunderstorm winds damaged trees and crops in the area. The amount of damage could not be determined.</td>
</tr>
<tr>
<td>5/24/2010</td>
<td>Wilmont</td>
<td>61 kts MG</td>
<td>Thunderstorm winds caused widespread tree damage, including large limbs blown down. The winds also damaged grain bins, siding and gutters on a home, and blew parts of the roofs off 2 hog barns.</td>
</tr>
<tr>
<td>7/17/2010</td>
<td>Lismore</td>
<td>61 kts MG</td>
<td>Thunderstorm winds caused an unknown amount of tree damage.</td>
</tr>
<tr>
<td>7/23/2010</td>
<td>Rushmore, Worthington</td>
<td>61 - 65 kts MG</td>
<td>In Rushmore, thunderstorm winds blew the roof off a barn and caused tree damage. In Worthington, thunderstorm winds blew a semi off Interstate 90, and also caused tree damage, including several trees blown down.</td>
</tr>
<tr>
<td>5/19/2017</td>
<td>Rushmore</td>
<td>60 kts MG</td>
<td>Wind gust measured by Minnesota Department of Transportation automated weather station along Interstate 90.</td>
</tr>
</tbody>
</table>
**Windstorms and Climate Change**

Lack of high-quality long-term data sets make assessment of changes in wind speeds very difficult. One analysis generally found no evidence of significant changes in wind speed distribution. Other trends in severe storms, including the numbers of hurricanes and the intensity and frequency of tornadoes, hail, and damaging thunderstorm winds are uncertain. Since the impact of more frequent or intense storms can be larger than the impact of average temperature, climate scientists are actively researching the connections between climate change and severe storms.

**Tornadoes and Climate Change**

Tornadoes and other severe thunderstorm phenomena frequently cause as much annual property damage in the U.S. as do hurricanes, and often cause more deaths. Although recent research has yielded insights into the connections between global warming and the factors that cause tornadoes and severe thunderstorms, such as atmospheric instability and increases in wind speed with altitude, these relationships remain mostly unexplored, largely because of the challenges in observing thunderstorms and tornadoes and simulating them with computer models.

According to Harold Brooks of NOAA’s National Severe Weather Laboratory, there is increasing variability in the “start” of tornado season. The number of days with more than 30 EF1 or greater tornadoes is increasing, while the number of days with at least 1 EF1 or greater tornadoes is decreasing. Thus, tornadoes are occurring on fewer days, but more are occurring on outbreak days.

Tornadoes have not been recorded in Minnesota in the winter months of December, January and February (MN DNR, 2014). However, the state of Wisconsin has recorded 3 tornadoes in January and 6 in December during the period of 1844-2013 including a recent January tornado in 2008.

**Vulnerability**

Tornado and Straight-line Wind events are likely to take place in any year. Tornadoes are less common than straight-line wind events, but communities need to be prepared since loss of life is a risk associated with these two hazards. Severe wind events can cause minor damage to structural failure and full-scale devastation. Residents and travelers must be warned of impending danger immediately before and during a tornado or severe straight-line wind event.

**Plans and Programs**

- Severe Weather Spotter Network – The severe storm spotter network, sponsored by the National Weather Services (NWS), enlists the help of trained volunteers to spot severe storm conditions and report this information to the NWS. No tornado warnings are given unless the storm has been spotted by someone or is confirmed by NWS radar reports. Nobles County annually trains 80 to 100 severe weather spotters who report directly to the NWS when severe weather is observed. Local fire department and law enforcement spotters can also connect directly with a Nobles County Dispatcher to request activation of any siren in Nobles County. The Nobles County Sheriff designated a talk group.

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75 Kunkel, et al., Regional Climate Trends and Scenarios for the U.S. National Climate Assessment, 2013
76 Kunkel, et al., Regional Climate Trends and Scenarios for the U.S. National Climate Assessment, 2013
77 Del Genio, Yao, & Jonas, Will moist convection be stronger in a warmer climate?, 2007
78 Kunkel, et al., Regional Climate Trends and Scenarios for the U.S. National Climate Assessment, 2013
on the ARMER Radio System that is dedicated to fire departments to use to communicate across the county during a weather event where spotters are needed.

- **Severe Weather Shelters** – The Minnesota State Zoning Ordinance regarding severe weather shelters has been adopted by Nobles County. This ordinance requires on-site shelter for mobile home park residents or provides information on evacuation routes to safe shelters elsewhere. There are two mobile home parks in Nobles County located in Worthington and Brewster. NOAA Weather Radio – NWR broadcasts official warnings, watches, forecasts, and other hazard information 24 hours a day, seven days a week. The nationwide network of radio stations broadcast continuous weather information from the nearest National Weather Service office. The NWR is your primary source of comprehensive weather and emergency information regarding all hazards.

- **Outdoor warning sirens** – The primary purpose of the outdoor warning siren is to alert people who are outside to severe weather. If you hear an outdoor warning siren you should seek shelter immediately and turn to local media to get information on what is happening. Most of the cities in Nobles County have good coverage by emergency sirens that can be activated to warn residents in a severe weather event. All of the sirens in Nobles County have been converted to narrow band frequency. Most sirens in Nobles County can be heard for a half-mile radius.

### Table #62  
Outdoor Warning Sirens – Nobles County

<table>
<thead>
<tr>
<th>Cities</th>
<th>Sirens Adequate</th>
<th>Have backup battery</th>
<th>Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adrian</td>
<td>4</td>
<td>No</td>
<td>#1 East side of baseball field, #2 Corner of Arkansas Ave &amp; Fourth St., #3 Behind Fire Hall on Maine Ave between 3rd/4th St., #4 Behind Adrian Country Living Cottages on 200 Block of 7th St. W. #5 Pending – Proposed location to serve Suedkamp Addition to be placed at very east end of Eighth St. E pending funding.</td>
</tr>
<tr>
<td>Bigelow</td>
<td>1</td>
<td>No</td>
<td>Behind the Fire Hall at 1537 Broadway</td>
</tr>
<tr>
<td>Brewster</td>
<td>1</td>
<td>No</td>
<td>On the Water Tower behind the Fire Hall at 922 3rd Ave.</td>
</tr>
<tr>
<td>Dundee</td>
<td>1</td>
<td>Yes</td>
<td>N Main &amp; 2nd St (former Dundee Fire Hall)</td>
</tr>
<tr>
<td>Ellsworth</td>
<td>2</td>
<td>No</td>
<td>#1 Broadway and 4th #2 West end of Washington Ave</td>
</tr>
<tr>
<td>Kinbrae</td>
<td>0</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Lismore</td>
<td>1</td>
<td>No</td>
<td>Behind City Hall at 249 East Second St.</td>
</tr>
<tr>
<td>Leota Township</td>
<td>1</td>
<td>No</td>
<td>110th St. near Leota Café</td>
</tr>
<tr>
<td>Reading</td>
<td>0</td>
<td>NA</td>
<td>Possible location – Summit Lake Grader Shed</td>
</tr>
<tr>
<td>Round Lake</td>
<td>1</td>
<td>No</td>
<td>302 2nd Avenue by the Fire Hall or 43 degrees 32 feet 25.77 inches North, 95 degrees 28 feet 7.79 inches West</td>
</tr>
<tr>
<td>Rushmore</td>
<td>1</td>
<td>No</td>
<td>In the alley behind City Hall at 136 N Thompson Ave.</td>
</tr>
</tbody>
</table>
• Text Alert – All the Public Schools in Nobles County have a text alert system for emergencies and school closings.

• Tornado drills – All schools (public and private) in Nobles County participate in Severe Weather Awareness Week by participating in Tornado Drill Day. Each school has a plan in place for sheltering during a tornado or other severe weather event.

• Emergency shelters – Each city in Nobles County is responsible for identifying a safe place to shelter during a severe weather event.

### Table #63

#### Emergency Shelters & Safe Rooms – Nobles County

<table>
<thead>
<tr>
<th>Cities</th>
<th>Emergency Shelter</th>
<th>Safe Room</th>
<th>Need</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adrian</td>
<td>Adrian Fire Hall at 310 Main Ave is a brick-constructed building that is used as a storm shelter. Campground and swimming pool patrons are instructed to move there in severe weather.</td>
<td>None</td>
<td>A 25-30 person storm shelter just west of the swimming pool for pool and campground patrons and others during severe weather.</td>
</tr>
<tr>
<td>Bigelow</td>
<td>City Hall/Community Center attached to Fire Hall at 1537 Broadway.</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Brewster</td>
<td>City Hall at 246 19th St. for snow emergency shelter for stranded travelers. Tornado Shelter in trailer court on 7th Ave.</td>
<td>The city built a storm shelter made of block at the city trailer park behind 825 7th Ave.</td>
<td></td>
</tr>
<tr>
<td>Dundee</td>
<td>First Lutheran Church</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Ellsworth</td>
<td>Parkview Manor Nursing Home, 309 W Sherman</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Kinbrae</td>
<td></td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Lismore</td>
<td>City Hall at 249 East Second St.</td>
<td>None</td>
<td></td>
</tr>
</tbody>
</table>
Cities | Emergency Shelter | Safe Room | Need
--- | --- | --- | ---
Round Lake | Use local churches | None | 
Rushmore | Community Room at School | None | 
Wilmont | City Hall | None | 
Worthington | Worthington School District has agreement with Public Health for Mass Dispensing, Places to shelter but not built to code for "safe room." St. Mary’s School only has basement for sheltering, no agreements. Worthington Christian School has no agreements, no safe room, no basement but do have designated sheltering areas. | | 

**Gaps and Deficiencies**

- Emergency shelters in mobile home parks – Mobile homes typically do not provide adequate emergency shelter for residents. Worthington and Brewster have mobile home parks and were identified as needing emergency shelters.
- Warning siren range – The effective range of warning sirens is limited. Rural areas are outside the range of the severe weather warning system areas. Locations where sirens should be considered include: Reading, Maka-Oicu County Park; North side of Lake Ocheda; Corner of Plotts Ave/290th near Hawkinson Bridge; Area near 295th and Palm Ave.
- Local radio and television warnings – Local radio and television stations do provide warnings, but they are effective only if tuned to the local channel. Satellite and internet based mediums are widely used, so local emergency broadcasts are limited. Language barriers can also be an issue regarding severe weather warnings.
- Tornado preparedness training – Training should be given to educate residents as to where to go in their own homes during a tornado.
- Emergency shelter and safe rooms – Not all parks in Nobles County have emergency shelters. There is one safe room in Nobles County (Brewster). Funding is an obstacle for the construction of safe rooms.
- Warning sirens in county parks – None of the county parks in Nobles County have a warning siren.
- Warning siren backup batteries – Not all sirens are equipped with a backup battery. If the power goes off as a result of the storm, the siren is useless if it does not have a backup generator. See Table #6 for warning sirens in Nobles County that do and do not have backup batteries (backup power generation).
- Diversity and language barriers – There are a number of nationalities and languages spoken in Nobles County. This makes it difficult to send out emergency broadcast. Having to translate emergency broadcasts into multiple languages takes time and money.
5.4.7 Extreme Cold

Minnesota experiences winter weather from mid-autumn through the winter season into spring. Extreme cold can immobilize large regions at the same time. All types of winter storms can be accompanied by extreme cold—both absolute temperatures and wind chill. All locations in Nobles County are equally likely to be exposed to this hazard. Rural areas are more likely to be severely impacted by the hazard. Rural homes and farms face the threat of isolation and utility failure during winter storms.

Given the rural nature of Nobles County, residents of smaller communities may face similar isolation issues as rural residents. City residents are also at risk. Attempting to travel between communities would expose city dwellers to higher levels of risk corresponding with their rural counterparts.

Extreme cold events are when temperatures lead to direct dangers to people and animals. Infants and the elderly are most susceptible to prolonged exposure to the cold. Wind and cold weather can combine to cause wind chill temperatures as low as 70 degrees below zero. Prolonged exposure can cause frostbite or hypothermia and can be life-threatening.

Below freezing temperatures can also damage vegetation and cause pipes to freeze and burst inside homes. More deaths are attributed to winter storms than to extreme cold weather events, but some populations are at more risk than others. The best advice is to stay inside. Over half of winter-weather deaths occurred in a vehicle, and 30 percent occurred outdoors.

Figure #29 Wind Chill Table

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Relationship to Other Hazards—Cascading Effects

- **Transportation Crashes.** Winter storms often lead to hazardous conditions for transportation infrastructure. Icy roads can make travel difficult. Poor driving conditions and poorly designed transportation infrastructure can contribute to motor vehicle crashes.

- **Wildfire.** Extreme cold directly impacts firefighting, making fire suppression more difficult and increasing the likelihood of equipment damage.

- **Public Health.** Frozen septic systems can lead to the release of increased levels of untreated wastewater into the environment.

- **Public Safety.** Anyone exposed to extremely cold temperatures can develop frostbite and hypothermia. The elderly, children and those who engage in outdoor work or recreation may be most susceptible to the danger of extremely cold temperatures.

**Extreme Cold History in Nobles County**

From January 2000 through May 2017, there have been nine documented extreme cold events in Nobles County. In the table below are extreme cold events that occurred in that timeframe.

<table>
<thead>
<tr>
<th>Date</th>
<th>Location(s)</th>
<th>Event Narrative</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/14/2009</td>
<td>Nobles County</td>
<td>Moderate to strong northwest winds and very cold air combined to lower wind chills to 35 to 45 below zero at times. The coldest winds chills were during the morning of January 14th with strong winds, and the night of January 14th to daybreak of January 15th when temperatures were falling and winds were slowly decreasing. The actual temperature dropped to 26 below zero at Worthington on the morning of January 15th after the wind had subsided.</td>
</tr>
<tr>
<td>1/7/2010</td>
<td>Nobles County</td>
<td>Persistent north to northwest winds combined with very cold air to produce wind chill values the frequently dropped to 35 below zero or a little colder. These extremely dangerous wind chills added to the hazards produced by the preceding winter storm. As winds slowly subsided during the night of January 7th, temperatures continued to drop to well below zero, keeping the wind chills at the very dangerous level through the morning of January 8th.</td>
</tr>
<tr>
<td>2/1/2011</td>
<td>Nobles County</td>
<td>North to northwest winds averaging 15 to 30 mph combined with temperatures dropping below zero to produce wind chills of 20 to 35 below zero on February 1st. On the night of February 1st and the early morning of February 2nd, wind chills reached the 35 to 40 below zero range at times despite slowly decreasing winds, as temperatures fell further below zero.</td>
</tr>
<tr>
<td>12/23/2013</td>
<td>Nobles County</td>
<td>Temperatures of 15 to 28 below zero and winds reaching 10 to 15 mph at times combined to produce wind chills of 35 to 45 below zero.</td>
</tr>
<tr>
<td>1/23/2014</td>
<td>Nobles County</td>
<td>Temperatures reaching double digits below zero and northwest winds of 10 to 15 mph combined to produce wind chill readings of 35 to 40 below zero in southwest Minnesota.</td>
</tr>
</tbody>
</table>
Date | Location(s) | Event Narrative
--- | --- | ---
2/27/2014 | Nobles County | Temperatures dropping to double digits below zero, combined with winds of 10 to 20 mph, produced wind chill readings around 35 below zero for several hours ending a little after sunrise on February 27th.
3/2/2014 | Nobles County | Temperatures dropping to around 15 below zero, combined with northwest winds of 5 to 15 mph, produced wind chill readings around 35 below zero for several hours ending a little after sunrise on March 2nd.
1/16/2016 | Nobles County | Wind chills dropped to the 35 to 45 below zero range for much of the night and morning hours on January 16-17. Northwest winds gusted to around 20 mph early in the event, but generally averaged 10 to 15 mph when the coldest wind chills were reached, during which time actual temperatures were 15 to 20 degrees below zero.
12/17/2016 | Nobles County | Strong northwest winds on December 17th, decreasing to around 10 mph during the night of the 17th, combined with falling temperatures to lower wind chill readings to 40 to 55 below zero. Actual temperatures dropped to colder than 20 below zero.

National Climatic Data Center (NCDC / NOAA) Storm Events database

**Extreme Cold and Climate Change**

There is not yet any observable trend related to extreme cold events and climate change in Minnesota. Cold temperatures have always been a part of Minnesota’s climate and extreme cold events will continue. However, an increase in extreme precipitation or storm events such as ice storms as the climate changes could lead to a higher risk of residents being exposed to cold temperatures during power outages or other storm-related hazards during extreme cold.

**Vulnerability**

Extreme cold temperatures affect the county nearly every year. The amount of snow and ice, number of blizzard conditions, and days of sub-zero temperatures each year are unpredictable.

Within Nobles County the risk of extreme cold does not vary geographically. Citizens living in climates such as these must always be prepared for situations that put their lives or property at risk. It is not always the depth of the cold, but an unprepared individual with a vehicle breakdown or unmaintained garage that are at risk. Rural citizens not connected to city gas lines are more vulnerable to issues with extreme cold. The vulnerability of each jurisdiction to extreme cold has not changed due to any development in the last five years.

**Plans and Programs**

- Real-time weather monitoring – The City of Worthington has a real-time weather monitoring station at the Worthington Municipal Airport that provides current temperatures, dew point, wind speed, wind direction, and barometric pressure.
- Travel Assistance – “511 is a public service of the Minnesota Department of Transportation (MnDOT) to help traveler’s access information about road conditions, traffic incidents, commercial vehicle restrictions, and weather information via the phone or the Web, 24 hours a day, seven days a week.”

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• Regional Forecasts – Nobles County is in the Sioux Falls broadcasting region. Weather forecasts in the Sioux Falls region tend to be a good predictor of weather in Nobles County. Nobles County uses this information in regards to school closures and other weather related announcements.

• School closings – Nobles County’s school districts have a policy of closing schools when wind chills exceed certain thresholds, low visibilities create unsafe driving conditions, or when heavy snow has fallen making travel difficult. Local radio stations partner with the school districts to make sure the announcements are out by 6:00 am or earlier if possible.

• Wind chill warnings – The local radio and television media partner with the National Weather Service to issue a wind chill warning when temperatures are -30 degrees Fahrenheit or lower. Severe wind chill warnings are provided when conditions warrant and when safety is a factor. Wind chills of -40 degrees Fahrenheit or lower frequently prompt the closing of schools to protect children, particularly in rural areas.

• Emergency generators – Emergency generators help keep emergency services available during winter storms. Refer to Table #46 for public entities with emergency generators in Nobles County.

Gaps and Deficiencies

• Automated weather stations at schools – Automated weather stations at schools throughout Nobles County would provide more current information and quicker response to dangerous and changing weather conditions.

• 511 System – The 511 system does not incorporate local knowledge as well as it could. County staff has little involvement in providing updates to the 511 system. Including snowplow drivers and other county staff could help to improve the accuracy of the system. County staff has local knowledge regarding the road network and can provide accurate information into the system.

• Road Closures Coordination – MnDOT closes state highways and does not talk to local emergency managers. There needs to be a direct line of communications between MnDOT and local emergency managers. This is an issue for emergency response and mass sheltering.

• Language barriers – Language barriers can be an issue regarding severe weather warnings. There are a number of nationalities and languages spoken in Nobles County. This makes it difficult to send out emergency broadcast. Having to translate emergency broadcasts into multiple languages takes time and money.
5.4.8 Extreme Heat

During the spring, summer and autumn excessive heat can occur. Extreme heat events were assigned a hazard rank of moderate by the planning team. Excessive heat temperatures and temperature change is one of the variables that impact summer storms. All locations in Nobles County are at risk to be affected by this hazard. Severe summer storms and extreme heat events will be more widespread.

Extreme heat helps to contribute to the magnitude of a thunderstorm and often accompanies severe summer storms. The combination of high temperatures and exceptionally humid conditions can lead to overheating, heat stress, and a severe strain on the system. Heat stress can lead to heat cramps, heat exhaustion, heatstroke, and even death. According to the Centers for Disease Control and Prevention (CDC), more than 300 Americans die annually from excessive heat exposure from 1979 - 2003. More people in the United States died from extreme heat than from hurricanes, lightning, tornadoes, flood and earthquakes combined.82

Relationship to other Hazards

- **Drought and Wildfire** - Dry, hot conditions can reduce the protective moisture of woodlands and increase the risk of wildfire.
- **Public Safety** - Anyone exposed to extreme heat can develop heat exhaustion and heat stroke. The elderly, children and those who engage in outdoor work or recreation may be most susceptible to the danger of extreme heat.

**Extreme Heat History in Nobles County**

Extreme heat events are documented as a separate event by NOAA. Excessive heat occurs from a combination of high temperatures and high humidity index. From 1979 to 2003, more people in the U.S. died from extreme heat than from hurricanes, lightning, tornadoes, floods, and earthquakes combined.83

<table>
<thead>
<tr>
<th>Table #65</th>
<th>NOAA Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Excessive Heat Outlook</strong></td>
<td>A combination of temperature and humidity over a certain number of days are designed to provide an indication of areas of the country where people and animals may need to take precautions against the heat during the months of May through November.</td>
</tr>
<tr>
<td><strong>Excessive Heat Warning</strong></td>
<td>Issued within 12 hours of the onset of the following criteria: heat index of at least 105°F for more than 3 hours per day for 2 consecutive days, or heat index more than 115°F for any period of time.</td>
</tr>
<tr>
<td><strong>Excessive Heat Watch</strong></td>
<td>Issued by the National Weather Service when heat indices are in excess of 105°F (41°C) during the day combined with nighttime low temperatures of 80°F (27°C) or higher are forecast to occur for two consecutive days.</td>
</tr>
</tbody>
</table>

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There were six documented extreme heat events in Nobles County from January 2000 through May 2017.

### Table #66

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Event Narrative</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/15/2011</td>
<td>Nobles County</td>
<td>An extended period of excessive heat produced daytime temperatures reaching the 90s and dew points in the 70s to lower 80s, with heat indices often reaching or exceeding 115 degrees. Nighttime temperatures often in the mid-70s to lower 80s with continued high humidity provided little if any relief. The heat and humidity caused prolonged stress on people and livestock. At least 20 livestock deaths were reported in the county.</td>
</tr>
<tr>
<td>6/24/2012</td>
<td>Nobles County</td>
<td>Temperatures reaching the 90s and high humidity with dew points in the 70s caused excessive heat, with the heat index peaking between 100 and 105 degrees.</td>
</tr>
<tr>
<td>7/2/2012</td>
<td>Nobles County</td>
<td>Temperatures reaching the 90s to just above 100, and high humidity with dew points in the 70s, caused an extended period of excessive heat. The heat index peaked at 100 to 110 degrees each day, and did not fall enough at night to provide much relief to indoor locations that were not otherwise cooled.</td>
</tr>
<tr>
<td>7/16/2012</td>
<td>Nobles County</td>
<td>Temperatures reaching the 90s, and high humidity with dew points in the 70s, caused excessive heat. The heat index peaked at 100 to 105 degrees.</td>
</tr>
<tr>
<td>6/10/2016</td>
<td>Nobles County</td>
<td>Temperatures reaching daytime highs in the mid to upper 90s after a period of cool weather were accompanied by humid conditions, with the heat index rising to 100 degrees or a little hotter. An unknown number of people suffered from heat stress, heat exhaustion, or dehydration, as reported by hospital emergency rooms.</td>
</tr>
<tr>
<td>7/20/2016</td>
<td>Nobles County</td>
<td>Temperatures reaching daytime highs in the 90s were accompanied by very humid conditions, with the heat index rising to 100 to 110 degrees. An unknown number of people suffered from heat stress, heat exhaustion, or dehydration, as reported by hospital emergency rooms.</td>
</tr>
</tbody>
</table>

*National Climatic Data Center (NCDC / NOAA) Storm Events database*
Figure #30  Number of Extreme Heat Events by County 1995 - 2012

Extreme Heat and Climate Change

Minnesota’s average temperature has increased more than 1.5°F since recordkeeping began in 1895, with increased warming happening in recent decades (International Climate Adaptation Team, 2013). Annual temperatures in the Midwest have generally been well above the 1901-1960 average since the late 1990s, with the decade of the 2000s being the warmest on record.\(^{84}\) Seven of Minnesota’s ten warmest years occurred in the last 15 years. Projected increases are 2°F to 6°F more by 2050 and 5°F to 10°F by 2100.\(^{85}\) The Midwest has experienced major heat waves and their frequency has increased over the last 6 decades (Perera, et al., 2012). For the U.S., mortality increases 4% during heat waves compared with non-heat wave days (Anderson & Bell, 2011). During July 2011, 132 million people across the U.S. were under a heat alert – and on July 20 the majority of the Midwest experienced temperatures in excess of 100°F. Heat stress is projected to increase as a result of climbing summer temperatures and humidity (Schoof, 2012). On July 19, 2011, Moorhead Minnesota set a new state record for the hottest heat index ever, at 134°F. That same day, Moorhead also recorded a new state record for the highest dew point at 88. It was the hottest, most humid spot on the planet that day (Douglas, 2011).

\(^{84}\) (Kunkel, et al., Regional Climate Trends and Scenarios for the U.S. National Climate Assessment, 2013
\(^{85}\) MN Environmental Quality Board, 2014
Increasing temperatures impacts Minnesota’s agricultural industry. Agriculture is highly dependent on specific climate conditions. As a result of increasing temperature, crop production areas may shift to new regions of the state where the temperature range for growth and yield of those crops is optimal. According to the National Climate Assessment, the Midwest growing season has lengthened by almost 2 weeks since 1950 due in large part to earlier timing of the last spring freeze. This trend is expected to continue. While a longer growing season may increase total crop production, other climate changes, such as increased crop losses and soil erosion from more frequent and intense storms, and increases in pests and invasive species, could outweigh this benefit. There may also be higher livestock losses during periods of extreme heat and humidity. Losses of livestock from extreme heat lead to a challenge in disposal of animal carcasses. Currently there are only 2 rendering facilities in Minnesota available for livestock disposal. If a rendering facility is not available, lost livestock must be composted on an impervious surface. If losses are high, finding an impervious surface large enough is a challenge. In an attempt to adapt to increased temperatures, livestock areas in Minnesota may shift farther north. As a result of new livestock areas and the resulting manure production, farmers may transition to manure-based fertilizer applications in areas where traditionally only commercial fertilizers have been used, with accompanying environmental advantages and disadvantages.\(^8\)

**Vulnerability**

Severe summer storms are highly likely to take place every year, including excessive heat, lighting, and hail. People do not always recognize their limitations. Summer heat can pose a serious risk to all populations, especially the young and elderly population. Informed about extreme heat events and other summer storms is important in preventing accidents.

**Plans and Programs**

- **Heat advisories** – The local radio and television media are in contact with the National Weather Service to issue a heat advisory when the combination of temperature and humidity create risks for people and animals. A heat index of 105 to 114 warrants a heat advisory. This occurs when air temperature reaches 95 degrees and the relative humidity is 50 percent. An excessive heat warning is issued when the heat index reaches 115. This occurs with an air temperature of 95 degrees and relative humidity of 60 percent. A heat index of 115 or higher puts both humans and animals at risk.
- **Emergency alert system** – Nobles County has the Nixle emergency notification system. Nixle allows emergency officials to notify residents and businesses by telephone, cell phone, text message, email and social media regarding time-sensitive general and emergency notifications.
- **Weather Ready Nation Ambassador** – Nobles County is a Weather Ready Nation Ambassador. “The Weather-Ready Nation Ambassador™ initiative is the National Oceanic and Atmospheric Administration’s (NOAA) effort to formally recognize NOAA partners who are improving the nation’s readiness, responsiveness, and overall resilience against extreme weather, water, and climate events. As a WRN Ambassador, partners commit to working with NOAA and other Ambassadors to strengthen national resilience against extreme weather.”\(^7\)

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\(^8\) Adapting to Climate Change in Minnesota: 2013 Report of the Interagency Climate Adaptation Team, 2013

• Local media – Severe weather warnings are broadcasted via local media. Public service announcements are one of the ways to warn the public of severe weather.
• Severe weather spotter training – an annual training is provided in Nobles County. The National Weather Service conducts the training.

**Gaps and Deficiencies**

• Public education – The public may not be aware of the real risks associated with heat exhaustion, extreme heat events, and other severe summer storms.
5.4.9 Drought

Drought is defined as a prolonged period of dry weather with very little or no precipitation. There are four types of drought: meteorological drought (departure from average), hydrological drought (shortfall of stream flows or groundwater), agricultural drought (soil moisture deficiencies), and socioeconomic or water management drought. Droughts can have lasting effects and can cause a serious depletion of surface and ground waters.

The entire county is equally at risk for drought; however, areas within the county may react differently to drought conditions. Areas with well-drained soils may be more likely to experience adverse impacts to crops. Areas that rely on individual wells for drinking water supplies are more likely to experience shortages than areas with access to municipal and rural water suppliers. Different areas in Nobles County may be impacted differently by a drought, but the small size of the county and interdependence of the residents will result in any drought event having a significant impact on the entire county.

The Cities of Adrian, Ellsworth, Leota, and Worthington have their own water system that consists of multiple wells. Lincoln-Pipestone Rural Water System (LPRW) provides most of the potable water service to rural Nobles County and the Cities of Adrian, Bigelow, Brewster, Ellsworth, Lismore, Round Lake, Rushmore, Wilmont and Worthington. LPRW currently does not provide any emergency backup to cities in Nobles County that have their own water system.

City of Dundee is serviced by Red Rock Rural Water as of November 2017. Red Rock Rural Water also services a small portion of northeastern Nobles County. The City of Kinbrae residents all have private wells.

With limited supplies of groundwater, rural water systems will be an increasingly important asset for communities, livestock producers and rural residents. Nobles Local Water Management Plan 2009 p.24 Lincoln-Pipestone Rural Water (LPRW) serves portions of western Nobles County. Red Rock Rural Water (RRRW) recently announced an expansion to serve townships in southeastern Nobles County and is exploring the opportunity to provide water to the City of Round Lake. The City of Worthington and LPRW, among others, are participating in the Lewis & Clark Regional Water System. This project will bring Missouri River water to Southeast South Dakota, Northwest Iowa, and Rock and Nobles counties in Southwest Minnesota.
Figure #31  Nobles County MPCA Ground Water Map

Source: http://pca-gis02.pca.state.mn.us/eda_groundwater/index.html
Figure #32  Lincoln-Pipestone Rural Water Map

Lincoln-Pipestone Rural Water Distribution System
415 East Benton St.
Lake Benton, MN  56149
(507)396-4248

Legend
LPRW Service Areas

DOT Roads
- Interstates
- US/State Highway
- Trails
- Counties

0  5  10  15  20  25  30  Miles
Nobles County’s economy is based heavily on agriculture. A severe drought could cause economic hardship within the county. Corn and soybeans yields can be dramatically decreased by drought conditions. Livestock operations are affected by loss of feedstock, pasture and general forage, as well as drinking water. Reduced yields due to a drought event will not only have an economic impact on individual farmers, but on secondary suppliers who buy and sell crops and livestock, agricultural retailers, and local governments that rely on sales taxes. Drought insurance for crops does help compensate for losses, but there can still be economic hardship as the result of a drought.

A drought will not only produce a hardship for the farmers growing the crops, but overall supply can decrease causing food prices to rise.

**Relationship to Other Hazards—Cascading Effects**

Drought can increase the risk of a number of natural and other hazards.

- **Wildfires.** Drought stressing woods, brush land, and non-cultivated fields significantly increases the risk of wildfires and lightning strikes onto dry fields have the potential to cause wildfires as well. In addition, moving equipment within Nobles County like trains or combines during fall harvest have the potential to cause wildfires.
- **Insect Infestation.** An increase in the amount of insects and other pests are often caused or impacted by severe drought conditions.
- **Tree Loss.** Due to the lack of moisture, tree loss or decline can be experienced resulting in several problems including: loss of shade for homes requires increased power consumption, and loss of windbreaks provided by trees allows for an increase in soil erosion.
- **Wells/Aquifers.** The absence of rain for a long period of time is insufficient to recharge aquifers and eventually, the loss of water in underground wells results.
- **Business Interruption.** A drought can result in watering bans. Businesses that are heavier water users will be impacted. Golf courses, processing facilities, car washes, and a number other businesses will be impacted.
- **Utility/Infrastructure.** Nobles County’s limited groundwater resources, provided by surficial aquifers, can be easily negatively impacted by drought.
- **Dust Storms.** As surface soils dry out and the winds blow, an increased amount of soil erosion occurs.
- **Civil Disturbance.** A long lasting drought can cripple the economic opportunity in greater Minnesota and other areas that have an agricultural based economy. This loss in economic opportunity can cause social unrest.
Drought History in Nobles County

From January 2000 through May 2017, there were 13 documented droughts in Nobles County. In the table below are documented droughts that occurred from January 2013 through May 2017.

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Event Narrative</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/1/2013</td>
<td>Nobles, Lyon, Lincoln, Jackson, Cottonwood, Pipestone, Murray, Rock</td>
<td>Drought conditions continued over all of southwest Minnesota in January. Precipitation was below to well below normal, although with the low midwinter normals, even greater precipitation would have been unlikely to change the dry soil conditions. There was little noted in the way of new effects of the drought, with the dry conditions giving a poor outlook for the Spring and Summer, including poor germination of the winter wheat crop during the dry fall. Water restrictions continued to be few during the winter because of the low water usage, but the area was becoming more vulnerable to even marginally weather if it developed in the spring and summer. Drought was generally listed as continued severe to extreme for the area.</td>
</tr>
<tr>
<td>2/1/2013</td>
<td>Nobles, Lyon, Lincoln, Jackson, Cottonwood, Pipestone, Murray, Rock</td>
<td>Drought conditions continued over all of southwest Minnesota in February, despite precipitation which was a little above normal. The excess of a few tenths of an inch in the driest month of the year did little to relieve the long term dry soil conditions. There was little noted in the way of new effects of the drought, with the dry conditions giving a poor outlook for the Spring and Summer, including the poor germination of the winter wheat crop during the dry fall. Water restrictions continued to be few during the winter because of the low water usage, but the area was deemed vulnerable to even marginally dry weather if it developed in the spring and summer. Drought was generally listed as continued severe to exceptional for the area, with the northern edge of the area, from Ivanhoe to Marshall, making a slight improvement to severe because of greater snowfall and snow cover during the month.</td>
</tr>
<tr>
<td>3/1/2013</td>
<td>Nobles, Lyon, Lincoln, Jackson, Cottonwood, Pipestone, Murray, Rock</td>
<td>Drought conditions continued over all of southwest Minnesota in March. Precipitation was normal to half of normal, with drought rated severe to extreme over all of the area. There continued to be a lack of soil moisture as winter approached its end, since even normal winter precipitation is low compared to the warmer seasons. Also, the frozen ground forced runoff of what precipitation and snowmelt there was. There was little noted in the way of new effects of the drought, with the dry conditions giving a poor outlook for the Spring and Summer, including the winter wheat crop, which was also affected by poor germination conditions in the dry fall. Water restrictions continued to be few because of the low water usage, but the area was deemed vulnerable to even marginally dry weather if it developed in the spring and summer. Some effect was noted on livestock, although the majority of the livestock was in good condition despite persistent feed shortages.</td>
</tr>
</tbody>
</table>
Date | Location | Event Narrative
--- | --- | ---
4/1/2013 | Nobles, Lyon, Lincoln, Jackson, Cottonwood, Pipestone, Murray, Rock | Extreme to exceptional drought abated slowly to the moderate to severe category over southwest Minnesota during April. Near to a little above normal precipitation was not enough to end the long standing drought entirely, given the long term dry soil conditions that carried over into the month. Accordingly, the area was still deemed very sensitive to the potential of below normal rainfall during the planting and growing seasons. However, the severity of the drought generally decreased. No new effects of the drought were noted during the month.

Figure #33

National Climatic Data Center (NCDC / NOAA) Storm Events database

U.S. Drought Monitor

August 1, 2017
(Released Thursday, Aug. 3, 2017)
Valid 8 a.m. EDT

Drought Impact Types:
- Delineates dominant impacts
- S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
- L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

Intensity:
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

http://droughtmonitor.unl.edu/
Drought and Climate Change

Droughts have been happening throughout Minnesota’s history and it is not yet clear how climate change may impact this.\textsuperscript{88} While there was no apparent change in drought duration in the Midwest over the past century (Dai, 2011), the average number of days without precipitation is projected to increase in the future.\textsuperscript{89}

Even in areas where precipitation does not decrease, projected higher air temperatures will cause increased surface evaporation and plant water loss, leading to drier soils. As soil dries out, a larger proportion of the incoming heat from the sun goes into heating the soil and adjacent air rather than evaporating its moisture, resulting in hotter summers under drier climatic conditions.\textsuperscript{90} Temperature has risen in Minnesota about 2°F since the early 20th century. Under a higher emissions pathway, historically unprecedented warming is projected by the end of the 21st Century. While warmer temperatures will reduce the heating energy demand and lengthen the growing season, it will also increase the intensity of

\textsuperscript{90} Mueller and Seneviratne. PNAS, July 31, 2012, vol. 109, no. 31
naturally occurring droughts.\textsuperscript{91} In 2007, 24 Minnesota counties received drought designation, while 7 counties were declared flood disasters. In 2012, 55 Minnesota counties received federal drought designation at the same time 11 counties declared flood emergencies (MN Environmental Quality Board, 2014).

\textit{Vulnerability}

Droughts do occur throughout Nobles County.

\textit{Plans and Programs}

- Watering Ban Ordinance – Cities can develop ordinances on water usage within their communities and can place restrictions on this usage in times of drought. The watering bans decrease the demand for water. This is done to curve demand for nonessential watering. Residents are alerted through the media when a watering ban is enacted.
- Burning ban – Nobles County can issue a burning ban during a drought event.
- Nobles County Water Management Plan – The Nobles County Comprehensive Water Management Plan serves as the five year ‘Work Plan’ for the Nobles County Soil and Water Conservation District (SWCD). Yearly Plans are developed to achieve the goals and objectives of the Water Plan. The Water Plan identifies and maps the major and minor aquifers serving the county. The Nobles County Comprehensive Water Management Plan can be found on the Nobles County SWCD website.\textsuperscript{92} The next update is planned for 2018.
- Recharge rates – The Nobles County Water Management Plan documents the number of gallons of water used per year by municipalities and large water users within the county. Regionally, recharge rates are tracked regional by Minnesota Board of Soil and Water Conservation.
- Shoreline zoning – Nobles County has adopted a shoreline ordinance pursuant to the authorization and policies contained in Minnesota Statutes, Chapter 103F, Minnesota Regulation, Parts 6120.2500 – 6120.3900, and the planning and zoning enabling legislation in Minnesota Statutes, Chapter 394.
- Aquifer inventories – Recharge rates and capacities of the county’s aquifers are recorded and inventoried by United States Geological Survey (USGS). These studies help to determine the capacities and recharge rates of the county’s aquifers in order to better assess use restrictions and provisions during times of drought.
- Usage rates – The Department of Natural Resources (DNR) regulates withdrawal and usage rates. There has to be a draw down study before irrigation permits can be issued.
- Public outreach – Educational campaigns regarding water conservation by the Nobles County Soil and Water Conservation District and rural water systems. This helps to ensure Nobles County’s ground water supplies are sufficient to meet demands.

\textit{Gaps and Deficiencies}

- Water conservation outreach – Water conservation programs need to be established to educate residents on the need and ways to conserve water usage.

\textsuperscript{91} NCICS State Summaries. Accessed: 8/10/17. Available: \url{https://statesummaries.ncics.org/mn}

- Lack of watering ban ordinance – Nobles County and the Cities of Adrian and Worthington, have developed ordinances on water usage within their communities and can place restrictions on this usage in time of drought. Cities with populations over 1,000 have a Water Supply Plan with the DNR, which has triggers for water reduction measures.

- Water supply – A number of communities are dependent on or rely on rural water as a backup. Water supply could be an issue in Nobles County.

- Lack of Fire Breaks – The County needs a program that places fire breaks in between the continuous CRP tracts of land or other state wildlife areas during times of severe drought.

- Large water users – Food processors are large water users. The City of Worthington is a large water user, since one of the city’s main industries is food processing. An adequate water supply is critical to the food processing industry in Worthington and Nobles County.
5.4.10 Earthquakes

“An earthquake is a sudden motion or trembling caused by an abrupt release of accumulated strain in the tectonic plates that comprise the earth’s crust.”

All of Nobles County is at equal risk of an earthquake according to the United States Geological Survey (USGS) seismic map of Minnesota. It is important to acknowledge that earthquakes are a possibility in Nobles County and plan accordingly.

The average magnitude for an earthquake in Minnesota is 3.2. The effects of an earthquake with a magnitude of 3.0 – 3.9 range from a few persons feeling the vibration, especially on upper floors of a building to many people noticing the vibration. Standing motor cars may rock slightly.

Table #68  Richter Scale

<table>
<thead>
<tr>
<th>Magnitude</th>
<th>Description</th>
<th>Average earthquake effects</th>
<th>Average global frequency of occurrence (estimated)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0–1.9</td>
<td>Micro</td>
<td>Not felt, or felt rarely. Recorded by seismographs.</td>
<td>Continual/several million per year</td>
</tr>
<tr>
<td>2.0–2.9</td>
<td>Minor</td>
<td>Felt slightly by some people. No damage to buildings.</td>
<td>Over one million per year</td>
</tr>
<tr>
<td>3.0–3.9</td>
<td>Minor</td>
<td>Often felt by people, but very rarely causes damage. Shaking of indoor objects can be noticeable.</td>
<td>Over 100,000 per year</td>
</tr>
<tr>
<td>4.0–4.9</td>
<td>Light</td>
<td>Noticeable shaking of indoor objects and rattling noises. Felt by most people in the affected area. Slightly felt outside. Generally causes none to minimal damage. Moderate to significant damage very unlikely. Some objects may fall off shelves or be knocked over.</td>
<td>10,000 to 15,000 per year</td>
</tr>
<tr>
<td>5.0–5.9</td>
<td>Moderate</td>
<td>Can cause damage of varying severity to poorly constructed buildings. At most, none to slight damage to all other buildings. Felt by everyone.</td>
<td>1,000 to 1,500 per year</td>
</tr>
<tr>
<td>6.0–6.9</td>
<td>Strong</td>
<td>Damage to a moderate number of well-built structures in populated areas. Earthquake-resistant structures survive with slight to moderate damage. Poorly designed structures receive moderate to severe damage. Felt in wider areas; up to hundreds of miles/kilometers from the epicenter. Strong to violent shaking in epi-central area.</td>
<td>100 to 150 per year</td>
</tr>
</tbody>
</table>

### Average earthquake effects

<table>
<thead>
<tr>
<th>Magnitude</th>
<th>Description</th>
<th>Average earthquake effects</th>
<th>Average global frequency of occurrence (estimated)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0–7.9</td>
<td>Major</td>
<td>Causes damage to most buildings, some to partially or completely collapse or receive severe damage. Well-designed structures are likely to receive damage. Felt across great distances with major damage mostly limited to 250 km from epicenter.</td>
<td>10 to 20 per year</td>
</tr>
<tr>
<td>8.0–8.9</td>
<td>Great</td>
<td>Major damage to buildings, structures likely to be destroyed. Will cause moderate to heavy damage to sturdy or earthquake-resistant buildings. Damaging in large areas. Felt in extremely large regions.</td>
<td>One per year</td>
</tr>
<tr>
<td>9.0 and greater</td>
<td>Great</td>
<td>At or near total destruction – severe damage or collapse to all buildings. Heavy damage and shaking extends to distant locations. Permanent changes in ground topography.</td>
<td>One per 10 to 50 years</td>
</tr>
</tbody>
</table>

### Relationship to Other Hazards—Cascading Effects
An earthquake can be the catalyst to a number of other natural and other hazards.

- **Flooding.** An earthquake could result in dam failure and flooding downstream.
- **Transportation Infrastructure.** An earthquake could damage transportation infrastructure and make emergency response difficult.
- **Civil Disturbance.** An earthquake could cause countywide distress. Emergency responders may not be able to handle everything, so as people grow desperate, distress can take over and cause civil unrest.

### Earthquake History in Nobles County
Nobles County has not had any significant earthquake events. “Minnesota has one of the lowest occurrence levels of earthquakes in the United States, but a total of 21 small to moderate earthquakes have been documented since 1860.”

---

### Earthquakes, Minnesota

<table>
<thead>
<tr>
<th>Epicenter (nearest Town)</th>
<th>Date</th>
<th>Magnitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alexandria</td>
<td>4/29/2011</td>
<td>2.5</td>
</tr>
<tr>
<td>Rosholt</td>
<td>10/20/1995</td>
<td>3.7</td>
</tr>
<tr>
<td>Granite Falls</td>
<td>2/9/1994</td>
<td>3.1</td>
</tr>
<tr>
<td>Dumont</td>
<td>6/4/1993</td>
<td>4.1</td>
</tr>
<tr>
<td>Walker</td>
<td>9/27/1982</td>
<td>2.0</td>
</tr>
<tr>
<td>Cottage Grove</td>
<td>4/24/1981</td>
<td>3.6</td>
</tr>
<tr>
<td>Nisswa</td>
<td>7/26/1979</td>
<td>1.0</td>
</tr>
<tr>
<td>Rush City</td>
<td>5/14/1979</td>
<td>0.1</td>
</tr>
<tr>
<td>Evergreen</td>
<td>4/16/1979</td>
<td>3.1</td>
</tr>
<tr>
<td>Milaca</td>
<td>3/5/1979</td>
<td>1.0</td>
</tr>
<tr>
<td>Morris</td>
<td>7/9/1975</td>
<td>4.7</td>
</tr>
<tr>
<td>Pipestone</td>
<td>9/28/1964</td>
<td>3.4</td>
</tr>
<tr>
<td>Alexandria</td>
<td>2/15/1950</td>
<td>3.6</td>
</tr>
<tr>
<td>Detroit Lakes</td>
<td>1/28/1939</td>
<td>3.9</td>
</tr>
<tr>
<td>Bowstring</td>
<td>12/23/1928</td>
<td>3.8</td>
</tr>
<tr>
<td>Staples</td>
<td>9/3/1917</td>
<td>4.3</td>
</tr>
<tr>
<td>Red Lake</td>
<td>2/6/1917</td>
<td>3.8</td>
</tr>
<tr>
<td>New Ulm</td>
<td>02/12/1881</td>
<td>3.0 - 4.0</td>
</tr>
<tr>
<td>St Vincent</td>
<td>12/28/1880</td>
<td>3.6</td>
</tr>
<tr>
<td>New Prague</td>
<td>12/16/1860</td>
<td>4.7</td>
</tr>
<tr>
<td>Long Prairie</td>
<td>Date unknown (1860-61)</td>
<td>5.0</td>
</tr>
</tbody>
</table>

*National Climatic Data Center (NCDC / NOAA) Storm Events database*

**Earthquakes and Climate Change**

There is no evidence that climate change will increase the risk of earthquakes in Minnesota.
Vulnerability
The USGS Seismic Map shows the seismic activity in the United States, the potential for an earthquake of any significant magnitude happening in Nobles County is very minimal. Since it is unlikely for an earthquake to occur in Nobles County, little or no preparation has occurred. There have been multiple earthquakes in Minnesota with a magnitude of 4.0 – 5.0. An earthquake registering a 5.0 on the Richter Scale could occur and cause major damage to poorly constructed buildings.

Plans and Programs
- Nobles County does recognize that there is some risk associated with earthquakes, but there are not extensive plans and programs to address the risk. Past mitigation measures consist of recognizing that an earthquake is possible in Nobles County.
- Well defined response – Emergency responders have a well-defined response protocol outlined in the Emergency Operations Plan. The response protocol is in regards to all hazards. An earthquake would result in a large hazard event with a number of smaller events that include the risk of fire, transportation infrastructure damage, utility damage, civil disturbance, and water supply contamination. The response protocols would generally be applied to an earthquake and the resulting hazard events.

Gaps and Deficiencies
- The risk associated with an Earthquake in Nobles County is perceived as very minimal, so extensive planning does not take place. This lack of preparation could result in an earthquake causing large damages and disorganization in the aftermath of the hazard.
5.4.11 Landslides, Erosion, Substance

Erosion is the wearing away of land, such as the loss of a riverbank, beach, shoreline, or dune material. It is measured as the rate of change in the position or displacement of a riverbank or shoreline over a period of time. Short-term erosion typically results from periodic natural events, such as flooding, hurricanes, storm surges, and windstorms, but may be intensified by human activities. Long-term erosion is a result of multi-year impacts such as repetitive flooding, wave action, sea level rise, sediment loss, subsidence, and climate change. Death and injury are not typically associated with erosion; however, it can destroy buildings and infrastructure (FEMA, 2013).

The movement of a mass of rock, debris, or earth down a slope by the force of gravity is considered a landslide. They occur when the slope or soil stability changes from stable to unstable, which may be caused by earthquakes, storms, volcanic eruptions, erosion, fire, or additional human-induced activities. Slopes greater than 10 degrees are more likely to slide, as are slopes where the height from the top of the slope to its toe is greater than 40 feet. Slopes are also more likely to fail if vegetative cover is low and/or soil water content is high. Potential impacts include environmental disturbance, property and infrastructure damage, and injuries or fatalities (FEMA, 2013).

Relationship to Other Hazards—Cascading Effects
Numerous.

Soil Erosion/Landslides History in Nobles County
Some areas of Nobles County have had issues with soil erosion and landslides, though they were not major. However, there is increasing concern about the hazard in the county, particularly with the higher levels of rain they have been receiving.

Soil Erosion/Landslides and Climate Change
The increased magnitude and frequency of flooding events and storm activity that may result from climate change may in turn increase the risk of soil erosion and landslides. According to University of Washington geologist Dave Montgomery, “If the climate changes in a way that we get a lot more rainfall you would expect to see a lot more landslides” (Phillips, 2014).

In Minnesota, the wettest days are getting wetter. This can contribute to increased erosion in many locations due to flooding and saturation of soils. Reduced ice cover on lakes and shorelines (due to warmer temperatures) could potentially expose shorelines to increased erosion or damage during weather events when they previously may have been covered with ice (National Climate Assessment Development Advisory Committee, 2013).

According to the 2014 National Climate Assessment, “Increased precipitation intensity also increases erosion, damaging ecosystems and increasing delivery of sediment and subsequent loss of reservoir storage capacity” (Pryor, et al., 2014).

Vulnerability
The vulnerability of each jurisdiction to soil erosion and landslides has not changed due to any development in the last 5 years.
Plans and Programs in Place

- Public Information and Warning – Nixle is used by Nobles County to send out notifications to the public during emergencies in a timely manner. This can be area-specific if needed. The Nobles County Sheriff’s Office also has a Facebook page, which is used to send out information to the public. Nobles County has a good relationship with the media and NWS (National Weather Service), both of which assist in reaching the public with critical information.

- Emergency Operations Plan (EOP) – Nobles County has an EOP, which includes all of the county departments as well as city officials and emergency organizations. The plan is organized to assist with the responsibilities and assignments during any type of emergency.

- SWCD 2017 Operational Plan – the 2017 plan includes an operational objective for Protection of Natural Resources, which has a specific focus on erosion control education and mitigation measures. Example actions include:
  - “Control erosion by promoting upland practices where they apply and assist in their implementation through state and federal cost share programs and providing landowners with technical assistance.”
  - “Serve as a cooperative technical agency to City and County Townships in conducting plat reviews for all proposed developments with emphasis on controlling runoff, erosion and protecting wetlands.”
  - “Administer and implement elements of the County Soil Erosion ordinance for suburban development and rural activities.”

Program Gaps and Deficiencies

None identified.
5.5 Other Hazards

Hazards were ranked by the planning team as stated in Section 5.1.3 Calculated Priority Risk Index and are listed in this section from high to low priority (see Table #70).

Table #70

<table>
<thead>
<tr>
<th>Type</th>
<th>Risk Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Health Emergencies</td>
<td>High</td>
</tr>
<tr>
<td>Transportation Infrastructure</td>
<td>Low</td>
</tr>
<tr>
<td>Hazardous Materials</td>
<td>High</td>
</tr>
<tr>
<td>Utility Failure</td>
<td>High</td>
</tr>
<tr>
<td>Water Supply Contamination</td>
<td>High</td>
</tr>
<tr>
<td>Civil Disturbance / Terrorism</td>
<td>Low</td>
</tr>
</tbody>
</table>
5.5.1 Hazardous Materials

Hazardous materials are found everywhere, from farm to home. A hazardous material is any item which has the potential to cause harm to humans, animals, or the environment, by itself or through interaction with other factors. Spilled material can be costly to clean up and may render the area of the spill unusable for an extended period of time. Water supplies may become contaminated by the introduction of point and non-point source pollutants into public ground water and/or surface water supplies.

In Nobles County there are a number of manufacturers who use and or produce a number of hazardous chemicals. US Hwy 71, MN 59, MN 60, and MN 91 run through the county and these major transportation corridors have high volumes of semi-truck traffic. The loads coming to the county and through the county varies, but some of these loads could pose a serious chemical hazard if a crash would take place. Oil tankers are one example.

Many chemicals are also used daily in agriculture, putting farms and rural communities at risk. Anhydrous ammonia is one dangerous chemical used in agriculture that if not handled properly can be very dangerous. Methamphetamine (commonly referred to as “meth”) manufacturers have targeted isolated rural homes and abandoned farm sites for illegal drug labs. However, these individuals also have been known to set up labs in their car or basement in town, so populations in town are equally at risk of a meth lab explosion and other hazards.

Federal law defines certain hazardous chemicals, and requirements for emergency planning for facilities at which hazardous substances are present. According to the Minnesota AHMP, approximately 6,000 facilities across the state report their storage of hazardous chemicals to the Minnesota Department of Public Safety’s Emergency Planning and Community Right-To-Know Act (EPCRA) Program, US Environmental Protection Agency (EPA), and their local fire department. Within Nobles County there are eleven facilities that report hazardous material storage to state and local authorities.95 These eleven facilities are known as 302 facilities after EPCRA Section 302(c) that require state and local authorities to develop chemical emergency preparedness and response capabilities through better coordination and planning with local businesses.

Chemicals

Land use activities and farming practices can have significant impacts on vulnerable aquifers. Aquifers in the region are often shallow and have a high potential of contamination from nitrate leaching. Deeper aquifers may not be suitable for water supplies due to naturally occurring contaminants, such as sulfur, or because of slow well recharge. Nitrates have been identified as a specific problem in the region.

Pipelines

The State Fire Marshall’s Pipeline Safety Team (SFMPST) oversees pipeline operations in Minnesota. The National Pipeline Mapping System identifies no Hazardous Liquid Pipelines traversing Nobles County. There is one Gas Transmission Pipelines in Nobles County coming in from the east and connecting in the City of Worthington. This pipelines is blue on the map below. Pipelines are pressurized and monitored, so pipelines can be quickly shut off in case of an accident. Pipelines are a safer way to transport hazardous

liquids than by trucks or rail. “The evidence is clear: transporting oil and natural gas by pipeline is safe. Furthermore, pipeline transportation is safer than transportation by road, rail, or barge, as measured by incidents, injuries, and fatalities—even though more road and rail incidents go unreported.”

Figure #36  Hazardous Liquid Pipelines – Nobles County


Decommissioning of Wind Towers

There are approximately 315 wind towers in Nobles County and more being built. There is a concern of wind towers being abandoned and property owners left with removal and cleanup. There are removal and cleanup guarantees in the majority of the contracts with the wind farms, but if the wind farm files bankruptcy or closes all together, there may not be funding for removal and cleanup. There would be a substantial cost associated with decommissioning wind towers.

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Meth

Meth is a powerful stimulant drug that is similar to a family of drugs called amphetamines. During the production process there are a number of dangerous chemicals that are mixed that can cause dangerous fires and explosions. According to the Rand Drug Policy Research Center, amphetamines are the most widely used illicit drug worldwide, after marijuana. Information in regional data systems and feedback from law-enforcement agencies and local Medical Centers indicate that meth is still a problem facing the populations they serve.

Meth labs are a concern in the region and an incident at a lab could result in a major hazard material incident. A number of hazardous chemicals are used in the production process. An explosion and fire could result in a number of chemicals being emitted into the air and the ground water. There is also chemical byproduct from cooking meth that is often discarded. This chemical byproduct could infiltrate the ground water and cause ground water contamination.

Source: https://eerscmap.usgs.gov/windfarm/

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As traditional drugs, like cocaine, become more scarce and expensive due to the War on Drugs, it is likely demand for synthetic drugs, like meth, will increase. This increase in demand will entice more people to supply the drug. Meth can be produced locally and is relatively inexpensive to manufacture, so as the number of meth labs increase due to the increase in demand, the probability of a hazardous event involving a meth lab increases.

**Relationship to Other Hazards—Cascading Effects**

- **Fire.** Hazardous materials incidents may cause or occur in conjunction with a fire. This could result in the fire spreading at a fast rate and can make containing and fighting the fire more difficult. Specialized equipment may be required to combat the fire caused or in conjunction with a hazard material.

- **Water Supply Contamination.** An incident involving hazardous materials on the roads, rail, or in the air can lead to a water contamination issue. Wellhead Protection Plans discuss the infiltration of chemicals leaking into ground water aquifers. The issue of infiltration could be multiplied by a load of hazardous materials being transported on any of the main highways being in a crash and causing contamination to the ground water.

- **Terrorist activity.** Most hazardous materials in transit are marked, but there is an unknown volume of government materials being shipped that are not marked due to security reasons. Since US Interstate 90 passes through Nobles County, there is an increased risk of a semi-truck being stolen and used in a terrorist activity.

- **Public Health Emergency.** Hazardous materials being processed in or shipped through Nobles County could be involved in a crash. The exposure of radiological substances by unprotected humans might result in the negative effects caused by such an exposure. It can be life threatening depending upon how much exposure and the length of the exposure time.

**Hazardous Materials History in Nobles County**

Hazardous material incidents can occur in different locations:

- Fixed site facilities
- Highway and rail transportation
- Air transportation
- Pipeline transportation

Since 2000, there have been 13 hazardous material incidents in Nobles County.\(^98\) Hazardous material incidents also include the discovery of underground storage tanks and other minor incidents. Removal of underground storage tanks is required procedure by EPA, but in the past barrels and other materials were buried and discarded. It is unknown how many hazardous materials are buried in Nobles County.

---

<table>
<thead>
<tr>
<th>Date</th>
<th>Nearest City</th>
<th>Type</th>
<th>Cause</th>
<th>Description / Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/4/2017</td>
<td>Adrian</td>
<td>Mobile</td>
<td>Dumping</td>
<td>An individual has dumped 30 gallons of motor oil onto the lawn when they changed the oil on a semi-truck in the driveway. The oil slick is 30ft x 50 ft.</td>
</tr>
<tr>
<td>6/30/2016</td>
<td>Worthington</td>
<td>Railroad</td>
<td>Unknown</td>
<td>A release of diesel from a locomotive onto the ballast and ground for unknown reasons. No waterways affected. It may have been an overfilled fuel tank but investigation is still ongoing.</td>
</tr>
<tr>
<td>1/11/2010</td>
<td>Worthington</td>
<td>Fixed</td>
<td>Equipment Failure</td>
<td>A glycol heat exchanger had a pressure relief valve malfunction causing a spill of materials.</td>
</tr>
<tr>
<td>4/2/2010</td>
<td>Cty Hwy 35 &amp; 13 Nobles County</td>
<td>Storage Tank</td>
<td>Unknown</td>
<td>A spill of diesel fuel from a storage tank due to unknown causes. Caller had limited information.</td>
</tr>
<tr>
<td>6/2/2009</td>
<td>Worthington</td>
<td>Fixed</td>
<td>Unknown</td>
<td>A release of anhydrous ammonia at a facility due to unknown causes.</td>
</tr>
<tr>
<td>11/21/2009</td>
<td>Worthington</td>
<td>Storage Tank</td>
<td>Operator Error</td>
<td>Wastewater was discharged from a storage tank when an employee opened the valve at the bottom of the tank. The wastewater entered a storm water drain system.</td>
</tr>
<tr>
<td>12/8/2009</td>
<td>Worthington</td>
<td>Fixed</td>
<td>Operator Error</td>
<td>An ammonia release during the installation of safety relief valves. Caller states that in the process of ensuring the system was flat they opened a 3 way valve and that resulted in the release.</td>
</tr>
<tr>
<td>7/17/2008</td>
<td>Bigelow</td>
<td>Storage Tank</td>
<td>Equipment Failure</td>
<td>Anhydrous ammonia vapors released from a bulk storage tank into the air due to a defective seal in a manway access panel on a storage tank.</td>
</tr>
<tr>
<td>12/19/2007</td>
<td>Brewster</td>
<td>Pipeline</td>
<td>Equipment Failure</td>
<td>A relief valve on an 8 inch steel distribution line has failed causing a natural gas release to the atmosphere.</td>
</tr>
<tr>
<td>11/12/2004</td>
<td>Worthington</td>
<td>Railroad non-Release</td>
<td>Unknown</td>
<td>Train collided with a vehicle at a grade crossing due to unknown causes.</td>
</tr>
<tr>
<td>5/28/2002</td>
<td>Worthington</td>
<td>Fixed</td>
<td>Unknown</td>
<td>Material believed to be anti-freeze (greenish in color) in a large (20ft x 20ft) puddle.</td>
</tr>
<tr>
<td>7/2/2001</td>
<td>Worthington</td>
<td>Mobile</td>
<td>Other</td>
<td>Material was released from a 55 gallon drum on a trailer due to drum fatigue.</td>
</tr>
</tbody>
</table>

Vulnerability

With I-90, US Hwy 59, MN 60, MN 91, and MN 264 passing through the county and one Class I railroad (the Union Pacific) and one Class I railroad (MSWy/BRRRA) there is a high probability that there will be a crash involving hazardous materials. Refer to Figure #42 for the Minnesota Railroad Map in the Transportation Infrastructure subsection. This volume of hazard materials traversing Nobles County poses a serious risk of a hazardous material incident occurring. Precautionary measures are in place to prevent an incident from occurring, but a crash on I-90, US Hwy 59, MN 60, MN 91, or MN 264 involving a tanker of hazardous materials could result in a major hazardous material incident. A major incident could have large cascading effects since almost all water for public consumption in Southwest Minnesota is sourced from underground aquifers, rather than surface waters.

Plans and Programs

- State agency cooperation – Nobles County works directly with the appropriate state agencies to address needs for responding to and mitigating the impacts of a hazardous materials event.
- Emergency Operations Plan – The EOP discusses Radiological/Hazardous Materials and outlines procedures for dealing with hazardous material accidents, spills, and releases. EOP identifies the 302/312 facilities within Nobles County that maintain a supply of hazardous chemicals.
- Training of emergency personnel – All emergency personnel are trained to at least the minimum Hazardous Materials Awareness level and all first responder groups conduct the required Occupational Health and Safety Administration training on a yearly basis.
- Nobles County Solid Waste Plan – In 2014, Nobles County updated its 10 year Solid Waste Plan. The plan identifies the policies and programs regarding Hazardous Waste Management for the county. The plan also identifies the large waste generators within the county.
- Hazardous chemicals collection – Nobles County’s Emergency Manager works with the Department of Public Safety, Emergency Response Commission to assist in the statewide collection of hazardous chemicals existing at facilities throughout Nobles County so that local emergency officials can prepare for incidents.
- Household Hazardous Waste Facility – Nobles County Household Hazardous Waste Facility takes any hazardous waste that comes from a household such as paint, cleaners, fluorescent lights, etc.
- Hazardous Materials Response Team – Nobles County does not have a HAZMAT Team. Nobles County coordinates with the HAZMAT Team out of Marshall. Sioux Falls could potentially be added as a HAZMAT Team, but state lines can make coordination more difficult.
- Monitoring program – A number of store owners currently report to the sheriff’s office when products are sold that are used in making meth.
- Regional Deacon Trailer – Mass decontamination can be performed using this asset. This asset is portable and available to the HSEM Region Five.
- Sanford Worthington Medical Center has a portable decontamination shower. The facility has access to other decontamination assets, personal protective equipment (PPE), and other resources through the System and Regional partners which can be deployed with a phone call (through SW - HPP).
- MnDOT – MnDOT has several departments to address hazardous materials, freight, emergency management and disaster preparedness. The District State Aid Engineer is a good contact for access to those resources.
• County assistance – Although the potential risk of a radiological emergency to the county is small, Nobles County could potentially be asked to house displaced residents from eastern Minnesota around the Prairie Island Nuclear Power Plant.

• Water plan – Nobles County’s water plan recognizes that the county’s ground water is impacted by both agricultural and residential fertilizer and pesticide applications.

• Regional and State assistance – Plans are in place specifying hazardous material cleanup and protocol for who should be contacted for regional and state assistance.

Gaps and Deficiencies

• Specialized equipment – Nobles County fire departments are in need of specialized equipment to deal with hazardous materials. This equipment is often a single use item and is a high cost item. Maintaining this equipment is expensive, so this equipment is often not purchased, available, or dies on the shelf.

• Public education regarding drug ingredients – Public outreach to business owners needs to occur more frequently regarding substances used in making meth and other controlled substances.

• Hazard material / Meth lab cleanup - The sheriff’s office and local fire departments are trained to handle a number of hazardous materials, but for meth labs and other hazard materials a HAZMAT certified cleanup team is required. The Nobles County sheriff’s office does not have a HAZMAT Team. Meth lab clean up can be very costly. If a fire fighter goes into a fire and sees that it is a meth lab, the equipment the fire fighter is wearing is no longer good. The chemicals in the fire contaminate the suit, so there are other costs that can be associated with a meth lab fire and clean up.

• Hazardous material training for first responders – First responders are trained to recognize hazardous materials and establish a perimeter. Hazardous material training only happens every three years for emergency responders. A refresher course would be helpful for emergency responders.

• 302 Facilities portable database – It may be time consuming to look up what hazardous materials a 302 facility is storing. A more usable database could assist with emergency response and increasing the safety of emergency responders.

• Proper hazardous waste disposal – Although the Nobles County Household Hazardous Waste Facility is open, there is still a need to educate the public and businesses on how to dispose of their waste properly.

• Drug Drop Box outreach and marketing – There is a prescription and over the counter medication disposal drop box in Worthington at the Prairie Justice Center. The Nobles County sheriff’s office in conjunction with the Worthington police department helped to setup the drug drop box. Additional outreach and marketing to the public is needed to increase use of the drug drop box.
5.5.2 Public Health Emergencies

As technology developed people started to demand sewer systems, running water, and waste disposal. This helped to prevent the spread of disease and helped to maintain a healthier public. As building technology also developed people started to demand safe and well-built buildings. This made it safer for people to live and work. Local government recognized these demands and have tried to create uniformity through regulation. Through this government regulation the public health service evolved.

Public health services today face new challenges to counter ever-evolving disease. The Minnesota Department of Health (MDH) works with the Department of Public Safety (DPS) and other agencies to prepare for large-scale emergencies of many types. Infectious diseases can present wide threats to many people, or very narrow threats to highly susceptible populations.

- An “epidemic” is a disease that occurs suddenly in numbers clearly in excess of normally expected rates.
- A “pandemic” is an epidemic that spreads across a large region.

“Infectious diseases have the potential to affect any form of life.”

Some infectious diseases that were thought to have been eradicated have re-emerged and new strains present threats to the populations and require monitoring. Different strains of the influenza virus emerge seasonally and require modifications to antibiotics and vaccinations.

Infectious diseases in livestock also pose a significant risk. Food supplies could be affected and the livelihood of the owners of livestock could be impacted. Certain infectious diseases are considered more likely to present a public health emergency hazard in rural Minnesota.

Many infectious diseases are preventable and controllable. Measles, Rubella, Polio, and Pertussis are all vaccine preventable diseases. These diseases are no longer common, but a single case can cause a public health emergency. Doctors are often not looking for these diseases, so they may be overlooked which can cause the disease to spread. Also, more parents are electing not to vaccinate which puts the entire population at greater risk.

Arboviral Encephalitis commonly known as West Nile Virus is a mosquito transmitted disease that can cause encephalitis in people and horses. This virus was usually found in mosquitoes and birds in Africa and Europe. However, West Nile encephalitis was reported in New York City in 1999. In 2013, there were three deaths in Minnesota associated with West Nile Virus and in Nobles County there was one donor who was reported as being a carrier of West Nile Virus. There were no reported cases in Nobles County in 2014.

In 2009, the Centers for Disease Control and Prevention (CDC) started taking larger steps to combat H1N1 (sometimes called “swine flu”). H1N1 was first detected in people in the United States in April 2009. This

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virus has the potential to spread fast and can cause severe illness in people. The virus can spread person to person, virtually the same way the seasonal influenza virus spreads. 103

Smallpox has not been an issue in the United States for more than 50 years. Due to the threat of terrorism, this disease has been thrust to the forefront of public concern and fear. Smallpox is a serious, contagious, and sometimes fatal infectious disease. There is no specific treatment for smallpox. The only prevention for small pox is vaccination.

“Ebola is a rare and deadly disease caused by infection with a strain of Ebola virus. The 2014 Ebola epidemic is the largest in history, affecting multiple countries in West Africa. The risk of an Ebola outbreak affecting multiple people in the U.S. is very low.”104

Relationship to Other Hazards—Cascading Effects

- Emergency Response. A public health emergency will affect the ability to respond and recover from any natural or man-made hazard. If a pandemic event were to occur, deaths could be in the many hundreds of thousands across the nation.
- Civil Disturbance. If the health of the general public is perceived to be threatened on a large scale, riots or states of lawlessness are a possibility.

Public Health Emergencies History in Nobles County

Many infectious diseases are preventable and controllable. Standard procedures involve collection of accurate assessment data, outbreak detection and investigation, and development of appropriate control strategies based on specific epidemiological data. These activities require close collaboration between health care providers, clinical laboratories, state and local health departments, and federal agencies.

There have been no major public health emergencies in Nobles County in recent years. Influenza is a common seasonal occurrence in Nobles County, but no major outbreak has occurred. Seasonal influenza is planned for every year. The annual seasonal influenza usually peaks in February.

There are strands of influenza that can be more devastating. Influenza Type A virus has caused three pandemics in the past century worldwide with significant loss of life. Pandemics are caused by the unstable nature of Influenza Type A, and new subtypes that appear through genetic drifts or shifting.

### Table #72

Cases of Selected Communicable Diseases Reported to the Minnesota Department of Health by District of Residence, 2015

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaplasmosis</td>
<td>145</td>
<td>104</td>
<td>96</td>
<td>186</td>
<td>49</td>
<td>5</td>
<td>23</td>
<td>5</td>
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<tr>
<td>Arboviral disease</td>
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<tr>
<td>La Crosse</td>
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### District (population per U.S. Census 2014 estimates)

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* Duration ≤1 year
** Duration >1 year
*** Includes unstaged neurosyphilis, latent syphilis of unknown duration, and latent syphilis with clinical manifestations

### County Distribution within Districts

**Metropolitan** - Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, Washington

**Northwestern** - Beltrami, Clearwater, Hubbard, Kittson, Lake of the Woods, Marshall, Pennington, Polk, Red Lake, Roseau

**Northeastern** - Aitkin, Carlton, Cook, Itasca, Koochiching, Lake, St. Louis

**Central** - Benton, Cass, Chisago, Crow Wing, Isanti, Kanabec, Mille Lacs, Morrison, Pine, Sherburne, Stearns, Todd, Wadena, Wright

**West Central** - Becker, Clay, Douglas, Grant, Mahnomen, Norman, Otter Tail, Pope, Stevens, Traverse, Wilkin

**South Central** - Blue Earth, Brown, Faribault, Le Sueur, McLeod, Martin, Meeker, Nicollet, Sibley, Waseca, Watonwan

**Southeastern** - Dodge, Fillmore, Freeborn, Goodhue, Houston, Mower, Olmsted, Rice, Steele, Wabasha, Winona

**Southwestern** - Big Stone, Chippewa, Cottonwood, Jackson, Kandiyohi, Lac Qui Parle, Lincoln, Lyon, Murray, Nobles, Pipestone, Redwood, Renville, Rock, Swift, Yellow Medicine

Vulnerability
People contract seasonal influenza every year and other diseases occur regularly as well.

If an outbreak occurs that is contagious it is critical to quarantine the population affected by the disease. This is often difficult since an outbreak may go undetected for a period of time resulting in exposure to other individuals. Certain mutations of a disease are also becoming more resistant to antibiotics, this is particularly true regarding Influenza Type A and multi-drug resistant Tuberculosis. Individuals with a compromised immune system, such as very young children or elderly persons are at a higher risk for acquiring diseases.

Plans and Programs

- **Emergency Operations Plan** – County Emergency Management is working closely with Public Health and local healthcare facilities to mitigate and effectively respond to potential Public Health Emergencies. The Nobles County Emergency Operations Plan outlines procedures for county and local governments for contacting appropriate state and federal agencies and provides guidelines and strategies for dealing with infectious diseases. An Incident Command Structure between local public health and the Emergency Manager is also outlined in the Emergency Operations Plan.

- **Nobles County Community Services (NCCS)** – NCCS works with the Minnesota Department of Health (MDH) to address infectious diseases that are listed in MN Rule #4605.7040 (such as Encephalitis, Hepatitis, Influenza, Lyme’s Disease, Tuberculosis, and Syphilis). If any of these or other listed diseases appear in Nobles County, NCCS works with MDH and local medical providers to limit the spread of the disease. NCCS routinely receives information from MDH via the Health Alert Network (HAN) for outbreaks occurring in Minnesota or outbreaks that could impact the state and issues appropriate information based on the most current alerts. NCCS provides information to public and private employers, schools and hospitals about potential infectious disease threats and prevention measures.

- **Area Strategic Stockpile Plan** – NCCS has a Strategic National Stockpile (SNS) plan in place. NCCS works with the Minnesota Department of Health and other regional and local partners for the mass distribution of needed medicines and supplies for a public health emergency. NCCS will continue to coordinate with regional partners for mass distribution of needed medical supplies for a public health emergency.

- **Response capabilities (facilities)** – NCCS has designated buildings for the Strategic National Stockpile and Medical Countermeasure Dispensing Sites.

- **Medical Countermeasure Dispensing Plan** – NCCS has a Medical Countermeasure Dispensing Plan in place. The plan covers mass dispensing of medicines and supplies/Medical Countermeasure Dispensing (MDS). In the event of a naturally occurring outbreak, bioterrorism incident, or other event requiring vaccination, dispensing of medication may be needed within a short period of time to prevent morbidity and/or mortality. NCCS has four designated medical countermeasure dispensing sites (MDS) which could be utilized as emergency or temporary public health clinics to provide immunizations or medications to a large number of residents. NCCS follows guidance from the Minnesota Department of Health (MDH) and works with other local, state, federal, and non-governmental agencies, as necessary.

- **Isolation/Quarantine (I/Q) Plan** – NCCS has developed an Isolation & Quarantine plan to prevent the spread of diseases. The I/Q will be event specific. The plan will address measures to protect the public and prevent spread of disease. Isolation measures are directed towards people who are identified as...
infectious, who are usually within a health care facility or off site care. Quarantine is a tool used to hold & limit contact between persons who have been exposed to a disease in their own home. Both measures are effective tools in preventing spread of disease. NCCS may or may not monitor individuals once they are place in I/Q. Sometimes the required monitoring is performed by MDH

- Media outreach – County Emergency Management works with NCCS and local media throughout the county in the event of an infectious disease outbreak.
- Vaccination program – NCCS conducts outreach programs to educate residents on the benefits of routine vaccinations. Part of this outreach is to assure that children and adults have access to recommended vaccines. Targeted groups include uninsured children or adults, children on MN Health Care Programs, and under-insured individuals. People in these groups can receive immunizations through the agency. Flu vaccinations are also targeted to some adults within the county. Immunizations are designed to assist families of need in protecting their children and themselves from infectious diseases. NCCS also participates in the South Central/Southwest Minnesota Immunization Information Connection (MIIC), which is a confidential, computerized network of shared immunizations records. It provides clinics, schools, day care providers, and parents/adults with accurate, complete, and up-to-date immunization records. This system can assist in alerting participating families if there is any disease outbreak that may put them at risk.
- Environmental health regulations and policies – NCCS works in cooperation with MDH in following the established environmental health regulations, available policy guides, and appropriate procedures to address infectious disease and food borne illness. The MN Department of Health is currently responsible for inspection and suspected violations for Food, Pools, and Lodging establishments in Nobles County.
- Outbreaks – Sanford Worthington Medical Center has written plans for investigation of suspected outbreaks, significant epidemiologic occurrences or sentinel events, pandemic influenza, flu center, and reporting of communicable diseases.
- Southwest Healthcare Preparedness Coalition – The coalition represents 23 hospitals, 43 primary care clinics, 50 Nursing Homes, 103 EMS groups and two tribal governments in our 16-county region in southwest Minnesota. Additional coalition members include: State and local representatives from Public Health, Homeland Security and Emergency Management, the Minnesota Department of Health, and the Emergency Medical Services Regulatory Board. The coalition is working together toward enhancing our response capability to local, regional, statewide, and national emergencies.  
- MDH FluSafe Program – Sanford Worthington Medical Center has performed staff vaccination and tracked the percentage of staff vaccinated each year through participation in the MDH FluSafe Program. Sanford has achieved vaccination staff rates of greater than 90% for several years.
- Public Health education – NCCS, is the agency responsible for the delivery of public health and social services in Nobles County. Various campaigns to educate the public on the importance of active living, healthy eating, vaccinations, tobacco cessation, and other public health issues are conducted throughout each year.
  - Utilizing existing agencies and resources such as Senior LinkAge Line®, 411, Disability Linkage Line, Text 4 Life, etc.

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Gaps and Deficiencies

- Strategic National Stockpile is vulnerable to power outages – Nobles County Community Services (NCCS) and the Minnesota Department of Health maintains a Strategic National Stockpile (SNS) of needed medicines and supplies for Public Health Emergencies. A power outage could result in medicines and supplies not being kept cold and spoiling.

- Response capabilities (facilities) – NCCS works with Emergency Management, various units of government, and health care facilities to clarify and determine the use of buildings needed to respond to a public health emergencies or other hazards.

- Aging population – An aging population puts the county at greater risk of Public Health Emergencies. The population cohort 85 plus has increased by 22.4 percent from 2000 to 2010. As the population ages, these individuals are increasingly dependent on the younger population cohorts to help them stay healthy. This puts a greater need for the rest of the population to stay healthy as well. When healthcare staff becomes ill that also puts a strain on the care capacity of the community and may be more damaging to assisted living facilities or other elderly care facilities.

- Cultural Diversity and Vaccination disparities: Immunizations are given across the lifespan. Children receive their first vaccination shortly after birth and individuals continue to need vaccinations into old age. Adults and children have different recommended vaccination schedules. Vaccination against childhood diseases is one of the greatest public health success stories since the mid-20th century. In the United States immunization rates are at all-time high levels, and vaccine-preventable diseases (with few exceptions) are at all-time lows. At the beginning of the 20th century, infectious diseases were widely prevalent in the United States and took an enormous emotional, social, and economic toll on the population. However, since the mid-1900s, with the development of vaccines such as diphtheria, pertussis, tetanus, measles, rubella, mumps, polio, and meningitis - to name a few - there has been a dramatic decline in many infectious diseases in the United States, Minnesota and specifically in Nobles County; despite having an increasingly growing diverse population. While Minnesota’s high overall rates of immunization place it at or near the top in most state rankings, disparities in immunization rates among racial/ethnic groups continue to be a pressing issue. Many factors influence immunization rates i.e. poverty, which is closely intertwined with insurance status, access to regular source of care, and race which contributes to disparities across racial/ethnic groups. NCCS has made significant progress in raising overall on-time immunization for children and adults, and in decreasing disparities in immunization rates across populations in Nobles County. In response to the Legislature’s charge to reduce immunization disparities among children and adults by 50% by 2010. NCCS has adopted the following recommendations in order to continue making progress toward the twin goals of achieving high overall immunization rates and eliminating disparities;
  - NCCS is working through the Federal and Minnesota vaccines for children programs to expand eligibility for free vaccines for uninsured and underinsured, reducing barriers to on-time immunization due to poverty.
  - Using school immunization laws, such as Minnesota’s law requiring all students to receive certain immunizations by the time they begin kindergarten, have dramatically increased vaccination rates and lower-rates of vaccine-preventable diseases. Daycare providers in the County are monitored by MDH to ensure they are compliant and ensuring that all children are up-to-date on required

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immunization by the time they begin school. The Independent School District 518 works closely with Local Public Health to ensure that all students are up-date with necessary vaccinations.

- Translating information about immunization requirements, concerns, and payment/coverage into multiple languages, and increasing outreach to populations at high risk for under-immunization.
- Hiring Community Health Workers (CHWs) on the NCCS staff to work directly with new immigrant populations (Hispanic and those of African descents) and connect them to resources alongside explaining the value of vaccinations for both adults and young children. The CHWs help to close the language and cultural barriers and also work to educate at-risk populations about immunizations and offer information about where and when to receive required immunizations.
- Collaborate with health care providers/clinics who work with low-income people and Populations of Color to enhance and coordinate activities to raise immunization rates. Opportunities for increased collaboration include integration of immunization status into Child and Teen Check-ups status through the WIC program and the family home visiting program. Public Health Nurses check with parents on their children’s immunization status, if this is not up-to-date or the parents lack insurance- they are referred to LPH to complete these immunizations.

- Lack of Alzheimer’s treatment – There is a lack of treatment facilities for Alzheimer’s in southwest Minnesota.
- Lack of mental health treatment – There is a lack of treatment facilities for mental health issues in southwest Minnesota. Mental health issues go undiagnosed and too many people are not getting treatment. Jail space is being used to house people with mental health issues.
5.5.3 Transportation Infrastructure

Minnesotans move goods and people on a variety of transportation networks. In the wake of the Interstate 35W bridge collapse, the 2008 update of the Minnesota AHMP focused attention on the status of bridges across Minnesota. Infrastructure is the skeleton and nervous system of a community and includes roads and bridges, rail, air and transit.

Roads, bridges, rails, landing strips, and other transportation infrastructure wear out. Transportation infrastructure is characterized by long-term, capital-intensive investments that are interdependent and vulnerable to both natural and manmade hazards. Transportation infrastructure continually needs to be inspected and upgraded. Infrastructure is a critical need for the operation and competitiveness of a city, county, or region and numerous locations in Nobles County have the potential to be affected by transportation infrastructure hazards.

Nobles County’s transportation network is comprised of highways, railways, airports and trails. The system is designed to serve local residents, agriculture and industry, as well as travelers and regional commerce. The Minnesota Department of Transportation (MnDOT) works with the county engineer and municipal authorities to construct, maintain, and regulate a comprehensive system of roads, rail and airports for public and private use.

**Roads**

There are hundreds of miles of roadway to be monitored and maintained in Nobles County. There are city highways, county roads, township roads, and city streets traversing Nobles County that all require different monitoring and upkeep. It is critical to keep the system in a good state of repair, so people and goods can travel safely.

Nobles County has roads and bridges in state, county, and local jurisdictions with each entity having primary responsibility for construction and maintenance over their segments. The road network is designated by jurisdiction:

- **Trunk Highway System.** Statewide routes originally established under a 1920 constitutional amendment. The routes are the responsibility of MnDOT. Nobles County is located in MnDOT’s District 7, which has its primary office in Mankato. U.S. Interstate 90, US Highway 59, and State Highways 60 and 91 are Trunk Highways (TH routes).
- **County State Aid Highways (CSAH).** Roads or streets established and designated under county jurisdiction in accordance with Minnesota Statutes Chapter 162. The State provides funding assistance to maintain the CSAH system.
- **County Roads (CR).** Roads established and maintained by the county under the sole authority of the county board.
- **Township Roads.** Roads established and maintained by township boards or reverted back to township jurisdiction by the county board.
- **City Streets.** Any street/road in a municipality not otherwise designated.
One issue that affects road conditions is winter weather. Ice and snow can build up on the road and can cause hazardous driving conditions. Due to the prevailing wind patterns in the area, east-west roads are more susceptible to ice and snow affecting the road surface. Road crews are responsible for maintaining the roadway, clearing snow, and salting for ice. It is also the responsibility of the driver to take the road conditions into consideration and drive appropriately. Winter weather is just one variable that impacts road conditions. There are a number of other variables that impact road conditions.

Traffic crashes are the primary hazard to people and property related to transportation infrastructure. The potential severity of transportation crashes is substantial according to the planning team. The Minnesota Department of Transportation (MnDOT) and Minnesota Department of Public Safety (DPS) developed a Comprehensive Highway Safety Plan in 2004. The plan was intended to examine the underlying causes of traffic deaths and serious injuries, determine strategies to mitigate those causes, and implement the most promising strategies in the “Toward Zero Deaths” program. The Toward Zero Death program continues today.

Minnesota Comprehensive Strategic Highway Safety Plan (CHSP) study for Area Transportation Partnership (ATP) 7 found the most frequent crash types and contributing factors included:107

- Impaired Driving
- Safety Belt Usage
- Young Drivers
- Aggressive Drivers
- Lane Departures
- Intersections
- Driver Safety Awareness
- Data Information Systems

These variables along with transportation infrastructure conditions and design can impact the severity of crash or incident.

**Bridges**

There are approximately 406 bridges on federal, state, county, municipal, and township roadways within Nobles County. MnDOT lists 302 bridges in Nobles County on their inventory of bridges over 20 feet. Of the 406 bridges, 73 bridges intersect with the mapped floodplain. These bridges are inspected and a grade of the bridge is given. This helps to ensure the safety of crossing using a bridge. There are ten bridges in Nobles County that have been identified as structurally deficient, January 1, 2016. In Minnesota, 9.1 percent of bridges are structurally deficient in 2012.

![Road & Bridge Map – Nobles County](image)

Bridges are classified as “structurally deficient” if they have a general (poor) condition rating for the deck, superstructure, substructure, or culvert or if the road approaches regularly overtop due to flooding. The

fact that a bridge is structurally deficient does not imply that it is unsafe. The condition can be a variable that is assumed to be safe, as in the 35W bridge collapse. If a bridge has been identified as unsafe during a physical inspection, the structure will be closed.

**Railroads**

There are two railroads serving Nobles County, the Union Pacific (UP) Railroad and the Nobles/Rock Short Line. The UP is a Class I railroad and the Nobles/Rock Short Line is a Class III railroad. Class I railroads have operating revenues of 433.2 million or more. Class III railroads are often called a “short line railroad.” Class III railroads have operating revenues of $36.6 million or less. These railroads are a critical element in Nobles County’s transportation system.

The UP enters Nobles County from the south east and heads northeast and runs from the Twin Cities through Worthington and continues through Sioux City, IA, and Omaha, NE. The UP has 724 miles of track in Minnesota and agricultural products account for the majority of rail commodities shipped in the region, including grain, farm and chemical products. UP also hauls significant amounts of coal into the state and a variety of hazmat shipments including petroleum products like ethanol and other fuels, corrosives/ acids, compressed gases, etc.

The Nobles/Rock Short Line, formerly the Rock Railroad, was established in 1993, and is owned by the Buffalo Ridge Rail Authority (BRRA). The Nobles/Rock Short Line runs 41.5 miles from Org, MN to Manley, SD. The main office for the railroad is located in Luverne, MN. It enters Nobles County from the west (BNSF at Manley, MN) and heads east and connects to the UP line south of Worthington in Org, MN. The Nobles/Rock Short Line ships commodities such as lumber, scrap metals, farm products, and chemicals in addition to ethanol and isobutanol.

Railroad crossings pose a serious risk for motor vehicles passing over the tracks. Railroad crossings are marked and a number have crossing arms, but according to MnDOT, the chance of death or serious injury from a vehicle and train crash is 11 times greater than other traffic collisions. Since there is an increased risk of crossing, additional measures should be taken to ensure the safety of the crossing.

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Figure #40  Union Pacific Freight Overview

Figure #41  Union Pacific Freight Overview

TOP FIVE COMMODITIES SHIPPED
2016 BY VOLUME

1. GRAIN
2. MEALS AND OILS
3. NON-METALLIC MINERALS
4. COAL AND PETROLEUM COKE
5. CORN REFINING

TOP FIVE COMMODITIES RECEIVED
2016 BY VOLUME

1. COAL
2. FERTILIZER
3. ASSEMBLED AUTOS
4. NON-METALLIC MINERALS
5. INDUSTRIAL CHEMICALS
Figure #42
Railroads – Minnesota

MINNESOTA FREIGHT RAILROAD MAP
Office of Freight and Commercial Vehicle Operations
September 2015

LEGEND
Major Railroads (Class I)
- BNSF (1,584 Miles)
- CN (425 Miles)
- CP (1,179 Miles)
- UP (435 Miles)
Other Railroads
- Class II, III & Private (821 Miles)
- Out of Service

Other
- Class I Subdivisions
- SOO - Soo Line
- WC - Wisconsin Central

Class II Railroads:
- CPSE - Rapid City, Pierre & Eastern

Class II and Private Railroads:
- CTRF - Cloquet Terminal
- LSMR - Lake Superior & Mississippi
- MOW - Minnesota, Dakota & Western
- MNN - Minnesota Northern
- MNKH - Minnesota Commercial
- MPLU - Minnesota Prairie Line
- MSWY - Minnesota Southw.
- NL - Northern Lines
- NPR - Northern Plains
- NMC2 - Northshore Mining
- NSGF - North Shore Scenic
- CVWR - Cuyahoga Valley
- PRR - Progessive Rail
- RRWY - Red River Valley & Western
- SCSX - St. Croix Valley
- TCWN - Twin Cities & Western
- CTVY - LTV/CLT

Railroad Owners:
- BRRFA - Buffalo Ridge Regional Rail Authority (BRRFA)
- MRRFA - Minnesota Valley RR
- SLLCRRFA - St. Louis & Lake County RR

Disclaimer: The State of Minnesota makes no representation or warranties express or implied, with respect to the accuracy or completeness of the information contained in this map. The user accepts the data "as is". The State of Minnesota assumes no responsibility for data or changes made as a result of any changes made to the map. This map and other materials provided herein are protected by copyright. Permission is granted to copy and use the materials herein.
Air Transportation

There is one municipal airport in Nobles County, the Worthington Municipal Airport. The Worthington Airport was built to handle air traffic ranging from general aviation to commuter airlines. Thus, its runways, hangars, passenger terminal and systems easily accommodate business jets and corporate travelers, as well as medical emergency flights. There are two asphalt runways, both in excellent condition. The airport is equipped with an ILS (Instrument Landing System), which enables operation and landing of aircraft during instrument meteorological conditions (IMC), such as low ceilings or reduced visibility due to fog, rain, or blowing snow. This system is utilized by

- Runway 11-29 is 5506’ x 100’
- Runway 29 is equipped for ILS, NDB or GPS approach
- Runway 11 is equipped for VOR or GPS approach
- Runway 17-35 is 4200’ x 75’
- Both 17 and 35 are equipped for VOR or GPS approach
- Runway 17-35 and its taxi-ways were completely reconstructed in 2009/2010, and Runway 11-29 with its taxiways has also been completely reconstructed and was resealed in 2010.

Federal and State grant assistance is available for such projects, and the City of Worthington is proactive in securing these funds to keep its infrastructure competitive. Since 1998 the Worthington Airport has received $11 million in federal funding. The current funding for major projects is 95 percent federal, leaving 5 percent for payment locally. MnDOT has participated at 70/30 for minor improvements, such as a new access road and water and sewer, and the state provides 60% of funding for maintenance equipment. The City annually submits to the state five-year Capital Improvements Program (CIP). The state then works with the federal government to program projects to be funded. The next project to be submitted is the building of additional T-hangars, as the current hangars are full.

The 14,000 sq. ft. maintenance facility is used for aircraft maintenance and repair as well as offering ample space to hangar transient aircraft. This facility serves everything from small aircraft trainers to King Airs to corporate jets. A new 7200 sq. ft. corporate hangar was built in 2008, with space leased out for local corporate aircraft. There are 20 T-hangars leased for individual aircraft, with plans to build more when funding is available. Six of these hangars can accommodate light twin-engine aircraft. Both 100LL and JETA aviation fuels are available 24-hours.

The city of Worthington has adopted Airport Zoning regulations to protect adjacent land use from conflicts with airport traffic. MnDOT also reviews applications within a certain distance of an airport to reduce the chance of future use conflicts.
Relationship to Other Hazards—Cascading Effects

- **Hazardous Materials.** Dangerous roadways can lead to an accident and hazardous materials being spilled. A spill can result in ground water contamination, dangerous chemicals going into the air, and dangerous fire scenarios. If a fuel tanker is involved in the crash, the fire would be extremely hot and would burn until the right equipment is brought in to control the fire.

- **Emergency Response.** Dangerous roadways can make emergency response difficult.

**Transportation Infrastructure & Transportation Crashes History in Nobles County**

Rails, landing strips, and other transportation infrastructure are monitored, inspected, and maintained to ensure people and goods are transported safely. There are a number of variables that can impact safety that vary from current weather condition to design to age and upkeep. Driving and planning for the conditions are important to ensure safety. Infrastructure failure, like a bridge collapsing, can also cause transportation crashes, but are less common. Listed below are the historical accidents/incidents for transportation infrastructure in Nobles County.

**Aviation**

Since 2010, there has been one aviation accident / incident in Nobles County.\(^{112}\)

- **February 3, 2014,** the pilot returned to the airfield after a short cross-country flight. According to the pilot, he chose runway 36, and observed a slight crosswind off to the right. The pilot added that the

\(^{112}\) NTSB Aviation Accident Database & Synopses. Accessed: 8/15/17. Available: [https://www.ntsb.gov/_layouts/ntsb.aviation/Results.aspx?queryId=be5f147f-735a-41e7-a6d8-97e31800d845](https://www.ntsb.gov/_layouts/ntsb.aviation/Results.aspx?queryId=be5f147f-735a-41e7-a6d8-97e31800d845)
tailwheel equipped airplane swerved left after touchdown, so he attempted a go-around maneuver; he closed the carburetor heat control and added full throttle. During the attempted go-around, the airplane's main landing gear remained in contact with the ground and the airplane exited the runway. The airplane then crossed between the runway and taxiway, impacted a snow berm, and came to rest inverted.

**Bridges**

There have been no recent bridge related incidents Nobles County.

**Railroads**

There have been no major train derailments; however one crash involving a train in Nobles County has occurred since 1996.\(^{113}\) Other transport trails also pose a serious risk, if a derailment occurs.

- A vehicle with two people failed to stop for the train at the crossing. The train was not able to stop for the vehicle. The crash resulted in both passengers dying. The crossing safety is being updated in 2018.\(^{114}\)

**Vulnerability**

Transportation infrastructure is a basic component of government. Rails, landing strips, and other transportation infrastructure are monitored, inspected, and maintained to ensure people and goods are transported safely. The potential severity of transportation infrastructure is substantial according to the planning team. There are a number of variables that can impact safety that vary from current weather conditions to design to age and upkeep. Funding for transportation infrastructure should be maintained in every budget cycle, but funding previously allocated for transportation infrastructure has been used for other programs, like subsidizing ethanol and other programs in the general fund. This has resulted in less funding to maintain our transportation infrastructure. This decrease in funding makes maintaining and improving our transportation infrastructure more difficult.

Fatal crashes are more likely to occur in rural areas, which are defined as having a population of less than 5,000 people. In 2015, 70 percent of all fatal crashes in Minnesota occurred in rural areas.\(^{115}\) There are a number of variables that impact the likelihood of a crash from driver distraction to infrastructure failure. Distracted drivers are a definite threat to safety regarding other drivers, pedestrians, and bicyclists. Infrastructure failure, like a bridge collapsing, can also cause transportation crashes, but are less common.

**Plans and Programs**

- Road authorities – The Nobles County High Department works closely with MnDOT to improve local transportation infrastructure. MnDOT encourages discussions to identify and improve locations where higher risk areas of conflict may exist and is interested in suggestions to improve safety. Public Roadways and other transportation infrastructure are inspected, monitored, and maintained to ensure safety.

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\(^{113}\) NTSB Aviation Accident Database & Synopses. Accessed: 8/15/17. Available: [https://www.ntsb.gov/investigations/AccidentReports/Pages/railroad.aspx](https://www.ntsb.gov/investigations/AccidentReports/Pages/railroad.aspx)

\(^{114}\) Email from Steve Schnieder, Nobles County Public Works, Received 12/18/2017.

• Safe Routes to School (SRTS) – Transportation projects around schools may be eligible for SRTS funding. These projects can be related to education, encouragement, enforcement, evaluation, and engineering. Southwest Regional Development Commission Staff and MnDOT can discuss potential SRTS projects on request.

• Traffic safety resources – Several publications, such as the National Cooperative Highway Research Program (NCHRP), are available to MnDOT to suggest options for improved safety for all users. Other technical guides exist to improve pedestrian safety and include: MnDOT Road Design Manual, ADA Tool Kit, MnDOT Bikeways Facility Design Manual, Minnesota Manual on Uniform Traffic Control Devices, and multiple Safe Routes to School Resources.

• Snow management – According to MnDOT, “Drift-free roads are achievable through two mitigation strategies, proper road design and/or the use of snow fences. A suitably designed roadway will promote snow deposition in ditches rather than on the roadway and blowing snow that does reach the road will move across without drifting. Snow fences can also help maintain clear roadways by capturing blowing snow upwind of a problem area and storing that snow over the winter season.”

• Living snow fences – Nobles County in partnership with the Extension Service and the Board of Soil and Water Conservation continues to explore the use of and reimbursement of natural snow fences to protect highways against drifting snow.

• National Bridge Inventory System – Bridges or culverts that carry vehicular traffic and are longer than 20 feet are part of the National Bridge Inventory System. In Minnesota, bridges 10 feet or longer are inspected and inventoried. The general condition rating ranges from 0 (failed condition) to 9 (excellent) based on the physical condition of the deck (riding surface), the superstructure (load carrying members such as beams or trusses that support the driving surface), and substructures (abutments and piers).

• Nobles County Transportation Safety Plan – the Nobles County Highway Department develops a transportation safety plan to identify higher risk intersections and other transportation related safety concerns. Higher risk intersections are identified by the number of crashes and local knowledge by the Nobles County Highway Department and local law enforcement.

• Comprehensive Plan – the City of Worthington has a Comprehensive Plan, which contains a chapter on transportation. Transportation goals are outlined in the plan to mitigate transportation related issues.

• ADA Accessibility – MN West Community & Technical College (MN West) promotes ADA accessibility as a tool to attract students. As a result, MN West has a higher number of persons who require ADA accommodations.

• There are a number of regional assets that are shared throughout southwest Minnesota in Emergency Management Region Five. Primary among these shared assets is the Minnesota Emergency Response and Industrial Training (MERIT) Center located in Marshall. The MERIT Center provides training opportunities for local and regional emergency responders for a wide variety of situations, including hazardous materials spills, tanker spills and renewable energy related disasters.

Gaps and Deficiencies

• Transportation Funding – As funding has declined the condition of the transportation infrastructure has also declined.

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• High commuting numbers – Many people in Nobles County commute to work, which increases exposure to transportation hazards. The population of Worthington doubles during the work day.
• Road width limitations – A narrow road can cause difficulties when trying to improve safety. If a road is too narrow there is not room to add rumble strips and a safe place to pull over in case of an emergency. Rumble strips alert drivers that they are leaving the travel lane.
• Train derailment – Train derailments have occurred in Nobles County. As the number of trains increase the likelihood of a derailment causing injury, death, and property damage goes up.
• Hazardous materials transport – Hazardous materials are being shipped on both the Nobles/Rock Short Line and UP trains on a routine basis through Nobles County.
• Worthington Municipal Airport – There has been limited training with the Worthington Fire Department regarding emergency response at the Worthington Regional Airport.
5.5.4 Utility Failure

Utility failure consists of power outages, water treatment system failure, and waste water treatment system failure. Citizens have come to expect these services on a 24/7 basis. When these services fail there can be a social, economic, and public health impact. The majority of Nobles County residents are connected to and rely on one or more of these systems: power grid, water treatment system, and waste water treatment system. A small percentage of residents have personal backup generator, personal wells, and septic tanks. In the event of a major utility failure, the majority of Nobles County residents will be affected by the event.

The electric utility industry is comprised of municipal utilities, cooperatives and investor-owned utilities. Municipal utilities are governed by the city council or appointed utility commission. Municipals are non-profit. Capital is raised through operating revenues or sale of tax-exempt bonds. There are 125 municipal electric utilities in the state. Cooperatives are governed by an elected board of directors. Those cooperative customers whose name appears on a bill are eligible to vote for these directors. Cooperatives are non-profit entities but make a ‘margin’ on sales. Cooperatives often access funds through the federal Rural Utilities Service, or the National Rural Utilities Cooperative Finance Corporation (CFC), a privately owned, non-governmental organization. Traditionally, cooperative boards set their own rates. Investor-owned utilities, also known as IOUs, are governed by a board of directors elected by stockholders. IOUs are a P.U.C. state-regulated monopoly. They exist to make a profit for their stockholders while serving the public. Capital is raised through stock sales, taxable bonds and through operating revenues. Five IOUs operate in Minnesota.

There are ten main electric utilities in Nobles County. The main electric utilities include: Nobles Cooperative Electric, Brewster Light and Power, Worthington Public Utilities, City of Round Lake, City of Bigelow, Federated Rural Electric Association, City of Rushmore, City of Adrian, City of Dundee, and Sioux Valley Southwestern Electric. Refer to Figure #44 for electric utility service area map.

Nobles Cooperative Electric (NCE) provides electrical service to the majority of the county including the cities of Ellsworth, Leota, Lismore, Rushmore, St. Killian, Wilmont, and the unincorporated towns of Org and Reading. NCE is considered a monopoly as they have a set territory and their members cannot choose a different utility for their electrical service. However, NCE is a member-owned cooperative and exists to serve its membership. Federated Rural Electric Association provides electrical service to a very small portion of the northeast area of the county and part of the city of Kinbrae. Sioux Valley Southwestern Electric provides electrical service to a very small portion of the eastern area of the county.

The City of Adrian provides electrical service to the city of Adrian. Brewster Light and Power provides electrical service to the city of Brewster and a small portion southeast on MN 60. City of Worthington Municipal Utilities provides electrical service to the city of Worthington. The City of Bigelow provides electrical service to the city of Bigelow. The City of Round Lake provides electrical service to the city of Round Lake. The City of Dundee provides electrical service to the city of Dundee.
Utility failure can cause hardship and economic loss. The loss of power can have a cascading effect. A loss of power can result in water supply pumps not being able to replenish the water supply for a city or rural water system and water treatment facilities not being able to process waste water. Power interruption can also result in food spoiling, adequate drinking water supplies being diminished, and extreme cold and warm temperatures causing hardship and can be potentially life threatening for both people and livestock. The majority of all feedlots operating within the county rely on electricity for their livestock’s water. In terms of animal production, a loss of power could result in large livestock losses. Routine daily activities can also become difficult and overwhelming at times.

Information Technology Failure
A variety of situations can cause the county’s information technology systems and/or infrastructure emergencies. From physical damage to the infrastructure to intrusions or system failures these emergencies can result in significant operational and financial liabilities. The purpose of emergency preparedness for information technology is to minimize disruption, contain data loss or exposure, and ensure maximum business continuity. Telecommunications failures are failures of data transfer, communications, or processing brought about either by physical destruction of computers or communications equipment or a performance failure of software. An information system failure can cause financial loss, commercial embarrassment, loss of customers and revenue streams, sanctions and the loss of staff morale or stakeholder allegiance in an organization. Appropriate measures should be put in place to prevent failure of the information system project.
Relationship to Other Hazards—Cascading Effects

- **Civil Disturbance.** Food and water are basic necessities and if power is out for multiple days, supplies could be diminished to critical levels. When the supply of a necessity becomes drastically low distress can take over and cause civil unrest. Scarce resources could cause the public to loot and cause civil disorder.

- **Public Health Emergency.** The failure of septic treatment facilities and systems can have immediate adverse impacts on human health due to communicable diseases and epidemics. A water treatment failure could also result in contamination of the water supply.

- **Fire.** Utility failures caused by downed power lines can cause wildfires and structure fires. Fighting a fire would be more challenging since electric pumps are not able to replenish the water supply and refueling may have to take place a number of miles from the fire. These variables will affect the response time, and will make it more difficult to stay ahead of the fire.

Utility Failure History in Nobles County

Nobles County has experienced a countywide power loss. Typically, when the power is down it is confined to certain localities and crews can respond immediately and have power restored within hours. However, a severe daylong blizzard can keep crews from getting to the problem. The initial storm and piled up snow left behind can cause the power outage to last for multiple days. Ice storms can also cause power outages that last for multiple days.

In the spring of 2013, an ice storm hit Nobles County that caused hundreds of electric poles to snap in half. More than 70,000 utility customers in southwest Minnesota and eastern South Dakota were without power for over 24 hours. The city of Worthington established rolling blackouts to keep homes livable and avoid having to open emergency shelters. The ice storm caused miles of downed power lines that took weeks to fully repair. There were unconfirmed reports that major high-voltage supply lines in the region were down over a stretch of five miles.\(^{117}\) Federated Rural Electric reported original outage numbers were 2,000, Nobles County Electric were 4,200 Sioux Valley Energy were 3,000, and the City of Worthington were 1,700. It said more than 200 power poles are reported down, along with numerous sagging or downed power lines. For close to a week some Nobles County residents were without power.

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Vulnerability
Natural hazards will continue to cause power outages. Hardening of the utility grid will help to prevent large outages, but the costs of redundancy and hardening of the utility grid will limit the extent of the project.

There are miles of power lines in Nobles County that are above ground on poles. This makes them vulnerable to winter storms, ice buildup, tornadoes and straight-line winds, and other natural disasters. The risk level assigned to utility failure by the planning team is average.

Plans and Programs
- Tree maintenance – Electric utility providers identify and clean up areas of Nobles County that are most likely to experience damage to power lines from falling tree limbs. Nobles County works with each of its communities to ensure that these activities are conducted regularly.
- Utility grid upgrades – The utility grid is constantly being upgraded with new poles and technology to make the system more reliable.
- Water storage – There are planning recommendations to help mitigate the impact of utility failure. To help ensure adequate water storage capacity, cities consider two basic recommendations when analyzing water storage needs. First, Minimum storage should be at least 40 gallons/capita. Second, municipal water supply should have a minimum water storage capacity equal to the average daily water usage. During a power outage the water stored in water holding facilities can act as a reserve water supply until power can be regained.
- **Emergency primary care facility** – The Worthington High School is designated as an emergency primary care facility.
- Underground gas lines – Most gas mains within the county have been placed underground. This makes the lines less susceptible to damage to the system.
- **Lewis & Clark Regional Water System is expanding to Worthington**. This expansion will provide a more reliable water supply in this area.
- **Mutual Aid Agreement** – Nobles Cooperative Electric has mutual aid agreements with neighboring electric utilities to provide support in case of a large scale outage.
• Nobles Cooperative Electric – is working on a four year plan regarding redundancy. Part of this plan is also to bring their new territories into a plan for the future.

• MnWARN – “MnWARN is a formal emergency response program in Minnesota. MnWARN is a mutual aid agreement to provide a program whereby water, wastewater, and storm water utilities sustaining physical damage from natural or other disasters in the state of Minnesota can obtain emergency assistance, in the form of personnel, equipment, and materials and other associated services necessary to protect the health and welfare of the utilities' customers.” The following cities are members of MnWARN: Adrian, [__________], [__________], Rushmore, and Worthington.

• Utility grid hardening – Local electrical cooperatives are hardening the electrical grid through various building techniques. Rural electrics suffer from storm damage and interruptions mainly from ice, wind, and severe weather on its overhead lines, so additional mitigation funding could advance utility hardening projects at a faster rate.


**Gaps and Deficiencies**

- **Above ground power lines** – Many power lines in the county are above ground and subject to damage from ice storms, wind, and falling tree limbs.

- **Backup generators** – Not all communities have backup electrical generators to guarantee the operation of essential services in the event of a county wide utility failure. Water supplies could be diminished quickly, medical supplies that need to be cold may spoil, large amounts of food may spoil, and waste water could become an issue.

- **Essential operating systems** – Facilities that have backup generators learned, in the spring ice storm of 2013, that all essential operating systems were not hooked up to the generator. There are also key facilities that do not have backup generators. Refer to Table #47 for a list of facilities that need new or additional backup generators.

- **Cell phone coverage** – Cell phone service in rural areas in Nobles County is not reliable. In the case of an emergency, landline and satellite phones are needed to call for help.

- **Public education** – Public awareness should be increased for alerting the public of potential damage to gas mains and lines as these could be disrupted at many locations within the county.

- **Natural gas lines and township road maintenance** – there is a risk associated with snagging natural gas lines along township roads when work is being done. County roads require getting a permit. A permit should also be required along township roads.

- **Hardening of the electrical grid** – It is important to increase redundancy between the different electrical utilities in Nobles County. There is redundancy within individual systems, but there should also be redundancy between systems and suppliers. This would increase the reliability of the grid within Nobles County.

- **Funding for hardening of the electrical grid** – Local cooperatives will be able to harden the grid at a faster rate if rural electric funding could be supplemented with mitigation funding from FEMA and other sources.

- **Limiting electrical power** - Rolling blackouts decrease the demand for electricity and conserves energy during peak demand. A rolling blackout is having certain portions of the community scheduled to lose power. This is done to keep the system from overloading. Residents are alerted through the media when their portion of town will be without power. NCE does not use rolling power blackouts.
5.5.5 Water Supply Contamination

Water supply contamination is the introduction of point and non-point source pollutants into public ground water and/or surface water supplies.\(^{118}\) Water supply contamination can be the result of mismanaged landfills and dumps, negative externalities of industrial activity, and agricultural run-off.

Groundwater is not as reliable a source in Nobles County as in some other areas of the region. Surficial formations in glacial outwash, a common groundwater source, have variable yield depending on local factors of grain size, degree of sorting and extent of deposit. Cretaceous bedrock may provide adequate farm yields from deep wells, while Precambrian Sioux Quartzite typically gives small to moderate yields from fractures and loose sand zones. Quartzite deposits are known to be typically high in dissolved minerals (sulfate, iron, manganese) that many find objectionable for human consumption. In addition, the loss of surface wetlands has been cited in previous editions of the water plan for the negative impact on groundwater recharge quantities and quality, especially to glacial drift aquifers. These surficial aquifers yield “young water”, with 10-12 year recharge cycles from precipitation. This makes them more susceptible to drought and contamination from both point and non-point sources. The highest quality water comes from these shallow aquifers. The deeper the aquifers the more iron and manganese there is in the water. The more shallow aquifers are preferred since they have better quality water, but are more susceptible to contamination.

Microbiological and chemical contaminants can enter the ground water through leaking underground storage tanks, feedlots, and waste disposal sites. Human wastes and pesticides can also be carried to lakes and streams during heavy rains or snow melt. Areas in Nobles County have different risk factors in regards to certain contaminates, but there is equal risk throughout the county for water contamination.

A major contamination could cause massive disruption to Nobles County’s economy and surrounding communities. Removing contaminants from a water supply or relocating a well is an expensive process. Treating water for both human and animal consumption may result in people and farming operations relocating to new locations. This would leave areas of Nobles County unused until contaminates are removed from the water supply.

There is growing concern in the region about the quantity and quality of available ground water. Worthington Public Utilities (WPU) has 12 wells used to supply water to the City of Worthington’s residential, commercial and industrial users. Seven of these wells are around Lake Bella, three in the Malcolm well field and two on the south edge of Worthington. Industry accounts for slightly over half of water used in the city. A long-term, sustainable water supply is essential to future growth and development in Nobles County.

With limited supplies of groundwater, rural water systems will be an increasingly important asset for communities, livestock producers and rural residents. Nobles Local Water Management Plan 2009 p.24 Lincoln-Pipestone Rural Water (LPRW) serves portions of western Nobles County. Red Rock Rural Water (RRRW) recently announced an expansion to serve townships in southeastern Nobles County and is exploring the opportunity to provide water to the City of Round Lake. The City of Worthington and LPRW, among others, are participating in the Lewis & Clark Regional Water System. This project will bring

Missouri River water to Southeast South Dakota, Northwest Iowa, and Rock and Nobles counties in Southwest Minnesota.

### Table #73 Public Water Supplies – Nobles County

<table>
<thead>
<tr>
<th>Public Water Suppliers</th>
<th>Surface / Ground Water Assessment</th>
<th>City</th>
</tr>
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<tbody>
<tr>
<td>City of Adrian</td>
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<td>Bigelow</td>
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<td>Worthington</td>
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<tr>
<td>Hubbard Feeds, Inc.</td>
<td>Purchased Water</td>
<td>Worthington</td>
</tr>
<tr>
<td>Immanuel American Lutheran Church</td>
<td>GW</td>
<td>Fulda</td>
</tr>
<tr>
<td>Indian Lake Baptist Church</td>
<td>Purchased Water</td>
<td>Worthington</td>
</tr>
<tr>
<td>Kinbrae Supper Club</td>
<td>GW</td>
<td>Dundee</td>
</tr>
<tr>
<td>Leota</td>
<td>Purchased Water</td>
<td>GW</td>
</tr>
<tr>
<td>City of Lismore</td>
<td>GW</td>
<td>Lismore</td>
</tr>
<tr>
<td>Maka Oicu Park</td>
<td>Purchased Water</td>
<td>GW</td>
</tr>
<tr>
<td>Nobles Cooperative Electric</td>
<td></td>
<td>Worthington</td>
</tr>
<tr>
<td>Prairie View Golf Course</td>
<td></td>
<td>Worthington</td>
</tr>
<tr>
<td>Reading</td>
<td>Purchased Water</td>
<td>Reading</td>
</tr>
<tr>
<td>Round Lake</td>
<td>Purchased Water</td>
<td>GW</td>
</tr>
<tr>
<td>City of Rushmore</td>
<td>GW</td>
<td>Rushmore</td>
</tr>
<tr>
<td>City of Wilmont</td>
<td></td>
<td>Wilmont</td>
</tr>
<tr>
<td>City of Worthington</td>
<td></td>
<td>Worthington</td>
</tr>
<tr>
<td>Worthington Ag parts</td>
<td></td>
<td>Worthington</td>
</tr>
<tr>
<td>Travel/Information Center MNDOT</td>
<td></td>
<td>Worthington</td>
</tr>
</tbody>
</table>

*Source: Minnesota Department of Health*
Relationship to Other Hazards—Cascading Effects

- **Public Health Emergency.** Since Nobles County has a more shallow well system, the county is more susceptible to water supply contamination. Polluted water sources can cause illness and epidemics in both humans and animals.

- **Civil Disturbance.** A water supply shortage could also lead to public unrest and civil disturbances. When the supply of a necessity becomes drastically low distress can take over and cause civil unrest. Scarce resources could cause the public to loot and cause civil disorder.

Water Supply Contamination History in Nobles County

Nobles County has not had a major groundwater contamination problem.

Vulnerability

Nobles County relies on more shallow aquifers since the water quality is better than deeper aquifers. Water recharge in shallow wells can occur in a matter of hours, so wells that are drilled into the shallow aquifer are more vulnerable to pollutants infiltrating the water supply. There are also an unknown number of wells that continue to provide pathways for potential pollutants to reach the county’s aquifers. Nobles County is at a greater risk of water supply contamination since the county is tapped into shallower aquifers, but no major groundwater contamination has occurred. A number of regulations and monitoring procedures are in place to help maintain a quality water supply. Refer to the **Plans and Programs** section under Vulnerability for more measures to keep ground water supplies safe.

Plans and Programs

- **Nobles County Soil & Water Conversation District Plan** – The Nobles County Soil & Water Conversation District Plan addresses management of water, effective environmental protection, and efficient resource management. The water management plan is intended to identify existing and potential water issues in the context of watershed units and groundwater systems. The Plan identifies and maps the major and minor aquifers serving the county. The Plan outlines Nobles County’s enforcement of the state code for septic systems and floodplain ordinances. The county also does testing of some private wells through the guidelines set in the county’s water plan.

- **Wellhead Protection Program** – Several municipalities in Nobles County have set up a wellhead protection program, as promoted by the Minnesota Department of Health. All incorporated communities in Nobles County will eventually be developing wellhead protection plans. Since 1974, all water wells constructed in Minnesota must meet the location and construction requirements of the Minnesota Well Code.

- **Abandoned Well Sealing Program** - Nobles County has a cost share program for sealing abandoned wells. This program is part of the Local Water Management Plan.

- **Feedlot pollution prevention** – Nobles County actively works to protect water sources from feedlot runoff. County ordinances require that all feedlots within the county participate in the state’s feedlot program. Also, county and county extension services promote best management practices to minimize runoff from feedlots into rivers. County zoning ordinances also limit feedlot locations.

- **Subsurface Sewage Treatment Systems (SSTS)** – SSTS are commonly known as septic systems and are regulated by Minnesota Statutes 115.55 and 115.56. Minnesota Pollution Control Agency (MPCA) enforces the statutes and Nobles County continually works with MPCA towards updating failing septic systems.
- Septic System Code – Nobles County enforces the state code for septic systems and floodplain ordinances.
- Household Hazardous Waste Program (HHW) – The Nobles County’s HHW program, helps residents with the disposal of toxic household products and provides an exchange program for usable leftover products.119
- Wastewater water monitoring – The MPCA requires routine inspection of all public wastewater systems. State staff, in the Water-Quality Point-Source Program, issue permits and monitors compliance through data review and inspections, and enforces permit conditions. Employees at the Nobles County wastewater facilities are certified operators under state requirements. These operators are required to take state training to maintain their certified operator status.
- Public water system monitoring – The MDH requires routine inspection of all public water systems. State staff issues permits and monitors compliance through data review and inspections, and enforces permit conditions. Employees at the Nobles County water facilities are certified operators under state requirements. These operators are required to take state training to maintain their certified operator status.
- Drinking water standards – The U.S. Environmental Protection Agency (EPA), as required by the Safe Drinking Water Act of 1974, sets uniform nationwide minimum standards for drinking water. State public health and environmental agencies have the primary responsibility for ensuring that each public water supplier meets the federal drinking water standards or more stringent ones established by the state. The EPA requires an ongoing water quality monitoring program to ensure public water systems are working properly. Local officials work together with the MDH and EPA to ensure that all public water supplies are safe. Also, the EPA requires all local suppliers to promptly inform the public should the supply become contaminated.
- Shoreline zoning – Nobles County has adopted the state’s statutory shoreline riparian zoning classifications and minimum standards via ordinance.
- Floodplain Management Program – The Floodplain Management Program outlines how Nobles County tests general water quality following a heavy rain or flood event. The water quality test is looking for high levels of nitrates or phosphorus. The MDH assists Nobles County with the program.
- Clean Water, Land and Legacy Amendment – The Clean Water, Land and Legacy Amendment of 2008 increased the sales and use tax rate by three-eighths of one percent on taxable sales, starting July 1, 2009, continuing through 2034. Approximately 33 percent of this revenue is dedicated to the Clean Water Fund to protect, enhance, and restore water quality in lakes, rivers, streams, and groundwater.
- Sediment ponds – The Nobles County Highway Department works with the DNR and other organizations to increase the number of sedimentation ponds along roadways in Nobles County. Sedimentation ponds hold back water, which allows for a more natural filtration process to occur and helps to increase water quality and aquifer recharge rates.
- County zoning – Several steps are being taken to protect ground water sources from feedlot runoff. County ordinances require that all feedlots within Nobles County participate in the State’s feedlot programs. Also, county extension services promote best management practices to minimize runoff from feedlots into streams and rivers. County zoning ordinances also limit feedlot locations.

• Inflow & Infiltration – All cities in Nobles County work to reduce inflow and infiltration in their sanitary sewer systems.
• Sedimentation pond – Sedimentation ponds are being integrated into highway projects to help slow the flow of water and allow for a more natural water filtration process.

Gaps and Deficiencies
• Backup drinking water sources – The Nobles County Emergency Management Plan should identify alternate sources of drinking water, including locations for acquiring adequate amounts of bottled water, in the event of well contamination.
• Public outreach for wellhead protection – Efforts to educate private well owners on the importance of wellhead protection plans are not well planned and coordinated with state and federal efforts.
• Septic system inspection – Compliance inspections are required where there is a repair of an existing system, expansion or change in use of the building being served by an existing SSTS, a complaint or other notice of a system malfunction, property sale or transfer. The initial installation of an SSTS has to meet MPCA requirements, and it has to be designed by a licensed SSTS designer.
• Security around public water sources – Wells, water towers, groundwater storage tanks and water treatment plants should have additional security. This may include fencing around sites, alarm systems for break-ins and the addition of surveillance cameras. Rural water supplies may be more vulnerable, since security is less.
• Backup electrical generators – Not all communities have backup electrical generators to guarantee the operation of their water supply and/or wastewater treatment facilities.
• Annual recharge rates – Nobles County does not have estimated annual recharge rates, but there is a robust mounting of heavy water users and wells.
• Sump pump public education – The general public may be unaware that sump pumps cannot drain into the city wastewater system.
• Wellhead protection plans - All cities do not have Wellhead Protection Plans. The Cities of Adrian, Ellsworth, Rushmore, and Worthington have wellhead protection plan. All of the other cities in Nobles County are served by rural water. Some of those cities do have backup wells, but MDH does not go through the Wellhead Protection Planning Process for backup wells. Nobles County currently does not have a wellhead protection program. Existing rural wells can provide a pathway for potential pollutants to reach the county’s aquifers.
• Wellhead protection plan funding – The Minnesota Department of Health lacks resources to work with every community to complete wellhead protection plans quickly.
• Nitrates – Aquifers in the region are often shallow and have a high potential of contamination from nitrate leaching. Deeper aquifers may not be suitable for water supplies due to naturally occurring contaminants, such as sulfur, or because of slow well recharge. Nitrates have been found to be a specific problem in the region.
• Aging infrastructure – The water supply infrastructure in the majority of cities in southwest Minnesota is past its useful life. The water supply infrastructure is old, in need of repair, and is extremely costly to replace. Repairs and replacement is occurring, but this process could be accelerated with state and federal funding. Accelerated funding would help to decrease costs, so cities could make larger updates. There are economies of scale in larger projects and having work done in multiple adjacent cities.
5.5.6 Civil Disturbance/Terrorism

Terrorism is the use of force or violence against persons or property in violation of the criminal laws of the United States for purposes of intimidation, coercion or ransom. Terrorists often use threats to create fear among the public, to try to convince citizens that their government is powerless to prevent terrorism, and to get immediate publicity for their causes.\(^{120}\)

U.S. Code 18 U.S.C. § 2331 defines Domestic Terrorism activities as acts that:

- Involve acts dangerous to human life that violate federal or state law;
- Appear intended
  - to intimidate or coerce a civilian population;
  - to influence the policy of a government by intimidation or coercion; or
  - to affect the conduct of a government by mass destruction, assassination, or kidnapping;
- Occur primarily within the territorial jurisdiction of the U.S.

U.S. Code 18 U.S.C. § 2331 defines International Terrorism activities as acts that:

- Involve violent acts or acts dangerous to human life that violate federal or state law;
- Appear to be intended
  - to intimidate or coerce a civilian population;
  - to influence the policy of a government by intimidation or coercion; or
  - to affect the conduct of a government by mass destruction, assassination, or kidnapping;
- Occur primarily outside the territorial jurisdiction of the U.S., or transcend national boundaries in terms of the means by which they are accomplished, the persons they appear intended to intimidate or coerce, or the locale in which their perpetrators operate or seek asylum.
- U.S. Code 18 U.S.C. § 2331 defines the term "federal crime of terrorism" as an offense that:
  - Is calculated to influence or affect the conduct of government by intimidation or coercion, or to retaliate against government conduct; and
  - Is a violation of one of several listed statutes, including § 930(c) (relating to killing or attempted killing during an attack on a federal facility with a dangerous weapon): and § 1114 (relating to killing or attempted killing of officers and employees of the U.S.)

Locations Affected by the Hazard

Public buildings and facilities, such as the Courthouse, schools and utilities, are potential targets for domestic or international terrorists. Agricultural chemical depots may also be targets. Isolated rural farmsteads may also be inviting staging grounds for terroristic groups or individuals, away from watchful eye of law enforcement.

Extent of the Hazard
The initial edition of the 2011 Nobles County AHMP considered the possibility of civil disturbance from union labor and associated peaceful demonstrations that could be incited to riot.

Relationship to Other Hazards—Cascading Effects
The nature of terrorism and civil disturbance is inherently unpredictable. Cascading effects depend on the specifics of the event. Release of anthrax or other biological agents could lead to animal and crop disaster. Destruction of a dam could lead to flooding. Destruction of an industrial or farm chemical site could lead to a hazardous material crisis. Destruction of any structure would also likely lead to fires.

Previous Occurrences of the Hazard
Nobles County has been fortunate not to have experienced many incidents that could be classified as terrorism. The All Hazard Mitigation Planning Team identified no recent events within the county.

As there have been no recent events of this type, the Nobles County All Hazard Mitigation Planning Team judged this as a low priority hazard. An intentional effort to contaminate food or water sources may be the most significant localized terrorist threat to be considered.

Probability of Future Events of this Hazard
Minnesota is at an increased risk from terrorism as a target of economic strategic value with financial centers, agribusiness, and an international airport located in our borders. Nobles County is home to several company headquarters and on a major interstate highway (I-90) and therefor threat assessments for those facilities and I-90 will be ongoing. As there have been no recent events of this type, the Nobles County All Hazard Mitigation Planning Team judged this as a low priority hazard.

Information from recent unrest in Ferguson, MO and Minneapolis, MN showed a trend of individuals and groups from outside those cities coming to those locations in an attempt to heighten incidents between law enforcement and protestors. As a result several road/highway blockages occurred as well as situational violence at a Minneapolis police precinct with rioting and property damage taking place.

Vulnerability
While a labor strike at the county’s largest employer, the JBS plant, would be a possible civil disturbance, the likelihood is minimal without some type of notice (“intent to strike” statement from a labor union). A labor strike at a meatpacking plant in Mower County in the late 1980s covered several weeks with several skirmishes taking place. Additional resources would be needed here, including law enforcement mutual aid as well as a contingency plan for help from various State of Minnesota resources.

Plans and Programs
- Emergency Operations Plan - The current Emergency Operations Plan for Nobles County does list civil disturbance and terrorism (including biological, chemical and radiological) as potential hazards for Nobles County. Terrorism is also listed as a “trigger point” that may implement the EOP and activate the EOC. The current EOP will be updated in 2018.

Gaps and Deficiencies

- Manpower – there’s a city/county Emergency Response Unit (ERU) for warrant service and search warrant/arrest warrant entries but its small and help would be needed to dispel a large mob being civilly disobedient. The FBI would be the main contact for a terrorism scene/incident.
- Training – having a usable plan for quarterly or annual training. Training with other area departments for a mutual aid response; with National Guard units to better understand and work with military personnel.
- Equipment - Protective gear for crowd control as well as higher level response gear (Class A HazMat suits for possible chemical incidents; crowd control devices - gas launchers, etc.) for terrorism or a civil disturbance.
5.6 Hazard Identification Process

5.6.1 Methodology

The hazard identification process was conducted with the assistance of the CPRI, a tool to help profile the identified hazards. In Section 2 above, the results of the Planning Team’s CPRI were included in the profile of the identified natural and other hazards. The profile and the hazard identification helped the planning team assign priority to hazard mitigation strategies. Table #74 shows the sorting criteria for categories in the CPRI.

### Table #74  CPRI Sorting Criteria

<table>
<thead>
<tr>
<th>Potential Frequency:</th>
<th>Unlikely if &lt;1% chance in the next 100 years, Occasional = 1% and 10% chance in next year, Likely = between 10% and 100% chance in next year, Highly Likely = greater than 10% chance in next year.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spatial Extent:</td>
<td>Countywide or Local</td>
</tr>
<tr>
<td>Potential Severity:</td>
<td>Limited =&lt;10% area affected destroyed, Minor = 10% to 25% area affected, Major = 25% to 50% area affected, Substantial = &gt;50% area affected.</td>
</tr>
<tr>
<td>Warning Time:</td>
<td>Minimal, 6 – 12 hours, 12– 24 hours, 24+ hours</td>
</tr>
<tr>
<td>Risk Level:</td>
<td>Subjective ranking by Planning Team based on previous categories</td>
</tr>
<tr>
<td>Hazard Rank:</td>
<td>Subjective ranking by Planning Team based on previous categories</td>
</tr>
</tbody>
</table>

### Table #75  CPRI Worksheet—Planning Team Rankings

<table>
<thead>
<tr>
<th>Threat / Hazard / Technological Accident</th>
<th>Probability</th>
<th>Magnitude / Severity</th>
<th>Warning Time</th>
<th>Duration</th>
<th>Risk Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tornado</td>
<td>3.14</td>
<td>3.10</td>
<td>3.66</td>
<td>2.46</td>
<td>3.14</td>
</tr>
<tr>
<td>Winter Storm</td>
<td>3.66</td>
<td>2.54</td>
<td>2.31</td>
<td>2.83</td>
<td>3.04</td>
</tr>
<tr>
<td>Hail</td>
<td>3.43</td>
<td>1.86</td>
<td>3.14</td>
<td>1.40</td>
<td>2.71</td>
</tr>
<tr>
<td>Windstorm</td>
<td>3.03</td>
<td>2.37</td>
<td>2.77</td>
<td>2.20</td>
<td>2.71</td>
</tr>
<tr>
<td>Extreme Cold</td>
<td>3.17</td>
<td>1.94</td>
<td>2.00</td>
<td>3.11</td>
<td>2.62</td>
</tr>
<tr>
<td>Lightning</td>
<td>3.37</td>
<td>1.63</td>
<td>2.71</td>
<td>1.60</td>
<td>2.57</td>
</tr>
<tr>
<td>Drought</td>
<td>2.43</td>
<td>1.77</td>
<td>1.97</td>
<td>3.54</td>
<td>2.27</td>
</tr>
<tr>
<td>Flash Flood</td>
<td>2.29</td>
<td>2.00</td>
<td>2.65</td>
<td>2.23</td>
<td>2.25</td>
</tr>
<tr>
<td>Extreme Heat</td>
<td>2.57</td>
<td>1.57</td>
<td>1.86</td>
<td>2.89</td>
<td>2.20</td>
</tr>
<tr>
<td>Flood (Riverine)</td>
<td>1.79</td>
<td>1.76</td>
<td>1.85</td>
<td>2.18</td>
<td>1.83</td>
</tr>
<tr>
<td>Erosion</td>
<td>2.06</td>
<td>1.26</td>
<td>1.89</td>
<td>2.09</td>
<td>1.79</td>
</tr>
<tr>
<td>Wildfire</td>
<td>1.31</td>
<td>1.46</td>
<td>2.00</td>
<td>1.57</td>
<td>1.49</td>
</tr>
<tr>
<td>Subsidence</td>
<td>1.15</td>
<td>1.39</td>
<td>2.19</td>
<td>1.97</td>
<td>1.46</td>
</tr>
<tr>
<td>Earthquake</td>
<td>0.89</td>
<td>1.43</td>
<td>1.77</td>
<td>1.29</td>
<td>1.22</td>
</tr>
<tr>
<td>Dam Failure</td>
<td>0.91</td>
<td>1.06</td>
<td>1.69</td>
<td>1.35</td>
<td>1.12</td>
</tr>
<tr>
<td>Landslide/Mudslide</td>
<td>0.89</td>
<td>1.03</td>
<td>1.54</td>
<td>1.26</td>
<td>1.06</td>
</tr>
</tbody>
</table>
5.6.2 Repetitive Flood Claim Properties and Severe Repetitive Loss Properties

Repetitive loss properties are defined by FEMA as having two or more losses of at least $1,000 each paid under the National Flood Insurance Program (NFIP) within any 10-year period since 1978. A Severe Repetitive Loss (SRL) property is defined by FEMA as a residential property covered under NFIP that has at least four NFIP claim payments over $5,000 each and the cumulative amount of such claims exceeds $20,000. An SRL property may also be one for which at least two separate NFIP payments have been made with the cumulative amount of the building portion of these claims exceeding the market value of the building.

**Repetitive Loss Properties**

FEMA has a nonpublic database of all of the repetitive loss structures within the State. These structures are those which have sustained damages on two separate occasions within a ten-year time span for which the cost of repairs at the time of the flood meets or exceeds 25 percent of the market value of the structure before the damage occurred.

Based on this database Nobles County does not have any repetitive loss structures identified. From January 1, 1978, through November 30, 2017, zero total losses were reported in rural Nobles County.122

**Table #76**

<table>
<thead>
<tr>
<th>Community Name</th>
<th>Total Losses</th>
<th>Closed Losses</th>
<th>Open Losses</th>
<th>Closed Without Payment Losses</th>
<th>Total Payments</th>
</tr>
</thead>
<tbody>
<tr>
<td>City of Adrian</td>
<td>4</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>$8,527.99</td>
</tr>
<tr>
<td>City of Worthington</td>
<td>64</td>
<td>48</td>
<td>0</td>
<td>16</td>
<td>$152,149.26</td>
</tr>
<tr>
<td>Nobles County</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>Totals</td>
<td>68</td>
<td>51</td>
<td>0</td>
<td>17</td>
<td>$160,677.25</td>
</tr>
</tbody>
</table>

FEMA: Loss Statistics

**Severe Repetitive Loss Properties**

As of November 2017, there were no Severe Repetitive Loss properties in Nobles County.123

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5.6.3 Analyzing Development Trends

**Land Use and Development Trends**

Nobles County is a rural county with urban growth in the City of Worthington. There are 380,579 acres in farm production in Nobles County. Agriculture and food processing are two primary business categories in Nobles County.

A large percentage of tillable land in Nobles County is farmed equally among crops and livestock. There are also lands in conservation programs, parks, and other more natural settings. Not having all of the tillable ground in production helps to maintain ground water quality, wetlands, and plants and wildlife.

**Figure #46 Nobles County Farm Land Use**

Prohibiting development in floodplains also helps to mitigate the negative effects of flooding and runoff. Grasslands, shrubs, and other vegetation help to negate the negative effects that flooding and runoff can have. It is important to incorporate land conservation practices into local and county land use policy and development plans.

One percent floodplain areas do exist in Nobles County. These floodplain areas follow the Kanaranzi Creek around Adrian and Lismore; Lake Okabena and County Ditch 12 in Worthington; Little Rock River in south central Nobles County; Jack Creek south of Kinbrae; Okabena Creek south of Brewster; and numerous creeks north of Ellsworth. Compatible development has occurred along Okabena Lake in the City of Worthington. Refer to the subsection under Flooding, Location Affected by the Hazard, on page 159 for more information regarding the one percent floodplain.

In southwest Minnesota there have also been a growing number of wind farms, solar farms, ethanol plants, and other biofuel plants. This development trend poses some unique challenges. In regards to roads and bridges, there is an increase of oversized loads, which can wear out the infrastructure faster and pose safety concerns to other motorists.

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Firefighting also may be challenging. Specialized equipment is required to reach the top of the turbines, so firefighters have been instructed to sit back and let the wind turbine burn. Firefighters will monitor the fire to make sure the fire does not spread.

Ethanol plants and other biofuel plants have the potential to generate large and very hot fires. Plans are in place to address these new developments, but there is not extensive experience in mitigating hazards related to these development trends. Refer to 5.4.2 Fires (Wildfires and Structure Fires) for more information related to wind turbines ethanol plants, and biofuel fires.

A combination of conservation and planning has helped Nobles County maintain safe and efficient development. Nobles County is a rural county, so emergency response is impacted by distance and time and the availability of equipment and resources. Regional efforts help to mitigate the effects of natural and other hazards in Nobles County.
Section 6 – Mitigation Strategy

The goal of mitigation is to protect lives and reduce the future impacts of hazards including property damage, disruption to local and regional economies, the amount of public and private funds spent to assist with recovery, and to build disaster-resistant communities. Mitigation actions and projects should be based on well-constructed risk assessments, provided in Section 5 of this plan. Mitigation should be an ongoing process adapting over time to accommodate a community’s needs.

6.1 Community Capability Assessment

The capability assessment identifies current activities used to mitigate hazards. The capability assessment identifies the policies, regulations, procedures, programs, and projects that contribute to the lessening of disaster damages. The assessment also provides an evaluation of these capabilities to determine whether the activities can be improved in order to more effectively reduce the impact of future hazards. The following sections identify existing plans and mitigation capabilities within all of the communities.

6.1.1 National Flood Insurance Program (NFIP)

The NFIP is a federal program created by Congress to mitigate future flood losses nationwide through sound, community-enforced building and zoning ordinances and to provide access to affordable, federally-backed flood insurance protection for property owners. The NFIP is designed to provide an insurance alternative to disaster assistance to meet the escalating costs of repairing damage to buildings and their contents caused by floods. Participation in the NFIP is based on an agreement between local communities and the federal government that states that if a community will adopt and enforce a floodplain management ordinance to reduce future flood risks to new construction in Special Flood Hazard Areas (SFHAs), the federal government will make flood insurance available within the community as a financial protection against flood losses.

There is one flood insurance policy (FIP) in Nobles County, one FIP in the City of Adrian, and 132 FIPs in the city of Worthington. Each policy covers a single building, but all single family home policies include detached garages. Refer to Table #48 for an outline of policies in each city.

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Table #77 below shows which jurisdictions in Nobles County participate in the National Flood Insurance Program (NFIP).

### Table #77  NFIP Participation in Nobles County

<table>
<thead>
<tr>
<th>Jurisdiction Name</th>
<th>NFIP</th>
<th>Mapped High-Risk Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nobles County</td>
<td>Yes</td>
<td>5/19/2017</td>
</tr>
<tr>
<td>City of Adrian</td>
<td>Yes</td>
<td>5/19/2017</td>
</tr>
<tr>
<td>City of Bigelow</td>
<td>No – determined not to have an A Zone</td>
<td>5/19/2017</td>
</tr>
<tr>
<td>City of Brewster</td>
<td>No – determined not to have an A Zone</td>
<td>5/19/2017</td>
</tr>
<tr>
<td>City of Dundee</td>
<td>No – determined not to have an A Zone</td>
<td>5/19/2017</td>
</tr>
<tr>
<td>City of Ellsworth</td>
<td>No – Has an A Zone but chooses not to participate</td>
<td>5/19/2017 Sanction Date: 5/19/2014</td>
</tr>
<tr>
<td>City of Kinbrae</td>
<td>No – determined not to have an A Zone</td>
<td>5/19/2017</td>
</tr>
<tr>
<td>City of Lismore</td>
<td>No – determined not to have an A Zone</td>
<td>5/19/2017</td>
</tr>
<tr>
<td>City of Round lake</td>
<td>No – determined not to have an A Zone</td>
<td>5/19/2017</td>
</tr>
<tr>
<td>City of Rushmore</td>
<td>No – determined not to have an A Zone</td>
<td>5/19/2017</td>
</tr>
<tr>
<td>City of Wilmont</td>
<td>No – determined not to have an A Zone</td>
<td>5/19/2017</td>
</tr>
<tr>
<td>City of Worthington</td>
<td>Yes</td>
<td>5/19/2017</td>
</tr>
</tbody>
</table>

Source: FEMA NFIP Community Status Book

### 6.1.2 Plans and Ordinances

Nobles County and its incorporated communities have a number of plans and ordinances in place to ensure the safety of residents and the effective operation of communities, including a Zoning Ordinance, Floodplain Ordinance, Wellhead Protection Plan, Local Water Plan, Transportation Plan, Economic Development Plan, and Emergency Operations Plan.

In Section 5.4 of this plan (Hazard Profiles) a review of the plans and programs in place was included as related to each of the hazards addressed in the plan.

For a full listing of plans and programs in place in Nobles County, see Appendix H: Nobles County Plans & Programs in Place.
6.2 Mitigation Goals

In Section 5.0 of this plan, the risk assessment identified Nobles County as prone to a number of natural and other hazards. Planning team members understand that although hazards cannot be eliminated altogether, Nobles County can work toward building disaster-resistant communities.

Hazard mitigation is intended to protect our communities by reducing or eliminating long-term risk to people and property before a disaster strikes. Emergency management involves a cycle through which communities prepare, respond, and recover from emergencies and disasters. The planning team formulated goals, objectives, and strategies to mitigate the effects of natural and manmade hazards.

Goals are general guidelines that explain what Nobles County wants to achieve. Objectives narrow the general guidelines and define in more detail what Nobles County wants to achieve. Strategies are the actual steps to be taken to achieve the goals.

A qualitative approach was used by the planning team to judge and prioritize the mitigation strategies based on perceived costs and benefits. The process used to judge and prioritize the mitigation strategies was the STAPLE+E Process.

<table>
<thead>
<tr>
<th>Table #78</th>
<th>STAPLE+E Planning Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>S – Social</strong></td>
<td>Mitigation actions are acceptable to the community if they do not adversely affect a particular segment of the population, do not cause relocation of lower income people, and if they are compatible with the community’s social and cultural values.</td>
</tr>
<tr>
<td><strong>T – Technical</strong></td>
<td>Mitigation actions are technically most effective if they provide a long-term reduction of losses and have minimal secondary adverse impacts.</td>
</tr>
<tr>
<td><strong>A – Administrative</strong></td>
<td>Mitigation actions are easier to implement if the jurisdiction has the necessary staffing and funding.</td>
</tr>
<tr>
<td><strong>P – Political</strong></td>
<td>Mitigation actions can truly be successful if all stakeholders have been offered an opportunity to participate in the planning process and if there is public support for the action.</td>
</tr>
<tr>
<td><strong>L – Legal</strong></td>
<td>It is critical that the jurisdiction or implementing agency have the legal authority to implement and enforce a mitigation action.</td>
</tr>
<tr>
<td><strong>E – Economic</strong></td>
<td>Budget constraints can significantly deter the implementation of mitigation actions. Hence, it is important to evaluate whether an action is cost-effective, as determined by a cost benefit review, and possible to fund.</td>
</tr>
<tr>
<td><strong>E – Environmental</strong></td>
<td>Sustainable mitigation actions that do not have an adverse effect on the environment, comply with federal, state, and local environmental regulations, and are consistent with the community’s environmental goals, have mitigation benefits while being environmentally sound.</td>
</tr>
</tbody>
</table>

Refer to Section 2 for Planning Process and for more information relating to the STAPLE+E Process and the planning process.
It should be noted that not every hazard identified within the risk assessment has a goal outlined below. Goals were combined for certain hazards with similar mitigation measures. For example, severe summer storms and tornadoes both require similar awareness, prevention and structural measures. The main benefit of the actions listed is the improved health, safety and welfare of the community and residents. The highest ranking hazards are listed first, followed by moderate rank hazards and finally low rank hazards. An acronym list of entities listed in the strategies below can be found on page 240, Section 6.3 Mitigation Strategies Acronym List.

6.2.1 Hazard Mitigation Actions

Nobles County and its included municipalities share a common All Hazard Mitigation Plan and worked closely to develop it. These people work together with their city councils and the Nobles County Emergency Management Director to assure that the hazards and mitigation actions included in this plan are accurate and addressed in their jurisdictions. Table #79 lists all mitigation actions for Nobles County and its jurisdictions.

Each of these mitigation action charts detail the hazard, the mitigation action to address it, the priority ranking for implementation (1 = High Priority; 2 = Moderate Priority; 3 = Low Priority), its current stage of implementation, the timeframe for implementation going forward, the jurisdictions who have identified they will work to implement the action, the responsible parties to carry through with implementation, and comments on how the plan will be implemented through existing planning mechanisms and funding to make implementation happen.

In addition to ranking the hazard mitigation actions using STAPLE+E, the planning team also reports on the status of the mitigation action. Completed and deleted mitigation actions are denoted in Appendix F.

**Status**

Ongoing mitigation actions from the initial review were incorporated into annual reviews by the mitigation team. The status designations for the mitigation action chart are below. The status designations are broken into new and existing.

New Mitigation Strategy
- New – new action added to the AHMP

Existing Mitigation Strategy
- Ongoing – actions require continuing application
- In Progress – actions are currently being acted upon
- Complete – the action is complete
- Deferred – no progress has been made

**Timeframe**

The timeframe for implementing a mitigation strategy is divided into three categories:
- Short Term – 1 to 5 years
- Long Term – 5 + years
- Continuous
6.2.2 Strategy Implementation & Administration

Prioritization does not mean that all strategies with a priority ranking of five have to be accomplished before strategies with a four and so on can be implemented. The purpose of the prioritization is to show that the planning team talked about possible options and with unlimited resources, this is what they chose to accomplish first. Due to scarce resources, it may be necessary to start with a goal that has less upfront costs and is relatively easier to implement. The goals, objectives, and strategies being outlined in the Nobles County AHMP are recommendations from the planning team, so during implementation modifications can take place.

Nobles County Emergency Management is the primary agency responsible for implementation and administration of this plan. The County will implement mitigation strategies within the next five years, and will seek appropriate funding to do so.

Local jurisdictions with comprehensive plans and land use controls will be strongly encouraged to incorporate applicable goals, objectives, and strategies into their local plans upon their next update. Transmittal of the final plan will include a letter from the County Emergency Manager requesting that each participating jurisdiction 1) adopt this Hazard Mitigation Plan as a primary policy document, and 2) review and incorporate all applicable policies of this document into the community’s existing plans by inclusion or by reference.
### 6.3 Mitigation Strategies Acronym List

#### Cities

<table>
<thead>
<tr>
<th>Acronym</th>
<th>City</th>
<th>Status</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>CiA</td>
<td>City of Adrian</td>
<td>CiL City of Lismore</td>
<td>1 = High</td>
</tr>
<tr>
<td>CiBi</td>
<td>City of Bigelow</td>
<td>CiRL City of Round Lake</td>
<td>2 = Medium</td>
</tr>
<tr>
<td>CiBr</td>
<td>City of Brewster</td>
<td>CiRu City of Rushmore</td>
<td>3 = Low</td>
</tr>
<tr>
<td>CiD</td>
<td>City of Dundee</td>
<td>CiWi City of Wilmont</td>
<td>HP = High Priority</td>
</tr>
<tr>
<td>CiE</td>
<td>City of Ellsworth</td>
<td>CiWo City of Worthington</td>
<td></td>
</tr>
<tr>
<td>CiK</td>
<td>City of Kinbrae</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Townships

<table>
<thead>
<tr>
<th>Townships</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Twps</td>
<td>All Townships</td>
</tr>
</tbody>
</table>

#### Local Organizations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Entities/Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAZ</td>
<td>HAZMAT Team</td>
</tr>
<tr>
<td>NCA</td>
<td>Nobles County Administration</td>
</tr>
<tr>
<td>NCE</td>
<td>Nobles Cooperative Electric</td>
</tr>
<tr>
<td>NCCS/PH</td>
<td>Nobles County Community Services (Public Health)</td>
</tr>
<tr>
<td>NCEM</td>
<td>Nobles County Emergency Management</td>
</tr>
<tr>
<td>NCES</td>
<td>Nobles County Environmental Services Office</td>
</tr>
<tr>
<td>NCPW</td>
<td>Nobles County Public Works</td>
</tr>
<tr>
<td>NCSO</td>
<td>Nobles County Sheriff’s Office</td>
</tr>
<tr>
<td>NRCS</td>
<td>Natural Resources Conversation Service</td>
</tr>
<tr>
<td>SWCD</td>
<td>Soil and Water Conservation District</td>
</tr>
<tr>
<td>BWSR</td>
<td>MN Board of Water and Soil Resources</td>
</tr>
<tr>
<td>DNR</td>
<td>Department of Natural Resources</td>
</tr>
<tr>
<td>DPS</td>
<td>Department of Public Safety</td>
</tr>
<tr>
<td>EXT</td>
<td>University of Minnesota Extension</td>
</tr>
<tr>
<td>Fire</td>
<td>Fire Districts</td>
</tr>
<tr>
<td>FSA</td>
<td>USDA Farm Services Agency</td>
</tr>
<tr>
<td>Hosp</td>
<td>Hospitals &amp; Clinics</td>
</tr>
<tr>
<td>LE</td>
<td>Law Enforcement</td>
</tr>
<tr>
<td>LPRW</td>
<td>Lincoln-Pipestone Rural Water</td>
</tr>
<tr>
<td>MDA</td>
<td>MN Dept. of Agriculture</td>
</tr>
<tr>
<td>MDH</td>
<td>MNDpt. of Health</td>
</tr>
<tr>
<td>MnDOT</td>
<td>MN Dept. of Transportation</td>
</tr>
<tr>
<td>MPCA</td>
<td>MN Pollution Control Agency</td>
</tr>
<tr>
<td>OCRW</td>
<td>Osceola County Rural Water</td>
</tr>
<tr>
<td>PU</td>
<td>Public Utilities</td>
</tr>
<tr>
<td>Rail</td>
<td>Local Railroads</td>
</tr>
<tr>
<td>RC</td>
<td>American Red Cross</td>
</tr>
<tr>
<td>RRRW</td>
<td>Red Rock Rural Water</td>
</tr>
<tr>
<td>RWS</td>
<td>Rural Water Systems</td>
</tr>
<tr>
<td>Sch</td>
<td>Local School districts</td>
</tr>
<tr>
<td>USDA</td>
<td>U.S. Department of Agriculture</td>
</tr>
<tr>
<td>Air</td>
<td>Local Airports (Worthington)</td>
</tr>
<tr>
<td>BAH</td>
<td>MN Board of Animal Health</td>
</tr>
<tr>
<td>EBSR</td>
<td>MN Board of Water and Soil Resources</td>
</tr>
<tr>
<td>EMS</td>
<td>Medical Response Personnel</td>
</tr>
<tr>
<td>DNR</td>
<td>Department of Natural Resources</td>
</tr>
<tr>
<td>DPS</td>
<td>Department of Public Safety</td>
</tr>
<tr>
<td>EXT</td>
<td>University of Minnesota Extension</td>
</tr>
<tr>
<td>Fire</td>
<td>Fire Districts</td>
</tr>
<tr>
<td>FSA</td>
<td>USDA Farm Services Agency</td>
</tr>
<tr>
<td>Hosp</td>
<td>Hospitals &amp; Clinics</td>
</tr>
<tr>
<td>LE</td>
<td>Law Enforcement</td>
</tr>
<tr>
<td>LPRW</td>
<td>Lincoln-Pipestone Rural Water</td>
</tr>
<tr>
<td>MDA</td>
<td>MN Dept. of Agriculture</td>
</tr>
<tr>
<td>MDH</td>
<td>MNDpt. of Health</td>
</tr>
<tr>
<td>MnDOT</td>
<td>MN Dept. of Transportation</td>
</tr>
<tr>
<td>MPCA</td>
<td>MN Pollution Control Agency</td>
</tr>
<tr>
<td>OCRW</td>
<td>Osceola County Rural Water</td>
</tr>
<tr>
<td>PU</td>
<td>Public Utilities</td>
</tr>
<tr>
<td>Rail</td>
<td>Local Railroads</td>
</tr>
<tr>
<td>RC</td>
<td>American Red Cross</td>
</tr>
<tr>
<td>RRRW</td>
<td>Red Rock Rural Water</td>
</tr>
<tr>
<td>RWS</td>
<td>Rural Water Systems</td>
</tr>
<tr>
<td>Sch</td>
<td>Local School districts</td>
</tr>
<tr>
<td>USDA</td>
<td>U.S. Department of Agriculture</td>
</tr>
<tr>
<td>Ag Disease</td>
<td>Agricultural Disease</td>
</tr>
<tr>
<td>Civil</td>
<td>Civil Disturbance / Terrorism</td>
</tr>
<tr>
<td>Drought</td>
<td>Drought</td>
</tr>
<tr>
<td>Earthquakes</td>
<td>Earthquakes</td>
</tr>
<tr>
<td>Erosion</td>
<td>Erosion, Landslide, and Subsidence</td>
</tr>
<tr>
<td>E Cold</td>
<td>Extreme Cold</td>
</tr>
<tr>
<td>E Heat</td>
<td>Extreme Heat</td>
</tr>
<tr>
<td>Flood</td>
<td>Flooding</td>
</tr>
<tr>
<td>Fire</td>
<td>Fire</td>
</tr>
<tr>
<td>HazMat</td>
<td>Hazardous Materials</td>
</tr>
<tr>
<td>Public Health</td>
<td>Public Health Emergencies</td>
</tr>
<tr>
<td>S-Storms</td>
<td>Severe Summer Storms</td>
</tr>
<tr>
<td>Tornado</td>
<td>Tornado &amp; Straight-line Wind Events</td>
</tr>
<tr>
<td>Trans Inf</td>
<td>Transportation Infrastructure</td>
</tr>
<tr>
<td>Utility</td>
<td>Utility Failure</td>
</tr>
<tr>
<td>Water</td>
<td>Water Supply Contamination</td>
</tr>
<tr>
<td>W-Storms</td>
<td>Severe Winter Storms</td>
</tr>
</tbody>
</table>

#### Hazards in Plan
### 6.4 Mitigation Strategies

Table #79 All 2018 Mitigation Actions for Nobles County.

*Note: The first agency listed in “Responsibility” column is the lead agency for the mitigation action.*

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>W-Storms / S-Storms</td>
<td>Ensure that critical facilities have access to back up power generators.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County (HP), Bigelow, Brewster, Ellsworth, Lismore, Round Lake, Rushmore, Wilmont, Worthington</td>
<td>NCEM, CiBi, CiBr, CiE, CiL, CiRL, CiRu, CiWi, CiWo, RWS, Leota Twps,</td>
<td>Worthington has capability to do rolling power.</td>
<td>Medium / Unknown</td>
</tr>
<tr>
<td>2</td>
<td>W-Storms</td>
<td>Harden utilities, require local electrical distribution lines to be buried where feasible.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County (HP)</td>
<td>Utilities, NCEM, NCES</td>
<td></td>
<td>High / Unknown</td>
</tr>
<tr>
<td>3</td>
<td>W-Storms / Flood / Trans Inf</td>
<td>Use road design to help control snow on roadways and mitigate flooding.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Cities Townships including Bloom, Larkin, Olney, and Seward</td>
<td>NCPW, NCES, MnDOT, Twps, CiA, CiBi, CiBr, CID, CiE, CiK, CiL, CiRL, CiRu, CiWi, CiWo</td>
<td>Cut down hills to remove snow drifting. Excavate, remove unused fences, and replant area ditches for adequate water flow and water evacuation. Inspect and repair roads, culverts, ditches for improvements to mitigate snow blockage and water damage.</td>
<td>Unknown</td>
</tr>
<tr>
<td>4</td>
<td>All</td>
<td>Public awareness and educational campaigns to educate and target non-English speaking and vulnerable populations.</td>
<td>1</td>
<td>New</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCEM, NCCS/PH, Fire, LE, Hosp</td>
<td></td>
<td>Low - Medium / Unknown</td>
</tr>
<tr>
<td>--------------</td>
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<td>-----------------------------------------------------------------------</td>
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</tr>
<tr>
<td>5</td>
<td>S-Storms</td>
<td>Conduct a study to determine areas deficient in safe rooms/not covered by warning systems; Construct at least one new safe room or improve warning system in one community each year (including county and municipal parks), maintain or upgrade sirens in place, and install new warning sirens in identified underserved population areas.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Adrian, Bigelow, Brewster, Dundee, Ellsworth, Kinbrae, Lismore, Round Lake, Rushmore, Wilmont, Worthington</td>
<td>NCEM, NCES, CiA, CIBi, CiBr, CiD, CiE, CiK, CiL, CiRu, CiWi, CiWo, Sch - all</td>
<td>High / Unknown</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>S-Storms</td>
<td>Educate local schools, nursing homes, hospitals, public and private sectors, etc. on importance of doing “Severe Weather Awareness Week” workshop for their staff, including identifying evacuation routes and safety shelters; Encourage all residents and public buildings to have and use NOAA Public Alert Radios with SAME technology; encourage staff and residents to sign up for Nixle alerts.</td>
<td>1</td>
<td>In Progress</td>
<td>Annually</td>
<td>Nobles County</td>
<td>NCEM, Sch ,all, Hosp., all cities</td>
<td>Low / Unknown</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>S-Storms</td>
<td>Make nursing home staff aware of the need/importance of providing shelter locations and evacuation routes for nursing home residents in case of severe weather.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Adrian, Ellsworth, Worthington</td>
<td>NCEM, NCCS/PH,, CiA, CiE, CiWo</td>
<td>Low / Unknown</td>
<td></td>
</tr>
<tr>
<td>---------------</td>
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<td></td>
</tr>
<tr>
<td>8</td>
<td>S-Storms</td>
<td>Ensure that each manufactured home park has an updated emergency plan; work with park managers and owners to improve communication during severe storm events; ensure residents are familiar with the emergency plan and recognize evacuation routes and shelter sites.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County (HP), Brewster, Worthington</td>
<td>NCEM, NCES, CiA, CiBr,</td>
<td>Medium / Unknown</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CiE, CiRL, CiWo</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>S-Storms</td>
<td>To mitigate damage to electric lines and/or road closures, keep trees trimmed or removed along roadways and remove debris after storms.</td>
<td>1</td>
<td>New</td>
<td>Ongoing</td>
<td>Nobles County, Cities, Townships including Olney, Larkin, Round Lake</td>
<td>All Twps all Cities, NCPW, NCE, CiRL</td>
<td>Medium / Cities, Twps, County, State</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>S-Storms</td>
<td>Install lightning detectors on school property for notification during outdoor events and activities.</td>
<td>2</td>
<td>New</td>
<td>1/2020</td>
<td>School Districts</td>
<td>Sch - all</td>
<td>Unknown / Unknown</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Public Health</td>
<td>Improve coordination and communication with the local media (radio, print, TV, social) for dissemination of public health information, including prior to and during incidents/public health emergencies.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Bloom Twps</td>
<td>NCEM, NCCS/PH</td>
<td>Low / Unknown</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Public Health</td>
<td>Work with MDH on the mass distribution of needed medicines and supplies for public health emergencies.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCCS/PH, NCEM, NCSO, LE, Hosp</td>
<td>Low / Unknown</td>
<td></td>
</tr>
<tr>
<td>---------------</td>
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<td>-------------------------------------------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>13</td>
<td>Public Health</td>
<td>Develop a quarantine plan in coordination with local doctors and other health professionals.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCCS/PH, Hosp, NCEM, NCSO, LE</td>
<td></td>
<td>Low / Unknown</td>
</tr>
<tr>
<td>14</td>
<td>Haz Mat / W-Storms / S- Storms / Flood</td>
<td>Determine future population trends, create evacuation procedure for hazardous spill, public health outbreaks, flood, etc., and identify resources available for disasters.</td>
<td>1</td>
<td>New</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCEM, NCSO, Fire, LE, NCCS/PH</td>
<td></td>
<td>Low-Medium / Unknown</td>
</tr>
<tr>
<td>15</td>
<td>Ag Disease</td>
<td>Provide information on agricultural disease and prevention to producers and residents.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCES, USDA, FSA, EXT</td>
<td></td>
<td>Medium / Unknown</td>
</tr>
<tr>
<td>16</td>
<td>Ag Disease</td>
<td>Review the Emergency Operations Plan for response and care of animals, including disposal, in a hazard event.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>USDA, FSA, MDA, MPCA, NCEM, NCES</td>
<td></td>
<td>Low / Unknown</td>
</tr>
<tr>
<td>17</td>
<td>Ag Disease / HazMat</td>
<td>Apply for funding to assist farmers with hazardous materials containment.</td>
<td>3</td>
<td>New</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>BWSR, MPCA, USDA, FSA, NCES</td>
<td></td>
<td>Low / Unknown</td>
</tr>
<tr>
<td>18</td>
<td>Fire</td>
<td>Encourage building construction to include fire/smoke alarms and sprinkler systems.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>Fire, NCES, all Cities</td>
<td></td>
<td>Low / Unknown</td>
</tr>
<tr>
<td>19</td>
<td>Fire</td>
<td>Investigate building code adoption.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>Fire, NCES, all cities</td>
<td></td>
<td>Low / Unknown</td>
</tr>
<tr>
<td>20</td>
<td>Fire</td>
<td>Update Quick Response Unit.</td>
<td>1</td>
<td>New</td>
<td>12/202</td>
<td>Rushmore</td>
<td>CiRu, Fire</td>
<td></td>
<td>$80,000</td>
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<tbody>
<tr>
<td>21</td>
<td>Fire</td>
<td>Develop management plans that outline the scheduled maintenance of Conservation properties.</td>
<td>3</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Bloom Twps</td>
<td>NCPW, SWCD, Fire, DNR, FSA</td>
<td>Install fire-filling stations in rural areas which currently require tanker trucks for water. Identify water sources in which the DNR would allow for pumping surface water for area wildfires.</td>
<td>Medium / HSEM, Local</td>
</tr>
<tr>
<td>22</td>
<td>Fire</td>
<td>Investigate alternative water sources for rural fire suppression, including exploration of creating filling stations to rural water infrastructure in order for local fire departments to have a local water source to connect to in case of fires.</td>
<td>2</td>
<td>New</td>
<td>Ongoing</td>
<td>Nobles County, all Townships including Larkin and Olney</td>
<td>NCEM, NCPW, all Twps, all Rural Water servicers</td>
<td></td>
<td>Medium / Unknown</td>
</tr>
<tr>
<td>23</td>
<td>Utility</td>
<td>Cooperate with county/state to improve access to cellular services and broadband access for all of Nobles County.</td>
<td>1</td>
<td>New</td>
<td>Ongoing</td>
<td>Nobles County, Olney Township</td>
<td>Nobles County, NCEM, all Cities, all Twps, Sch</td>
<td></td>
<td>High / Unknown</td>
</tr>
<tr>
<td>24</td>
<td>Utility</td>
<td>Ensure essential facilities and equipment are protected from potential loss of fiber services.</td>
<td>1</td>
<td>New</td>
<td>12/2019</td>
<td>Nobles County</td>
<td>NCEM, NCE, NCSO</td>
<td>NCE – includes installing security cameras in electrical substations. Regional Hospital – has protection in place.</td>
<td>Medium / Unknown</td>
</tr>
<tr>
<td>25</td>
<td>Utility / Public Health</td>
<td>Update and/or connect private sewer systems to municipal sewer in high vulnerability areas, educate producers regarding best farming practices, conduct public awareness and information campaigns, and install bioreactors in wellhead protection streams.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Adrian</td>
<td>NCES, SWCD, BWSR, NCCS/PH, NCPW, NCEM</td>
<td></td>
<td>Medium / HSEM, Water Shed districts, Public Health</td>
</tr>
</tbody>
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<tbody>
<tr>
<td>26</td>
<td>HazMat</td>
<td>Develop Geographic Information Systems (GIS) capability to map locations of fixed facilities using hazardous materials and associated transportation corridors.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCEM, NCES, CiWo, NCGIS</td>
<td></td>
<td>Medium / Unknown</td>
</tr>
<tr>
<td>27</td>
<td>HazMat / Water</td>
<td>Update the County water plan to include all potential groundwater contaminants.</td>
<td>1</td>
<td>In Progress</td>
<td>12/2019</td>
<td>Nobles County</td>
<td>NCES, SWCD, BWSR, Okabena SWCD</td>
<td>One Watershed One Plan</td>
<td>Medium / Unknown</td>
</tr>
<tr>
<td>28</td>
<td>HazMat / Water</td>
<td>Educate county residents, farmers and businesses on reporting and evaluate potential impacts of hazardous material spills, clean-up, and monitoring procedures.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCES, NCEM, MPCA, Fire</td>
<td></td>
<td>Low / Unknown</td>
</tr>
<tr>
<td>29</td>
<td>HazMat</td>
<td>Increase awareness of the household hazardous waste facility, its importance, and how to utilize its services.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCPW, NCES</td>
<td></td>
<td>Low / Unknown</td>
</tr>
<tr>
<td>30</td>
<td>HazMat</td>
<td>Create County Response Team made up of emergency personnel which will be the first responders to accidental hazardous materials spills; educate and train emergency personnel so all types of potential hazardous spills will be readily recognized upon arrival at the scene.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County (HP)</td>
<td>NCEM, NCES, Fire, LE</td>
<td></td>
<td>Low / Unknown</td>
</tr>
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</tr>
<tr>
<td>31</td>
<td>Drought</td>
<td>Work with the Minnesota Department of Health to develop and implement Wellhead Protection Plans.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Adrian, Brewster, Dundee, Ellsworth, Kinbrae, Round Lake, Rushmore, Wilmont, Worthington</td>
<td>NCES, CiA, CiBr, CiD, CiE, CiK, CiRL, CiRu, CiWi, CiWo, Leota, Reading, SWCD, RWS, LPRW, RRRW, OCRW</td>
<td></td>
<td>Medium / Unknown</td>
</tr>
<tr>
<td>32</td>
<td>Drought</td>
<td>Develop ordinances that contain conservation provisions and use restrictions in times of severe drought.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCPW, RWS, USDA, LPRW, RRRW, OCRW</td>
<td></td>
<td>Medium / Unknown</td>
</tr>
<tr>
<td>33</td>
<td>Drought</td>
<td>Work to provide Rural Water Service within the entire county.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCPW, RWS, USDA, LPRW, RRRW, OCRW</td>
<td></td>
<td>High / Unknown</td>
</tr>
<tr>
<td>34</td>
<td>Civil</td>
<td>Update Nobles County Emergency Operations Plan to reflect possible civil unrest (domestic terrorism), including mass casualties situations along with response responsibilities, USDA Food Orders, and USDA resource lists.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCEM, NCSO, LE</td>
<td>Nobles County has limited capacity in morgue and funeral home capacity for mass casualties situations.</td>
<td>High / Unknown</td>
</tr>
<tr>
<td>35</td>
<td>Civil</td>
<td>Complete and maintain a comprehensive community risk and threat assessment to include civil disturbance and terrorism.</td>
<td>3</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, all cities</td>
<td>NCEM, NCSO, LE</td>
<td></td>
<td>Low / Unknown</td>
</tr>
<tr>
<td>36</td>
<td>Civil</td>
<td>Limit public access to high profile critical facilities, following the Department of Homeland Security’s warning system.</td>
<td>3</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCSO, LE, NCEM</td>
<td></td>
<td>Medium / Unknown</td>
</tr>
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</tr>
<tr>
<td>37</td>
<td>Civil</td>
<td>Create County Operations Plan (COOP) to move dispatch Center to an outside location; conduct training on COOP.</td>
<td>3</td>
<td>In Progress</td>
<td>3/2018</td>
<td>Nobles County, Nobles County Sherriff’s Office</td>
<td>NCSO, NCEM, LE</td>
<td>Plan needs to be completed and follow with training. Plan will be activated when circumstances pose a considerable safety hazard to personnel in the building or services to public are compromised.</td>
<td>Unknown/ Unknown</td>
</tr>
<tr>
<td>38</td>
<td>Flood</td>
<td>Encourage sewered communities to address infiltration to reduce extra flow in storm events; Inspect, maintain, and repair area sewage lagoons to ensure adequate capacity and operation.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, All sewered cities</td>
<td>NCES, MPCA, NCPW, Local PW, all sewered cities</td>
<td></td>
<td>High / Unknown</td>
</tr>
<tr>
<td>39</td>
<td>Flood</td>
<td>Adopt buffer system and Best Management Practices (BMPs) in agricultural lands within the flood fringe areas.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCES, SWCD, FSA</td>
<td>New Buffer Ordinance adopted and currently in implementation phase.</td>
<td>Low / Unknown</td>
</tr>
<tr>
<td>40</td>
<td>Flood</td>
<td>Continue to indicate on zoning forms if property is a flood hazard area.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Adrian, Worthington</td>
<td>NCES, CiA, CiWo</td>
<td></td>
<td>Low / Unknown</td>
</tr>
<tr>
<td>41</td>
<td>Flood</td>
<td>Develop a program to voluntarily acquire, relocate or elevate at-risk structures in floodplains.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Adrian, Worthington</td>
<td>NCES, NCEM, CiA, CiWo</td>
<td></td>
<td>High / Unknown</td>
</tr>
<tr>
<td>42</td>
<td>Flood</td>
<td>Implement County Ditch 12 Flood Reduction Plan.</td>
<td>1</td>
<td>In Progress</td>
<td>2019-2020</td>
<td>Nobles County, Adrian, Worthington</td>
<td>CiWo, NCPW, all SWCD</td>
<td></td>
<td>High / FEMA</td>
</tr>
<tr>
<td>---------------</td>
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<td>---------------</td>
<td>---------------------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>43</td>
<td>Flood</td>
<td>Monitor and inspect dams, ditches, culverts, and bridges for maintenance, repair, and replacement needs.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, all Twps including Olney</td>
<td>DNR, NCPW, CiA, CiWo, all Twps including Bloom and Larkin, all SWCD</td>
<td>Low / Unknown</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>Flood</td>
<td>Develop, plan and implement flood reduction plan for the ditch which runs from east side of state highway 91 to Mulberry Street.</td>
<td>1</td>
<td>In Progress</td>
<td>Unknown</td>
<td>CiE</td>
<td>CiE, Nobles, State of MN</td>
<td>Excessive rainfall too much for storm sewer to handle. Ditch runs through implement dealer to the west.</td>
<td>Medium / FEMA, State</td>
</tr>
<tr>
<td>45</td>
<td>Flood / Fire / HazMat / Erosion / W-Storm</td>
<td>Purchase physical barriers and road closure signs to prepare for road closure emergencies.</td>
<td>3</td>
<td>New</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCEM, NCPW</td>
<td>Utilize mutual aid agreements county wide.</td>
<td>Medium / NCEM, Fire</td>
</tr>
<tr>
<td>46</td>
<td>Flood</td>
<td>Improve storm water drainage system capacity by creating and maintaining storm water retention ponds to improve water quality.</td>
<td>2</td>
<td>New</td>
<td>1/1/2018 Unknown</td>
<td>Worthington ISD #518, Okabena Ocheda Watershed District</td>
<td>Worthington ISD #518, Okabena Ocheda Watershed District</td>
<td>Part of overall development of School District owned property in Nobles county.</td>
<td>Unknown / Unknown</td>
</tr>
<tr>
<td>47</td>
<td>Plan Maintenance</td>
<td>Budget to perform additional data collection and analysis to identify vulnerable structures in specific detail in next plan update.</td>
<td>-</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCEM</td>
<td></td>
<td>Medium / Unknown</td>
</tr>
<tr>
<td>48</td>
<td>Plan Maintenance</td>
<td>Budget to perform estimates of potential monetary loses to structures, contents, and functions in specific detail in next plan update.</td>
<td>-</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCEM</td>
<td></td>
<td>Medium / Unknown</td>
</tr>
</tbody>
</table>
6.4.1 Mitigation Actions by Community

Action items for Participating Jurisdictions
Nobles County is a rural county with one full-time paid staff in the area of emergency management. Jurisdictions in Nobles County rely on Nobles County Emergency Management for services regarding emergency management and hazard mitigation. Nobles County Emergency Management maintains regular communication with all local units of government in the county to facilitate intergovernmental cooperation.

Combining strategies between jurisdictions is due to the rural nature of the county, and that a number of jurisdictions are similar in regards to the natural or other hazard the strategy is trying to mitigate. A number of strategies in the Nobles County AHMP have “All Cities” listed as who will be working to implement the strategy. Some strategies specifically outline a specific city or multiple specific cities to work together on implementing the strategy. The listed entities under each strategy have had the opportunity to provide input and recommendations in regards to the strategy and will work together to implement the strategy.

See Appendix G for a listing of Mitigation Actions by Jurisdiction.

Implementation by Local Jurisdictions
Each local jurisdiction will implement and integrate the strategies identified in the hazard mitigation plan as they update their own comprehensive plans, zoning ordinances, and other plans that the community may from time to time need to update. When “All Cities” are identified within the strategies, it means that all jurisdictions mentioned in a strategy will take the strategy into consideration when updating planning processes and undergoing construction or development projects. In many of the smaller jurisdictions these strategies will be implemented as changes are made, but changes in the smaller jurisdictions do not occur as frequently as in the larger jurisdictions.
Section 7 – Plan Maintenance

7.1 Monitoring, Evaluation, and Updating the Plan

The Nobles County All Hazard Mitigation Plan (AHMP) should be considered a living document. The plan should be reviewed at a minimum of every 5 years. The guidance in this section will function as the primary tool when reviewing progress on the implementation of the Nobles County AHMP.

**Plan Monitoring**

It is the intent of the plan to serve as a guide for mitigating current and future hazards. Nobles County Emergency Management Department maintains regular contact with all jurisdictions in Nobles County. This will allow the Nobles County Emergency Management Director and Department to monitor and implement strategies outlined in the AHMP. The Nobles County Emergency Management Director will evaluate the goals that have been implemented by Nobles County and jurisdictions within the county. The Nobles County Emergency Management Director will also evaluate the Nobles County AHMP on the number of strategies that have been implemented and the number of goals that were reached.

Public participation is critical in implementing strategies outlined in the plan. Local residents and representatives have a thorough understanding of local issues. Local residents and representatives can assist in gathering support and technical information to help ensure the project is successful. Maintaining regular contact with the jurisdictions in Nobles County will help to ensure that the Nobles County Emergency Management Director and Department are able to effectively implement the strategies outlined in the plan.

**Evaluating the Plan**

It is recommended that the County Emergency Management Director review and formally evaluate the plan within eighteen months of adoption, as well as after every disaster event, to adequately prepare for the plan update. When implementing strategies from the existing plan it is important to consider improvements that can be made to the planning process, implementation, and evaluation of the plan. AHMP are evolving documents that need to stay up to date. Information gathering and evaluation should be taking place throughout the five year cycle of updating the plan. This will help to insure existing risk assessments are accurate and that mitigation efforts are effective.

**Updating the Plan**

FEMA requires that plans be reviewed, updated and re-approved every five years or sooner. The planning process timeline for reviewing, updating, and approving an AHMP at Minnesota Homeland Security and Emergency Management (HSEM) and Federal Emergency Management Agency (FEMA) is around 15 months. Within three years of adoption, the Emergency Management Director will formulate a work plan and seek input from Nobles County AHMP Planning Team members, local units of government, and local residents to start the process to update the Nobles County AHMP. The Emergency Management Director will also extend an invitation to non-participating jurisdictions to join the planning process for the update.
7.2 Implementation

Nobles County and its included municipalities share a common All Hazard Mitigation Plan and work together closely to develop, revise, and implement it. This AHMP provides a comprehensive chart of mitigation actions for Nobles County and its jurisdictions (see Section 6.2.1, Hazard Mitigation Actions, and Strategies Table 79). Jurisdictions participated in the AHMP planning process and identified the specific mitigation strategies that they would seek to implement in their communities during the 5-year planning cycle.

A number of implementation tools are available to address hazards. Many of these tools are below, however, in some cases additional discussion is needed in order to identify what strategies are most appropriate to use. This will be part of an ongoing discussion as Nobles County looks for opportunities for plan implementation. The following tools should be considered:

Education: In many cases education of residents has been identified as one of the most effective mitigation strategies.

Capital Investments: Capital investments such as fire and ambulance equipment, sprinkler systems and dry hydrants are tools that can limit risks and impacts of natural and other hazards.

Data Collection and Needs Assessments: Data collection and needs assessments can aid in gaining a better understanding of threats and allow planning for mitigation strategies accordingly. As resources are limited for this part of the planning process, additional data collection is likely to be an ongoing activity as resources become available.

Coordination: Responsibilities for mitigation strategies run across various county departments, local fire and ambulance departments, city and township governments, and a host of state and federal agencies. Ongoing coordination is an important tool to ensure resources are used efficiently. Coordination can also avoid duplication of efforts or prevent gaps that are created because of unclear roles and responsibilities. The mitigation plan review process can function as a tool to have an ongoing discussion of roles, responsibilities, and opportunities for coordination.

Regional Cooperation: Counties and public safety services providers throughout the Southwest Region of Minnesota often share similar challenges and concerns. In some cases a regional approach may be warranted as a mitigation strategy in order to save resources. Mutual aid agreements are a tool already in use for a number of services. Needs assessments for fire and ambulance services and development of assistance for volunteer recruiting, training, and retention could benefit from a regional approach. Cooperation among counties could also help in lobbying for certain funding priorities that address concerns relating to challenges in service delivery in rural areas. Organizations such as FEMA Region V and the MN Department of HSEM through the Regional Program Coordinator can offer tools and resources to assist in these cooperative efforts.

Regulation: Regulation is an important mitigation tool for Nobles County. Regulation plays a particularly important role for land use, access to structures and the protection of water resources and public health.
Continued public involvement is critical to the successful implementation of the All Hazard Mitigation Plan (AHMP). The County and its participating jurisdictions should continue to engage new public stakeholders in planning discussions and project implementation during the 5-year cycle of this plan.

Nobles County maintains a website that includes a page for Emergency Management. The SRDC also maintains a website that includes a page for hazard mitigation. Both of these websites will be the main point of access for the public regarding information about the Nobles County AHMP. A PDF copy of the approved plan will be available on these pages along with other information related to the update and hazard mitigation. The public will have access to the plan and be able to provide input regarding progress on the mitigation strategies.

http://www.co.nobles.mn.us/

http://www.swrdc.org/planning/hazard-mitigation/

Other Opportunities for Involvement

Hazard mitigation has been a regional effort in Southwest Minnesota with services overlapping between counties. All Hazard Mitigation Plan (AHMP) development starts with reviewing the counties’ existing mitigation plan and comparing the plan with the neighboring counties. There are many opportunities during the development of a plan for involvement provided from neighboring communities, agencies involved in hazard mitigation, businesses, academia, and other relevant private and non-profit interests. SWRDC has helped to develop mitigation plans for the following counties in southwest Minnesota:

- Cottonwood County
- Jackson County
- Lincoln County
- Lyon County
- Murray County
- Nobles County
- Pipestone County
- Redwood County
- Rock County

During the 5-year period before the plan is updated, planning team members will be responsible to keep their city councils, city departments, schools, and community members updated and engaged in the implementation of their respective mitigation actions. Each respective jurisdiction will report their progress in this area to the Nobles County Emergency Management Director. Jurisdictions will use numerous means of public outreach to engage new public stakeholders in providing input on mitigation efforts or concerns on hazards by sharing information at city council meetings, sharing information at special events, working with local schools and partner organizations, and posting information on relevant local or social media that their communities use to inform and engage the public. As local mitigation projects are implemented, jurisdictions will work to keep the public updated and engaged in those local efforts.
Conclusion

Hazards can occur with little or no warning. The relatively unpredictable nature of some hazards makes mitigating the effects of an event more difficult, but history and probability says that natural and other hazards are going to occur. Since hazardous events are going to take place, hazard mitigation is here to minimize the damages to property and loss of life.

When planning mitigation projects and investing in the future, it is critical to consider all the costs, not just the construction costs. There are costs associated with the potential loss of life, public and private property damages, interruption to the economy, decreased connectivity, health outcomes, and loss of community. Decision makers need to consider health and include health related outcomes in the benefits and costs of a project.

Health benefits of a project could be related to increasing livability, connectivity, and creating an environment where people want to live. When people are there, people invest and create demand. Hazard mitigation can be the link between livability, economic vitality, and public safety.

Figure #47 Disaster Management Cycle
APPENDICES

NOBLES COUNTY ALL HAZARD MITIGATION PLAN, 2018

Appendix A – Nobles County Maps
Appendix B – Nobles County Hazard Events
Appendix C – Resolutions after FEMA Review
Appendix D – Planning Team Meetings
Appendix E – Public Meeting Notices and Meeting Notes
Appendix F – Completed and Deleted Actions from the 2011 Plan
Appendix G – Mitigation Actions by Jurisdiction
Appendix H – Nobles County Plans & Programs in Place
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Appendix A - Nobles County Maps
Figure A - 1. Nobles County Population by Census Block, 2010

Figure A-2. Distribution of Estimated Economic Loss for Nobles County in 100-Year Flood

Total Potential Economic Loss
- 0 - $30,000
- $31,000 - $150,000
- $151,000 - $500,000
- $501,000 - $1,500,000
- $1,501,000 - $4,519,000
- Nobles_Lakes

2010 U.S. Census and FEMA Hazus-MH
Figure A-3  100-Year Flood Loss Estimates in Worthington
Figure A-4. 100-Year Flood Loss Estimates in Adrian
Figure A-5. 100-Year Flood Loss Estimates in Brewster
Figure A-6. Census Block #271051054004010 and 100-Year Floodplain, Public Works, Worthington
Figure A - 7.  

Census Block # 271051054001078 and 100-Year Floodplain, Bedford Industries, Worthington
Figure A-8. Census Block # 271051054001073 and 100-Year Floodplain, Hy-Vee, Holiday-Inn Express, Worthington
Figure A-9. Census Block # 271051054003003 and 100-Year Floodplain, Worthington
Figure A-10. Census Block #271051054003010 and 100-Year Floodplain, Oxford Street, Worthington
Figure A-12. Nobles County Townships
Appendix B - Nobles County Hazard Events
The National Climatic Data Center Database was queried for all notable events through May, 2017. However, some categories of events do not have records prior to 1996.

Table B - 1. All severe tornado events recorded by NCDC, 1950 through May 2017

<table>
<thead>
<tr>
<th>Location or County</th>
<th>Date</th>
<th>Type</th>
<th>Magnitude</th>
<th>Deaths</th>
<th>Injuries</th>
<th>Property Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nobles Co.</td>
<td>04/27/1955</td>
<td>Tornado</td>
<td>F1</td>
<td>0</td>
<td>0</td>
<td>0.25K</td>
</tr>
<tr>
<td>Nobles Co.</td>
<td>05/10/1956</td>
<td>Tornado</td>
<td>F2</td>
<td>0</td>
<td>0</td>
<td>250.00K</td>
</tr>
<tr>
<td>Nobles Co.</td>
<td>08/10/1964</td>
<td>Tornado</td>
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Highest Value Property Damage: 2

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Table B-2. All severe hail storm events recorded by NCDC, 1955 through May, 2017.

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<th>Location or County</th>
<th>Date</th>
<th>Type</th>
<th>Hail Size (inches)</th>
<th>Deaths</th>
<th>Injuries</th>
<th>Property Damage</th>
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<tr>
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<td>Type</td>
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<td>Injuries</td>
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<td>07/25/2011</td>
<td>Hail</td>
<td>1.00 in.</td>
<td>0</td>
<td>0</td>
<td>0.00K</td>
</tr>
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<td>05/04/2012</td>
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<td>0</td>
<td>0</td>
<td>0.00K</td>
</tr>
<tr>
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<td>0</td>
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<td>0.00K</td>
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<td>0</td>
<td>0.00K</td>
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<tr>
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<td>0.00K</td>
</tr>
<tr>
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<td>0</td>
<td>0</td>
<td>0.00K</td>
</tr>
<tr>
<td>Brewster</td>
<td>05/23/2012</td>
<td>Hail</td>
<td>0.75 in.</td>
<td>0</td>
<td>0</td>
<td>0.00K</td>
</tr>
<tr>
<td>Round Lake</td>
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<td>1.00 in.</td>
<td>0</td>
<td>0</td>
<td>0.00K</td>
</tr>
<tr>
<td>Brewster</td>
<td>07/25/2013</td>
<td>Hail</td>
<td>1.75 in.</td>
<td>0</td>
<td>0</td>
<td>0.00K</td>
</tr>
<tr>
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<td>1.75 in.</td>
<td>0</td>
<td>0</td>
<td>0.00K</td>
</tr>
<tr>
<td>Round Lake</td>
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<td>0.88 in.</td>
<td>0</td>
<td>0</td>
<td>0.00K</td>
</tr>
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<td>1.75 in.</td>
<td>0</td>
<td>0</td>
<td>0.00K</td>
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<td>Hail</td>
<td>1.00 in.</td>
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<td>0</td>
<td>0.00K</td>
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<td>0</td>
<td>0</td>
<td>0.00K</td>
</tr>
<tr>
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<td>0</td>
<td>0.00K</td>
</tr>
<tr>
<td>Wilmont</td>
<td>06/16/2014</td>
<td>Hail</td>
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<td>0</td>
<td>0</td>
<td>0.00K</td>
</tr>
<tr>
<td>Wilmont</td>
<td>04/12/2015</td>
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<td>0.75 in.</td>
<td>0</td>
<td>0</td>
<td>0.00K</td>
</tr>
<tr>
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<td>05/25/2015</td>
<td>Hail</td>
<td>1.00 in.</td>
<td>0</td>
<td>0</td>
<td>0.00K</td>
</tr>
<tr>
<td>Ellsworth</td>
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<td>Hail</td>
<td>1.75 in.</td>
<td>0</td>
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<td>0.00K</td>
</tr>
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### Table B - 3. All severe thunderstorm wind events recorded by NCDC, 1955 through May 2017

<table>
<thead>
<tr>
<th>Location Or County</th>
<th>Date</th>
<th>Type</th>
<th>Wind Speed in Knots</th>
<th>Deaths</th>
<th>Injuries</th>
<th>Property Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nobles Co.</td>
<td>08/23/1955</td>
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</tr>
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</tr>
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</tr>
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<td>0</td>
<td>0.00K</td>
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<td>0</td>
<td>0.00K</td>
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<td>0</td>
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<td>0.00K</td>
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<td>0.00K</td>
</tr>
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<td>0.00K</td>
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</tr>
<tr>
<td>Location Or County</td>
<td>Date</td>
<td>Type</td>
<td>Wind Speed in Knots</td>
<td>Deaths</td>
<td>Injuries</td>
<td>Property Damage</td>
</tr>
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<td>0</td>
<td>0.00K</td>
</tr>
<tr>
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<td>0</td>
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<td>0</td>
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<td>Type</td>
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<td>Injuries</td>
<td>Property Damage</td>
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Highest Value Property Damage: 3.355M
Table B - 4. All extreme flood events recorded by NCDC, 1997 through May, 2017.

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<th>Type</th>
<th>Deaths</th>
<th>Injuries</th>
<th>Property Damage</th>
</tr>
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<td>Flash Flood</td>
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</tr>
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<td>0.00K</td>
</tr>
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</tr>
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Highest Value Property Damage: **50.00K**

Table B - 5. All severe snow events recorded by NCDC, 1996 through May, 2017.

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<th>Deaths</th>
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### Table B - 6. All severe ice storm events recorded by the NCDC, 1996 through May, 2017.

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### Table B - 7. All extreme cold/wind chill events recorded by NCDC, 1996 through May, 2017.

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<th>Type</th>
<th>Deaths</th>
<th>Injuries</th>
<th>Property Damage</th>
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</thead>
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<td><strong>Property Damage</strong></td>
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Table B - 8. All extreme heat events recorded by NCDC, 1996 through May, 2017.

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<tr>
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<td>Highest Value</td>
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<td></td>
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Property Damage:
Appendix C - Resolutions after FEMA Review
RESOLUTION 201814 OF NOBLES COUNTY

ADOPTION OF THE
NOBLES COUNTY ALL-HAZARD MITIGATION PLAN

WHEREAS, Nobles County has participated in the hazard mitigation planning process as established under the Disaster Mitigation Act of 2000, and
WHEREAS, the Act establishes a framework for the development of a County Hazard Mitigation Plan; and
WHEREAS, the Act as part of the planning process requires public involvement and local coordination among neighboring local units of government and businesses; and
WHEREAS, the Nobles County Plan includes a risk assessment including past hazards, hazards that threaten the County, an estimate of structures at risk, a general description of land uses and development trends; and
WHEREAS, the Nobles County Plan includes a mitigation strategy including goals and objectives and an action plan identifying specific mitigation projects and costs; and
WHEREAS, the Nobles County Plan includes a maintenance or implementation process including plan updates, integration of the plan into other planning documents and how Nobles County will maintain public participation and coordination; and
WHEREAS, the Plan has been shared with the Minnesota Division of Homeland Security and Emergency Management and the Federal Emergency Management Agency for review and comment; and
WHEREAS, the Nobles County All-Hazard Mitigation Plan will make the County and participating jurisdictions eligible to receive FEMA hazard mitigation assistance grants; and
WHEREAS, this is a multi-jurisdictional Plan and cities that participated in the planning process may choose to also adopt the County Plan.

NOW THEREFORE BE IT RESOLVED that Nobles County supports the hazard mitigation planning effort and wishes to adopt the Nobles County All-Hazard Mitigation Plan.

Passed and adopted by the Board of Commissioners of the County of Nobles, Minnesota this __________ day of April 2018.

[Signature]
Robert S. Demuth, Chair
Nobles County, Minnesota Board of Commissioners

ATTTEST:

[Signature]
Tom Johnson, County Administrator
Nobles County, Minnesota

(SEAL)
May 1, 2018

Ms. Jennifer Nelson
State Hazard Mitigation Officer
Minnesota Department of Public Safety
Homeland Security and Emergency Management
445 Minnesota Street, Suite #223
St. Paul, Minnesota 55101-6223

Dear Ms. Nelson:

Thank you for submitting adoption documentation for the Nobles County All Hazards Mitigation Plan update. The plan was reviewed based on the local plan criteria contained in 44 CFR Part 201, as authorized by the Disaster Mitigation Act of 2000. Nobles County met the required criteria for a multi-jurisdiction hazard mitigation plan on April 5, 2018 and the plan is now effective for the City of Worthington. Please submit adoption resolutions for the remaining jurisdictions who participated in the planning process.

The approval of this plan ensures continued availability of the full complement of Hazard Mitigation Assistance (HMA) Grants. All requests for funding, however, will be evaluated individually according to the specific eligibility and other requirements of the particular program under which the application is submitted.

We encourage Nobles County to follow the plan’s schedule for monitoring and updating the plan and continue their efforts to implement the mitigation measures. The expiration date of the Nobles County plan is April 5, 2023. In order to continue project grant eligibility the plan must be reviewed, revised as appropriate, resubmitted, and approved no later than the expiration date.

Please pass on our congratulations to Nobles County for completing this significant action. If you or the county have any questions, please contact Christine Meissner at (312) 466-4460 or at christine.meissner@fema.dhs.gov.

Sincerely,

Melissa A. Johnson
Chief, Risk Analysis Branch
Mitigation Division

www.fema.gov
Appendix D - Planning Team Meetings
Nobles County has received a grant from the Federal Emergency Management Agency (FEMA) to prepare an update of its multi-jurisdictional, Hazard Mitigation Plan (HMP). In order to remain eligible for Federal Hazard Mitigation Grant Program funding, FEMA requires that HMPs be updated every five years as per FEMA requirements.

As a critical part of the planning process, FEMA requires that a Planning Team be developed that includes representation from local government jurisdictions, as well as other key stakeholder agencies or organizations that have a role in hazard mitigation planning and implementation in the County. The role of the Planning Team is to provide input on development of the plan, including prioritization of mitigation strategies and identification of projects for implementation, costs with public outreach and participation in public meetings, review draft plan and facilitate the required final adoption of the HMP by local government.

You have been identified as a key local government official or stakeholder to participate on the Nobles County HMP Planning Team. We encourage you to invite additional individual(s) you feel will enhance the planning process. If you personally cannot participate, please provide an alternate representative to participate on the team.

The Planning Team will initially meet as a group and then will be contacted individually to provide feedback remotely. Public meetings will also be held in different parts of Nobles County and Planning Team representatives will be requested.

Please mark your calendars

Planning Team Meeting
Thursday November 3rd
1:00 PM - 4:30 PM
Farmers Room, Lower level
Nobles County Government Building ~ 335 Tenth Street, Worthington, MN 56187

Please RSVP by clicking here and choose attending / not attending by October 9th
you can also contact Judy

Attached you will find the:
- New 2nd Meeting Agenda,
- the STAPLE Process,
- the CPR Workshop, and
- the 2011 Plan’s Mitigation Strategies.

PLEASE do the following tasks PRIOR to the Nov 2nd meeting:
1. Complete the CPR Workshop and return to Judy by October 2nd
2. Review the STAPLE process
3. Review the mitigation strategies from the 2011 plan

IMPORTANT NOTE

HSM has requested the update of the Nobles County Hazard Mitigation Plan be "FAST TRACKED"
In order to complete a mitigation funding request for County ditch 12 in Worthington.
Per this request, we will have approximately a 6 month timeframe to complete a 12+ month project
(see agenda for timeframe).
We will have one large group meeting (Nov 2nd) which will be three planning meetings rolled into one.
In addition, we will have two subcommittees to assist in speeding up the process.

IT IS VERY IMPORTANT to have all participating jurisdictions at this initial meeting and everyone complete & return to Judy the attached CPR worksheet by October 9th.

Thank you for your support to work together towards a stronger and more disaster-resilient Nobles County.
Please contact either Judy or Joyce with any questions.

Respectfully,
Joyce Jacobs
Nobles County Emergency Management Director
321 1st Ave S, Worthington, MN 56187
507-883-1212

Judy Billing Pruskar, USDA, MSW FCSA
Development Planner - SouthCentral Regional Development Corporation
jub@mn.gov
507-883-1242
**Public Meeting Sign In Sheet**

**Date:** 11-2-2017  
**Time Held:** 1:00 PM to 4:30 PM  
**City/County Location:** Worthington / Nobles County - MN  
**Purpose:** Hazard Mitigation Planning Meeting

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<td>Stephen Schneider</td>
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**Reported by:**  
**Signature:**

The value of participation by volunteer members of the public is $25.20/hour.

The Community Affiliation is if the attendee wish to state a public or private organization they are representing or if they are representing themselves.
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<td>Recorder - Nobles County</td>
</tr>
<tr>
<td>John Meyer</td>
<td>Signatures</td>
<td>Nobles County</td>
</tr>
<tr>
<td>Renee Schlotter</td>
<td>Signatures</td>
<td>Deputy Auditor - Nobles County</td>
</tr>
<tr>
<td>Dave Bullamore</td>
<td>Signatures</td>
<td>Assessors Office</td>
</tr>
</tbody>
</table>

The value of participation by volunteer members of the public is $25.20/hour.

The Community Affiliation is if the attendee wish to state a public or private organization they are representing or if they are representing themselves.
November 2, 2017, 1:00pm – 4:30pm
Planning Team meeting - Agenda

1:00 PM  Introductions – Joyce Jacobs, Nobles County Emergency Manager

1:10 PM  Why the Fast Track on this Plan? - Judy Elling Przybilla

Timeline
- November 2nd: Team meeting #1 is held.
- by December 15th: Mitigation Strategies Sub Committee meeting
- by January 5th: Plan Review Sub Committee meeting
- by January 10th: Draft plan ready for public review.
  - Plan published on websites and holding public meetings.
- February 15th: Draft plan ready for FEMA review.
- March 15th: FEMA reviewed plan ready for adoption.

1:20 PM  Presentation – Judy Elling Przybilla, SW Regional Development Commission

1) Intro to Hazard Mitigation Planning & Benefits
   - Planning Process
   - Types of Mitigation Assistance

2) Hazards review
   - Historical Hazard data from 2011 plan
     - Review and update per their current status.
     - Historical data update since the 2011 plan
       - Use to determine if a hazard is still applicable or should be deleted.
     - Identify Hazards not addressed in the 2011 plan which may added to 2018 plan.

3) HAZUS Flood Assessment Review

3:00 PM  Short Break

3:10 PM  Review completed CPRI Worksheet
   - (compiled from CPRIs emailed to Planner prior to meeting)
Finalize and prioritize hazards to be in 2018 plan

3:30 PM  STAPLE+E
Review Mitigation Strategies from 2011 Plan (sent in email prior to meeting)
Identified completed / deleted strategies
Identify which strategies will carry over into updated plan
Handout Mitigation strategy “Homework”

4:10 PM  Sub-Committee Formation & scheduling of subcommittee meetings (if needed)
   - Mitigation Strategies Subcommittee
   - Plan Review Subcommittee

4:20 PM  Questions, Comments, Observations

4:30 PM  Adjourn
Nobles County Multi Hazard Mitigation Plan (MHMP)

Planning Team Kickoff Meeting
November 2, 2017
Nobles County Emergency Management & Southwest Regional Development Commission

Agenda
- Welcome & Introductions
  - State (By Sue, Nobles County Emergency Management Director)
  - Why the Fast Track on this plan?
- Overview of Nobles County All-Hazard Mitigation Plan
  - Julia Bregar, Planning/Development
  - Why the Fast Track?
    - Agenda Authors
- Short Break

**Why the Fast Track?**

Flood mitigation improvements are to be completed in two or more phases. These improvements complement and build upon the flood storage provided along 3rd Street between Interchange 90 and 91 S.

- Improvements currently being developed for construction:
  - 3rd Street Channel improvement:
    - Improve flood storage by constructing a new channel in the 3rd Street Channel. This task will mitigate the losses in the flood plain resulting from upstream improvements.
    - Replace existing 30’ x 30’ box culvert with 30’ x 30’ box culvert.
    - Replace existing 30’ x 30’ box culvert on 3rd Street (under 90th Street) with 30’ x 30’ box culvert.
  - Improvements needed subsequent to currently proposed improvements:
    - Extend 30’ x 30’ box culvert under 90th Street through McMillan Street to replace open ends and 30’ x 30’ culvert on 3rd Street under McMillan Street.
    - Within channel and provide additional flood storage upstream of McMillan Street.

All of these improvements are identified in the May 24, 2013 Flood Mitigation Study prepared by Bostock & Miers, Inc. for the City of Worthington as they may have been or may be revisited in detailed project design.
Role of the MHMP Planning Team
1. Provide input on development of the plan
2. Rank hazards, prioritize mitigation strategies, and identify projects for implementation.
3. Assist with public outreach and participate in public meetings.
4. Review draft plans and provide feedback.
5. Facilitate final adoption of the AHMP by local governments.

About the Plan
- The Multi-Hazard Mitigation Plan (MHMP) is a requirement of the Federal Disaster Mitigation Act 2000 (DMA 2000). The development of a local government plan is required in order to maintain eligibility for certain federal disaster assistance and hazard mitigation funding programs.
- Contents:
  - Noble County physical and social profile
  - Asset inventory
  - Hazard Assessment and Vulnerability Analysis
  - Mitigation Actions

Hazard Identification
- This plan is a multi-jurisdictional plan that covers Noble County, including all 11 incorporated cities, and participating townships.
- Hazard Identification
  - Existing County Plans
  - Hazard Banking
  - Hazard of Threats (PPSA, PGCIC)
  - GIS and HAZUS (Flood only)

What hazards can be addressed?
- An AHMP looks primarily at natural disasters, which can include any of the following (not all required):

| SInat | Earthquake | Flood | Flooding | Drought | Flood (Flash/Flash) | Heat | Freeze
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Other Hazards
- Non-natural hazards (other) are not required by the DMA 2000 to be addressed in the AHMP and are not eligible for FEMA mitigation funds, but may be eligible for mitigation funds from other departments.
- Can include, but not limited to:
  - Civil Disasters/Disasters
  - Storm, tornadoes, & lightning
  - Hazardous Materials
  - Public Health Emergencies
  - Transportation Infrastructure
  - Utility Failure
  - Water Supply Contamination

Hazard Ranking - CPRII Worksheet
Worksheet that allows each jurisdiction to rank the risk that each natural hazard poses to the jurisdiction.
- Probability
- Magnitude/Severity
- Warning Time
- Duration
Creation & Implementation of Mitigation Actions

- Happens at every jurisdictional level.
- Happens in partnership with other local, State, and Federal agencies and non-profit organizations.
- Can be inexpensive ("low-hanging fruit")
- Can be high-cost (some are HMA-eligible)
- Some may be implemented quickly, others may be ongoing, and some may occur over several years.

The impact of hazards on people and property can only be reduced when efforts are made to mitigate against them before they occur.

Nobles County
Historical Hazards Review

Hazard Events (January 2000 - July 2017)

Natural
- Blizzards: 14
- Drought: 13
- Earthquakes: 0
- Extreme Cold: 9
- Extreme Heat: 6
- Flash Floods: 19
- Flooding: 4
- Hail: 56

- Lightning: 3
- Thunderstorm Winds: 33
- Tornadoes: 8
- Wildfire: 0
- Winter Storms: 30

Man-Made
- Aircraft/TAO (since 2014)
- Hazardous Materials: 13

Types of FEMA Declarations

Major Disaster Declarations: The President can declare a major disaster for any natural event, including any hurricane, tornado, storm, high water, flood, river, wind, hail, wave, earthquake, volcano eruption, landslide, mudslide, storm surge, or drought, or regardless of cause, fire, flood, or explosion, that the President determines has caused damage of such severity that it is beyond the combined capabilities of the State and local governments to respond.

Emergency Declarations: The President can declare an emergency for any situation or instance when the President determines federal assistance is needed. Emergency declarations supplement State and/or Indian tribal government efforts in providing emergency services, such as the protection of lives, property, public health and safety, or to lessen or avert the threat of a catastrophe in any part of the United States.

FEMA-Declared Disasters in Nobles County

<table>
<thead>
<tr>
<th>Event Type</th>
<th>Date of Declaration</th>
<th>Disaster Type</th>
<th>Federal Assistance Offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop Damage</td>
<td>03/01/2000</td>
<td>Crop Damage</td>
<td>Yes</td>
</tr>
<tr>
<td>Flood</td>
<td>06/20/2000</td>
<td>Flood</td>
<td>Yes</td>
</tr>
<tr>
<td>Storm Damage</td>
<td>07/30/2000</td>
<td>Storm Damage</td>
<td>Yes</td>
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</tbody>
</table>

FEMA-Declared Emergencies in Nobles County

<table>
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<th>Disasters Declared</th>
<th>Federal Assistance Offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storm Damage</td>
<td>08/01/2001</td>
<td>Storm Damage</td>
<td>Yes</td>
</tr>
<tr>
<td>Flood</td>
<td>09/01/2001</td>
<td>Flood</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Page | D - 9
Historical Hazard Mitigation Funding - Nobles County

<table>
<thead>
<tr>
<th>Project Description</th>
<th>Amount</th>
<th>Source</th>
</tr>
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<tbody>
<tr>
<td>Flood Mapping</td>
<td>$10,000</td>
<td>County</td>
</tr>
<tr>
<td>Flood Mitigation</td>
<td>$50,000</td>
<td>State</td>
</tr>
<tr>
<td>Flood Resilience</td>
<td>$15,000</td>
<td>Federal</td>
</tr>
</tbody>
</table>

Hazus Flood Assessment

What is HAZUS?

1. Prepares maps, tables, and reports
2. Analyzes social and economic impacts
3. Considers what is at risk
4. Analyzes potential hazards

HAZUS - Building Losses Categories

1. Direct Building Losses
   - The estimated costs to repair or replace the damage caused to the building and its contents.
2. Business Interruption Losses
   - Associated with inability to operate a business because of the damage sustained during the flood.
   - Also includes the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were $17.60 million dollars.

HAZUS - Total Economic Loss from 100yr Flood

<table>
<thead>
<tr>
<th>Sector</th>
<th>Estimated Total</th>
<th>Buildings</th>
<th>Total Building Loss</th>
<th>Total Economic Loss</th>
<th>Economic Loss (in $100s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>167</td>
<td>0</td>
<td>$15,400</td>
<td>$5,480</td>
<td>$670</td>
</tr>
<tr>
<td>Education</td>
<td>21</td>
<td>0</td>
<td>$55,420</td>
<td>$4,960</td>
<td>$100</td>
</tr>
<tr>
<td>Government</td>
<td>23</td>
<td>0</td>
<td>$41,080</td>
<td>$3,830</td>
<td>$150</td>
</tr>
<tr>
<td>Industrial</td>
<td>82</td>
<td>0</td>
<td>$58,450</td>
<td>$5,000</td>
<td>$250</td>
</tr>
<tr>
<td>Religious/house</td>
<td>10</td>
<td>0</td>
<td>$50,240</td>
<td>$4,400</td>
<td>$150</td>
</tr>
<tr>
<td>Residential</td>
<td>3,527</td>
<td>188</td>
<td>$650,250</td>
<td>$52,680</td>
<td>$8,550</td>
</tr>
<tr>
<td>Total</td>
<td>8,831</td>
<td>188</td>
<td>$1,186,150</td>
<td>$102,690</td>
<td>$16,940</td>
</tr>
</tbody>
</table>
HAZUS

HAZUS - Adrian

HAZUS - Brewster

HAZUS - Worthington

HAZUS - Census Blocks w/Greatest Estimated Losses

HAZUS - Census Block #271021054004010 and 100-Year Floodplain, Public Works, Worthington
HAZUS - County Properties w/ Highest Building/Contents Value Intersection 100yr Floodplain

<table>
<thead>
<tr>
<th>Property Type</th>
<th>Flood Zone</th>
<th>Building Value</th>
<th>Contents Value</th>
<th>Total Value</th>
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</thead>
<tbody>
<tr>
<td>Residential</td>
<td>A</td>
<td>$120,000</td>
<td>$70,000</td>
<td>$190,000</td>
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<tr>
<td>Commercial</td>
<td>B</td>
<td>$250,000</td>
<td>$100,000</td>
<td>$350,000</td>
</tr>
<tr>
<td>Agriculture</td>
<td>C</td>
<td>$50,000</td>
<td>$30,000</td>
<td>$80,000</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>$420,000</td>
<td>$200,000</td>
<td>$620,000</td>
</tr>
</tbody>
</table>

HAZUS - Other Analysis

- Local Climate Zones
- Average Temperature: 50°F
- Average Precipitation: 30" per year

- Hazard Mitigation Measures
- Elevation Hardening
- Floodproofing
- Sandbags and Emergency Supplies

- Total Cost: $1,200,000
The STAPLE+E Process

What is STAPLE+E?
A process we will use when reviewing mitigation strategies.
- Guidance for ranking mitigation activities is drawn from FEMA evaluation criteria.
- See handout for suggested questions to ask yourself while reviewing mitigation strategies.
- The table below lists the factors to consider in the analysis and prioritization of actions.

Mitigation Strategies

Mitigation Strategies – 2011 Plan

What is STAPLE+E?
Implementation of the mitigation plan is critical to the overall success of the mitigation planning process.
- The first step is to decide, based upon many factors, which action will be undertaken first.
- In order to pursue the top priority first, an analysis and prioritization of the actions is important.
- Some actions may occur before the top priority due to financial, engineering constraints, and the control issues.
- Public awareness and input of these mitigation actions can increase knowledge to capitalize on funding opportunities and monitoring the progress of an action.

Mitigation Strategies
- Prevention (P): Government, administrative, or regulatory actions.
- Property Protection (PP): Design or modification of existing buildings or structures to protect them from a hazard.
- Public Education and Awareness (EA): Actions to inform and educate others, elected officials, and property owners about the hazards and potential ways to mitigate them.
- Natural Resource Protection (NRP): Actions that minimize hazard losses and reduce the functions of natural systems.
- Emergency Services (ER): Actions that protect people and property during and immediately after a disaster or hazard event. Services include warning systems, emergency response services, and protection of critical facilities.
- Structural Protection (SP): Actions that involve the construction of structures to reduce the impact of a hazard, for example, floodwalls, safe rooms.
<table>
<thead>
<tr>
<th>Event Term</th>
<th>Category Name</th>
<th>Priority</th>
<th>Event Type</th>
<th>Likelihood</th>
<th>Vulnerability</th>
<th>Mitigation Actions</th>
<th>Details</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>Mitigation</td>
<td>High</td>
<td>Low</td>
<td>Monitoring</td>
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<tr>
<td></td>
<td></td>
<td>2</td>
<td>Mitigation</td>
<td>High</td>
<td>Low</td>
<td>Training</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>3</td>
<td>Mitigation</td>
<td>High</td>
<td>Low</td>
<td>Public Awareness</td>
<td></td>
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<td></td>
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<td>4</td>
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<td>High</td>
<td>Low</td>
<td>Emergency Planning</td>
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<td></td>
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<td>5</td>
<td>Mitigation</td>
<td>High</td>
<td>Low</td>
<td>Education</td>
<td></td>
</tr>
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<td>6</td>
<td>Mitigation</td>
<td>High</td>
<td>Low</td>
<td>Awareness</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>7</td>
<td>Mitigation</td>
<td>High</td>
<td>Low</td>
<td>Public Information</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** The above table represents a simplified example of a risk management strategy for a county's all-hazard mitigation plan. Each row corresponds to a specific risk scenario, detailing the category, priority, event type, likelihood, vulnerability, mitigation actions, and associated details.
Implementation of Mitigation Actions

- Happens at every jurisdictional level.
- Happens in partnership with other local, State, and Federal agencies and non-profit organizations.
- Can be transformative (low-hanging fruit)
- Can be high-cost (some are HMA-eligible)
- Some may be implemented quickly, others may be ongoing, and some may occur over several years.

The impact of hazards on people and property can only be reduced when efforts are made to mitigate against them before they occur.

Mitigation Actions Eligible for HMA

- Retrofit or construction of safe rooms or facilities to protect public during extreme wind events.
- Purchase of generators for backup power to support the operation of essential function in critical facilities in the event of severe storms.
- Burying or strengthening of power lines to reduce the risk of power outages from downed lines during a severe storm.
- Install new warning systems in identified vulnerable locations.
- Mitigation measures to reduce the threat of wildfires.
- Infrastructure retrofit for flood-prone areas.
- Mitigation of localized flood reduction projects to lessen the frequency of flooding and decrease predicted flood damages.
- Back-up flood-prone properties or acquire and demolish flood-prone properties.
- Dry-proof or waterproof facilities that are flood-prone.

Homework – due Nov 17th to Joyce Jacobs

Using the column heading above, create mitigation strategies for your jurisdiction(s).

- Identify the hazard it addresses.
- Explain the Mitigation Action.
- What Priorities? (1 = high, 2 = medium, 3 = low)
- Mitigation Action: [Type,udget, Improvement, Protection, Protection]
- Estimate Cost: Estimate construction, improvement, or protection costs.
- Estimated Cost: Estimated cost of improvements.
- What Jurisdiction(s) it affects? (City, township, county)
- Responsibilities: which offices, individuals, organizations, Departments are responsible for completing the mitigation action.

Abbreviations for Homework

Subcommittees Formation
Mitigation Strategies Committee
- Review Mitigation strategies that have been submitted.
- Determine duplicates / combine similar if needed.
- Identify if any strategies have been missed.
- Determine responsible entities.
- Review timeframe for each strategy.
- Review cost for each strategy.
- Review and finalize priority for each strategy.

Plan Review Committee
- Review the plan and approve final draft for public review.
- Prepare for public hearings.

Next Steps
- Turn in your Mitigation Strategies to Joyce Jacobs by November 17th.
  - Firm deadline.

- Hold Subcommittees Meetings
  - Mitigation Strategies Subcommittee – complete by Nov 13th.
  - Plan Review Subcommittee – completed by Jan 19th.

- Public Hearings Scheduled
  - Online by January 10th.
  - Public hearing in Worthington.
  - Public hearing in Adrian.

Nobles County AHMP Contacts:
Joyce Jacobs
Emergency Management Director – Nobles County
315 Tenth Street, Worthington MN 56187
jjoaacs@co.nobles.mn | 507-295-5212

Judy Elling Przybilla
Development Planner – Southwest Regional Development Commission
2401 Broadway Ave, Slayton, MN 56172
jprzybilla@brcd.org | 507-836-1642
Nobles County Hazard Mitigation Planning Meeting - NOTES
November 2, 2017 ~ 1:00pm – 4:30pm
Nobles County Government Center – Farmers Room

Email attachments provided with meeting invite:
1) Nov 6th meeting agenda
   1. STAPLE+E
   2) CPRW Worksheet
   3) 2011 Plan Mitigation Strategies

Meeting Deliverables:
- Better understanding of planning process, research and data gathering responsibilities
- Presented HAZUS analysis report
- Updated list of hazards and prioritized hazards for county
- Identified completed / deleted strategies
- Identify which strategies will carry over into updated plan
- Begin work on identifying new mitigation strategies

Meeting convened at 1:00pm with 47 attendees
- Introductions provided by Joyce Jacobs, Nobles County Emergency Manager

Explained why the Plan is being expedited.
- Provided description of County Dick 12 work plan and FEMA grant timeline.
  o Dewayne Haffeld and Joyce Jacobs

Reviewed Hazard Mitigation Planning Timeline

November 2nd
Team meeting #1 is held.

by December 15th
Mitigation Strategies Sub Committee meeting

by January 5th
Plan Review Sub Committee meeting

by January 10th
Draft plan ready for public review.
Plan published on websites and holding public meetings.

February 15th
Draft plan ready for FEMA review.

March 15th
FEMA reviewed plan ready for adoption.

Presentation provided by Judy Elling Przybilla, SW Regional Development Commission

1) Intro to Hazard Mitigation Planning & Benefits
   - Planning Process
   - Types of Mitigation Assistance

2) Hazards review
   - Review Historical Hazard data from 2011 plan
     o Review and update per their current status.
     o Historical data update since the 2011 plan.
   - Identify Hazards not addressed in the 2011 plan which may added to 2018 plan.
   - Comments/discussions:
     o Combine and add in Erosion, Landslides, and Subsidence

3) HAZUS Flood Assessment Review
   - Comments/discussions:
     o Information needed from Assessor’s office to identify the parcels.
     o Send out HAZUS Report to Planning Team members
     o Question: Where is the flooding coming from? – along waterways and low lying areas.
     o TS – should be WHS in the report
Reviewed completed CPRI Worksheet
- compiled from CPRI: emailed to Planner prior to meeting
- Comments/discussion:
  - No comments/Questions/Discussions
  - What is warning time in CPRI – explained the CPRI scoring on

Finalized and prioritized hazards to be in 2018 plan
- Comments/discussion:
  - Attendees discussed rankings of the hazards and determined by vote which hazards are to be identified at high priority hazards. Those hazards are:
    - Severe Winter Storms (Blizzard/Ice)
    - Flooding (Flash/Ravine/Dam failure)
    - Severe Summer Storms (Tornado/Straight-line winds/Thunderstorms/Hail/Lightning)
    - Hazardous Materials
    - Public Health Emergencies
    - Utility Failure
    - Water Contamination
  - Nobles Electrical Coop
    - Should we be looking at less number of hazards then having many (7 vs 17)
    - Stated ice and wind storms hit the area hard
  - Additional changes:
    - Dam/Levee Failure to be placed under Flooding
    - Ice storm place under winter storm
    - Keep Transportation – Infrastructure
    - Add in terrorism and civil disturbance under man made hazards
      - Need people to help compose this section (Joyce Jacobs with assist)
    - Flood - be sure flash and ravine are together and place dam failure in same section
    - Add in Technology Failure under Utility Failure
      - Nobles County IT Director to get information to Planner for this section.

Reviewed STAPLE+E process
- Comments/discussion:
  - No comments/Questions/Discussions

Reviewed Mitigation Strategies from 2011 Plan
- Reviewed acronyms from last plan’s mitigation strategies.
- Identified completed / deleted strategies from 2011 plan
- Identified which strategies from 2011 plan will carry over into updated plan
- Comments/discussion:
  - Change: Nobles County Land Use Management in mitigation strategies acronyms to Nobles County Environmental Services.
  - Other comments are reflected in the mitigation strategies in the 2018 plan.
    - These comments were discussion of each mitigation strategy listed in the 2011 Plan.
    - Transportation – “use road design and living snow fences” – poor property owner participation – need to add into transportation infrastructure section a paragraph about constructing a permanent snow blockage by the county in those areas - will provide Planner with information for this piece
Nobles County Hazard Mitigation Planning Meeting - NOTES
November 2, 2017 ~ 1:00pm – 4:30pm
Nobles County Government Center – Farmers Room

- Ron McCarvel not in attendance – Joyce will follow up with Ron McCarvel in Nobles County to determine status of Ag Disease mitigation Strategies from the 2011 Plan.
- Add in: Column on the 2011 Mitigation strategies Sheet to show what the planning team has determined each strategy’s status to be: Deleted, Deferred, In Progress, Completed, or a ? mark for unknown.
- Planner to send out updated 2011 Mitigation Strategies list to the planning team to assist them with their 2018 mitigation strategies planning.

Reviewed and explained Handout Mitigation strategy “Homework”
- Reviewed the mitigation creation process and what each column on the worksheet means.
- Reviewed why we do mitigation planning
- Reminded to keep STAPLE+E process in their thoughts when creating mitigation strategies.
- Each jurisdiction is to create mitigation strategies for their jurisdiction and return them to Joyce Jacobs for the mitigation subcommittee to review and include in the Plan.
  - Due by Nov 17th to Joyce Jacobs.
  - FIRM deadline due the time line for the 2018 Plan.
- Do they want individual townships listed on the acronyms list or do they want the townships listed as a group under one township acronym?
  - Planning team determined they want to have the townships listed as one acronym.
- Planner is asked to list hazards in the plan on the first page of the 2018 mitigation strategies homework
- Comments/discussions:
  - Can you send us the presentation slide with ideas?
  - Planner provided copies (paper & electronic) of the Hazard Mitigation Ideas booklet.
  - Nobles County will post it on the Nobles County Emergency management page.
  - Schools Districts want to have each school district listed separately for the Acronyms for the mitigation strategies.

Discussed Sub-Committee Formation & scheduling of subcommittee meetings (if needed)
- Mitigation Strategies Subcommittee
  - Explained that the mitigation will review mitigation strategies, determine if some can be combined into strategy, and if any are missing and also review timelines, cost, jurisdictions, and priority of strategies.
  - FIRM - Completed by Dec 15th
  - After mitigation committee completes this it will be sent out to everyone on the planning team to review and approve the final strategies.
    - This will be a quick turnaround – be prepared to return edits and approvals quickly.
  - Signup sheet for the committee in the back
    - Prefer to have someone from each type of jurisdiction on the committee
    - Comments/discussions:
      - Joyce made a call for people to sit on this committee
      - How many people do you want on the committee?
        - Joyce = 6 - 10 people would be good.

- Plan Review Subcommittee
  - Need 5 -6 people plus Joyce to review the plan for corrections, edits before the plan is placed out for public comment.
  - Completed before January 5th
  - Comments/discussions:
    - Joyce will have the draft place on the NCEM website with a password for the committee members to access the plan.

Provided 10 minutes for Questions, Comments, Observations
- No additional comments, questions or observations were stated.

Adjourned at 4:30pm
Meeting #2 – Mitigation Strategies Sub-Committee
November 30, 2017

Greetings!

First off, thanks to everyone who attended the meeting last Thursday. We know there were a lot of conflicts including harvest!

For those of you who were in attendance, Judy’s (our planner) went over the Mitigation Strategies from our 2011 plan and updated the strategies with information from those in attendance. That updated document is attached for your review and will serve as a starting point for our 2018 list of strategies.

We have also included a worksheet that we need to have each jurisdiction/entity complete with mitigation strategies (projects/ideas) that you would like to see happen in your jurisdiction/entity. The worksheets are due back to me (Joyce) by no later than Friday, November 17th. The worksheet attached does give you an example, and we are also attaching a PDF copy of the FEMA Mitigation Ideas document that provides lots of strategy examples in their city to work on this as a group if you wish. (Example — City of Elwood, Elwood FD, Elwood School, Parkview Manor, etc.)

Once we get the worksheets back, we will work with the Mitigation Strategy Committee to pull similar ideas/strategies together as well as prioritizing the strategies, for the county plan. There will be opportunity during the plan review process for your jurisdiction/entity to see other ideas/strategies and you may decide that you would like your city, township, etc. also listed under that strategy.

As Judy mentioned at the meeting, the FEMA Mitigation Ideas PDF (attached) will give ideas for strategies to use for a variety of hazards. You do not need lengthy responses — short and to the point will be appreciated.

The worksheet is attached as a PDF and in Word, so you can use whichever format you’d like. Those documents will also be available (hopefully by Thursday morning) on the Emergency Management webpage at: http://www.co.nobles.mn.us/departments/emergency-management. We will continue to add documents to this site, including some of the maps that were shared at the November 2nd meeting, and other documents as they are created and updated.

If you have questions, please call or email either one of us at the contact information listed below our names. Again, we need to have your mitigation strategies back to by no later than Friday, November 17th.

We are also looking for a few more volunteers to serve on the Mitigation Strategy Review Committee, so if you would like to help, please let us know.

Thanks! — Joyce and Judy

Joyce Jacobs
Nobles County Emergency Management Director
Safety Officer
315 Tenth Street
P.O. Box 757
Worthington, MN 56187-0757
jacobs@co.nobles.mn.us
Cell (507) 560-3351
Office (507) 295-5212

Judy Filberg Pryvoll, LSW, MSW-PDDA
Development Planner
Southwest Regional Development Commission
507.886.1642
www.SRDC.org
First off, thanks for volunteering to be on the Mitigation Strategy Review Committee! Since the “homework” for strategies is due on the 17th, I thought we should look at a possible date to meet shortly after the 17th. Can everyone let me know their availability for the dates/times below? Once we set a date/time, I will let you know what room we will be in for the meeting.

Here are some options:

Monday, November 20th at 1 PM
Tuesday, November 21st at 2 PM
Monday, November 27th at 9 AM
Monday, November 27th at 1 PM
Thursday, November 30th at 2 PM

Judy would like us to have the mitigation strategies reviewed and our work completed before December 15, so I’m hoping if we can meet on one of the dates listed above, we will have enough time to meet again and/or work on the process via email as needed to meet the deadline on the 15th.

Looking forward to working with all of you! Thanks again! –J

Joyce Jacobs
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jjacobs@co.nobles.mn.us
Cell (507) 360-3351
Office (507) 290-0212
Just a reminder about our meeting on Thursday at 1:30 PM in the Farmers Room. Thanks-JJ

Happy Friday – It looks like Thursday the 30th will work the best for everyone, but could we start at 1:30 PM? Please respond and let me know if Thursday at 1:30 will work for you. We will meet in the Farmers Room. I’d say to plan for a couple of hours – so hopefully we are done by 3:30 or 4 PM at the latest. Again – please let me know if this works for you. Have a great weekend! Thanks-JJ

Joyce Jacobs
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office (507) 295-5212
Notes: Mitigation strategies from Jurisdictions were reviewed, combined and edited by subcommittee. Planner will enter these into a spreadsheet, committee will conduct review via email, then Emergency Manager will send via email to entire Planning Team for final approval.

Upon final approval they will be added to Plan document. And Plan will be sent to the Plan review sub Committee for review and edits to be completed prior to Public Meetings in January 2018.
Meeting #3– Plan Review Sub-Committee
Via email month of December 2017

From: Joyce Jacobs [mailto:jjacobs@co.nobles.mn.us]
Sent: Tuesday, December 19, 2017 2:53 PM
To: BRUCE HEITKAMP - Adrian City Administrator (adrian_admin@iw.net) <adrian_admin@iw.net>; Sherry Swanson - Nobles Coop Electric (sswanson@noblesce.com) <sswanson@noblesce.com>; ron.mccarvel@mn.usda.gov; athiner@ci.worthington.mn.us; dan.livdahl@okabenaachedawd.org
Cc: Judy Elling Przybilla (JudyP@swrdc.org) <JudyP@swrdc.org>; Dwayne Haffield (d.haffield@ci.worthington.mn.us) <d.haffield@ci.worthington.mn.us>
Subject: Plan review instructions

Thanks to each of you for agreeing to help with the review process for the Hazard Mitigation Plan. As I mentioned in the phone call, you will be getting an email from Judy, our planner, and it will include a link for you to access the document. She is hoping to use a “Dropbox” and set up a separate folder for each of you. Judy will email each of you when the document is ready which will likely be late Wednesday or Thursday this week.

When you go in to do the reviewing, please open the Word document and make sure that you have the “Track Changes” function active so Judy can SEE your changes. If you have never used the tracking function, I’ve attached a copy on how to use it. It is pretty easy, but if you have any problems, give me a call and I’ll help you. If you prefer to print off the pages and write in your changes, you can also do that and scan and email them to either Judy or me. Either way – please shoot one of us an email to let me know that you are done with your review.

When you open your document, please ignore any highlighting or comments as those are reminders for Judy and me to follow up on.

The plan is very long, so if each of you could focus on section(s) of the plan that are your areas of expertise or interest, that would be ideal! You can find those sections listed in the index, but if you could also do a search of key words that will bring you to other sections in the plan that may have a reference to your expertise/interest and review those paragraphs as well, that would be great. So for example, since Sherry is from Nobles Cooperative Electric, she would likely search words like electricity, power outage, power lines, power poles, ice storm, etc. (To do a document search – hit “ctrl” and the “f” key and when the box pops up, type in the word(s) you are looking for and press enter. A list will pop up with any “matches” and a simple click will take you right to that section in the document.)

We unfortunately can’t stop the process for the holidays with the timeline we are on, so if you can do the reviewing as soon as possible that would be appreciated – please and thanks!! Please keep in mind that Judy has taken portions of our old plan, other county plans and information from the web to create the plan and then we have incorporated lots of information from local jurisdictions and entities to get to this point, so it is highly likely that you will find something that needs changing or revising – and catching grammatically errors is appreciated too! I’d appreciate it if you could get your section(s) reviewed by December 28th or sooner. If that is not possible, please let me know and we will figure something out. (The plan will be on public review for 30 days and we can continue to make changes, but I’d like as many of the changes made before we post it on the website for the public to see.)

Again, please call me if you have questions! Thanks again! - JJ

Joyce Jacobs
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Safety Officer
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jjacobs@co.nobles.mn.us
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office (507) 295-5212
Appendix E - Public Hearing Notices and Meeting Notes/Comments
Press Release

Public hearing/meeting notice was posted a minimum of 10 days prior to the event in the Nobles County newspapers (Daily Globe and Nobles County Review):

Nobles County is holding the following public review meetings to gather public input on the Nobles County All Hazard Mitigation Plan.

Tuesday, January 16, 2017
11:00 am – 1:00 pm
Council Chambers - Adrian Government Center – 209 Main Ave., Adrian, MN

Tuesday, January 16, 2017
3:00 pm – 5:00 pm
Farmers Room - Nobles County Government Center – 315 Tenth Street, Worthington, MN

For more information on Hazard Mitigation planning or to review the draft of the Nobles County AHMP (available for a period of 30 days starting January 10th) please go to:
http://www.co.nobles.mn.us/departments/emergency-management/
**Poster for Notification**

Posters/Flyers were also posted in public locations in government buildings Nobles County and cities in Nobles County.

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**Nobles County All Hazard Mitigation Plan**

**Public Review Meetings**

The Nobles County All Hazard Mitigation Plan (AHMP) identifies hazards that pose a threat to Nobles County, as well as what is currently being done to mitigate their impacts. The purpose of this plan is to determine how to reduce property damage and loss of life resulting from natural and manmade hazards. The plan also provides a list of actions and programs that may enable Nobles County to further reduce negative impacts caused by disasters.

Before the plan is submitted to HSEM / FEMA for approval, there is a public comment period. The community is encouraged to attend one of two Public Review Meetings for the plan. These meetings will provide local residents, businesses, agencies, and organizations an opportunity to learn about the draft plan, ask questions, and provide feedback on mitigation strategies and recommended actions for implementation.

The meeting will be open forum and anyone can attend at any time during the meeting's block of time.

---

**Public Review Meetings:**

**Tuesday, January 16, 2017**

11:00 am – 1:00 pm

Council Chambers - Adrian Government Center – 209 Main Ave., Adrian, MN

**Tuesday, January 16, 2017**

3:00 pm – 5:00 pm

Farmers Room - Nobles County Government Center – 315 Tenth Street, Worthington, MN

**Snow date: January 23, 2018 same times and locations**

Community members and staff may also participate by reviewing the plan online and submitting comment as directed at the Nobles County Emergency Management website. A draft Nobles County MHMP is available on the Nobles County Website:

[http://www.co.nobles.mn.us/departments/emergency-management/](http://www.co.nobles.mn.us/departments/emergency-management/)

If you have any questions please contact Joyce Jacobs at the Nobles County Emergency Management Office (507) 295-5212, jiacobs@co.nobles.mn.us or Judy Elling Przybilla at the SRDC, (507) 836-1642, JudyP@swrdc.org.
**Public Hearings:**

The meetings were conducted in an open meeting format with no set presentation given, the 2018 Mitigation Strategies were printed on large display paper and displayed with markers for attendees to write comments on the strategies. Two copies of the plan in its entirety were also provided with sheets of paper for attendees to write their comments. Half sheet flyers were also handed out providing the website where the 2018 All Hazard Mitigation Plan can be accessed and public comment procedure for the entire plan can be submitted by the public. The online public comment site logged 120 page views (95 of which were unique) during the 30-day review period from January 5-February 3, 2018.

![Public Comment}

The Nobles County Emergency Manager, SRDC Planner, and some members of the Planning Team were also present to discuss with public attendees the process and the plan, answer any questions, and collect public comments at each of the meetings.
Public Meeting #1 – Adrian, MN 1-16-2017

Public Comments:

Section 3.1 – Page 31 (Table) – Larkin Township participated with this plan / G.H. Larkin Township

Mitigation Action #3 - Add Larkin Township under Jurisdictions / G.H. Larkin Township

Mitigation Action #9 - Add Larkin Township under Responsibility / G.H. Larkin Township

Mitigation Action #22 - Add Larkin Township under Jurisdictions / G.H. Larkin Township

Mitigation Action #43 - Add Larkin Township under Responsibility / G.H. Larkin Township
Adrian Public Hearing Sign-in Sheet:

Public Meeting Sign In Sheet

Date: January 16, 2018
Time Held: 11:00 AM to 1:00PM
City/County Location: Adrian / Nobles County - MN
Purpose: Hazard Mitigation Public Hearing #1

<table>
<thead>
<tr>
<th>PRINT NAME</th>
<th>SIGNATURE</th>
<th>COMMUNITY AFFILIATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bruce A. Heising</td>
<td></td>
<td>City of Adrian</td>
</tr>
<tr>
<td></td>
<td></td>
<td>USDA - Nobles</td>
</tr>
<tr>
<td>Gary Koenemann</td>
<td></td>
<td>Parkins Top</td>
</tr>
<tr>
<td>Tam Johnson</td>
<td></td>
<td>Nobles County</td>
</tr>
</tbody>
</table>

Reported by: [Signature]
Agency: Southwest Regional Development Commission

The value of participation by volunteer members of the public is $25.20/hour.
The Community Affiliation is if the attendee wish to state a public or private organization they are representing or if they are representing themselves.
Public Comments:

Mitigation Actions - List the lead agency under “Responsibility” column first and indicate in text prior to table that the first agency listed is the lead agency. / R.F. Hospitals

Mitigation Action #3 – Road Flooding – caused by DNR controlled property / J.J. Bloom Township

Mitigation Action #3 - Add Bloom Township under Jurisdictions / J.J. Bloom Township

Mitigation Action #3 – Add Seward township under Jurisdictions / D.D. Seward Township

Mitigation Action #4 - Add Hospitals under Responsibility / R.F. Hospitals

Mitigation Action #11 - Add Bloom Township under Jurisdictions, Bee Stings - Epi Pens needed, township has lots of DNR shallow water, concerns regarding lost hunters / J.J. Bloom Township

Mitigation Action #12 - Add Hospitals under Responsibility / R.F. Hospitals

Mitigation Action #12 – West Nile concerns – increase mosquito numbers caused by DNR controlled property / J.J. Bloom Township

Mitigation Action #13 - Add Hospitals under Responsibility / R.F. Hospitals

Mitigation Action #21 - Add Bloom Township under Jurisdictions, wild fire concerns as there is a need for proper maintenance of DNR lands / J.J. Bloom Township

Mitigation Action #24 – Change wording of mitigation action to reflect all sources of loss of fiber services not just cyber-attacks, also add in under “Comments” column that the regional hospital has protection in place for this hazard/mitigation. / R.F. Hospitals

Mitigation Action #43 - Add Bloom Township under Responsibility / J.J. Bloom Township

Mitigation Action #45 – Could use more road closed signs during flooding. / D.D. Seward Township
## Worthington Public Hearing Sign-in Sheet:

**Public Meeting Sign In Sheet**

<table>
<thead>
<tr>
<th>PRINT NAME</th>
<th>SIGNATURE</th>
<th>COMMUNITY AFFILIATION</th>
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<tbody>
<tr>
<td>James O Joens</td>
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<td>Bloom Township</td>
</tr>
<tr>
<td>David Dunn</td>
<td></td>
<td>Seward Township</td>
</tr>
<tr>
<td>Ron Janssen</td>
<td></td>
<td>Seward Township</td>
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<tr>
<td>Peter Erkkila</td>
<td></td>
<td>NCCS / PH</td>
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<tr>
<td>Kevin Streeten</td>
<td></td>
<td>Bloom TWP</td>
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<tr>
<td>Jay Naukkas</td>
<td></td>
<td>AUD / TREAS.</td>
</tr>
<tr>
<td>Kathy Hendricks</td>
<td>Kathy Hendricks</td>
<td>NCEnv Svc</td>
</tr>
<tr>
<td>Reed Fricke</td>
<td></td>
<td>Sanford Worthing-</td>
</tr>
<tr>
<td>Tony Jacobs</td>
<td></td>
<td>Nobles EM</td>
</tr>
</tbody>
</table>

**Reported by:**

**Agency:** Southwest Regional Development Commission

The value of participation by volunteer members of the public is $25.20/hour.
The Community Affiliation is if the attendee wish to state a public or private organization they are representing or if they are representing themselves.
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Appendix F - Completed & Deleted Actions from the 2011 Plan
### Table 5-6
**Priority Action Items for Nobles County**

<table>
<thead>
<tr>
<th>Mitigation Strategy</th>
<th>Survey Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.1.a.1 Critical facility back-up power</td>
<td>4.7</td>
</tr>
<tr>
<td>A.1.d.5 Hospital back-up power</td>
<td>4.3</td>
</tr>
<tr>
<td>A.1.c.5 Train to ID HazMat spills</td>
<td>4.2</td>
</tr>
<tr>
<td>A.1.a.3 Harden utilities, bury electric lines</td>
<td>4.0</td>
</tr>
<tr>
<td>A.1.b.4 Update EM plan for manufactured home parks</td>
<td>4.0</td>
</tr>
</tbody>
</table>

Source: All-Hazard Mitigation Planning Team

### Table 5-7
**Mitigation Actions by City**

<table>
<thead>
<tr>
<th>Mitigation Strategy</th>
<th>Adrian</th>
<th>Bigelow</th>
<th>Brewster</th>
<th>Dundee</th>
<th>Ellsworth</th>
<th>Kinbrae</th>
<th>Lismore</th>
<th>Round Lake</th>
<th>Rushmore</th>
<th>Wilmont</th>
<th>Worthington</th>
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<tbody>
<tr>
<td>A.1.a.1 Hazard: Winter Storms</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td>A.1.b.1 Hazard: Summer Storms</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
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<td>A.1.b.3</td>
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<td>A.1.d.4 Hazard: Public Health</td>
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<td>X</td>
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<td>A.2.b.1 Hazard: Drought</td>
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<td>B.1.a.1 Hazard: Flooding/Dam Failure</td>
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</table>

Source: All-Hazard Mitigation Planning Team
<table>
<thead>
<tr>
<th>Hazard</th>
<th>Mitigation Action</th>
<th>Priority</th>
<th>Mitigation Type</th>
<th>Status</th>
<th>Timeframe</th>
<th>Jurisdictions</th>
<th>Responsibility</th>
<th>Estimated Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winter Storms</td>
<td>A.1.a.1 – Ensure that critical facilities have access to back up power generators</td>
<td>1</td>
<td>PP</td>
<td>In Progress</td>
<td>2011-2015</td>
<td>Nobles County</td>
<td>NCEM, CIBi, CIBr, CIL, CiRu, CiWi, RWS</td>
<td>Medium</td>
</tr>
<tr>
<td>Winter Storms</td>
<td>A.1.a.2 – Install internet-capable automated weather stations at schools and fire halls</td>
<td></td>
<td>PE</td>
<td>Deferred</td>
<td>2013-2015</td>
<td>Nobles County</td>
<td>NCEM, Fire, Sch, MnWest</td>
<td>Medium</td>
</tr>
<tr>
<td>Winter Storms</td>
<td>A.1.a.3 – Harden utilities, require local electrical distribution lines to be buried where feasible</td>
<td>1</td>
<td>PP</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCEM, NCES, Utilities</td>
<td>High</td>
</tr>
<tr>
<td>Winter Storms</td>
<td>A.1.a.4 – Use road design and living snow fences to help control snow on roadways.</td>
<td></td>
<td>PP</td>
<td>Deleted</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCPW, SWCD, MnDOT</td>
<td>Medium</td>
</tr>
<tr>
<td>Winter Storms</td>
<td>A.1.a.5 – Support amateur radio / communications improvements.</td>
<td></td>
<td>PE</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCEM</td>
<td>Low</td>
</tr>
<tr>
<td>Summer Storms</td>
<td>A.1.b.1 – Conduct a study to determine areas deficient in safe rooms / not covered by warning systems; Construct at least one new safe room or improve warning system in one community each year.</td>
<td>1</td>
<td>SI</td>
<td>Deferred</td>
<td>2011-2015</td>
<td>Nobles County</td>
<td>NCEM,NCES, CIA, CIBi, CIBr, CiD, CiE, CiK, CIL, CiRL, CiRu, CiWi, CiWo, Sch</td>
<td>High</td>
</tr>
<tr>
<td>Summer Storms</td>
<td>A.1.b.2 – Educate local schools, nursing homes, hospitals, etc. on importance of doing “Severe Weather Awareness Week” workshop for their staff, including identifying evacuation routes and safety shelters.</td>
<td>1</td>
<td>PE</td>
<td>In Progress</td>
<td>Annually</td>
<td>Nobles County</td>
<td>NCEM, Sch, Hosp</td>
<td>Low</td>
</tr>
<tr>
<td>Summer Storms</td>
<td>A.1.b.3 – Make nursing home staff aware of the need/importance of providing shelter locations and evacuation routes for nursing home residents in case of severe weather.</td>
<td>1</td>
<td>PE</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NRCHS, CIA, CIE, CiWo</td>
<td>Low</td>
</tr>
<tr>
<td>Summer Storms</td>
<td>A.1.b.4 – Ensure that each manufactured home park has an updated emergency management plan; work with park managers to improve communication during severe storm events; ensure residents are familiar with the emergency management plan and recognize evacuation routes and shelter sites.</td>
<td>1</td>
<td>P</td>
<td>In Progress</td>
<td>2012-2013</td>
<td>Nobles County</td>
<td>NCEM, NCES, CIA, CIBr, CIE, CiRL, CiWo</td>
<td>Medium</td>
</tr>
<tr>
<td>Hazard</td>
<td>Mitigation Action</td>
<td>Priority</td>
<td>Mitigation Type</td>
<td>Status</td>
<td>Timeframe</td>
<td>Jurisdictions</td>
<td>Responsibility</td>
<td>Estimated Cost</td>
</tr>
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<td>-------------------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Summer Storms</td>
<td>A.1.b.5 – Encourage all residents &amp; public buildings to have and use NOAA Public Alert radios with SAME technology.</td>
<td>1</td>
<td>P</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCEM,NCES, CIA, CiBi, CiBr, CID, CiE, CiK, CiL, CiRL, CiRu, CiWi, CiWo, Sch</td>
<td>Low</td>
</tr>
<tr>
<td>HazMat</td>
<td>A.1.c.1 – Develop Geographic Information Systems (GIS) capability to map locations of fixed facilities using hazardous materials and associated transportation corridors.</td>
<td>1</td>
<td>P</td>
<td>In Progress</td>
<td>2015</td>
<td>Nobles County</td>
<td>NCEM, NCES, CiWo</td>
<td>Medium</td>
</tr>
<tr>
<td>HazMat</td>
<td>A.1.c.2 – Update the County water plan to include all potential groundwater contaminants.</td>
<td>1</td>
<td>P</td>
<td>In Progress</td>
<td>2012-2013</td>
<td>Nobles County</td>
<td>NCES, SWCD, BWSR</td>
<td>Medium</td>
</tr>
<tr>
<td>HazMat</td>
<td>A.1.c.3 – Educate county residents, farmers and businesses on potential impact of hazardous material spills.</td>
<td>1</td>
<td>PE</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCEM, MPCA</td>
<td>Low</td>
</tr>
<tr>
<td>HazMat</td>
<td>A.1.c.4 – Increase awareness of the household hazardous waste facility, its importance, and how to utilize its services.</td>
<td>1</td>
<td>PE</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCPW</td>
<td>Low</td>
</tr>
<tr>
<td>HazMat</td>
<td>A.1.c.5 – Train County emergency personnel so that all types of potential spills will be readily recognized upon arrival at the scene.</td>
<td>1</td>
<td>PE</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCEM, Fire, LE</td>
<td>Low</td>
</tr>
<tr>
<td>Public Health</td>
<td>A.1.d.1 – Improve coordination and communication with the local media</td>
<td>1</td>
<td>PE</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCEM, NRCHS</td>
<td>Low</td>
</tr>
<tr>
<td>Public Health</td>
<td>A.1.d.2 – Work with MDH on the mass distribution of needed medicines and supplies for public health emergencies.</td>
<td>1</td>
<td>ES</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCEM, NRCHS, Hosp</td>
<td>Low</td>
</tr>
<tr>
<td>Public Health</td>
<td>A.1.d.3 – Develop a quarantine plan in coordination with local doctors and other health professionals.</td>
<td>1</td>
<td>ES</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCEM, NRCS, NCSO, LE</td>
<td>Low</td>
</tr>
<tr>
<td>Public Health</td>
<td>A.1.d.4 – Develop a West Nile Virus protection plan.</td>
<td>1</td>
<td>P</td>
<td>Deferred</td>
<td>Annually</td>
<td>Nobles County</td>
<td>NRCHS, CIA, CiBi, CiBr, CiWi, CiWo, CiWi, CiWo</td>
<td>Medium</td>
</tr>
<tr>
<td>Public Health</td>
<td>A.1.d.5 – Ensure that hospitals have access to back up power generators. Examine needs and costs for providing back up power generation where none currently exists.</td>
<td>1</td>
<td>PP, ES</td>
<td>Complete</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCEM, NRCHS1</td>
<td>Medium</td>
</tr>
<tr>
<td>Hazard</td>
<td>Mitigation Action</td>
<td>Priority</td>
<td>Mitigation Type</td>
<td>Status</td>
<td>Timeframe</td>
<td>Jurisdictions</td>
<td>Responsibility</td>
<td>Estimated Cost</td>
</tr>
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</tr>
<tr>
<td>Ag Disease</td>
<td>A.2.a.1 – Provide information on agricultural disease and prevention to producers and residents.</td>
<td>2</td>
<td>PE</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCES, SWCD, FSA</td>
<td>Low</td>
</tr>
<tr>
<td>Ag Disease</td>
<td>A.2.a.2 – Review the Emergency Operations Plan for response and care of animals, including disposal, in a hazard event.</td>
<td>2</td>
<td>ES</td>
<td>In Progress</td>
<td>2011-2012</td>
<td>Nobles County</td>
<td>NCEM, MDA, MPCA</td>
<td>Medium</td>
</tr>
<tr>
<td>Drought</td>
<td>A.2.b.1 - Work with the Minnesota Department of Health to develop and implement Wellhead Protection Plans</td>
<td>2</td>
<td>P</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCES, CIA, CiBR, CiD, CiE, CiK, CiRL, CiRu, CiWI, CiWo, Leota, Reading, SWCD</td>
<td>Medium</td>
</tr>
<tr>
<td>Drought</td>
<td>A.2.b.2 – Develop ordinances that contain conservation provisions and use restrictions in times of severe drought.</td>
<td>2</td>
<td>P</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCEM, NCES</td>
<td>Medium</td>
</tr>
<tr>
<td>Drought</td>
<td>A.2.b.3 – Work to provide Rural Water Service within the entire county.</td>
<td>2</td>
<td>P</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCPW, RWS, USDA</td>
<td>Low</td>
</tr>
<tr>
<td>Structure Fires</td>
<td>A.2.d.1 – Encourage building construction to include fire/smoke alarms and sprinkler systems.</td>
<td>2</td>
<td>P</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>Fire, NCES</td>
<td>Low</td>
</tr>
<tr>
<td>Structure Fires</td>
<td>A.2.d.2 – Investigate building code adoption.</td>
<td>2</td>
<td>PE</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>Fire, NCES</td>
<td>Low</td>
</tr>
<tr>
<td>Wildfire</td>
<td>A.3.a.1 – Develop management plans that outline the scheduled maintenance of Conservation properties.</td>
<td>3</td>
<td>P</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCPW, SWCD, Fire, DNR, FSA</td>
<td>Medium</td>
</tr>
<tr>
<td>Terrorism</td>
<td>A.3.a.1 – Update Nobles County Emergency Operations Plan to reflect possible worst-case scenarios for civil unrest (domestic terrorism).</td>
<td>3</td>
<td>P</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCEM, NCSO, LE</td>
<td>High</td>
</tr>
<tr>
<td>Terrorism</td>
<td>A.3.a.1 – Complete and maintain thorough community risk and threat assessments.</td>
<td>3</td>
<td>ES</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCEM, NCSO, LE</td>
<td>Low</td>
</tr>
<tr>
<td>Terrorism</td>
<td>A.3.a.1 – Limit public access to high profile critical facilities, following the Department of Homeland Security warning systems.</td>
<td>3</td>
<td>P</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCEM, NCSO, LE</td>
<td>Medium</td>
</tr>
<tr>
<td>Plan Maintenance</td>
<td>A.4.a.1 – Budget to perform additional data collection and analysis to identify vulnerable structures in specific detail in next plan update.</td>
<td>-</td>
<td>P</td>
<td>In Progress</td>
<td>2012-2013</td>
<td>Nobles County</td>
<td>NCEM</td>
<td>Medium</td>
</tr>
<tr>
<td>Hazard</td>
<td>Mitigation Action</td>
<td>Priority</td>
<td>Mitigation Type</td>
<td>Status</td>
<td>Timeframe</td>
<td>Jurisdictions</td>
<td>Responsibility</td>
<td>Estimated Cost</td>
</tr>
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</tr>
<tr>
<td>Plan Maintenance</td>
<td>A.4.a.1 – Budget to perform estimates of potential monetary losses to structures, contents, and functions in specific detail in next plan update.</td>
<td>-</td>
<td>P</td>
<td>In Progress</td>
<td>2012-2013</td>
<td>Nobles County</td>
<td>NCEM</td>
<td>Medium</td>
</tr>
<tr>
<td>Flood / Dam</td>
<td>B.1.a.1 – Work with DNR and FEMA to adopt digital floodplain maps and update ordinances.</td>
<td>2</td>
<td>P</td>
<td>Complete</td>
<td>2011</td>
<td>Nobles County</td>
<td>NCES, CiA, CiE, CiWo</td>
<td>Low</td>
</tr>
<tr>
<td>Flood / Dam</td>
<td>B.1.a.2 – Encourage sewered communities to assess infiltration to reduce extra flow in storm events.</td>
<td>2</td>
<td>SI</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCES, MPCA</td>
<td>High</td>
</tr>
<tr>
<td>Flood / Dam</td>
<td>B.1.a.3 – Adopt buffer system and Best Management Practices (BMP,s) in agricultural lands within the flood fringe areas.</td>
<td>2</td>
<td>NRP</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCES, SWCD, FSA</td>
<td>Low</td>
</tr>
<tr>
<td>Flood / Dam</td>
<td>B.1.a.4 – Continue to indicate on zoning forms if property is a flood hazard area.</td>
<td>2</td>
<td>PP</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCES, CiA, CiWo</td>
<td>Low</td>
</tr>
<tr>
<td>Flood / Dam</td>
<td>B.1.a.5 – Encourage all property owners in flood hazard areas to purchase flood insurance.</td>
<td>2</td>
<td>PE</td>
<td>Deferred</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCEM, NCES, CiA, CiWo</td>
<td>Low</td>
</tr>
<tr>
<td>Flood / Dam</td>
<td>B.1.a.6 – Develop a program to voluntarily acquire, relocate or elevate at-risk structures in floodplains.</td>
<td>2</td>
<td>PP</td>
<td>Deferred</td>
<td>2013-2015</td>
<td>Nobles County</td>
<td>NCEM, NCES, CiA, CiWo</td>
<td>High</td>
</tr>
<tr>
<td>Flood / Dam</td>
<td>B.1.a.7 – Implement County Ditch 12 Flood Reduction Plan.</td>
<td>2</td>
<td>NRP</td>
<td>In Progress</td>
<td>2011-2013</td>
<td>Nobles County</td>
<td>CiWo, NCPW, Watershed Districts</td>
<td>High</td>
</tr>
<tr>
<td>Flood / Dam</td>
<td>B.1.a.8 – Monitor dams and ditches for maintenance and repair needs.</td>
<td>2</td>
<td>NRP</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>DNR, CiA, CiWo, Watershed Districts</td>
<td>Low</td>
</tr>
</tbody>
</table>
Appendix G - Mitigation Actions by Jurisdiction

Table G – 1. Mitigation Action Identified for Jurisdictional Implementation in the City of Adrian
Table G – 2. Mitigation Action Identified for Jurisdictional Implementation in the City of Bigelow
Table G – 3. Mitigation Action Identified for Jurisdictional Implementation in the City of Brewster
Table G – 4. Mitigation Action Identified for Jurisdictional Implementation in the City of Dundee
Table G – 5. Mitigation Action Identified for Jurisdictional Implementation in the City of Ellsworth
Table G – 6. Mitigation Action Identified for Jurisdictional Implementation in the City of Kinbrae
Table G – 7. Mitigation Action Identified for Jurisdictional Implementation in the City of Lismore
Table G – 8. Mitigation Action Identified for Jurisdictional Implementation in the City of Round Lake
Table G – 9. Mitigation Action Identified for Jurisdictional Implementation in the City of Rushmore
Table G – 10. Mitigation Action Identified for Jurisdictional Implementation in the City of Wilmont
Table G –11. Mitigation Action Identified for Jurisdictional Implementation in the City of Worthington
<table>
<thead>
<tr>
<th>Action Number</th>
<th>Hazard</th>
<th>City of Adrian Mitigation Action</th>
<th>Priority</th>
<th>Status</th>
<th>Time-frame</th>
<th>Jurisdictions</th>
<th>Responsibility</th>
<th>Est. Cost/ Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>W-Storms / Flood / Trans Inf</td>
<td>Use road design to help control snow on roadways and mitigate flooding.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Cities Townships including Bloom, Larkin, Olney, and Seward</td>
<td>NCPW, NCES, MnDOT, Twps, CiA, CiBi, CiBr, CiD, CiE, CiK, CiL, CiRL, CiRu, CiWi, CiWo</td>
<td>Unknown</td>
</tr>
<tr>
<td>5</td>
<td>S-Storms</td>
<td>Conduct a study to determine areas deficient in safe rooms/not covered by warning systems; Construct at least one new safe room or improve warning system in one community each year (including county and municipal parks), maintain or upgrade sirens in place, and install new warning sirens in identified underserved population areas.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Adrian, Bigelow, Brewster, Dundee, Ellsworth, Kinbrae, Lismore, Round Lake, Rushmore, Wilmont, Worthington</td>
<td>NCEM, NCES, CiA, CiBi, CiBr, CiD, CiE, CiK, CiL, CiRL, CiRu, CiWi, CiWo</td>
<td>High / Unknown</td>
</tr>
<tr>
<td>Action Number</td>
<td>Hazard</td>
<td>City of Adrian Mitigation Action</td>
<td>Priority</td>
<td>Status</td>
<td>Time-frame</td>
<td>Jurisdictions</td>
<td>Responsibility</td>
<td>Est. Cost/ Source</td>
</tr>
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</tr>
<tr>
<td>6</td>
<td>S-Storms</td>
<td>Educate local schools, nursing homes, hospitals, public and private sectors, etc. on importance of doing “Severe Weather Awareness Week” workshop for their staff, including identifying evacuation routes and safety shelters; Encourage all residents and public buildings to have and use NOAA Public Alert Radios with SAME technology; encourage staff and residents to sign up for Nixle alerts.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing Annually</td>
<td>Nobles County</td>
<td>NCEM, Sch, all, Hosp., all cities</td>
<td>Low / Unknown</td>
</tr>
<tr>
<td>7</td>
<td>S-Storms</td>
<td>Make nursing home staff aware of the need/importance of providing shelter locations and evacuation routes for nursing home residents in case of severe weather.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Adrian, Ellsworth, Worthington</td>
<td>NCEM, NCCS/PH, CiA, CiE, CiWo</td>
<td>Low / Unknown</td>
</tr>
<tr>
<td>8</td>
<td>S-Storms</td>
<td>Ensure that each manufactured home park has an updated emergency plan; work with park managers and owners to improve communication during severe storm events; ensure residents are familiar with the emergency plan and recognize evacuation routes and shelter sites.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County (HP), Brewster, Worthington</td>
<td>NCEM, NCES, CiA, CiBr, CiE, CiRL, CiWo</td>
<td>Medium / Unknown</td>
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</tr>
<tr>
<td>9</td>
<td>S- Storms</td>
<td>To mitigate damage to electric lines and/or road closures, keep trees trimmed or removed along roadways and remove debris after storms.</td>
<td>1</td>
<td>New</td>
<td>Ongoing</td>
<td>Nobles County, Cities, Townships including Olney, Larkin, Round Lake</td>
<td>All Twps all Cities, NCPW, NCE, CiRL</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Fire</td>
<td>Encourage building construction to include fire/smoke alarms and sprinkler systems.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>Fire, NCES, all Cities</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Fire</td>
<td>Investigate building code adoption.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>Fire, NCES, all cities</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Utility</td>
<td>Cooperate with county/state to improve access to cellular services and broadband access for all of Nobles County.</td>
<td>1</td>
<td>New</td>
<td>Ongoing</td>
<td>Nobles County, Olney Township</td>
<td>Nobles County, NCEM, all Cities, all Twps, Sch</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Drought</td>
<td>Work with the Minnesota Department of Health to develop and implement Wellhead Protection Plans.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Adrian, Brewster, Dundee, Ellsworth, Kinbrae, Round Lake, Rushmore, Wilmont, Worthington</td>
<td>NCES, CiA, CiBr, CiD, CiE, CiK, CiRL, CiRu, CiWi, CiWo, Leota, Reading, SWCD, RWS, LPRW, RRRW, OCRW</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Flood</td>
<td>Encourage sewered communities to address infiltration to reduce extra flow in storm events; Inspect, maintain, and repair area sewage lagoons to ensure adequate capacity and operation.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, All sewered cities</td>
<td>NCES, MPCA, NCPW, Local PW, all sewered cities</td>
<td></td>
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<tr>
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</tr>
<tr>
<td>40</td>
<td>Flood</td>
<td>Continue to indicate on zoning forms if property is a flood hazard area.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Adrian, Worthington</td>
<td>NCES, CiA, CiWo</td>
<td>Low / Unknown</td>
</tr>
<tr>
<td>41</td>
<td>Flood</td>
<td>Develop a program to voluntarily acquire, relocate or elevate at-risk structures in floodplains.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Adrian, Worthington</td>
<td>NCES, NCEM, CiA, CiWo</td>
<td>High / Unknown</td>
</tr>
<tr>
<td>43</td>
<td>Flood</td>
<td>Monitor and inspect dams, ditches, culverts, and bridges for maintenance, repair, and replacement needs.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, all Twps including Olney</td>
<td>DNR, NCPW, CiA, CiWo, all SWCD</td>
<td>Low / Unknown</td>
</tr>
</tbody>
</table>
### Table G – 2. Mitigation Action Identified for Jurisdictional Implementation in the City of Bigelow

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>W-Storms / S-Storms</td>
<td>Ensure that critical facilities have access to back up power generators.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County (HP), Bigelow, Brewster, Ellsworth, Lismore, Round Lake, Rushmore, Wilmont, Worthington</td>
<td>NCEM, CiBi, CiBr, CiE, CiL, CiRL, CiRu, CiWi, CiWo, RWS, Leota Twps,</td>
<td>Worthington has capability to do rolling power.</td>
<td>Medium / Unknown</td>
</tr>
<tr>
<td>3</td>
<td>W-Storms / Flood / Trans Inf</td>
<td>Use road design to help control snow on roadways and mitigate flooding.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Cities Townships including Bloom, Larkin, Olney, and Seward</td>
<td>NCPW, NCES, MnDOT, Twps, CiA, CiBi, CiBr, CID, CIE, CiK, CiL, CiRL, CiRu, CiWi, CiWo</td>
<td>Cut down hills to remove snow drifting. Excavate, remove unused fences, and replant area ditches for adequate water flow and water evacuation. Inspect and repair roads, culverts, ditches for improvements to mitigate snow blockage and water damage.</td>
<td>Unknown</td>
</tr>
<tr>
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</tr>
<tr>
<td>5</td>
<td>S-Storms</td>
<td>Conduct a study to determine areas deficient in safe rooms/not covered by warning systems; Construct at least one new safe room or improve warning system in one community each year (including county and municipal parks), maintain or upgrade sirens in place, and install new warning sirens in identified underserved population areas.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Adrian, Bigelow, Brewster, Dundee, Ellsworth, Kinbrae, Lismore, Round Lake, Rushmore, Wilmont, Worthington</td>
<td>NCEM, NCES, CiA, CiBi, CiBr, CiD, CiE, CiK, CiL, CiRL, CiRu, CiWi, CiWo, Sch - all</td>
<td>High / Unknown</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>S-Storms</td>
<td>Educate local schools, nursing homes, hospitals, public and private sectors, etc. on importance of doing “Severe Weather Awareness Week” workshop for their staff, including identifying evacuation routes and safety shelters; Encourage all residents and public buildings to have and use NOAA Public Alert Radios with SAME technology; encourage staff and residents to sign up for Nixle alerts.</td>
<td>1</td>
<td>In Progress</td>
<td>Annually</td>
<td>Nobles County</td>
<td>NCEM, Sch, all, Hosp., all cities</td>
<td>Low / Unknown</td>
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</tr>
<tr>
<td>9</td>
<td>S-Storms</td>
<td>To mitigate damage to electric lines and/or road closures, keep trees trimmed or removed along roadways and remove debris after storms.</td>
<td>1</td>
<td>New</td>
<td>Ongoing</td>
<td>Nobles County, Cities, Townships including Olney, Larkin, Round Lake</td>
<td>All Twps all Cities, NCPW, NCE, CiRL</td>
<td></td>
<td>Medium / Cities, Twps, County, State</td>
</tr>
<tr>
<td>18</td>
<td>Fire</td>
<td>Encourage building construction to include fire/smoke alarms and sprinkler systems.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>Fire, NCES, all Cities</td>
<td></td>
<td>Low / Unknown</td>
</tr>
<tr>
<td>19</td>
<td>Fire</td>
<td>Investigate building code adoption.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>Fire, NCES, all cities</td>
<td></td>
<td>Low / Unknown</td>
</tr>
<tr>
<td>23</td>
<td>Utility</td>
<td>Cooperate with county/state to improve access to cellular services and broadband access for all of Nobles County.</td>
<td>1</td>
<td>New</td>
<td>Ongoing</td>
<td>Nobles County, Olney Township</td>
<td>Nobles County, NCEM, all Cities, all Twps, Sch</td>
<td></td>
<td>High / Unknown</td>
</tr>
<tr>
<td>31</td>
<td>Drought</td>
<td>Work with the Minnesota Department of Health to develop and implement Wellhead Protection Plans.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Adrian, Brewster, Dundee, Ellsworth, Kinbrae, Round Lake, Rushmore, Wilmont, Worthington</td>
<td>NCES, CiA, CiBr, CiD, CiE, CiK, CiRL, CiRu, CiWi, CiWo, Leota, Reading, SWCD, RWS, LPRW, RRRW, OCRW</td>
<td></td>
<td>Medium / Unknown</td>
</tr>
<tr>
<td>38</td>
<td>Flood</td>
<td>Encourage sewered communities to address infiltration to reduce extra flow in storm events; Inspect, maintain, and repair area sewage lagoons to ensure adequate capacity and operation.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, All sewered cities</td>
<td>NCES, MPCA, NCPW, Local PW, all sewered cities</td>
<td></td>
<td>High / Unknown</td>
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### Table G – 3. Mitigation Action Identified for Jurisdictional Implementation in the City of Brewster

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</thead>
<tbody>
<tr>
<td>1</td>
<td>W-Storms / S-Storms</td>
<td>Ensure that critical facilities have access to back up power generators.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County (HP), Bigelow, Brewster, Ellsworth, Lismore, Round Lake, Rushmore, Wilmont, Worthington</td>
<td>NCEM, CiBi, CiBr, CiE, CiL, CiRL, CiRu, CiWi, CiWo, RWS, Leota Twps,</td>
<td>Worthington has capability to do rolling power.</td>
<td>Medium / Unknown</td>
</tr>
<tr>
<td>3</td>
<td>W-Storms / Flood / Trans Inf</td>
<td>Use road design to help control snow on roadways and mitigate flooding.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Cities Townships including Bloom, Larkin, Olney, and Seward</td>
<td>NCPW, NCES, MnDOT, Twps, CiA, CiBi, CiBr, CiD, CiE, CiK, CiL, CiRL, CiRu, CiWi, CiWo</td>
<td>Cut down hills to remove snow drifting. Excavate, remove unused fences, and replant area ditches for adequate water flow and water evacuation. Inspect and repair roads, culverts, ditches for improvements to mitigate snow blockage and water damage.</td>
<td>Unknown</td>
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</tr>
<tr>
<td>5</td>
<td>S-Storms</td>
<td>Conduct a study to determine areas deficient in safe rooms/not covered by warning systems; Construct at least one new safe room or improve warning system in one community each year (including county and municipal parks), maintain or upgrade sirens in place, and install new warning sirens in identified underserved population areas.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Adrian, Bigelow, Brewster, Dundee, Ellsworth, Kinbrae, Lismore, Round Lake, Rushmore, Wilmont, Worthington</td>
<td>NCEM, NCES, CiA, CiBi, CiBr, CiD, CiE, CiK, CiL, CiRL, CiRu, CiWi, CiWo, Sch - all</td>
<td>High / Unknown</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>S-Storms</td>
<td>Educate local schools, nursing homes, hospitals, public and private sectors, etc. on importance of doing “Severe Weather Awareness Week” workshop for their staff, including identifying evacuation routes and safety shelters; Encourage all residents and public buildings to have and use NOAA Public Alert Radios with SAME technology; encourage staff and residents to sign up for Nixle alerts.</td>
<td>1</td>
<td>In Progress</td>
<td>Annually</td>
<td>Nobles County</td>
<td>NCEM, Sch, all, Hosp., all cities</td>
<td>Low / Unknown</td>
<td></td>
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<tr>
<td>8</td>
<td>S-Storms</td>
<td>Ensure that each manufactured home park has an updated emergency plan; work with park managers and owners to improve communication during severe storm events; ensure residents are familiar with the emergency plan and recognize evacuation routes and shelter sites.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County (HP), Brewster, Worthington</td>
<td>NCEM, NCES, CiA, CiBr, CiE, CiRL, CiWo</td>
<td></td>
<td>Medium / Unknown</td>
</tr>
<tr>
<td>9</td>
<td>S-Storms</td>
<td>To mitigate damage to electric lines and/or road closures, keep trees trimmed or removed along roadways and remove debris after storms.</td>
<td>1</td>
<td>New</td>
<td>Ongoing</td>
<td>Nobles County, Cities, Townships including Olney, Larkin, Round Lake</td>
<td>All Twps all Cities, NCPW, NCE, CiRL</td>
<td></td>
<td>Medium / Cities, Twps, County, State</td>
</tr>
<tr>
<td>18</td>
<td>Fire</td>
<td>Encourage building construction to include fire/smoke alarms and sprinkler systems.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>Fire, NCES, all Cities</td>
<td></td>
<td>Low / Unknown</td>
</tr>
<tr>
<td>19</td>
<td>Fire</td>
<td>Investigate building code adoption.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>Fire, NCES, all cities</td>
<td></td>
<td>Low / Unknown</td>
</tr>
<tr>
<td>23</td>
<td>Utility</td>
<td>Cooperate with county/state to improve access to cellular services and broadband access for all of Nobles County.</td>
<td>1</td>
<td>New</td>
<td>Ongoing</td>
<td>Nobles County, Olney Township</td>
<td>Nobles County, NCEM, all Cities, all Twps, Sch</td>
<td></td>
<td>High / Unknown</td>
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<tr>
<td>31</td>
<td>Drought</td>
<td>Work with the Minnesota Department of Health to develop and implement Wellhead Protection Plans.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Adrian, Brewster, Dundee, Ellsworth, Kinbrae, Round Lake, Rushmore, Wilmont, Worthington</td>
<td>NCES, CiA, CiBr, CiD, CiE, CiK, CiRL, CiRu, CiWi, CiWo, Leota, Reading, SWCD, RWS, LPRW, RRRW, OCRW</td>
<td>Medium / Unknown</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Flood</td>
<td>Encourage sewered communities to address infiltration to reduce extra flow in storm events; Inspect, maintain, and repair area sewage lagoons to ensure adequate capacity and operation.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, All sewered cities</td>
<td>NCES, MPCA, NCPW, Local PW, all sewered cities</td>
<td>High / Unknown</td>
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### Table G – 4. Mitigation Action Identified for Jurisdictional Implementation in the City of Dundee

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</thead>
<tbody>
<tr>
<td>3</td>
<td>W-Storms / Flood / Trans Inf</td>
<td>Use road design to help control snow on roadways and mitigate flooding.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Cities Townships including Bloom, Larkin, Olney, and Seward</td>
<td>NCPW, NCES, MnDOT, Twps, CiA, CiBi, CiBr, CID, CIE, CIK, CIL, CiRL, CiRu, CiWi, CiWo</td>
<td>Cut down hills to remove snow drifting. Excavate, remove unused fences, and replant area ditches for adequate water flow and water evacuation. Inspect and repair roads, culverts, ditches for improvements to mitigate snow blockage and water damage.</td>
<td>Unknown</td>
</tr>
<tr>
<td>5</td>
<td>S-Storms</td>
<td>Conduct a study to determine areas deficient in safe rooms/not covered by warning systems; Construct at least one new safe room or improve warning system in one community each year (including county and municipal parks), maintain or upgrade sirens in place, and install new warning sirens in identified underserved population areas.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Adrian, Bigelow, Brewster, Dundee, Ellsworth, Kinbrae, Lismore, Round Lake, Rushmore, Wilmont, Worthington</td>
<td>NCEM, NCES, CiA, CiBi, CiBr, CID, CIE, CIK, CIL, CiRL, CiRu, CiWi, CiWo, Sch - all</td>
<td>High / Unknown</td>
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<tr>
<td>6</td>
<td>S-Storms</td>
<td>Educate local schools, nursing homes, hospitals, public and private sectors, etc. on importance of doing “Severe Weather Awareness Week” workshop for their staff, including identifying evacuation routes and safety shelters; Encourage all residents and public buildings to have and use NOAA Public Alert Radios with SAME technology; encourage staff and residents to sign up for Nixle alerts.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing Annually</td>
<td>Nobles County</td>
<td>NCEM, Sch, all, Hosp., all cities</td>
<td></td>
<td>Low / Unknown</td>
</tr>
<tr>
<td>9</td>
<td>S-Storms</td>
<td>To mitigate damage to electric lines and/or road closures, keep trees trimmed or removed along roadways and remove debris after storms.</td>
<td>1</td>
<td>New</td>
<td>Ongoing</td>
<td>Nobles County, Cities, Townships including Olney, Larkin, Round Lake</td>
<td>All Twps all Cities, NCPW, NCE, CiRL</td>
<td></td>
<td>Medium / Cities, Twps, County, State</td>
</tr>
<tr>
<td>18</td>
<td>Fire</td>
<td>Encourage building construction to include fire/smoke alarms and sprinkler systems.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>Fire, NCES, all Cities</td>
<td></td>
<td>Low / Unknown</td>
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<tr>
<td>19</td>
<td>Fire</td>
<td>Investigate building code adoption.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>Fire, NCES, all cities</td>
<td></td>
<td>Low / Unknown</td>
</tr>
<tr>
<td>23</td>
<td>Utility</td>
<td>Cooperate with county/state to improve access to cellular services and broadband access for all of Nobles County.</td>
<td>1</td>
<td>New</td>
<td>Ongoing</td>
<td>Nobles County, Olney Township</td>
<td>Nobles County, NCEM, all Cities, all Twps, Sch</td>
<td></td>
<td>High / Unknown</td>
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</tr>
<tr>
<td>31</td>
<td>Drought</td>
<td>Work with the Minnesota Department of Health to develop and implement Wellhead Protection Plans.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Adrian, Brewster, Dundee, Ellsworth, Kinbrae, Round Lake, Rushmore, Wilmont, Worthington</td>
<td>NCES, CiA, CiBr, CiD, CiE, CiK, CiRL, CiRu, CiWi, CiWo, Leota, Reading, SWCD, RWS, LPRW, RRRW, OCRW</td>
<td>Medium / Unknown</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Flood</td>
<td>Encourage sewer communities to address infiltration to reduce extra flow in storm events; Inspect, maintain, and repair area sewage lagoons to ensure adequate capacity and operation.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, All sewered cities</td>
<td>NCES, MPCA, NCPW, Local PW, all sewered cities</td>
<td>High / Unknown</td>
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### Table G – 5. Mitigation Action Identified for Jurisdictional Implementation in the City of Ellsworth

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</thead>
<tbody>
<tr>
<td>1</td>
<td>W-Storms / S-Storms</td>
<td>Ensure that critical facilities have access to back up power generators.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County (HP), Bigelow, Brewster, Ellsworth, Lismore, Round Lake, Rushmore, Wilmont, Worthington</td>
<td>NCEM, CiBi, CiBr, CiE, CiL, CiRL, CiRu, CiWi, CiWo, RWS, Leota Twps,</td>
<td>Worthington has capability to do rolling power.</td>
<td>Medium / Unknown</td>
</tr>
<tr>
<td>3</td>
<td>W-Storms / Flood / Trans Inf</td>
<td>Use road design to help control snow on roadways and mitigate flooding.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Cities Townships including Bloom, Larkin, Olney, and Seward</td>
<td>NCPW, NCES, MnDOT, Twps, CiA, CiBi, CiBr, CID, CiE, CiK, CiL, CiRL, CiRu, CiWi, CiWo</td>
<td>Cut down hills to remove snow drifting. Excavate, remove unused fences, and replant area ditches for adequate water flow and water evacuation. Inspect and repair roads, culverts, ditches for improvements to mitigate snow blockage and water damage.</td>
<td>Unknown</td>
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<tr>
<td>5</td>
<td>S-Storms</td>
<td>Conduct a study to determine areas deficient in safe rooms/not covered by warning systems; Construct at least one new safe room or improve warning system in one community each year (including county and municipal parks), maintain or upgrade sirens in place, and install new warning sirens in identified underserved population areas.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Adrian, Bigelow, Brewster, Dundee, Ellsworth, Kinbrae, Lismore, Round Lake, Rushmore, Wilmont, Worthington</td>
<td>NCEM, NCES, CI-A, CI-BI, CI-Br, CI-D, CI-E, CI-K, CI-L, CI-RL, CI-Ru, CI-Wi, CI-Wo, Sch - all</td>
<td>High / Unknown</td>
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</tr>
<tr>
<td>6</td>
<td>S-Storms</td>
<td>Educate local schools, nursing homes, hospitals, public and private sectors, etc. on importance of doing “Severe Weather Awareness Week” workshop for their staff, including identifying evacuation routes and safety shelters; Encourage all residents and public buildings to have and use NOAA Public Alert Radios with SAME technology; encourage staff and residents to sign up for Nixle alerts.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing Annually</td>
<td>Nobles County</td>
<td>NCEM, Sch, all, Hosp., all cities</td>
<td>Low / Unknown</td>
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<tr>
<td>8</td>
<td>S-Storms</td>
<td>Ensure that each manufactured home park has an updated emergency plan; work with park managers and owners to improve communication during severe storm events; ensure residents are familiar with the emergency plan and recognize evacuation routes and shelter sites.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County (HP), Brewster, Worthington</td>
<td>NCEM, NCES, CiA, CiBr, CiE, CiRL, CiWo</td>
<td></td>
<td>Medium / Unknown</td>
</tr>
<tr>
<td>9</td>
<td>S-Storms</td>
<td>To mitigate damage to electric lines and/or road closures, keep trees trimmed or removed along roadways and remove debris after storms.</td>
<td>1</td>
<td>New</td>
<td>Ongoing</td>
<td>Nobles County, Cities, Townships including Olney, Larkin, Round Lake</td>
<td>All Twps all Cities, NCPW, NCE, CiRL</td>
<td></td>
<td>Medium / Cities, Twps, County, State</td>
</tr>
<tr>
<td>18</td>
<td>Fire</td>
<td>Encourage building construction to include fire/smoke alarms and sprinkler systems.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>Fire, NCES, all Cities</td>
<td></td>
<td>Low / Unknown</td>
</tr>
<tr>
<td>19</td>
<td>Fire</td>
<td>Investigate building code adoption.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>Fire, NCES, all cities</td>
<td></td>
<td>Low / Unknown</td>
</tr>
<tr>
<td>23</td>
<td>Utility</td>
<td>Cooperate with county/state to improve access to cellular services and broadband access for all of Nobles County.</td>
<td>1</td>
<td>New</td>
<td>Ongoing</td>
<td>Nobles County, Olney Township</td>
<td>Nobles County, NCEM, all Cities, all Twps, Sch</td>
<td></td>
<td>High / Unknown</td>
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<tr>
<td>31</td>
<td>Drought</td>
<td>Work with the Minnesota Department of Health to develop and implement Wellhead Protection Plans.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Adrian, Brewster, Dundee, Ellsworth, Kinbrae, Round Lake, Rushmore, Wilmont, Worthington</td>
<td>NCES, CiA, CiBr, CiD, CiE, CiK, CiRL, CiRu, CiWi, CiWo, Leota, Reading, SWCD, RWS, LPRW, RRRW, OCRW</td>
<td>Medium / Unknown</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Flood</td>
<td>Encourage sewer communities to address infiltration to reduce extra flow in storm events; Inspect, maintain, and repair area sewage lagoons to ensure adequate capacity and operation.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, All sewered cities</td>
<td>NCES, MPCA, NCPW, Local PW, all sewered cities</td>
<td>High / Unknown</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>Flood</td>
<td>Develop, plan and implement flood reduction plan for the ditch which runs from east side of state highway 91 to Mulberry Street.</td>
<td>1</td>
<td>In Progress</td>
<td>Unknown</td>
<td>CiE</td>
<td>CiE, Nobles, State of MN</td>
<td>Excessive rainfall too much for storm sewer to handle. Ditch runs through implement dealer to the west.</td>
<td>Medium / FEMA, State</td>
</tr>
</tbody>
</table>
Table G - 6. Mitigation Action Identified for Jurisdictional Implementation in the City of Kinbrae

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>W-Storms / Flood / Trans Inf</td>
<td>Use road design to help control snow on roadways and mitigate flooding.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Cities Townships including Bloom, Larkin, Olney, and Seward</td>
<td>NCPW, NCES, MnDOT, Twps, CiA, CiBi, CiBr, CID, CIE, CiK, CiL, CiRL, CiRu, CiWi, CiWo</td>
<td>Cut down hills to remove snow drifting. Excavate, remove unused fences, and replant area ditches for adequate water flow and water evacuation. Inspect and repair roads, culverts, ditches for improvements to mitigate snow blockage and water damage.</td>
<td>Unknown</td>
</tr>
<tr>
<td>5</td>
<td>S-Storms</td>
<td>Conduct a study to determine areas deficient in safe rooms/not covered by warning systems; Construct at least one new safe room or improve warning system in one community each year (including county and municipal parks), maintain or upgrade sirens in place, and install new warning sirens in identified underserved population areas.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Adrian, Bigelow, Brewster, Dundee, Ellsworth, Kinbrae, Lismore, Round Lake, Rushmore, Wilmont, Worthington</td>
<td>NCEM, NCES, CiA, CiBi, CiBr, CiD, CIE, CiK, CiL, CiRL, CiRu, CiWi, CiWo, Sch - all</td>
<td>High / Unknown</td>
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</tr>
<tr>
<td>6</td>
<td>S- Storms</td>
<td>Educate local schools, nursing homes, hospitals, public and private sectors, etc. on importance of doing “Severe Weather Awareness Week” workshop for their staff, including identifying evacuation routes and safety shelters; Encourage all residents and public buildings to have and use NOAA Public Alert Radios with SAME technology; encourage staff and residents to sign up for Nixle alerts.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing Annually</td>
<td>Nobles County</td>
<td>NCEM, Sch, all, Hosp., all cities</td>
<td>N/A</td>
<td>Low / Unknown</td>
</tr>
<tr>
<td>9</td>
<td>S- Storms</td>
<td>To mitigate damage to electric lines and/or road closures, keep trees trimmed or removed along roadways and remove debris after storms.</td>
<td>1</td>
<td>New</td>
<td>Ongoing</td>
<td>Nobles County, Cities, Townships including Olney, Larkin, Round Lake</td>
<td>All Twps all Cities, NCPW, NCE, CiRL</td>
<td>N/A</td>
<td>Medium / Cities, Twps, County, State</td>
</tr>
<tr>
<td>18</td>
<td>Fire</td>
<td>Encourage building construction to include fire/smoke alarms and sprinkler systems.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>Fire, NCES, all Cities</td>
<td>N/A</td>
<td>Low / Unknown</td>
</tr>
<tr>
<td>19</td>
<td>Fire</td>
<td>Investigate building code adoption.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>Fire, NCES, all cities</td>
<td>N/A</td>
<td>Low / Unknown</td>
</tr>
<tr>
<td>23</td>
<td>Utility</td>
<td>Cooperate with county/state to improve access to cellular services and broadband access for all of Nobles County.</td>
<td>1</td>
<td>New</td>
<td>Ongoing</td>
<td>Nobles County, Olney Township</td>
<td>Nobles County, NCEM, all Cities, all Twps, Sch</td>
<td>N/A</td>
<td>High / Unknown</td>
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</tr>
<tr>
<td>31</td>
<td>Drought</td>
<td>Work with the Minnesota Department of Health to develop and implement Wellhead Protection Plans.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Adrian, Brewster, Dundee, Ellsworth, Kinbrae, Round Lake, Rushmore, Wilmont, Worthington</td>
<td>NCES, CiA, CiBr, CiD, CiE, CiK, CiRL, CiRu, CiWi, CiWo, Leota, Reading, SWCD, RWS, LPRW, RRRW, OCRW</td>
<td>Medium / Unknown</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Flood</td>
<td>Encourage sewer communities to address infiltration to reduce extra flow in storm events; Inspect, maintain, and repair area sewage lagoons to ensure adequate capacity and operation.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, All sewered cities</td>
<td>NCES, MPCA, NCPW, Local PW, all sewered cities</td>
<td>High / Unknown</td>
<td></td>
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</tbody>
</table>
Table G – 7. Mitigation Action Identified for Jurisdictional Implementation in the City of Lismore

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>W-Storms / S-Storms</td>
<td>Ensure that critical facilities have access to back up power generators.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County (HP), Bigelow, Brewster, Ellsworth, Lismore, Round Lake, Rushmore, Wilmont, Worthington</td>
<td>NCEM, CiBi, CiBr, CiE, CiL, CiRL, CiRu, CiWi, CiWo, RWS, Leota Twps,</td>
<td>Worthington has capability to do rolling power.</td>
<td>Medium / Unknown</td>
</tr>
<tr>
<td>3</td>
<td>W-Storms / Flood / Trans Inf</td>
<td>Use road design to help control snow on roadways and mitigate flooding.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Cities Townships including Bloom, Larkin, Olney, and Seward</td>
<td>NCPW, NCES, MnDOT, Twps, CiA, CiBi, CiBr, CID, CiE, CiK, CiL, CiRL, CiRu, CiWi, CiWo</td>
<td>Cut down hills to remove snow drifting. Excavate, remove unused fences, and replant area ditches for adequate water flow and water evacuation. Inspect and repair roads, culverts, ditches for improvements to mitigate snow blockage and water damage.</td>
<td>Unknown</td>
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<tr>
<td>5</td>
<td>S-Storms</td>
<td>Conduct a study to determine areas deficient in safe rooms/not covered by warning systems; Construct at least one new safe room or improve warning system in one community each year (including county and municipal parks), maintain or upgrade sirens in place, and install new warning sirens in identified underserved population areas.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Adrian, Bigelow, Brewster, Dundee, Ellsworth, Kinbrae, Lismore, Round Lake, Rushmore, Wilmont, Worthington</td>
<td>NCEM,NCES, CiA, CiBi, CiBr, CiD, CiE, CiK, CiL, CiRL, CiRu, CiWi, CiWo, Sch - all</td>
<td>High / Unknown</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>S-Storms</td>
<td>Educate local schools, nursing homes, hospitals, public and private sectors, etc. on importance of doing “Severe Weather Awareness Week” workshop for their staff, including identifying evacuation routes and safety shelters; Encourage all residents and public buildings to have and use NOAA Public Alert Radios with SAME technology; encourage staff and residents to sign up for Nixle alerts.</td>
<td>1</td>
<td>In Progress</td>
<td>Annually</td>
<td>Nobles County</td>
<td>NCEM, Sch, all, Hosp., all cities</td>
<td>Low / Unknown</td>
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<td>---------------------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>9</td>
<td>S-Storms</td>
<td>To mitigate damage to electric lines and/or road closures, keep trees trimmed or removed along roadways and remove debris after storms.</td>
<td>1</td>
<td>New</td>
<td>Ongoing</td>
<td>Nobles County, Cities, Townships including Olney, Larkin, Round Lake</td>
<td>All Twps all Cities, NCPW, NCE, CiRL</td>
<td>Medium / Cities, Twps, County, State</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Fire</td>
<td>Encourage building construction to include fire/smoke alarms and sprinkler systems.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>Fire, NCES, all Cities</td>
<td>Low / Unknown</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Fire</td>
<td>Investigate building code adoption.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>Fire, NCES, all cities</td>
<td>Low / Unknown</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Utility</td>
<td>Cooperate with county/state to improve access to cellular services and broadband access for all of Nobles County.</td>
<td>1</td>
<td>New</td>
<td>Ongoing</td>
<td>Nobles County, Olney Township</td>
<td>Nobles County, NCEM, all Cities, all Twps, Sch</td>
<td>High / Unknown</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Flood</td>
<td>Encourage sewered communities to address infiltration to reduce extra flow in storm events; Inspect, maintain, and repair area sewage lagoons to ensure adequate capacity and operation.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, All sewered cities</td>
<td>NCES, MPCA, NCPW, Local PW, all sewered cities</td>
<td>High / Unknown</td>
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### Table G–8. Mitigation Action Identified for Jurisdictional Implementation in the City of Round Lake

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<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>W-Storms / S-Storms</td>
<td>Ensure that critical facilities have access to back up power generators.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County (HP), Bigelow, Brewster, Ellsworth, Lismore, Round Lake, Rushmore, Wilmont, Worthington</td>
<td>NCEM, CiBi, CiBr, CiE, CiL, CiRL, CiRu, CiWi, CiWo, RWS, Leota Twps,</td>
<td>Worthington has capability to do rolling power.</td>
<td>Medium / Unknown</td>
</tr>
<tr>
<td>3</td>
<td>W-Storms / Flood / Trans Inf</td>
<td>Use road design to help control snow on roadways and mitigate flooding.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Cities Townships including Bloom, Larkin, Olney, and Seward</td>
<td>NCPW, NCES, MnDOT, Twps, CiA, CiBi, CiBr, CiD, CiE, CiK, CiL, CiRL, CiRu, CiWi, CiWo</td>
<td>Cut down hills to remove snow drifting. Excavate, remove unused fences, and replant area ditches for adequate water flow and water evacuation. Inspect and repair roads, culverts, ditches for improvements to mitigate snow blockage and water damage.</td>
<td>Unknown</td>
</tr>
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</tr>
<tr>
<td>5</td>
<td>S-Storms</td>
<td>Conduct a study to determine areas deficient in safe rooms/not covered by warning systems; Construct at least one new safe room or improve warning system in one community each year (including county and municipal parks), maintain or upgrade sirens in place, and install new warning sirens in identified underserved population areas.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Adrian, Bigelow, Brewster, Dundee, Ellsworth, Kinbrae, Lismore, Round Lake, Rushmore, Wilmont, Worthington</td>
<td>NCEM, NCES, CiA, CiBi, CiBr, CiD, CiE, CiK, CiL, CiRL, CiRu, CiWi, CiWo, Sch - all</td>
<td>High / Unknown</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>S-Storms</td>
<td>Educate local schools, nursing homes, hospitals, public and private sectors, etc. on importance of doing “Severe Weather Awareness Week” workshop for their staff, including identifying evacuation routes and safety shelters; Encourage all residents and public buildings to have and use NOAA Public Alert Radios with SAME technology; encourage staff and residents to sign up for Nixle alerts.</td>
<td>1</td>
<td>In Progress</td>
<td>Annually</td>
<td>Nobles County</td>
<td>NCEM, Sch ,all, Hosp., all cities</td>
<td>Low / Unknown</td>
<td></td>
</tr>
<tr>
<td>Action Number</td>
<td>Hazard</td>
<td>City of Round Lake Mitigation Action</td>
<td>Priority</td>
<td>Status</td>
<td>Time-frame</td>
<td>Jurisdictions</td>
<td>Responsibility</td>
<td>Est. Cost/Source</td>
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<tr>
<td>8</td>
<td>S-Storms</td>
<td>Ensure that each manufactured home park has an updated emergency plan; work with park managers and owners to improve communication during severe storm events; ensure residents are familiar with the emergency plan and recognize evacuation routes and shelter sites.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County (HP), Brewster, Worthington</td>
<td>NCEM, NCES, CiA, CiBr, CiE, CiRL, CiWo</td>
<td>Medium / Unknown</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>S-Storms</td>
<td>To mitigate damage to electric lines and/or road closures, keep trees trimmed or removed along roadways and remove debris after storms.</td>
<td>1</td>
<td>New</td>
<td>Ongoing</td>
<td>Nobles County, Cities, Townships including Olney, Larkin, Round Lake</td>
<td>All Twps all Cities, NCPW, NCE, CiRL</td>
<td>Medium / Cities, Twps, County, State</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Fire</td>
<td>Encourage building construction to include fire/smoke alarms and sprinkler systems.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>Fire, NCES, all Cities</td>
<td>Low / Unknown</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Fire</td>
<td>Investigate building code adoption.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>Fire, NCES, all cities</td>
<td>Low / Unknown</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Utility</td>
<td>Cooperate with county/state to improve access to cellular services and broadband access for all of Nobles County.</td>
<td>1</td>
<td>New</td>
<td>Ongoing</td>
<td>Nobles County, Olney Township</td>
<td>Nobles County, NCEM, all Cities, all Twps, Sch</td>
<td>High / Unknown</td>
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</tr>
<tr>
<td>31</td>
<td>Drought</td>
<td>Work with the Minnesota Department of Health to develop and implement Wellhead Protection Plans.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Adrian, Brewster, Dundee, Ellsworth, Kinbrae, Round Lake, Rushmore, Wilmont, Worthington</td>
<td>NCES, CiA, CiBr, CiD, CiE, CiK, CiRL, CiRu, CiWi, CiWo, Leota, Reading, SWCD, RWS, LPRW, RRRW, OCRW</td>
<td></td>
<td>Medium / Unknown</td>
</tr>
<tr>
<td>38</td>
<td>Flood</td>
<td>Encourage sewer communities to address infiltration to reduce extra flow in storm events; Inspect, maintain, and repair area sewage lagoons to ensure adequate capacity and operation.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, All sewered cities</td>
<td>NCES, MPCA, NCPW, Local PW, all sewered cities</td>
<td></td>
<td>High / Unknown</td>
</tr>
</tbody>
</table>
Table G – 9. Mitigation Action Identified for Jurisdictional Implementation in the City of Rushmore

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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>W-Storms / S-Storms</td>
<td>Ensure that critical facilities have access to back up power generators.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County (HP), Bigelow, Brewster, Ellsworth, Lismore, Round Lake, Rushmore, Wilmont, Worthington</td>
<td>NCEM, CiBi, CiBr, CiE, CiL, CiRL, CiRu, CiWi, CiWo, RWS, Leota Twps,</td>
<td>Worthington has capability to do rolling power.</td>
<td>Medium / Unknown</td>
</tr>
<tr>
<td>3</td>
<td>W-Storms / Flood / Trans Inf</td>
<td>Use road design to help control snow on roadways and mitigate flooding.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Cities Townships including Bloom, Larkin, Olney, and Seward</td>
<td>NCPW, NCES, MnDOT, Twps, CiA, CiBi, CiBr, CID, CiE, CiK, CiL, CiRL, CiRu, CiWi, CiWo</td>
<td>Cut down hills to remove snow drifting. Excavate, remove unused fences, and replant area ditches for adequate water flow and water evacuation. Inspect and repair roads, culverts, ditches for improvements to mitigate snow blockage and water damage.</td>
<td>Unknown</td>
</tr>
<tr>
<td>Action Number</td>
<td>Hazard</td>
<td>City of Rushmore Mitigation Action</td>
<td>Priority</td>
<td>Status</td>
<td>Time-frame</td>
<td>Jurisdictions</td>
<td>Responsibility</td>
<td>Est. Cost/Source</td>
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</tr>
<tr>
<td>5</td>
<td>S-Storms</td>
<td>Conduct a study to determine areas deficient in safe rooms/not covered by warning systems; Construct at least one new safe room or improve warning system in one community each year (including county and municipal parks), maintain or upgrade sirens in place, and install new warning sirens in identified underserved population areas.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Adrian, Bigelow, Brewster, Dundee, Ellsworth, Kinbrae, Lismore, Round Lake, Rushmore, Wilmont, Worthington</td>
<td>NCEM, NCES, CiA, CiBi, CiBr, CiD, CiE, CiK, CiL, CiRL, CiRu, CiWi, CiWo, Sch - all</td>
<td>High / Unknown</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>S-Storms</td>
<td>Educate local schools, nursing homes, hospitals, public and private sectors, etc. on importance of doing “Severe Weather Awareness Week” workshop for their staff, including identifying evacuation routes and safety shelters; Encourage all residents and public buildings to have and use NOAA Public Alert Radios with SAME technology; encourage staff and residents to sign up for Nixle alerts.</td>
<td>1</td>
<td>In Progress</td>
<td>Annually</td>
<td>Nobles County</td>
<td>NCEM, Sch ,all, Hosp., all cities</td>
<td>Low / Unknown</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Fire</td>
<td>Encourage building construction to include fire/smoke alarms and sprinkler systems.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>Fire, NCES, all Cities</td>
<td>Low / Unknown</td>
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</tr>
<tr>
<td>19</td>
<td>Fire</td>
<td>Investigate building code adoption.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>Fire, NCES, all cities</td>
<td></td>
<td>Low / Unknown</td>
</tr>
<tr>
<td>20</td>
<td>Fire</td>
<td>Update Quick Response Unit.</td>
<td>1</td>
<td>New</td>
<td>12/2021</td>
<td>Rushmore</td>
<td>CiRu, Fire</td>
<td></td>
<td>$80,000 HMA / DNR / Fire Dept</td>
</tr>
<tr>
<td>23</td>
<td>Utility</td>
<td>Cooperate with county/state to improve access to cellular services and broadband access for all of Nobles County.</td>
<td>1</td>
<td>New</td>
<td>Ongoing</td>
<td>Nobles County, Olney Township</td>
<td>Nobles County, NCEM, all Cities, all Twps, Sch</td>
<td></td>
<td>High / Unknown</td>
</tr>
<tr>
<td>31</td>
<td>Drought</td>
<td>Work with the Minnesota Department of Health to develop and implement Wellhead Protection Plans.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Adrian, Brewster, Dundee, Ellsworth, Kinbrae, Round Lake, Rushmore, Wilmont, Worthington</td>
<td>NCES, CiA, CiBr, CiD, CiE, CiK, CiRL, CiRu, CiWi, CiWo, Leota, Reading, SWCD, RWS, LPRW, RRRW, OCRW</td>
<td></td>
<td>Medium / Unknown</td>
</tr>
<tr>
<td>38</td>
<td>Flood</td>
<td>Encourage sewer communities to add infiltration to reduce extra flow in storm events; Inspect, maintain, and repair area sewage lagoons to ensure adequate capacity and operation.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, All sewered cities</td>
<td>NCES, MPCA, NCPW, Local PW, all sewered cities</td>
<td></td>
<td>High / Unknown</td>
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</tbody>
</table>
### Table G – 10. Mitigation Action Identified for Jurisdictional Implementation in the City of Wilmont

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>W-Storms / S-Storms</td>
<td>Ensure that critical facilities have access to back up power generators.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County (HP), Bigelow, Brewster, Ellsworth, Lismore, Round Lake, Rushmore, Wilmont, Wilmont</td>
<td>NCEM, CiBi, CiBr, CiE, CiL, CiRL, CiRu, CiWi, CiWo, RWS, Leota Twps</td>
<td>Worthington has capability to do rolling power.</td>
<td>Medium / Unknown</td>
</tr>
<tr>
<td>3</td>
<td>W-Storms / Flood / Trans Inf</td>
<td>Use road design to help control snow on roadways and mitigate flooding.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Cities Townships including Bloom, Larkin, Olney, and Seward</td>
<td>NCPW, NCES, MnDOT, Twps, CiA, CiBi, CiBr, CID, CIE, CiK, CiL, CiRL, CiRu, CiWi, CiWo</td>
<td>Cut down hills to remove snow drifting. Excavate, remove unused fences, and replant area ditches for adequate water flow and water evacuation. Inspect and repair roads, culverts, ditches for improvements to mitigate snow blockage and water damage.</td>
<td>Unknown</td>
</tr>
<tr>
<td>---------------</td>
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<td>-----------------------------------------------------------------------------------------------</td>
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<td>----------------</td>
<td>-------------------------------------------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>5</td>
<td>S-Storms</td>
<td>Conduct a study to determine areas deficient in safe rooms/not covered by warning systems; Construct at least one new safe room or improve warning system in one community each year (including county and municipal parks), maintain or upgrade sirens in place, and install new warning sirens in identified underserved population areas.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Adrian, Bigelow, Brewster, Dundee, Ellsworth, Kinbrae, Lismore, Round Lake, Rushmore, Wilmont, Worthington</td>
<td>NCEM, NCES, CiA, CiBi, CiBr, CiD, CiE, CiK, CiL, CiRL, CiRu, CiWi, CiWo, Sch - all</td>
<td>High / Unknown</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>S-Storms</td>
<td>Educate local schools, nursing homes, hospitals, public and private sectors, etc. on importance of doing “Severe Weather Awareness Week” workshop for their staff, including identifying evacuation routes and safety shelters; Encourage all residents and public buildings to have and use NOAA Public Alert Radios with SAME technology; encourage staff and residents to sign up for Nixle alerts.</td>
<td>1</td>
<td>In Progress</td>
<td>Annually</td>
<td>Nobles County</td>
<td>NCEM, Sch, all, Hosp., all cities</td>
<td>Low / Unknown</td>
<td></td>
</tr>
<tr>
<td>---------------</td>
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<td>---------------------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>9</td>
<td>S-Storms</td>
<td>To mitigate damage to electric lines and/or road closures, keep trees trimmed or removed along roadways and remove debris after storms.</td>
<td>1</td>
<td>New</td>
<td>Ongoing</td>
<td>Nobles County, Cities, Townships including Olney, Larkin, Round Lake</td>
<td>All Twps all Cities, NCPW, NCE, CiRL</td>
<td></td>
<td>Medium / Cities, Twps, County, State</td>
</tr>
<tr>
<td>18</td>
<td>Fire</td>
<td>Encourage building construction to include fire/smoke alarms and sprinkler systems.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>Fire, NCES, all Cities</td>
<td></td>
<td>Low / Unknown</td>
</tr>
<tr>
<td>19</td>
<td>Fire</td>
<td>Investigate building code adoption.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>Fire, NCES, all cities</td>
<td></td>
<td>Low / Unknown</td>
</tr>
<tr>
<td>23</td>
<td>Utility</td>
<td>Cooperate with county/state to improve access to cellular services and broadband access for all of Nobles County.</td>
<td>1</td>
<td>New</td>
<td>Ongoing</td>
<td>Nobles County, Olney Township</td>
<td>Nobles County, NCEM, all Cities, all Twps, Sch</td>
<td></td>
<td>High / Unknown</td>
</tr>
<tr>
<td>31</td>
<td>Drought</td>
<td>Work with the Minnesota Department of Health to develop and implement Wellhead Protection Plans.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Adrian, Brewster, Dundee, Ellsworth, Kinbrae, Round Lake, Rushmore, Wilmont, Worthington</td>
<td>NCES, CiA, CiBr, CiD, CiE, CiK, CiRL, CiRu, CiWi, CiWo, Leota, Reading, SWCD, RWS, LPRW, RRRW, OCRW</td>
<td></td>
<td>Medium / Unknown</td>
</tr>
<tr>
<td>38</td>
<td>Flood</td>
<td>Encourage sewered communities to address infiltration to reduce extra flow in storm events; Inspect, maintain, and repair area sewage lagoons to ensure adequate capacity and operation.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, All sewered cities</td>
<td>NCES, MPCA, NCPW, Local PW, all sewered cities</td>
<td></td>
<td>High / Unknown</td>
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</tbody>
</table>
Table G-11. Mitigation Action Identified for Jurisdictional Implementation in the City of Worthington

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>W-Storms / S-Storms</td>
<td>Ensure that critical facilities have access to back up power generators.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County (HP), Bigelow, Brewster, Ellsworth, Lismore, Round Lake, Rushmore, Wilmont, Worthington</td>
<td>NCEM, CIBi, CIBr, CIE, CiL, CiRL, CiRu, CiWi, CiWo, RWS, Leota Twps,</td>
<td>Worthington has capability to do rolling power.</td>
<td>Medium / Unknown</td>
</tr>
<tr>
<td>2</td>
<td>W-Storms / Flood / Trans Inf</td>
<td>Use road design to help control snow on roadways and mitigate flooding.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Cities Townships including Bloom, Larkin, Olney, and Seward</td>
<td>NCPW, NCES, MnDOT, Twps, CiA, CiBi, CiBr, CID, CIE, CiK, CiL, CiRL, CiRu, CiWi, CiWo</td>
<td>Cut down hills to remove snow drifting. Excavate, remove unused fences, and replant area ditches for adequate water flow and water evacuation. Inspect and repair roads, culverts, ditches for improvements to mitigate snow blockage and water damage.</td>
<td>Unknown</td>
</tr>
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</tr>
<tr>
<td>5</td>
<td>S-Storms</td>
<td>Conduct a study to determine areas deficient in safe rooms/not covered by warning systems; Construct at least one new safe room or improve warning system in one community each year (including county and municipal parks), maintain or upgrade sirens in place, and install new warning sirens in identified underserved population areas.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Adrian, Bigelow, Brewster, Dundee, Ellsworth, Kinbrae, Lismore, Round Lake, Rushmore, Wilmont, Worthington</td>
<td>NCEM, NCES, CiA, CiBI, CiBr, CiD, CiE, CiK, CiL, CiRL, CiRu, CiWi, CiWo, Sch - all</td>
<td>High / Unknown</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>S-Storms</td>
<td>Educate local schools, nursing homes, hospitals, public and private sectors, etc. on importance of doing “Severe Weather Awareness Week” workshop for their staff, including identifying evacuation routes and safety shelters; Encourage all residents and public buildings to have and use NOAA Public Alert Radios with SAME technology; encourage staff and residents to sign up for Nixle alerts.</td>
<td>1</td>
<td>In Progress</td>
<td>Annually</td>
<td>Nobles County</td>
<td>NCEM, Sch, all, Hosp., all cities</td>
<td>Low / Unknown</td>
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</table>

Nobles County All Hazard Mitigation Plan, 2018
<table>
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<tr>
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</thead>
<tbody>
<tr>
<td>7</td>
<td>S-Storms</td>
<td>Make nursing home staff aware of the need/importance of providing shelter locations and evacuation routes for nursing home residents in case of severe weather.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Adrian, Ellsworth, Worthington</td>
<td>NCEM, NCCS/PH., CiA, CIE, CiWo</td>
<td>Nobles County Comments</td>
<td>Low / Unknown</td>
</tr>
<tr>
<td>8</td>
<td>S-Storms</td>
<td>Ensure that each manufactured home park has an updated emergency plan; work with park managers and owners to improve communication during severe storm events; ensure residents are familiar with the emergency plan and recognize evacuation routes and shelter sites.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County (HP), Brewster, Worthington</td>
<td>NCEM, NCES, CiA, CiBr, CIE, CiRL, CiWo</td>
<td>Nobles County Comments</td>
<td>Medium / Unknown</td>
</tr>
<tr>
<td>18</td>
<td>Fire</td>
<td>Encourage building construction to include fire/smoke alarms and sprinkler systems.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>Fire, NCES, all Cities</td>
<td>Nobles County Comments</td>
<td>Low / Unknown</td>
</tr>
<tr>
<td>19</td>
<td>Fire</td>
<td>Investigate building code adoption.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>Fire, NCES, all cities</td>
<td>Nobles County Comments</td>
<td>Low / Unknown</td>
</tr>
<tr>
<td>23</td>
<td>Utility</td>
<td>Cooperate with county/state to improve access to cellular services and broadband access for all of Nobles County.</td>
<td>1</td>
<td>New</td>
<td>Ongoing</td>
<td>Nobles County, Olney Township</td>
<td>Nobles County, NCEM, all Cities, all Twps, Sch</td>
<td>Nobles County Comments</td>
<td>High / Unknown</td>
</tr>
<tr>
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</tr>
<tr>
<td>26</td>
<td>HazMat</td>
<td>Develop Geographic Information Systems (GIS) capability to map locations of fixed facilities using hazardous materials and associated transportation corridors.</td>
<td>1</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County</td>
<td>NCEM, NCES, CiWo, NCGIS</td>
<td></td>
<td>Medium / Unknown</td>
</tr>
<tr>
<td>31</td>
<td>Drought</td>
<td>Work with the Minnesota Department of Health to develop and implement Wellhead Protection Plans.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Adrian, Brewster, Dundee, Ellsworth, Kinbrae, Round Lake, Rushmore, Wilmont, Worthington</td>
<td>NCES, CiA, CiBr, CiD, CiE, CiK, CiRL, CiRu, CiWi, CiWo, Leota, Reading, SWCD, RWS, LPRW, RRRW, OCRW</td>
<td></td>
<td>Medium / Unknown</td>
</tr>
<tr>
<td>38</td>
<td>Flood</td>
<td>Encourage sewered communities to address infiltration to reduce extra flow in storm events; Inspect, maintain, and repair area sewage lagoons to ensure adequate capacity and operation.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, All sewered cities</td>
<td>NCES, MPCA, NCPW, Local PW, all sewered cities</td>
<td></td>
<td>High / Unknown</td>
</tr>
<tr>
<td>40</td>
<td>Flood</td>
<td>Continue to indicate on zoning forms if property is a flood hazard area.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Adrian, Worthington</td>
<td>NCES, CiA, CiWo</td>
<td></td>
<td>Low / Unknown</td>
</tr>
<tr>
<td>41</td>
<td>Flood</td>
<td>Develop a program to voluntarily acquire, relocate or elevate at-risk structures in floodplains.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, Adrian, Worthington</td>
<td>NCES, NCEM, CiA, CiWo</td>
<td></td>
<td>High / Unknown</td>
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</tr>
<tr>
<td>42</td>
<td>Flood</td>
<td>Implement County Ditch 12 Flood Reduction Plan.</td>
<td>1</td>
<td>In Progress</td>
<td>2019-2020</td>
<td>Nobles County, Adrian, Worthington</td>
<td>CiWo, NCPW, all SWCD</td>
<td></td>
<td>High / FEMA</td>
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<tr>
<td>43</td>
<td>Flood</td>
<td>Monitor and inspect dams, ditches, culverts, and bridges for maintenance, repair, and replacement needs.</td>
<td>2</td>
<td>In Progress</td>
<td>Ongoing</td>
<td>Nobles County, all Twps including Olney</td>
<td>DNR, NCPW, CiA, CiWo, all Twps including Bloom and Larkin, all SWCD</td>
<td></td>
<td>Low / Unknown</td>
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Appendix H - Nobles County Plans & Programs in Place
### Planning & Regulatory

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<tr>
<th>Plans/Programs</th>
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<tbody>
<tr>
<td>Comprehensive/Master Plan</td>
<td>Yes</td>
</tr>
<tr>
<td>Capital Improvements Plan</td>
<td>Yes</td>
</tr>
<tr>
<td>Economic Development Plan – Some cities in County have EDA Plans</td>
<td>No</td>
</tr>
<tr>
<td>Emergency Operations Plan</td>
<td>Yes</td>
</tr>
<tr>
<td>Continuity of Operations Plan</td>
<td>Yes</td>
</tr>
<tr>
<td>Transportation Plan</td>
<td>Yes</td>
</tr>
<tr>
<td>Storm water Management Plan – Some cities in County have plans</td>
<td>No</td>
</tr>
<tr>
<td>Community Wildfire Protection Plan – No federal lands in county</td>
<td>No</td>
</tr>
<tr>
<td>FireWise Program</td>
<td>No</td>
</tr>
<tr>
<td>Water Conservation/Emergency Preparedness Plan – Cities would have this (County has no control over water)</td>
<td>No</td>
</tr>
<tr>
<td>Wellhead Protection Plan (see page 225) – Some cities have.</td>
<td>No</td>
</tr>
<tr>
<td>Database of dry hydrants/well access</td>
<td>No</td>
</tr>
<tr>
<td>Burning permits/restrictions</td>
<td>Yes</td>
</tr>
<tr>
<td>Water Management Plan</td>
<td>Yes</td>
</tr>
<tr>
<td>Zoning ordinance</td>
<td>Yes</td>
</tr>
<tr>
<td>Subdivision ordinance – County does not have any subdivisions</td>
<td>No</td>
</tr>
<tr>
<td>Floodplain ordinance</td>
<td>Yes</td>
</tr>
<tr>
<td>Natural hazard specific ordinance (storm water, steep slope, wildfire)</td>
<td>No</td>
</tr>
<tr>
<td>Flood insurance rate maps</td>
<td>Yes</td>
</tr>
<tr>
<td>Acquisition of land for open space and public recreation uses</td>
<td>Yes</td>
</tr>
<tr>
<td>School closing policy/communications plan in event of inclement weather/temperatures</td>
<td>Yes</td>
</tr>
<tr>
<td>Storm/Emergency shelters (See Table #63)</td>
<td>Yes</td>
</tr>
<tr>
<td>Warning sirens (See Table #62)</td>
<td>Yes</td>
</tr>
<tr>
<td>SKYWARN Program</td>
<td>Yes</td>
</tr>
<tr>
<td>Nixle Mass Notification System</td>
<td>Yes</td>
</tr>
<tr>
<td>Severe Weather Awareness Week</td>
<td>Yes</td>
</tr>
<tr>
<td>Winter Weather Awareness Week</td>
<td>Yes</td>
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<tr>
<td>NOAA Weather Radios</td>
<td>Yes</td>
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### Education & Outreach

<table>
<thead>
<tr>
<th>Program/Organization</th>
<th>Yes / No</th>
</tr>
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<tbody>
<tr>
<td>Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.</td>
<td>Yes</td>
</tr>
<tr>
<td>Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)</td>
<td>Yes</td>
</tr>
<tr>
<td>Natural disaster or safety related school programs</td>
<td>Yes</td>
</tr>
<tr>
<td>StormReady certification</td>
<td>No</td>
</tr>
<tr>
<td>Firewise Communities certification</td>
<td>No</td>
</tr>
<tr>
<td>Public-private partnership initiatives addressing disaster-related issues</td>
<td>No</td>
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</table>
## Administrative & Technical

<table>
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<th>Administrative &amp; Technical</th>
<th>Yes / No</th>
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<tr>
<td>Administration</td>
<td>Yes / No</td>
</tr>
<tr>
<td>Planning Commission</td>
<td>Yes</td>
</tr>
<tr>
<td>Mitigation Planning Committee</td>
<td>Yes</td>
</tr>
<tr>
<td>Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)</td>
<td>Yes</td>
</tr>
<tr>
<td>Mutual aid agreements</td>
<td>Yes</td>
</tr>
<tr>
<td>Staff</td>
<td>Yes / No</td>
</tr>
<tr>
<td>Chief Building Official</td>
<td>No</td>
</tr>
<tr>
<td>Floodplain Administrator</td>
<td>Yes</td>
</tr>
<tr>
<td>Emergency Manager</td>
<td>Yes</td>
</tr>
<tr>
<td>Community Planner – Some cities have this position</td>
<td>No</td>
</tr>
<tr>
<td>Civil Engineer</td>
<td>Yes</td>
</tr>
<tr>
<td>GIS Coordinator</td>
<td>Yes</td>
</tr>
<tr>
<td>Technical</td>
<td>Yes / No</td>
</tr>
<tr>
<td>Warning systems/services (Reverse 911, outdoor warning signals)</td>
<td>Yes</td>
</tr>
<tr>
<td>Hazard data and information</td>
<td>Yes</td>
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<tr>
<td>HAZUS analysis</td>
<td>Yes</td>
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