

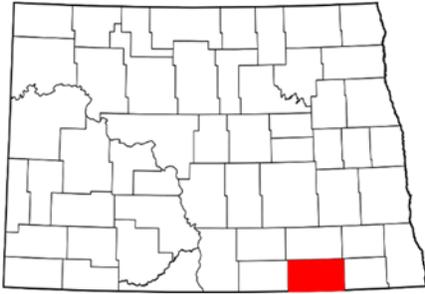
Dickey County Multi-Hazard Mitigation Plan 2019 Update



PREPARED BY:
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2019 Dickey County Multi-Jurisdictional Multi-Hazard Mitigation Plan

Dickey County, North Dakota



Plan Development Managed by:
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1. Introduction

Executive Summary

The updating of the Dickey County Multi-Jurisdictional Multi-Hazard Mitigation Plan (MHMP) was conducted per the FEMA grant timeline. It included the review of hazards, risks, vulnerabilities, and capabilities of the county, and resulting mitigation actions in Dickey County, North Dakota. The review of hazard impacts to the county is ongoing by county officials, as are the efforts to mitigate injuries and damages from hazards. The planning process and this plan allow the county's residents, businesses, stakeholders, and federal and state agencies to have input and to identify actions to assure the safety and protection of people and property.

The hazards profiled in this plan include communicable disease, dam failure, drought, flood, hazardous material release, homeland security incident, severe summer weather, severe winter weather, shortage or outage of critical materials or infrastructure, transportation accident, urban fire/structure collapse, wildland fire, and windstorm.

This update of the Dickey County Multi-Jurisdictional Multi-Hazard Plan includes a mitigation strategy consisting of five goals and specific mitigation projects for each incorporation jurisdiction based on the risk assessment developed at Planning Committee and jurisdictional meetings. All hazards and threats were considered and mitigation projects were formulated based on the potential or previous effects of hazards, the high probability of hazard or threat occurrences, the vulnerability of jurisdictions to hazards, and hazards each project can mitigate against.

The following are the five goals that were reviewed, updated and approved:

Goal 1: Improve public awareness, education and planning of hazard and action to protect themselves.

Goal 2: Reduce impacts of floods on people and property.

Goal 3. Reduce impacts of fires and drought.

Goal 4. Implement cost effective measures to reduce impacts of manmade and natural disasters.

Goal 5. Provide safe drinking water, places and early warnings for public to take protective action during hazard events.

To assist in the use, implementation, and updating of this document, the plan includes the federal and state plan approval letters and plan review of this update, and the adoption letters from each of the jurisdictions are included in this document. The chapters and appendices provide a history of the data reviewed and analyzed in the production process of the plan.

Jurisdictions

The impact and other issues from natural hazard and manmade threats varies between jurisdictions. Based on information gathered at each jurisdictional meeting, a problem statement was formed to summarize the needs of the jurisdictions.

Dickey County

Dickey County is impacted by communicable disease, dam failure, drought, flood, hazardous materials storage & release, homeland security incident, severe summer weather, severe winter Storm, shortage or

outage of critical materials or infrastructure, transportation accidents, urban fire/structure collapse, wildland fire, and windstorm. Education, public outreach and communicating emergency and disaster messages to the people throughout the county is challenging with the limited local media sources and the limited number of people with the expertise, experience and time to do website and social media development and maintenance. All jurisdictions have limited paid staff to take on additional duties. The energy production in the western portion of the State and the increased agricultural industry has resulted in an increase in hazardous materials being transported through the county by trucks and railroad. The county has planning and regulatory, administrative and technical, financial, education and outreach capabilities to accomplish mitigation. However, the county relies on outside sources for large-scale mitigation projects. Education and outreach, upgrading of critical facilities and infrastructure, upgrading of emergency sirens, generators to maintain services, improved access for emergency services, and additional storms shelters are a priority in the county.

Ellendale

Ellendale is located on U.S. Highway 281 on the border of North and South Dakota. It is called the gateway to North Dakota as the city is the first stop traveling northward into the state on U.S. Highway 281 from South Dakota.

The city of Ellendale has an elementary school and a high school; medical clinics; county courthouse; city shop (Ellendale Street Department); county shop; library; airport; city hall-ambulance building; police department; fire hall; park district; post office; N.D. Department of Transportation shop; USDA Farm Service Agency offices; and Ellendale Job Development Authority office.

The nearest hospitals to the city are Oakes Community Hospital in Oakes, N.D. and, Avera St. Luke's Hospital and Sanford Hospital in Aberdeen, S.D. Vulnerable populations are located at the two nursing homes in Ellendale (Prince of Peace Care Center and Evergreen Place) and the college dorms at Trinity Bible College.

Forbes

Forbes is a small, farming community located near the South Dakota border and 19 miles west-southwest of Ellendale. The city does not have building codes, an inspector or building permits.

The city of Forbes has a city hall and city park, which is managed by the Forbes City Council. The city also has an inert landfill. The city does not have a post office or school.

The nearest medical services are provided by the city of Ellendale, approximately 19 miles to the east-northeast. The nearest hospital is located in Aberdeen, S.D., roughly 47 miles south-southeast. The nearest North Dakota hospital is located in the city of Oakes, approximately 50 miles to the east-northeast.

Fullerton

Fullerton is a farming community located between the cities of Monango and Oakes in north-central Dickey County. The city does not have building codes, an inspector or building permits.

The city of Fullerton has a city hall, fire hall and park. The community is served by a U.S. Post Office and does not have a school.

The city of Oakes, approximately 16 miles to the east, serves Fullerton with a hospital, health clinic, and ambulance services. Clinics are also located in Ellendale, approximately 17 miles to the south-southwest.

The city hall and fire hall do not have generators

Ludden

Ludden is located on N.D. Highway 1 and N.D. Highway 11, and is 11 miles south of Oakes and 19 miles east of Ellendale. The city does not have building codes, an inspector or building permits.

There are no government buildings in the city.

Ambulance and fire protection for the community are provided by the Ellendale providers. The nearest hospital is located in Oakes 11 miles north of the city.

Monango

The city of Monango is small rural farming community in central Dickey County located along U.S. Highway 281, the most prominent north-south highway between U.S. Highway 83 and Interstate 29. The city does not have building codes, an inspector or building permits.

The city owns and maintains a city park.

Emergency services are provided by: Ellendale Ambulance Service, Ellendale Fire Department, and Dickey County Sheriff's Office. The nearest hospital is located in Oakes 25 miles to the east.

Oakes

The city of Oakes, located along N.D. Highway 1, is the largest city in Dickey County. The community is in a productive agricultural region that supports numerous agricultural businesses. The city has adopted the state building code and issues building permits.

The city of Oakes has a preschool, elementary school and high school; Oakes Community Hospital and clinic; Sanford Clinic; Oakes Police Department; Oakes Ambulance Service; Oakes Fire Department; pharmacy; dialysis center; chiropractic care; optometrist; counseling services; drug store; regional career and technology center; city hall/ambulance hall; city garage; city fire station; county shop; post office; park district; airport; armory National Guard Company; N.D. Department of Transportation shop; N.D. Job Service office; social services; and Veteran's Service Office.

The new ambulance hall is a designated shelter for people living in mobile structures. The armory is also a designated shelter.

Background

The Dickey County Multi-Jurisdictional Multi-Hazard Mitigation Plan (MHMP) was developed and approved by Federal Management Agency (FEMA) in 2014. The plan was updated and submitted for FEMA approval in 2014 to address the needs of people living and working in Dickey County and its incorporated cities: Ellendale, Forbes, Fullerton, Ludden, Monango, and Oakes.

This document includes a profile of Dickey County and its incorporated cities. The planning process is explained along with those involved in the updating of the county's multi-jurisdictional plan. A comprehensive assessment is included in the plan of the risks that affect the county and its jurisdictions, maps, hazards, threats and risk assessment, mitigation strategies including goals, objectives, projects, and plan maintenance.

This document articulates the discussions and considerations stated during the planning process in 2018 to update the 2014 Plan. The MHMP Planning Committee understands that the plan must be dynamic

and detailed to include the specific risks of threats and hazards to the county and its jurisdictions. Improvements, updates, and revisions will be made constantly to assure this plan continues to mitigate the potential losses and damages that can impact people and property in Dickey County.

Purpose

As defined by the Disaster Mitigation Act of 2000, hazard mitigation is any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards. The Act of 2000 was an amendment to the Robert T. Stafford Disaster Relief and Emergency Assistance to authorize a program for pre-disaster mitigation, to streamline the administration of disaster relief, to control the Federal costs of disaster assistance, and for other purposes. According to the 2014 State of North Dakota MHMP, for every dollar spent on mitigation, society saves on average four dollars in avoided future losses. Mitigation can range from infrastructure projects such as raising of roads, burying of power lines, or installation of generators for critical facilities and infrastructure to public education and outreach programs.

The purpose of this plan is to fulfill federal, state, and local hazard mitigation planning responsibilities; to promote pre- and post-disaster mitigation measures, short and/or long range strategies that minimize suffering, loss of life, and damage to property resulting from hazardous or potentially hazardous conditions to which citizens and institutions within the county are exposed; to improve quality of life; and to eliminate or minimize conditions which would have an undesirable impact on our citizens, the economy, environment, and well-being of the county.

Objective

The objective of this plan is to establish a methodical process to assist in hazard and threat identification, impact evaluation, and action plan development to decrease the impacts from hazards where possible and to protect lives and property.

Scope

The scope of the Dickey County Multi-Hazard Mitigation Plan is countywide. The Plan is not necessarily limited to Federal, State, or locally declared disasters or emergencies. Any time situations or incidents occur that produce a requirement for mitigation actions, activities, and strategies, etc.; they will be developed and incorporated into the Dickey County Multi-Hazard Mitigation Plan.

2. Adoption Documentation

Authority

Federal: Public Law 93-288 as amended, established the basis for federal mitigation activity in 1974. A section of this Act requires the identification, evaluation, and mitigation of hazards as a prerequisite for state receipt of future disaster assistance outlays. Since 1974, many additional programs, regulations, and laws have expanded on the original Stafford Act, several additional provisions were also added that provided for the availability of significant mitigation measures in the aftermath or presidentially declared disasters. Civil preparedness Guide 1-3, Chapter 6-Hazard Mitigation Assistance Programs places emphasis on hazard mitigation planning directed towards hazards with a high impact and threat potential.

Legislative: The North Dakota Century Code, Chapter 37-17.1 requires North Dakota Division of Emergency Management to coordinate the development of a Hazard Mitigation Plan. Other state laws require various state agencies to mitigate the effects or impacts of hazards in regard to public safety, environment, etc. The North Dakota State Water Commission is responsible for assisting in the flood insurance program and is the lead agency in flood hazard mitigation actions.

Executive: The Governor has the leadership role in the issuance of guidance to all state agencies to minimize the effects of hazards on the citizens of North Dakota. In state and federal recovery agreements following a presidentially declared disaster, the Governor initiates updating of the state and local mitigation plans based on federal requirements or state and presidentially declared disaster (see State Administrative Recovery Handbook for Mitigation Assistance).

Local: Local governments play an essential role in implementing effective mitigation, both before and after disaster events. Each local government will review all damages, losses, and related impacts to determine the need or requirement for mitigation action and planning whenever seriously affected by a disaster, or when applying for state or federal recovery assistance. In Dickey County, the local governing body responsibility for carrying out plans and policies is the County Commission. The Dickey County Commission and each incorporated city in the county – Ellendale, Forbes, Fullerton, Ludden, Monango, and Oakes – are responsible for reviewing and updating ordinances. The County Commission represents all townships and unincorporated communities in the county for planning purposes. Budgets are limited and do not allow the county and jurisdictions the ability to complete as many projects as desired.

Promulgation Statement

Government at all levels has the responsibility for the protection of life, property, and the environment from hazards and threats which are known to impact jurisdictions. The jurisdictions of Dickey County, by resolution, hereby adopt the concepts and conditions set forth by the Dickey County Multi-Hazard Mitigation Plan (MHMP).

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3. Planning Process

Background

The Dickey County Commission began the process to update its multi-hazard mitigation plan by applying for and receiving a grant to assist in the cost of the planning process. The Dickey County Multi-Jurisdictional Multi-Hazard Mitigation Plan was approved by the N.D. Department of Emergency Services (NDDDES) and the Federal Emergency Management Agency (FEMA) in 2014 and the update in 2018. The six jurisdictions in the 2014-approved plan participated in the planning process for the 2018 plan update. (Table 3.1)

Table 3.1 – Jurisdictional Participation in Mitigation Planning

Jurisdictions Represented in Plan	Participation
Dickey County	Continued Participation (2004-2018)
City of Ellendale	Continued Participation (2004-2018)
City of Forbes	Continued Participation (2004-2018)
City of Fullerton	Continued Participation (2004-2018)
City of Ludden	Continued Participation (2004-2018)
City of Monango	Continued Participation (2014-2018)
City of Oakes	Continued Participation (2004-2018)

Whereas, the jurisdictions have limited capability to undertake the preparation of a hazard mitigation plan, the Dickey County Commission contracted with the South Central Dakota Regional Council located in Jamestown, N.D., to act on behalf of the county's jurisdictions to facilitate the planning process and write of the update to Dickey County's plan.

Table 3.2 – Planning Committee Members

Representing	Name
Dickey County Emergency Manager/911 Communications	Charles Russell
Dickey County Commission & Ellendale Township	Joel Hamar
City of Oakes Mayor	Monty Zimmer
Dickey County Auditor	Wanda Shephard
City of Ellendale City Council	Don Flaherty, Richard Wadholm
City of Ellendale Mayor	Matt Thorpe
Law Enforcement	
Dickey County Sheriff's Department	Chris Estes, Steven Harmer
Ellendale Police Department	Lucas VanZee
Oakes Police Department	Matt O'Brien
Fire Departments	
Ellendale Fire Department	Matt Thorpe, Corey Gulke
Ellendale Fire Chief	Paul Wedell
Emergency Medical Services	
Ellendale Volunteer Ambulance	Michele Thorpe, NREMT; Charlie Russell
Oakes Volunteer Ambulance Service	Mike Sandy
Medical	
CHI Oakes Hospital	Lori Novak, Quality/Risk; Tina Ochsner, Workforce Safety/Infection Prevention; Mary Quandt, EP
Central Valley Health District	Frank Bolak, EPR Coordinator

Prince of Peace Care Center/ Evergreen Place	Michele Thorpe, RN, DON
Dickey County Health Department	Amber Miller, RN; Laurie Wang, RN-DON;
Education	
Oakes Public School Superintendent	Kraig Steinhoff
Ellendale Public School Superintendent	Michael Kaiser
Ellendale Public School School Board VP	Michele Thorpe
Trinity Bible College - Facilities Coordinator	Todd Staley
LaMoure County	
LaMoure County Public Health	Tony Hanson, ADM

Summary

After reviewing the county's history of hazards, identifying vulnerabilities and losses, the Planning Committee reviewed hazards and identified the Dickey County Hazards (See Table 3.11) to include:

- Communicable Disease
- Drought
- Flood
- Hazardous Materials Storage & Release
- Homeland Security Incident
- Severe Summer Weather
- Severe Winter Storm
- Shortage or Outage of Critical Materials or Infrastructure
- Transportation Accident
- Urban Fire or Structure Collapse
- Wildland Fire
- Windstorm

This update of the Dickey County Multi-Jurisdictional Multi-Hazard Plan includes a mitigation strategy consisting of five goals and specific mitigation projects for each incorporation jurisdiction based on the risk assessment developed at Planning Committee and jurisdictional meetings.

- **Goal 1:** Improve public awareness, education and planning of hazard and action to protect themselves.
- **Goal 2:** Reduce impacts of floods on people and property.
(Combination of goals 2 and 3 from previous plan)
- **Goal 3:** Reduce impact of fires and drought.
(Combination of goals 4 and 6 from previous plan)
- **Goal 4:** Implement cost effective measures to reduce impacts of manmade and natural disasters.
(Old goal 5, combination of goals 7 and 8 from previous plan)
- **Goal 5:** Provide safe places and warnings for public to take protective action during hazard events.

The 15 projects are identified and ranked in Chapter 6 of this plan. The status of each mitigation project from the 2014 Dickey County MHMP is shown in Table 3.3.

This mitigation plan will also be incorporated into city, county, regional and state plans. The information is being incorporated into the county's Emergency Operations Plan and other emergency preparedness and response plans. All jurisdictions will use the plan's data as they review county and city ordinances. The data in this plan is being used in Oakes and Ellendale capital improvement and development plans, South Central Dakota Regional Council's Comprehensive Economic Development Strategies and Disaster Resiliency Plan for the U.S. Department of Commerce Economic Development Administration and the state of North Dakota mitigation plan.

Table 3.3 – Changes to Mitigation Projects from 2014 Dickey County Mitigation Plan

Project	Affected Jurisdictions	Responsible Agency	Hazard Mitigated	Status
8. Encourage jurisdictions to review and implement ordinances and capital improvement plans that address vulnerabilities to hazards, to adopt State Building Codes, and to review ordinances prior to new developments	All	All	All	Removed
11. Remove Oakes sanitary sewer infrastructure from area of impact by James River Flooding	Oakes	Oakes	River Flooding	Complete
13. Encourage residents to participate in NFIP to mitigate impacts of flooding	Dickey County, Oakes	Emergency Manager, Auditor	Flood	Removed
16. Maintain and create drainage.	All	Emergency Manager, County, Townships, Cities	Overland Flooding	Combined with Original # 15
18. Create a plan identifying alternative water sources for fire suppression	All	Fire Districts, County Commission, City Government	Drought, Transportation Accident, Hazardous Materials Incident	Removed
20. Maintain system for implementation and communication of burn bans	All	Fire Districts, County Commission, City Government	Drought, Hazardous Materials Incident, Wildland Fire	Complete
22. Partner with utility companies to identify areas where trees need trimming and vegetation removed.	All	Power Companies	Severe Winter Storm, Sever Summer Weather, Windstorm	Electric Companies do this and have for years, so it is an irrelevant project.
23. Voluntary inventory location, type and maximum storage of hazardous materials on private agricultural sites throughout the county	All	Emergency Manager, Applicators	Hazardous Materials Incident, Fire	This is done to the best of their ability, but will never be complete since farmers move their

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				materials on a regular basis.
24. Develop a system to gather immediate aerial applications data	All	Emergency Manager, Applicators	Hazardous Materials Incident, Fire	This is done to the best of their ability, but will never be complete since farmers move their materials on a regular basis.
25. Partner with fuel, propane, and pipeline companies to share locations of fuel storage and pipeline for mapping of hazardous materials	All	Emergency Management, Fire Departments	Hazardous Materials Incident, Fire	This is done to the best of their ability but will never be complete since farmers move their materials on a regular basis.
26. Raise road grades to prevent blockage	All	County Road Manager, County, Townships	Severe Winter Weather, Severe Summer Weather, Flood	Complete
27. Add living snow fences, remove tree lines or structures to limit blowing and drifting of snow and do ditch improvements	All	Public Works	Severe Winter Storm, Flood	Done on a volunteer basis already
28. Maintain and establish truck routes and assure communication with state to limit loads through each jurisdiction	All	County Road Manager, Townships	Transportation Accidents	Complete
29. Create, provide, and/or designate a community shelter in every community	All	Emergency Manager	Shortage or Outage of Critical Materials or Infrastructure, Severe Winter Storms, Severe Summer Weather, Flood	Complete
30. Create plans for loss of services	All	Cities, County, State	Shortage or Outage of Critical Materials or Infrastructure, Severe Winter Storms, Severe Summer Weather, Flood	Complete
31. Install generators and quick connections for critical facilities and infrastructure to ensure resiliency	All	All	Severe Winter Weather, Severe Summer Weather, Shortage or Outage of Critical Materials or Infrastructure.	Complete - All medical facilities have generators. Ellendale high school has generator

32. Install and maintain warning systems	All	City and County Government	All	Complete
33. Assure access of emergency vehicles on both sides of railroad tracks in Oakes	All	City Council	All	Removed
34. Work with Bismarck-based state radio to improve reception quality and reliability	All	Emergency Manager	All	Complete

Planning Process Details

Included on the following pages is a summary of the planning process. More details of the meetings held are located in Appendix 5. Roughly two weeks prior to Planning Committee meetings, invitation postcards were sent via the postal service to local jurisdictions, stakeholders, agencies, and neighboring emergency managers. The week prior to the Planning Committee meetings, reminder emails were sent to the aforementioned parties. (See Appendix 3 for invite materials and documentation, and Appendix 4 for media coverage documentation.)

The first Dickey County Planning Committee Meeting, which included the county’s LEPC and representatives of cities in the county, was held on February 12, 2019, at the Fireside Steak House in Ellendale. The planning committee also met in March and April, 2019.

Discussion at the meetings included the purpose of mitigation and the update of the Dickey County Multi-Jurisdictional Multi-Hazard Mitigation Plan (MHMP), how the current mitigation plan is used, who needed to be involved in the planning process, how to get public involvement, when to hold meetings, and review of the 2014 Dickey County MHMP, an initial review of the county’s and state’s hazards and vulnerabilities, and identification of the processes and steps to be taken in the planning process.

The Planning Committee identified that the plan is for the seven jurisdictions in the county: Dickey County Commission, the cities of Ellendale, Forbes, Fullerton, Ludden, Monango, and Oakes. Representatives from each jurisdiction were encouraged to be part of the planning process. Jurisdictional meetings would be held in each jurisdiction to conduct a specific risk assessment, identify vulnerable areas, assess level of readiness and preparedness, estimate potential losses from specific hazard events, decide on capacity and on how to allocate resources, and prioritize mitigation measures, actions, and projects for each jurisdiction. The Planning Committee voted that incorporated jurisdictions would be eligible for inclusion in the update upon completion of a jurisdictional meeting and not by representation at committee meetings.

The Planning Committee voted to make decisions in the planning process by a simple majority vote of committee members present. Committee members discussed how to gather the information needed to update the plan and how to garner public involvement. Letters, phone calls, and surveys were discussed. Other community and jurisdictional plans were discussed. The committee discussed that entities, such as school districts, park districts, water boards, rural electric cooperatives that can apply directly for FEMA grant funds, that participated in the process could also sign a resolution to adopt the plan.

The Planning Committee had its first review of the Dickey County and jurisdictions’ hazards. The committee compared the hazards and their rankings in the 2014 State of North Dakota MHMP to the county’s 2018 identified hazards and rankings. The committee compared the ranking of the frequency and likelihood of hazards in the state plan and in the 2019 county plan to the updated history and data. The Planning Committee voted on which hazards to exclude from the planning process and voted to include windstorm as a separate hazard in the update. (See Table 3.12)

Per recommendations from the state and FEMA, public involvement was through a community survey, news releases, and information shared at community events. The Planning Committee created a survey for public outreach. Participants agreed to distribute the survey through businesses, organizations, churches, and individuals.

The 2018 Dickey County MHMP was posted on the South Central Dakota Regional Council website at www.scdrc.org.

Insert Snip of Site

Public Participation and Comment Integration

All planning meetings were open to the public. In addition, one public meeting was held. The public meeting was held on **Date and Place The** agenda for the public meeting included review and acceptance of public comments. See Appendix 5 for meeting notes.

The plan was presented to the Dickey County Commission on **DATE** and was approved. The plan was submitted to the N.D. Dept. of Emergency Services on **DATE**.

Roles and Responsibilities

Table 3.4 indicates who participated and how each participated in the mitigation planning process from each Dickey County jurisdiction in 2004, 2014 and 2019.

Table 3.4 – Jurisdictional Participation in Planning Process

Jurisdictions Represented	Name and Title	Form of Participation	Status of Plan Participation
Dickey County	Charlie Russell Emergency Manager	Survey Comments Information Review	2004, 2014, 2019
Dickey County	Wanda Shephard	Comments Information Review	2019
City of Oakes	Lori Novak CHI Oakes Hospital	Comments Information Review	2019
City of Oakes	Tina Ochsner CHI Oakes Hospital	Comments Information Review	2019
Dickey County City of Fullerton	Dean Simek County Commissioner Mayor of Fullerton	Comments Information Review	2014
Dickey County	Thor Sand Dickey County Commissioner	Comments Information Review	2014
Dickey County	Joel Hamar County Commissioner	Comments Information Review	2004, 2014, 2019
City of Ellendale	Candace Middlestead	Comments	2014

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	Ellendale City Auditor	Information Projects	
City of Oakes	Jerry Hollingsworth Oakes Fire Department	Comments Information Projects	2014
City of Oakes	Monty Zimmer Oakes Mayor	Comments Information Projects Review	2004, 2014, 2019
City of Oakes	Justin Prochnow Oakes Police Department	Comments Information Review	2014
City of Oakes	Jeff Forward Oakes City Council Oakes Enhancement	Comments Information	2014
City of Ellendale	Matt Thorpe Ellendale Fire Department	Comments Information	2014, 2019
City of Ellendale	Michele Thorpe Ellendale Ambulance	Comments Information Review	2019
City of Oakes	Mike Sandy Oakes Ambulance	Comments Information	2014, 2019
City of Ellendale Ellendale Ambulance and Fire Department	Corey Gulke Ellendale Ambulance and Fire Department	Comments Information	2014, 2019
City of Oakes	Greg Strutz Oakes City Council	Comments	2014
City of Oakes	Nick Harris Oakes City Council	Comments	2014
City of Monango	Tyler Kinzler Monango Mayor	Comments Information	2014
City of Oakes	April Haring Oakes City Auditor	Comments Information	2014
City of Ellendale Dickey County	Don Flaherty Ellendale Mayor and Dickey County Tax Director	Comments Information Review	2004, 2014, 2019
City of Ellendale	Richard Wadholm	Comments Information Review	2019
Dickey County	Steven Harmer Dickey County Sheriff's Department	Comments Information Review	2019
City of Ellendale	Lucas VanZee City Police Department	Comments Information Review	2019
City of Oakes	Matt O'Brien City Police Department	Comments Information Review	2019
City of Ellendale	Paul Wedell	Comments	2019

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	City Fire Department Chief	Information Review	
Dickey County Health Department	Amber Miller, RN	Comments Information Review	2019
Dickey County Health Department	Laurie Wang, RN-DON	Comments Information Review	2019
City of Oakes	Mark Roberts Chief of Police Dept.	Comments Information Review	2014
City of Oakes	Doug Sitzler Oakes City Council	Comments	2014
City of Ellendale	Mike Frannea Chief of Police	Comments Information	2014
Dickey County	Chris Estes Deputy	Comments Information	2014, 2019
City of Oakes	Ryan Marthaller Oakes Fire Department	Comments Information	2014
City of Ludden	Chuck German Mayor	Comments Information Review	2014
Dickey County, City of Ellendale	Resa Russell	Comments Information	2014
City of Oakes	Andrea Masse Secretary-Sheriff's Office	Comments Information	2014
Dickey County	Jim Bohannon Sheriff's Department	Comments Information Review	2014
City of Ellendale	Theresa Kassa Inspector, Chamber UP	Comments Information	2014
City of Ellendale	Todd Flynn-Public Works Superintendent	Comments Information	2014
City of Ellendale	Sandy Ulmer Ellendale City Council	Comments Information	2014
City of Ellendale	Tim Belmore City Council	Comments Information	2014
City of Ellendale	Darren Pahl City Council	Comments Information	2014
City of Ellendale	Jolene Maunu City Council	Comments Information	2014
City of Ellendale	Troy Schilling City Council, CFO-Dickey Rural Networks	Comments Information	2014
City of Fullerton	Dean Arit Fire Dept., City Council	Comments Information	2014
City of Fullerton	Darren Adams City Council	Comments Information	2014
City of Fullerton	Steve Peterson Fire Dept., City Council	Comments Information	2014

City of Fullerton	Virginia Hagen City Auditor	Comments Information	2014
City of Monango	Sue Kinzler City Auditor	Comments Information	2014
City of Monango	Austin Smith City Council	Comments Information	2014
City of Monango	Jasmine Smith City Council	Comments Information	2014
City of Ludden	Susan German City Auditor	Comments Information	2014
City of Forbes	Judy McFarlane City Board Member	Comments Information	2014
City of Forbes	Dan Bradenburger City Board Member	Comments Information	2014
City of Forbes	Dennis Schrum Mayor	Comments Information	2014
Dickey County	Lance Kohlmeyer Dickey County Sheriff	Comments Information	2014

Additional participants in the plan development are listed in Table 3.6. Each was allowed the opportunity to comment on the plan.

Table 3.6 – Federal, State, Regional, Business and Other Participation in Planning Process

Other Participation	Representing	Name and Title	Form of Participation	Status of Plan Participation
Business/Industry	Ellendale Farmers Union	David Maunu	Comments	2014
Business/Industry	Ellendale Farmers Union	Jerry Rekow	Comments	2004, 2014
Business/Industry	Cenex	Roger Warbis	Comments	2014
Business/Industry	Farmer	Tim Belmore Farmer	Comments Information	2014
Business/Industry	Oakes Community Hospital	Ashley Reed Quality Risk Manager	Comments Information	2014
Business/Industry	Sanford Health Clinics	Theresa Kelly Director	Comments Information	2014
Business/Industry	Avera Health Clinic	Lorlei Maier Business Manager	Comments Information	2014
Business/Industry	Oakes Community Hospital	Lee Boyles President	Comments Information	2014
Business/Industry	Oakes Community Hospital	Elnora Hokana	Comments Information	2014
Business/Industry	Oakes Community Hospital	Mary Quandt Emergency Preparedness Coordinator	Comments Information	2014, 2019
Business/Industry	CHI Oakes Hospital	Lori Novak	Comments Information Review	2019

Business/Industry	CHI Oakes Hospital	Tina Ochsner	Comments Information Review	2019
Business/Industry	Oakes Community Hospital	Kathy Baumann	Comments Information	2014
Business/Industry	Prince of Peace Center/Evergreen Place	Michele Thorpe, RN, DON	Comments Information Review	2019
Federal	Farm Services Agency	Judy Nohrenberg County Executive Director	Comments Information	2014
Federal	National Weather Service	John Paul “JP” Martin Warning Coordination Meteorologist	Comments Information	2014
Federal	U.S. Army Corps of Engineers	Bob Martin, Pipestem Dam manager for U.S. Army Corps of Engineers, Jamestown, ND	Comments Information	2014
Public	Young Township	Marlon Steinwand Township Board	Comments Information	2014
Public	Clement Township	Gaylon Brandy	Comments	2014
Public	Clement Township	Jeff Anderson	Comments	2014
Public	Clement Township	Doug Ptacek	Comments	2014
Education	Trinity Bible College	Admissions Officer	Information	2014
Education	Trinity Bible College	Todd Staley Facilities Coordinator	Comments Information Review	2019
Education	Ellendale Public School	Michael Kaiser Superintendent	Comments Information Review	2019
Education	Oakes Public School	Kraig Steinhoff Superintendent	Comments Information Review	2019
Education	Ellendale Public School	Michele Thorpe School Board VP	Comments Information Review	2019
State	N.D. Aeronautics Commission	Website	Information	2014
State	N.D. Department of Transportation	John Thompson District 2 Engineer	Comments Information	2014
State	N.D. League of Cities	Jerry Hjelmstad	Comments Information	2014
State	Central Valley Health	Frank Bolak	Comments Information	2019
Utilities	Dickey Rural Networks	Troy Schilling, CFO	Comments Information	2014
Utilities	Dickey Rural Networks	James Byerley	Comments Information	2014

LaMoure County	LaMoure County Public Health	Tony Hanson, ADM	Comments Information Review	2019
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Public Participation and Comment Integration

All planning meetings were open to the public. A community survey was distributed throughout the county to encourage people's opinions and discussions about mitigation

Community Hazard Survey

A two-page Dickey County Community Hazard Survey was created by the plan consultant, Emergency Manager and the LEPC for distribution to encourage more public input. This survey was distributed through GoDaddy.com, hard copy by the Emergency Manager and through jurisdictional and county meetings. These survey results were used to Complete survey results are in Appendix 7.

Review and Incorporation of Existing Plans and Information

The Dickey County MHMP was developed with the consultation of local, state and federal agencies, local businesses, educational institutions and nonprofits. The Planning Committee reviewed information from their plans and programs and used this information in this plan document. The plans and organizations consulted and the information used in this plan document are identified in Table 3.10. The information gathered from these sources was used in the profile of the county and each community to identify capacity, vulnerabilities, hazards and threats to complete the risk assessment and identify mitigation strategies and who would be responsible to implement the action, partners and sources of funding for projects.

Table 3.10 – Review and Incorporation of Existing Plans and Information

Organization	Existing Plans and Information
Job Service of North Dakota	<ul style="list-style-type: none"> • Job Force Statistics in Dickey County
Oakes Community Hospital	<ul style="list-style-type: none"> • Health care services and statistics
Avera Clinic	<ul style="list-style-type: none"> • Health care services and statistics
Sanford Health	<ul style="list-style-type: none"> • Health care services and statistics
National Climatic Data Center (NCDC)	<ul style="list-style-type: none"> • Weather Event History Data
National Oceanic and Atmospheric Administration (NOAA) Satellite and Information Service	<ul style="list-style-type: none"> • Weather Event History Data • Snowfall History • Climatological Data • Tornado Statistics and Information
National Register of Historic Places	<ul style="list-style-type: none"> • Historic Preservation
National Weather Service	<ul style="list-style-type: none"> • Weather Event History Data • North Dakota Fire Danger Index
North Dakota Agricultural Statistic Service, USDA	<ul style="list-style-type: none"> • Livestock data/Ranking • Crop Production/Ranking • Agricultural Statistics • County Land Types
North Dakota Department of Emergency Services	<ul style="list-style-type: none"> • Technical Assistance Provided
North Dakota Department of Health	<ul style="list-style-type: none"> • Disease Prevention/Statistics • Public Health • Influenza History • Terrorism Information

Chapter 3

North Dakota Department of Transportation	<ul style="list-style-type: none"> • North Dakota Department of Transportation, TransAction III, North Dakota’s Statewide Strategic Transportation Plan 2012
North Dakota Game and Fish	<ul style="list-style-type: none"> • Wildlife Data
North Dakota Multi-Hazard Mitigation Plan, March 2011 and 2014	<ul style="list-style-type: none"> • State Mitigation Plan
North Dakota State Fire Marshal’s Office	<ul style="list-style-type: none"> • National Fire Incident Reporting Program
North Dakota State University Extension Service	<ul style="list-style-type: none"> • County Land Use
North Dakota State Water Commission	<ul style="list-style-type: none"> • Dam Safety • National Flood Insurance Program • Drought Disaster • Flood Control
Dickey County Emergency Manager	<ul style="list-style-type: none"> • Dickey County Emergency Operations Plan • Accident Reports • Emergency Action Plan-Jamestown Dam • Emergency Action Plan-Pheasant Lake Dam
Dickey County Leader	<ul style="list-style-type: none"> • Photos and County Hazard History Events
Dickey County Office of Emergency Services	<ul style="list-style-type: none"> • Hazardous Preparedness Information
Dickey County Sheriff’s Office	<ul style="list-style-type: none"> • Traffic Safety
Dickey County Multi-Hazard Mitigation Plan, July 2004, 2014	<ul style="list-style-type: none"> • Reviewed and Updated
Housing Needs Assessment for the North Dakota Planning Region VI	<ul style="list-style-type: none"> • Housing Data for Dickey County • Household Projections • Population Statistics and Projections • Special Needs facilities • Housing demand and analysis
Spatial Hazard Events and Losses Database for the United States (SHELDUS)	<ul style="list-style-type: none"> • Weather Event History Data • Weather Descriptions
U.S. Census 2010	<ul style="list-style-type: none"> • Demographic Data
U.S. Centers for Disease Control and Prevention (CDC)	<ul style="list-style-type: none"> • Disease Control • Disease Transmission
U.S. Department of Commerce	<ul style="list-style-type: none"> • Economic Development
U.S. Drought Monitor	<ul style="list-style-type: none"> • Drought Statistics
U.S. Fish and Wildlife Service, North Dakota Field Office	<ul style="list-style-type: none"> • Endangered Species Data
U.S. Geological Survey	<ul style="list-style-type: none"> • Geologic Research

Hazard Identification

Table 3.11 shows the hazards included in the plan, how identified and why included in the plan.

Table 3.11 – Dickey County Major Hazards

Hazard Profile	How Identified	Why Identified
Communicable Disease	<ul style="list-style-type: none"> • ND Department of Agricultural • ND Department of Health 	<ul style="list-style-type: none"> • Agricultural Community • Disease Statistics for Dickey County
Drought	<ul style="list-style-type: none"> • National Climatic Data Center • U.S. Drought Monitor • U.S. Department of Agricultural 	<ul style="list-style-type: none"> • Drought History • Current Drought conditions • Presidential Disaster Declarations • Agricultural Community
Urban Fire or Structure Fire	<ul style="list-style-type: none"> • ND State Fire Marshal’s Office • County Fire Districts 	<ul style="list-style-type: none"> • National Fire Reporting Incident Report • County Fire history
Wildland Fire	<ul style="list-style-type: none"> • ND State Fire Marshal’s Office • County Fire Districts 	<ul style="list-style-type: none"> • National Fire Reporting Incident Report • County Fire history
Flood	<ul style="list-style-type: none"> • National Climatic Data Center • Dickey County Emergency Manager • National Weather Service 	<ul style="list-style-type: none"> • History Events • Presidential Disaster Declarations • County Flooding Events
Hazardous Materials Storage & Release	<ul style="list-style-type: none"> • Dickey County Emergency Manger • ND Department of Transportation • Farm Service Agency 	<ul style="list-style-type: none"> • Hazardous materials routes through county • History of hazardous Material incidents • High truck traffic through county on Highway 281 • Pipeline located in county • Agricultural community - fertilizer use
Homeland Security Incidents	<ul style="list-style-type: none"> • Dickey County Emergency Manager 	
Shortage or Outage of Critical Materials or Infrastructure	<ul style="list-style-type: none"> • Dickey County Emergency Manager • ND Public Service Commission • Stakeholder input MDU, Dakota Valley, Dickey Rural Networks 	<ul style="list-style-type: none"> • History of power outages • Shortage of critical materials history • Communication outages
Severe Summer Weather	<ul style="list-style-type: none"> • National Climatic Data Center • National Weather Service • Dickey County Emergency Manager • SHELDUS 	<ul style="list-style-type: none"> • Presidential Disaster Declarations history • History of extensive damage from Summer Storms • Dickey County Summer Storm History
Transportation Accidents	<ul style="list-style-type: none"> • ND Department of Transportation • Dickey County Sheriff’s Office • Oakes Police Department • Ellendale Police Department • North Dakota Highway Patrol 	<ul style="list-style-type: none"> • Accident history in county
Severe Winter Storm	<ul style="list-style-type: none"> • National Climatic Data Center • National weather Service • Dickey County Emergency Manager • SHELDUS 	<ul style="list-style-type: none"> • Winter Storm history in county • Presidential Disaster Declaration for severe Winter Storms

Windstorm	<ul style="list-style-type: none"> • National Climatic Data Center • National Weather Service • Dickey County Emergency Manager • SHELDUS 	<ul style="list-style-type: none"> • Presidential Disaster Declarations history • History of extensive damage from Summer Storms • Dickey County Summer Storm History
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Table 3.12 shows the hazards the Planning Committee determined should be excluded from the plan and reasons why this decision was made. (See Appendix 5)

Table 3.12 – Hazards Excluded from Plan

Hazard	Why Excluded
Coastal Erosion	<ul style="list-style-type: none"> • Dickey County does not have an ocean coastline
Dam Failure	<ul style="list-style-type: none"> • There are no dams in Dickey County
Geological Earthquake	<ul style="list-style-type: none"> • No historical data or incident reports • No past emergency declarations
Hurricane	<ul style="list-style-type: none"> • Dickey County does not have an ocean coastline
Tsunami	<ul style="list-style-type: none"> • Dickey County does not have an ocean coastline

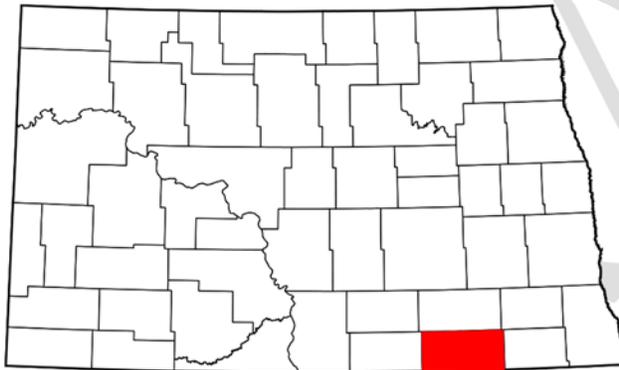
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4. County and Jurisdictions Profile and Inventory

Dickey County and Jurisdictions Overview

Dickey County is located in south-central North Dakota, bordering South Dakota. The county encompasses 1,142 square miles. Of those 1,142 square miles, 1,131 square miles of it is land (99.04 percent) and 11 square miles (0.96 percent) include water. The 2010 population of the county is 5,289 people, with a population density of 4.7.

The county is approximately twenty-four (24) miles from north to south and approximately forty-seven-and a half (47.5) miles from east to west. The county is bordered on the north by LaMoure County, on the northeast by Ransom County, on the east by Sargent County, on the south by Brown County, S.D., , on the southwest by McPherson County, S.D., and McIntosh County on the west. Agriculture is the main economic enterprise in the county. Other sectors of the economy are comprised mostly of agricultural-related and agriculture value-added industries. U.S. Highway 281, a major trade route extending from the Canadian border to the Mexican border, traverses north and south through the county and lies parallel to the hills to the west which mark the beginning of the rolling Great Plains. Other major highways in the county include N.D. Highway 1, N.D. Highway 11, and N.D. Highway 56. There are thirty-two (32) townships in the county. All are organized townships. They are: Ada, Albertha, Albion, Bear Creek, Clement, Divide, Elden, Ellendale, Elm, German, Grand Valley, Hamburg, Hudson, James River Valley, Kent, Kentner, Keystone, Lorraine, Lovell, Maple, Northwest, Port Emma, Porter, Potsdam, Riverdale, Spring Valley, Valley, Van Meter, Whitestone, Wright, Yorktown, and Young. A detailed map of Dickey County is shown in Chapter 9.



Dickey County is the highlighted county located on the southern border of North Dakota.

Dickey County features two national protected areas. Both are managed under Kulm Wetland Management District. The first, Dakota Lake National Wildlife Refuge is located in southern Dickey County. The refuge is a migration stopover for thousands of waterfowl and shore birds. The second, Maple River National Refuge, encompasses 1,120 acres of land, and is located in the central portion of the county.

Climate

The county's geographic location results in a sub-humid continental climate characterized by marked fluctuations in daily and seasonal maximum and minimum temperatures, and light to moderate precipitation. The precipitation tends to be irregular in occurrence, amounts, and area coverage. The inconsistency of the county's weather arises from the interaction of three major air masses which originate in distinct global regions; cold, dry air from the polar region; warm, moist air from the Gulf of Mexico; and cool, moist air from the Northern Pacific. Both the temperature and the moisture characteristics of a northern Pacific air mass change as the air moves across the Rocky Mountains. The resulting air, which is usually mild and dry, reinforces the continental nature of the county's climate. The

polar air mass tends to dominate the other two, but its influence is considerably lessened during the summer.

Normally, the temperature is moderate until the beginning of July, after which short hot periods are experienced through the end of August. The freeze-free period is the number of days between the average last occurrences of 32 degrees Fahrenheit (F) or lower in the spring and the first occurrence in the fall. The length of the freeze-free period approximates the length of the growing season which ranges from 110 days to 129 days between May 23 and September 11. Topography and local weather conditions can produce subfreezing temperatures at the ground surface while the air temperature a few feet above the ground remains above 32 degrees F. The lowest temperature ever recorded in Dickey County was -45 degrees on January 2, 1906, and the highest temperature ever recorded was 112 degrees on July 6, 1936.

Seasonally Average Expectations

Though no single year is likely to have “average” weather through its entire course of seasons there are certain weather expectations anticipated in an average or normal year. Several years in the 60's, the early 70's, mid-80's and early 90's may fit this description best.

- Winter - Typically 35-40 inches of snow, with 2.5 to 3.0 inches of water equivalent. Perhaps 6-8 winter storms, with 3-4 reaching blizzard intensity, the remainder having a combination of heavy snow, freezing rain, or windblown snow. These storms may generally last from 24 hours to 4 days. Extremely cold wind chills of less than - 40F° (old scale - 60F°) usually occur a few times a winter.
- Spring - Typically the spring will bring one or two late season heavy snow or blizzard events, and perhaps another high wind event affecting most of the County. An average season's snowmelt will generally cause minor river flooding, though it may be aggravated by heavier rains or heavier snowfall in upstream portions of the river and reach to moderate levels. Prior to spring green-up there is typically a slight wildfire risk, especially for grassland acreages and roadsides.
- Summer - Typical summer season precipitation will fall from the nearly 100 thunderstorms which occur on around 30 days (from late spring through fall). Of these, approximately 20 storms will reach severe intensity and produce 10-15 distinct large hail events (events separated by 10 miles or 15 minutes), a half-dozen damaging wind events, and approximately one weak tornado or flash flood each year.
- Autumn - Typically the fall will transition from thunderstorms, to widespread rain storms, to winter storms, with a month or so of dry and pleasant weather. A typical fall will have one or two high wind periods, each lasting from 4 to 20 hours.

Extreme Wet Cycle Expectations

Though the overall record of weather observations across Dickey County is relatively short (around 60 years), the protracted wet cycle of 1993-2002 has resulted in several different seasons where the number of weather events reached extreme levels.

- Winter - An extreme winter may reach 80-100 inches of snow, with 5-7 inches of water equivalent. Winter storms may last for 1-3 days, with nearly continuous wind driven snows and drifting making travel nearly impossible for many days on end. Temperatures can easily remain well below zero Fahrenheit for many days and even weeks. Extremely cold Wind Chills of less than - 40F° (old scale - 60F°) can occur several times through this period.

- Spring - Typically the wet cycle spring will bring two or more late season heavy snow or Blizzard events, followed quickly by ice storms, and then heavy rains on top of melting ice and snow. The spring flood of 1997 established new records along most rivers in the North Dakota Basin Watersheds. Cool and wet conditions will generally mean a low wildfire threat.
- Summer - An extreme winter does not always mean an extreme summer, or vice versa. However, under wet cycle conditions the summer could be cool and wet or hot and wet. If it is hot and wet, like the summers of 2001 and 2002, there could be a 50 percent increase in the number of thunderstorms, each storm could cover a larger area, and the occurrence of large hail and damaging winds could easily double to around 30 distinct events. The highest number of reported tornadoes in the county was three in 1960. Approximately 2 or 3 events will produce flash flooding or protracted overland flooding.
- Autumn - An extreme fall will continue the typical transition from thunderstorms, to widespread rain storms, to winter storms, but with little or no dry-period. The fall may produce 2-3 high wind events then hit with early season winter storms. The heaviest and wettest snowfalls will likely be in the late fall or early spring.

Annual EAS Activations

The National Weather Service issues forecasts and warnings for specific weather hazards for the protection of life and property and for the enhancement of the national economy. Certain of these hazards require activation of the Emergency Alert System (EAS) to alert the public. In a typical year the NWS will issue 52 routine weekly EAS tests, 6-8 winter storm watches and 6-8 winter storm warnings, 1-2 flood or flash flood watches or warnings, 5 severe thunderstorm or tornado watches for 20-25 severe thunderstorms, and another 1-2 high wind watches or warnings. This will result in nearly 100 county-wide EAS activations during the course of the year, half as part of the system test and half for real life-threatening weather situations.

Table 4.1 – 7/1/1914 to 11/1/2017 Dickey County Snowfall/Depth, Temperature, and Precipitation

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	44	47	56	67	76	84	88	86	78	69	58	47	67
Average Min. Temperature (F)	13	15	23	34	44	54	61	59	49	37	27	18	10
Average Total Precipitation (in.)	2.80	2.54	3.37	2.93	3.88	3.67	3.99	3.84	3.44	3.19	2.88	3.14	39.78
Average Total Snowfall (in.)	5.3	2.3	0	0	0	0	0	0	0	.6	2.7	5.3	16.1
Average Snow Depth (in.)	3	4	1	0	0	0	0	0	0	0	0	2	6

Source: High Plains Regional Climate Center

Population

Population statistics for Dickey County for the years 1980, 1990, 2000 and 2010 were obtained through the U.S. Census Bureau-Decennial Census. Population estimates for 2012, and projections for 2015 and 2020 were provided by the Housing Needs Assessment for The North Dakota Planning Region VI. Table 4.2 summarizes the population statistics for Dickey County. Figures 4.1 and 4.2 illustrate population trends and projections for Dickey County and city jurisdictions following the table. Statistics on population trends and projections are needed to understand the distribution of people across the county to help determine appropriate allocation of resources for mitigation purposes. These statistics also highlight where potential future needs may be.

The population of Dickey County has been declining for the past several decades despite job creation and economic stability. The decline in population is primarily due to agricultural mechanization and the decrease in family size. Between 1990 and 2000, the county lost 5.7 percent of its population and an additional 8.1 percent between 2000 and 2010.

As of the 2010 Census, all jurisdictions in Dickey County experienced population loss with the exception of Monango, which added eight people, an increase of 29.6 percent. Projecting forward to 2020, the city of Ellendale is expected to increase in population to 1,615. The city of Oakes is expected to remain relatively stable over the next decade with a 2020 projected population of 1,855.

Table 4.2 – 1990 to 2030 Dickey County Population Statistics

	1990	2000	2010	Percent Change 1990 to 2000	Percent Change 2000 to 2010	Estimate	Projections	
						2016	2020	2030
Dickey County	6107	5757	5289	-5.7%	-8.1%	5160	5283	5575
Ellendale	1798	1559	1394	-13.3%	-10.6%	1432	1615	1815
Forbes	56	64	53	14.3%	-17.2%	27	-	-
Fullerton	94	85	54	-9.6%	-36.5%	62	-	-
Ludden	41	29	23	-29.3%	-20.1%	36	-	-
Monango	53	28	36	-47.2%	29.6%	40	-	-
Oakes	1775	1979	1856	11.5%	-6.2%	2043	1855	1825

Sources: U.S. Census: American Fact Finder, Housing Needs Assessment for The North Dakota Planning Region VI

Poverty Statistics

Statistics on poverty in Dickey County are provided by the 2012-2016 American Community Survey, 5-Year Estimate from the U.S. Census Bureau. Information shown includes: Number and percent of individuals with incomes below and above the poverty level. Poverty statistics are important to understand where populations in poverty are living, which tend to be more vulnerable to natural and man-made hazards. Table 4.3 summarizes poverty statistics in Dickey County.

Per the 2012-2016 American Community Survey, 5-Year Estimate, there are 304 individuals in Dickey County with incomes below the poverty level, representing 9 percent of individuals in Dickey County. Conversely, there are 2,035 individuals with incomes above the poverty level, representing 91 percent of people in Dickey County.

Table 4.3 – 2016 American Community Survey - 5-Year Estimate Poverty Statistics

TOTAL	Income below Poverty Level	Income Above Poverty Level	Percent Below Poverty Level	Percent Above Poverty Level
Dickey County	476	4,813	9%	91%

Source: 2012-2016 American Community Survey 5-Year Estimates

Table 4.5 – Housing Units in Dickey County – Where populations are located.

Housing Units	Dickey County	Ellendale	Forbes	Fullerton	Ludden	Monango	Oakes
Single-Family Homes	1986	500	21	30	9	19	621
Multifamily Homes	481	214	5	0	0	0	246
Mobile Homes	188	34	0	8	10	3	72
Total Housing Units	2655	748	26	38	19	22	939

Source: 2012-2016 American Community Survey 5-Year Estimates

Major Recreation Areas and Top Attractions

Fullerton City Park Campground, located in Fullerton, ND

James River in Dickey County, located west of Ludden. Boat access on 1,354 acres of Waterfowl Management Area.

Oakes Golf Course, located 2 miles north of Oakes on Highway 11. A 9-hole course is a bent grass course featuring 2,998 yards of golf from the longest tees for a par of 36.

Oakes Irrigation Canal, located 4.5 miles south of Oakes. Fish for Bigmouth Buffalo, common carp and white sucker.

Oster Park Campground, located in Ellendale, ND

Paul Klinger Eagle Scout Park, located in Oakes, ND

Pheasant Lake, located seven miles west of Ellendale on N.D. Highway 11, which has a public beach, picnic area, fishing, boating, and camping.

Ellendale Country Club, located 3.5 miles south of town along N.D. Highway 28 and is home to a nine-hole golf course and a restaurant.

Westside Mobile Court and Campground, located just west of town, is a full hook-up campground with designated tent camping areas as well as a mobile home park.

Wilson Dam, located 7 miles west of Monango on US Hwy 281. Features a fishing pier, campground and limited playground equipment.

Table 4.4 – Services Provided in Dickey County Jurisdictions

Services	Ellendale	Forbes	Fullerton	Ludden	Monango	Oakes
City Garbage	X					
Inert Landfill	X	X				
Landfill	X					X
Lagoon	X	X		X		
Lift Station(s)	X	X		X		
Septic Systems			X			X
Sanitary Sewer System	X	X		X		
Southeast Water Users District	X		X			X
Water: Web Water		X				
Water: City Water				X	X	
Storm Water System	X					

Table 4.6 – Dickey County Jurisdictional Buildings – public owned buildings in each jurisdiction

Jurisdictional Buildings	Dickey County	Ellendale	Forbes	Fullerton	Ludden	Monango	Oakes
Airport		X					X
City Hall		X	X	X			X
City Shop		X					X
County Public Health	X*	X					
Golf Course		X					
County Courthouse	X*	X					
County Shop	X*	X					X
Library		X					X
Park		X	X	X		X	X
Senior Center		X					
School		X					X
Swimming pool		X					X
U.S.D.A. Farm Service Agency		X					
U.S. Post Office		X		X			X

X* denotes that the county-owned building is both listed under county and the city of Ashley, the county seat.

Table 4.7 shows the emergency response services and facilities in each jurisdiction. Due to the small size of some jurisdictions, services are provided by outside entities or jurisdictions. These jurisdictions are marked by an asterisk (*).

Table 4.7 – Dickey County Jurisdictional Emergency Response Services and Facilities

Emergency Response Services/Facilities	Ellendale	Forbes	Fullerton	Ludden	Monango	Oakes
Ambulance	X	X*	X*	X*	X*	X
Ambulance Hall	X	X*	X*			X
County Sheriff	X	X*	X*	X*	X*	
Fire Department	X	X	X	X*	X*	X
Fire District	X					
Fire Hall	X					X
Law Enforcement	X	X*	X*	X*	X*	X
Sirens	X	X	X			X

*Denotes jurisdictions with emergency response services provided by an outside entity or another jurisdiction.

Table 4.8 shows the utility providers for jurisdictions in Dickey County. Some providers for utilities, such as fuel oil and propane are unknown as residents choose providers on an individual basis.

Table 4.8 –Utility Providers serving Dickey County

Utility Providers	Ellendale	Forbes	Fullerton	Ludden	Monango	Oakes
Montana Dakota Utilities	X	X	X	X	X	X
Otter Tail Power Company						X
Fuel Oil	X	X	X	X	X	X
Individual Wells				N		
City Water Wells				N		
Natural Gas	N	N	N	N	N	N
Propane	X	X	X	X	X	X
Satellite/DirecTV	X	X	X	X	X	X
Dickey Rural – Phone, Internet, Television	X	X	X	X	X	X

Dickey County. Residents of Dickey receive water from South Central Regional Water District and maintain individual wells. The county does not have a sanitary sewer or storm water system, or a lagoon and lift stations. There is a landfill in the county. The official newspaper of the county is the Dickey County Leader.

Ellendale. The city of Ellendale receives its water from Southeast Water Users District. Electrical power in the city of Ellendale is provided by Montana-Dakota Utilities. In areas outside the city limits, electrical power is provided by Dakota Valley Electric Cooperative. The city does not have natural gas. Some heating of buildings is done by fuel oil and propane. Sanitary sewer and storm sewer are provided by the city of Ellendale. The city of Ellendale Water Treatment Plant has a generator for the plant to run pumps. The same generator can provide backup power the master lift station for waste water in the city. The official newspaper of the county is the Dickey County Leader.

Forbes. The city of Forbes receives its water from Web Water. The city maintains an inert landfill. Electrical power in the city of Forbes is provided by Montana-Dakota Utilities. In areas outside the city limits, electrical power is provided by Dakota Valley Electric Cooperative. The city does not have natural gas. Some heating of buildings is done by fuel oil and propane. Sanitary sewer is provided by the city of Forbes and the lagoon is located on the east side of the city. The city does not have a storm sewer system.

Fullerton. The city of Fullerton receives its water from Southeast Water Users District. Electrical power to the city is provided by Montana-Dakota Utilities. Dakota Valley Electric Cooperative provides electricity to areas outside city limits. The city does not have natural gas. Propane and fuel oil are used in town for heating. Sanitary sewer needs in the community are met by individual septic systems. The city does not have a storm sewer system, however, drain tile and culverts have been installed on Monroe Street in limited capacity. The official newspaper of the county is the Dickey County Leader.

Ludden. Electrical power to the city is provided by Montana-Dakota Utilities. Dakota Valley Electric Cooperative provides electricity to areas outside city limits. The city does not have natural gas. The community maintains its own sanitary sewer system and potable water system. The city does not have a storm water system. The official newspaper of the county is the Dickey County Leader.

Monango. The city of Monango receives its water from Southeast Water Users District. The city does not have natural gas or a sanitary sewer system. Residents have individual septic systems. There is not a storm water system in the city. The official newspaper of the county is the Dickey County Leader.

Oakes. The city of Oakes receives its water from Southeast Water Users District. The city has a sanitary sewer system and a lagoon with four cells. The city does not have a storm water system. The city has a lift station for the sanitary sewer system. The city provides sanitation services and delivers to Waste Management. The city maintains an inert and regular landfill. The official newspaper of the county is the Dickey County Leader.

Storm Shelters

Storm shelters provide area of refuges for people during incidents of natural hazards or manmade threats. Information on storm shelters is necessary to mitigation planning to help reduce or eliminate loss of life. Dickey County jurisdictions do not have any American Red Cross shelters.

County and City-Owned Buildings and Property

The following critical facilities and infrastructure shown in Table 4.10 are owned by local governments in Dickey County, according to the 2014 NDMHMP. A majority of facilities and infrastructure owned by county governments, cities and townships are insured through the North Dakota Fire and Tornado Fund. Data shown is a near complete assessment of the replacement value for local government facilities if impacted by hazards.

A total of 5 building properties were identified with a total value of \$488,862. The local governments also own 11 personal property policies valued at \$276,144. There is a total of 32 outdoor properties in the county valued at \$326,945. There are no trailer properties owned by local jurisdictions in Dickey County. The total value of buildings, personal property and outdoor properties is \$1,091,951.

Table 4.10 – 2014 Critical Facilities and Infrastructure Owned by Local Governments

County	# of Building Properties	Building Property Value	# of Personal Property Policies	Personal Property Value
Dickey	5	\$488,862	11	\$276,144
# of Outdoor Properties	Outdoor Property Value	# of Trailer Properties	Trailer Property Value	Total Value
3	\$326,945	0	0	\$1,091,951

Source: 2014 North Dakota Multi-Hazard Mitigation Plan

Freight Railroad Operated in Dickey County

According to the 2007 North Dakota State Rail Plan, two freight rail lines are operated in Dickey County by Dakota Missouri Valley and Western (DMVW) and the Red River Valley and Western (RRVW). Information on the transportation system, including freight railroad, bridges and airports, is important for understanding the transportation system and potential risk involved with transportation accidents, among other hazards. Table 4.7 summarizes this information.

The Wishek-Hankinson line, operated by the DMVW carrier, runs approximately 135.4 miles from Wishek to Hankinson and connects to the RRVW third subdivision at Oakes and the Canadian Pacific Railroad (CPR) Elbow Lake Subdivision main line at Hankinson. The line has a maximum speed of 10 m.p.h. The maximum carload is 143 tons, but is restricted to 134 tons between Fullerton and Wishek. Data from 2004 reveals that 31.6 million bushels of grain were transported on the line, generating approximately 8,196 carloads of grain.

Table 4.7 – 2007 Freight Railroad Operated in Dickey County

Railroad	Rail Line	Subdivision	Length in Miles	Maximum Speed	Maximum Carload	Tons Generated (3 yr. avg.)
Dakota Missouri Valley and Western (DMVW)	Wishek-Hankinson	Dakota Subdivision	135.4	10 mph	143 tons	850,906
Red River Valley and Western (RRVW)	Oakes Junction-Independence	Third Subdivision	88.8	25 mph	143 tons	397,225

Source: North Dakota State Rail Plan, 2017

The Oakes Junction-Independence line, operated by the RRVW carrier, connects to the Burlington Northern Santa Fe (BNSF) main line at Wahpeton and runs approximately 88.8 miles to the Independence Station in LaMoure via Oakes. The line has a maximum speed of 25 m.p.h. and a maximum carload capacity of 143 tons. Data from 2004 reveals that 19.08 million bushels of grain were transported on the line, generating approximately 4,986 carloads.

Dickey County Bridges

There is one scour bridge located in Dickey County as shown in the 2014 NDMHMP from information provided by the North Dakota Department of Transportation. Scour is erosion within a streambed due to flowing water. A bridge is scour critical if the bridge foundation is determined to be unstable for the calculated scour conditions and is especially vulnerable during flooding. The scour bridge in Dickey County is classified as structurally deficient. The location of the scour bridge is unknown but is most likely located outside city jurisdictions and, therefore, is likely to have a very low traffic volume.

Dickey County Airports

Information regarding airports in Dickey County is summarized in Table 4.8 and was obtained from the North Dakota Aeronautics Commission (NDAC), the Oakes Community Hospital and Air NAV. The NDAC was established in 1947 by the state legislature, assigning responsibility for state aviation functions and serves the public by providing economic and technical assistance for the aviation community. Air NAV is a website publishing aeronautical and [airport](#) information released by the [Federal Aviation Administration](#) (FAA). The data shown for aircraft operations was collected for a 12-month period ending August 9, 2013.

There are two city airports in Dickey County located in cities of Ellendale and Oakes. The Ellendale City Airport reported an average of 54 aircraft operations per week consisting of 71 percent local general aviation, 25 percent transient general aviation, four percent air taxi and less than one percent military. The airport is located one-mile northeast of Ellendale and is situated at an elevation of 1,457 feet above sea level. The Oakes Municipal Airport reported an average of 93 aircraft operations per week, consisting of 62 percent local general aviation, 31 percent transient general aviation, six percent air taxi and one percent military. The airport is located two miles north of Oakes and is situated at an elevation of 1,335 feet above sea level. Detailed information on the helipad at Oakes Community Hospital is discussed in the medical facilities section.

Aerial photographs of the Ellendale City Airport and Oakes Municipal Airport can be found in Chapter 9.

Table 4.8 – Dickey County Airports

Airport	Jurisdiction	Aircraft Operations August 2016-August 2017			
Ellendale City Airport	Ellendale	Operations avg. 54/wk.	71 percent local general aviation	25 percent transient general aviation	4 percent air taxi, <1 percent military
Oakes Municipal Airport	Oakes	Operations avg. 93/wk.	62 percent local general aviation	31 percent transient general aviation	6 percent air taxi, 1 percent military
Oakes Hospital Helipad	Oakes	Lifeflight avg. 1/month	Aberdeen via Careflight	Fargo via Sanford Lifeflight	

Sources: AirNAV, 2014 NDMHMP

Medical Facilities

Locations of medical facilities in Dickey County were provided by the Dickey County Health District. Information was collected on the medical facilities by contacting the business office of each facility. Medical facilities are critical infrastructure in the county for emergency services and play an important role in determining the vulnerabilities of the county for mitigation. Table 4.8 summarizes these facilities.

The only hospital in Dickey County is Oakes Community Hospital in Oakes. The hospital has a total bed capacity of 20 and a total staff of 102, including doctors. The hospital is designated as a Trauma Level V and provides medical and surgical services. The hospital also has a helicopter pad for transporting patients to larger hospitals in Aberdeen, South Dakota via Careflight and Fargo, North Dakota via Sanford Lifeflight. On average, one patient per month is transported via helicopter. The hospital also operates a clinic certified through rural health. The clinic is open Monday through Friday all day and half days on Saturday. The clinic has five exam rooms and provides family practice, internal medical and primary care services. There are no future expansion plans for the hospital or clinic as of January 2014.

The Sanford Health-Ellendale Clinic is open four, half-days and one, full-day per week and is staffed by a full-time physician assistant. A physician is scheduled for work at the clinic every other week. The clinic is certified rural health with three exam rooms. Services provided are family practice and internal medicine. The Sanford Health-Oakes Clinic is open 8 a.m. to 5 p.m. Monday through Friday and 8 a.m. to 12 p.m. on Saturday. The clinic has 12 exam rooms. Services provided include family practice, internal medicine, physical therapy, full lab and x-ray.

The Avera Clinic of Ellendale is a certified rural health clinic providing six exam rooms and one emergency room. Family practice services are provided. Hours of operations are 8 a.m. to 5 p.m. Monday through Friday. The clinic is closed on the weekends.

Table 4.9 – 2019 Dickey County Medical Facilities

Facility Name	Type	City	Capacity	Services
CHI Oakes Hospital	Hospital – Trauma Level V	Oakes	20 Beds	Medical/surgery, Careflight and Sanford Lifeflight
Sanford Health-Ellendale Clinic	Certified Rural Health	Ellendale	3 exam rooms	Family practice, internal medicine
Sanford Health-Oakes Clinic	--	Oakes	12 exam rooms	Family practice, internal medicine, physical therapy, full lab and x-ray
Avera Clinic of Ellendale	Certified Rural Health	Ellendale	6 exam rooms, one ER room	Family practice

Special Needs/Age Restricted Facilities

Dickey County has three facilities housing the elderly or individuals with special needs. Information on these facilities was obtained from the Housing Needs Assessment for The North Dakota Planning Region VI. The needs assessment was conducted in 2013. This information is included to show populations that would need assistance in evacuation during times of hazards and is summarized in Table 4.10.

Facilities catering to special population groups such as the disabled, elderly and incarcerated are often more vulnerable during disasters. There are a total of 20 assisted living units and 11 memory care units for a total of 31 special needs/age-restricted housing units in Dickey County. The assisted living units comprise 64.5 percent of the total units in Dickey County. No market rate independent/active adult rental or for-sale units, affordable/subsidized independent/active adult units or skilled nursing was identified in the county.

Table 4.10 – 2013 Special Needs/Age Restricted Facilities in Dickey County

Building Name	Type	City	Total Units
Good Samaritan Society	Assisted Living	Oakes	14
Evergreen Place	Assisted Living	Ellendale	6
Prince of Peace Care Center-Subiaco Unit	Memory Care	Ellendale	11

Source: Housing Needs Assessment for the North Dakota Planning Region VI

Primary Education

Students in Dickey County are served primarily by the Ellendale and Oakes school districts, which geographically cover approximately 75 percent of Dickey County. Neighboring LaMoure County school districts of Kulm, Edgeley and LaMoure, and Ashley in McIntosh County also provide services to students in Dickey County. Information on the enrollment of the Oakes and Ellendale school districts was provided by the North Dakota Office of Public Instruction. Table 4.10 summarizes enrollments of the school districts in Dickey County. Figure 4.3 shows the school districts and their respective geographic extent in Dickey County. Information on the location of primary education buildings are needed for mitigation to identify vulnerable populations that would need assistance in evacuating during hazard events.

The Ellendale Public School District covers central and southeast Dickey County and operates the Ellendale Public School and the Maple River Elementary school, which is located at the Maple River Hutterite Colony. Enrollment has declined 8.3 percent from 351 students in 2008 to 522 students in 2013.

The Oakes School District covers the eastern third of Dickey County and includes a high school and elementary school. Enrollment has varied over the past six years with 502 students in 2008 declining to 473 in 2010. Enrollment has been increasing since to 504 students in 2013. Table 4.11 shows the enrollment trends of school districts in Dickey County.

Table 4.11 – 2012 to 2017 Dickey County School District Enrollments

Jurisdiction	Number of Students (K-12) by School Year					
	2012	2013	2014	2015	2016	2017
Ellendale Public School and Maple River Elementary School	333	320	326	352	315	336
Oakes High School and Elementary School	489	495	488	490	494	493

Source: North Dakota Department of Public Instruction

Higher and Secondary Education

There is one private community college and one vocational technology center located in Dickey County. Enrollment figures represent fall-term full-time enrollment. Information on the location of higher and secondary education buildings is needed for mitigation to identify vulnerable populations would need assistance in evacuating during hazard events.

Trinity Bible College is a private community college located in Ellendale. The Southeast Regional Career and Technology Center is a vocational school for high school students and adults located in Oakes.

The Trinity Bible College admissions office provided data on enrollment, which represents full-time fall-term enrollment and is summarized in Table 4.12. Figure 4.4 shows a photo of the Trinity Bible College Campus.

Table 4.12 – 2007 to 2015 Private Community College Enrollment in Dickey County

College	Location	2007	2008	2009	2010	2011	2012	2013	2014	2015
Trinity Bible College	Ellendale	255	250	241	242	219	227	187	220	237

Source: Trinity Bible College

Figure 4.4 – Trinity Bible College Campus



Source: Trinity Bible College website with permission.

The Southeast Regional Career and Technology Center in Oakes offers educational programs and various support services to students from the following school districts: Ellendale, Fairmont, Hankinson, Lidgerwood, Lisbon, Oakes, Sargent Central, Wahpeton, Wyndmere, Campbell-Tintah and Richland 44. Information for the Southeast Regional Career and Technology Center was gathered via the school's website and is summarized in Table 4.13.

Table 4.13 – Southeast Regional Career and Technology Center

Vocational School	Location	Typical Enrollment
Southeast Region Career and Technology Center	Oakes, ND	Low of 25 with peak morning attendance of 75 to 100 physically on the campus.

Source: Southeast Region Business Office.

Housing Units

Information on housing units for Dickey County and city jurisdictions was provided by the U.S. Census Bureau-American Community Survey and the Housing Needs Assessment for the North Dakota Planning Region VI. Housing unit information presented includes: total housing units, median year built and median value of owner-occupied units in 2011. This information is important for understanding the

potential impact hazards will have on property and the potential magnitude of damage. Table 4.17 summarizes this information.

Table 4.17 – 2010 & 2016 Dickey County Housing Units Statistics

	Number of Housing Units 2010	Total Area Per Square Mile	Number of Housing Units per Square Mile	Median Value of Owner-Occupied Housing Units 2016
Dickey County	2,629	1,142	2.3	\$105,500
Ellendale	698	1.52	459.2	\$69,600
Forbes	41	0.25	164	\$0
Fullerton	39	0.39	100	\$36,300
Ludden	19	0.77	24.7	\$103,600
Monango	22	0.37	59.5	\$156,300
Oakes	912	1.64	556.1	\$110,300

Sources: U.S. Census: American Fact Finder, Housing Needs Assessment for The North Dakota Planning Region VI

Housing

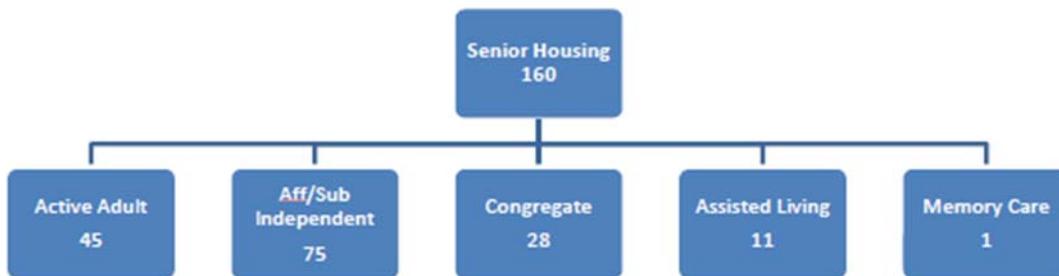
Figure 4.2 shows projected demand for housing in Dickey County from 2012 to 2020 from the Housing Needs Assessment for The North Dakota Planning Region VI. Projected increases in housing is critical to understanding where emergency services will be needed and where mitigation projects will have the great impact to mitigate hazards.

Figure 4.2 – 2012 to 2020 Projected General Occupancy Demand Dickey County

Dickey County Projected General Occupancy Demand, 2012 – 2020



Dickey County Projected Senior Demand, 2017



Note: Because households are mobile and are willing to seek out various housing products in adjacent communities, these demand figures may experience fluctuations.

Source: Housing Needs Assessment for The North Dakota Planning Region VI

5. Threat and Hazard Identification and Risk Assessment

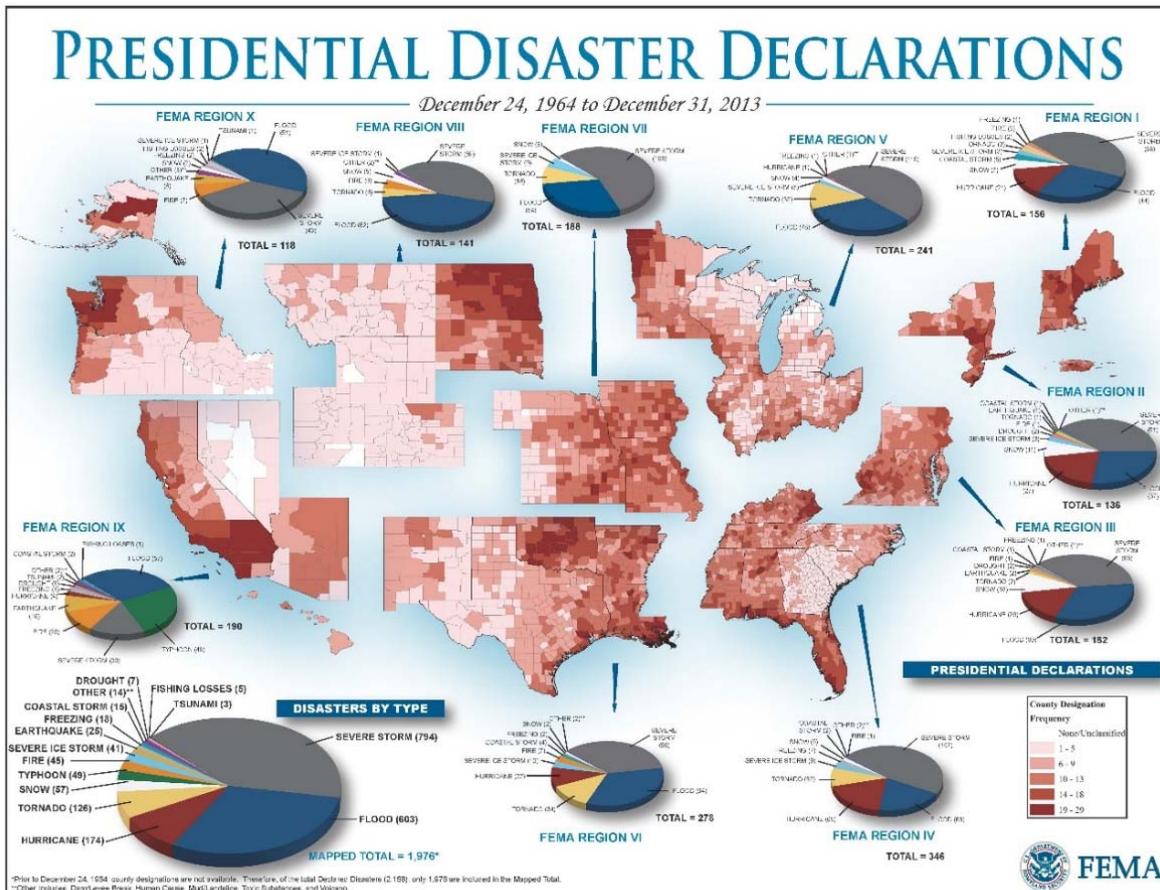
Dickey County has a history of damages from disasters. In the updating of this plan, the Planning Committee and county and city officials identified 12 hazards to be included in this plan because risk analysis showed that mitigation, planning, response, and preparedness would assist in limiting injury, loss of life, and loss of property. The following sections of this chapter detail the risk assessment for Dickey County and each of its jurisdictions for each of the 12 hazards.

The 12 hazards are:

- Communicable Disease
- Drought
- Flood
- Hazardous Material Release
- Homeland Security Incident
- Shortage or Outage of Critical Materials or Infrastructure
- Severe Summer Weather
- Transportation Accident
- Severe Winter Weather
- Structure Fire and Structure Collapse
- Wildland Fire and Rural Fire
- Windstorm

Dickey County history shows a high risk of damage from disasters. The FEMA Presidential Disaster Declaration map in Figure 5.1 shows that North Dakota and Dickey County are one of the areas in the nation with the most presidential disaster declarations in the past 50 years.

Figure 5.1 – 1964 to 2013 Presidential Disaster Declaration Frequency by FEMA Region



Source: Federal Emergency Management Agency

As shown in Figure 5.1, Dickey County and the eastern third of North Dakota have had the most Presidential Disaster Declarations as shown by the dark shading of the counties. The frequency of declarations for severe storms and flooding highlight the need for continued mitigation in Dickey County pertaining to these disasters as the county has experienced major losses. The frequency of flooding in Dickey County highlights the need for the county to be flood mapped to better understand the hazard and increase the effectiveness of mitigation projects pertaining to flooding to decrease and/or eliminate future losses to people and property.

Dickey County has had 20 Presidential Disaster Declarations (Table 5.1), including declarations for flooding, severe storms, ice jams, snowmelt, and ground saturation. These declarations highlight the large level of losses experienced in Dickey County and the value of mitigation actions.

Table 5.1 – 1953 through 2014 Presidential Disaster Declarations for Dickey County, N.D.

Decision Number	Date	Disaster Description	Statewide Costs Constant 2009 \$	President
216	03/23/1969	Flooding	6,144,924	Johnson
256	04/18/1969	Flooding	20,349,850	Nixon
475	07/11/1975	Severe Storms, Flooding	18,771,101	Ford
554	04/17/1978	Storms, Ice Jams, Snowmelt, Flooding	11,165,307	Carter
581	04/26/1979	Severe Storms, Snowmelt, Flooding	57,100,615	Carter
581	04/26/1979	Severe Storms, Snowmelt, Flooding	57,100,615	Carter
1001	07/26/1993	Flooding, Severe Storms		Clinton
1032	07-01-1994	Severe Storm, Flooding		Clinton
1050	05/16/1995	Severe Storms, Flooding, Ground Sat.	24,294,145	Clinton
1118	06/05/1996	Severe Storms, Flooding, Ice Jams	18,135,392	Clinton
1157	01/12/1997	Severe Winter Storms, Blizzard	21,264,168	Clinton
1174	04/07/1997	Severe Flooding, Severe Winter Storm	531,404,655	Clinton
1220	06/15/1998	Flooding, Ground Sat, Severe Storms	24,468,099	Clinton
1279	06/08/1999	Severe Storms, Flooding, Snow, Ice	145,619,808	Clinton
1334	06/27/2000	Severe Storms, Flooding, Ground Sat	113,151,807	Clinton
1376	05/28/2001	Severe Storms, Flooding, Ground Sat	45,117,082	GWBush
1597	07/22/2005	Severe Storms, Flooding, Ground Sat	19,237,140	GWBush
3247	09/13/2005	Hurricane Katrina Evacuation		GWBush
1616	11/21/2005	Severe Winter Storm and Record and/or Near Record Snow		GWBush
1713	07/17/2007	Severe Storms, Flooding	4,938,793	GWBush
1829	03/24/2009	Severe Storms, Flooding	107,590,628	Obama
1879	02/26/2010	Severe Winter Storm	20,602,060	Obama
1907	04/30/2010	Flooding	6,212,845	Obama
1981	05/10/2011	Flooding	43,547,540	Obama

Source: FEMA

In addition, Dickey County has had 12 disasters where the governor requested a Presidential Disaster Declaration, but was turned down. These turndowns assist in showing the history of damages from drought, high winds, and wildfire threats.

Table 5.2 – 1953 through 2014 Declined State Requested Disaster Declarations for N.D.

Number	Turn Down Date	Type	Disaster Description	President
61005	08/31/1961	Major	Drought	Kennedy
69006	03/21/1969	Major	Snow Removal, Flood Preparations	Nixon

71045	06/24/1971	Major	Flooding	Nixon
72022	04/25/1972	Major	Flooding	Nixon
75079	04/09/1975	Major	Snow, Floods	Ford
76010	09/03/1975	Major	Storms, High Winds	Ford
78018	01/25/1978	Major	Severe Winter Storms	Carter
78042	02/16/1978	Emergency	Snowstorm	Carter
80045	06/16/1980	Emergency	Drought	Carter
88022	11/18/1988	Major	Drought	Reagan
96176	11/19/1996	Major	Severe Storms	Clinton
2106	09/05/2002	Emergency	ND-Wildfire Threat	GWBush
	10/7/2017	Major	Drought	Trump

Source: Federal Emergency Management Agency; Public Entity Risk Institute

Each jurisdiction conducted a risk assessment of each hazard and threat. Each was scored as defined below for impact, frequency, likelihood, vulnerability and capability.

Impact is what damage or losses/consequence/effects the hazard causes in a community annually.

Scored 1	Negligible – Minimal damage to jurisdiction/people/property
Scored 2	Limited – Noticeable damage to jurisdiction/people/property
Scored 3	Critical – Considerable damage to jurisdiction/people/property
Scored 4	Catastrophic – Substantial damage to jurisdiction/people/property

Frequency is how often the hazard occurs annually.

Scored 1	Unlikely – history of events shows less than 1% chance hazard occur
Scored 2	Possible – history of events shows between 1% to 10% chance hazard occurs
Scored 3	Likely – history of events shows between 10% to 100% chance hazard occurs
Scored 4	Highly likely – history of events shows nearly 100% chance hazard occurs

Likelihood is how probable it is that the hazard will occur annually.

Scored 1	Unlikely – less than 1% chance hazard will occur
Scored 2	Possible – 1% to 10% chance hazard will occur
Scored 3	Likely – 10% to 100% chance hazard will occur
Scored 4	Highly likely – Nearly 100% chance hazard will occur

Vulnerability is the characteristics of the community assets making them susceptible to damage

1. vulnerable areas, such as trailer courts, building construction, and blocked roads and
2. vulnerable population, individuals with special needs, elderly, day cares, and schools

Scored 1	Low vulnerability: Adequate resources in the jurisdiction to address any hazard
Scored 2	Moderate vulnerability: Various resources in the jurisdiction
Scored 3	High vulnerability: Few resources in the jurisdiction
Scored 4	Very high vulnerability: Little to no resources in the jurisdiction

Capability is the ability to protect itself against the hazard with resources (i.e. buildings, infrastructure, equipment, personnel, plans, technical, financial/tax base)

Scored 1	Low capability: Little to no ability of the jurisdiction for mitigation
Scored 2	Moderate capability: Few abilities of the jurisdiction for mitigation
Scored 3	High capability: Various abilities of the jurisdiction for mitigation
Scored 4	Very high capability: Adequate abilities of the jurisdiction for mitigation

The formula to determine the total is: Impact plus Frequency plus Likelihood plus Vulnerabilities minus Capabilities equals Total. Higher total scores indicate more vulnerability and lower scores indicate less vulnerability.

Table 5.2 on the following pages summarizes the risk assessment scoring of each hazard at county and city jurisdictions. The individual results of each hazard assessment are repeated in each hazard section.

Table 5.3 – Dickey County Jurisdiction Risk Assessment Scoring Summary

Risk Assessment		Jurisdiction: Dickey County				
Hazard	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Communicable Disease	3	4	4	3	1	13
Drought	4	2	3	4	2	11
Flood	4	4	4	3	3	12
Hazardous Material Release	3	4	4	3	2	12
Homeland Security Incident	3	2	2	3	1	9
Shortage or Outage of Critical Materials or Infrastructure	4	3	3	4	2	12
Severe Summer Weather	4	4	4	3	2	13
Transportation Accident	4	4	4	4	2	14
Severe Winter Weather	4	4	4	4	2	14
Urban Fire/Structure Collapse	3	2	2	3	2	8
Wildland Fire	4	4	4	3	2	13
Windstorm	3	3	3	3	2	10

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Risk Assessment		Jurisdiction: Ellendale				
Hazard	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Communicable Disease	3	4	4	3	2	12
Drought	4	2	2	3	3	8
Flood	3	4	2	2	3	8
Hazardous Material Release	3	4	4	2	2	11
Homeland Security Incident	2	1	1	1	2	3
Severe Summer Weather	3	4	4	3	3	11
Severe Winter Weather	3	4	4	4	4	11
Shortage or Outage of Critical Materials or Infrastructure	3	2	2	2	3	6
Transportation Accident	4	4	4	3	2	13
Urban Fire/Structure Collapse	2	2	2	3	3	6
Wildland Fire	3	2	2	2	2	7

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Risk Assessment**Jurisdiction: Forbes**

Hazard	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Communicable Disease	2	1	1	1	1	4
Drought	4	2	3	1	2	8
Flood	4	4	4	1	2	11
Hazardous Material Release	4	2	2	1	1	8
Homeland Security Incident	4	1	1	1	1	6
Severe Summer Weather	4	4	4	4	1	15
Severe Winter Weather	3	4	4	1	2	10
Shortage or Outage of Critical Materials or Infrastructure	4	4	4	1	1	12
Transportation Accident	4	2	3	1	1	9
Urban Fire/Structure Collapse	4	2	4	1	1	10
Wildland Fire	4	2	3	1	2	8
Windstorm	3	4	4	4	1	14

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Risk Assessment**Jurisdiction: Fullerton**

Hazard	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Communicable Disease	1	2	2	1	1	5
Drought	4	1	2	3	1	9
Flood	4	4	4	1	1	12
Hazardous Material Release	4	1	2	2	2	7
Homeland Security Incident	3	1	1	1	1	5
Severe Summer Weather	3	4	4	1	1	11
Severe Winter Weather	3	4	4	1	2	10
Shortage or Outage of Critical Materials or Infrastructure	4	4	4	1	1	12
Transportation Accident	4	2	3	1	1	9
Urban Fire/Structure Collapse	3	2	3	4	2	10
Wildland Fire	1	2	2	4	2	7
Windstorm	3	4	4	2	1	12

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Risk Assessment **Jurisdiction: Ludden**

Hazard	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Communicable Disease	3	2	1	1	1	6
Drought	2	2	2	2	3	5
Flood	3	2	2	1	2	6
Hazardous Material Release	3	2	2	1	1	7
Homeland Security Incident	3	2	1	1	2	5
Severe Summer Weather	3	3	3	1	2	8
Severe Winter Weather	3	4	4	1	2	10
Shortage or Outage of Critical Materials or Infrastructure	3	2	2	1	2	6
Transportation Accident	3	2	2	1	2	6
Urban Fire/Structure Collapse	3	2	2	1	1	7
Wildland Fire	4	2	2	1	1	8
Windstorm	3	3	3	4	1	12

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Risk Assessment **Jurisdiction: Monango**

Hazard	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Communicable Disease	2	1	1	1	1	4
Drought	1	2	2	1	1	5
Flood	1	2	2	1	1	5
Hazardous Material Release	4	2	3	1	1	9
Homeland Security Incident	1	1	1	2	1	4
Severe Summer Weather	4	3	3	1	1	10
Severe Winter Weather	4	4	4	1	1	12
Shortage or Outage of Critical Materials or Infrastructure	3	3	3	2	1	10
Transportation Accident	4	2	2	1	1	8
Urban Fire/Structure Collapse	3	3	3	1	1	9
Wildland Fire	4	2	2	1	1	8
Windstorm	3	3	3	4	1	12

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Risk Assessment**Jurisdiction: Oakes**

Hazard	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Communicable Disease	3	4	4	3	3	11
Drought	4	2	2	3	3	8
Flood	3	4	2	2	3	8
Hazardous Material Release	3	4	4	2	2	11
Homeland Security Incident	2	1	1	2	2	4
Severe Summer Weather	3	4	4	3	3	11
Severe Winter Weather	3	4	4	4	4	11
Shortage or Outage of Critical Materials or Infrastructure	3	2	2	3	3	7
Transportation Accident	4	4	4	3	3	12
Urban Fire/Structure Collapse	2	1	1	3	3	4
Wildland Fire	3	2	2	3	3	7
Windstorm	3	3	3	4	1	12

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

DRAFT

5. Risk Assessment/Hazard Profiles

5.1 Communicable Disease

Including Human, Animal, and Plant Diseases.

Characteristics

Communicable disease is an illness that is caused by an infectious agent, such as bacteria, virus, fungi or parasites and/or toxin microorganisms and is transmittable from an infected person, animal or plant to another person, animal or plant. Some diseases are passed on by direct or indirect contact with infected person or with excretions. Most diseases are spread through contact or close proximity because the causative bacteria or viruses are airborne. Diseases can be spread by plants, animals and insects. The causes and significance of diseases vary. Such diseases can devastate human, animal, and plant populations as well as the economy.

A communicable disease could affect anywhere from only a few individuals, animals or plants to covering a large geographic or numeric extent. The entire county could be impacted affecting schools, businesses, and medical facilities. Elderly, young-children, and individuals with suppressed immune systems are at greatest risk. It could overwhelm local health care resources, force quarantines, and result in mass casualties, requiring the need for mass care facilities. Through the use of vaccines, members of the community can be protected against such diseases if the vaccines are available. Points of distribution may be required to administer mass vaccinations.

Disease transmission may occur naturally or intentionally, as in the case of bioterrorism, and infect populations rapidly with little notice. New diseases regularly emerge or mutate. Known diseases, such as influenza, can be particularly severe in any given season, like the H1N1 flu of 2009. Terrorism experts also theorize the possibility of attack using biological agents.

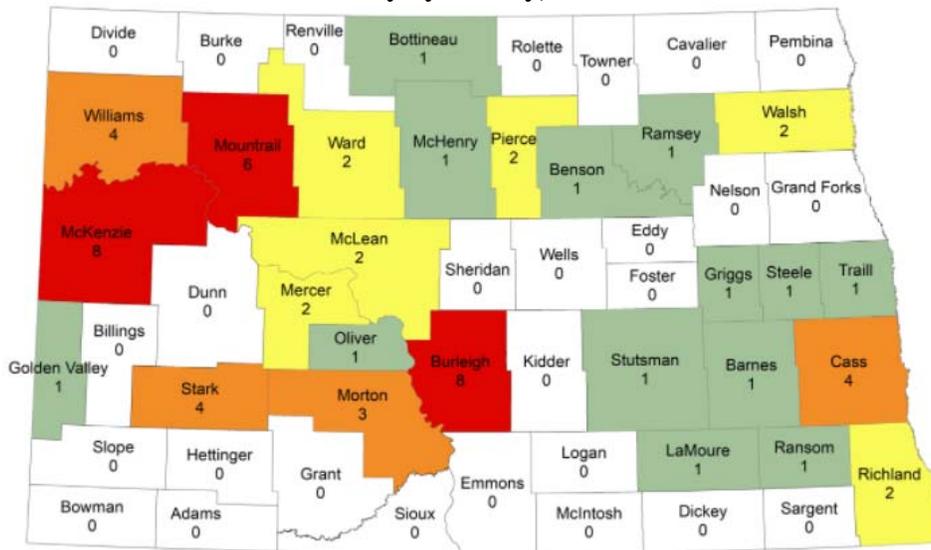
Natural illnesses of concern include: Influenza, Meningitis, Pertussis (Whooping Cough), Measles, Norwalk Virus, Severe Acute Respiratory Syndrome (SARS), and food-borne illnesses, such as E. Coli and Salmonella outbreaks, among others. These diseases can infect populations rapidly, particularly through groups of people in close proximity such as schools, assisted living and nursing facilities, and workplaces.

Animal and plant diseases, those that infect livestock and crops, can hurt the agricultural community and lead to severe economic loss. They often have negative economic impact and lead to a loss of jobs. Anthrax is a disease found in livestock. The bacteria *Bacillus Anthracis* causes anthrax. Spores of the bacteria lie dormant in the ground for decades and become active under ideal conditions, such as heavy rainfall, flooding and drought. When animals graze or consume forage or water contaminated with spores, they can possibly develop anthrax. (Source: N.D. Department of Agriculture)

History

According to the North Dakota Department of Health, Dickey County has not experienced a pandemic outbreak in years. Seasonal influenza outbreaks do occur annually. Dickey County reported 10 confirmed West Nile Cases in humans 2007, seven in 2012 and three in 2016. Figure 5.1.1 shows the frequency of West Nile virus North Dakota.

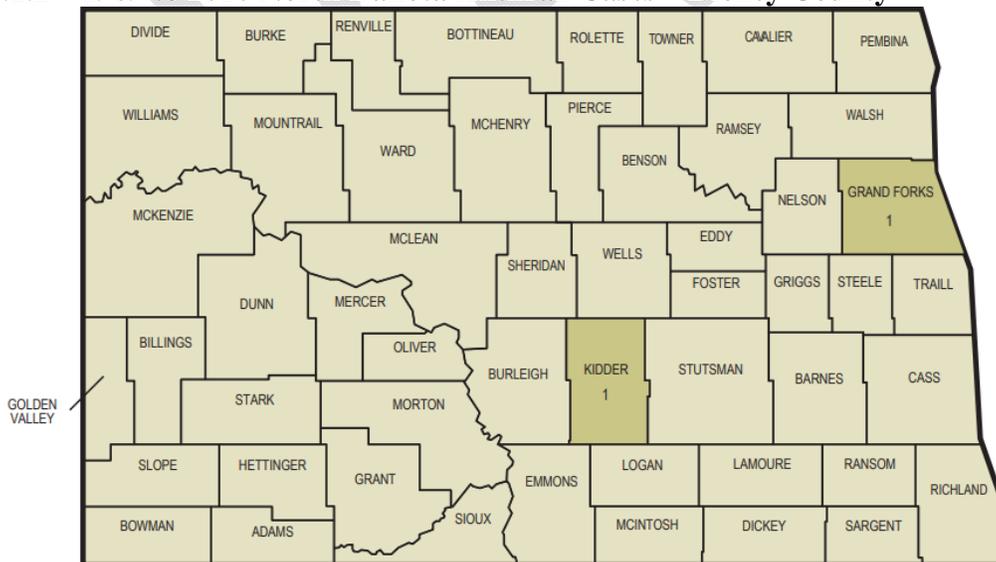
Figure 5.1.1 – 2017 West Nile Virus Activity by County, North Dakota



Source: North Dakota Department of Health

Anthrax has been most frequently reported in northeast, southeast and south-central North Dakota, but has been suspected in almost every part of the state. Dickey County reported seven cases in 2005 and one case in 2010. Due to efforts by veterinarians and extension agents to encourage producers to vaccinate their animals there has been a dramatic reduction in livestock deaths according to the North Dakota Department of Agriculture. Figure 5.1.2 shows the number of incidents of anthrax in North Dakota in 2015.

Figure 5.1.2 – 1989 to 2010 North Dakota Anthrax Cases—Dickey County



Source: N.D. Department of Agriculture

Crop loss from communicable disease is tracked by the United States Department of Agriculture Risk Management Agency (RMA). The RMA provides data on the crop type affected, net claimed acres, indemnity, loss liability, loss cost and the number of policies covered. The net claimed acres is the total acres planted for crops in the county for the given year. Liability is the total value in crops planted in the

county for the given year and indemnity is the amount paid to cover insurance claims from crop loss due to disease. The loss liability of crops was \$2,958,382 in Dickey County between 1990 and 2017 on 16,558 acres. Indemnity paid was \$1,795,159 resulting in losses of 61 percent of total liability. Crop loss indemnity paid over the 28-year period resulted in an annual average of \$64,100. Detailed data is available per crop for each year and can be found in Appendix 8.1. Data comes from Sheldus

There have been no declared disasters or emergencies pertaining to communicable disease in humans, animals or plants in Dickey County.

Probability and Magnitude

Data from the N.D. Department of Health illustrates a range of 21 to 30 cases of influenza in 2017; 20 cases of West Nile between 2007 and 2017; and 8 cases of anthrax occurring between the years 2005 and 2010. Hazard history for animals was not available. Hazard history for crops was gathered from the North Department of Health with crop losses and associated impacts obtained from USDA Risk Management Agency, Billings Regional Office. Crop loss data covers a 28-year period from 1990 through 2017 and shows an average of approximately \$64,100 in crop loss coverage paid each year. Data comes from Sheldus. Based on data gathered, the probability of communicable disease in humans, animals and plants is 100 percent as incidences occur each year. The magnitude of such events is subjective to each year and depends on precipitation for plants and animals, and overall weather patterns for all diseases.

Risk Assessment

Table 5.1.2 shows the risk assessment as determined by individual jurisdictions and the planning committee for communicable disease. The risk assessment methodology can be found in the beginning of Chapter 5 Risk Assessment Hazard Profiles. The total in Table 5.1.2 represents the sum of each jurisdiction’s impact, frequency, likelihood and vulnerability to a hazard less the jurisdiction’s capabilities to respond to the hazard.

Table 5.1.1 – Risk Assessment Summary Communicable Disease Scored Chart

Communicable Disease	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Dickey County	3	4	4	3	1	13
Ellendale	3	4	4	3	2	12
Forbes	2	4	4	2	2	10
Fullerton	1	2	2	1	1	5
Ludden	2	4	4	2	2	10
Monango	2	4	4	2	2	10
Oakes	3	4	4	3	3	11

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Seasonal Pattern	None, Flu has been fall and winter, now can be year-round
Duration	Could be multiple waves, 9 months, could be ongoing
Speed of Onset	6 weeks or less

Capabilities of and Vulnerabilities to Jurisdictions

Upon review of the statistics from the N.D. Department of Health and crop loss data from plant disease from the Risk Management Agency, the frequency and likelihood of communicable disease in Dickey County varied based on site specific accounts by residents, the agricultural industry and weather patterns for each specific year.

Capabilities and vulnerabilities of jurisdictions were scored at jurisdictional meetings with participation from the mayor and city auditor, in addition to members from the city council, business owners, emergency services representatives, and members of the general public. Participants discussed the incidents that occur in their jurisdiction and how frequent impacts are from the hazard to score impact and frequency. Participants compared the impacts and frequency of the hazard to determined future prevalence. The likelihood of the hazard was then scored. Vulnerability was scored with participants stating what makes the jurisdiction less vulnerable given their resources or more vulnerable by identifying resources not available.

Risk assessment hazard scoring and notes for the county are contained in the following graphic. The jurisdictional risk assessments can be found in Chapter 8, Jurisdictions.

Dickey County

Communicable Disease - 13

Impact	3	<ul style="list-style-type: none"> • U.S. declared an H1N1 was a declared pandemic in 2009 • Generalized shortage of essential medical supplies. • U.S. experienced a vaccine shortage in 2009 • Rural impact zoonotic social stigmas • Loss of Economy from Crop and/or livestock loss can be severe • Potential Loss of Life
Frequency	4	<ul style="list-style-type: none"> • Seasonal flu happens every year. • Tuberculosis in very low numbers for the area. • West Nile virus is a deadly disease that has occurred in the county on multiple occasions between 2007 and 2011. • Rabies in very low numbers for the area.
Likelihood	4	<ul style="list-style-type: none"> • Seasonal flu happens every year. • Hepatitis A risk due to seasonal flooding, high elderly population, ag lifestyle • Tuberculosis in very low numbers for the area. • Rabies in very low numbers for the area.
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: Emergency services must travel long distances to reach county populations spread out in rural areas. • More vulnerable: Always susceptible to diseases which can spread throughout the world population • More Vulnerable: College and active church groups with frequent international travel • More vulnerable: High elderly population • More vulnerable: Lack of specialized medical care and facilities • More vulnerable: Due to rural nature, lack of ability to recruit and retain medical personnel. Desperate need for emergency credentialing and accountability system • More Vulnerable: Due to rural agricultural economy, foreign, seasonal, transient workers abound

		<ul style="list-style-type: none"> • More vulnerable: Low number of staff/volunteers in the area to be able to support isolation and quarantine • More vulnerable: Long response times due to rural nature • More vulnerable: Dependent on vaccines being developed for any new viruses and picking the right strains of flu for the flu vaccine. • Less vulnerable: County has an active emergency management department with detailed plans • Less vulnerable: Robust public health department to educate the public on communicable disease available on the department’s website and social media
Capability	1	<ul style="list-style-type: none"> • Active and responsive county commission • Active emergency management department with detailed plans • County web site, social media, mass notification system available for education and information

The city of Ellendale - Communicable Disease - 12

Impact	3	<ul style="list-style-type: none"> • U.S. declared an H1N1 was a declared pandemic in 2009. • U.S. experienced a vaccine shortage in 2009. • Potential loss of life • Potential loss of economy • Entire City could be impacted by an outbreak
Frequency	4	<ul style="list-style-type: none"> • Seasonal flu happens every year. • West Nile Disease occurs frequently • Crop and localized livestock loss occur every year to a varying degree
Likelihood	4	<ul style="list-style-type: none"> • Seasonal flu happens every year • West Nile has happened in the past • Tuberculosis and rabies are very low numbers for the area
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: 20.7% of population is over 65 • More vulnerable: Some abandoned buildings and homes in town • More vulnerable: No stockpile of medical supplies, vaccines • More vulnerable: Some lots in town are overgrown with vegetation • More vulnerable: Blighted structures occupied by individuals who hoard or collect • More vulnerable: Dependent on vaccines being developed for any new viruses and picking the right strains of flu for the flu vaccine. • More vulnerable: Fire Service and First Responders often over stretched by mutual aid requests • Less vulnerable: City mows overgrown lots • Less vulnerable: Internet connections and TV help inform residents • Less vulnerable: Fire Service and First Responders • Less vulnerable: Two clinics
Capability	2	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish large projects independently

The city of Forbes - Communicable Disease - 10

Impact	2	<ul style="list-style-type: none"> • U.S. declared an H1N1 was a declared pandemic in 2009. • U.S. experienced a vaccine shortage in 2009. • Potential loss of life • Entire City could be impacted by an outbreak
Frequency	4	<ul style="list-style-type: none"> • Seasonal flu happens every year. • Crop and localized livestock loss occur every year to a varying degree
Likelihood	4	<ul style="list-style-type: none"> • Seasonal flu happens every year • Tuberculosis and rabies are very low numbers for the area
Vulnerability	2	<ul style="list-style-type: none"> • More vulnerable: 40% of population is over 65 • More vulnerable: Some abandoned buildings and homes in town • More vulnerable: No stockpile of medical supplies • More vulnerable: The city has no medical facilities. • More vulnerable: Some lots in town are overgrown with vegetation • More vulnerable: Blighted structures occupied by individuals who hoard or collect • More vulnerable: Dependent on vaccines being developed for any new viruses and picking the right strains of flu for the flu vaccine. • Less vulnerable: Residents mow lawns to keep vegetation under control • Less vulnerable: City mows overgrown lots • Less vulnerable: Internet connections and TV help inform residents • Less vulnerable: Fire Service and First Responders
Capability	2	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish large projects independently

The city of Fullerton - Communicable Disease - 5

Impact	1	<ul style="list-style-type: none"> • U.S. declared an H1N1 was a declared pandemic in 2009. • U.S. experienced a vaccine shortage in 2009. • Potential loss of life • Entire City could be impacted by an outbreak
Frequency	2	<ul style="list-style-type: none"> • Seasonal flu happens every year. • Crop and localized livestock loss occur every year to a varying degree
Likelihood	2	<ul style="list-style-type: none"> • Seasonal flu happens every year • Tuberculosis and rabies are very low numbers for the area
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: 25.9% of population is over 65 • More vulnerable: Some abandoned buildings and homes in town • More vulnerable: No stockpile of medical supplies • More vulnerable: The city has no medical facilities, public fueling capacity or public lodging. • More vulnerable: Some lots in town are overgrown with vegetation • More vulnerable: Blighted structures occupied by individuals who hoard or collect • More vulnerable: Dependent on vaccines being developed for any new viruses and picking the right strains of flu for the flu vaccine. • Less vulnerable: Residents mow lawns to keep vegetation under control • Less vulnerable: Small gathering spaces such as Ranch House and Carroll House, limiting spread of disease as gathering of large crowds does not occur • Less vulnerable: Increased awareness and education of city residents

		<ul style="list-style-type: none"> • Less vulnerable: City mows overgrown lots • Less vulnerable: Internet connections and TV help inform residents • Less vulnerable: Fire Service and First Responders
Capability	1	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish large projects independently

City of Ludden - Communicable Disease – 6

Impact	2	<ul style="list-style-type: none"> • U.S. declared an H1N1 was a declared pandemic in 2009. • U.S. experienced a vaccine shortage in 2009. • Potential loss of life • Entire City could be impacted by an outbreak
Frequency	4	<ul style="list-style-type: none"> • Seasonal flu happens every year. • Crop and localized livestock loss occur every year to a varying degree
Likelihood	4	<ul style="list-style-type: none"> • Seasonal flu happens every year • Tuberculosis and rabies are very low numbers for the area
Vulnerability	2	<ul style="list-style-type: none"> • More vulnerable: 34% of population is over 65 • More vulnerable: Some abandoned buildings and homes in town • More vulnerable: No stockpile of medical supplies • More vulnerable: The city has no medical facilities, public fueling capacity or public lodging • More vulnerable: Some lots in town are overgrown with vegetation • More vulnerable: Blighted structures occupied by individuals who hoard or collect • More vulnerable: Dependent on vaccines being developed for any new viruses and picking the right strains of flu for the flu vaccine • More vulnerable: No local ambulance, prolonged response times • Less vulnerable: Residents mow lawns to keep vegetation under control • Less vulnerable: City mows overgrown lots • Less vulnerable: Internet connections and TV help inform residents • Less vulnerable: Fire Service and First Responders
Capability	2	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish large projects independently

The city of Monango - Communicable Disease – 10

Impact	2	<ul style="list-style-type: none"> • U.S. declared an H1N1 was a declared pandemic in 2009. • U.S. experienced a vaccine shortage in 2009. • Potential loss of life • Entire City could be impacted by an outbreak
Frequency	4	<ul style="list-style-type: none"> • Seasonal flu happens every year. • Crop and localized livestock loss occur every year to a varying degree
Likelihood	4	<ul style="list-style-type: none"> • Seasonal flu happens every year • Tuberculosis and rabies are very low numbers for the area
Vulnerability	2	<ul style="list-style-type: none"> • More vulnerable: 40% of population is over 65 • More vulnerable: Some abandoned buildings and homes in town

		<ul style="list-style-type: none"> • More vulnerable: No stockpile of medical supplies • More vulnerable: The city has no medical facilities • More vulnerable: Some lots in town are overgrown with vegetation • More vulnerable: Blighted structures occupied by individuals who hoard or collect • More vulnerable: Dependent on vaccines being developed for any new viruses and picking the right strains of flu for the flu vaccine • More vulnerable: Located on U.S. Highway 281 • Less vulnerable: Residents mow lawns to keep vegetation under control • Less vulnerable: City mows overgrown lots • Less vulnerable: Internet connections and TV help inform residents • Less vulnerable: Fire Service and First Responders
Capability	2	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish large projects independently

City of Oakes – Communicable Disease – 11

Impact	3	<ul style="list-style-type: none"> • U.S. declared an H1N1 was a declared pandemic in 2009. • U.S. experienced a vaccine shortage in 2009. • Potential loss of life • Entire City could be impacted by an outbreak
Frequency	4	<ul style="list-style-type: none"> • Seasonal flu happens every year. • West Nile Disease occurs frequently • Crop and localized livestock loss occur every year to a varying degree
Likelihood	4	<ul style="list-style-type: none"> • Seasonal flu happens every year • West Nile has happened in the past few years • Tuberculosis and rabies are very low numbers for the area
Vulnerability	2	<ul style="list-style-type: none"> • More vulnerable: 24.1% of population is over 65 • More vulnerable: Some abandoned buildings and homes in town • More vulnerable: No stockpile of medical supplies, vaccines • More vulnerable: Some lots in town are overgrown with vegetation • More vulnerable: Blighted structures occupied by individuals who hoard or collect • More vulnerable: Dependent on vaccines being developed for any new viruses and picking the right strains of flu for the flu vaccine. • Less vulnerable: City mows overgrown lots • Less vulnerable: Internet connections and TV help inform residents • Less vulnerable: Fire Service and First Responders
Capability	2	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish large projects independently

Vulnerabilities to County-Owned Buildings and Property

Most structures remain unaffected by impacts from communicable disease as people, plants and animals are susceptible to the hazard. Buildings can potentially become contaminated with a communicable disease such as mold, which can potentially render the building uninhabitable. This can be extremely expensive to remediate.

Vulnerabilities of Critical Facilities and Infrastructure

Since humans, plants and animals are affected by communicable disease, critical facilities and infrastructure is relatively unaffected in structural terms. However, critical facilities such as hospitals and clinics can become quickly overwhelmed if an outbreak of communicable disease occurs in humans. Due to the high quantities of livestock in the county, veterinary services can also become overwhelmed in the case of an outbreak in farm animals. The onset of stress to medical facilities can occur quickly with limited personnel and resources in rural areas such as Dickey County. Likewise, emergency services can also be stressed as the county and its population is spread over a large geographic area. Other facilities at risk are those that house large populations in close quarters such as the Trinity Bible College, public schools, assisted living facilities and nursing homes. Due to an aging population and projected population increases through 2017, the vulnerability and exposure to communicable diseases is likely to increase.

As shown in Table 5.1.2, youth populations age 19 and under consisted of 25.8 percent of the Dickey County population in 2010 and is estimated to decrease to 24.4 percent by 2016. Conversely, the 65 to 74 and 75+ populations consisted of 9.9 percent and 12.3 percent of the Dickey County population in 2010 and is estimated to increase to 10.5 percent and decrease to 11.2 percent by 2016, respectively. Chapter 4 provides an inventory of county and city owned property in Dickey County.

Table 5.1.2 – 2010 to 2016 Dickey County Vulnerable Populations

Age Group	2010	2016	Percent of Population 2010	Percent of Population 2016
Under 19	1,362	1,261	25.8%	24.4%
65 to 74	521	540	9.9%	10.5%
75+	649	580	12.3%	11.2%

Source: Housing Needs Assessment for The North Dakota Planning Region VI, American Fact Finder

Due to the high numbers of livestock in the county, veterinary services can also become overwhelmed in the case of an outbreak in farm animals and livestock. The onset of stress to veterinarian and medical facilities can occur quickly with limited personnel and resources in rural areas such as Dickey County.

Vulnerabilities to New and Future Development

New development would largely not be impacted by communicable disease. However, with the lack of building codes in smaller jurisdictions, new structures could be susceptible to deterioration from contamination if structures are not constructed properly lacking windows and other construction materials of higher quality.

Data Limitations and Other Key Documents

Increased public awareness and education is a primary reason for decreases in losses from communicable disease. The lack of emergency action plans in most jurisdictions in Dickey County result in the inability to track loss estimates. Statistics were not available for Winter Wheat in North Dakota as the Risk Management Agency does not insure this type of crop.

This plan incorporates data from the following documents and information from this plan will be incorporated in the update of the following documents.

- North Dakota Department of Health, Pandemic Influenza Plan
- North Dakota Department of Health, Public Health & Medical All-Hazards Plan
- North Dakota Department of Health, Specific Disease Agent Plans
- North Dakota Department of Agriculture, Foreign Animal Disease Plan
- North Dakota Emergency Operations Plan, Animal Health Annex
- North Dakota Emergency Operations Plan, Infectious Diseases Annex
- North Dakota Emergency Operations Plan, Plant Health Annex
- Dickey County 2014 Multi-Hazard Mitigation Plan
- Dickey County Emergency Operations Plan
- Dickey County Sheltering/Mass-Care Plan

DRAFT

5.2 Drought

Characteristics

Definition: Drought is a deficiency in precipitation over an extended period, usually a season or more, resulting in a water shortage causing adverse impacts on vegetation, animals, and/or people. Drought is a temporary diversion from normal climatic conditions and is different than aridity, which is a permanent feature of climate in regions where low precipitation is the norm, as in a desert. Drought characteristics usually include precipitation levels well below normal and temperatures higher than normal.

In addition to severe damage to vegetation, soil in a drought area becomes dry and crumbles. Often topsoil is blown away by hot, dry winds. Streams, ponds, and wells often dry up during a drought, thus wildlife and livestock suffer and even die.

Human factors, such as water demand and water management, can affect the impact that drought has on a region. Below are four commonly used definitions by the National Drought Mitigation Center.

- Meteorological drought is defined based on the degree of dryness (in comparison to some “normal” or average) and the duration of the dry period. Drought onset generally occurs with a meteorological drought.
- Agricultural drought occurs when there isn’t enough soil moisture to meet the needs of a particular crop at a particular time. Agricultural drought happens after meteorological drought but before hydrological drought. Agriculture is usually the first economic sector to be affected by drought.
- Hydrological drought usually occurs following periods of extended precipitation shortfalls that impact water supply (examples: stream flow, reservoir and lake levels, ground water), potentially resulting in significant social impacts.
- Socioeconomic drought occurs when physical water shortage starts to affect people, individually and collectively. Or, drought associated with the supply and demand of an economic good.

Weather forecaster cannot predict just when a drought will occur. However, drought tends to alternate with wetter than normal periods. Droughts of the past can be read in the growth rings of trees. In wet periods, the ring is thicker than in dry periods. It is a fact that precipitation deficits as little as four to six inches can cause severe drought conditions. Drought severity regarding agricultural procedures depends on the time of year, timing of precipitation, amount of stored soil water, type of crop, stage of growth, and meteorological variables such as temperature, humidity, and wind.

The U.S. is vulnerable to the social, economic, and environmental impacts of drought. The over 100-year weather record of the U.S. indicates that there were three to four major drought events. Two of these, the 1930s Dust Bowl drought and the 1950s drought, each lasted five to seven years and covered large areas of the continental United States.

Several secondary hazards are generally associated with drought. Rural grassland fires increase because of dry vegetation. Reduction in vegetation cover will expose the soil to wind, and dust storms and soil erosion will occur. Because of reduction in flow, the chemical quality of river and lake water will change, and sediment transport regimes of streams will be altered.

Deterioration in water quality, in turn, results in injury and death to plants and animals. Stagnant pools along river courses will provide favorable habitats for insects, particularly mosquitoes and grasshoppers. Finally, with the return of rain, the dry and unstable top soil is vulnerable to gullying and flooding.

Drought produces a complex web of impacts that spans many sectors of the economy and reaches well beyond the area experiencing physical drought. The complexity exists because water is integral to our ability to produce goods and provide services.

Impacts are commonly referred to as direct or indirect. Reduced crop, rangeland, and forest productivity; increased fire hazard; reduced water levels; increased livestock and wildlife mortality rates; and damage to wildlife and fish habitat are a few examples of direct impacts. The consequences of these impacts illustrate indirect impacts. For example, a reduction in crop, rangeland, and forest productivity may result in reduced income for farmers and agribusiness, increased prices for food and timber, unemployment, reduced tax revenues, increase crime, foreclosures on bank loans to farmers and businesses, mitigation, and disaster relief programs. In fact, the web of impacts becomes so diffuse that it's very difficult to come up with financial estimates of damages.

The U.S. Department of Agriculture frequently declares agricultural disasters because of drought as is noted in the history section. In Dickey County, the impacts would first be realized in agricultural losses as the county's economy relies on agricultural.

History

Information provided by the Spatial Hazard Events and Losses Database for the United States (SHELDUS) indicates one period of drought in 1988 for Dickey County. Information gathered from committee and jurisdiction meetings have indicated that while dryer periods have come and gone, the one true drought was in 1988. The 1988 drought was so severe that nearly all aspects of local economies were affected. Table 5.2.1 summarizes the history of drought in Dickey County. The data is also shown in Appendix 8.3.

Table 5.2.1 – 1988 Drought Hazard History Summary

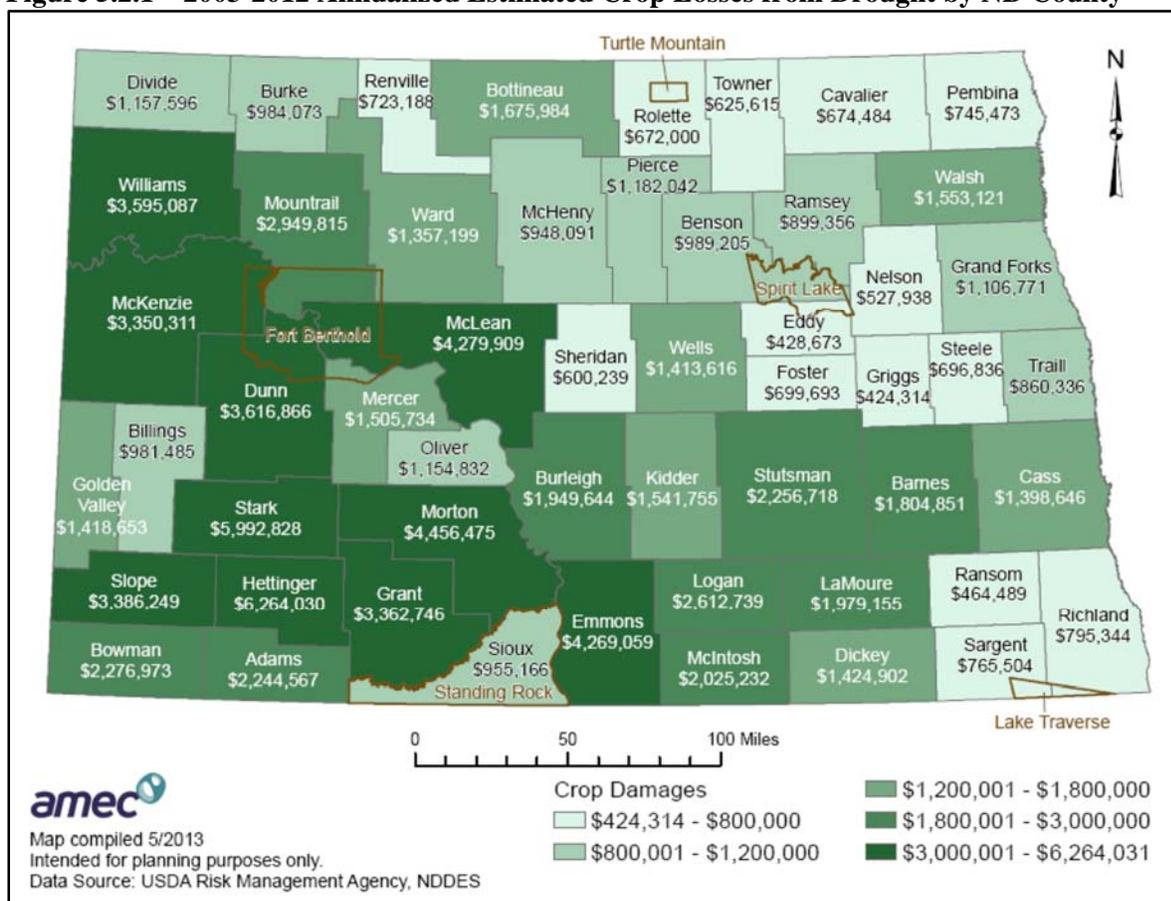
Date	Injuries	Fatalities	Property Damage	Crop Damage	Remarks
6/1/1988	0.00	0.00	\$94,339.62	\$94,339.62	Drought - Heat

Source: Source: Spatial Hazard Events and Losses Database for the United States (SHELDUS)

Crop loss from drought is tracked by the United States Department of Agriculture Risk Management Agency (RMA). The RMA provides data on the crop type affected, net claimed acres, indemnity, loss liability, loss cost and the number of policies covered. The net claimed acres is the total acres planted for crops in the county for the given year. Liability is the total value in crops planted in the county for the given year and indemnity is the amount paid to cover insurance claims from crop loss due to drought. The loss liability of crops was \$104,584,965 in Dickey County between 1990 and 2013 on 351,885 acres. Indemnity paid was \$35,545,049 resulting in losses of 33 percent of total liability. Crop loss indemnity paid from drought over the 24-year period resulted in an annual average of \$1,439,377. Detailed data is available per crop for each year and can be found in Appendix 8.3.

Figure 5.2.1 shows the annualized estimated crop losses experienced in Dickey County from drought between 2003 and 2012 from the 2014 NDMHMP. Dickey County experienced an estimated \$1,424,902 in annual crop losses from drought, roughly the same from data provided by the RMA. Although only one true drought event has been recorded, dry conditions persist from year to year and impact all types of crops to a varying degree.

Figure 5.2.1 – 2003-2012 Annualized Estimated Crop Losses from Drought by ND County



Source: North Dakota Department of Emergency Services

Dickey County has not had any Disaster Declarations for drought. North Dakota had three requests that were turned down. Table 5.2.2 summarizes this information. Two requests for drought disasters declarations were requested in 1961 and 1980. Categories of potential drought losses are shown in Appendix 8 and provide information in understanding the various types of drought, related causes and types of loss expected. This data helps in determining why losses from drought have occurred in Dickey County in years in addition to the official drought in 1988.

Table 5.2.2 – Turned Down State Requested Disaster Declarations for North Dakota

Requested Number	Turn Down Date	Type	Disaster Description	President
61005	08/31/1961	Major	Drought	Kennedy
80045	06/16/1980	Emergency	Drought	Carter
88022	11/18/1988	Major	Drought	Reagan

Source: FEMA

Probability and Magnitude

Hazard history was gathered from the SHELDUS, which showed one occurrence of drought in 1988. Due to one instance of an official drought declaration, the probability of drought is very low in Dickey

County. However, dry weather always persists year to year and varies in intensity. Due to the local economy being heavily reliant on the agriculture industry, the probability and magnitude of drought can be measured by crop loss. As shown from data provided by the 2014 NDMHMP and the RMA, crop losses from drought in Dickey County averaged between \$1,424,902 and 1,439,377 annually. Therefore, the probability of crop loss from drought is 100 percent and magnitude depend on the weather conditions in the given year.

Risk Assessment

Table 5.2.3 shows the risk assessment as determined by individual jurisdictions and the planning committee for drought. The risk assessment methodology can be found in the beginning of Chapter 5, Risk Assessment Hazard Profiles. The total in Table 5.2.3 represents the sum of each jurisdiction's impact, frequency, likelihood and vulnerability to a hazard less the jurisdiction's capabilities to respond to the hazard.

Table 5.2.3 – Risk Assessment Summary Drought Scored Chart

Drought	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Dickey County	4	2	3	4	2	11
Ellendale	4	2	2	3	3	8
Forbes	3	3	3	3	1	11
Fullerton	4	1	2	3	1	9
Ludden	2	2	2	2	3	5
Monango	3	3	3	3	1	11
Oakes	3	3	3	3	1	11

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Seasonal Pattern	Starts with limited Snowfall/Rain
Duration	1 to 5 years, up to a decade in severe cases
Speed of Onset	Slow and gradual

Capabilities of and Vulnerabilities to Jurisdictions

Upon review of the statistics from SHELDUS and the 2014 NDMHMP, the frequency and likelihood of drought in Dickey County was scored low. However, impact across most jurisdictions was scored high due to local economics relying on the agriculture industry.

Capabilities and vulnerabilities of jurisdictions were scored at committee meetings with participants including the mayor and city auditor, in addition to members from the city council, business owners, emergency services representatives, and members of the general public. Participants discussed the incidents that occur in their jurisdiction and how frequent impacts are from the hazard. Afterwards, they scored impacts and frequency of the hazard. Participants compared the impacts and frequency of the hazard and determined future prevalence. The likelihood of the hazard was then scored. Vulnerability was scored with participants stating what makes the jurisdiction less vulnerable given their resources at hand or more vulnerable by identifying resources not available.

Risk assessment hazard scoring and notes for the county are contained in the following graphic. The jurisdictional risk assessments can be found in Chapter 8, Jurisdictions.

Dickey County – Drought – 11

Impact	4	<ul style="list-style-type: none"> • Water holes that supply livestock are impacted. • Hay shortages during times of drought impact livestock. • Loss of farm economy impacts service industries • Drought would hinder fire suppression efforts as water would not be readily available. • Concern for potable water for the population • Multiple years of drought would have a severe impact
Frequency	2	<ul style="list-style-type: none"> • Dry conditions during the 1980's. • A drought event was recorded by SHELDUS in June 1988. • Moderate drought going into the 2018 winter – dry conditions
Likelihood	3	<ul style="list-style-type: none"> • Cyclical pattern to rains so there is always a possibility of a severe drought.
Vulnerability	4	<ul style="list-style-type: none"> • Depending on duration, vulnerability changes. • More vulnerable: Large cattle population • More vulnerable: Economy relies heavily on farming • More vulnerable: Lack of water sources for drought relief • More vulnerable: Potable Water • More vulnerable: Special needs population in County makes potable water essential • Less vulnerable: Public Awareness training and warning systems, cell phones, internet, radio and TV • Less vulnerable: Burn bans implemented during dry periods • Less vulnerable: Local fire departments conduct fire awareness and education programs for schools. • More vulnerable: Private potable water wells within the county have been capped recently
Capability	2	<ul style="list-style-type: none"> • The county has fire protection • Active county commission • Lacks technical, administrative and financial resources for mitigation • Relies on regional, state and other agencies for assistance • Dickey County has an active emergency management department that maintains a website with detailed plans to educate the public on drought.

City of Ellendale– Drought - 8

Impact	4	<ul style="list-style-type: none"> • Range Land Fire Index Used • Hay shortages during times of drought impact livestock. • Potential severe loss of economy due to reliance on agriculture • Water holes that supply livestock are impacted
Frequency	2	<ul style="list-style-type: none"> • Cyclical patterns make droughts possible • Dickey County was very dry during the 1980's. • 1988 was an especially dry year, along with 2016.
Likelihood	2	<ul style="list-style-type: none"> • Cyclical patterns make droughts possible • 2016 this pattern was reversed. • High possibility of drought in any year.
Vulnerability	3	<ul style="list-style-type: none"> • Depending on duration, vulnerability changes. • More vulnerable: Economy relies heavily on farming

		<ul style="list-style-type: none"> • Less vulnerable: City has water reserves tanks and its own drinking water system with generator backup • Less vulnerable: City has adequate fire suppression equipment to assist in providing water to dry areas for crops or livestock • Less vulnerable: Burn bans implemented during dry periods
Capability	3	<ul style="list-style-type: none"> • The city has fire protection, however, is dependent on access to water. • City is base headquarters of the county emergency management department • County emergency management has detailed plans to educate public on drought • Active city council • The elevator in town has some manpower and equipment • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance

City of Forbes – Drought - 8

Impact	4	<ul style="list-style-type: none"> • Potential of severe economic loss due to being reliant on agricultural sector • Range Land Fire Index Used • Burn bans happened in 2016 • Hay shortages during times of drought impact livestock. • Loss of farm economy impacts service industries • Water holes that supply livestock are impacted
Frequency	2	<ul style="list-style-type: none"> • Although dry in spring of 2013, the last real drought was in 1988 • Dickey County was very dry during the 1980's. • 1988 was an especially dry year, along with 2016.
Likelihood	3	<ul style="list-style-type: none"> • Cyclical pattern to rains normally wetter in the east than in the west. 2016 this pattern was reversed. • High possibility of drought in any year due to the clay soil.
Vulnerability	1	<ul style="list-style-type: none"> • Depending on duration, vulnerability changes. • More vulnerable: 40% of population is over 65 • More vulnerable: There are several ag fires a year (tractors, hay bales, field fires) most all are mutual aided to Ellendale when Forbes doesn't answer two pages adding up to 15 minutes before Ellendale Fire is paged. • The city has no public works personnel or equipment. All maintenance is contracted out as needed. • More vulnerable: Local Fire department has one tanker, one brush truck, one pumper-the newest is a 1980's model. Most of the departments "able body firemen" work out of town during the days leaving town virtually uncovered. • More vulnerable: Economy relies heavily on farming • Less vulnerable: Burn bans implemented during dry periods • Less vulnerable: City has reserves tanks located in their city hall and has surrounding sloughs as sources of water
Capability	2	<ul style="list-style-type: none"> • The city has fire protection, however, is dependent on access to water. • Active city council

		<ul style="list-style-type: none"> • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently
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City of Fullerton - Drought - 9

Impact	4	<ul style="list-style-type: none"> • Possible economic loss • Range Land Fire Index Used • Burn bans happened in 2016 • Hay shortages during times of drought impact livestock. • Loss of farm economy impacts service industries • Water holes that supply livestock are impacted
Frequency	1	<ul style="list-style-type: none"> • Drought possible every year. • Last dry conditions were spring 2013, but last real drought was in 1988 • Dickey County was very dry during the 1980's. • 1988 was an especially dry year, along with 2016.
Likelihood	2	<ul style="list-style-type: none"> • Cyclical pattern to rains normally wetter in the east than in the west. 2016 this pattern was reversed. • High possibility of drought in any year due to the soil conditions.
Vulnerability	3	<ul style="list-style-type: none"> • Depending on duration, vulnerability changes. • More vulnerable: 25.9% of population is over 65 • More vulnerable: There are several ag fires a year (tractors, hay bales, field fires) Fire response is 20 min away coming from Oakes • More vulnerable: The city has no public works personnel or equipment. All maintenance is contracted out as needed. • More vulnerable: There is no fire, EMS or law in Fullerton. All responders come from Oakes with a 20 minute average response • More vulnerable: There is no public works personnel or equipment-all maintenance is contracted out as needed. • More vulnerable: Economy relies heavily on farming • More vulnerable: City does not have water reserves, such as a water tower • Less vulnerable: City purchased floating pumps and discharge hoses to use in pumping water for general use. • Less vulnerable: Burn bans implemented during dry periods
Capability	1	<ul style="list-style-type: none"> • The city has NO fire protection, however, is dependent on access to water. • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

City of Ludden - Drought - 5

Impact	2	<ul style="list-style-type: none"> • Range Land Fire Index Used • Burn bans happened in 2016 • Hay shortages during times of drought impact livestock. • Loss of farm economy impacts service industries • Water holes that supply livestock are impacted
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Frequency	2	<ul style="list-style-type: none"> • High possibility of drought in any year due to the clay soil in the county. • Dickey County was very dry during the 1980's. • 1988 was an especially dry year, along with 2016.
Likelihood	2	<ul style="list-style-type: none"> • Cyclical pattern to rains normally wetter in the east than in the west. • 2016 this pattern was reversed. • High possibility of drought in any year due to the clay soil.
Vulnerability	2	<ul style="list-style-type: none"> • Depending on duration, vulnerability changes. • More vulnerable: 34% of population is over 65 • More vulnerable: There are several ag fires a year (tractors, hay bales, field fires) most all are mutual aided to Ellendale when Ludden doesn't answer two pages adding up to 15 minutes before Ellendale Fire is paged. • The city has no public works personnel or equipment. All maintenance is contracted out as needed. • More vulnerable: There is no fire, EMS or law in Ludden. All responders come from Oakes with a 20-minute average response • More vulnerable: There is no public works personnel or equipment-all maintenance is contracted out as needed. • More vulnerable: City does not have water reserves, such as a water tower • More vulnerable: Economy relies heavily on farming • Less vulnerable: Burn bans implemented during dry periods • Less vulnerable: City located adjacent to James River and surrounding sloughs, which acts as a source of backup water if necessary • Less vulnerable: City purchased floating pumps and discharge hoses to use in pumping water for general use
Capability	3	<ul style="list-style-type: none"> • Active city council • The elevator in town has some manpower, heavy equipment and work with area farmers to be pro-active in protecting the city • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

City of Monango - Drought - 11

Impact	3	<ul style="list-style-type: none"> • Range Land Fire Index Used • Hay shortages during times of drought impact livestock • Loss of farm economy impacts service industries • Water holes that supply livestock are impacted
Frequency	3	<ul style="list-style-type: none"> • High possibility of drought in any year due to the clay soil in the county. Dickey County was very dry during the 1980's. • 1988 was an especially dry year, along with 2016.
Likelihood	3	<ul style="list-style-type: none"> • Cyclical pattern to rains normally wetter in the east than in the west. 2016 this pattern was reversed. • High possibility of drought in any year due to the clay soil.
Vulnerability	3	<ul style="list-style-type: none"> • Depending on duration, vulnerability changes. • More vulnerable: 40% of population is over 65 • More vulnerable: There are several ag fires a year (tractors, hay bales,

		<p>field fires) Fire response is 20 min away coming from Ellendale</p> <ul style="list-style-type: none"> • The city has no public works personnel or equipment. All maintenance is contracted out as needed. • More vulnerable: There is no fire, EMS or law in Monango. All responders come from Ellendale with a 20 minute average response on a good weather day. • More vulnerable: There is no public works personnel or equipment-all maintenance is contracted out as needed. • More vulnerable: There is no water storage within the city • More vulnerable: Economy relies heavily on farming • Less vulnerable: Burn bans implemented during dry periods
Capability	1	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

City of Oakes– Drought - 11

Impact	3	<ul style="list-style-type: none"> • Hay shortages during times of drought impact livestock. • Loss of farm economy impacts service industries • Water holes that supply livestock are impacted
Frequency	3	<ul style="list-style-type: none"> • High possibility of drought in any year due to type of soil in the county. • Dickey County was very dry during the 1980's. • 1988 was an especially dry year, along with 2016.
Likelihood	3	<ul style="list-style-type: none"> • Cyclical pattern to weather patterns makes it possible
Vulnerability	3	<ul style="list-style-type: none"> • Depending on duration, vulnerability changes. • More vulnerable: 24.1% of population is over 65 • More vulnerable: There are several ag fires a year (tractors, hay bales, field fires) • More vulnerable: Economy relies heavily on farming • Less vulnerable: Burn bans implemented during dry periods
Capability	1	<ul style="list-style-type: none"> • The city has fire protection, however, is dependent on access to water. • Active city council • The elevator in town has some manpower and equipment • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance

Vulnerabilities to County-Owned Buildings and Property

Drought does not have an impact on structures in the county. However, loss of water supply would influence the function of county-owned buildings. Disruptions in service and extended periods of closure may occur. Drought would threaten county-owned property from the increase in fire threat and the potential decreases in available water supplies for fire suppression.

Vulnerabilities of Critical Facilities and Infrastructure

Critical facilities that rely on water for operation and continued use are most susceptible to drought. Large employers in the agriculture sector and manufacturing can be negatively affected by drought and

are viewed as critical facilities, depending on the number of people they employ and the impact they have on local economies. Critical infrastructure that is vulnerable to drought are public water systems that provide drinking water for the general public and disposal of waste water. Many public water systems extract water from surface bodies of water. If water levels become too low, public water systems may be forced to ration water or cease operation altogether. As a result, Dickey County and jurisdictions would have less access to water for fighting fires. A summary of county and city owned property in Dickey County is provided in Chapter 4.

Vulnerabilities to New and Future Development

The greatest vulnerability from drought to new and future development would be underground water sources. New development has the potential to diminish underground sources with increases in population and economic activity. The N.D. Department of Health monitors public water systems. Individuals with wells and septic systems are not regulated and would be more susceptible to drought.

The agriculture sector, with high crop prices and increasing yields, is becoming increasingly mechanized and requiring larger amounts of water. Increased demand for water in the agriculture sector may increase vulnerability of drought in the county.

Based on information in the 2014 NDMHMP obtained from the Drought Impact Reporter, the state can expect drought conditions affecting certain counties and regions on a more reoccurring basis. With the possibility of climate change, this hazard may impact more regions of the State with more frequency.

Data Limitations and Other Key Documents

A data limitation for understanding impacts from drought is the difficulty in identifying the true extent of the drought in terms of time, or when a drought begins and when a drought concludes. Characteristics of drought are hard to distinguish between periods of dryer than normal conditions and cyclical weather patterns. Droughts tend to impact areas slowly and are not sudden like other hazards such as severe winter weather or flooding. In addition, impacts of drought are far reaching and tend to have a trickle-down effect on many sectors of the economy. Therefore, a process to determine near accurate loss estimates for drought is nearly impossible.

This plan incorporates data from the following documents and information from this plan will be incorporated in the update of the following documents.

- North Dakota Drought Response Plan
- North Dakota Emergency Operations Plan
- Dickey County Emergency Operations Plan
- 2014 ND Multi-Hazard Mitigation Plan
- 2014 Dickey County Multi-Hazard Mitigation Plan

5.3 Flood

Including River Flooding, Overland Flooding, Ice Jams, and Flash Floods

Characteristics

Flooding, as a natural hazard, has been a part of the county's conflict with nature throughout history and is defined as an overflow of water on land not normally covered by water. Floods are a natural phenomenon; however, flood hazards are often intensified by man because he interferes with or alters natural conditions.

Flood hazards arise from the complex effects of water on land surfaces and by water pressure. Flooding and its impact occur from the overflow of rivers, creeks, drainage channels, streams, lakes, and other bodies of standing water. Also, the inundation of low lands, the temporary backup of sewer and storm water systems, the rise of ground water, and finally the failure of flood control facilities such as dams, dikes, and levees.

Floods can occur when the ground is frozen and/or saturated with moisture and cannot absorb any further moisture and can also result from ice jamming or blocking streams.

Flash flooding occurs when heavy rain falls in such a short time that the soil cannot absorb it and/or drainage systems (natural or man-made) cannot carry the volume of water away as quickly as it accumulates. A flash flood can happen in any jurisdiction in the county and is caused by: Thunderstorms, heavy rains or snowpack, dam, dike or levee failures. This type of flood happens with little warning and response.

Overland flooding occurs when waterways or other bodies of water quickly fill with rain water and jump their banks and cause flooding to surrounding areas.

Description of problem: High runoff produced by excessive rainfall and/or sudden spring thaws after periods of heavy snowfall will cause a river or other bodies of water to overflow and inundate areas, causing or threatening damage. The loss of life and severe damages may result when floodwaters strike cities, industries, and farms located in or near river valleys. Usually the damaged area is in a floodplain, which is a strip of relatively level land bordering a stream.

History

Before settlers came to North Dakota, there were few flood damages. River and streams carved the valleys and the nomadic peoples who inhabited the territory moved to higher lands. Today, however, these valleys are populated with people and development needed to sustain those people has taken place.

Flooding of land adjoining the normal course of a stream or river has been a natural occurrence since the beginning of time. If these floodplain and floodway areas were left in their natural state, the floods would not cause any major damage. However, the economic attractiveness of the vacant land has resulted in the development of some floodplain areas despite the risk. The urban, industrial, and agricultural encroachment on natural floodplains areas has increased the potential for dangerous flooding and causes the flood waters to adversely affect land that formally was considered safe. The flood potential is increased because rainfall that used to soak into the ground or take several days to reach a stream/river via a natural drainage basin now quickly runs off streets, parking lots, rooftops, and through man-made channels and pipes.

A tremendous amount of soil erosion takes place throughout all river basins, drainage areas, streams, etc., by water movement and its pressure on land surfaces. Runoff from the eroded areas is swift, thus

contributing to flood magnitude. Additionally, the eroded materials settle within runoff channels taking up space that previously was occupied by water during runoff periods. This sedimentation increases flood potential.

The spring flood danger occurs during March and April. A wet fall, early freeze up with saturated ground at the time of freezing, heavy winter precipitation, and warm rains during and after spring thaw add to the seriousness of the spring flooding situation.

Flood control development had its beginning with the Flood Control Act of 1936. This act provided a basic plan and authorized program for the control of water resources. In the early 1940s, the North Dakota Water Commission cooperated with the Federal agencies to plan and engineer the overall program for North Dakota.

The U.S. Army Corps of Engineers occupies one of the major roles in flood control planning and construction. Two reservoirs built by the U.S. Soil Conservation Service have contributed materially to flood control by the construction of watershed projects in North Dakota. These watershed projects include channel work and flood retention structures. In such projects, the Soil Conservation District has the responsibility for assuring that 50 percent of the farms above a structure are under a basic conservation plan.

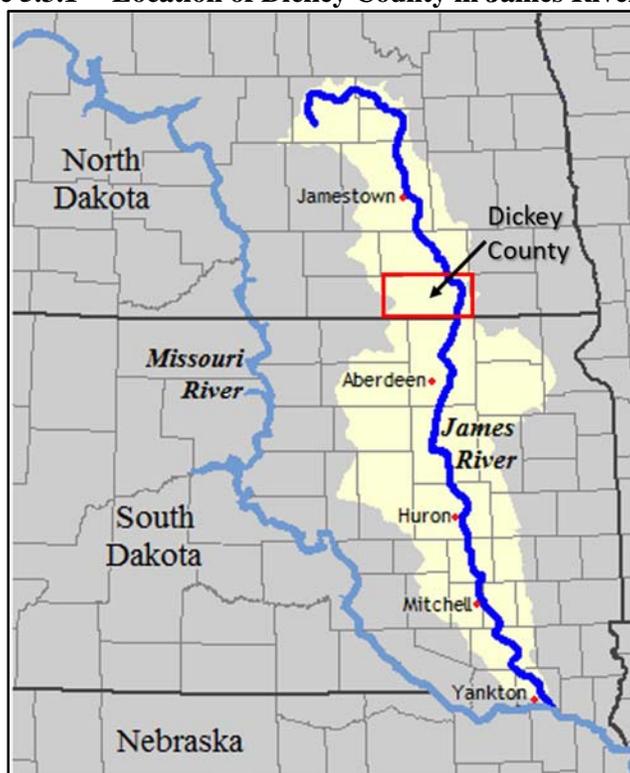
Floodplain Management in North Dakota: North Dakota has recognized that good floodplain management involves the utilization of a variety of tools to reduce the impact of flood disasters. It is also recognized that a balance must be reached between the three aspects of floodplain management which are: structural works designed to modify the flood itself, regulatory functions and emergency preparedness actions which may reduce susceptibility to flooding, and emergency preparedness actions which minimize a flood's effect during a disaster.

The Federal Disaster Protection Act of 1973 requires state and local government to participate in the National Flood Insurance Program (NFIP) as a condition to the receipt of any federal loan or grant for construction projects in flood prone areas. Participation in the NFIP requires communities to adopt floodplain regulations that meet NFIP objectives, which are: Buildings must be protected from flooding damages that occur because of the 100-year flood and new development must not cause an increase in flood damages to other property.

Communities have been provided assistance through passage, in 1981, of the state's first Floodplain Management Act that directs the State Engineer to aid local government to reduce flood damages through floodplain management. As a start, the state legislature provided the State Engineer with an appropriation to be used in assisting communities to obtain base 100-year flood elevation data. With appropriate planning, we will see continued reduction in flood damage susceptibility across the state. It will likely take many years to achieve the established goals.

Dickey County is in the James River Basin. The James River is the largest river in the basin; tributaries include Pipestem, Maple, Beaver, Bone Hill, and Cottonwood Creeks. As shown, nearly all of Dickey County is geographically located in the James River Basin.

Figure 5.3.1 -- Location of Dickey County in James River Basin



Source: US Geological Survey

The Jamestown Reservoir Dam and the Pipestem Dam, both located north of the city of Jamestown, hold water throughout the year and provide flood protection to areas along the James River from Jamestown to the South Dakota state line. Dickey County borders South Dakota. The dam on the Pipestem Lake, is managed by the U.S. Army Corps of Engineers, and the dam on the Jamestown Reservoir is managed by U.S. Department of Interior, Bureau of Reclamation. These dams provide 90 percent flood damage reduction along the James River. In 2014, Bob Martin continues to serve as Pipestem Dam manager for the U.S. Army Corps of Engineers, Jamestown, N.D. During flood stage, the U.S. Army Corps of Engineers manages the release of flows from both dams. The releases from the dams are closely monitored with readings at several locations downriver of the dams. The flows are only increased when properties downstream are protected and are closely managed.

Flooding has occurred in the James River Basin. Flooding in this area is often caused by rapid runoff from steep tributaries to the nearly flat main channel of the James River, which can be obstructed by log jams, vegetation, sediment deposits, inadequate bridge capacities, or smaller jams. Tributary discharge can exceed the channel capacity of the James.

Periodic flooding of agricultural cropland, hay land, pasture, and communities are the major water problems in the James River Basin. Dickey County communities affected by the James River include Oakes and Ludden. (U.S. Geological Survey)

Table 5.3.1 – 2000 to 2013 Flood Event History Summary in Dickey County

Number of Occurrences	Date Range	Property Damage
2	2000-20013	\$127,000

Sources: 2014 ND State MHMP

According to the N.D. Department of Emergency Services, there are no repetitive loss properties from flooding in Dickey County

Table 5.3.2 lists the Presidential Disaster Declarations for flooding in Dickey County. A total of 17 declarations were made in Dickey County between 1969 and 2013. The absence of turned down requests after 1975 indicates an increasing intensity of losses from flooding.

Table 5.3.2 – 1969 to 2013 Presidential Disaster Declarations for Flooding in Dickey County

Decision Number	Date	Type	Disaster Description	Statewide Costs Constant 2009	President
216	03/23/1969	F	Flooding	6,144,924	Johnson
256	04/18/1969	F	Flooding	20,349,850	Nixon
475	07/11/1975	F	Severe Storms, Flooding	18,771,101	Ford
554	04/17/1978	F	Storms, Ice Jams, Snowmelt, Flooding	11,165,307	Carter
581	04/26/1979	F	Severe Storms, Snowmelt, Flooding	57,100,615	Carter
1050	05/16/1995	W	Severe Storms, Flooding, Ground	24,294,145	Clinton
1118	06/05/1996	W	Severe Storms, Flooding, Ice Jams	18,135,392	Clinton
1174	04/07/1997	F	Severe Flooding, Severe Winter Storm	531,404,655	Clinton
1220	06/15/1998	F	Flooding, Ground Saturation, Severe	24,468,099	Clinton
1279	06/08/1999	S	Severe Storms, Flooding, Snow, Ice	145,619,808	Clinton
1334	06/27/2000	F	Severe Storms, Flooding, Ground Saturation	113,151,807	Clinton
1376	05/28/2001	F	Severe Storms, Flooding, Ground Saturation	45,117,082	GWBush
1597	07/22/2005	W	Severe Storms, Flooding, Ground Saturation	19,237,140	GWBush
1713	07/17/2007	W	Severe Storms, Flooding	4,938,793	GWBush
1829	03/24/2009	W	Severe Storms, Flooding	107,590,628	Obama
1907	04/30/2010	NA	Flooding	6,212,845	Obama
1981	05/10/2011	NA	Flooding	43,547,540	Obama

Source: FEMA

Crop loss from flooding is tracked by the United States Department of Agriculture Risk Management Agency (RMA). The RMA provides data on the crop type affected, net claimed acres, indemnity, loss liability, loss cost and the number of policies covered. The net claimed acres is the total acres planted for crops in the county for the given year. Liability is the total value in crops planted in the county for the given year and indemnity is the amount paid to cover insurance claims from crop loss due to flooding. Indemnity paid in Dickey County between 1990 and 2017 on 1,221 acres was \$136,672. Crop loss indemnity paid from flooding over the 28-year period resulted in an annual average of \$4,881.

Table 5.3.5 shows the state requested disaster declarations for flooding in North Dakota that impacted Dickey County and were turned down. Four requests were turned down between 1969 and 1975 with no requests turned down thereafter. Losses from flooding has been enough to grant declarations for each request after 1975.

Table 5.3.5 – Turned Down State Requested Disaster Declarations for North Dakota

Number	Date	Type	Disaster Description	President
69006	03/21/1969	Major	Snow Removal, Flood, Preparations	Nixon
71045	06/24/1971	Major	Flooding	Nixon
72022	04/25/1972	Major	Flooding	Nixon
75079	04/09/1975	Major	Snow, Floods	Ford

Source: FEMA

Probability and Magnitude

Based on hazard history information provided by NOAA, NCDC and SHELDUS, the probability of flooding events in Dickey County is 30 percent based on 10 events occurring between 1979 and 2011. Crop losses data from flooding provided by the RMA over the 24-year period resulted in an annual average indemnity paid of \$1,289. The magnitude can be classified as moderate due to recorded losses. Damage from flooding commonly occurs to homes, roads, agricultural land and public infrastructure.

The number of people and housing units potentially impacted is difficult to determine as Dickey County is not flood mapped. However, the population and housing units of townships and cities bordering the James River were compiled to provide the worst-case scenario of the number of people needing to be evacuated and the number of housing units impacted. The townships bordering the James River are: Bear Creek, Clement, Divide, Hudson, James River Valley, Lovell, Port Emma, Riverdale and Wright. The cities of Ludden and Oakes border the James River. These nine townships and two cities have a combined population of 2,600 people and 1,276 housing units based on data from the 2010 U.S. Census.

Figure 5.3.2 – Prairie Pothole Region Map

Sources: ppjv.org/prairie-conservation

Risk Assessment

Table 5.3.2 shows the risk assessment as determined by individual jurisdictions and the committee. The total in this chart represents the sum of each jurisdiction's impact, frequency, likelihood and vulnerability to a hazard less the jurisdiction's capabilities to respond to the hazard.

Table 5.3.6 – Risk Assessment Summary Flood Scored Chart

Flood	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Dickey County	4	4	4	3	3	12
Ellendale	3	4	2	2	3	8
Forbes	4	4	4	1	2	11
Fullerton	4	4	4	1	1	12
Ludden	3	2	2	1	2	6
Monango	4	2	2	3	1	10
Oakes	3	4	2	2	3	8

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Seasonal Pattern	Spring snow melt off, Summer flash flooding, seasonal rain
Duration	2 weeks
Speed of Onset	More than 24 hours warning

Table 5.3.7 shows the communities participating in the National Flood Insurance Program. Communities that participate in the National Flood Insurance Program (NFIP) are required to adopt flood plain regulations that meet NFIP objectives:

- New buildings must be protected from flooding damages that occur because of the 100-year flood.
- New development must not cause an increase in flood damages to other property.

Table 5.3.7 – Communities Participating in National Flood Insurance Program

Community Name	INIT FHBM Identified	INIT FIRM Identified	Current Effective Map Date	Reg-Emer Date
Dickey County	-	-	01/01/20	01/22/98 (E)
City of Ellendale	09/12/75		(NSFHA)	08/20/10
City of Oakes	02/14/75		(NSFHA)	11/01/79

Source: FEMA Community Status Book Report, North Dakota

Capabilities of and Vulnerabilities to Jurisdictions

Upon review of statistics and data regarding flooding, the impact and frequency of flooding was ranked a “3” or “4” in the county and all jurisdictions except for the cities of Ludden and Monango. Flooding is a concern for residents in the county given past losses and frequency of the hazard. The ranking for likelihood, vulnerabilities and capabilities for flooding varied between jurisdictions.

Capabilities and vulnerabilities of jurisdictions were scored at jurisdictional meetings with participants including the mayor and city auditor, in addition to members from the city council, business owners, emergency services representatives, and members of the general public. Participants discussed the incidents that occur in their jurisdiction and how frequent impacts are from the hazard. Afterwards, they scored impacts and frequency of the hazard. Participants compared the impacts and frequency of the hazard and determined future prevalence. The likelihood of the hazard was then scored. Vulnerability was scored with participants stating what makes the jurisdiction less vulnerable given their resources at hand or more vulnerable by identifying resources not available. Capabilities were scored by the plan consultants based on the capability assessment worksheet found in the 2013 Mitigation Planning Handbook.

Dickey County – Flood - 12

Impact	4	<ul style="list-style-type: none"> • Blocked roads can lead to delayed emergency response from flooding from County River Systems. • Heavy rains and snow melt can also cause flooding of city streets and county roads causing inaccessibility from overland flooding and river system flooding. • Culverts wash out blocking access to rural residents • Farmland loss, entire farms have experienced long-term inundation from overland flooding, displacing families. • Loss of power • Loss of transportation routes • Potential ice jams in creeks and rivers • Water seepage into basements • Power outage can result in inoperable sump pumps flooding basements • Critical infrastructure in city jurisdictions, such as lift stations, can experience disruption in service and results in sewer backups. • Increased mosquito population and transmitting of diseases • Potential loss of life • Access to Oakes Hospital and economic activity can be restricted
Frequency	4	<ul style="list-style-type: none"> • Areas of the county experience various types of flooding – overland, riverine, flash floods – on a yearly basis from multiple causes.
Likelihood	4	<ul style="list-style-type: none"> • there is always a possibility of flooding occurring each year in the county and in the future.
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: county is bisected by the James River, which impacts all emergency responses, and can extend response times • More vulnerable: Individuals living on a road must go 10 miles instead of 5 to go through dry roads • More vulnerable: Vulnerable populations dependent on electricity • More vulnerable: Individuals driving on flooded highways • Less vulnerable: The county emergency management is equipped to enforce regulations and can coordinate between agencies
Capability	3	<ul style="list-style-type: none"> • Limited tax base • Active county commission • County has a floodplain administrator/manager, who is the Emergency Manager, for administrative capabilities • Relies on regional, state and other agencies for assistance • The emergency management department maintains a website with beneficial information, serving as a resource of education for county residents.

City of Ellendale - Flood - 8

Impact	3	<ul style="list-style-type: none"> • Areas surrounding the town suffer from damaged roads, bridges and culverts creating emergency access problems as well as the occasional downed power lines • Washed out culverts • Cemeteries under water • Water seepage into basements • Blocked roads limit access for emergency services and daily routines.
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		<ul style="list-style-type: none"> • Increased mosquito population and transmitting of diseases from standing water. • Property and crop damage or loss • Potential loss of life • Flooded roads block bus routes transporting kids to school • Wastewater outage
Frequency	4	<ul style="list-style-type: none"> • Depends largely on weather patterns but Overland Flooding happens to some degree yearly. • In 2012, flash flooding caused the sanitary sewer system to blow resulting in 30% of homes experiencing sewer backups
Likelihood	2	<ul style="list-style-type: none"> • Heavy spring melting and heavy rains cause flooding yearly
Vulnerability	2	<ul style="list-style-type: none"> • More vulnerable: Ambulances, school buses, fire protection having to detour around flooding. • More vulnerable: Individuals driving on flooded highways • More vulnerable: 20.7% of population is over 65 • More vulnerable: Lift Station and lagoon could be inundated • More vulnerable: Flat terrane and lakes filled result in flooding due to the lack of rivers. • More vulnerable: Overland flooding can damage roads and impede access to rural farms as well as the town. • More vulnerable: Basements in town flood frequently • More vulnerable: Overland flooding produces puddles of water and full ditches that breed mosquitos. • Less vulnerable: Tree trimming, and drainage ditch maintenance programs are in place to ensure proper drainage of water to mitigate overland flooding. • Less vulnerable: The City participates in the NFIP • Less vulnerable
Capability	3	<ul style="list-style-type: none"> • No flood plan, but one in process • Active city council and well-equipped City Public works crew • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • Law enforcement can radio actuate the siren or can be operated by Dickey County Emergency Management

City of Forbes - Flood – 11

Impact	4	<ul style="list-style-type: none"> • There are no rivers, most flooding is overland flooding. • Washed out culverts • Cemeteries under water • Water seepage into basements • Blocked roads limit access for emergency services and daily routines. • Increased mosquito population and transmitting of diseases from standing water. • Property and crop damage or loss • Potential loss of life • Flooded roads block bus routes transporting kids to school • Waste water outage
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		<ul style="list-style-type: none"> • Flat terrain and lakes filled to capacity result in overland flooding due to the lack of rivers.
Frequency	4	<ul style="list-style-type: none"> • Depends largely on weather patterns but significant flooding to roads, buildings and homes occurs every two to three years
Likelihood	4	<ul style="list-style-type: none"> • Heavy spring melting and heavy rains cause flooding.
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: Ambulances, school buses, fire protection having to detour around flooding • More vulnerable: One highway serves the city on a north and south direction • More vulnerable: Individuals driving on flooded highways • More vulnerable: 40% of population is over 65 • More vulnerable: City lacks equipment and infrastructure and has no public works personnel or equipment. All maintenance is contracted out as needed. • More vulnerable: Lift Station and lagoon would be inundated • More vulnerable: Lack of proper storm water system • More vulnerable: Lack of drain tile in the area • More vulnerable: Individuals living on a road must go 10 miles instead of 5 to go through dry roads. • More vulnerable: Flat area at the base of the hills drain a huge area through town which inundates the town and leaves puddles in low areas and ditches which breeds mosquitos. Overland flooding can damage roads and impede access to rural farms as well as the town. This event happens to some level every spring and after significant rain events. Overland flooding has dropped the occasional power pole resulting in power outages. • More vulnerable: Lack of manpower by the city and public • Less vulnerable: No school within city • Less vulnerable: 2 foot berm surrounding the city constructed by a local resident to shield the city from flood waters during the spring thaw
Capability	2	<ul style="list-style-type: none"> • City does have a flood plan, but it was created in 1980 • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

City of Fullerton - Flood - 12

Impact	4	<ul style="list-style-type: none"> • Overland flooding is not much of an issue for the town as it is on high ground directly off the major North/South county road DC8. Areas surrounding the town suffer from damaged roads, bridges and culverts creating emergency access problems as well as the occasional downed power lines • Washed out culverts • Water seepage into basements • Blocked roads limit access for emergency services and daily routines. • Increased mosquito population and transmitting of diseases from standing water. • Property and crop damage or loss • Potential loss of life
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		<ul style="list-style-type: none"> • Flooded roads block bus routes transporting kids to school • Wastewater outage • Flat terrane and lakes filled to capacity result in overland flooding due to the lack of rivers.
Frequency	4	<ul style="list-style-type: none"> • Depends largely on weather patterns • City has lost power lines three times in recent years from flooding
Likelihood	4	<ul style="list-style-type: none"> • Heavy spring melting and heavy rains cause flooding.
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: Ambulances, school buses, fire protection having to detour around flooding. • More vulnerable: Individuals driving on flooded highways • More vulnerable: 25.9% of population is over 65 • More vulnerable: City lacks equipment and infrastructure and has no public works personnel or equipment. All maintenance is contracted out as needed. • More vulnerable: septic tanks can become inundated • More vulnerable: Lack of proper storm water system • More vulnerable: Lack of drain tile in the area • More vulnerable: Individuals living on a road must go 10-20 miles instead of 5 to go through dry roads. • More vulnerable: Flat area at the base of the hills drain a huge area through town which inundates the town and leaves puddles in low areas and ditches which breeds mosquitos. Overland flooding has dropped the occasional power pole resulting in power outages. • More vulnerable: City becomes an island for up to a week or more when the Maple River leaves its banks. Often this occurs with accompanying power failures due to down lines. Law enforcement and EMS must come from the north which adds up to an hour to the already delayed response times • More vulnerable: Lack of manpower by the city and public • Less vulnerable: No school within city • Less vulnerable: City has installed drain tile on Monroe Street and the likelihood of overland flooding in the city is somewhat diminished
Capability	1	<ul style="list-style-type: none"> • No flood plan • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

City of Ludden - Flood - 6

Impact	3	<ul style="list-style-type: none"> • Areas surrounding the town suffer from damaged roads, bridges and culverts creating emergency access problems as well as the occasional downed power lines • Washed out culverts • Cemeteries under water • Water seepage into basements • Water table is high in Ludden • Blocked roads limit access for emergency services and daily routines.
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		<ul style="list-style-type: none"> • Increased mosquito population and transmitting of diseases from standing water. • Property and crop damage or loss • Potential loss of life • Flooded roads block bus routes transporting kids to school • Waste water outage • Flat terrane and lakes filled to capacity result in overland flooding due to the lack of rivers.
Frequency	2	<ul style="list-style-type: none"> • Depends largely on weather patterns
Likelihood	2	<ul style="list-style-type: none"> • Heavy spring melting and heavy rains cause flooding.
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: Ambulances, school buses, fire protection having to detour around flooding. • More vulnerable: Individuals driving on flooded highways • More vulnerable: 34% of population is over 65 • More vulnerable: City lacks equipment and infrastructure and has no public works personnel or equipment. All maintenance is contracted out as needed. • More vulnerable: Lift Station and lagoon would be inundated • More vulnerable: Lack of proper storm water system • More vulnerable: Lack of drain tile in the area • More vulnerable: Individuals living on a road must go 10 miles instead of 5 to go through dry roads. • More vulnerable: Overland flooding and yearly snow melt are huge issues in this low-lying town. They have invested in ditches and pumps to remove water. Overland flooding can damage roads and impede access to rural farms as well as the town. This event happens to some level every spring and after significant rain events • More vulnerable: James River flooding is an issue for Ludden • More vulnerable: 2009 and 2010 flooding saw the river within five feet of the houses • More vulnerable: Lack of manpower by the city and public • Less vulnerable: No school within city • Less vulnerable: Elevation of city would protect from flood waters
Capability	2	<ul style="list-style-type: none"> • No flood plan • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • Have a radio operated storm siren operated by Dick County Emergency Management • The elevator in town has some manpower, heavy equipment and work with area farmers to be pro-active in protecting the city

City of Monango - Flood - 10

Impact	4	<ul style="list-style-type: none"> • There are no rivers. Overland flooding is not much of an issue for the town as it is on high ground directly off of US Hwy 281. Areas surrounding the town suffer from damaged roads, bridges and culverts
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		<p>creating emergency access problems as well as the occasional downed power lines</p> <ul style="list-style-type: none"> • Washed out culverts • Cemeteries under water • Water seepage into basements • Blocked roads limit access for emergency services and daily routines. • Increased mosquito population and transmitting of diseases from standing water. • Property and crop damage or loss • Potential loss of life • Flooded roads block bus routes transporting kids to school • Wastewater outage
Frequency	2	<ul style="list-style-type: none"> • Depends largely on weather patterns
Likelihood	2	<ul style="list-style-type: none"> • Heavy spring melting and heavy rains cause flooding.
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: Ambulances, school buses, fire protection having to detour around flooding. • More vulnerable: Individuals driving on flooded highways • More vulnerable: 40% of population is over 65 • More vulnerable: City lacks equipment and infrastructure and has no public works personnel or equipment. All maintenance is contracted out as needed. • More vulnerable: septic tanks can become inundated • More vulnerable: Lack of proper storm water system • More vulnerable: Lack of drain tile in the area • More vulnerable: Individuals living on a road must go 10 miles instead of 5 to go through dry roads. • More vulnerable: Lack of manpower by the city and public • Less vulnerable: No school within city • Less vulnerable: No river or large body of water and therefore is not vulnerable to severe flooding • Less vulnerable: Elevation of city would protect from flood waters
Capability	1	<ul style="list-style-type: none"> • No flood plan • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

City of Oakes - Flood – 8

Impact	3	<ul style="list-style-type: none"> • Areas surrounding the town suffer from damaged roads, bridges and culverts creating emergency access problems • Downed power lines • Washed out culverts • Cemeteries under water • Water seepage into basements • Blocked roads limit access for emergency services and daily routines. • Increased mosquito population and transmitting of diseases from standing water. • Property and crop damage or loss
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		<ul style="list-style-type: none"> • Potential loss of life • Flooded roads block bus routes transporting kids to school • Waste water outage
Frequency	4	<ul style="list-style-type: none"> • Depends largely on weather patterns • Always possible as culverts and drainage have become blocked from flash flooding due to heavy precipitation and low-lying areas filling with water that lack proper drainage.
Likelihood	2	<ul style="list-style-type: none"> • Heavy spring melting and heavy rains cause flooding
Vulnerability	2	<ul style="list-style-type: none"> • More vulnerable: Ambulances, school buses, fire protection having to detour around flooding. • More vulnerable: Individuals driving on flooded highways • More vulnerable: 24.1% of population is over 65 • More vulnerable: Lift Station and lagoon would be inundated • More vulnerable: Lack of proper storm water system • More vulnerable: Lack of drain tile in the area • More vulnerable: When James River floods it cuts the county in half requiring the redistricting of all emergency services causing a huge strain in the system and citizens. • More vulnerable: Overland flooding and yearly snow melt are huge issues in this low-lying town. They have invested in ditches and pumps to remove water. Overland flooding can damage roads and impede access to rural farms as well as the town. This event happens to some level every spring and after significant rain events • More vulnerable: James River flooding is also a major issue for Oakes. • More vulnerable: 2009 and 2010 flooding saw the river within five feet of the houses • More vulnerable: Lack of manpower by the city and public • Less vulnerable: Elevation of city would protect from flood waters • Less vulnerable: City has their own water modern plant, city water and sewer infrastructure
Capability	3	<ul style="list-style-type: none"> • The City also participates in the NFIP, which requires communities to adopt and enforce ordinances that meet or exceed the requirements of FEMA. • Active city council and well-equipped City Public works crew • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

Vulnerabilities to County-Owned Buildings and Property

Vulnerabilities to county-owned buildings and properties from floods are always present whether flooding is due to flash flooding, overland, basement, riverine or closed basin. Locations of county-owned buildings will largely determine vulnerabilities to riverine and overland flooding. Basement flooding is mostly a site-specific issue occurring when mechanical systems fail or high precipitation causes water tables to rise. A summary of city and county owned buildings is provided in Chapter 4, Profile and Inventory.

Vulnerabilities of Critical Facilities and Infrastructure

Damage to critical infrastructure, mainly drinking water and sewer systems, roadways and electric power lines can occur when flooding of any kind occurs. Drinking water and sewer systems can be shut down as power to lift stations and water treatment facilities can be suspended. Roads can be washed out or blocked from overland flooding, which limits access to critical facilities such as emergency services and hospitals. An inventory of county and city owned property in Dickey County is provided in Chapter 4.

Vulnerabilities to New and Future Development

New and future development in Dickey County are at high risk to flooding if allowed in a floodplain. With projected population increases in Dickey County through 2030, more people can be vulnerable to flooding if development is not restricted from flood prone areas. Since Dickey County is not flood mapped, identifying appropriate areas to ban development is not available. Due to the lack of this data, Dickey County should direct all new and future development to occur in close proximity to Ellendale and Oakes, which have been flood mapped.

Data Limitations and Other Key Documents

The absence of flood mapping for Dickey County is the largest data limitation to understanding the impact and extent of flooding.

This plan incorporates data from the following documents and information from this plan will be incorporated in the update of the following documents.

- North Dakota Emergency Operations Plan, Flood Annex
- North Dakota Water Development Reports
- 2014 North Dakota State Multi-Hazard Mitigation Plan
- 2014 Dickey County Multi-Hazard Mitigation Plan

5.4 Hazardous Material Release

Characteristics

Hazardous materials are any substance posing an unreasonable risk to the safety, health, environment, and property of citizens and defined and/or managed under several federal, state, and local laws, regulations, plans and ordinances. The term “hazardous material” covers a wide array of products, from relatively innocuous ones such as hair spray in aerosol dispensers and wash preservatives such as creosote to highly toxic or poisonous material such as anhydrous ammonia and phosgene gas. The potential severity of hazards of these material is varied but the primary reason for their designation is their risk to public safety.

The Federal Motor Carrier Safety Administration has nine categories of hazardous materials that are:

- Explosives (Class 1)
- Oxidizing substances and organic peroxides (Class 5)
- Miscellaneous hazardous materials/products, substances, or organisms (Class 9)
- Radioactive materials (Class 7)
- Flammable and combustible liquids (Class 3)
- Gases (Class 2)
- Flammable solids, spontaneously combustible, and dangerous when wet (Class 4)
- Toxic/poisonous substances poison inhalation (Class 6)
- Corrosive substances (Class 8)

Further definitions can be found in laws, i.e. Federal Water Pollution Act, Clean Water Act, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) commonly known as Superfund, and Amendments, Low Level Radioactive Waste Policy Act, Nuclear Waste Policy Act, and the Hazardous Materials Transportation Act.

A stationary hazardous material release is any occurrence resulting in the uncontrolled release of materials from a fixed site capable of posing a risk to health, safety, and property, as determined in Environmental Protection Agency regulations. Areas at risk include the locations of hazardous material manufacturing, processing, or storage facilities, as well as all hazardous waste treatment, storage, and disposal (legal and illegal) sites.

Other significant hazardous material concerns are the hazardous by-products from the production of the drug methamphetamine. This drug is easily “cooked” up using readily available hazardous materials in clandestine labs. These labs may then be contaminated with a variety of toxic chemicals such as methanol, ether, benzene, methylene chloride, trichloroethane, toluene, muriatic acid, sodium hydroxide, anhydrous ammonia, and red phosphorus. Hazardous materials are also often used during terrorist attacks. They can cause damages to the water supply and food supply.

It is common to view hazardous material releases in a worst-case scenario. However, most these incidents involve small spills and releases requiring little response or recovery actions. The problem for decision makers at all levels of government is to create a safe system for the use, storage, transportation, etc. of hazardous materials while retaining the state’s economic viability.

Although many of the spills and releases are small, a single hazardous material release can result in the loss of many lives and cause millions of dollars of property damage. Water supplies, sewer lagoons, fish and wildlife habitats can be threatened if hazardous materials leak into rivers, streams, underground water resources.

Hazardous materials have major components that affect incident related response and recovery. These components include planning, organization of responders, training, equipment, and exercises. These elements combined can provide for an effective overall response. The chance remains that major harm

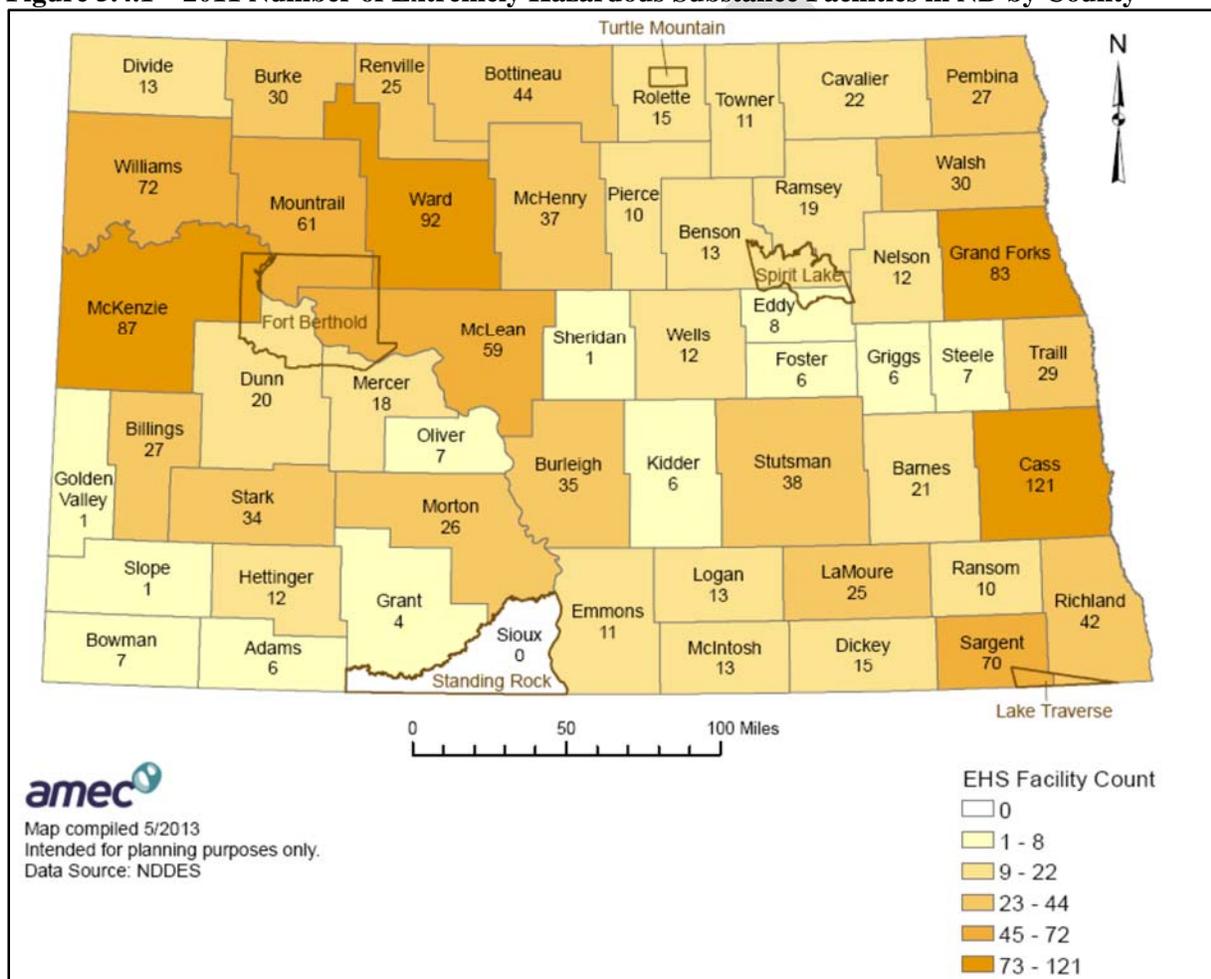
may be incurred by first responders or the public. Due to the potential exposure of a hazardous material release at a fixed facility, the population in the related jurisdiction would be in the impact zone.

History

There have been no declared disasters or emergencies pertaining to hazardous material release in Dickey

Figure 5.4.1 shows the number of extremely hazardous substance facilities in Dickey County as of 2011. In 2011, approximately 15 extremely hazardous substances facilities are in Dickey County. These facilities are required under the Occupational Safety and Health Administration (OSHA) regulations to maintain data on material safety and report quantities of chemicals that are equal or greater than 500 pounds.

Figure 5.4.1 – 2011 Number of Extremely Hazardous Substance Facilities in ND by County



Source: North Dakota Department of Emergency Services, 2014 NDMHMP

Probability and Magnitude

Given that the local economy is heavily reliant on agriculture and the amount of extremely hazardous substance facilities in Dickey County, as shown in Figure 5.4.1, it is likely a hazardous material release will occur in Dickey County in the future. Therefore, the probability is assumed to be 100 percent. The magnitude of a hazardous material release can vary from minimal in localized incidents to catastrophic in situations of explosions or high wind.

Risk Assessment

Table 5.4.2 – Risk Assessment Summary Hazardous Material Release Scored Chart

Hazardous Material Release	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Dickey County	3	4	4	3	2	12
Ellendale	3	4	4	2	2	11
Forbes	4	2	2	1	1	8
Fullerton	4	1	2	2	2	7
Ludden	3	2	2	1	1	7
Monango	3	3	3	4	1	12
Oakes	4	4	4	3	2	13

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Seasonal Pattern	Summer
Duration	Application of chemicals
Speed of Onset	Immediate

Mapping

There is a pipeline traversing Dickey County. The pipeline carries fuel oil and passes by the city of Monango one-half mile to the west of city limits. It crosses U.S. Highway 281 just to the north of Monango and crosses the D.M.V.W. rail line to the west of the city with approximately 26 miles of hazardous material liquid pipeline of refined petroleum, shown in figure 5.4.2.

Figure 5.4.2 – Nustar Pipeline Operating Partnership L.P. Pipeline in North Dakota



Source: National Pipeline Mapping System

Capabilities of and Vulnerabilities to Jurisdictions

Upon review of statistics from the 2014 NDMHMP, National Pipeline Mapping System and the Oakes Fire Department Incident Report, the impact, frequency, likelihood and vulnerabilities of hazardous material release varied based on the location of industry and infrastructure. The capabilities for hazardous material release is shared across the county by the Emergency Management Department.

Capabilities and vulnerabilities of jurisdictions were scored at jurisdictional meetings with participants including the mayor and city auditor, in addition to members from the city council, business owners, emergency services representatives, and members of the general public. Participants discussed the incidents that occur in their jurisdiction and how frequent impacts are from the hazard. Afterwards, they scored impacts and frequency of the hazard. Participants compared the impacts and frequency of the hazard and determined future prevalence. The likelihood of the hazard was then scored. Vulnerability was scored with participants stating what makes the jurisdiction less vulnerable given their resources at hand or more vulnerable by identifying resources not available.

Risk assessment hazard scoring and notes for the county are contained in the following graphic. The jurisdictional risk assessments can be found in Chapter 8, Jurisdictions.

Dickey County – Hazardous Material Release - 12

Impact	3	<ul style="list-style-type: none"> • County has a large quantity of chemicals stored in uncontrolled environments. • Unmapped locations of these chemicals can cause loss of life and damage for emergency responders. • Anhydrous spills have occurred • Potential explosions, spills and contamination • Blocked roads • Potential loss of life • Property damage and loss of economy • Spills can occur on farms where chemicals are stored. • Clean up crews running through the county • Potential financial impacts due to clean-up
Frequency	4	<ul style="list-style-type: none"> • Minor spills happen frequently
Likelihood	4	<ul style="list-style-type: none"> • Minor spills happen frequently
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: Wind in the right direction in relationship to a spill makes the population in the city and surrounding areas susceptible. • More vulnerable: Transportation of hazardous materials along major highways and railroads. • More Vulnerable: Nustar Pipeline 3 miles west of 281 • More vulnerable: No local hazmat capability • Less vulnerable: County Emergency Department has trained personnel such as the Emergency Manager to respond to releases. • Less vulnerable: County has equipment and various resources
Capability	2	<ul style="list-style-type: none"> • Capabilities for minor spills • Active county commission • Active and well-trained County Emergency Manager • Lacks technical, administrative and financial resources for mitigation • Relies on regional, state and other agencies for assistance

City of Ellendale Hazardous Materials Release - 11

Impact	3	<ul style="list-style-type: none"> • Potential loss of life • Crop loss • Livestock loss • Economy loss • Blocked roads leading to loss of mobility
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		<ul style="list-style-type: none"> • Small size of city could lead to large percentage of population affected
Frequency	4	<ul style="list-style-type: none"> • Minor spills happen yearly due to prevalence of chemicals used in agriculture • No major occurrences or incidences
Likelihood	4	<ul style="list-style-type: none"> • Minor spills happen yearly due to prevalence of chemicals used in agriculture
Vulnerability	2	<ul style="list-style-type: none"> • More vulnerable: Propane and diesel fuel are used for heating alternative • More vulnerable: Located on US 281 and ND 11 junction. • More vulnerable: Trucks and farmers transporting larger tanks more frequently on highways through the city limits. • More vulnerable: Elevator complex, industrial plant, 2 fertilizer operations and seed vendors, bulk propane plant with storage, bulk fuels plant with storage • More vulnerable: Pipeline runs to the west of the city and could potentially release fuel • Less vulnerable: There is public lodging and three public fueling facilities. • More vulnerable: No stockpile of medical supplies
Capability	2	<ul style="list-style-type: none"> • Active city council • City has zoning in place restricting where hazardous material can be stored and located • City has a radio-operated storm siren operated by Dickey County Emergency Management • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

City of Forbes - Hazardous Material Release - 8

Impact	4	<ul style="list-style-type: none"> • Potential loss of life • Crop loss • Livestock loss • Economy loss • Fire potential • Blocked roads leading to loss of mobility • Small size of city could lead to large percentage of population affected
Frequency	2	<ul style="list-style-type: none"> • Minor spills happen yearly • No major occurrences or incidences
Likelihood	2	<ul style="list-style-type: none"> • Minor spills will happen
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: 40% of population is over 65 • More vulnerable: Propane is used for heating alternative • More vulnerable: Trucks and farmers transporting larger tanks more frequently on Highway through the city limits. • More vulnerable: High Risk of Hazardous chemical release or transportation accident as it is on a major county road as well as a state line road. • More vulnerable: The city has no public works personnel or equipment- all maintenance is contracted out as needed. • More vulnerable: No stockpile of medical supplies

Capability	1	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently
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City of Fullerton - Hazardous Material Release - 7

Impact	4	<ul style="list-style-type: none"> • Potential loss of life • Crop loss • Livestock loss • Economy loss • Fire potential • Blocked roads leading to loss of mobility • Small size of city could lead to large percentage of population affected
Frequency	1	<ul style="list-style-type: none"> • Minor spills happen yearly • No major occurrences or incidences
Likelihood	2	<ul style="list-style-type: none"> • Minor spills will happen
Vulnerability	2	<ul style="list-style-type: none"> • More vulnerable: 25.9% of population is over 65 • More vulnerable: Propane is used for heating alternative • More vulnerable: Trucks and farmers transporting larger tanks more frequently on highways through the city limits. • More vulnerable: Anhydrous tanks driven through and parked in the city. • More vulnerable: The city has no public works personnel or equipment-all maintenance is contracted out as needed. • More vulnerable: No stockpile of medical supplies
Capability	2	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

City of Ludden - Hazardous Material Release - 7

Impact	3	<ul style="list-style-type: none"> • Potential loss of life • Crop loss • Livestock loss • Economy loss • Fire potential • Blocked roads leading to loss of mobility • Small size of city could lead to large percentage of population affected
Frequency	2	<ul style="list-style-type: none"> • Minor spills happen yearly • No major occurrences or incidences
Likelihood	2	<ul style="list-style-type: none"> • Minor spills will happen
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: 34% of population is over 65 • More vulnerable: Propane is used for heating alternative • More vulnerable: Trucks and farmers transporting larger tanks more frequently on highways through the city limits. • More vulnerable: High Risk of Hazardous chemical release or transportation accident as it is on state highway • More vulnerable: The city has no public works personnel or equipment-all maintenance is contracted out as needed.

		<ul style="list-style-type: none"> • More vulnerable: There is no public fueling capacity or public lodging • More vulnerable: No stockpile of medical supplies
Capability	1	<ul style="list-style-type: none"> • Active city council • City has a radio-operated storm siren operated by Dickey County Emergency Management • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

City of Monango - Hazardous Material Release – 12

Impact	3	<ul style="list-style-type: none"> • Potential loss of life • Crop loss • Livestock loss • Economy loss • Fire potential • Blocked roads leading to loss of mobility • Small size of city could lead to large percentage of population affected
Frequency	3	<ul style="list-style-type: none"> • Minor spills happen yearly • No major occurrences or incidences
Likelihood	3	<ul style="list-style-type: none"> • Minor spills will happen
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: 40% of population is over 65 • More vulnerable: Propane is used for heating alternative • More vulnerable: Trucks and farmers transporting larger tanks more frequently on highways through the city limits. • More vulnerable: The city has no public works personnel or equipment- all maintenance is contracted out as needed. • More vulnerable: No stockpile of medical supplies
Capability	1	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

City of Oakes Hazardous Materials Release – 13

Impact	4	<ul style="list-style-type: none"> • Potential loss of life • Crop loss • Livestock loss • Economy loss • Fire potential • Blocked roads leading to loss of mobility • Small size of city could lead to large percentage of population affected
Frequency	4	<ul style="list-style-type: none"> • Minor spills happen yearly • No major occurrences or incidences
Likelihood	4	<ul style="list-style-type: none"> • Minor spills will happen
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: 24.1% of population is over 65 • More vulnerable: Propane is used for heating alternative • More vulnerable: Trucks and farmers transporting larger tanks more frequently on highways through the city limits. • More vulnerable: High Risk of Hazardous chemical release or

		<p>transportation accident as it is on ND Hwy 1 and there is a fertilizer, seed, two railroad tracks and elevator operation in town</p> <ul style="list-style-type: none"> • More vulnerable: City has a bulk propane plant, bulk fuels plant and storage facility. • More vulnerable: City does not have hazardous material route • Less vulnerable: There is public lodging and three public fueling facilities. • More vulnerable: No stockpile of medical supplies
Capability	2	<ul style="list-style-type: none"> • Active city council • City has a radio-operated storm siren operated by Dickey County Emergency Management • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

Vulnerabilities to County-Owned Buildings and Property

All county-owned buildings are at risk to hazardous material release as this type of hazard can occur anywhere at any given time for a multitude of reasons. However, facilities located near or adjacent to transportation modes, such as highways, railroads or airports, are more at risk as the hazard typically occurs during transportation of hazardous material. If facilities are located near fixed hazardous material sites, such as propane or anhydrous ammonia tanks, the risk is increased as the source for the hazard will always be present. If an explosion were to occur, critical facilities located in close proximity could experience moderate to severe damage, depending on the intensity and duration of the release. Chapter 4 provides a summary of county and city owned buildings in Dickey County.

Vulnerabilities of Critical Facilities and Infrastructure

Similarly, to county-owned buildings, the vulnerability of the hazard to critical facilities and infrastructure depends largely on location. Critical facilities and infrastructure located near hazardous material storage sites are most at risk. Depending on the facility or infrastructure, impact could range from moderate to severe. Water infrastructure could become contaminated and threat public health. Critical facilities such as hospitals or emergency services could be shut down temporarily or indefinitely. If a release were to occur on a major roadway, emergency services would be limited and response times could be drastically reduced. Chapter 4 provides a summary of county and city owned buildings Dickey County.

Vulnerabilities to New and Future Development

The vulnerability of new and future development depends largely on the type and density being proposed and where development is allowed. Residential development should be developed in areas away from hazardous material storage sites or major transportation arteries where chemicals are transported. If new development is already in progress and near the hazard area, a development moratorium should be implemented to stop future growth or densities should be limited to reduce the number of people potentially at risk. Industrial development is a sector that maintains demand for hazardous material and is best situated near storage sites or transportation arteries to limit time spent in transit. Ultimately, hazardous material should be prohibited from locating in residential or commercial areas, near hospitals, schools or community gathering spaces. If already existing, plans should be put into place for relocation at a future time when funding permits or an appropriate site becomes available.

Data Limitations and Other Key Documents

The difficulty in understanding the particulars of a hazardous material release (location, time of day, and what material are involved) limits the ability to understand the true impact of the hazard. With numerous sources for potential release, whether from the agriculture sector, oil and gas sector, commercial and residential entities, or a combination from another hazard such as a transportation accident, understanding how releases occur and identifying ways to mitigate this hazard proves impractical. Developing an inventory from agriculture and commercial operations on the location and type of hazardous material being used in economic activity, and what mode is being utilized for transportation, would assist in understanding the hazard. Similarly, details regarding the amount, type and timing of liquid passing through the Northern Border Pipeline Company pipeline that traverses the county.

This plan incorporates data from the following documents and information from this plan will be incorporated in the update of the following documents.

- North Dakota Emergency Operations Plan, Hazardous Material Annex
- 2014 Dickey County Multi-Hazard Mitigation Plan
- 2014 North Dakota State Multi-Hazard Mitigation Plan
- National Pipeline Mapping System
- Dickey County Emergency Operations Plan

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5.5 Homeland Security Incident

Characteristics

A homeland security incident is any intentional adversarial human-caused incident, domestic or international, that causes mass casualties, large economic losses, or widespread panic in the country. Terrorism and civil unrest are examples of human-caused hazards that are intentional and often planned. Terrorism, both domestic and international, is a violent act done to try and influence government or the population of some political or social objective. Terrorist acts can come in many forms or may be subtle using untraditional methods.

Universities, industry, government officials and buildings, power grids, telecommunication systems, dams, water supplies, and pipelines are potential terrorism targets. Another potential terrorist activity that must be considered is violence in the workplace.

- Chemical Terrorism – use of chemical agent to poison, kill, or incapacitate the population or animals, destroy crops or national resources, or deny access to certain areas.
- Explosive Terrorism – use of explosive and incendiary devices including bombs and any other technique that creates an explosive, destructive effect.
- Biological Terrorism – use of biological agents, such as Anthrax, Ricin, or Smallpox, to infect the population, plants, or animals with disease
- Radiological/Nuclear Terrorism – use of radiological dispersal devices, nuclear weapons, or nuclear facilities to attack the population.
- Cyber Terrorism – attack or hijack of the information technology infrastructure that is critical to the functions controlled by computer networks such as: operating, financial, communications, and trade systems.
- Civil Unrest – typically occur on a smaller scale than other types of terrorism. Civil unrest can occur when large groups, organizations or distraught individuals take action with potentially disastrous or disruptive results.

History

No history was available pertaining to homeland security incidents in Dickey County. Oral history from county residents indicate that bomb and other security threats to public schools have occurred sparingly over the past decade.

Probability and Magnitude

Determining the probability of the homeland security incident hazard on Dickey County is difficult at best. However, during jurisdictional meetings, city council members and meeting participants said that there is always a chance for an incident to occur at any time and no community is immune to the hazard. The probability is much lower in jurisdictions without schools since schools in the United States have had numerous incidents. An incident could have a large magnitude. However, impact would be limited due to the rural nature of Dickey County, which has a population density of four people per square mile. Since the economy of Dickey County is largely based on agriculture, an incident involving agriculture has the potential to be disastrous and large in magnitude. Crops and agricultural products are shipped across the United States. If a homeland incident were to target agriculture products through contamination using chemicals, the impact could be far-reaching with the potential to affect hundreds to tens-of-thousands of people.

Risk Assessment

Table 5.5.1 shows the risk assessment as determined by individual jurisdictions and the committee. The risk assessment methodology can be found on page 5-3 of Chapter 5, Threat and Hazard Identification and Risk Assessment. The total in this chart represents the sum of each jurisdiction’s impact, frequency, likelihood and vulnerability to a hazard less the jurisdiction’s capabilities to respond to the hazard.

Table 5.5.1 – Risk Assessment Summary Homeland Security Incident Scored Chart

Homeland Security Incident	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Dickey County	3	2	2	3	1	9
Ellendale	2	1	1	1	2	3
Forbes	4	1	1	1	1	6
Fullerton	3	1	1	1	1	5
Ludden	3	2	1	1	2	5
Monango	3	1	1	4	1	8
Oakes	3	1	1	4	1	8

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Seasonal Pattern	None
Duration	Low
Speed of Onset	Little time or warning

Capabilities of and Vulnerabilities to Jurisdictions

Data and statistics pertaining to homeland security incident was unavailable primarily due to the lack of any incident of the hazard occurring in the county. As such, the impact, frequency, likelihood and vulnerabilities, and capabilities of homeland security incident scored relatively low, with the exception impact for the city of Forbes. The capabilities for hazardous material release is mostly shared across the county by the Emergency Management Department.

Capabilities and vulnerabilities of jurisdictions were scored at jurisdictional meetings with participants including the mayor and city auditor, in addition to members from the city council, business owners, emergency services representatives, and members of the general public.

Risk assessment hazard scoring and notes for the county are contained in the following graphic. The jurisdictional risk assessments can also be found in Chapter 8, Jurisdictions.

Dickey County – Homeland Security Incident - 9

Impact	3	<ul style="list-style-type: none"> • Potential targeting of critical facilities • Potential targeting of public entities including schools, churches, public gatherings. • Potential disruption of government and emergency services • Potential loss of life, economy and livestock • Cyber security – loss of confidential information, need stronger firewalls, better anti-virus, cyber response person. • Potential loss of fiber grid, and communication systems - including communication between emergency officials.
Frequency	2	<ul style="list-style-type: none"> • History of the hazard occurring in jurisdictions in the county.

Likelihood	2	<ul style="list-style-type: none"> • Homeland security incidents always have the potential to occur • Social media makes this type of activity more active
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: Limited law enforcement personnel and equipment • More vulnerable: Limited emergency services resources • More vulnerable: Limited school safety resources including equipment and personnel. Not all classrooms can be secured from the inside in a lock down, cameras, secure entrances and windows, metal detectors and/or wands, weapon detection equipment, • More vulnerable: Limited security in courthouses and city halls • More vulnerable: Limited ability to access mental health • More vulnerable: County does have vulnerable populations and critical infrastructure. • More vulnerable: The county is located on U.S. Highway 281, which is a major transportation route in the area and supports economic activity. • More vulnerable: US. Highway 281 provides access to the county • More vulnerable: College campus within the county • More vulnerable: Major electrical grid hub within the county • More vulnerable: Petroleum Pipeline within the county • Less vulnerable: County Emergency Department has trained personnel such as the Emergency Manager to respond to releases. • Less vulnerable: County has equipment and various resources
Capability	1	<ul style="list-style-type: none"> • Few abilities for a major homeland security threat. • Lacks technical, administrative and financial resources for mitigation • Active county commission • Active Emergency Management • Relies on regional, state and other agencies for assistance

City of Ellendale - Homeland Security Incident - 3

Impact	2	<ul style="list-style-type: none"> • Potential loss of life • Loss of economy • Loss of livestock • Potential for large percentage of population loss • Emergency services could be overwhelmed
Frequency	1	<ul style="list-style-type: none"> • Always a possibility of an event occurring. • Trinity Bible College was the scene of protest by a liberal political group in the early 2000s, but the demonstration was said to be peaceful
Likelihood	1	<ul style="list-style-type: none"> • Always a possibility of an event occurring.
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: Limited mental health services • More vulnerable: Located on US 281 and ND 11 junction. • More vulnerable: 20.7% of population is over 65 • More vulnerable: Small town, everyone is impacted, fearful and anxious • More vulnerable: Influx of population from other parts of the U.S. • More vulnerable: Trinity Bible College within city limits • More vulnerable: County Courthouse within city limits • Less vulnerable: City has assisted living and rest home services that are both generated • More vulnerable: No Hospital • Less vulnerable: Two clinics

		<ul style="list-style-type: none"> • Less vulnerable: Sparse population and rural nature of the city
Capability	2	<ul style="list-style-type: none"> • Headquarters of Dickey County Emergency Services located in Ellendale • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

City of Forbes - Homeland Security Incident – 6

Impact	4	<ul style="list-style-type: none"> • Potential loss of life • Loss of economy • Loss of livestock • Potential for large percentage of population loss • Emergency services could be overwhelmed
Frequency	1	<ul style="list-style-type: none"> • Always a possibility of an event occurring. • No incidents have occurred
Likelihood	1	<ul style="list-style-type: none"> • Always a possibility of an event occurring.
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: Limited mental health services. • More vulnerable: 40% of population is over 65 • More vulnerable: Small town, everyone is impacted, fearful and anxious • More vulnerable: Influx of population from other parts of the U.S. • More vulnerable: No local law enforcement, depends on County Sheriff • Less vulnerable: Sparse population and rural nature of the city • Less vulnerable: No school
Capability	1	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

City of Fullerton - Homeland Security Incident - 5

Impact	3	<ul style="list-style-type: none"> • Potential loss of life • Loss of economy • Loss of livestock • Potential for large percentage of population loss • Emergency services could be overwhelmed
Frequency	1	<ul style="list-style-type: none"> • Always a possibility of an event occurring. • No incidents have occurred
Likelihood	1	<ul style="list-style-type: none"> • Always a possibility of an event occurring.
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: Limited mental health services or medical facilities • More vulnerable: 25.9% of population is over 65 • More vulnerable: Small town, everyone is impacted, fearful and anxious • More vulnerable: Influx of population from other parts of the U.S. • More vulnerable: No local law enforcement, depends on County Sheriff • Less vulnerable: Sparse population and rural nature of the city • Less vulnerable: City has neighborhood watch program in place • Less vulnerable: No school in city
Capability	1	<ul style="list-style-type: none"> • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance

		<ul style="list-style-type: none"> • Lacks resources to accomplish projects independently
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City of Ludden - Homeland Security Incident - 5

Impact	3	<ul style="list-style-type: none"> • Potential loss of life • Loss of economy • Loss of livestock • Potential for large percentage of population loss • Emergency services could be overwhelmed
Frequency	2	<ul style="list-style-type: none"> • Always a possibility of an event occurring. • No incidents have occurred
Likelihood	1	<ul style="list-style-type: none"> • Always a possibility of an event occurring.
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: Limited mental health services. • More vulnerable: 34% of population is over 65 • More vulnerable: Small town, everyone is impacted, fearful and anxious • More vulnerable: Influx of population from other parts of the U.S. • More vulnerable: No local law enforcement, depends on County Sheriff • More vulnerable: Located at the crossroads of two major highways • Less vulnerable: Sparse population and rural nature of the city
Capability	2	<ul style="list-style-type: none"> • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

City of Monango - Homeland Security Incident - 8

Impact	3	<ul style="list-style-type: none"> • Potential loss of life • Loss of economy • Loss of livestock • Potential for large percentage of population loss • Emergency services could be overwhelmed
Frequency	1	<ul style="list-style-type: none"> • Always a possibility of an event occurring. • No incidents have occurred
Likelihood	1	<ul style="list-style-type: none"> • Always a possibility of an event occurring.
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: Limited mental health services. • More vulnerable: 40% of population is over 65 • More vulnerable: Small town, everyone is impacted, fearful and anxious • More vulnerable: Influx of population from other parts of the U.S. • More vulnerable: No local law enforcement, depends on County Sheriff • More vulnerable: Located on Hwy 281 • Less vulnerable: Sparse population and rural nature of the city
Capability	1	<ul style="list-style-type: none"> • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

City of Oakes - Homeland Security Incident - 8

Impact	3	<ul style="list-style-type: none"> • Potential loss of life • Loss of economy • Loss of livestock • Potential for large percentage of population loss
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		<ul style="list-style-type: none"> Emergency services could be overwhelmed
Frequency	1	<ul style="list-style-type: none"> Always a possibility of an event occurring. No incidents have occurred
Likelihood	1	<ul style="list-style-type: none"> Always a possibility of an event occurring.
Vulnerability	4	<ul style="list-style-type: none"> More vulnerable: Limited mental health services. More vulnerable: 24.1% of population is over 65 More vulnerable: Small town, everyone is impacted, fearful and anxious More vulnerable: Influx of population from other parts of the U.S. More vulnerable: City has assisted living and rest home services. The rest home is not generated. More vulnerable: The K-12 School and vocational tech are not generated Less vulnerable: City has a hospital, two clinics and a dialysis center. Less vulnerable: Sparse population and rural nature of the city
Capability	1	<ul style="list-style-type: none"> Active city council Lacks technical, administrative and financial resources for mitigation Relies on county, regional, state and other agencies for assistance Lacks resources to accomplish projects independently

Vulnerabilities to County-Owned Buildings and Property

County-owned buildings and infrastructure are vulnerable to homeland security incidents. Facilities supporting functions key to daily operations of the county, such as buildings supporting emergency services and county shops for snow removal, would be the most vulnerable as an attack. A summary of county-owned buildings is provided in Chapter 4.

Vulnerabilities of Critical Facilities and Infrastructure

The Dickey County Courthouse in Ellendale would be the critical facility most at risk to a homeland security incident. Government facilities are typically targeted for public protests or other attacks. Individuals or political groups in disagreement with local government action taken would be an entity most likely to carry out an attack. Incidents affecting infrastructure such as roads, hospitals, water pipes and power lines can disrupt economic activity, limit access for emergency services, and put people at risk due to a shortage or outage of critical materials and infrastructure. The loss of critical facilities and infrastructure could lead to rapid spread of communicable diseases, or possibly dam failures if these structures were targeted. Table 5.6.2 illustrates vandalism and theft claims paid on critical facilities insured by the State of North Dakota from 1989 to 2013

Table 5.6.2 – 1989 to 2013 Vandalism and Theft Claims Paid on Critical Facilities Insured by State

	State Agencies	Adjutant General	State Universities	Local Governments	School Districts	Total
Dickey Co.	\$0	\$0	\$0	\$0	\$17,590	\$17,590

Source: 2014 North Dakota State Multi-Hazard Mitigation Plan

According to the 2014 NDMHMP, the North Dakota Critical Infrastructure Program identified specific facilities, also referred to as Critical Infrastructure and Key Resources, are critical to homeland security in seven different sectors. These sectors are:

- Food / Agriculture: major food distribution centers
- Public Health: hospitals and public health offices
- Emergency Services: police, fire and dispatch centers
- Energy: power generation/chemical facilities
- Transportation: bridges and major highways
- Communications: communications towers

- Water: treatment facilities

According to the 2014 NDMHMP, in Dickey County, there are two public health CIKR facilities, one transportation CIKR facility, two emergency services CIKR facilities; and one communications CIKR for a total of six CIKR facilities. Chapter 4 provides an inventory of county and city owned property in Dickey County.

Vulnerabilities to New and Future Development

Since incidents of the homeland security incident hazard are nearly impossible to predict, vulnerabilities to new and future development will be difficult to determine. However, new and future development constructed near major highways or critical facilities and infrastructure would be more vulnerable to incidents of homeland security.

Data Limitations and Other Key Documents

The plan does not document history of homeland security hazard incidents in Dickey County. The rarity of the hazard and confidentiality limit the data that is available.

This plan incorporates data from the following documents and information from this plan will be incorporated in the update of the following documents.

- North Dakota Emergency Operations Plan, Terrorism Annex
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)
- Dickey County Emergency Operations Plan, CERT Teams
- 2014 Dickey County MHMP
- 2014 North Dakota Multi-Hazard Mitigation Plan

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5.6 Severe Summer Weather

Including Tornadoes, hail, downbursts, thunderstorm winds, lightning and extreme heat.

Characteristics

Severe summer storms can result in loss of life, injuries, and damage to property and crops. Every thunderstorm produces lightning, which kills more people each year than tornadoes.

Summer storms are caused by atmospheric temperature imbalances. Thunderstorms develop as warm, moist air rises. These conditions will produce updraft and downdrafts that can reach velocities of 170 mph. Updrafts and downdrafts are the reason for gust fronts, heavy rain (flash flooding), lightning, hail, and high winds. Downburst or straight-line winds can be as deadly as tornados. If a thunderstorm continues to intensify, a tornado may develop. A thunderstorm affects a relatively small area when compared to a winter storm. The typical thunderstorm is 15 miles in diameter and lasts an average of 30 minutes. Despite their small size, all thunderstorms are dangerous. Severe summer storms can result in loss of life, injuries, and damage to property and crops.

Downburst/Strong Winds/Straight-line Winds: A downburst is created by an area of significantly rain-cooled air that, after reaching ground level, spreads out in all directions producing strong winds. Unlike winds in a tornado, winds in a downburst are directed outwards from the point where it hits land or water. Dry downbursts are associated with thunderstorms with very little rain, while wet downbursts are created by thunderstorms with high amounts of rainfall. The number one cause of wind damage in North Dakota is from downburst winds, not tornados.

Straight-line winds cause the most thunderstorm wind damage. Straight-line winds are any winds not associated with the rotation of a tornado. Straight-line winds come in speeds that can exceed 125 mph.

Extreme Heat: Heat kills by pushing the human body beyond its limits. In extreme heat and high humidity, evaporation is slowed, and the body must work extra hard to maintain a normal temperature. When the body heats too quickly to cool itself safely, or when you lose too much fluid or salt through dehydration or sweating, your body temperature rises, and heat-related illness may develop.

As the days get warmer, State and Federal emergency management officials warn that extreme heat can be very dangerous and, in some instances, even fatal. Older adults, young children and those who are sick or overweight are most vulnerable to extreme heat. Conditions that can induce heat-related illnesses include stagnant atmospheric conditions and poor air quality. Consequently, people living in urban areas may be at greater risk from the effects of a prolonged heat wave than those living in rural areas.

Each year, dozens of children left in parked vehicles die from hyperthermia. Hyperthermia is an acute condition that occurs when the body absorbs more heat than it can handle. Hyperthermia can occur even on a mild day.

The most common heat disorders are:

- Sunburn – Redness and pain, in severe cases swelling of skin, blisters, fever, headaches
- Heat Cramps – Painful spasms usually in the muscles of legs and abdomen with heavy sweating
- Heat Exhaustion – Heavy sweating, weakness, cold, pale, clammy skin, unsteady pulse, fainting, and vomiting, but may have normal temperature
- Heat Stroke (or Sunstroke) – High body temperature (106 degrees F or higher), hot dry skin, rapid and strong pulse, possible unconsciousness. Heat stroke is a severe medical emergency that can be life-threatening

During extremely hot weather, you should take the following precautions:

- Stay indoors as much as you can, on lower floors if possible
- Limit exposure to the sun and use sun block with a high sun protector factor rating
- If your home does not have air conditioning, spend the hottest part of the day in public buildings such as libraries, schools, movie theaters, shopping malls, and other community facilities
- Use fans. Circulating air can cool the body by increasing the perspiration rate of evaporation.
- If you have window air conditioning, eliminate any holes or gaps around the installation.
- Check air-conditioning ducts for proper insulation
- Eat well-balanced, light, and regular meals. Avoid using salt tablets unless directed by physician.
- Drink plenty of water.
- Dress in loose-fitting, lightweight, and light-colored clothes that cover as much skin as possible.
- Protect your face and head by wearing a wide-brimmed hat.
- Check on family, friends, and neighbors who do not have air conditioning.
- Never leave children or pets alone in a closed vehicle
- Avoid strenuous work during the warmest part of the day, 11 a.m. to 4 p.m. Have a buddy system when working in extreme heat and take frequent breaks.
- Exercise should be done in the early morning hours between 4-7 a.m.
- Make sure there is enough food and water for pets.

Livestock/animals and extreme heat: Extreme heat causes significant stress for all animals. Managing animals in high temperatures requires good forward planning. Water, shelter, and proper handling are important considerations during periods of extreme heat. Location of water should be familiar to animals before days of extreme heat. Shelter should be provided if possible or an alternative such as shelterbelts.

Hail: Strong rising currents of air within a storm, called updraft, carry water droplets to a height where they freeze. Ice particles grow in size, becoming too heavy to be supported by the updraft, and fall to the ground as hail. Hail is larger than sleet and forms only in thunderstorms. Hail can be larger than a softball which is a 5 inch diameter. Hail tends to fall in swaths that range from 20 to 150 miles in length and 5 to 30 miles wide. Large hailstones can fall in speeds faster than 100 mph. The major hazard is to crops, aircraft, automobiles, roofs, and windows. Hail causes more than \$1 billion in crop and property damage each year. The destructiveness of hailstorms is not due to the hailstones alone. Hail damage is difficult to determine as hail, wind, and rain frequently occur at the same time.

Lightning: The rising air in a thunderstorm cloud causes various types of frozen precipitation to form within the cloud. Included in these precipitation types are very small ice crystals and much larger pellets of ice. The smaller ice crystals are carried upward towards the top of the clouds by the rising air while the heavier and denser pellets are either suspended by the rising air or start falling toward the ground. Collisions occur between the ice crystals and the pellets, and these collisions serve as the charging mechanism of the thunderstorm. The small ice crystals become positively charged while the pellets become negatively charged. At the same time, the ground underneath the cloud becomes charged oppositely of the charges directly overhead.

The vast majority of lightning victims were going to a safe place, but waited too long before seeking shelter. More than 80% of lightning fatality victims are male, typically between the ages of 15 and 40. Lightning fatalities are most common during summer afternoons and evenings. The energy from one lightning flash could light a 100-watt light bulb for more than three months. Many wildfires are ignited by lightning.

The channel of air through which lightning passes can be heated to 50,000 F, hotter than the surface of the sun. The rapid heating and cooling of the air near the lightning channel causes a shockwave that results in the sound we know as thunder.

Almost all lightning deaths have occurred outdoors. In recent years, fatal activities have included:

- Boating
- Riding horse
- Riding on a lawn mower
- Golfing
- Walking
- Mountain climbing
- Camping
- Standing under a tree
- Swimming
- Playing sports
- Watching the storm
- Loading a truck
- Fishing
- Running to shelter
- Showering
- Inside near open windows or doors

Tornados: Although tornados occur in many parts of the world, they are found most frequently in the United States. In an average year, 1,200 tornados cause 60-65 fatalities and 1,500 injuries nationwide. The peak time of the year that tornados occur is from the end of May through the beginning of August. As with thunderstorms that create them, tornados can form anytime day or night. The peak time, however, is during the evening hours from 6:00 to 8:00 p.m.

A tornado is a violently rotating column of air extending from a cumuliform cloud, such as a thunderstorm, to the ground. Tornados may appear nearly transparent until dust and debris are picked up or a cloud forms within the funnel. The average tornado moves from southwest to northeast, but tornados can move in any direction and can suddenly change their direction of motion. The average speed of a tornado is 30 mph but may vary from nearly stationary to 70 mph. The strongest tornados have rotating winds of more than 200 mph. The typical tornado is on the ground for less than ten minutes. However, tornados may only touchdown for one second and then go back up, or be on the ground for an hour or longer. Their funnel-shapes clouds can affect areas ranging from ¼ mile to a full mile wide and upward to 16 miles long. Extreme events have been known to travel over areas up to a mile wide and 300 miles long.

The National Weather Service uses the Enhanced Fujita Scale or EF-Scale to assign a tornado a rating based on estimated wind speeds and related damage.

Table 5.6.1 – Tornado Scale

Enhanced Fujita Scale Rating	3 Second Wind Gust (mph)		
0	65 mph	-	85 mph
1	86 mph	-	110 mph
2	111 mph	-	135 mph
3	136 mph	-	165 mph
4	166 mph	-	200 mph
5	200+ mph	-	

Source: National Weather Service

Before thunderstorms develop, winds change direction and increase in speed and altitude. This creates an invisible, horizontal spinning effect in the lower atmosphere. Rising air within the thunderstorm updraft tilts the rotating air from horizontal to vertical. An area of rotation, 2-6 miles wide, now extends through much of the storm. Most tornados form within this area of strong rotation.

Figure 5.6.1 Tornado Strengths

**Weak Tornadoes**

- 88% of all tornadoes
- Cause less than 5% of tornado deaths
- Lifetime 1-10+ minutes
- Winds less than 110 mph
- Produces EF0 or EF1 damages

**Strong Tornadoes**

- 11% of all tornadoes
- Cause nearly 30% of all tornado deaths
- May last 20 minutes or longer
- Winds 111-165 mph
- Produces EF2 or EF3 damage

**Violent Tornadoes**

- Less than 1% of all tornadoes
- Cause 70% of all tornado deaths
- Can exceed 1 hour
- Winds greater than 166 mph
- Produces EF4 or EF5 damage

Source: National Weather Service

The National Weather Service has a Doppler radar network strategically located across the country that can detect air movement toward or away from the radar. Early detection of increasing rotation aloft with in a thunderstorm can allow lifesaving warnings to be issued before a tornado forms.

Flying debris kills over 90 percent of all people killed by tornadoes. The winds of a tornado can reach extreme speeds, and at these speeds, neither man nor nature makes many things that can hold together. The one thing to remember about a tornado is that nothing can be done about them and they will go where they want. Get to a shelter immediately. With this in mind, the best place to go is underground, or as underground as possible to avoid wind and flying debris.

History

Dickey County has a documented hazard history that shows a 100 percent frequency and likelihood of the hazard occurring based on past occurrences. Approximately 129 occurrences of the hazards were recorded over a span of 46 years between 1966 and 2012, resulting in 7.83 injuries and no fatalities. Property damage was approximately \$4.2 million and crop damage was \$3.4 million. Table 5.6.2 summarizes the history of severe summer weather occurrences in Dickey County. History shows 10 requests for presidential declarations for severe summer weather and windstorm dating from 1975 to 2009. Table 5.6.3 summarizes the presidential declarations for Dickey County for the hazards. Table 5.6.4 summarizes the turned down state requested disaster declarations.

Table 5.6.2 – Severe Summer Weather Summary

Severe Summer Weather						
Number of Occurrences	Date Range	Probability	Injuries	Fatalities	Property Damage	Crop Damage
134	1966-2017	100 %	7.83	0	\$4,446,507.80	\$3,615,093.24

Sources: Spatial Hazard Events and Losses Database of the United States (SHELDUS)

Crop loss from severe summer weather is tracked by the United States Department of Agriculture Risk Management Agency (RMA). The RMA provides data on the crop type affected, net claimed acres, indemnity, loss liability, loss cost and the number of policies covered. The net claimed acres is the total acres planted for crops in the county for the given year. Liability is the total value in crops planted in the county for the given year and indemnity is the amount paid to cover insurance claims from crop loss due to flooding. Indemnity paid in Dickey County between 1990 and 2017 was 238,604,335.40. Crop loss indemnity paid from severe summer weather over the 28-year period resulted in an annual average of approximately \$8,521,583. Detailed data is available per crop for each year and can be found in Appendix 8.8.

Table 5.6.3 shows the Presidential Disaster Declarations for North Dakota for severe summer weather that included Dickey County. A total of 10 disaster declarations have been declared between 1975 and 2009. Presidential Declarations for severe summer weather have become more frequent in North Dakota

Table 5.6.3 – 1975 to 2009 Presidential Disaster Declarations for North Dakota

	Date	Type	Disaster Description	Statewide Costs (2009 dollars)	President
1829	03/24/2009	W	Severe Storms, Flooding	107,590,628	Obama
1713	07/17/2007	W	Severe Storms, Flooding	4,938,793	GWBush
1597	07/22/2005	W	Severe Storms, Flooding, Ground Saturation	19,237,140	GWBush
1376	05/28/2001	F	Severe Storms, Flooding, Ground Saturation	45,117,082	GWBush
1334	06/27/2000	F	Severe Storms, Flooding, Ground Saturation	113,151,807	Clinton
1220	06/15/1998	F	Flooding, Ground Saturation, Severe Storms	24,468,099	Clinton
1174	04/07/1997	F	Severe Flooding, Severe Winter Storm	531,404,655	Clinton
1050	05/16/1995	W	Severe Storms, Flooding, Ground	24,294,145	Clinton
581	4/26/1979	F	Severe Storms, Snowmelt, Flooding	\$57,100,615	Carter
475	7/11/1975	F	Severe Storms, Flooding	\$18,771,101	Ford

Source: FEMA

Probability and Magnitude

Hazard history was gathered from NOAA, NCDC, SHELDUS, newspaper accounts, and the previous FEMA-approved Dickey County Mitigation Plan. This data covers a 56-year period from 1960 through 2016, and documents 87 notable severe summer weather occurrences, which equates to a probability of 100 percent, or guaranteed instances of severe summer weather each year. The magnitude of the hazard ranges from large tornados and hail causing massive property damage, to heavy rain blocking roads.

All areas of Dickey County have been and will be in the future affected by Severe Summer Weather.

Risk Assessment

Table 5.6.4 shows the risk assessment as determined by individual jurisdictions and the committee. The risk assessment methodology can be found on page 5-3 of Chapter 5, Threat and Hazard Identification and Risk Assessment. The total in this chart represents the sum of each jurisdiction's impact, frequency, likelihood and vulnerability to a hazard less the jurisdiction's capabilities to respond to the hazard.

Table 5.6.4 – Risk Assessment Summary Severe Summer Weather Scored Chart

Severe Summer Weather	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Dickey County	4	4	4	3	2	13
Ellendale	3	4	4	3	3	11
Forbes	4	4	4	4	1	15
Fullerton	3	4	4	4	1	14
Ludden	3	4	4	4	2	12
Monango	4	3	3	3	1	12
Oakes	3	4	4	3	1	13

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Seasonal Pattern	None
Duration	24 hours
Speed of Onset	12 to 16 hours warning

Capabilities of and Vulnerabilities to Jurisdictions

According to the 2014 NDMHMP, Dickey County has a low vulnerability to tornados, hail, lightning, thunderstorm winds, and a low-moderate vulnerability to extreme heat. The county has an overall vulnerability raking of low to severe summer weather.

Capabilities and vulnerabilities of jurisdictions were scored at committee meetings and at each jurisdictional meeting with participants including the mayor and city auditor, in addition to members from the city council, business owners, emergency services representatives, and members of the general public. Participants discussed the incidents that occur in their jurisdiction and how frequent impacts are from the hazard. Afterwards, they scored impacts and frequency of the hazard. Participants compared the impacts and frequency of the hazard and determined future prevalence. The likelihood of the hazard was then scored. Vulnerability was scored with participants stating what makes the jurisdiction less vulnerable given their resources at hand or more vulnerable by identifying resources not available.

Risk assessment hazard scoring and notes for the county are contained in the following graphic. The jurisdictional risk assessments can be found in Chapter 8, Jurisdictions.

Dickey County – Severe Summer Weather - 13

Impact	4	<ul style="list-style-type: none"> • Possible loss of life • Potential hail damage • Crop and livestock damage • Blocked road access • Potential property damage • Ambulance and first responders are sent out during severe weather. • Downed powerlines block roads and cause power outages. • Heavy rains cause overland flooding • Lightning strikes cause fires. • Dry thunderstorms produce thunder and lightning. • Haystacks are frequently struck by lightning resulting in fires. • Home and public facilities damage • Possible downed trees • Prolonged heat could cause loss of life, economy, equipment, livestock
Frequency	4	<ul style="list-style-type: none"> • Multiple summer storms are experienced annually.
Likelihood	4	<ul style="list-style-type: none"> • More intense weather has been experienced in recent years.
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: Nursing homes in the county • More vulnerable: Topography in the county is generally flat open farmland with little to no obstruction to wind, rain, hail, and heavy rain • More vulnerable: Populations that lack a backup power source • More vulnerable: No public storm shelters in the county. • More vulnerable: Large vulnerable populations due to college campus and apartment complexes. • More vulnerable: Large transient population moving through on large highways. • More vulnerable: Large transient population due to seasonal farm and construction labor. • Less vulnerable: Web site featuring beneficial information to educate residents
Capability	2	<ul style="list-style-type: none"> • Lacks technical, administrative and financial resources for mitigation • County-wide educational events during the year. • Active County Emergency Management • Evacuation and shelter plans are in place. • Active county commission • Relies on regional, state and other agencies for assistance

City of Ellendale - Severe Summer Weather - 11

Impact	3	<ul style="list-style-type: none"> • Hail damage to homes and community buildings including broken windows, siding and shingles. • Power outages • Economy loss • Lightning strikes cause fires • Potential injury • Potential loss of life • High winds damage property • Heavy rain produces flash flooding
Frequency	4	<ul style="list-style-type: none"> • Multiple storms are experienced annually causing property damage. • Extreme summer weather seasons occur every two to three years.

Likelihood	4	<ul style="list-style-type: none"> • Multiple storms are experienced annually causing property damage. • More intense weather in recent years • More rapid, heavy rain events occurring each year
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: 20.7% of population is elderly over 65 • More vulnerable: Fuel and propane tanks within city limits adjacent to infrastructure and critical facilities that are vulnerable to severe summer weather incidents. • Less vulnerable: City has generators for the sanitary sewer • Less vulnerable: Sparse population and rural nature of the city • Less vulnerable: Siren system can be radio actuated by law enforcement or Dickey County Emergency Management. • Less vulnerable: Roads in and out of town are well maintained
Capability	3	<ul style="list-style-type: none"> • Limited tax base • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • The siren can be radio actuated by law enforcement or Dickey County Emergency Management.

City of Forbes - Severe Summer Weather - 15

Impact	4	<ul style="list-style-type: none"> • Hail damage to homes and community buildings including broken windows, siding and shingles. • Power outages • Economy loss • Lightning strikes cause fires • Potential injury • Potential loss of life • High winds damage property • Heavy rain produces flash flooding • Fire potential if lightning occurs during drought. • Prolonged response times and limited access for emergency services
Frequency	4	<ul style="list-style-type: none"> • Multiple storms are experienced annually causing property damage. • Extreme summer weather seasons occur every two to three years. • In 2010 we bused vulnerable people to Ellendale and sheltered them in a local restaurant meeting area during the days for warmth and hot food.
Likelihood	4	<ul style="list-style-type: none"> • Multiple storms are experienced annually causing property damage. • More intense weather in recent years • More rapid, heavy rain events occurring each year
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: 40% of population is elderly over 65 • More vulnerable: Lack of manpower at emergency services • More vulnerable: Populations that lack a backup power source. • More vulnerable: No local law enforcement, depends on County Sheriff • More vulnerable: No generated public building or storm shelter in town. Area receives 4-5 power outages lasting more than 8 hours and usually at least one which lasts 2-3 days. • More vulnerable: There are two trailer homes in the city • Less vulnerable: Sparse population and rural nature of the city

		<ul style="list-style-type: none"> • Less vulnerable: City lacks early warning system and has a radio controlled for remote storm warning. • Less vulnerable: Roads in and out of town are well maintained
Capability	1	<ul style="list-style-type: none"> • Limited tax base • No Building Code enforcement • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

City of Fullerton - Severe Summer Weather - 14

Impact	3	<ul style="list-style-type: none"> • Hail damage to homes and community buildings including broken windows, siding and shingles. • Power outages • Economy loss • Lightning strikes cause fires • Potential injury • Potential loss of life • High winds damage property • Heavy rain produces flash flooding • Fire potential if lightning occurs during drought. • Prolonged response times and limited access for emergency services
Frequency	4	<ul style="list-style-type: none"> • Multiple storms are experienced annually causing property damage. • Extreme summer weather seasons occur every two to three years.
Likelihood	4	<ul style="list-style-type: none"> • Multiple storms are experienced annually causing property damage. • More intense weather in recent years • More rapid, heavy rain events occurring each year
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: 25.9% of population is elderly over 65 • More vulnerable: Lack of manpower at emergency services • More vulnerable: Populations that lack a backup power source. • More vulnerable: No local law enforcement, depends on County Sheriff • More vulnerable: No generated public building or storm shelter in town. Area receives 4-5 power outages lasting more than 8 hours and usually at least one which lasts 2-3 days. • Less vulnerable: Sparse population and rural nature of the city • Less vulnerable: City lacks early warning system and has a radio controlled for remote storm warning. • Less vulnerable: Roads in and out of town are well maintained • Less vulnerable: Residents possess equipment to clean up debris
Capability	1	<ul style="list-style-type: none"> • Limited tax base • No Building Code enforcement • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • City has a radio operated storm siren operated by Dickey County Emergency Management.

City of Ludden - Severe Summer Weather – 13

Impact	3	<ul style="list-style-type: none"> • Hail damage to homes and community buildings including broken windows, siding and shingles. • Power outages • Economy loss • Lightning strikes cause fires • Potential injury • Potential loss of life • High winds damage property • Heavy rain produces flash flooding • Fire potential if lightning occurs during drought. • Prolonged response times and limited access for emergency services
Frequency	4	<ul style="list-style-type: none"> • Multiple storms are experienced annually causing property damage. • Extreme summer weather seasons occur every two to three years.
Likelihood	4	<ul style="list-style-type: none"> • Multiple storms are experienced annually causing property damage. • More intense weather in recent years • More rapid, heavy rain events occurring each year
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: 34% of population is elderly over 65 • More vulnerable: No fire, EMS in the town. All responders come from Oakes with a 20-minute average response on a good weather day. • More vulnerable: Populations that lack a backup power source. • More vulnerable: No local law enforcement, depends on County Sheriff • More vulnerable: No generated public building or storm shelter in town. Area receives 4-5 power outages lasting more than 8 hours and usually at least one which lasts 2-3 days. • More vulnerable: City has no public works personnel or equipment. All maintenance is contracted out as needed • More vulnerable: No medical facilities, public fueling capacity or lodging • More vulnerable: The immediate area surrounding the city is grassland and farmland allowing wind direct access on the community. • More vulnerable: The city does not have a shelter or an emergency siren. • Less vulnerable: Sparse population and rural nature of the city • Less vulnerable: City lacks early warning system and has a radio controlled for remote storm warning. • Less vulnerable: Roads in and out of town are well maintained • Less vulnerable: The City purchased discharge hoses to pump excess water out of the city.
Capability	2	<ul style="list-style-type: none"> • Limited tax base • No Building Code enforcement • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • City has a radio operated storm siren operated by Dickey County Emergency Management.

City of Monango - Severe Summer Weather - 12

Impact	4	<ul style="list-style-type: none"> • Hail damage to homes and community buildings including broken windows, siding and shingles. • Power outages • Economy loss • Lightning strikes cause fires • Potential injury • Potential loss of life • High winds damage property • Heavy rain produces flash flooding • Fire potential if lightning occurs during drought. • Prolonged response times and limited access for emergency services
Frequency	3	<ul style="list-style-type: none"> • Multiple storms are experienced annually causing property damage. • Extreme summer weather seasons occur every two to three years. • 2011 storm took out half of the city’s trees
Likelihood	3	<ul style="list-style-type: none"> • Multiple storms are experienced annually causing property damage. • More intense weather in recent years • More rapid, heavy rain events occurring each year
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: 40% of population is elderly over 65 • More vulnerable: Lack of manpower at emergency services • More vulnerable: Populations that lack a backup power source. • More vulnerable: No local law enforcement, depends on County Sheriff • More vulnerable: No generated public building or storm shelter in town. Area receives 4-5 power outages lasting more than 8 hours and usually at least one which lasts 2-3 days. • Less vulnerable: Sparse population and rural nature of the city • Less vulnerable: City lacks early warning system and has a radio controlled for remote storm warning. • Less vulnerable: Roads in and out of town are well maintained
Capability	1	<ul style="list-style-type: none"> • Limited tax base • No Building Code enforcement • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • City has a radio operated storm siren operated by Dickey County Emergency Management.

City Oakes Severe Summer Weather – 13

Impact	3	<ul style="list-style-type: none"> • Hail damage to homes and community buildings including broken windows, siding and shingles. • Power outages • Economy loss • Lightning strikes cause fires • Potential injury • Potential loss of life • High winds damage property • Heavy rain produces flash flooding
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		<ul style="list-style-type: none"> • Fire potential if lightning occurs during drought.
Frequency	4	<ul style="list-style-type: none"> • Multiple storms are experienced annually causing property damage. • Extreme summer weather seasons occur every two to three years.
Likelihood	4	<ul style="list-style-type: none"> • Multiple storms are experienced annually causing property damage. • More intense weather in recent years • More rapid, heavy rain events occurring each year
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: 24.1% of population is elderly over 65 • More vulnerable: Populations that lack a backup power source. • More vulnerable: Rest home, K-12 school and vocational tech are not generated • More vulnerable: City contains fuel and propane tanks within city limits adjacent to infrastructure and critical facilities • Less vulnerable: Sparse population and rural nature of the city • Less vulnerable: City has a shelter • Less vulnerable: Building codes and ordinances in place to assure safety in construction of buildings • Less vulnerable: City has clinic • Less vulnerable: Siren system can be radio actuated by law enforcement or Dickey County Emergency Management. • Less vulnerable: Roads in and out of town are well maintained
Capability	1	<ul style="list-style-type: none"> • Limited tax base • No Building Code enforcement • The elevator in town has some manpower, heavy equipment and work with area farmers to be pro-active in protecting the city. • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • The siren can be radio actuated by law enforcement or Dickey County Emergency Management.

Vulnerabilities to County-Owned Buildings and Property

County-owned buildings are susceptible to severe summer weather in many forms. Buildings are often constructed to adequately withstand impacts from severe summer weather, but may not sustain high wind speeds, tornados or large hail. Large hail can damage building roofs, break windows and injure people. Depending on the size of the building and the role it plays in day-to-day operations, the vulnerability to severe summer weather can vary from nominal for larger structures such as the Dickey County Courthouse in Ellendale to severe for county shops in smaller cities, which are considerably less sturdy. A summary of city and county owned buildings is provided in Chapter 4.

Vulnerabilities of Critical Facilities and Infrastructure

Building codes ensure buildings and structures are built adequately to withstand severe weather of any kind. The cities of Ellendale and Oakes have building codes and extensive ordinances regulating the construction height of everything from fencing and materials used for construction, to location of trees and other vegetation. The smaller cities of Forbes, Fullerton, Ludden and Monango lack building codes and do not have a common standard for new and future development. These cities are more at risk to damage and impacts from sever summer weather and windstorms as a result.

Critical facilities such as schools, water towers, roadways, county-owned buildings and other specialty facilities such as hospital, nursing homes and assisted living facilities are vulnerable to severe summer weather in a similar fashion to county-owned buildings and property. In terms of infrastructure, power lines are susceptible to wind and debris, which can disrupt service and cause power outages. Disruptions in water service can be caused by damage to water towers or lift stations. Roadways can become blocked due to windblown debris and limit access for emergency services.

Data Limitations and Other Key Documents

Residents often experience impacts from these hazards, such as broken windows on homes or damage to vehicles, they do not report. Weather data provided by NOAA and other agencies can be incomplete. Fewer storm spotters reduce the amount of reported weather information.

This plan incorporates data from the following documents and information from this plan will be incorporated in the update of the following documents.

- Dickey County Emergency Operations Plan
- North Dakota State Building Code
- Ellendale City Ordinances
- Oakes City Ordinances
- 2014 Dickey County Multi-Hazard Mitigation Plan
- 2014 North Dakota State Multi-Hazard Mitigation Plan

DRAFT

5.7 Severe Winter Weather

Including Blizzards, Heavy Snow, Recycled Snow, Ice Storms, and Extreme Cold.

Characteristics

Winter storms have the capability to completely immobilize large areas of a state or several states simultaneously. Winter storms occur in several forms, such as heavy snow storms, blizzards, extended extreme cold temperatures and ice storms. Each in its own way is a potential killer of hundreds of people whenever the storm strikes. A brief explanation of each follows:

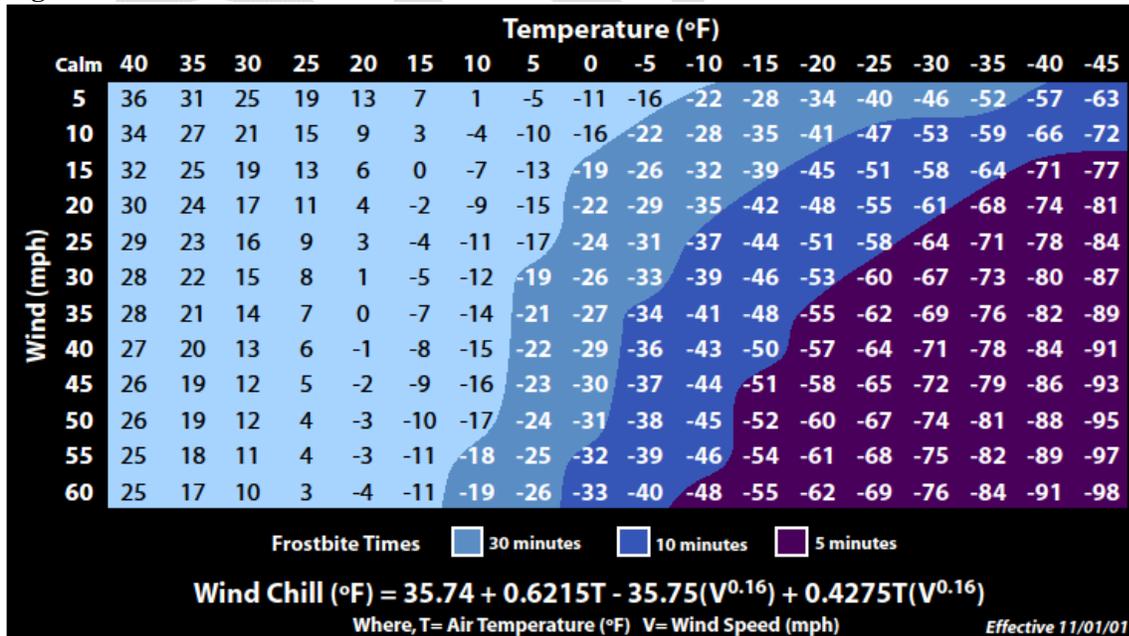
Blizzards are a combination of sustained winds or frequent gusts of 35mph or greater and visibilities of less than a quarter mile from falling or blowing snow for 3 hours or more. Blizzards are usually characterized by low temperatures and by strong winds bearing large amounts of snow. The impact of a severe blizzard with low visibility, heavy snow, and cold temperatures can bring the entire county to a standstill.

Heavy Snow Storms do not meet the criteria of a blizzard but are also hazardous. Six inches of snow or more in 12 hours or eight inches or more in 24 hours constitutes conditions that may significantly hamper travel or create hazardous conditions. Snow can be continuous, intermittent, flurries or if showery in nature, snow squalls.

Ice Storms develop when a layer of warm (above freezing), moist air aloft coincides with a shallow cold (below freezing) pool of air at the surface. As snow falls into a warm layer of air, it melts to rain, and then freezes on contact when hitting the frozen ground or cold objects at the surface, creating a smooth layer of ice. Extended periods of freezing rain can lead to accumulations of ice on roadways, walkways, power lines, trees, and buildings. Thick accumulations can bring down trees and power lines.

Extreme Cold includes long periods of cold temperatures throughout the winter months. People are forced to limit time spent outdoors in extreme cold conditions. When cold temperatures combine with wind, dangerous wind chill occurs. Wind chill is how cold it feels when outside.

Figure 5.7.1 Wind Chill Chart



Source: National Weather Service

The winter season can begin as early as September and last into May. Generally, a period from mid-November through early April provides the bulk of winter storms.

Each year, dozens of Americans die due to exposure to cold. Add to that number, vehicle accidents and fatalities, fires due to dangerous use of heaters and other winter weather fatalities and you have a significant threat. People can be hurt or killed in traffic accidents on icy roads, while shoveling snow, or from hypothermia due to prolonged exposure to cold.

Blizzards can last from from than 24 hours (in faster moving storms) to more than four days (in slower moving ones). There are two major winter storm tracks that can be explained. The northern track produces the Alberta Low Pressure System, commonly called the Alberta Clipper. This is usually a fast moving storm producing blizzard conditions for a relatively short period of time. They are usually followed by extreme low temperatures. Alberta Lows have traveled as fast as 90 mph and have not been known to stop and become stationary. The southern track produces the Colorado Low Pressure System. This type of storm moves more slowly and more erratically than the Alberta Low. The Colorado Lows have traveled as fast as 60 mph, but have also been known to stop and become stationary for as long as 18 hours. Both of these storms can be deadly.

Low temperatures combined with high winds are extremely dangerous. Each year a number of people, stranded in a blizzard attempt to walk to safety and become lost. Lowering of the body core temperature leads to the condition known as “hypothermia.” Hypothermia has often been called “The killer of the unprepared”. The blood is cooled, thereby reducing the amount of oxygen which is carried to the brain, thus dulling the senses. The victim becomes fatigued, delirious, and loses dexterity of arms and legs. If the body’s core temperature continues to drop to about 85 degrees F, the victim eventually slips into unconsciousness. If the treatment is not started immediately, the result is arrest of the circulatory and respiratory systems and death.

Wind chill is not the actual temperature but rather how wind and cold feel on exposed skin.

The livestock industry can be severely impacted during winter storm situations. The snow can prevent cattlemen from getting feed and water to their livestock

History

Dickey County has a documented hazard history that shows a 100 percent frequency and likelihood of the hazard occurring in the future. History shows eight years of requests for presidential declarations for snow-related events dating back to the 1978.

In addition to the eight disaster declarations listed in the prior table, North Dakota also had four requests turned down. Table 5.7.3 details turned down requests. The span of time since a turned down requests indicates that losses from severe summer weather have been substantial enough to make a declaration, potentially from increasing strength of impacts and storm intensity.

Table 5.7.1 – 1960 to 2017 Dickey County Severe Winter Weather History Summary

Severe Winter Weather					
Number of Occurrences	Date Range	Injuries	Fatalities	Property Damage	Crop Damage
140	1960-2017	1.53	1.83	\$9,919,420.71	\$5368.86

Sources: Spatial Hazard Events and Losses Database for the United States (SHELDUS); National Oceanic and Atmospheric Administration (NOAA); Information Service/National Climatic Data Center (NCDC)

Table 5.7.2 – 1953 through 2009 Granted Disaster Declarations for Dickey County

#	Date	Type	Disaster Description	Statewide Costs Constant 2009 \$	President
554	04/17/1978	F	Storms, Ice Jams, Snowmelt, Flooding	11,165,307	Carter
581	04/26/1979	F	Severe Storms, Snowmelt, Flooding	57,100,615	Carter
1001	07/26/1993	F	Severe Storms, Flooding	48,607,868	Clinton
1118	06/05/1996	W	Severe Storms, Flooding, Ice Jams	18,135,392	Clinton
1157	01/12/1997	S	Severe Winter Storms, Blizzard	21,264,168	Clinton
1174	04/07/1997	F	Severe Flooding, Severe Winter Storm	531,404,655	Clinton
1279	06/08/1999	S	Severe Storms, Flooding, Snow, Ice	145,619,808	Clinton
1879	02/26/2010	NA	Severe Winter Storm	20,602,060	Obama

Source: FEMA

Table 5.7.3 – Turned Down State Requested Disaster Declarations for North Dakota

Requested Number	Turn Down Date	Type	Disaster Description	President
69006	03/21/1969	Major	Snow Removal, Flood Preparations	Nixon
75079	04/09/1975	Major	Snow, Floods	Ford
78018	01/25/1978	Major	Severe Winter Storms	Carter
78042	02/16/1978	Emergency	Snowstorm	Carter

Source: FEMA

Probability and Magnitude

Hazard history was gathered from NOAA, NCDC, SHELDUS, newspaper accounts, and the previous FEMA-approved Dickey County Mitigation Plan. This data covers a 20-year period from 1993 through 2017, and documents 66 notable severe winter weather occurrences, which equates to a probability of 100 percent, or roughly three significant instances of severe winter weather per season.

Risk Assessment

The table below, Table 5.8.5, shows the risk assessment as determined by individual jurisdictions and the planning committee. The table represents the sum of each jurisdiction's impact, frequency, likelihood and vulnerability to a hazard less the jurisdiction's capabilities to respond to the hazard. Impact, frequency, likelihood, vulnerability and capabilities are defined and scored as:

Table 5.7.5 – Risk Assessment Summary Severe Winter Weather Scored Chart

Severe Winter Weather	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Dickey County	4	4	4	2	2	12
Ellendale	3	4	4	4	1	14
Forbes	3	4	4	4	2	13
Fullerton	3	4	4	4	2	13
Ludden	3	4	4	4	2	13
Monango	3	4	4	4	1	14
Oakes	3	4	4	4	1	14

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Seasonal Pattern	October through May
Duration	2 to 3 days
Speed of Onset	6 to 12 hours

Capabilities of and Vulnerabilities to Jurisdictions

Upon review of the statistics and oral history of residents, the frequency and likelihood of severe winter weather in Dickey County and all jurisdictions are ranked as “4” as this type of weather takes place in the county and its jurisdictions on an annual basis with multiple occurrences. Scoring for impact, vulnerability and capability is specific to each jurisdiction based on past experiences.

Capabilities and vulnerabilities of jurisdictions were scored at committee meetings and at each jurisdictional meeting with participants including the mayor and city auditor, in addition to members from the city council, business owners, emergency services representatives, and members of the general public. Participants discussed the incidents that occur in their jurisdiction and how frequent impacts are from the hazard. Afterwards, they scored impacts and frequency of the hazard. Participants compared the impacts and frequency of the hazard and determined future prevalence. The likelihood of the hazard was then scored. Vulnerability was scored with participants stating what makes the jurisdiction less vulnerable given their resources at hand or more vulnerable by identifying resources not available.

Risk assessment hazard scoring and notes for the county are contained in the following graphic. The jurisdictional risk assessments can be found in Chapter 8, Jurisdictions.

Dickey County – Severe Winter Weather - 12

Impact	4	<ul style="list-style-type: none"> • Potential Property damage • Blocked roads – lack of critical emergency access. • Cattle, crop and economic loss • Property damage or loss including structure collapse • Winter weather related school closures occur frequently. • Downed power lines • Potential injury • Potential loss of life • Potential loss of infrastructure • Power Outages • Economic loss due to school closures • Potential school transportation accidents or incidents • Potential transportation accidents or incidents
Frequency	4	<ul style="list-style-type: none"> • Years with multiple winter events are the normal
Likelihood	4	<ul style="list-style-type: none"> • Will happen in the future due to the climate, occurs annually
Vulnerability	2	<ul style="list-style-type: none"> • More vulnerable: Emergency Services access is limited • More vulnerable: Have unburied power lines • More vulnerable: Do not have large snow removal equipment for long-term storm activity • More vulnerable: No public generated shelters • Less vulnerable: County road department is aggressive in clearing roads to maintain access • Less vulnerable: County has snow removal equipment in remote shops • Less vulnerable: Residents possess individual snow removal equipment • Less vulnerable: recent buried power lines to mitigate power outages
Capability	2	<ul style="list-style-type: none"> • Snow removal equipment and labor force to address average storms • Active county commission • Active County Emergency Management • Lacks technical, administrative and financial resources for mitigation • Relies on regional, state and other agencies for assistance

City of Ellendale - Severe Winter Weather - 14

Impact	3	<ul style="list-style-type: none"> • Ice storms, heavy and blowing snow cause travel issues, power outages, and property damage • Potential isolation of community • Severe low temperatures increase utility costs and affect alternative fuel • Potential loss of life • Potential injury • Economy loss • Increased cost for snow removal • Highways and city streets become icy and blocked • Heavy snow results in potential flooding in the spring • City streets build up with compacted snow causing damage to streets • Increased potential for hazardous material release • Temporary outage of emergency services
Frequency	4	<ul style="list-style-type: none"> • Occurs annually • Years with multiple winter events are normal
Likelihood	4	<ul style="list-style-type: none"> • Will happen in the future due to the climate, occurs annually
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: 20.7% of population is elderly over 65 • More vulnerable: Trinity College is not generated and those students are dependent on the City during hazards • Less vulnerable: K-12 School is Generated • Less vulnerable: The rest home is generated • Less vulnerable: City maintains a capital improvements plan • Less vulnerable: Small community where neighbors help neighbors
Capability	1	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • There are a few certified, trained and equipped citizens in the community • City siren can be radio actuated by law enforcement or by Dickey County Emergency Management • The elevator in town has some manpower, heavy equipment and work with area farmers to be pro-active in protecting the city

City of Forbes - Severe Winter Weather - 13

Impact	3	<ul style="list-style-type: none"> • Ice storms, heavy and blowing snow cause travel issues, power outages, and property damage • Potential isolation of community • Severe low temperatures increase utility costs and affect alternative fuel sources • Potential loss of life • Potential injury • Economy loss • Increased cost for snow removal • Highways and city streets become icy and blocked • Heavy snow results in potential flooding in the spring • City streets build up with compacted snow causing damage to streets • Increased potential for hazardous material release • Temporary outage of emergency services
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Frequency	4	<ul style="list-style-type: none"> Occurs annually, few years without severe winter weather Years with multiple winter events are the normal
Likelihood	4	<ul style="list-style-type: none"> Will happen in the future due to the climate, occurs annually
Vulnerability	4	<ul style="list-style-type: none"> More vulnerable: 40% of population is elderly over 65 More vulnerable: Lack of manpower at emergency services More vulnerable: No local law enforcement, depends on County Sheriff More vulnerable: Removal of shelter belts increases ground blizzard More vulnerable: There are two mobile homes in the area Less vulnerable: City lacks early warning system and has a radio controlled for remote storm warning. Less vulnerable: Small community where neighbors help neighbors
Capability	2	<ul style="list-style-type: none"> Active city council Lacks technical, administrative and financial resources for mitigation Relies on county, regional, state and other agencies for assistance Lacks resources to accomplish projects independently There are a few certified, trained and equipped citizens in the community

City of Fullerton - Severe Winter Weather - 13

Impact	3	<ul style="list-style-type: none"> Ice storms, heavy and blowing snow cause travel issues, power outages, and property damage Potential isolation of community Severe low temperatures increase utility costs and affect alternative fuel Potential loss of life Potential injury Economy loss Increased cost for snow removal Highways and city streets become icy and blocked Heavy snow results in potential flooding in the spring City streets build up with compacted snow causing damage to streets Increased potential for hazardous material release Temporary outage of emergency services
Frequency	4	<ul style="list-style-type: none"> Occurs annually, few years without severe winter weather Years with multiple winter events are the normal
Likelihood	4	<ul style="list-style-type: none"> Will happen in the future due to the climate, occurs annually
Vulnerability	4	<ul style="list-style-type: none"> More vulnerable: 25.9% of population is elderly over 65 More vulnerable: Lack of manpower at emergency services More vulnerable: No city equipment More vulnerable: No local law enforcement, depends on County Sheriff More vulnerable: Removal of shelter belts increases ground blizzard Less vulnerable: City lacks early warning system and has a radio controlled for remote storm warning. Less vulnerable: Small community where neighbors help neighbors
Capability	2	<ul style="list-style-type: none"> Active city council Lacks technical, administrative and financial resources for mitigation Relies on county, regional, state and other agencies for assistance Lacks resources to accomplish projects independently There are a few certified, trained and equipped citizens in the community

		<ul style="list-style-type: none"> • City has a radio operated storm siren operated by Dickey County Emergency Management
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City of Ludden - Severe Winter Weather - 13

Impact	3	<ul style="list-style-type: none"> • Ice storms, heavy and blowing snow cause travel issues, power outages, and property damage • Potential isolation of community • Severe low temperatures increase utility costs and affect alternative fuel sources • Potential loss of life • Potential injury • Economy loss • Increased cost for snow removal • Highways and city streets become icy and blocked • Heavy snow results in potential flooding in the spring • City streets build up with compacted snow causing damage to streets • Increased potential for hazardous material release • Temporary outage of emergency services
Frequency	4	<ul style="list-style-type: none"> • Occurs annually, few years without severe winter weather • Years with multiple winter events are the normal
Likelihood	4	<ul style="list-style-type: none"> • Will happen in the future due to the climate, occurs annually
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: 34% of population is elderly over 65 • More vulnerable: No fire, medical facilities or EMS. All responders come from Oakes with a 20-minute average response • More vulnerable: No local law enforcement, depends on County Sheriff which takes a minimum of one-half hour to arrive. • More vulnerable: Removal of shelter belts increases ground blizzard conditions • More vulnerable: No siren or shelter • More vulnerable: City has no public works personnel or equipment. • More vulnerable: No public fueling capacity or public lodging • Less vulnerable: City lacks early warning system and has a radio controlled for remote storm warning • Less vulnerable: Small community where neighbors help neighbors
Capability	2	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • There are a few certified, trained and equipped citizens in the community • City has a radio operated storm siren operated by Dickey County Emergency Management • The elevator in town has some manpower, heavy equipment and work with area farmers to be pro-active in protecting the city

City of Monango - Severe Winter Weather - 14

Impact	3	<ul style="list-style-type: none"> • Ice storms, heavy and blowing snow cause travel issues, power outages, and property damage • Potential isolation of community
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		<ul style="list-style-type: none"> • Severe low temperatures increase utility costs and affect alternative fuel • Potential loss of life • Potential injury • Economy loss • Increased cost for snow removal • Highways and city streets become icy and blocked • Heavy snow results in potential flooding in the spring • City streets build up with compacted snow causing damage to streets • Increased potential for hazardous material release • Temporary outage of emergency services
Frequency	4	<ul style="list-style-type: none"> • Occurs annually, few years without severe winter weather • Years with multiple winter events are the normal
Likelihood	4	<ul style="list-style-type: none"> • Will happen in the future due to the climate, occurs annually
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: 40% of population is elderly over 65 • More vulnerable: Lack of manpower at emergency services • More vulnerable: No local law enforcement, depends on County Sheriff which takes a minimum of one-half hour to arrive. EMS is out of Ellendale again twenty-minute response on a good weather day. • More vulnerable: Removal of shelter belts increases ground blizzard • More vulnerable: No gas station • More vulnerable: No city shelter • More vulnerable: No grocery store • Less vulnerable: City lacks early warning system and has a radio controlled for remote storm warning. • Less vulnerable: Small community where neighbors help neighbors
Capability	1	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • There are a few certified, trained and equipped citizens in the community • City has a radio operated storm siren operated by Dickey County Emergency Management

City of Oakes - Severe Winter Weather - 14

Impact	3	<ul style="list-style-type: none"> • Ice storms, heavy and blowing snow cause travel issues, power outages, and property damage • Potential isolation of community • Severe low temperatures increase utility costs and affect alternative fuel sources • Potential loss of life • Potential injury • Economy loss • Increased cost for snow removal • Highways and city streets become icy and blocked • Heavy snow results in potential flooding in the spring • City streets build up with compacted snow causing damage to streets • Increased potential for hazardous material release • Temporary outage of emergency services
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Frequency	4	<ul style="list-style-type: none"> Occurs annually, few years without severe winter weather Years with multiple winter events are the normal
Likelihood	4	<ul style="list-style-type: none"> Will happen in the future due to the climate, occurs annually
Vulnerability	4	<ul style="list-style-type: none"> More vulnerable: 24.1% of population is elderly over 65 More vulnerable: Removal of shelter belts increases ground blizzard More vulnerable: K-12 and Vocational tech are not generated More vulnerable: The rest home is not generated Less vulnerable: City possesses street cleaning equipment Less vulnerable: Generators for critical facilities Less vulnerable: City shelter Less vulnerable: City maintains a capital improvements plan Less vulnerable: City has adopted building codes and ordinances Less vulnerable: Only hospital in Dickey County Less vulnerable: Small community where neighbors help neighbors
Capability	1	<ul style="list-style-type: none"> Active city council Lacks technical, administrative and financial resources for mitigation Relies on county, regional, state and other agencies for assistance There are a few certified, trained and equipped citizens in the community City siren can be radio actuated by law enforcement or by Dickey County Emergency Management The elevator in town has some manpower, heavy equipment and work with area farmers to be pro-active in protecting the city

Vulnerabilities to County-Owned Buildings and Property

Most structures remain unaffected by impacts from severe winter weather except for heavy snow loads, frozen pipes, utility failures or potential damage to structural foundations from freezing and thawing of soil. Roof collapses are the biggest single-event resulting from heavy snow loads. Human life is also at risk from roof collapses. A summary of county and city owned property in Dickey County is provided in Chapter 4.

Vulnerabilities of Critical Facilities and Infrastructure

The greatest issues for critical facilities resulting from severe winter weather impacts are inaccessibility due to blocked roads and utility and power outages. Emergency services can experience difficulty in providing services during power outages and are limited in responding to emergencies when roads are blocked. Critical facilities with backup generators are better equipped to handle impacts from severe winter weather if loss of power does occur.

The greatest issue for critical infrastructure is maintenance of the road system during severe winter weather. During blizzards or snow storms, cars and trucks can become stranded as roads become blocked with heavy snow and ice. This can result in extended response times for emergency services and prevent access to communities. Prolonged closures of roads can threaten propane, fuel and food supplies.

Vulnerabilities to New and Future Development

New and future development could be seriously impacted by severe winter weather in jurisdictions that lack building codes and/or enforcement. Homes and businesses lacking the capability of supporting heavy snow loads could experience roof collapse.

Street design also plays an important role in vulnerability to severe winter weather. New and future development developed in a “suburban style” manner containing curvilinear roads and cul-de-sacs are more susceptible to severe winter weather impacts. Snow removal on these roadways has been proven difficult and increases the potential for blocked roads and limits access for emergency services. Maintaining a high level of connectivity, which is defined as how often streets or roadways intersect, can increase the ease of snow removal and lessen the impact of blocked roads and maintain access for emergency services.

Increases in population further complicate matters when dealing with severe winter weather. An example of this would be higher numbers of people susceptible to vehicle accidents on icy or blocked roads, health hazards due to wind chill and extreme cold.

Data Limitations and Other Key Documents

The severity and magnitude are not always distinguishable as significant damage does not always occur. This results in data limitations regarding the true impact of the hazard. Fewer storm spotters reduce the amount of reported weather information. Weather data provided by NOAA and other entities can be incomplete.

This plan incorporates data from the following documents and information from this plan will be incorporated in the update of the following document.

- Dickey County Sheltering Plan
- Dickey County Emergency Operations Plan
- Dickey County Emergency Preparedness Education – 72-hour emergency kit
- North Dakota Emergency Operations Plan
- 2014 North Dakota Multi Hazard Mitigation Plan
- 2014 Dickey Multi-Hazard Mitigation Plan

DRAFT

5.9 Shortage or Outage of Critical Materials or Infrastructure

Characteristics

A shortage of critical materials or infrastructure occurs when the demand for a life sustaining product exceeds the supply. These shortages and outages may include a wide variety of resources including energy-related products, power transmission, medical products, food, and water.

The disruption of critical material supply system may be caused by weather conditions (severe low temperatures, ice/winter storm high winds, space weather such as solar flares), other natural disasters such as flooding and tornadoes, lack of infrastructure maintenance, human error, global conflict, oil embargo, major work stoppage, cyber security or a national security emergency. Any disruption, regardless of the cause could have immediate adverse impacts as well as severely diminish existing supplies, thereby threatening the long-term health, safety, and well-being of Dickey County citizens.

Examples of shortages or outages of critical material or infrastructure include:

- Widespread and prolonged electrical power failure, which impacts both day-to-day and emergency communications capability.
- A lack of transportation fuels, causing surface movement gridlock and disruption of commerce.
- Diminished supplies of heating fuels during winter causing severe economic and health impacts.
- A lack of medical supplies, especially vaccines, antibiotics, and anti-viral medications, pose a public health and safety threat.
- Private hoarding, compounding a shortage problem.
- A lack of adequate food, water, and shelter.

Every hazard, natural or manmade, can cause a shortage or outage of critical materials or infrastructure. According to the 2014 NDMHMP, the public relies upon utility, communication, and fuel services for everyday life and basic survival. Many in North Dakota depend on the typical utility and communication infrastructure such as water, sewer, electricity, propane, natural gas, telephone, internet, and gasoline. Water and sewer services are either provided through a public system or through individual wells and septic systems. Electricity is primarily provided by regional power companies through overhead or buried lines.

Homes and businesses are heated with fuels such as natural gas, propane, oil, and electricity. Those buildings heated with propane or oil typically have a nearby tank that is refilled regularly by a local vendor, but still rely on electricity to power their heating systems. Natural gas is provided through underground piping. Telephone, cellular telephone, and internet services are provided by several local and national companies. Privately-owned gas stations are located throughout the county.

History

Power outages in the county are the primary incident involved in shortage or outage of critical materials or infrastructure. Electrical power in the county is provided by Montana Dakota. Planned outages are described as outages put into place intentionally by the utility for maintenance purposes. An unplanned outage is described as an outage caused without warning from outside causes, such as severe weather. A momentary outage is described as an outage lasting less than five minutes, while a sustained power outage is described as an outage lasting five minutes or more.

According to Figure 5.8.1, reported power outages for Dickey County total 527 momentary power outages and 419 sustained power outages between January 1, 2010 and December 31, 2016, with MDU data being from 2013 only and KEM Electric being from 2012.

**Table 5.8.1 – January 1, 2018 through December 31, 2018
Dickey County Momentary and Sustained Power Outages**

Momentary and Sustained Power Outages				
Jurisdiction	Sustained Outages (Minutes)	Sustained Outages	Momentary Outages (Minutes)	Momentary Outages
Ellendale	22.12	1	9.20	6
Forbes	22.12	1	9.20	6
Fullerton	22.12	1	.96	18
Monango	22.12	1	.96	18
Oakes				
Ludden				
Total	211.06	527	211.06	527
Note: Length of Time for outages was rounded to the nearest hour when calculating Total Outage in Days.				
Sources: Montana Dakota Utilities				

Probability and Magnitude

The probability of the shortage or outage of critical materials or infrastructure hazard in Dickey County is hard to determine as the cause can either be natural or manmade. Power outage frequency as shown in Table 5.8.1 shows a 100 percent probability of outages of power will occur in the future. Aside from the power outage frequency shown, the lack of data results in an inability to calculate a probability for the hazard. However, during committee meetings and jurisdictional meetings, participants said there is always a chance any jurisdiction can experience shortage or outage of critical materials or infrastructure from threats and hazards. The probability is much lower in jurisdictions with redundancy in power connections to the grid, numerous grocery stores and gas stations; and other resources to sustain the daily routine of people's lives.

The probability of 100 percent can be justified as power outages occur on an annual basis at varying frequencies to some or all jurisdictions. Power outages occur with little to no warning. They generally result from other hazards. Calculating the probability of shortage or outage of critical materials or infrastructure pertaining to roads, water systems, food supplies, fuel, is difficult to determine due to the lack reporting when such incidents occur. Magnitude for shortage or outage of critical materials or infrastructure can range from minimal to severe, depending on the location, length of shortage or outage, infrastructure affected, the number of people affected and weather conditions.

Risk Assessment

Table 5.8.2 shows the risk assessment as determined by individual jurisdictions and the planning committee. Dickey County is susceptible to shortage or outage of critical materials or infrastructure because of the rural nature of the entire area.

Table 5.8.2 – Risk Assessment Summary Shortage or Outage of Critical Materials or Infrastructure

Shortage or Outage of Critical Materials or Infrastructure	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Dickey County	4	3	3	4	2	12
Ellendale	3	2	2	2	3	6
Forbes	4	4	4	3	1	14
Fullerton	4	4	4	1	1	12
Ludden	3	2	2	1	2	6
Monango	3	2	2	3	1	9
Oakes	3	2	2	3	1	9

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Seasonal Pattern	Spring, Fall, Summer, Winter
Duration	Year Round
Speed of Onset	Slow

Capabilities of and Vulnerabilities to Jurisdictions

According to the 2014 NDMHMP, the risk to jurisdictions in Dickey County from shortage or outage of critical materials or infrastructure was ranked low based on the number of people affected. The 2010 U.S. Census population for Dickey County was 5,289.

Capabilities and vulnerabilities of jurisdictions were scored at committee meetings and at each jurisdictional meeting with participants including the mayor and city auditor, in addition to members from the city council, business owners, emergency services representatives, and members of the public. Risk assessment hazard scoring and notes for the county are contained in the following graphic.

Dickey County – Shortage or Outage of Critical Materials or Infrastructure - 12

Impact	4	<ul style="list-style-type: none"> • Utility outages resulting in unheated homes causing frozen pipes, property damage and food loss. • Shortages of fertilizers, diesel fuel and gas/propane hinder economic activity and endanger community safety • Loss of sanitary sewer service causing sewer backups • Disruption in medications and supplies • Potential loss of economy • Potential loss of life • Potential loss of potable water • Potential loss of sewer due to power outages.
Frequency	3	<ul style="list-style-type: none"> • Short-term power outages are experienced periodically • Ellendale lost power to the entire critical infrastructure due to one line feeding that downtown area. Economy loss was experienced in the downtown business area. 2002 or 2003.
Likelihood	3	<ul style="list-style-type: none"> • Short-term power outages are experienced periodically
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: Individuals with special needs, elderly, day cares and schools all require special assistance during outages • More vulnerable: Dialysis patients in county would need to travel to Aberdeen for services if we lost power in Oakes. • More vulnerable: Heavily dependent on agriculture • More vulnerable: Limited grocery and fuel throughout county

		<ul style="list-style-type: none"> • More vulnerable: Snow drifts can hinder delivery of fuel • More vulnerable: 74 electricity dependent vulnerable populations that need electricity to run medical devices to live. Per the publichealthemergency.gov Empower map. • More vulnerable: A gravel road infrastructure is vulnerable to nature (flooding and snow drifts) • Less vulnerable: Generators to maintain minimal water service during times of power outage • More vulnerable: Rural water does not have generators to produce potable water to communities and rural homes. • More vulnerable: Multiple lift stations and water pumps would make it challenging to maintain minimum services over an extended period.
Capability	2	<ul style="list-style-type: none"> • Active county commission • Active County Emergency Management • Lacks technical, administrative and financial resources for mitigation • Relies on regional, state and other agencies for assistance • Limited education or outreach programs

City of Ellendale - Shortage or Outage of Critical Materials or Infrastructure - 6

Impact	3	<ul style="list-style-type: none"> • Long periods of time without power or water could lead to loss of life, due to the winter climate and high population over 65. • Reduced mobility from blocked roads • Limited drinking water and functionality of sanitary sewer • City could be left without power for heating and cooling • Loss of power can limit accessibility to fuel sources • Loss of food sources as refrigeration units are without power • Loss of economy • Loss of internet affects individuals and businesses • Delayed emergency services • Mail outages for a day or longer in winter of 2016-2017
Frequency	2	<ul style="list-style-type: none"> • In 2016, areas in and surrounding Ellendale experienced power outages from 3 hours to 2 to 3 days • Power outages are experienced annually • Have had shortages of fertilizers, diesel fuel, and gas/propane recently
Likelihood	2	<ul style="list-style-type: none"> • No improvements to power infrastructure planned • Power poles and wires of the power grid are outdated/suspended overhead • Power outages are experienced annually
Vulnerability	2	<ul style="list-style-type: none"> • More vulnerable: 20.7% of population is elderly over 65 • More vulnerable: 18 electricity dependent vulnerable populations that need electricity to run medical devices to live. Per the publichealthemergency.gov Empower map. • More vulnerable: No hospital in city • More vulnerable: Assisted living center and rest home both located in City • More vulnerable: Access to rural areas limited during a flooding, blizzard or ice storm. • Less vulnerable: The K-12 school, Vocational Tech and the rest home are generated • Less vulnerable: Rest Homes and school are generated

		<ul style="list-style-type: none"> • Less vulnerable: Some residents grow local food supply • Less vulnerable: Water is provided by the city • Less vulnerable: Some residents have their own generator • Less vulnerable: Medical Clinic
Capability	3	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • City siren system can be radio actuated by law enforcement or by Dickey County Emergency Management

City of Forbes - Shortage or Outage of Critical Materials or Infrastructure – 14

Impact	4	<ul style="list-style-type: none"> • Long periods of time without power or water could lead to loss of life, due to the winter climate and high population over 65. • Reduced mobility from blocked roads • Limited drinking water and functionality of sanitary sewer • City could be left without power for heating and cooling • Loss of power can limit accessibility to fuel sources • Loss of food sources as refrigeration units are without power • Loss of economy • Loss of internet affects individuals and businesses • Delayed emergency services • Mail outages for a day or longer in winter of 2016-2017
Frequency	4	<ul style="list-style-type: none"> • In 2009 during an outage of electric elderly residents were taken to Ellendale • In 2016, areas in and surrounding Forbes experienced power outages from 3 hours to 2 to 3 days without power • Short-term power outages are experienced annually
Likelihood	4	<ul style="list-style-type: none"> • No improvements to power infrastructure planned - Located on the end of the MDU transmission line and there are no plans to improve or duplicate service • Power poles and wires of the power grid are outdated and suspended overhead
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: 40% of population is elderly over 65 • More vulnerable: No backup generator for city infrastructure may cause sewer backup or outage of drinking water • More vulnerable: 11 electricity dependent vulnerable populations that need electricity to run medical devices to live. Per the publichealthemergency.gov Empower map. • More vulnerable: No public fueling capacity. • More vulnerable: No medical facility • More vulnerable: Access to rural areas limited during a blizzard • More vulnerable: No generated public building or storm shelter in town. • Less vulnerable: Some residents grow local food supply • Less vulnerable: Water is provided by the city • Less vulnerable: Some residents have their own generator • Less vulnerable: There is a non-profit grocery store located in the city
Capability	1	<ul style="list-style-type: none"> • Active city council

		<ul style="list-style-type: none"> • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently
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City of Fullerton - Shortage or Outage of Critical Materials or Infrastructure - 12

Impact	4	<ul style="list-style-type: none"> • Long periods of time without power or water could lead to loss of life, due to the winter climate and high population over 65. • Reduced mobility from blocked roads • Limited drinking water and functionality of sanitary sewer • City could be left without power for heating and cooling • Loss of power can limit accessibility to fuel sources • Loss of food sources as refrigeration units are without power • Loss of economy • Loss of internet affects individuals and businesses • Delayed emergency services • Mail outages for a day or longer in winter of 2016-2017
Frequency	4	<ul style="list-style-type: none"> • Short-term power outages are experienced annually
Likelihood	4	<ul style="list-style-type: none"> • No improvements to power infrastructure planned • Power poles and wires of the power grid are outdated/suspended
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: 25.9% of population is elderly over 65 • More vulnerable: No backup generator for city infrastructure may cause sewer backup or outage of drinking water • More vulnerable: 11 electricity dependent vulnerable populations that need electricity to run medical devices to live. Per the publichealthemergency.gov Empower map. • More vulnerable: No public fueling capacity or public lodging • More vulnerable: No fire, EMS or law in town. • More vulnerable: Access to rural areas limited during a blizzard • More vulnerable: No generated public building or storm shelter in town. • Less vulnerable: Some residents grow local food supply • Less vulnerable: Water is provided by the city • Less vulnerable: Some residents have their own generator
Capability	1	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • City has a radio operated storm siren operated by Dickey County Emergency Management

City of Ludden - Shortage or Outage of Critical Materials or Infrastructure - 6

Impact	3	<ul style="list-style-type: none"> • Long periods of time without power or water could lead to loss of life, due to the winter climate and high population over 65. • Reduced mobility from blocked roads • Limited drinking water and functionality of sanitary sewer • City could be left without power for heating and cooling • Loss of power can limit accessibility to fuel sources • Loss of food sources as refrigeration units are without power • Loss of economy
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		<ul style="list-style-type: none"> • Loss of internet affects individuals and businesses • Delayed emergency services • Mail outages for a day or longer in winter of 2016-2017
Frequency	2	<ul style="list-style-type: none"> • Short-term power outages are experienced annually but are infrequent
Likelihood	2	<ul style="list-style-type: none"> • No improvements to power infrastructure planned • Power poles and wires of the power grid are outdated/suspended
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: 34% of population is elderly over 65 • More vulnerable: No backup generator for city infrastructure may cause sewer backup or outage of drinking water • More vulnerable: 34 electricity dependent vulnerable populations that need electricity to run medical devices to live. Per the publichealthemergency.gov Empower map. • More vulnerable: No public fueling capacity or • More vulnerable: No public fueling capacity or public lodging • More vulnerable: No fire, medical facilities, EMS or law in town. • More vulnerable: Access to rural areas limited during a blizzard • More vulnerable: No generated public building or storm shelter in town. • Less vulnerable: Some residents grow local food supply • Less vulnerable: Water is provided by the city • Less vulnerable: Some residents have their own generator
Capability	2	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • City has a radio operated storm siren operated by Dickey County Emergency Management

City of Monango - Shortage or Outage of Critical Materials or Infrastructure - 9

Impact	3	<ul style="list-style-type: none"> • Long periods of time without power or water could lead to loss of life, due to the winter climate and high population over 65. • Reduced mobility from blocked roads • Limited drinking water and functionality of sanitary sewer • City could be left without power for heating and cooling • Loss of power can limit accessibility to fuel sources • Loss of food sources as refrigeration units are without power • Loss of economy • Loss of internet affects individuals and businesses • Delayed emergency services • Mail outages for a day or longer in winter of 2016-2017
Frequency	2	<ul style="list-style-type: none"> • Short-term power outages are experienced annually
Likelihood	2	<ul style="list-style-type: none"> • No improvements to power infrastructure planned • Power poles and wires of the power grid are outdated and suspended overhead
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: 40% of population is elderly over 65 • More vulnerable: No backup generator for city infrastructure may cause sewer backup or outage of drinking water • More vulnerable: 34 electricity dependent vulnerable populations that need electricity to run medical devices to live. Per the

		<p>publichealthemergency.gov Empower map.</p> <ul style="list-style-type: none"> • More vulnerable: No public fueling capacity or • More vulnerable: No public fueling capacity • More vulnerable: No fire, EMS or law in town. • More vulnerable: Access to rural areas limited during a blizzard • More vulnerable: No generated public building or storm shelter in town • Less vulnerable: Some residents grow local food supply • Less vulnerable: Water is provided by the city • Less vulnerable: Some residents have their own generator
Capability	1	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • City has a radio operated storm siren operated by Dickey County Emergency Management

City of Oakes - Shortage or Outage of Critical Materials or Infrastructure - 9

Impact	3	<ul style="list-style-type: none"> • Long periods of time without power or water could lead to loss of life, due to the winter climate and high population over 65. • Reduced mobility from blocked roads • Limited drinking water and functionality of sanitary sewer • City could be left without power for heating and cooling • Loss of power can limit accessibility to fuel sources • Loss of food sources as refrigeration units are without power • Loss of economy • Loss of internet affects individuals and businesses • Delayed emergency services • Mail outages for a day or longer in winter of 2016-2017
Frequency	2	<ul style="list-style-type: none"> • Short-term power outages are experienced annually
Likelihood	2	<ul style="list-style-type: none"> • No improvements to power infrastructure planned • Power poles and wires of the power grid are outdated and suspended overhead
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: 40% of population is elderly over 65 • More vulnerable: No backup generator for city infrastructure may cause sewer backup or outage of drinking water • More vulnerable: 34 electricity dependent vulnerable populations that need electricity to run medical devices to live. Per the publichealthemergency.gov Empower map. • More vulnerable: No public fueling capacity or • More vulnerable: No public fueling capacity • More vulnerable: No fire, EMS or law in town. • More vulnerable: Access to rural areas limited during a blizzard • More vulnerable: No generated public building or storm shelter in town • Less vulnerable: Some residents grow local food supply • Less vulnerable: Water is provided by the city • Less vulnerable: Some residents have their own generator
Capability	1	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation

	<ul style="list-style-type: none"> • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • City has a radio operated storm siren operated by Dickey County Emergency Management
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Vulnerabilities to County-Owned Buildings and Property

County-owned buildings and property are vulnerable to shortage or outage of critical materials and infrastructure because of other natural and manmade disasters. Power outages may occur due to downed power lines resulting from summer or winter storms, buildings can become flooded due to sewer backups from loss of power, water main breaks, traffic accidents, or overland flooding due to clogged drainage systems and heavy rain. Structures are not vulnerable directly, but damage can result from occurrences of other hazards. Chapter 4 provides a summary of county-owned buildings and property in Dickey County.

Vulnerabilities of Critical Facilities and Infrastructure

Disruptions to critical facilities and infrastructure can occur due to natural and manmade disasters, human error, low supplies of fuel or other resources, and failures of mechanical systems. The access to critical materials such as medical supplies and medications can be prolonged from blocked roads that do not allow residents to travel.

Vulnerabilities to New and Future Development

The size and intensity of new and future development can have a varying impact on the demand for electricity, food, water and medical supplies. Dickey County projects limited new development and increased population.

Data Limitations and Other Key Documents

The shortage or outage of critical materials or infrastructure hazard is a result of other natural or man-made hazards, and, therefore, it is not feasible to quantify an accurate amount of losses from the hazard. In addition, limited data is documented in Dickey County.

This plan incorporates data from the following documents and information from this plan will be incorporated in the update of the following documents.

- Dickey County Emergency Operations Plan
- 2014 State of North Dakota Multi-Hazard Mitigation Plan
- 2014 Dickey County Multi-Hazard Mitigation Plan

5.9 Transportation Accident

Including Vehicle, Railway, and Aircraft Accidents.

Characteristics

A transportation accident, as defined by the 2014 NDMHMP, is any large-scale vehicular, railroad, or aircraft accident involving mass casualties. Mass casualties can be defined as an incident resulting in many deaths and/or injuries that reach a magnitude that overtaxes the ability of local resources to adequately respond. In most disasters death and injury represent one of the effects of the hazard, while in transportation accidents, mass casualties are often the primary impact and focus of the event.

Transportation accidents occur with little or no warning. Cargo trains, buses, large-truck traffic, other highway vehicles, and passenger and cargo airplanes pose the highest risk. Due to the sparse population in Dickey County, even an incident involving a small number of deaths and/or injuries could overwhelm local resources.

Vehicle: Motorized passenger, school bus, cargo off-road and water craft.

Railroad: Cargo trains such as BNSF.

Air Craft: Small passenger, spraying, others traveling over the area

Transportation incidents occur with little or no warning. They involve many people and require special types of equipment and emergency medical personnel. Such accidents not only affect people with significant numbers of deaths/injuries, but also cause traffic problems, property damage, or even an explosion. The probability is increased during winter storms, periods of poor visibility from snow, smoke, or dust; festivities with more opportunities for drinking and driving; and times of increased traffic volume. The agricultural economy of the region also increases the opportunity for the release of hazardous materials in a transportation accident.

History

According to the 2014 NDMHMP, there have been no State Executive Orders or federal declarations dealing with transportation accidents in North Dakota. Accidents typically occur on major roadways and highways that require emergency services and can result in inconveniently long travel times for the public and hinder economic activity.

According to the 2014 NDMHMP, in 2011, there were approximately 159 crashes in Dickey County resulting in 27 injuries, no fatalities and approximately \$1,538,000 in injury costs. The North Dakota Department of Transportation stated that per the Crash Summary for 2011, “55 percent of the crashes in the state occurred in urban locations and 77 percent of the fatal crashes occurred on rural roads.” Since Dickey County is largely rural in nature, it has a higher probability of crashes resulting in fatalities.

Probability and Magnitude

According to the data provided by the N.D. Department of Transportation, there is 100 percent probability of the occurrence of an accident. In terms of magnitude, smaller and less severe accidents occur more frequently. The probability of transportation accidents varies by seasons and local weather patterns.

Since the number of fatalities from transportation accidents in Dickey County was low to moderate, the magnitude can be expressed qualitatively. According to the 2014 NDMHMP, transportation accidents can be classified as high frequency, low impact versus low frequency, high impact. Incidents involving buses or plane crashes can be classified as high magnitude events due to the potential to overwhelm local emergency services and the limited capacity of medical facilities in Dickey County. In Dickey County, the magnitude of transportation accidents can be classified as low frequency, high impact.

Risk Assessment

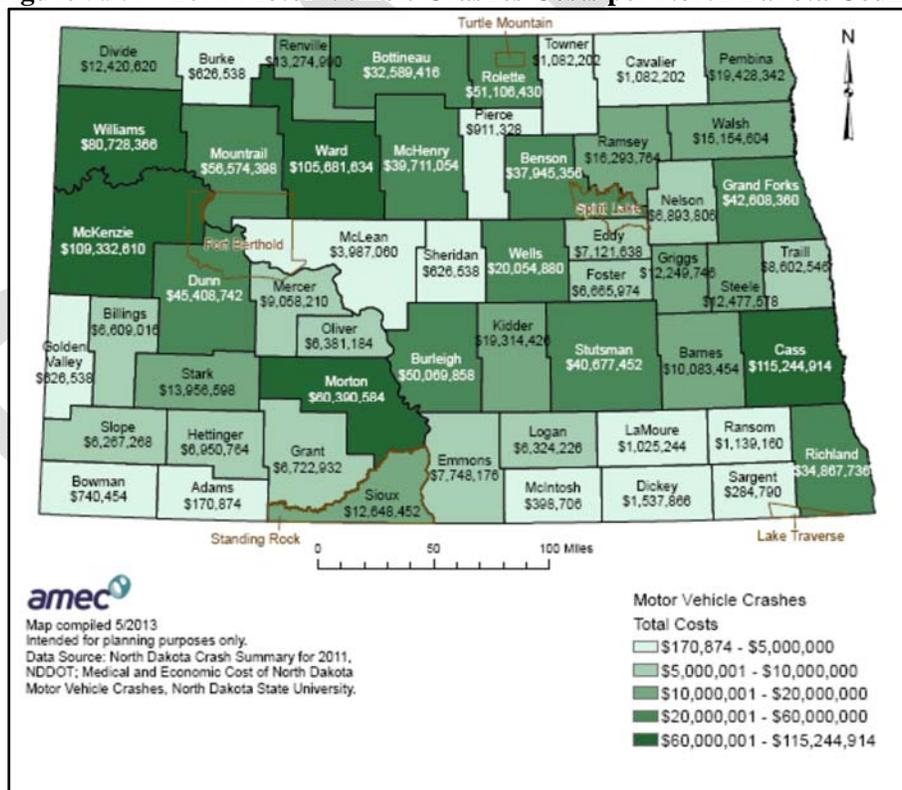
Table 5.9.1 shows the risk assessment as determined by individual jurisdictions and the planning committee. The risk assessment methodology can be found on page 5-3 of Chapter 5, Threat and Hazard Identification and Risk Assessment. The total in this chart represents the sum of each jurisdiction’s impact, frequency, likelihood and vulnerability to a hazard less the jurisdiction’s capabilities to respond to the hazard.

Table 5.9.1 – Risk Assessment Summary Transportation Accident Scored Chart

Transportation Accident	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Dickey County	4	4	4	4	2	14
Ellendale	4	4	4	3	3	12
Forbes	4	2	3	1	1	9
Fullerton	4	2	3	1	1	9
Ludden	3	2	2	1	2	6
Monango	3	2	2	2	2	7
Oakes	4	4	4	3	3	12

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Figure 5.9.1 – 2011 Motor Vehicle Crashes Costs per North Dakota County



Source: North Dakota Department of Emergency Services

Capabilities of and Vulnerabilities to Jurisdictions

Capabilities and vulnerabilities of jurisdictions were scored at committee meetings and at each jurisdictional meeting with participants including the mayor and city auditor, in addition to members from

the city council, business owners, emergency services representatives, and members of the general public. Participants discussed the incidents that occur in their jurisdiction and how frequent impacts are from the hazard. Afterwards, they scored impacts and frequency of the hazard. Participants compared the impacts and frequency of the hazard and determined future prevalence. The likelihood of the hazard was then scored. Vulnerability was scored with participants stating what makes the jurisdiction less vulnerable given their resources at hand or more vulnerable by identifying resources not available.

Risk assessment hazard scoring and notes for the county are contained in the following graphic. The jurisdictional risk assessments can be found in Chapter 8, Jurisdictions.

Dickey County – Transportation Accident - 14

Impact	4	<ul style="list-style-type: none"> • Potential of a hazardous material release incident • Potential of large-scale explosive incident (propane, fuel and anhydrous) • Potential injury and loss of life • Potential economic loss • Emergency services could be impacted resulting in prolonged times for other needs in the county
Frequency	4	<ul style="list-style-type: none"> • Accidents involving cars, trucks, farm equipment, railroads and airplanes occur on a yearly basis with multiple instances in various areas in the county. • Multiple car deer accidents have occurred
Likelihood	4	<ul style="list-style-type: none"> • Annual occurrence with vehicle accidents • Accidents involving cars, trucks, railroads and airplanes occur on a yearly basis with multiple instances in various areas in the county
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: Hwy 281, Hwy 11, Hwy 1 and rail transportation corridors traverses through the middle of the cities and county. Traffic includes tanker traffic, pedestrian traffic. • More vulnerable: Pipeline running along 281 is vulnerable to explosions along the highway. • More vulnerable: Increased traffic has been noticed on smaller highways and roads in jurisdictions and rural areas of the county due to increased economic activity including wind towers being constructed. • More vulnerable: Some county roads do not have adequate signage pertaining to speed limits. Very few hazardous material routes identified. • More vulnerable: Roads vary in condition and lack signage displaying roadway names and numbers for navigation • Less vulnerable: Emergency services in county have equipment and training for extraction.
Capability	2	<ul style="list-style-type: none"> • City and County web sites • Active county commission • Lacks technical, administrative and financial resources for mitigation

City of Ellendale - Transportation Accident - 12

Impact	4	<ul style="list-style-type: none"> • Potential loss of life • Potential injury • Economy loss • Property loss • Potential hazardous materials release • Potential fire • Potential Blocked Roads
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Frequency	4	<ul style="list-style-type: none"> • Accidents happen in the area each year
Likelihood	4	<ul style="list-style-type: none"> • Accidents happen in the area each year
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: 20.7% of population is over 65 • More vulnerable: Located on US 281 • More vulnerable: Bulk fuels transported through City • More vulnerable: Increased amount of time students spend on buses • More vulnerable: Trucks and farmers transporting larger tanks more frequently on highway through the city limits. • More vulnerable: Anhydrous tanks driven through and parked in the city. • More vulnerable: High risk of hazardous chemical release or transportation accident as it is located close to highway • More vulnerable: No hospital, all patients must be transported to Oakes or Aberdeen Hospitals • More vulnerable: City has an airport • Less vulnerable: City has clinic • Less vulnerable: Freight rail lines have been removed and no longer run through city limits
Capability	3	<ul style="list-style-type: none"> • Siren system can be radio actuated by Law enforcement or by Dickey County Emergency Management • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

City of Forbes - Transportation Accident - 9

Impact	4	<ul style="list-style-type: none"> • Potential loss of life • Potential injury • Economy loss • Property loss • Potential hazardous materials release • Potential fire
Frequency	2	<ul style="list-style-type: none"> • No major accidents in the area in recent years
Likelihood	3	<ul style="list-style-type: none"> • No major accidents in the area in recent years
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: 40% of population is over 65 • More vulnerable: Increased amount of time students spend on buses • More vulnerable: Trucks and farmers transporting larger tanks more frequently on Hwy 30 through the city limits. • More vulnerable: Anhydrous tanks driven through and parked in the city. • More vulnerable: No medical supplies in stock • More vulnerable: Fire Department has no equipment for accident extraction • More vulnerable: County Highway 2 traverses the city, people are not obeying the signs or speed laws • More vulnerable: No local law enforcement, depends on County Sheriff • Less vulnerable: No airport • Less vulnerable: City lacks early warning system and has a radio controlled for remote storm warning.
Capability	1	<ul style="list-style-type: none"> • Fire Department has no extraction capabilities for grain bin and vehicle accidents.

		<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently
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City of Fullerton - Transportation Accident - 9

Impact	4	<ul style="list-style-type: none"> • Potential loss of life • Potential injury • Economy loss • Property loss • Potential hazardous materials release • Potential fire
Frequency	2	<ul style="list-style-type: none"> • No major accidents in the area in recent years
Likelihood	3	<ul style="list-style-type: none"> • No major accidents in the area in recent years
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: 40% of population is over 65 • More vulnerable: Increased amount of time students spend on buses • More vulnerable: Trucks and farmers transporting larger tanks more frequently on Hwy 30 through the city limits. • More vulnerable: Anhydrous tanks driven through and parked in the city. • More vulnerable: No medical supplies in stock • More vulnerable: Fire Department has no equipment for accident extraction • More vulnerable: County Highway 2 traverses the city, people are not obeying the signs or speed laws • More vulnerable: No local law enforcement, depends on County Sheriff • Less vulnerable: No airport • Less vulnerable: City lacks early warning system and has a radio controlled for remote storm warning.
Capability	1	<ul style="list-style-type: none"> • Fire Department has no extraction capabilities for grain bin and vehicle accidents. • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

City of Ludden - Transportation Accident - 6

Impact	3	<ul style="list-style-type: none"> • Potential loss of life • Potential injury • Economy loss • Property loss • Potential hazardous materials release • Potential fire
Frequency	2	<ul style="list-style-type: none"> • No major accidents in the area in recent years • Many cars to deer accidents in the past several years • Plan crash involving an area farmer
Likelihood	2	<ul style="list-style-type: none"> • No major accidents in the area in recent years
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: 34% of population is over 65 • More vulnerable: Increased amount of time students spend on buses • More vulnerable: Trucks and farmers transporting larger tanks more

		<p>frequently on highway through the city limits.</p> <ul style="list-style-type: none"> • More vulnerable: Anhydrous tanks driven through and parked in the city. • More vulnerable: High risk of hazardous chemical release or transportation accident as it is located close to highway • More vulnerable: No fire, EMS, medical facility in town • More vulnerable: No local law enforcement, depends on County Sheriff • Less vulnerable: No airport • Less vulnerable: City lacks early warning system and has a radio controlled for remote storm warning.
Capability	2	<ul style="list-style-type: none"> • First Responder Group in Ellendale and Oakes • City has a radio operated storm siren operated by Dickey County Emergency Management • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

City of Monango - Transportation Accident - 7

Impact	3	<ul style="list-style-type: none"> • Potential loss of life • Potential injury • Economy loss • Property loss • Potential hazardous materials release • Potential fire
Frequency	2	<ul style="list-style-type: none"> • No major accidents in the area in recent years
Likelihood	2	<ul style="list-style-type: none"> • No major accidents in the area in recent years
Vulnerability	2	<ul style="list-style-type: none"> • More vulnerable: 40% of population is over 65 • More vulnerable: Increased amount of time students spend on buses • More vulnerable: Anhydrous tanks driven through and parked in the city. • More vulnerable: High risk of hazardous chemical release or transportation accident as it is on US Hwy 281. There is a fertilizer, seed operation in town. • More vulnerable: Vehicles speed through town on US Hwy 281 • More vulnerable: No medical supplies in stock • More vulnerable: Fire Department has no equipment for accident extraction • More vulnerable: No local law enforcement, depends on County Sheriff • Less vulnerable: No airport
Capability	2	<ul style="list-style-type: none"> • First Responder Group in Ellendale • City has a radio operated storm siren operated by Dickey County Emergency Management • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

City of Oakes - Transportation Accident – 12

Impact	4	<ul style="list-style-type: none"> • Potential loss of life • Potential injury
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		<ul style="list-style-type: none"> • Economy loss • Property loss • Potential hazardous materials release • Potential fire
Frequency	4	<ul style="list-style-type: none"> • Accidents happen in the area each year
Likelihood	4	<ul style="list-style-type: none"> • Accidents happen in the area each year
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: 24.1% of population is over 65 • More vulnerable: Increased amount of time students spend on buses • More vulnerable: Trucks and farmers transporting larger tanks more frequently on highway through the city limits. • More vulnerable: Anhydrous tanks driven through and parked in the city. • More vulnerable: N.D. Highway 1 runs through the city • More vulnerable: High risk of hazardous chemical release or transportation accident as it is located close to highway • More vulnerable: City has an airport • Less vulnerable: City has a hospital, two clinics and a dialysis center • Less vulnerable: City lacks early warning system and has a radio controlled for remote storm warning.
Capability	3	<ul style="list-style-type: none"> • First Responder Group in Oakes and public works crew • Siren system can be radio actuated by Law enforcement or by Dickey County Emergency Management • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

Vulnerabilities to County-Owned Buildings and Property

County-owned property should not be affected by transportation accidents except in an instance where a train derails or vehicle crashes into a building. Should an accident where a vehicle crashed into a county-owned building occur, damage could exceed hundreds of thousands of dollars, depending on the structure impacted. A summary of city- and county-owned buildings and property in Dickey County is provided in Chapter 4.

Vulnerabilities of Critical Facilities and Infrastructure

Like county-owned buildings, critical facilities and infrastructure should not be affected by transportation accidents, except in rare occurrences. Vulnerabilities could include a closure of a major transportation artery or primary route due to an accident, which can block emergency services access. A transportation accident can disrupt power lines if it occurred on a highway where power lines were in close proximity.

Vulnerabilities to New and Future Development

New and future development could result in increased traffic related to residential development or development of industrial areas. Any additional traffic will increase the probability of minor, moderate or major transportation accidents.

Data Limitations and Other Key Documents

A data limitation relating to transportation accidents is the lack of geographic details where the accidents are occurring. Without this knowledge, allocating resources and funding for mitigation of the hazard is

challenging. Transportation accidents and related impacts vary depending on the jurisdiction and the mode of transportation involved. Some accidents, especially those on farmsteads involving equipment, trucks, cars and aircraft, may not be reported. This data limitation makes understanding the true impact and formulating a probability for transportation accidents difficult. If data was provided on the route schedules for cargo trains, industrial trucking patterns and times of the year when aircraft is used for agricultural purposes, it would aid in quantifying the potential for transportation accidents and allow local jurisdictions to plan for the hazard.

This plan incorporates data from the following documents and information from this plan will be incorporated in the update of the following documents.

- 2015 North Dakota Crash Summary
- Dickey County Emergency Operations Plan
- 2017 North Dakota Highway Safety Plan
- 2014 Dickey County Multi-Hazard Mitigation Plan
- 2014 North Dakota State Multi-Hazard Mitigation Plan

5.10 Urban Fire/Structure Collapse

Characteristics

Fire is the rapid oxidation of a material in the exothermic chemical process of combustion, releasing heat, light, and various reaction products.

Structure Fire Structure Fire is the result of three components: a heat source, a fuel source, and an oxygen source according to the U.S. Fire Administration. When combined, these three sustaining factors will allow a fire to ignite and spread. Within a structure, a small flame can get completely out of control and turn into a major fire within seconds. Thick black smoke can fill a structure within minutes. The heat from a fire can be 100 degrees Fahrenheit at floor level and rise to 600 degrees at eye level. In five minutes, a room can get so hot that everything in it ignites at once; this is called flashover.

Winter weather can have a major effect on the number of fires that occur. Increasing costs of electricity, natural gas, propane, and fuel oil has led many people to look for alternative heating methods for their homes. Consequently, the use of space heaters, fireplaces, wood-burning stoves, and even continued use of coal stoves has created an increased fire hazard. Wood burning for heating has a poor safety record. Codes for the installation of stoves and chimneys may not be followed strictly, leading to increased fire risk. Many communities in North Dakota have not adopted building codes. Other energy sources include portable LP (propane) gas or kerosene heaters with self-contained fuel supplies. These are hazardous appliances, even when used according to manufacturer's instructions. Open flames and the leakage of fuel from containers are fire hazards and could cause explosions.

Although structure fires are usually individual disasters and not community-wide, the potential exists for widespread structure fires that displace several businesses or families and exceed local and even state resources. The “downtown” urban areas of North Dakota are particularly vulnerable to this hazard. A structure fire that rages uncontrollably despite firefighting efforts and burns a large portion of a downtown area or an important structure could have significant economic impacts. Large fires of this nature have also been known to require significant community resources. North Dakota has the potential for large scale residential fires, commercial fires, and fires in public venues. In industrial areas pose the potential of chemical plant fires producing hazardous smoke and fumes.

Smoke detectors, automatic fire alarm systems, automatic sprinkler systems, fire doors, and fire extinguishers can all prevent deaths, injuries, and damages from fire. Automatic sprinkler systems are especially important in preventing a small fire from growing.

Structure Collapse Structure collapse occurs when the forces of gravity or other external forces overcome the structural integrity of a building. The reasons for structure collapse can vary from poor construction to explosions to extreme winds to heavy snow loads. Structure collapse can trap occupants and damage property. In Dickey County, numerous commercial and private elevators and large storage bins could be subject to structure collapse. Cattle operations have large cattle confinement structures that are also at risk of collapse. Urban/structure collapse can happen independently from other types of incidents.

History

Table 5.10.1 summarizes structure fire and structure collapses in Dickey County. NFIRS only documents those fires that have been reported to the NFIRS.

Data provided by the National Fire Incident Reporting System (NFIRS) summarizes by fire department and district the number of structure fires, vehicle fires and unclassified fires from January 1, 2010 through June 30, 2019. Fire departments and districts based in Dickey County reported a total of 2 structure fires,

0 vehicle fires and 1 “other” or unclassified fires. Fires classified as “other” may be grass or wildland fires. NFIRS reports by fire department responding, not by location of the incident. Total number of fires reported may be more or less than what actually occurred in the county. As such, data from NFIRS was excluded from Table 5.10.1 to avoid skewing of data history.

Table 5.10.2 – 2010 to June 2019 Dickey County Fire Summary by Fire Department/District

Fire Protection Agency	Frequency 2010-2019				
	Structure Fire	Vehicle Fires	Outside Fires	Other Fires	Totals
Ellendale Fire Department	13	7	15	0	35
Oakes Fire Department	61	20	74	1	156
Totals	88	65	89	193	346

Source: National Fire Incident Reporting System Summary By Incident Type. 01/01/2010 to 6/30/2019

There have been no declared disasters or emergencies pertaining to urban fire/structure collapse in Dickey County.

Probability and Magnitude

According to data provided by NFIRS, 88 structure fires occurred between 2010 and 2019, resulting in a probability of 100 percent, or roughly seven incidents per year.

The probability of fires varies on seasons, local weather patterns, traffic conditions, among other variables. The chances of structure fires increase during winter months as people use electric heaters and other alternative sources for heating homes. The chances of rural and wildland fires increase during summer months when the agriculture sector is in full force and natural vegetation can become dry due to extreme heat. Fires from vehicles and transportation accidents can occur at any point in time during the year, but are more probable during summer months with higher traffic volumes.

According to the 2014 NDMHMP, Dickey County had a low-moderate structure fire or structure collapse vulnerability rating based on housing density per square mile, which was 2.33. The only cities with building codes are Ellendale and Oakes. The county does not have a building code.

Risk Assessment

Table 5.10.3 shows the risk assessment as determined by individual jurisdictions and the planning committee. The risk assessment methodology can be found on page 5-3 of Chapter 5, Threat and Hazard Identification and Risk Assessment. The total in this chart represents the sum of each jurisdiction’s impact, frequency, likelihood and vulnerability to a hazard less the jurisdiction’s capabilities to respond to the hazard.

Table 5.10.3 – Risk Assessment Summary Urban fire/structure collapse Scored Chart

Structure fire or Structure Collapse	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Dickey County	3	2	2	3	2	8

Ellendale	2	1	1	3	3	4
Forbes	4	2	4	1	1	10
Fullerton	3	4	3	4	2	12
Ludden	3	2	2	1	1	7
Monango	3	3	3	1	1	9
Oakes	3	2	2	3	3	7

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Seasonal Pattern	Spring to Fall
Duration	April to November
Speed of Onset	No warning

Capabilities of and Vulnerabilities to Jurisdictions

Capabilities and vulnerabilities of jurisdictions were scored at committee meetings and at each jurisdictional meeting with participants including the mayor and city auditor, in addition to members from the city council, business owners, emergency services representatives, and members of the general public.

Risk assessment hazard scoring and notes for the county are contained in the following graphic. The jurisdictional risk assessments can be found in Chapter 8, Jurisdictions.

Dickey – Urban Fire/Structure Collapse - 8

Impact	3	<ul style="list-style-type: none"> • Potential injury or loss of life • Loss of critical facilities and infrastructure • Economic loss • Property loss or damage
Frequency	2	<ul style="list-style-type: none"> • Urban Fire/Structure Collapse has happened annually.
Likelihood	2	<ul style="list-style-type: none"> • Urban Fire/Structure Collapse has happened annually.
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: Seasonal homes, abandoned homes and unoccupied homes • More vulnerable: Derelict unoccupied properties • More vulnerable: Two rural fire departments in rural communities and volunteers are out of town working. • More vulnerable: Approximately 50% of fire departments in county have equipment capable of handling structure fires • More vulnerable: Long distance responses and mutual aid agreements can put a strain on resources and leave county vulnerable • Less vulnerable: Residents of the county, particularly in rural areas, are self-sufficient and possess knowledge, skills and equipment to mitigate structure fire and collapse independently • More vulnerable: Grain elevator and fertilizer plants within county. • More vulnerable: Fuels, anhydrous and propane storage in city limits.
Capability	2	<ul style="list-style-type: none"> • Active fire departments with equipment and firefighters • Mutual Aid and Active county commission • Relies on regional, state and other agencies for assistance

City of Ellendale - Urban Fire/Structure Collapse - 4

Impact	2	<ul style="list-style-type: none"> • Urban fire events have resulted in total losses of homes and businesses. • Potential loss of life • Property loss
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		<ul style="list-style-type: none"> • Building loss • Economy loss • Loss of community assets • Loss of critical facilities and infrastructure • Potential temporary homeless population due to lack of alternative housing
Frequency	1	<ul style="list-style-type: none"> • House fires have occurred in the past five years. • Bans are issued frequently according to the ND Fire Index
Likelihood	1	<ul style="list-style-type: none"> • High likelihood of house fires • Bans are issued frequently according to the ND Fire Index. • High wind and drought conditions occur annually.
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: Older homes with older wiring • More vulnerable: Seasonal homes unoccupied • More vulnerable: Spacing of houses could lead to loss of multiple structures • More vulnerable: City has a well trained and equipped fire department often over stretched by mutual aid requests • More vulnerable: Lack of alternative housing for displaced residents • More vulnerable: Abandoned buildings and single-family homes • More vulnerable: Fire department limited in resources if multiple fire instances occur • Less vulnerable: Fully functioning fire department with equipment, water sources and staff. • Less vulnerable: City maintains building codes and ordinances • Less vulnerable: Less CRP near the city • Less vulnerable: City maintains vegetation on city lots • Less vulnerable: Have been able to contain fires to one building
Capability	3	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Mutual Aid with surrounding communities • Elevator in town has some manpower, heavy equipment and work with area farmers to be pro-active in protecting the city • Siren system can be radio actuated by law enforcement or Dickey County Emergency Management

City of Forbes – Urban Fire/Structure Collapse - 1

Impact	4	<ul style="list-style-type: none"> • Potential loss of life • Property loss • Building loss • Economy loss • Loss of community assets • Loss of critical facilities and infrastructure • Potential temporary homeless population due to lack of alternative housing
Frequency	2	<ul style="list-style-type: none"> • No severe structure fires or collapses in recent history
Likelihood	4	<ul style="list-style-type: none"> • No severe structure fires or collapses in recent history

Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: City does not have extensive fire suppression capabilities • More vulnerable: Older homes with older wiring • More vulnerable: Several large structures in the city are abandoned and hazard could go unnoticed or an extended period of time. • More vulnerable: Spacing of houses could lead to loss of multiple structures • More vulnerable: Lack of alternative housing for displaced residents • More vulnerable: Distance from neighboring fire departments can lead to more issues and prolonged response times • More vulnerable: Lack of break between crops and city • Less vulnerable: City lacks early warning system and has a radio controlled for remote storm warning. • Less vulnerable: City has water storage tank providing water backup for fire suppression.
Capability	1	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • Mutual Aid with Ellendale and Fredrick, SD • More vulnerable: Their fire siren can be radio activated by Dickey County Emergency Management for storm warning use

City of Fullerton – Urban Fire/Structure Collapse - 12

Impact	3	<ul style="list-style-type: none"> • Potential loss of life • Property loss • Building loss • Economy loss • Loss of community assets • Loss of critical facilities and infrastructure • Potential temporary homeless population due to lack of alternative housing
Frequency	2	<ul style="list-style-type: none"> • Two house fires have occurred annually in the past five years. • Bans are issued frequently according to the ND Fire Index
Likelihood	3	<ul style="list-style-type: none"> • City has experienced dryer fires at the elevator • Bans are issued frequently according to the ND Fire Index.
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: Older homes with older wiring • More vulnerable: Seasonal homes unoccupied • More vulnerable: Spacing of houses could lead to loss of multiple structures • More vulnerable: No crop break around the city and crops grown in city limits • More vulnerable: Lack of alternative housing for displaced residents • More vulnerable: Distance from neighboring fire departments can lead to more issues and prolonged response times. • Less vulnerable: City has a radio controlled for remote storm warning. • Less vulnerable: Have been able to contain fires to one building • Less vulnerable: City Fire Department

		<ul style="list-style-type: none"> • Less vulnerable: Elevator in the city has a 3,000 gallon water tank • Less vulnerable: Fire department has 300, 500, and 2,000 gallon trucks • Less vulnerable: City participates in mutual aid agreements
Capability	2	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • Mutual Aid with Ellendale • City has a radio operated storm siren operated by Dickey County Emergency Management

City of Ludden – Urban Fire/Structure Collapse - 7

Impact	3	<ul style="list-style-type: none"> • Potential loss of life • Property loss • Building loss • Economy loss • Loss of community assets • Loss of critical facilities and infrastructure • Potential temporary homeless population due to lack of alternative housing
Frequency	2	<ul style="list-style-type: none"> • Always possible • Bans are issued frequently according to the ND Fire Index
Likelihood	2	<ul style="list-style-type: none"> • Always possible • Bans are issued frequently according to the ND Fire Index.
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: Older homes with older wiring • More vulnerable: Seasonal homes unoccupied • More vulnerable: Lack of alternative housing for displaced residents • More vulnerable: Distance from neighboring fire departments can lead to more issues and prolonged response times. • More vulnerable: Abandoned buildings and single-family homes • More vulnerable: Lack of manpower for fire department, many volunteers work out of the area during daytime hours. • More vulnerable: Lack of crop break around city • More vulnerable: Lack of fire department • Less vulnerable: Have been able to contain fires to one building
Capability	1	<ul style="list-style-type: none"> • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

City of Monango – Urban Fire/Structure Collapse - 9

Impact	3	<ul style="list-style-type: none"> • Potential loss of life • Property loss • Building loss • Economy loss • Loss of community assets • Loss of critical facilities and infrastructure • Potential temporary homeless population due to lack of alternative housing
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Frequency	3	<ul style="list-style-type: none"> • Bans are issued frequently according to the ND Fire Index
Likelihood	3	<ul style="list-style-type: none"> • Bans are issued frequently according to the ND Fire Index
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: Older homes with older wiring • More vulnerable: Seasonal homes unoccupied • More vulnerable: Spacing of houses could lead to loss of multiple structures • More vulnerable: Lack of alternative housing for displaced residents • More vulnerable: Distance from neighboring fire departments can lead to more issues and prolonged response times. • More vulnerable: Abandoned buildings and single-family homes • Less vulnerable: City has a radio controlled for remote storm warning.
Capability	1	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

City of Oakes - Urban Fire/Structure Collapse – 7

Impact	2	<ul style="list-style-type: none"> • Potential loss of life • Property loss • Building loss • Economy loss • Loss of community assets • Loss of critical facilities and infrastructure • Potential temporary homeless population - lack of alternative housing
Frequency	3	<ul style="list-style-type: none"> • House fires have occurred in the past five years. • Bans are issued frequently according to the ND Fire Index
Likelihood	3	<ul style="list-style-type: none"> • Bans are issued frequently according to the ND Fire Index.
Vulnerability	2	<ul style="list-style-type: none"> • More vulnerable: Older homes with older wiring • More vulnerable: Seasonal homes unoccupied • More vulnerable: City has a well trained and equipped fire department often over stretched by mutual aid requests • More vulnerable: Lack of alternative housing for displaced residents • Less vulnerable: Enforces building codes and zoning ordinances • Less vulnerable: Newer structures are being built with better technology • Less vulnerable: Less CRP near the city • Less vulnerable: City lacks early warning system and has a radio controlled for remote storm warning.
Capability	3	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Mutual Aid with surrounding communities • Siren system can be radio actuated by law enforcement or Dickey County Emergency Management

Vulnerabilities to County-Owned Buildings and Property

All county-owned buildings are vulnerable to urban fire/structure collapse. The risk to the hazard depends on the location of the building and if it is equipped with fire suppression mechanisms, such as sprinkler systems and smoke detectors. Risk to building and property depends on the proximity of fire

suppression equipment and response times from fire departments. Older county-owned buildings may be more susceptible to fire being built to older building and electrical codes. County-owned buildings with flat roofs are more at risk to building collapse from snow loads. Chapter 4 provides a summary of city- and county-owned buildings and property in Dickey County.

Vulnerabilities of Critical Facilities and Infrastructure

Similar to county-owned buildings and property, critical facilities and infrastructure are vulnerable to urban fire/structure collapse. If an incident were to occur, the facility or infrastructure could result in loss of or delay in services. A fire affecting critical infrastructure such as power lines or lift stations could leave residents without power, potable water or sanitary sewer for days, depending on the severity of the incident.

Vulnerabilities to New and Future Development

New and future development could be more vulnerable in communities that lack building codes. Buildings in jurisdictions that lack building codes could be more susceptible to snow loads, structural instability and may lack fire suppression systems. In addition, new development located near or adjacent to industrial facilities housing hazardous chemicals could be more at risk. Dickey County has adopted the state building code which covers new and future development in the county. Adoption and enforcement of building codes should reduce the risk and vulnerability to new and future development.

Data Limitations and Other Key Documents

Fire data provided by the Oakes Fire Department provides an estimation of future problems, but does not provide specific details on property damage, location, among other descriptions. The lack of detailed data limits identification of problem areas regarding fire and does not allow for improvements to be made to fire suppression techniques by local fire departments and districts.

The Oakes Fire Department Incident Report and the NFIRS do not distinguish between a structure fire and structure collapse. As a result, determining the true probability and overall impact of structure collapse cannot be determined. Conversely, several fire departments and districts in Dickey County provide coverage to neighboring counties as well. The data does not disclose the geographic location of each fire and therefore limits the understanding of where fires are actually occurring in Dickey County.

This plan incorporates data from the following documents and information from this plan will be incorporated in the update of the following documents.

- Dickey County Emergency Operations Plan
- North Dakota Emergency Operations Plan, Fire Annex
- 2014 Dickey County Multi-Hazard Mitigation Plan
- 2014 North Dakota State Multi-Hazard Mitigation Plan

5.11 Wildland Fire

Including Wildland Fire and Rural Fire.

Characteristics

Fire is the rapid oxidation of a material in the exothermic chemical process of combustion, releasing heat, light, and various reaction products.

Wildland Fire. A wildland fire is an uncontrolled fire in a vegetated area. Wildland fires are a natural part of the ecosystem. They have a purpose in nature and following years of fire suppression, many areas have built up fuels that can lead to larger, more intense fires.

Any flame source can trigger a wildland fire. Once ignited, ambient conditions dictate whether the fire will spread or not. Moist, cool, and calm conditions or a lack of fuels will suppress the fire, whereas, dry, warm, windy conditions and dry fuels will contribute to fire spread. The terrain, accessibility, and capabilities of the fire agencies are also factors in the fire's growth potential. Problems with wildland fire occur when combined with the human environment. People and structures near wildland fire can be threatened unless adequately protected through evacuation, mitigation, or suppression.

The general wildland fire season runs from April 1st through October 31st. There are three critical periods during wildland fire season: early spring prior to green-up, late summer due to higher temperatures, and fall following heavy frosts until snowfall. The first peak occurs during the spring before vegetation turns green. This tends to be a very critical time due to the fuel buildup from the previous growing season, drying winds, decreasing humidity, warmer temperatures, and increased human activity outdoors. In general, statewide, the month of April accounts for about 20 percent of the wildland fire starts and over a third of the total acreage burned. The second peak in the fire season coincides with the increase in harvesting activities during mid to late summer. Temperatures remain hot, humidity is at its lowest, and precipitation has declined significantly. The third and final peak in fire season occurs between September 1st and October 31st when wildland fuels are fully cured out due to hard frosts, winds are frequent and high, humidity is low, and human activity remains high. Forty percent of the annual fire starts occurring in this third peak, accounting for 50 percent of the annual burned acreage. This third fire season typically extends until a season-ending snowfall.

The charred ground and thick smoke plumes that can be produced by wildland fire creates other, cascading hazards. The heavy smoke may lead to unhealthy air conditions affecting those with respiratory problems and otherwise healthy people. Smoky conditions can also lead to poor visibility and an increased probability of transportation accidents. With vegetation removed and the ground seared from a wildland fire, the area also becomes more prone to flash floods and landslides because of the ground's reduced ability to hold water. This can be especially problematic when wildland fire occurs in the spring at the same time that flood risk is high in North Dakota.

Humans and human activity cause most of the wildland fires in North Dakota based on historical data. Loss of fire containment while attempting controlled burns of fields, ditches, and sloughs is a source of fires in Dickey County. Other sources of fire are related to recreational activities such as hunting, camping, off-road vehicle travel, when conditions are right, occasionally along railroad right-of-ways, and through the annual use of fireworks around the 4th of July. There are also natural causes of wildland fires such as lightning.

Rural Fire. Rural fires result from farming activities whereby farm equipment may ignite a fire while haying, harvesting and other farming activities. With continued controlled burns by farmers, there is always a possibility for the hazard in the future in Dickey County.

History

History on wildland fire and rural fire was provided by the Oakes Fire Department Incident Report. Approximately 89 wildland fire and rural fire occurrences were recorded between 2010 and 2019.

There have been no declared disasters or emergencies pertaining to wildland fire in Dickey County.

Data provided by the National Fire Incident Reporting System (NFIRS) summarizes by fire department and district the number of structure fires, vehicle fires and unclassified fires from January 1, 2010, to June 30, 2019. Table 5.12.1 shows fires in Dickey County. NFIRS does not detail incident locations. The data is attributed to the responding department or district.

Table 5.12.1 – Dickey County Fire Summary by Fire Department/District

Fire Protection Agency	Frequency 2010-2019				
	Structure Fire	Vehicle Fires	Outside Fires	Other Fires	Totals
Ellendale Fire Department	13	7	15	0	35
Oakes Fire Department	61	20	74	1	156
Totals	88	65	89	193	346

Source: National Fire Incident Reporting System Summary By Incident Type. 01/01/2010 to 6/30/2019

Probability and Magnitude

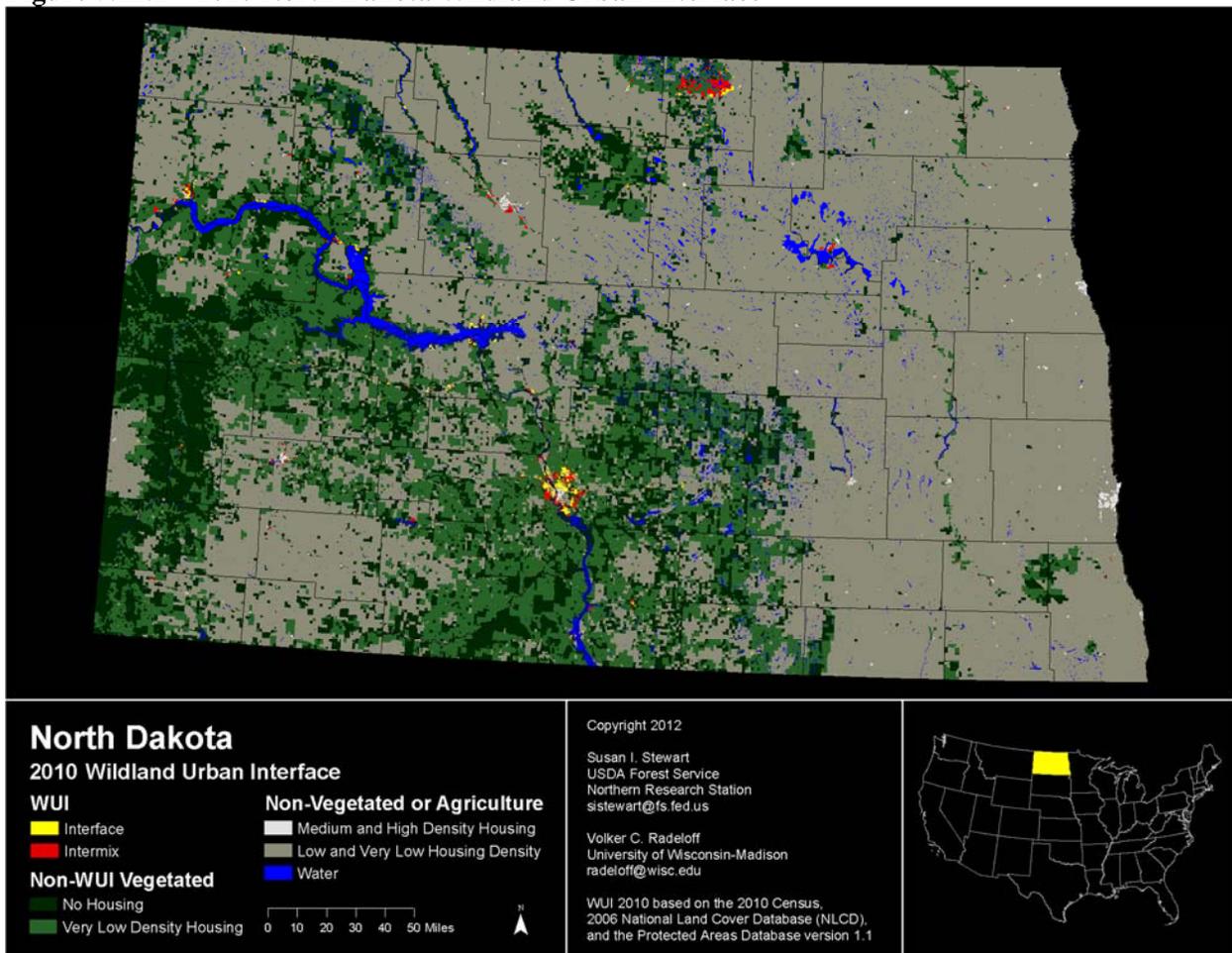
According to the data provided by the 2014 ND State Multi-Hazard Mitigation Plan, 22 incidents of wildland fire have occurred 2009 and 2012, resulting in a probability of roughly 100 percent as fires will occur on an annual basis. Discussions in jurisdictional meetings revealed that farmers conduct controlled burns each year and several become uncontrollable and evolve into wildland fires.

In terms of magnitude, smaller and less severe fires are typically occurring more frequently with larger and more severe fires happening sparingly. The probability of fires fluctuates based on season, local weather patterns, traffic conditions, among other variables. The chance of wildland fires increases during summer months when the agriculture sector is in full force and natural vegetation can become dry due to extreme heat. The magnitude of wildland fires can be assumed to be small as wildland fires remain less than 1,000 acres in the county.

Risk Assessment

Table 5.12.3 shows the risk assessment as determined by individual jurisdictions and the planning committee. The risk assessment methodology can be found on page 5-3 of Chapter 5, Threat and Hazard Identification and Risk Assessment. The total in this chart represents the sum of each jurisdiction's impact, frequency, likelihood and vulnerability to a hazard less the jurisdiction's capabilities to respond to the hazard.

Figure 5.12.1 – 2010 North Dakota Wildland Urban Interface



Source: <http://silvis.forest.wisc.edu>

Table 5.12.3 – Risk Assessment Summary Wildland Fire and Rural Fire Scored Chart

Rural Fire and Wildland Fire	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Dickey County	4	4	4	3	2	13
Ellendale	3	2	2	2	2	7
Forbes	4	2	3	3	2	10
Fullerton	3	2	3	4	2	10
Ludden	4	2	2	1	1	8
Monango	4	2	2	1	1	8
Oakes	3	2	2	3	3	7

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Seasonal Pattern	Spring to Fall
Duration	April to November
Speed of Onset	No warning

Mapping

The risk of wildland fire in Dickey County is ranked low per the 2014 NDMHMP. The risk was determined based on 2009 wildfire occurrences from the North Dakota Forest Service, fire department response capabilities and weather. The east side of the state receives more precipitation and generally has less dry conditions than the west.

Capabilities of and Vulnerabilities to Jurisdictions

Capabilities and vulnerabilities of jurisdictions were scored at committee meetings and at each jurisdictional meeting with participants including the mayor and city auditor, in addition to members from the city council, business owners, emergency services representatives, and members of the general public.

Risk assessment hazard scoring and notes for the county are contained in the following graphics. The jurisdictional risk assessments can be found in Chapter 8, Jurisdictions.

Dickey County – Wildland Fire - 13

Impact	4	<ul style="list-style-type: none"> • Loss of economy, crops, bales, grazing forage, farm equipment and livestock • Strain on local fire departments and resources • Power line sparks have caused fires. • Railroad causes fires • Cigarettes thrown from vehicles cause fires in ditches • Lightning strikes to hay bales cause fire • Grain and hay can spontaneously combust • Farm equipment causes fires frequently each year
Frequency	4	<ul style="list-style-type: none"> • Controlled burns each year become uncontrollable • Farm equipment causes fires frequently each year • 11 sections began burning in 2017. All fire departments were already committed elsewhere.
Likelihood	4	<ul style="list-style-type: none"> • Controlled burns each year become uncontrollable
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: Farmland, CRP and open areas • More vulnerable: Agriculture industry, which dominates the local economy, is highly mechanized and utilizes chemicals and fertilizers that can ignite wildland and rural fires • More vulnerable: large geographic extent of each fire department or district can lead to prolonged response times and may allow fires to spread rapidly or grow in size. • More vulnerable: Many smaller communities have fire departments and offer limited mutual aid, which strains resources in communities • Less vulnerable: Elevators and irrigators are source of water for rural fire departments. • More vulnerable: There are limited hydrants to rural water.
Capability	2	<ul style="list-style-type: none"> • Active fire departments with limited equipment and firefighters • Active county commission • Lacks technical, administrative and financial resources for mitigation • Relies on regional, state and other agencies for assistance • Mutual Aid within region

City of Ellendale - Wildland Fire - 7

Impact	3	<ul style="list-style-type: none"> • Potential Economy loss • Potential crop, livestock, equipment and graze land loss
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		<ul style="list-style-type: none"> • Potential loss of life • Potential injury • Potential hazardous material release • Health hazards due to poor air quality • Loss of wildlife habitat • Farm equipment, lightning strikes, power line sparks, and controlled burns cause fires
Frequency	2	<ul style="list-style-type: none"> • Wildland fires occur annually due to climate and economy.
Likelihood	2	<ul style="list-style-type: none"> • With continued controlled burns by farmers there is always a possibility for the hazard in the future • Happens yearly to some degree
Vulnerability	2	<ul style="list-style-type: none"> • More vulnerable: Farmland and open areas • More vulnerable: Mutual aid fire department response times lengthen • More vulnerable: Windy conditions each year • More vulnerable: Lack reliable source of water for fire suppression • More vulnerable: Lack of fire break around the city • More vulnerable: No rural water for fire suppression • More vulnerable: Lack reliable source of water for fire suppression • Less vulnerable: City maintains overgrown lots • Less vulnerable: City has a fire district with a fire hall, adequate manpower, equipment and resources of water for fire suppression • Less vulnerable: Participates in Mutual Aid
Capability	2	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

City of Forbes - Wildland Fire - 10

Impact	4	<ul style="list-style-type: none"> • Potential loss of life • Property loss • Building loss • Economy loss • Loss of community assets • Loss of critical facilities and infrastructure • Potential temporary homeless population due to lack of alternative housing
Frequency	2	<ul style="list-style-type: none"> • No severe structure fires or collapses in recent history
Likelihood	3	<ul style="list-style-type: none"> • No severe structure fires or collapses in recent history
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: City does not have extensive fire suppression capabilities • More vulnerable: Older homes with older wiring • More vulnerable: Several large structures in the city are abandoned and hazard could go unnoticed or an extended period of time. • More vulnerable: Spacing of houses could lead to loss of multiple structures • More vulnerable: Lack of alternative housing for displaced residents • More vulnerable: Distance from neighboring fire departments can lead to more issues and prolonged response times

		<ul style="list-style-type: none"> • More vulnerable: Lack of break between crops and city • Less vulnerable: Local fire department • Less vulnerable: City lacks early warning system and has a radio controlled for remote storm warning. • Less vulnerable: City has water storage tank providing water backup for fire suppression.
Capability	2	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • Mutual Aid with Ellendale and Fredrick, SD • More vulnerable: Their fire siren can be radio activated by Dickey County Emergency Management for storm warning use

City of Fullerton - Wildland Fire - 10

Impact	3	<ul style="list-style-type: none"> • Economy loss • Crop and Bale loss • Graze land loss • Farm equipment loss • Livestock loss • Potential loss of life • Potential injury • Potential hazardous material release • Health hazard due to poor air quality • Loss of wildlife habitat • Farm equipment, lightning strikes, power line sparks, and controlled burns cause fires
Frequency	2	<ul style="list-style-type: none"> • Wildland fires occur annually due to climate and economy.
Likelihood	3	<ul style="list-style-type: none"> • With continued controlled burns by farmers there is always a possibility for the hazard in the future • Dry conditions experienced annually for a couple weeks • Farm equipment, lightning strikes, power line sparks, and controlled burns cause fires annually.
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: Farmland and open areas • More vulnerable: Mutual aid fire department response times lengthen. • More vulnerable: Windy conditions each year • More vulnerable: Lack reliable source of water for fire suppression • More vulnerable: Strain on local fire departments and resources • More vulnerable: Spacing of houses could lead to loss of multiple structures • More vulnerable: Lack of fire break around the city • More vulnerable: Age of structures and wiring • More vulnerable: Lack reliable source of water for fire suppression • More vulnerable: Slough with cattails on one side and corn is grown • Less vulnerable: City has a volunteer fire department • Less vulnerable: 300, 500 and 2,000 gallon water trucks • Less vulnerable: Elevator in the city also has a 3,000 gallon water holding tank.

Capability	2	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • There are few certified trained and equipped citizens in the community • Mutual Aid with Ellendale
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City of Ludden - Wildland Fire – 8

Impact	4	<ul style="list-style-type: none"> • Economy loss • Crop and Bale loss • Graze land loss • Farm equipment loss • Livestock loss • Potential loss of life • Potential injury • Potential hazardous material release • Health hazard due to poor air quality • Loss of wildlife habitat • Farm equipment, lightning strikes, power line sparks, and controlled burns cause fires
Frequency	2	<ul style="list-style-type: none"> • Wildland fires occur annually due to climate and economy.
Likelihood	2	<ul style="list-style-type: none"> • With continued controlled burns by farmers there is always a possibility for the hazard in the future • Dry conditions experienced annually for a couple weeks • Farm equipment, lightning strikes, power line sparks, and controlled burns cause fires annually.
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: Farmland and open areas • More vulnerable: Windy conditions each year • More vulnerable: Lack reliable source of water for fire suppression • More vulnerable: Strain on surrounding fire departments and resources • More vulnerable: Spacing of houses could lead to loss of multiple structures • More vulnerable: Lack of fire break around the city • More vulnerable: Age of structures and wiring • More vulnerable: Lack reliable source of water for fire suppression • Less vulnerable: Decreasing CRP • Less vulnerable: City maintains overgrown lots • Less vulnerable: City has a radio operated storm siren operated by Dickey County Emergency Management
Capability	1	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • There are few certified trained and equipped citizens in the community • Mutual Aid with Ellendale and Oakes

City of Monango - Wildland Fire – 8

Impact	4	<ul style="list-style-type: none"> • Economy loss • Crop and Bale loss • Graze land loss • Farm equipment loss • Livestock loss • Potential loss of life • Potential injury • Potential hazardous material release • Health hazard due to poor air quality • Loss of wildlife habitat • Farm equipment, lightning strikes, power line sparks, and controlled burns cause fires
Frequency	2	<ul style="list-style-type: none"> • Wildland fires occur annually due to climate and economy.
Likelihood	2	<ul style="list-style-type: none"> • With continued controlled burns by farmers there is always a possibility for the hazard in the future • Dry conditions experienced annually for a couple weeks • Farm equipment, lightning strikes, power line sparks, and controlled burns cause fires annually.
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: Farm land and open areas • More vulnerable: Mutual aid fire department response times lengthen. No fire, EMS or law in the city. All responders come from Ellendale with a 20 minute average response on a good weather day • More vulnerable: Windy conditions each year • More vulnerable: Lack reliable source of water for fire suppression • More vulnerable: Strain on local fire departments and resources • More vulnerable: Spacing of houses could lead to loss of multiple structures • More vulnerable: Lack of fire break around the city • More vulnerable: State building codes not adopted or enforced • More vulnerable: Age of structures and wiring • More vulnerable: Lack reliable source of water for fire suppression
Capability	1	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • There are few certified trained and equipped citizens in the community • Mutual Aid with Ellendale

City of Oakes - Wildland Fire - 7

Impact	3	<ul style="list-style-type: none"> • Economy loss • Crop and Bale loss • Graze land loss • Farm equipment loss • Livestock loss • Potential loss of life • Potential injury • Potential hazardous material release
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		<ul style="list-style-type: none"> • Health hazard due to poor air quality • Loss of wildlife habitat • Farm equipment, lightning strikes, power line sparks, and controlled burns cause fires
Frequency	2	<ul style="list-style-type: none"> • Wildland fires occur annually due to climate and economy.
Likelihood	2	<ul style="list-style-type: none"> • With continued controlled burns by farmers there is always a possibility for the hazard in the future • Dry conditions experienced annually for a couple weeks • Farm equipment, lightning strikes, power line sparks, and controlled burns cause fires annually.
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: Farmland and open areas • More vulnerable: Mutual aid fire department response times lengthen • More vulnerable: Windy conditions each year • More vulnerable: Lack reliable source of water for fire suppression • More vulnerable: Strain on surrounding fire departments and resources • More vulnerable: Spacing of houses could lead to loss of multiple structures • More vulnerable: Lack of fire break around the city • More vulnerable: Age of structures and wiring • More vulnerable: Lack reliable source of water for fire suppression • Less vulnerable: Decreasing CRP • Less vulnerable: City maintains overgrown lots • Less vulnerable: City has a radio operated storm siren operated by law enforcement or Dickey County Emergency Management
Capability	3	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • Mutual Aid with surrounding communities

Vulnerabilities to County-Owned Buildings and Property

County-owned buildings and property located in remote areas of the county are vulnerable to wildland fire. The risk of the hazard depends on building and property location and if emergency services can reach the property in a timely manner.

Lack of firebreaks around jurisdictions in Dickey County pose a vulnerability to county-owned buildings and property. If a wildland fire were to grow and become uncontrollable, buildings and property would be at risk from the spread of the fire.

Vulnerabilities of Critical Facilities and Infrastructure

Similar to county-owned buildings and property, critical facilities and infrastructure are vulnerable to wildland fire. If an incident were to occur, the facility or infrastructure could result in loss of or delay in services. An inventory of county and city owned property in Dickey County is provided in Chapter 4.

Vulnerabilities to New and Future Development

Rural homesteads on large parcels of land in remote areas are a trend in residential development in North Dakota. Dickey County does not have planning regulations limiting lot size or directing where new residential development can occur. All types of development could be more vulnerable to wildland fire

and located farther from fire departments and emergency services. Residential development in remote areas increase the opportunity for human caused fires.

Data Limitations and Other Key Documents

Data provided by the National Fire Incident Reporting System, a data limitation is the lack of the location and details of wildland fires. Dickey County departments provide and receive mutual aid from neighboring counties within ND.

This plan incorporates data from the following documents and information from this plan will be incorporated in the update of the following documents.

- Dickey County Emergency Operations Plan
- North Dakota Emergency Operations Plan, Fire Annex
- North Dakota Forest Service, Building Sustainable Communities Through Forestry
- North Dakota Statewide Assessment of Forest Resources and Forest Resource Strategy
- Fire Management Plans for federal lands
- 2014 Dickey County Multi-Hazard Mitigation Plan
- 2014 North Dakota State Multi-Hazard Mitigation Plan
- Fire Management Plans for Federal Lands

5.13 Windstorm

Including high wind events that occur separately from tornados and severe thunderstorms.

Characteristics

Strong winds can occur year-round in Dickey County. These winds typically develop with strong pressure gradients and gusty frontal passages. The closer and stronger two systems are, (one high pressure, one low pressure) the stronger the pressure gradient, and therefore, the stronger the winds. Objects like trees, barns, outbuildings, high-profile vehicles, and power lines/poles can be toppled or destroyed in high winds. Roofs, windows, and homes can be damaged as wind speeds increase. Strong winds can be particularly dangerous to aviation.

In the U.S., FEMA recognizes four wind zones. Dickey County falls into Zone III. Winds speeds reach up to 200 miles per hour in Zone III. No special wind regions are identified in Dickey County.

History

Based on hazard history information provided by NOAA, NCDC and SHELDUS, and the previously FEMA-approved Dickey County Mitigation Plan, Dickey County has 49 reported high wind events between 1960 and 2018 resulting in no injuries or deaths. Table 5.12.1 summarizes the history of windstorm occurrences in Dickey County. Detailed history can be found in Appendix 8.

Figure 5.12.1 Wind Zones in the Unites States



Source: FEMA

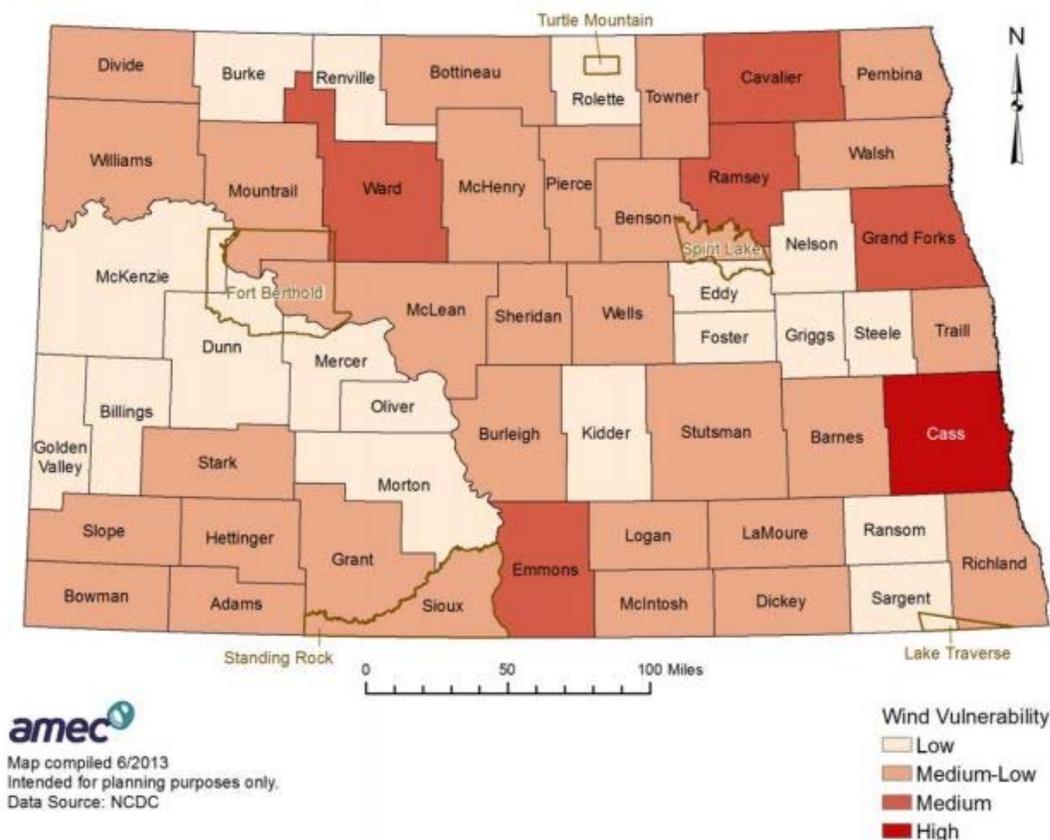
According to the 2014 NDMHMP, between 2000 and 2013 Dickey County experienced \$25,000 in property damages or \$1,923 annually, and \$541,386 in total insurance payments to cover crop losses or \$60,830 annually due to windstorms. **There have been no declared disasters or emergencies pertaining to windstorm.**

Table 5.12.1 – Dickey County Windstorm Summary

Windstorm						
Number of Occurrences	Date Range	Probability	Injuries	Fatalities	Property Damage	Crop Damage
66	1960	100%	0	0	\$1,750,174.10	\$2,014,933.33

Sources: Spatial Hazard Events and Losses Database for the United States (SHELDUS); National Oceanic and Atmospheric Administration (NOAA); Information Service/National Climatic Data Center (NCDC)

Figure 5.12.3 – 2000 to 2013 High Wind Events by North Dakota County



Probability and Magnitude

Hazard history was gathered from NOAA, NCDC, SHELDUS, the previously FEMA-approved Dickey County Mitigation plan and newspaper accounts. The data covers a 58-year period from 1960 through 2018, and documents 66 notable windstorm occurrences, which equates to a probability of 100 percent. Data from the 2014 NDMHMP shows 18 windstorm events between 2000 and 2013 resulting in a probability of 100 percent. Indemnity was paid for crop loss from windstorm.

The magnitude of the hazard can range from broken windows, damaged roofs to homes and businesses, toppled trees, power outages from downed power lines and collapse of poorly constructed structures.

Risk Assessment

Table 5.12.2 shows the risk assessment as determined by individual jurisdictions and the planning committee. The risk assessment methodology can be found on page 5-3 of Chapter 5, Threat and Hazard Identification and Risk Assessment. The total in this chart represents the sum of each jurisdiction's impact, frequency, likelihood and vulnerability to a hazard less the jurisdiction's capabilities to respond to the hazard.

All areas of Dickey County have been and will be in the future affected by Windstorm.

Table 5.12.2 – Risk Assessment Summary Windstorm Scored Chart

Rural Fire and Wildland Fire	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Dickey County	3	3	3	3	2	10
Ellendale	3	4	4	3	1	13
Forbes	3	3	3	4	1	12
Fullerton	3	3	3	4	1	12
Ludden	3	3	4	4	1	13
Monango	4	2	2	1	1	8
Oakes	3	4	4	4	1	14

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Seasonal Pattern	None
Duration	2 to 6 hours
Speed of Onset	12 to 16 hours warning

Capabilities of and Vulnerabilities to Jurisdictions

According to the 2014 NDMHMP, Dickey County has an overall vulnerability ranking of low to moderate on windstorms.

Capabilities and vulnerabilities of jurisdictions were scored at committee meetings and at each jurisdictional meeting with participants including the mayor and city auditor, in addition to members from the city council, business owners, emergency services representatives, and members of the general public.

Risk assessment hazard scoring and notes for the county are contained in the following graphic. The jurisdictional risk assessments can be found in Chapter 8, Jurisdictions.

Dickey County – Windstorm - 10

Impact	3	<ul style="list-style-type: none"> • Potential Loss of Life and injury • Potential Loss of Economy • Damage to critical infrastructure and essential services • Damage to utilities • Potential loss of property and livelihood • Potential loss of crops, livestock and agricultural economy •
Frequency	3	<ul style="list-style-type: none"> • Tornadoes and straight-line winds occur each year • Major straight-line wind occurrence each year • Straight line wind occurrence in Oakes 2010 • Monango community was highly affected in 2010 Tornado and Straight-line wind occurrences.
Likelihood	3	<ul style="list-style-type: none"> • Tornadoes and straight-line winds occur each year • Major straight-line wind occurrence each year
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: Lack of public storm shelters • More vulnerable: Large mobile home population within cities in county. • More vulnerable: Approximately 50% of fire departments in county have equipment capable of handling search, rescue and recovery. • More vulnerable: Long distance responses and mutual aid agreements can put a strain on resources and leave county vulnerable

		<ul style="list-style-type: none"> • Less vulnerable: High citizen volunteer and equipment to clean up debris • More vulnerable: These tend to produce large amounts of debris that hinder rescue operations as well as block roads. • More vulnerable: Debris management causes financial strain and strain on services.
Capability	2	<ul style="list-style-type: none"> • Active fire departments with limited equipment and firefighters • Active county commission • Warning sirens in each community • Lacks technical, administrative and financial resources for mitigation • Relies on regional, state and other agencies for assistance • Mutual Aid within region

City of Ellendale - Windstorm - 13

Impact	3	<ul style="list-style-type: none"> • Downed trees • Buildings loss • Downed power poles and lines • Economy loss • Damage to homes and community buildings such as broken windows, loss of shingles • Potential loss of life • Potential injury • Potential structure fires • Contributes to spread of wildland fire • Straight line winds occur in summer months
Frequency	4	<ul style="list-style-type: none"> • Hazard occurs multiple times each year and is a secondary result from severe summer weather or severe winter weather. • Strong winds are common in the city in all weather conditions • Blizzard conditions occur frequently in winter months due to climate • Power lines are damaged causing outages annually
Likelihood	4	<ul style="list-style-type: none"> • Strong winds are common in the city
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable – loss of trees leads to more ground blizzard conditions • More vulnerable: Power lines providing power to the city are not buried and outdated • More vulnerable: EMS is over stretched by mutual aid • More vulnerable: No storm shelters in City • More vulnerable: Age of structures and housing stock • Less vulnerable: City has an inert landfill for debris and branches
Capability	1	<ul style="list-style-type: none"> • Capabilities to respond, but nothing can be done to prepare. • LEPC – Local Emergency Planning Committee • Mutual aid agreements for emergency services with surrounding communities • Active county commission • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Siren system can be radio actuated by law enforcement or Dickey County Emergency Management

City of Forbes - Windstorm - 12

Impact	3	<ul style="list-style-type: none"> • Downed trees • Buildings loss • Downed power poles and lines • Economy loss • Damage to homes and community buildings such as broken windows, loss of shingles • Potential loss of life • Potential injury • Potential structure fires • Contributes to spread of wildland fire • City has lost many trees, buildings and structures due to high winds. • Straight line winds occur in summer months
Frequency	3	<ul style="list-style-type: none"> • Hazard occurs multiple times each year and is a secondary result from severe summer weather or severe winter weather. • Strong winds are common in the city in all weather conditions • Blizzard conditions occur frequently in winter months due to climate • Power lines are damaged causing outages annually
Likelihood	3	<ul style="list-style-type: none"> • Strong winds are common in the city in all weather conditions
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: There are two trailer homes in the city • More vulnerable – loss of trees leads to more ground blizzard conditions • More vulnerable: Power lines providing power to the city are not buried and outdated • Less vulnerable: Residents have equipment to clear debris or move snow • More vulnerable: Age of structures and housing stock • More vulnerable: Has not adopted state building codes • Less vulnerable: City has an inert landfill for debris and branches
Capability	1	<ul style="list-style-type: none"> • Mutual aid agreements for emergency services • Active county commission • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

City of Fullerton - Windstorm - 12

Impact	3	<ul style="list-style-type: none"> • Downed trees • Buildings loss • Downed power poles and lines • Economy loss • Damage to homes and community buildings such as broken windows, loss of shingles • Potential loss of life • Potential injury • Potential structure fires • Contributes to spread of wildland fire • City has lost many trees, buildings and structures due to high winds. • Increase in traffic accidents from low visibility during severe summer and/or winter weather
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		<ul style="list-style-type: none"> • Straight line winds occur in summer months
Frequency	3	<ul style="list-style-type: none"> • Hazard occurs multiple times each year and is a secondary result from severe summer weather or severe winter weather. • Strong winds are common in the city in all weather conditions • Blizzard conditions occur frequently in winter months due to climate • Power lines are damaged causing outages annually
Likelihood	3	<ul style="list-style-type: none"> • Strong winds are common in the city in all weather conditions
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: There are two trailer homes in the city • More vulnerable: Loss of trees leads to more ground blizzard conditions • More vulnerable: Power lines providing power to the city are not buried • Less vulnerable: Residents have equipment to clear debris or move snow • More vulnerable: Age of structures and housing stock • More vulnerable: Has not adopted state building codes • Less vulnerable: City has an inert landfill for debris and branches • Less vulnerable: City has a volunteer fire department
Capability	1	<ul style="list-style-type: none"> • Capabilities to respond, but nothing can be done to prepare. • LEPC – Local Emergency Planning Committee • Mutual aid agreements for emergency services • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • City has a radio operated storm siren operated by Dickey County Emergency Management

City of Ludden - Windstorm - 13

Impact	3	<ul style="list-style-type: none"> • Downed trees • Buildings loss • Downed power poles and lines • Economy loss • Damage to homes and community buildings such as broken windows, loss of shingles • Potential loss of life • Potential injury • Potential structure fires • Contributes to spread of wildland fire • City has lost many trees, buildings and structures due to high winds. • Increase in traffic accidents from low visibility during severe summer and/or winter weather • Straight line winds occur in summer months
Frequency	3	<ul style="list-style-type: none"> • Hazard occurs multiple times each year and is a secondary result from severe summer weather or severe winter weather. • Strong winds are common in the city in all weather conditions • Approximately 50 incidents of windstorms between 1960 and 2016 • Blizzard conditions occur frequently in winter months due to climate • Power lines are damaged causing outages annually
Likelihood	4	<ul style="list-style-type: none"> • Strong winds are common in the city in all weather conditions
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable – loss of trees leads to more ground blizzard conditions

		<ul style="list-style-type: none"> • More vulnerable: Power lines providing power to the city are not buried and outdated • More vulnerable: There is no fire, EMS, medical or Law in the town. All responders come from Oakes with a 20-minute average response on a good weather day. • Less vulnerable: Residents have equipment to clear debris or move snow • More vulnerable: Age of structures and housing stock • More vulnerable: Has not adopted state building codes • Less vulnerable: City has an inert landfill for debris and branches
Capability	1	<ul style="list-style-type: none"> • Capabilities to respond, but nothing can be done to prepare. • LEPC – Local Emergency Planning Committee • Mutual aid agreements for emergency services • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • Elevator in town has some manpower, heavy equipment and work with area farmers to be pro-active in protecting the city • City has a radio operated storm siren operated by Dickey County Emergency Management

City of Monango - Windstorm - 8

Impact	4	<ul style="list-style-type: none"> • Downed trees • Downed power poles and lines • Economy loss • Damage to homes and community buildings such as broken windows, loss of shingles • Potential loss of life • Potential injury • Potential structure fires • Contributes to spread of wildland fire • City has lost many trees, buildings and structures due to high winds. • Straight line winds occur in summer months
Frequency	2	<ul style="list-style-type: none"> • Hazard occurs multiple times each year and is a secondary result from severe summer weather or severe winter weather. • Strong winds are common in the city in all weather conditions • Blizzard conditions occur frequently in winter months due to climate • Power lines are damaged causing outages annually
Likelihood	2	<ul style="list-style-type: none"> • Strong winds are common in the city in all weather conditions
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: There are two trailer homes in the city • More vulnerable – loss of trees leads to more ground blizzard conditions • More vulnerable: Power lines providing power to the city are not buried • Less vulnerable: Residents have equipment to clear debris or move snow • More vulnerable: Age of structures and housing stock • More vulnerable: Has not adopted state building codes • Less vulnerable: City has an inert landfill for debris and branches • Less vulnerable: Fire hall has truck for fire suppression and assistance
Capability	1	<ul style="list-style-type: none"> • Capabilities to respond, but nothing can be done to prepare. • LEPC – Local Emergency Planning Committee

		<ul style="list-style-type: none"> • Mutual aid agreements for emergency services • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently
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City of Oakes - Windstorm – 14

Impact	3	<ul style="list-style-type: none"> • Downed trees • Buildings loss • Downed power poles and lines • Economy loss • Damage to homes and community buildings such as broken windows, loss of shingles • Potential loss of life • Potential injury • Potential structure fires • Contributes to spread of wildland fire • City has lost many trees, buildings and structures due to high winds. • Increase in traffic accidents from low visibility during severe summer and/or winter weather • Straight line winds occur in summer months
Frequency	4	<ul style="list-style-type: none"> • Hazard occurs multiple times each year and is a secondary result from severe summer weather or severe winter weather. • Strong winds are common in the city in all weather conditions • Blizzard conditions occur frequently in winter months due to climate • Power lines are damaged causing outages annually
Likelihood	4	<ul style="list-style-type: none"> • Strong winds are common in the city in all weather conditions
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable – loss of trees leads to more ground blizzard conditions • More vulnerable: Power lines providing power to the city are not buried and outdated • More vulnerable: EMS is over stretched by mutual aid requests with surrounding cities • Less vulnerable: Residents have equipment to clear debris or move snow • More vulnerable: Age of structures and housing stock • More vulnerable: Has not adopted state building codes • Less vulnerable: City has an inert landfill for debris and branches
Capability	1	<ul style="list-style-type: none"> • Capabilities to respond, but nothing can be done to prepare. • LEPC – Local Emergency Planning Committee • Mutual aid agreements for emergency services with surrounding communities • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Has a well-equipped city public works crew • Siren system can be radio actuated by law enforcement or Dickey County Emergency Management

Vulnerabilities to County-Owned Buildings and Property

County-owned buildings are susceptible to windstorms. Buildings may not be constructed to sustain excessively high wind speeds. Windstorms damage building roofs, break windows, topple trees and cause other objects and debris to become airborne. Airborne debris can injure people or in rare instances cause death. Depending on the size of the building and the role it plays in day-to-day operations, the vulnerability to windstorm can vary from nominal for larger structures such as the Dickey County Courthouse in Cooperstown to severe for county shops in smaller cities, which may be considerably less sturdy. A summary of city and county owned buildings is provided in Chapter 4.

Vulnerabilities of Critical Facilities and Infrastructure

Critical facilities such as schools, water towers, roadways and other specialty facilities such as nursing homes and assisted living facilities are vulnerable to windstorms in a similar fashion to county-owned buildings and property. Infrastructure such as power lines are susceptible to wind and debris, which can disrupt service and cause power outages. Disruptions in water service can be caused by damage to water towers or power lines. Roadways can become blocked due to windblown debris, limiting access for emergency services.

Vulnerabilities to New and Future Development

Building codes ensure buildings and structures are built adequately to better withstand high wind. The only cities that have adopted the state building code are Wishek and Zeeland. Jurisdictions with a high number of trailer and mobile homes, which are more susceptible to hazards such as a windstorm, may experience more impact from the hazard.

As populations grow, more people are at risk of injury and potential death from windstorms and windblown debris such as tree branches. Strengthening of buildings codes would mitigate impacts from the hazard.

Data Limitations and Other Key Documents

Recent history indicates more windstorms. This may be an increase in the amount of windstorms, or past windstorms may not have been independently recorded in county history events. High winds are also an aspect of severe summer weather and severe winter weather. Windstorm impacts and damages may be categorized under another hazard and not classified as a windstorm event.

Other key documents related to the windstorm hazard include:

- North Dakota Emergency Operations Plan, Severe Storms Annex
- Dickey County Emergency Action Plan
- 2014 Dickey County Mitigation Plan
- 2014 ND State Multi-Hazard Mitigation Plan

DRAFT

6. Mitigation Strategy

Mitigation Purpose, Goals, and Projects

This update of the Dickey County Multi-Jurisdictional Multi-Hazard Plan includes a mitigation strategy consisting of seven goals and specific mitigation projects for each incorporation jurisdiction based on the risk assessment developed at Planning Committee and jurisdictional meetings. A total of 32 projects were identified. All hazards and threats were considered, and mitigation projects were formulated based on the potential or previous effects of hazards, the high probability of hazard or threat occurrences, the vulnerability of jurisdictions to hazards, and hazards each project can mitigate against. The problem statement for Dickey County, which assisted in formulating specific mitigation actions to reduce the impacts of hazards, is shown before the mitigation actions.

Goal 1: Improve public awareness, education and planning of hazard and action to protect themselves

Goal 2: Reduce impacts of floods on people and property

Goal 3. Reduce impacts of fires and drought

Goal 4. Implement cost effective measures to reduce impacts of manmade and natural disasters

Goal 5. Provide safe drinking water, places and early warnings for public to take protective action during hazard events

Mitigation Project Development

The Planning Committee identified the following characteristics of each mitigation project and is included each project profile:

- Description/benefit
- Project status
- Responsible agency
- Timeframe
- Funding sources
- Hazard(s) addressed
- Priority
- Partners
- Cost

Scoring and Prioritization

The Plan Update Committee also scored and ranked projects based on a FEMA process – STAPLEE – that allows a community to understand the support for a project; the potential costs in dollars, time and expertise; environmental impact; and the benefit of the project. The specific words in the acronym STAPLEE are social, technical, administrative, political, legal, economic, and environmental.

Each project was scored using a low, medium or high scoring. A score of low indicated a project is ineffective, not feasible and/or too costly, and a high indicated the project was highly effective, feasible and/or a higher benefit compared to cost. A score of medium was neutral.

Each mitigation project included in the plan is valuable as it addresses needs specific to Dickey County and its jurisdictions. Due to a variety of constraints, not all projects can be implemented simultaneously and must be prioritized with the most critical projects being emphasized for implementation in the near term. However, the prioritization of each project can change over time to respond to changes in a community and to take advantage of resources that become available.

The Plan Update Committee prioritized each mitigation project on a high, medium and low designation based on scoring of the documentation, past experiences and professional judgment, and what projects are technically feasible to accomplish based on the capabilities of all jurisdictions. Table 6.1 summarizes the projects by priority by jurisdiction.

Table 6.1 – Prioritization of Mitigation Projects by Jurisdiction

Jurisdiction	Project Number by Prioritization	
	Medium	High
Dickey County – All Jurisdictions	1, 2, 3, 4, 5, 6, 7, 14, 15	8, 12
Dickey County	11	9, 10
Oakes	11, 13	9, 10
Ludden	11, 13	9

Acronyms and Definitions

The acronyms and definitions used in the responsible agency and partners section of each mitigation projects profile are described in Table 6.2.

Table 6.2 – Acronyms and Definitions of Responsible Agencies and Partners for Mitigation Projects

Acronym/Definition	Entity
Businesses	Dickey County Businesses
Bureau of Reclamation	Bureau of Reclamation
City Councils	Jurisdictional City Councils
County Commissioners	Dickey County Commissioners
County Public Works	Dickey County Public Works
County Road Dept.	Dickey County Road Department
Dept. of Commerce	N.D. Department of Commerce
Emergency Manager	Dickey County Emergency Manager
Extension Service	NDSU/Dickey County Extension Service
FEMA	Federal Emergency Management Agency
Fire Departments	Jurisdictional Fire Departments
First Responders	Jurisdictional First Responders
FSA	USDA Farm Service Agency
Health Director	Dickey County District Health Unit
MCWRB	Dickey County Water Resource Board
Media	Add Radio and TV Stations
Medical Service Providers	Add Medical Service Providers
NDAC	N.D. Association of Counties
NDDES	N.D. Department of Emergency Services
NDDH	N.D. Department of Health
NDDOT	N.D. Department of Transportation
Game & Fish	N.D. Game & Fish
NDLC	N.D. League of Cities
NDTOA	N.D. Townships Officers Association
NRCS	USDA Natural Resources Conservation Service
NWS	National Weather Service
Police Department	Wishek Police Department
Public Utilities	Dakota Valley Electric; KEM Electric; Montana Dakota Utilities(MDU)
Red Cross	American Red Cross
RD	U.S. Dept. of Agriculture – Rural Development
SCDRC	South Central Dakota Regional Council
Schools	Ellendale Public School, Oakes Public School, Trinity Bible College
Sheriff's Department	Dickey County Sheriff's Department
Social Services	Dickey County Social Services
SWC	N.D. State Water Commission
USACE	United States Army Corps. of Engineers
U.S. Dept. of Interior	United States Department of Interior

Problem Statements

Problem statements provide a concise description of the vulnerabilities of the jurisdiction to threats and hazards that should be addressed through mitigation actions. The specific mitigation actions to reduce the impacts of hazards are identified for each jurisdiction and are found after the problem statement. The problem statements and jurisdiction-specific mitigation projects can be found in Chapter 8, Jurisdictions.

Dickey County

Dickey County is impacted by communicable disease, drought, flood, hazardous material release, homeland security incident, severe summer weather, severe winter weather, shortage or outage of critical materials or infrastructure, transportation accident, urban fire/structure collapse, wildland fire, and windstorm. The county’s distance from major population centers and its sparse population limit and stress the resources to respond to disasters from hazards. Education, public outreach and communicating emergency and disaster messages to the people throughout the county is challenging with the limited local media sources and the limited number of people with the expertise, experience and time to do website and social media development and maintenance. All jurisdictions have limited paid staff to take on additional duties. The energy production in the western portion of the State and the increased agricultural industry has resulted in an increase in hazardous materials being transported through the county by trucks and railroad. The county has planning and regulatory, administrative and technical, financial, and education and outreach capabilities to accomplish mitigation. However, the county relies on outside sources for large-scale mitigation projects. Education and outreach, upgrading of critical facilities and infrastructure, upgrading of emergency sirens, generators to maintain services, improved access for emergency services, and additional storms shelters are a priority in the county.

Mitigation Project 1: Use county disaster preparedness website to improve household disaster preparedness including safe methods for new construction, disaster resilience.

Description/Benefit	To keep households ready in case of disaster.
Hazards Addressed	All hazards.
Affected Jurisdictions	All.
Project Status	Website developed and maintained. Ongoing and continue.
Priority	Medium.
Responsible Agency	Emergency Manager
Partners	DES, Red Cross, FEMA, NWS, EM, city & county governments, Health Districts, Social Services.
Timeframe for Completion	Ongoing.
Cost	Annual \$1,500 budget.
Funding Source	County, state, federal, city, private.

Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Admin.	TOTAL
3	3	1	1	1	1	3	2	15

Mitigation Project 2: Increase awareness of drought tolerant practices in farming.

Description/Benefit	Make public aware of farming, crop programs and practices to make use of green (recycled) water.
Hazards Addressed	Drought, Fire.
Affected Jurisdictions	Dickey County, Ellendale, Forbes, Fullerton, Ludden, Monango, Oakes.
Project Status	Education and awareness programs done. Ongoing and continue.
Priority	Low.
Responsible Agency	ND Extension Service.
Partners	Fires Department, County Extension, FSA, Soil Conservation, Elevators, City/County Government, Emergency Manager, State Water Commission, Garrison Diversion/Corp of Engineers.
Timeframe for Completion	Ongoing.
Cost	\$15,000 for educational materials and training.
Funding Source	Grants (state, federal, utility).

Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Admin.	TOTAL
2	3	1	1	1	2	3	1	14

Mitigation Project 3: Increase awareness of drought tolerant practices in municipalities.

Description/Benefit	Education and public water rationing/restrictions on water usage. Water filtration and cleaning. Restrictions on irrigation to assure water for municipal use.
Hazards Addressed	Drought, Fire, Shortage of Critical Materials and/or Infrastructure.
Affected Jurisdictions	Dickey County, Ellendale, Forbes, Fullerton, Ludden, Monango, Oakes.
Project Status	Education and awareness programs done. Ongoing and continue.
Priority	Medium.
Responsible Agency	Extension, Emergency Manager, FSA.
Partners	Fires Dept., FSA, Soil Conservation, Elevators, City/County Government, State Water Commission, Garrison Diversion/Corp of Engineers.
Timeframe for Completion	Ongoing.
Cost	\$15,000 for educational materials.
Funding Source	Local, Grants (state, federal, utility).

Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Admin.	TOTAL
2	3	1	1	1	2	3	1	14

Mitigation Project 4: Increase Fire Awareness Programs.

Description/Benefit	Make public aware of fire risks. Education and outreach programs. Goal to reach to entire school, not just kindergarten grade.
Hazards Addressed	Fire.
Affected Jurisdictions	Dickey County, Ellendale, Forbes, Fullerton, Ludden, Monango, Oakes.
Project Status	New project from 2004 plan.
Priority	Medium.
Responsible Agency	Emergency Manager, Fire Department.
Partners	Fire Departments, cities, schools, college, health care, EMS, Social Services, Farm Service Agency, National Weather Services.
Timeframe for Completion	Ongoing
Cost	\$15,000 per year for educational materials and training.
Funding Source	Grants (state, federal, utility).

Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Admin.	TOTAL
3	3	1	2	2	3	2	1	17

Mitigation Project 5: Make public aware of risk of shortage of critical materials and/or infrastructure and encourage citizens to be self-sufficient.

Description/Benefit	Make public aware of risk of shortage of critical materials and/or infrastructure and encourage citizens to be self-sufficient.
Hazards Addressed	Shortage or outage of critical materials or infrastructure
Affected Jurisdictions	Dickey County, Ellendale, Forbes, Fullerton, Ludden, Monango, Oakes.
Project Status	Education and awareness programs done. On website. Ongoing and continue.
Priority	Low.
Responsible Agency	Cities, county, state.
Partners	Social Services, Emergency Manager, Fire Departments, Health District, Public Utilities, County/City Government.
Timeframe for Completion	Ongoing.
Cost	\$15,000 for educational materials and training.
Funding Source	Grants (state, federal, utilities).

Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Admin.	TOTAL
3	2	2	1	1	3	3	1	16

Mitigation Project 6: Education regarding public and personal safety in vehicle, railroad and aircraft accidents.

Description/Benefit	Make public aware of hazards and ways to keep themselves and others safe. Allow safety and law enforcement to do their jobs to minimize damage.
Hazards Addressed	Transportation Accident.
Affected Jurisdictions	Dickey County, Ellendale, Forbes, Fullerton, Ludden, Monango, Oakes.
Project Status	Education and awareness programs done, on Website. Ongoing - continue.
Priority	Low.
Responsible Agency	Law enforcement, public safety, emergency, fire, ambulance, North Dakota State and Federal DOT.
Partners	City, State, Federal, Local government.
Timeframe for Completion	Ongoing.
Cost	Ongoing – cost of training, giving and receiving – (train the trainer).
Funding Source	Local, state, federal, private.

Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Admin.	TOTAL
3	3	1	1	1	2	3	1	15

Mitigation Project 7: Encourage people to have insurance to protect from property losses from hazards.

Description/Benefit	Benefit to crop insurance and residential conservation practices, property insurance.
Hazards Addressed	Drought, Flood, Severe Summer Weather.
Affected Jurisdictions	Dickey County, Ellendale, Forbes, Fullerton, Ludden, Monango, Oakes.
Project Status	Education and awareness programs done. Ongoing and continue.
Priority	Medium.
Responsible Agency	FSA.
Partners	Extension, Agricultural producers.
Timeframe for Completion	Ongoing.
Cost	Educational materials and training.
Funding Source	Local, state, federal.

Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Admin.	TOTAL
1	3	3	3	1	3	1	1	16

Mitigation Project 8: Assure County has FEMA-Approved Mitigation Plan.

Description/Benefit	Continuous assessing of jurisdictional vulnerabilities and update of hazards and impacts.
Hazards Addressed	All.
Affected Jurisdictions	All.
Project Status	Done. Ongoing and continue.
Priority	Medium.
Responsible Agency	Emergency Manager.
Partners	County Commission, City Councils, ND DES.
Timeframe for Completion	4 to 5 years.
Cost	\$30,000.
Funding Source	Local, state, federal.

Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Admin.	TOTAL
3	3	3	3	3	3	3	3	24

Mitigation Project 9: Remove existing structures from James River Floodplain.

Description/Benefit	Old bridges, diversions, debris. Silt. Buildings.
Hazards Addressed	Flood.
Affected Jurisdictions	Oakes, Ludden, Dickey County.
Project Status	Drainage plan compiled, awaiting implementation. Ongoing and continue. Floodplain mapping in process.
Priority	High.
Responsible Agency	Individual jurisdictions.
Partners	City, County, Engineering firms.
Timeframe for Completion	2 to 5 years.
Cost	Project based: \$2,000,000 estimated.
Funding Source	Local budgets, state, FEMA, homeowners, grants.

Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Admin.	TOTAL
3	3	3	2	2	3	2	2	20

Mitigation Project 10: Work with state and federal officials to have Dickey County flood mapped.

Description/Benefit	Accurate mapping would allow better planning and inform property owners of flood insurance need and rates based on mapped risk.
Hazards Addressed	Flood.
Affected Jurisdictions	Dickey County, Oakes.
Project Status	County is enrolled in NFIP. Continue.
Priority	High.
Responsible Agency	Emergency manager.
Partners	County Commission, Oakes City Council, ND Water Commission, FEMA, jurisdictional engineers.
Timeframe for Completion	Ongoing.
Cost	To be determined.
Funding Source	County and city, state, federal, grants.

Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Admin.	TOTAL
3	3	3	2	2	3	2	2	20

Mitigation Project 11: Review of ordinances to assure jurisdictions meet minimum federal and state requirements to comply with NFIP.

Description/Benefit	Program benefits are available to residents and jurisdictions.
Hazards Addressed	Flood.
Affected Jurisdictions	Dickey County, Oakes, Ludden.
Project Status	County New project.
Priority	Medium – mapping ongoing. Studying zoning options.
Responsible Agency	Emergency manager, City and County Auditor(s).
Partners	County Commission, City Councils, Regional Council.
Timeframe for Completion	Within 4 years
Cost	To be determined.
Funding Source	County and city, state, federal, grants.

Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Admin.	TOTAL
2	2	2	2	2	2	2	2	16

Mitigation Project 12: Maintain infrastructure improvement plan. Maintain and Create Drainage

Description/Benefit	Reduction of damage to roads from annual flooding to assure emergency access and economic activity year-round.
Hazards Addressed	Overland flooding.
Affected Jurisdictions	All.
Project Status	Numerous infrastructure improvements have been made. Ongoing and continue.
Priority	Medium.
Responsible Agency	City Councils, County Commission, Township Boards.
Partners	State Water Commission, Corp of Engineers.
Timeframe for Completion	Ongoing.
Cost	Project based.
Funding Source	Local, State and Federal Grants.

Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Admin.	TOTAL
3	3	2	3	3	3	3	1	21

Mitigation Project 13: Improve County Highway 3, N.D. Highway 11 and N.D. Highway 1 over the James River to provide emergency services access during floods.

Description/Benefit	Improve County 3 and Highway 11 over James River to provide emergency services during floods to improve emergency service access to entire county during a flood event. When flood adds hours to emergency transport and response.
Hazards Addressed	River Flooding.
Affected Jurisdictions	Oakes City, Ludden, townships of: Bear Creek, Hudson, Riverdale, Wright, Port Emma, James River Valley, Clement, Lovell.
Project Status	New project.
Priority	High.
Responsible Agency	Cities of Oakes and Ludden and townships.
Partners	City, county, townships.
Timeframe for Completion	Ongoing
Cost	\$10,000,000 redo bridge, roadbed to higher elevation insert culverts
Funding Source	County, state, federal, grants.

Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Admin.	TOTAL
3	1	1	3	3	1	3	1	16

Mitigation Project 14: Obtain firefighting equipment that will assure emergency response entities are equipped to fight fires and rescue people.

Description/Benefit	Have ladder truck/snorkel truck that will allow for fighting fires and rescue of people from elevators, grain bins, and school. Primary structure truck and storage of this vehicle.
Hazards Addressed	Fire, Transportation Accident, Hazardous Material Incident, Severe Winter Weather, Severe Summer Weather, Homeland Security Incident.
Affected Jurisdictions	Dickey County, Ellendale, Forbes, Fullerton, Ludden, Oakes.
Project Status	Ongoing
Priority	High.
Responsible Agency	Emergency Manager, Fire Department.
Partners	Elevators, Cities, County, surrounding fire departments.
Timeframe for Completion	Ongoing
Cost	\$150,000 - \$200,000 – used. \$100,000 minimum to add to existing fire stations.
Funding Source	Grants (state, federal, utility).

Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Admin.	TOTAL
3	3	2	1	1	1	1	1	13

Mitigation Project 15: Bury power lines.

Description/Benefit	Maintain power for critical services.
Hazards Addressed	Severe Winter Weather, Severe Summer Weather, Windstorm.
Affected Jurisdictions	All.
Project Status	Ongoing and continue.
Priority	Medium.
Responsible Agency	Power Companies: Otter Tail, Dakota Valley Electric, MDU.
Partners	Cities, county, state.
Timeframe for Completion	Ongoing
Cost	Analyze for identifying power lines needing to be buried Single phase - \$30,000 per mile; 3-phase \$80,000 per mile.
Funding Source	Federal and state grants and utility grant program.

Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Admin.	TOTAL
3	3	3	1	1	3	2	1	17

Dickey County Mitigation Actions Compared to the Hazards Addressed

The following table identifies each of the mitigation strategies by the type of action it is, and the hazard it may mitigate. Many projects reduce loss from more than one hazard.

Table 6.3 shows each mitigation project and the hazard or hazards it addresses. While some projects are specific to one or two hazards, others address all the hazards. Strategies aimed at reducing the effects of hazards on new and existing buildings and infrastructure are marked with an asterisk (*) next to the project number on the far-left column in Table 6.3.

Table 6.3 – Mitigation Project Number and Hazard Addressed by Jurisdiction

Incorporated Jurisdiction and Mitigation Project Number	Communicable Disease	Drought	Flood	Hazardous Material Release	Homeland Security Incident	Severe Summer Weather	Severe Winter Weather	Shortage of Critical Materials or Infrastructure	Transportation Accident	Urban Fire/Structure Collapse	Wildland Fire	Windstorm
Dickey County – All - Project 1	X	X	X	X	X	X	X	X	X	X	X	x
Dickey County – All – Project 2		X								X	X	
Dickey County – All – Project 3		X						X		X	X	
Dickey County – All – Project 4										X	X	
Dickey County – All – Project 5								X				
Dickey County – All – Project 6									X			
Dickey County – All – Project 7		X	X			X						
Dickey County – All – Project 8	X	X	X	X	X	X	X	X	X	X	X	X
Dickey County, Oakes, Ludden – Project 9			X									
Dickey County, Oakes – Project 10			X									
Dickey County, Oakes, Ludden – Project 11			X									
Dickey County – All – Project 12			X									
Dickey County – All – Project 13			X									
Dickey County, Ellendale, Forbes, Fullerton, Ludden, Oakes – Project 14				X	X	X	X		X	X	X	
Dickey County – All – Project 15						X	X					X

7. County/City Jurisdiction Mitigation Capability Assessment

Capability for mitigation is divided into four categories: Administrative and Technical, Education and Outreach, Financial, and Planning and Regulatory. The following definitions are provided for each capability category based on information from the Federal Emergency Management Agency. Table 7.1 highlights administrative and technical capabilities, Table 7.2 highlights education and outreach capabilities, Table 7.3 highlights financial capabilities and Table 7.4 shows additional planning and regulatory capabilities of each incorporated jurisdiction, including Dickey County. Table 7.5 lists state and federal sources for mitigation.

Boxes checked with an “X” indicate the jurisdiction possesses the capability; while boxes left blank indicate the jurisdiction is lacking the capability. Narratives following each table detail the capabilities of Dickey County. Information on the capabilities of each jurisdiction was gathered at jurisdictional meetings, committee meetings and interviews during the planning process.

Narratives detailing the capabilities of incorporated jurisdictions can be found in Chapter 8, Jurisdictions.

Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. A definition of each mitigation capability category is provided.

Administrative and Technical: Identification of administrative and technical capabilities, which include: staff and their skills and tools for mitigation planning to implement specific mitigation actions.

Education and Outreach: Identification of education and outreach programs, and methods already in place to implement mitigation activities and communicate hazard-related information.

Financial: Identification of access to or eligibility to use funding resources for hazard mitigation for jurisdictions.

Planning and Regulatory: Jurisdictional plans, policies, codes, and ordinances adopted and in place that prevent and reduce the impacts of hazards.

Table 7.1 shows the administrative and technical capabilities of Dickey County and incorporated jurisdictions. The fire ISO rating for each jurisdiction is listed in the table and discussed in the following narratives. Boxes marked with an “X” indicates the jurisdiction has or has access to the administrative or technical capability for mitigation. An asterisk (*) indicates a capability in progress.

Table 7.1 – Administrative and Technical Capabilities

Administrative and Technical Capability	Dickey Co.	Ellendale	Forbes	Fullerton	Ludden	Monango	Oakes
9-1-1 Coordinator	X	*	*	*	*	*	*
Chief Building Official	N/A	X	N/A	N/A	N/A	N/A	N/A
County/City Council or Commission	X	X	X	X	X	X	X
Civil Engineer	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Emergency Management	X	*	*	*	*	*	*
Emergency Services GIS/GPS Capable	X	N/A	N/A	N/A	N/A	N/A	N/A
Emergency Siren (manually-activated)	X	X	X	N/A	X	X	X
Fire Index Sign	N/A	N/A	X	N/A	X	N/A	N/A
Firewise Certification	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator (permanent)	X	X	N/A	N/A	N/A	N/A	X
Grant Writing Staff	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Infrastructure Maintenance Programs	X	X	X	X	X	X	X
LEPC	X	*	*	*	*	*	*
Mutual Aid Agreements	X	X	X	X	X	X	X
Other Staff for Administration	X	X	X	X	X	X	X
Planning and Zoning Administrator	X	X	N/A	N/A	N/A	N/A	X
Planning and Zoning Board	X	X	N/A	N/A	N/A	N/A	X
Planning Services	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Public Works/Road Department	X	*	*	*	*	*	*
Reporting of Data to Emergency Manager	X	X	X	X	X	X	X
Sheriff	X	*	*	*	*	*	*

*Denotes administrative and technical capability that can be obtained through the county, contracted services, or an outside entity.

Dickey County: Dickey County has an active county commission. The county does not have a chief building official or inspector. The county has a Local Emergency Planning Committee (LEPC). The county contracts with an engineering firm for civil engineering services. Charlie Russell is the emergency manager. The county has a 9-11 coordinator. The county can contract with the South Central Dakota Regional Council (SCDRC) or a private firm for planning services. The Highway Department is in charge of various preparatory stages of construction including the acquisition of right-of-way, survey and design requirements, and the letting of contracts in addition to the actual supervision of construction. The Department also maintains all bridges on Dickey County roads and township roads. The Dickey County Water Resource Board is responsible for river channel maintenance and clearing of debris to eliminate

snagging. The weed board conducts annual spraying for elimination of noxious weeds. Dickey County has grant writing capabilities. For administration capabilities, the county has the county auditor, deputy auditor, auditor's office administrative assistant, county sheriff, social services, NDSU/Dickey County Extension Service, and the County Highway Department Superintendent. The county can also contract with SCDRC for grant writing and administration. The county is responsible for implementation and maintenance of signage for navigation for emergency services and first responders on all county roads and most township roads. The county does not own fire index signs, but does follow the ND Fire Index rating for burn bans. The Sheriff's Office is in Ashley, which is the location of all county offices, which includes 9-1-1 dispatch, emergency management. Dickey County has no permanent backup generator capable of providing backup power to the central operations of the Sheriff's Office. The Dickey County Sheriff's Department provides law enforcement services. Fire protection is provided by local fire departments. The county does not have Firewise Certification. The county is not StormReady Certified.

Table 7.2 shows the education and outreach capabilities of Dickey County and incorporated jurisdictions. Boxes marked with an "X" indicates the jurisdiction has or has access to the education and outreach capability for mitigation.

Table 7.2 – Education and Outreach Capabilities – Research on the 2014 plan and online

Education and Outreach Mitigation Capability	Dickey Co.	Ellendale	Forbes	Fullerton	Ludden	Monango	Oakes
County/City Events	X	X	X	X	X	X	X
County Emergency Management	X	*	*	*	*	*	*
Entities Providing Public Education	X	X	N/A	N/A	N/A	N/A	N/A
Non-Profit Organizations	X	X	N/A	N/A	N/A	N/A	X
Public-Private Partnerships	X	X	N/A	N/A	N/A	N/A	X
School Programs	X	X	N/A	N/A	N/A	N/A	X
Website with Hazard Education/School	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Denotes education and outreach mitigation capability available to the jurisdiction through the county, contracted services, or an outside entity.

Dickey County: Dickey County does not maintain a website with hazard education information. The Dickey District Health Unit, Farm Services Agency (FSA), the Girl Scouts, the Boy Scouts, 4-H, Natural Resources Conservation Service (NRCS), NDSU/Dickey County Extension Service, and Dickey County Emergency Management provide public education on hazards. Brochures, pamphlets and other materials are available at the Dickey County Sheriff's Office. Emergency services (ambulance, fire,) provide education and outreach through programs at local schools. County events where hazard education can be conducted include: Dickey County Fair. The Local Emergency Planning Committee (LEPC) is a public-private partnership consisting of major employers, local government entities, and volunteer organizations that provides education and outreach on hazards.

Table 7.3 shows the financial capabilities of Dickey County and incorporated jurisdictions. Boxes marked with an "X" indicates the jurisdiction has or has access to the financial capability for mitigation.

Table 7.3 – Financial Capabilities

Financial Mitigation Capability	Dickey Co.	Ellendale	Forbes	Fullerton	Ludden	Monango	Oakes
Building Permits	X	X					X
Comm. Dev. Block Grant (CDBG)	X	X	X	X	X	X	X
General Obligation Bond/Special Tax Bond	X	X					X
Sanitary Sewer Fee	X	X	X	X	X	X	X
Special Assessments for New Development	X	X	X	X	X	X	X

Dickey County: There are no private entities providing financial assistance in Dickey County for hazard mitigation. The county does not meet the Low to Moderate Income (LMI) requirements for the Community Development Block Grants (CDBG), but could qualify for urgent need and removal of architectural barriers

The county does not have storm water utility or sanitary sewer fees. The county does levy special assessments for special needs in each city. The county does not incur debt through general obligation bonds or special tax bonds. The county does not issue building permits. However, individual townships, if zoned, require building permits.

In addition to the financial capabilities of the county and city jurisdictions, the following local, regional, state and federal entities can be used as funding sources for mitigation.

- Federal Emergency Management Agency
- Dickey County Water Resource Board
- N.D. Department of Emergency Services
- Other state programs

Table 7.4 shows the planning and regulatory capabilities of Dickey County and incorporated jurisdictions. Boxes marked with an “X” indicates the jurisdiction has or has access to the planning and regulatory capability. An asterisk (*) indicates a capability in progress.

Planning and Regulatory Mitigation Capability	Dickey Co.	Ellendale	Forbes	Fullerton	Ludden	Monango	Oakes
Building Codes	X	X					
Building Permits	X	X					X
Chief Building Official		X					
Comprehensive Plan	X	X					X
Continuity of Operations Plan							
FEMA Flood Map	X	X	X	X	X	X	X
Flood Insurance Study	X	X	X	X	X	X	X
Flood Operations/Management Plan							
Flood Ordinance	X	X					X
Hazard Mitigation Plan	X	X	X	X	X	X	X
Local Emergency Operations Plan	X	X	X	X	X	X	X
Planning Commission	X	X					X

Dickey County: Dickey County does not have a comprehensive, strategic, drought management or water conservation plan. The county road department maintains a schedule of projects. The county has a local emergency operations plan. The county highway department, townships or individual cities are responsible for their own plans. The county does not have an inspector. There are townships in Dickey County that maintain independent zoning authorities. In addition to the aforementioned planning and regulatory capabilities of the county and city jurisdictions, strategic plans for townships can be used for mitigation purposes.

Mitigation Funding Sources

Table 7.5 lists state and federal sources for mitigation. These sources have been identified to fund and administer mitigation projects in addition to the aforementioned local capabilities of the county and city jurisdictions.

Table 7.5 – State and Federal Mitigation Funding Sources

Name	Managing Agencies
AmeriCorps	Corporation for National & Community Service
Community Development Block Grant (CDBG)	US Housing and Urban Development North Dakota Department of Commerce
Economic Development Administration (EDA) Grants and Investments	US Economic Development Administration
Emergency Watershed Protection	US Natural Resources Conservation Service
Environmental Quality Incentives Program	US Natural Resources Conservation Service
Flood Mitigation Assistance Program	North Dakota State Water Commission and FEMA
Hazard Mitigation Grant Program (HMGP)	North Dakota Department of Emergency Services and FEMA
Hazardous Fuels Mitigation Program	North Dakota Department of Transportation
Homeland Security Grants	North Dakota Department of Emergency Services, US Department of Justice, US Department of Homeland Security
Individual Assistance (IA)	FEMA, North Dakota Department of Emergency Services
Map Modernization Program	North Dakota State Water Commission and FEMA
National Fire Plan (NFP)	North Dakota Forest Service and US Forest Service
NRCS Conservation Programs	U.S.D.A. Natural Resources Conservation Service
Pre-Disaster Mitigation (PDM) Grants	North Dakota Department of Emergency Services and FEMA
Public Assistance (PA)	North Dakota Department of Emergency Services and FEMA
Repetitive Flood Claims (RFC) Grant	North Dakota State Water Commission and FEMA
Rural Fire Assistance (RFA) Grant	National Interagency Fire Center
SBA Pre-Disaster Mitigation Loan Program	US Small Business Administration (SBA)
Severe Repetitive Loss (SRL) Grant	North Dakota State Water Commission and FEMA
Small Flood Control Projects	US Army Corps of Engineers (USACE)
Streambank & Shoreline Protection	US Army Corps of Engineers (USACE)
Wetland Program Development Grants	US Environmental Protection Agency

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8.1 City of Ellendale

Figure 8.1.1 shows an aerial view of the city of Ellendale.

Figure 8.1.1 – City of Ellendale



8.1.1 Profile and Inventory

The location, total population, vulnerable populations, housing units, services, jurisdictional buildings, emergency response services and utilities of the city of Ellendale. Detailed narratives follow each section heading to profile the city. Additional information on the city of Ellendale and Dickey County can be found in Chapter 4, Profile and Inventory.

Location

The city of Ellendale is located in southeastern North Dakota. Ellendale is located 30.4 miles southwest of Oakes, ND in Dickey County.

Population

The population is 1,394 per the 2010 U.S. Decennial Census.

Vulnerable Populations

As of the Decennial Census of 2010, there were 1,394 people, 562 households, and 313 families residing in the city. The population density was 917.1 inhabitants per square mile (354.1/km²). There were 698 housing units at an average density of 459.2 per square mile (177.3/km²).

Housing Units and Household Size

There were 562 households of which 23.3% had children under the age of 18 living with them, 46.8% were married couples living together, 7.5% had a female householder with no husband present, 1.4% had a male householder with no wife present, and 44.3% were non-families. 40.9% of all households were made up of individuals and 17.7% had someone living alone who was 65 years of age or older. The average household size was 2.11 and the average family size was 2.90. The median age in the city was 37.3 years. 20.3% of residents were under the age of 18; 17.8% were between the ages of 18 and 24; 19.6% were from 25 to 44; 21.8% were from 45 to 64; and 20.7% were 65 years of age or older. The gender makeup of the city was 48.1% male and 51.9% female.

Publicly Owned Jurisdictional Buildings

The city of Ellendale has the Dickey County Courthouse, post office, fire department, City Library, City Shop, City Hall, Senior Citizen Center, municipal airport and a municipal police force.

Services Provided

The city of Ellendale has their own water modern plant and new city water and sewer infrastructure as well as a well-equipped city public works crew. The city has a sanitary sewer system and lagoon. The sanitary sewer system is served by fourlift stations. The city has a partial storm water system. Ellendale provides garbage sanitation services. The city maintains an inert landfill. The official newspaper is The Oakes Times.

Emergency Response Services

Law enforcement is provided by the municipal police force. The sheriff's office is located in Ellendale, ND. The city has a fire department, medical, ambulance and EMS available.

Utility Providers

Potable water is provided by the city. Electricity is provided by Montana Dakota Utilities. Natural gas is not available in the city of Ellendale. Fuel oil and propane are used as an alternative heating source and is provided by companies chosen by the individual consumer. Cable, internet, and phone service is provided by DRN, AT&T and Verizon. Individual homes may choose to subscribe to direct broadcast satellite service providers or use an antenna to receive over the air programming.

8.1.2 Risk Assessment and Hazard Scoring Notes

Table 8.1.2 summarizes the risk assessment scoring of the city of Ellendale. The risk assessment and hazard scoring notes from the jurisdictional meeting for each hazard are shown after Table 8.1.2.

Table 8.1.2 – City of Ellendale Jurisdiction Risk Assessment Scoring Summary

Risk Assessment						
<u>Hazard</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	Total
Communicable Disease	3	4	4	3	2	12
Drought	4	2	2	3	3	8
Flood	3	4	2	2	3	8
Hazardous Material Release	3	4	4	2	2	11
Homeland Security Incident	2	1	1	1	2	3
Severe Summer Weather	3	4	4	3	3	11
Severe Winter Weather	3	4	4	4	1	14
Shortage or Outage of Critical Materials or Infrastructure	3	2	2	2	3	6
Transportation Accident	4	4	4	3	2	13
Urban Fire/Structure Collapse	2	2	2	3	3	6
Wildland Fire	3	2	2	2	2	7
Windstorm	3	4	4	3	1	13

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

City of Ellendale– Hazard Scoring

Communicable Disease - 12

Impact	3	<ul style="list-style-type: none"> • U.S. declared an H1N1 was a declared pandemic in 2009. • U.S. experienced a vaccine shortage in 2009. • Potential loss of life • Potential loss of economy • Entire City could be impacted by an outbreak • Emergency services can become quickly overwhelmed if an outbreak were to occur in humans
Frequency	4	<ul style="list-style-type: none"> • Seasonal flu happens every year. • West Nile Disease occurs frequently • Crop and localized livestock loss occur every year to a varying degree
Likelihood	4	<ul style="list-style-type: none"> • Seasonal flu happens every year • West Nile has happened in the past
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: 20.7% of population is over 65 • More vulnerable: Some abandoned buildings and homes in town • More vulnerable: No stockpile of medical supplies, vaccines • More vulnerable: Some lots in town are overgrown with vegetation • More vulnerable: Blighted structures occupied by individuals who hoard or collect • More vulnerable: Dependent on vaccines being developed for any new viruses and picking the right strains of flu for the flu vaccine.

		<ul style="list-style-type: none"> • More vulnerable: Fire Service and First Responders often over stretched by mutual aid requests • Less vulnerable: City mows overgrown lots • Less vulnerable: Internet connections and TV help inform residents • Less vulnerable: Fire Service and First Responders • Less vulnerable: Two clinics
Capability	2	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish large projects independently

Drought – 8

Impact	4	<ul style="list-style-type: none"> • Range Land Fire Index Used • Hay shortages during times of drought impact livestock. • Potential severe loss of economy due to reliance on agriculture • Water holes that supply livestock are impacted
Frequency	2	<ul style="list-style-type: none"> • Cyclical patterns make droughts possible • Dickey County was very dry during the 1980's. • 1988 was an especially dry year, along with 2016.
Likelihood	2	<ul style="list-style-type: none"> • Cyclical patterns make droughts possible • 2016 this pattern was reversed. • High possibility of drought in any year.
Vulnerability	3	<ul style="list-style-type: none"> • Depending on duration, vulnerability changes. • More vulnerable: Economy relies heavily on farming • Less vulnerable: City has water reserves tanks and its own drinking water system with generator backup • Less vulnerable: City has adequate fire suppression equipment to assist in providing water to dry areas for crops or livestock • Less vulnerable: Burn bans implemented during dry periods
Capability	3	<ul style="list-style-type: none"> • The city has fire protection, however, is dependent on access to water. • City is base headquarters of the county emergency management department • County emergency management has detailed plans to educate public on drought • Active city council • The elevator in town has some manpower and equipment • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance

Flood - 8

Impact	3	<ul style="list-style-type: none"> • Areas surrounding the town suffer from damaged roads, bridges and culverts creating emergency access problems as well as the occasional downed power lines • Washed out culverts • Cemeteries under water • Water seepage into basements • Blocked roads limit access for emergency services and daily routines.
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		<ul style="list-style-type: none"> • Increased mosquito population and transmitting of diseases from standing water. • Property and crop damage or loss • Potential loss of life • Flooded roads block bus routes transporting kids to school • Wastewater outage
Frequency	4	<ul style="list-style-type: none"> • Depends largely on weather patterns but Overland Flooding happens to some degree yearly. • In 2012, flash flooding caused the sanitary sewer system to blow resulting in 30% of homes experiencing sewer backups
Likelihood	2	<ul style="list-style-type: none"> • Heavy spring melting and heavy rains cause flooding yearly
Vulnerability	2	<ul style="list-style-type: none"> • More vulnerable: Ambulances, school buses, fire protection having to detour around flooding. • More vulnerable: Individuals driving on flooded highways • More vulnerable: 20.7% of population is over 65 • More vulnerable: Lift Station and lagoon could be inundated • More vulnerable: Flat terrane and lakes filled result in flooding due to the lack of rivers. • More vulnerable: Overland flooding can damage roads and impede access to rural farms as well as the town. • More vulnerable: Basements in town flood frequently • More vulnerable: Overland flooding produces puddles of water and full ditches that breed mosquitos. • Less vulnerable: Tree trimming, and drainage ditch maintenance programs are in place to ensure proper drainage of water to mitigate overland flooding. • Less vulnerable: The City participates in the NFIP • Less vulnerable
Capability	3	<ul style="list-style-type: none"> • No flood plan, but one in process • Active city council and well-equipped City Public works crew • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • Law enforcement can radio actuate the siren or can be operated by Dickey County Emergency Management

Hazardous Material Release – 11

Impact	3	<ul style="list-style-type: none"> • Potential loss of life • Crop loss • Livestock loss • Economy loss • Fire potential • Blocked roads leading to loss of mobility • Small size of city could lead to large percentage of population affected
Frequency	4	<ul style="list-style-type: none"> • Minor spills happen yearly due to prevalence of chemicals used in agriculture • No major occurrences or incidences

Likelihood	4	<ul style="list-style-type: none"> • Minor spills happen yearly due to prevalence of chemicals used in agriculture
Vulnerability	2	<ul style="list-style-type: none"> • More vulnerable: Propane and diesel fuel are used for heating alternative • More vulnerable: Located on US 281 and ND 11 junction. • More vulnerable: Trucks and farmers transporting larger tanks more frequently on highways through the city limits. • More vulnerable: Elevator complex, industrial plant, 2 fertilizer operations and seed vendors, bulk propane plant with storage, bulk fuels plant with storage • More vulnerable: Pipeline runs to the west of the city and could potentially release fuel • Less vulnerable: There is public lodging and three public fueling facilities. • More vulnerable: No stockpile of medical supplies
Capability	2	<ul style="list-style-type: none"> • Active city council • City has zoning in place restricting where hazardous material can be stored and located • City has a radio-operated storm siren operated by Dickey County Emergency Management • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

Homeland Security Incident - 3

Impact	2	<ul style="list-style-type: none"> • Potential loss of life • Loss of economy • Loss of livestock • Potential for large percentage of population loss • Emergency services could be overwhelmed
Frequency	1	<ul style="list-style-type: none"> • Always a possibility of an event occurring. • Trinity Bible College was the scene of protest by a liberal political group in the early 2000s, but the demonstration was said to be peaceful
Likelihood	1	<ul style="list-style-type: none"> • Always a possibility of an event occurring.
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: Limited mental health services • More vulnerable: Located on US 281 and ND 11 junction. • More vulnerable: 20.7% of population is over 65 • More vulnerable: Small town, everyone is impacted, fearful and anxious • More vulnerable: Influx of population from other parts of the U.S. • More vulnerable: Trinity Bible College within city limits • More vulnerable: County Courthouse within city limits • Less vulnerable: City has assisted living and rest home generated • More vulnerable: No Hospital • Less vulnerable: Two clinics • Less vulnerable: Sparse population and rural nature of the city
Capability	2	<ul style="list-style-type: none"> • Headquarters of Dickey County Emergency Services located in Ellendale • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

Severe Summer Weather - 11

Impact	3	<ul style="list-style-type: none"> • Hail damage to homes and community buildings including broken windows, siding and shingles. • Power outages • Economy loss • Lightning strikes cause fires • Potential injury • Potential loss of life • High winds damage property • Heavy rain produces flash flooding • Fire potential if lightning occurs during drought.
Frequency	4	<ul style="list-style-type: none"> • Multiple storms are experienced annually causing property damage. • Extreme summer weather seasons occur every two to three years.
Likelihood	4	<ul style="list-style-type: none"> • Multiple storms are experienced annually causing property damage. • More intense weather in recent years • More rapid, heavy rain events occurring each year
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: 20.7% of population is elderly over 65 • More vulnerable: Fuel and propane tanks within city limits adjacent to infrastructure and critical facilities that are vulnerable to severe summer weather incidents. • Less vulnerable: City has generators for the sanitary sewer if power outages occur • Less vulnerable: Sparse population and rural nature of the city • Less vulnerable: Siren system can be radio actuated by law enforcement or Dickey County Emergency Management. • Less vulnerable: Roads in and out of town are well maintained
Capability	3	<ul style="list-style-type: none"> • Limited tax base • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • The siren can be radio actuated by law enforcement or Dickey County Emergency Management.

Severe Winter Weather - 14

Impact	3	<ul style="list-style-type: none"> • Ice storms, heavy and blowing snow cause travel issues, power outages, and property damage • Potential isolation of community • Severe low temperatures increase utility costs and affect alternative fuel • Potential loss of life • Potential injury • Economy loss • Increased cost for snow removal • Highways and city streets become icy and blocked • Heavy snow results in potential flooding in the spring • City streets build up with compacted snow causing damage to streets • Increased potential for hazardous material release • Temporary outage of emergency services
Frequency	4	<ul style="list-style-type: none"> • Occurs annually

		<ul style="list-style-type: none"> • Years with multiple winter events are normal
Likelihood	4	<ul style="list-style-type: none"> • Will happen in the future due to the climate, occurs annually
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: 20.7% of population is elderly over 65 • More vulnerable: Trinity College is not generated and those students are dependent on the City during hazards • Less vulnerable: K-12 School is Generated • Less vulnerable: The rest home is generated • Less vulnerable: City maintains a capital improvements plan • Less vulnerable: Small community where neighbors help neighbors
Capability	1	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • There are a few certified, trained and equipped citizens in the community • City siren can be radio actuated by law enforcement or by Dickey County Emergency Management • The elevator in town has some manpower, heavy equipment and work with area farmers to be pro-active in protecting the city

Shortage or Outage of Critical Materials or Infrastructure - 6

Impact	3	<ul style="list-style-type: none"> • Long periods of time without power or water could lead to loss of life, due to the winter climate and high population over 65. • Reduced mobility from blocked roads • Limited drinking water and functionality of sanitary sewer • City could be left without power for heating and cooling • Loss of power can limit accessibility to fuel sources • Loss of food sources as refrigeration units are without power • Loss of economy • Loss of internet affects individuals and businesses • Delayed emergency services • Mail outages for a day or longer in winter of 2016-2017
Frequency	2	<ul style="list-style-type: none"> • In 2016, areas in and surrounding Ellendale experienced power outages from 3 hours to 2 to 3 days • Power outages are experienced annually • Have had shortages of fertilizers, diesel fuel, and gas/propane recently
Likelihood	2	<ul style="list-style-type: none"> • No improvements to power infrastructure planned • Power poles and wires of the power grid are outdated and suspended overhead • Power outages are experienced annually
Vulnerability	2	<ul style="list-style-type: none"> • More vulnerable: 20.7% of population is elderly over 65 • More vulnerable: 18 electricity dependent vulnerable populations that need electricity to run medical devices to live. Per the publichealthemergency.gov Empower map. • More vulnerable: No hospital in city • More vulnerable: Assisted living center and rest home both located in City • More vulnerable: Access to rural areas limited during a flooding, blizzard or ice storm. • Less vulnerable: The K-12 school, Vocational Tech and the rest home are generated

		<ul style="list-style-type: none"> • Less vulnerable: Rest Homes and school are generated • Less vulnerable: Some residents grow local food supply • Less vulnerable: Water is provided by the city • Less vulnerable: Some residents have their own generator • Less vulnerable: Medical Clinic
Capability	3	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • City siren system can be radio actuated by law enforcement or by Dickey County Emergency Management

Transportation Accident - 12

Impact	4	<ul style="list-style-type: none"> • Potential loss of life • Potential injury • Economy loss • Property loss • Potential hazardous materials release • Potential fire • Potential Blocked Roads
Frequency	4	<ul style="list-style-type: none"> • Accidents happen in the area each year
Likelihood	4	<ul style="list-style-type: none"> • Accidents happen in the area each year
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: 20.7% of population is over 65 • More vulnerable: Located on US 281 • More vulnerable: Bulk fuels transported through City • More vulnerable: Increased amount of time students spend on buses • More vulnerable: Trucks and farmers transporting larger tanks more frequently on highway through the city limits. • More vulnerable: Anhydrous tanks driven through and parked in the city. • More vulnerable: High risk of hazardous chemical release or transportation accident as it is located close to highway • More vulnerable: No hospital, all patients must be transported to Oakes or Aberdeen Hospitals • More vulnerable: City has an airport • Less vulnerable: City has clinic • Less vulnerable: Freight rail lines have been removed and no longer run through city limits
Capability	3	<ul style="list-style-type: none"> • Siren system can be radio actuated by Law enforcement or by Dickey County Emergency Management • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

Urban Fire/Structure Collapse - 4

Impact	2	<ul style="list-style-type: none"> • Urban fire events have resulted in total losses of homes and businesses. • Potential loss of life • Property loss • Building loss • Economy loss • Loss of community assets • Loss of critical facilities and infrastructure • Potential temporary homeless population due to lack of alternative housing
Frequency	1	<ul style="list-style-type: none"> • House fires have occurred in the past five years. • Bans are issued frequently according to the ND Fire Index
Likelihood	1	<ul style="list-style-type: none"> • High likelihood of house fires • Bans are issued frequently according to the ND Fire Index. • High wind and drought conditions occur annually.
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: Older homes with older wiring • More vulnerable: Seasonal homes unoccupied • More vulnerable: Spacing of houses could lead to loss of multiple structures • More vulnerable: City has a well trained and equipped fire department often over stretched by mutual aid requests • More vulnerable: Lack of alternative housing for displaced residents • More vulnerable: Abandoned buildings and single-family homes • More vulnerable: Fire department limited in resources if multiple fire instances occur • Less vulnerable: Fully functioning fire department with equipment, water sources and staff. • Less vulnerable: City maintains building codes and ordinances • Less vulnerable: Less CRP near the city • Less vulnerable: City maintains vegetation on city lots • Less vulnerable: Have been able to contain fires to one building
Capability	3	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Mutual Aid with surrounding communities • Elevator in town has some manpower, heavy equipment and work with area farmers to be pro-active in protecting the city • Siren system can be radio actuated by law enforcement or Dickey County Emergency Management

Wildland Fire - 7

Impact	3	<ul style="list-style-type: none"> • Potential Economy loss • Potential crop, livestock, equipment and graze land loss • Potential loss of life • Potential injury • Potential hazardous material release • Health hazards due to poor air quality • Loss of wildlife habitat
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		<ul style="list-style-type: none"> • Farm equipment, lightning strikes, power line sparks, and controlled burns cause fires
Frequency	2	<ul style="list-style-type: none"> • Wildland fires occur annually due to climate and economy.
Likelihood	2	<ul style="list-style-type: none"> • With continued controlled burns by farmers there is always a possibility for the hazard in the future • Happens yearly to some degree
Vulnerability	2	<ul style="list-style-type: none"> • More vulnerable: Farmland and open areas • More vulnerable: Mutual aid fire department response times lengthen • More vulnerable: Windy conditions each year • More vulnerable: Lack reliable source of water for fire suppression • More vulnerable: Lack of fire break around the city • More vulnerable: No rural water for fire suppression • More vulnerable: Lack reliable source of water for fire suppression • Less vulnerable: City maintains overgrown lots • Less vulnerable: City has a fire district with a fire hall, adequate manpower, equipment and resources of water for fire suppression • Less vulnerable: Participates in Mutual Aid
Capability	2	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

Windstorm -13

Impact	3	<ul style="list-style-type: none"> • Downed trees • Buildings loss • Downed power poles and lines • Economy loss • Damage to homes and community buildings such as broken windows, loss of shingles • Potential loss of life • Potential injury • Potential structure fires • Contributes to spread of wildland fire • Straight line winds occur in summer months
Frequency	4	<ul style="list-style-type: none"> • Hazard occurs multiple times each year and is a secondary result from severe summer weather or severe winter weather. • Strong winds are common in the city in all weather conditions • Blizzard conditions occur frequently in winter months due to climate • Power lines are damaged causing outages annually
Likelihood	4	<ul style="list-style-type: none"> • Strong winds are common in the city
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable – loss of trees leads to more ground blizzard conditions • More vulnerable: Power lines providing power to the city are not buried and outdated • More vulnerable: EMS is over stretched by mutual aid • More vulnerable: No storm shelters in City • More vulnerable: Age of structures and housing stock • Less vulnerable: City has an inert landfill for debris and branches
Capability	1	<ul style="list-style-type: none"> • Capabilities to respond, but nothing can be done to prepare.

	<ul style="list-style-type: none"> • LEPC – Local Emergency Planning Committee • Mutual aid agreements for emergency services with surrounding communities • Active county commission • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Siren system can be radio actuated by law enforcement or Dickey County Emergency Management
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8.1.3 Mitigation Strategy

This update of the Dickey County Multi-Jurisdictional Multi-Hazard Plan includes a mitigation strategy consisting of seven goals in Chapter 6.

Problem Statement

The city of Ellendale identified its high senior population and isolated populations in the surrounding countryside as necessary to mitigate impacts from severe summer weather, severe winter weather, windstorm, flood, and shortage or outage of critical materials or infrastructure. The emergency siren is can be activated by Law enforcement or Emergency Management for storm warning use. Due to the location of the city, isolation from severe weather and shortage or outage of critical materials or infrastructure such as emergency services, power, and roads is frequent. The number of abandoned buildings, single-family homes, and aging structures increase the impact of and vulnerability to communicable disease, urban fire/structure collapse, wildland fire and windstorm. The increase in economic activity in the area and the main highway running through town, farmers hauling anhydrous and other materials to and from farm sites through the City, and increased storage of chemicals on farm sites used for agriculture production increases the impact of and vulnerability to hazardous material release, homeland security incident, and transportation accident.

8.1.4 Mitigation Capability Assessment

Capability for mitigation is divided into four categories: Administrative and Technical, Education and Outreach, Financial, and Planning and Regulatory.

Administrative and Technical: Identification of administrative and technical capabilities, which include staff, their skills and tools for mitigation planning to implement specific mitigation actions.

Education and Outreach: Identification of education and outreach programs, and methods already in place to implement mitigation activities and communicate hazard-related information.

Financial: Identification of access to or eligibility to use funding resources for hazard mitigation for jurisdictions.

Planning and Regulatory: Jurisdictional plans, policies, codes, and ordinances adopted and in place that prevent and reduce the impacts of hazards.

Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. Information on the capabilities of the city was gathered at its jurisdictional meeting, committee meetings, and interviews during the planning process.

Administrative and Technical

The following narrative details the administrative and technical capabilities of the city of Ellendale.

The city of Ellendale has an active city council. The city does not have a chief building official or inspector. The city has an LEPC through the county. The city does not have a civil engineer on staff but does have the option to contract for engineering services when needed. Emergency management is available through the county. The city can contract with the SCDRC or a private firm for planning, grant writing and grant administration services. The city conducts infrastructure maintenance on an as-needed basis. The city council staff and fire department volunteers have administration capabilities for mitigation. The Dickey County Sheriff and the N.D. State Highway Patrol assist in law enforcement along with the City municipal police. The auditor reports hazard data to the emergency manager.

Education and Outreach

The following narrative details the education and outreach capabilities of the city of Ellendale.

The city does not have non-profit organizations providing education on hazards but has an active Emergency Manager in the County. The city does maintain an active web site. The city does not have any entities providing public education on hazards but has access to the NDSU/Dickey County Extension Service, Dickey District Health Unit, and Dickey County Emergency Management for public education on hazards. The city does not conduct events on hazard education. Dickey County Emergency Management conducts education and outreach on hazards in the city.

Financial

The following narrative details the financial capabilities of the city of Ellendale.

The city does set aside revenue for capital improvements. The city does not have storm water utility fees. The city does levy special assessments for new development. The city has incurred debt through USDA and Bank of ND for maintenance and emergency repairs to the City's infrastructure. The city does not have any private entities providing funding for mitigation. The rural electric cooperative for the surrounding area, water resource board, and surrounding township and school district are other sources of funding for mitigation.

Planning and Regulatory

The following narrative details the planning and regulatory capabilities of the city of Ellendale.

The city does not have a capital improvement, comprehensive, drought management, land use, storm water, strategic, or water conservation plan. The city does not have a flood damage reduction study, flood insurance study, or impact fees. The city has adopted state building codes. The city is not FEMA flood mapped but is in the process.

Plan Maintenance

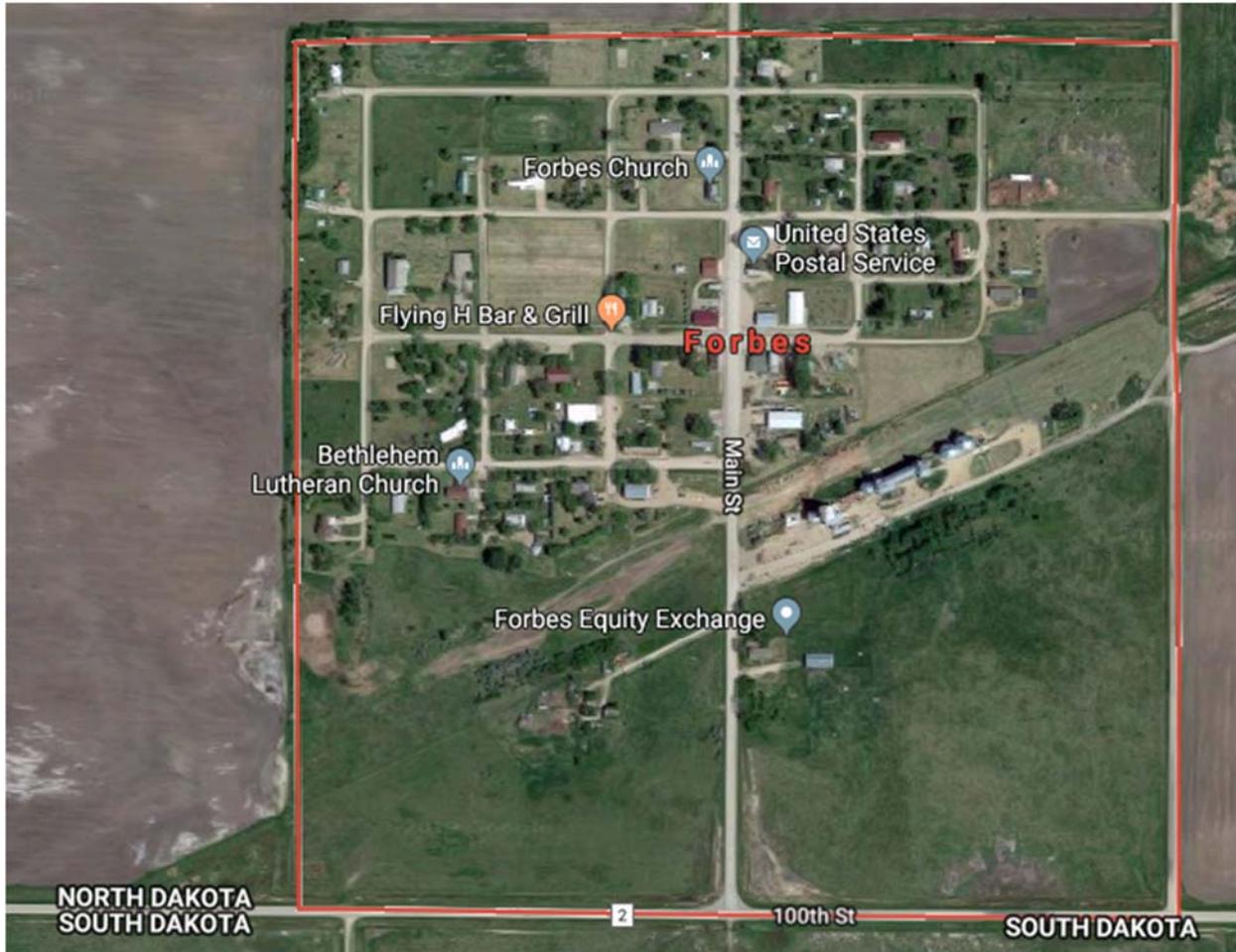
An important aspect of any useable plan is the maintenance and upkeep of the document. At any given time, planning, risk analysis, updating the situation assessment, research, coordinating, disaster response or other activity is occurring. Plan maintenance ensures the plan will remain useful in the county for many years. A mitigation action progress report form to conduct plan maintenance is in Chapter 10 of this plan.

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8.2 City of Forbes

Figure 8.2.1 shows an aerial view of the city of Forbes.

Figure 8.2.1 – City of Forbes



8.2.1 Profile and Inventory

The location, total population, vulnerable populations, housing units, services, jurisdictional buildings, emergency response services and utilities of the city of Forbes. Detailed narratives follow each section heading to profile the city. Additional information on the city of Forbes and Dickey County can be found in Chapter 4, Profile and Inventory.

Location

The city of Forbes is located at the intersections of 102nd St SE and 77th Ave SE, approximately 13 miles east-southeast of Ellendale and about thirty miles southeast of Ashley, right on the South Dakota border in Dickey County.

Population

The population is 53 per the 2010 U.S. Decennial Census.

Vulnerable Populations

According to the 2010 U.S. Decennial Census, the population of the city of Forbes consists of 13.8% children under the age of 18 living in households, 48.3% are married couples living together, 3.4% had a female householder with no husband present, 3.4% had a male householder with no wife present and 44.8% were non-families. 41.4% of all households were made up of individuals and 17.2% had someone living alone who was 65 years of age or older. The average household size was 1.83 and the average family size was 2.44.

Housing Units and Household Size

The 2011 to 2015 American Community Survey 5-Year Estimate shows there is a total of 41 housing units in the city consisting of 24 Owner Occupied, 4 Renter Occupied and 13 Vacant Housing units. Of the 41 single-family homes, 1 quad senior living apartment and two mobile homes.

Per the 2009 to 2013 American Community Survey 5-Year Estimate, there are 41 households in the city of Forbes resulting in an average household size of 1.86 people.

Publicly Owned Jurisdictional Buildings

Publicly owned buildings in the city of Forbes include a post office, American Legion Post 277 as well as the Schulstad Stone House Museum. The city does have an old church used for community events but no official Red Cross storm shelter, or armory.

Services Provided

The city of Forbes obtains potable water from WEB Water. The city has a sanitary sewer system and lagoon. The sanitary sewer system is served by two lift stations. The city does not have a storm water system. Gahner Sanitation - Forbes provides garbage sanitation services. The city maintains an inert landfill. The official newspaper is the Dickey County Leader.

Emergency Response Services

Law enforcement is provided by the Dickey County Sheriff. The sheriff's office is located in the Monango, ND. The Forbes Fire Department provides protection to the city and surrounding rural areas. The fire department is located in the city hall. Ambulance comes from Ellendale.

Utility Providers

Potable water is provided by the city WEB Water. Electricity is provided by Montana Dakota Utilities. Natural gas is not available in the city of Forbes. Fuel oil and propane are used as an alternative heating source and is provided by companies chosen by the individual consumer. Cable, internet, and phone service is provided by DRN, AT&T and Verizon. Individual homes may choose to subscribe to direct broadcast satellite service providers or use an antenna to receive over the air programming.

8.2.2 Risk Assessment and Hazard Scoring Notes

Table 8.2.2 summarizes the risk assessment scoring of the city of Forbes. The risk assessment and hazard scoring notes from the jurisdictional meeting for each hazard are shown after Table 8.2.2.

Table 8.2.2 – City of Forbes Jurisdiction Risk Assessment Scoring Summary

Risk Assessment						
Hazard	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Communicable Disease	2	1	1	1	1	4
Drought	4	2	3	1	2	8
Flood	4	4	4	1	2	11
Hazardous Material Release	4	2	2	1	1	8
Homeland Security Incident	4	1	1	1	1	6
Severe Summer Weather	4	4	4	4	1	15
Severe Winter Weather	3	4	4	1	2	10
Shortage or Outage of Critical Materials or Infrastructure	4	4	4	3	1	12
Transportation Accident	4	2	3	1	1	9
Urban Fire/Structure Collapse	4	2	3	3	2	10
Wildland Fire	4	2	3	1	2	8
Windstorm	3	4	4	4	1	14

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

City of Forbes– Hazard Scoring

Communicable Disease - 4

Impact	2	<ul style="list-style-type: none"> • U.S. declared an H1N1 was a declared pandemic in 2009. • U.S. experienced a vaccine shortage in 2009. • Potential loss of life • Entire City could be impacted by an outbreak
Frequency	1	<ul style="list-style-type: none"> • Seasonal flu happens every year. • Crop and localized livestock loss occur every year to a varying degree
Likelihood	1	<ul style="list-style-type: none"> • Seasonal flu happens every year • Tuberculosis and rabies are very low numbers for the area
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: 40% of population is over 65 • More vulnerable: Some abandoned buildings and homes in town • More vulnerable: No stockpile of medical supplies • More vulnerable: The city has no medical facilities. • More vulnerable: Some lots in town are overgrown with vegetation • More vulnerable: Blighted structures occupied by individuals who hoard or collect • More vulnerable: Dependent on vaccines being developed for any new viruses and picking the right strains of flu for the flu vaccine. • Less vulnerable: Residents mow lawns to keep vegetation under control • Less vulnerable: City mows overgrown lots • Less vulnerable: Internet connections and TV help inform residents • Less vulnerable: Fire Service and First Responders
Capability	1	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish large projects independently

Drought - 8

Impact	4	<ul style="list-style-type: none"> • Potential of severe economic loss due to being reliant on agricultural sector • Range Land Fire Index Used • Burn bans happened in 2016 • Hay shortages during times of drought impact livestock. • Loss of farm economy impacts service industries • Water holes that supply livestock are impacted
Frequency	2	<ul style="list-style-type: none"> • Although dry in spring of 2013, the last real drought was in 1988 • Dickey County was very dry during the 1980's. • 1988 was an especially dry year, along with 2016.
Likelihood	3	<ul style="list-style-type: none"> • Cyclical pattern to rains normally wetter in the east than in the west. 2016 this pattern was reversed. • High possibility of drought in any year due to the clay soil.
Vulnerability	1	<ul style="list-style-type: none"> • Depending on duration, vulnerability changes. • More vulnerable: 40% of population is over 65 • More vulnerable: There are several ag fires a year (tractors, hay bales, field fires) most all are mutual aided to Ellendale when Forbes doesn't answer two pages adding up to 15 minutes before Ellendale Fire is paged. • The city has no public works personnel or equipment. All maintenance is contracted out as needed. • More vulnerable: Local Fire department has one tanker, one brush truck, one pumper-the newest is a 1980's model. Most of the departments "able body firemen" work out of town during the days leaving town virtually uncovered. • More vulnerable: Economy relies heavily on farming • Less vulnerable: Burn bans implemented during dry periods • Less vulnerable: City has reserves tanks located in their city hall and has surrounding sloughs as sources of water
Capability	2	<ul style="list-style-type: none"> • The city has fire protection, however, is dependent on access to water. • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

Flood - 11

Impact	4	<ul style="list-style-type: none"> • There are no rivers, most flooding is overland flooding. • Washed out culverts • Cemeteries under water • Water seepage into basements • Blocked roads limit access for emergency services and daily routines. • Increased mosquito population and transmitting of diseases from standing water. • Property and crop damage or loss • Potential loss of life • Flooded roads block bus routes transporting kids to school • Waste water outage • Flat terrane and lakes filled to capacity result in overland flooding due to the lack of rivers.
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Frequency	4	<ul style="list-style-type: none"> • Depends largely on weather patterns but significant flooding to roads, buildings and homes occurs every two to three years
Likelihood	4	<ul style="list-style-type: none"> • Heavy spring melting and heavy rains cause flooding.
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: Ambulances, school buses, fire protection having to detour around flooding • More vulnerable: One highway serves the city on a north and south direction • More vulnerable: Individuals driving on flooded highways • More vulnerable: 40% of population is over 65 • More vulnerable: City lacks equipment and infrastructure and has no public works personnel or equipment. All maintenance is contracted out as needed. • More vulnerable: Lift Station and lagoon would be inundated • More vulnerable: Lack of proper storm water system • More vulnerable: Lack of drain tile in the area • More vulnerable: Individuals living on a road must go 10 miles instead of 5 to go through dry roads. • More vulnerable: Flat area at the base of the hills drain a huge area through town which inundates the town and leaves puddles in low areas and ditches which breeds mosquitos. Overland flooding can damage roads and impede access to rural farms as well as the town. This event happens to some level every spring and after significant rain events. Overland flooding has dropped the occasional power pole resulting in power outages. • More vulnerable: Lack of manpower by the city and public • Less vulnerable: No school within city • Less vulnerable: 2 foot berm surrounding the city constructed by a local resident to shield the city from flood waters during the spring thaw
Capability	2	<ul style="list-style-type: none"> • City does have a flood plan, but it was created in 1980 • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

Hazardous Material Release - 8

Impact	4	<ul style="list-style-type: none"> • Potential loss of life • Crop loss • Livestock loss • Economy loss • Fire potential • Blocked roads leading to loss of mobility • Small size of city could lead to large percentage of population affected
Frequency	2	<ul style="list-style-type: none"> • Minor spills happen yearly • No major occurrences or incidences
Likelihood	2	<ul style="list-style-type: none"> • Minor spills will happen
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: 40% of population is over 65 • More vulnerable: Propane is used for heating alternative • More vulnerable: Trucks and farmers transporting larger tanks more frequently on Highway through the city limits.

		<ul style="list-style-type: none"> • More vulnerable: High Risk of Hazardous chemical release or transportation accident as it is on a major county road as well as a state line road. • More vulnerable: The city has no public works personnel or equipment-all maintenance is contracted out as needed. • More vulnerable: No stockpile of medical supplies
Capability	1	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

Homeland Security Incident – 6

Impact	4	<ul style="list-style-type: none"> • Potential loss of life • Loss of economy • Loss of livestock • Potential for large percentage of population loss • Emergency services could be overwhelmed
Frequency	1	<ul style="list-style-type: none"> • Always a possibility of an event occurring. • No incidents have occurred
Likelihood	1	<ul style="list-style-type: none"> • Always a possibility of an event occurring.
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: Limited mental health services. • More vulnerable: 40% of population is over 65 • More vulnerable: Small town, everyone is impacted, fearful and anxious • More vulnerable: Influx of population from other parts of the U.S. • More vulnerable: No local law enforcement, depends on County Sheriff • Less vulnerable: Sparse population and rural nature of the city • Less vulnerable: No school
Capability	1	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

Severe Summer Weather – 15

Impact	4	<ul style="list-style-type: none"> • Hail damage to homes and community buildings including broken windows, siding and shingles. • Power outages • Economy loss • Lightning strikes cause fires • Potential injury • Potential loss of life • High winds damage property • Heavy rain produces flash flooding • Fire potential if lightning occurs during drought. • Prolonged response times and limited access for emergency services
Frequency	4	<ul style="list-style-type: none"> • Multiple storms are experienced annually causing property damage. • Extreme summer weather seasons occur every two to three years. • In 2010 we bused vulnerable people to Ellendale and sheltered them in a local restaurant meeting area during the days for warmth and hot food.

Likelihood	4	<ul style="list-style-type: none"> • Multiple storms are experienced annually causing property damage. • More intense weather in recent years • More rapid, heavy rain events occurring each year
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: 40% of population is elderly over 65 • More vulnerable: Lack of manpower at emergency services • More vulnerable: Populations that lack a backup power source. • More vulnerable: No local law enforcement, depends on County Sheriff • More vulnerable: No generated public building or storm shelter in town. Area receives 4-5 power outages lasting more than 8 hours and usually at least one which lasts 2-3 days. • More vulnerable: There are two trailer homes in the city • Less vulnerable: Sparse population and rural nature of the city • Less vulnerable: City lacks early warning system and has a radio controlled for remote storm warning. • Less vulnerable: Roads in and out of town are well maintained
Capability	1	<ul style="list-style-type: none"> • Limited tax base • No Building Code enforcement • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

Severe Winter Weather - 13

Impact	3	<ul style="list-style-type: none"> • Ice storms, heavy and blowing snow cause travel issues, power outages, and property damage • Potential isolation of community • Severe low temperatures increase utility costs and affect alternative fuel sources • Potential loss of life • Potential injury • Economy loss • Increased cost for snow removal • Highways and city streets become icy and blocked • Heavy snow results in potential flooding in the spring • City streets build up with compacted snow causing damage to streets • Increased potential for hazardous material release • Temporary outage of emergency services
Frequency	4	<ul style="list-style-type: none"> • Occurs annually, few years without severe winter weather • Years with multiple winter events are the normal
Likelihood	4	<ul style="list-style-type: none"> • Will happen in the future due to the climate, occurs annually
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: 40% of population is elderly over 65 • More vulnerable: Lack of manpower at emergency services • More vulnerable: No local law enforcement, depends on County Sheriff which takes a minimum of one half hour to arrive. EMS is out of Ellendale again twenty minute response on a good weather day. • More vulnerable: Removal of shelter belts increases ground blizzard conditions • More vulnerable: There are two mobile homes in the area

		<ul style="list-style-type: none"> • Less vulnerable: City lacks early warning system and has a radio controlled for remote storm warning. • Less vulnerable: Small community where neighbors help neighbors
Capability	2	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • There are a few certified, trained and equipped citizens in the community

Shortage or Outage of Critical Materials or Infrastructure – 14

Impact	4	<ul style="list-style-type: none"> • Long periods of time without power or water could lead to loss of life, due to the winter climate and high population over 65. • Reduced mobility from blocked roads • Limited drinking water and functionality of sanitary sewer • City could be left without power for heating and cooling • Loss of power can limit accessibility to fuel sources • Loss of food sources as refrigeration units are without power • Loss of economy • Loss of internet affects individuals and businesses • Delayed emergency services • Mail outages for a day or longer in winter of 2016-2017
Frequency	4	<ul style="list-style-type: none"> • 2009 during an outage of electric elderly residents were taken to Ellendale • In 2016, areas in and surrounding Forbes experienced power outages from 3 hours to 2 to 3 days without power • Short-term power outages are experienced annually
Likelihood	4	<ul style="list-style-type: none"> • No improvements to power infrastructure planned - Located on the end of the MDU transmission line and there are no plans to improve or duplicate service • Power poles and wires of the power grid are outdated and overhead
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: 40% of population is elderly over 65 • More vulnerable: No backup generator for city infrastructure may cause sewer backup or outage of drinking water • More vulnerable: 11 electricity dependent vulnerable populations that need electricity to run medical devices to live. Per the publichealthemergency.gov Empower map. • More vulnerable: No public fueling capacity. • More vulnerable: No medical facility • More vulnerable: Access to rural areas limited during a blizzard • More vulnerable: No generated public building or storm shelter in town. • Less vulnerable: Some residents grow local food supply • Less vulnerable: Water is provided by the city • Less vulnerable: Some residents have their own generator • Less vulnerable: There is a non-profit grocery store located in the city
Capability	1	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

Transportation Accident - 9

Impact	4	<ul style="list-style-type: none"> • Potential loss of life • Potential injury • Economy loss • Property loss • Potential hazardous materials release • Potential fire
Frequency	2	<ul style="list-style-type: none"> • No major accidents in the area in recent years
Likelihood	3	<ul style="list-style-type: none"> • No major accidents in the area in recent years
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: 40% of population is over 65 • More vulnerable: Increased amount of time students spend on buses • More vulnerable: Trucks and farmers transporting larger tanks more frequently on Hwy 30 through the city limits. • More vulnerable: Anhydrous tanks driven through and parked in the city. • More vulnerable: No medical supplies in stock • More vulnerable: Fire Department has no equipment for accident extraction • More vulnerable: County Highway 2 traverses the city, people are not obeying the signs or speed laws • More vulnerable: No local law enforcement, depends on County Sheriff • Less vulnerable: No airport • Less vulnerable: City lacks early warning system and has a radio controlled for remote storm warning.
Capability	1	<ul style="list-style-type: none"> • Fire Department has no extraction capabilities for grain bin and vehicle accidents. • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

Urban Fire/Structure Collapse - 10

Impact	4	<ul style="list-style-type: none"> • Potential loss of life • Property loss • Building loss • Economy loss • Loss of community assets • Loss of critical facilities and infrastructure • Potential temporary homeless population due to lack of alternative housing
Frequency	2	<ul style="list-style-type: none"> • No severe structure fires or collapses in recent history
Likelihood	3	<ul style="list-style-type: none"> • No severe structure fires or collapses in recent history
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: City does not have extensive fire suppression capabilities • More vulnerable: Older homes with older wiring • More vulnerable: Several large structures in the city are abandoned and hazard could go unnoticed or an extended period of time. • More vulnerable: Spacing of houses could lead to loss of multiple structures

		<ul style="list-style-type: none"> • More vulnerable: Lack of alternative housing for displaced residents • More vulnerable: Distance from neighboring fire departments can lead to more issues and prolonged response times • More vulnerable: Lack of break between crops and city • Less vulnerable: Local fire department • Less vulnerable: City lacks early warning system and has a radio controlled for remote storm warning. • Less vulnerable: City has water storage tank providing water backup for fire suppression.
Capability	2	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • Mutual Aid with Ellendale and Fredrick, SD • More vulnerable: Their fire siren can be radio activated by Dickey County Emergency Management for storm warning use

Wildland Fire - 8

Impact	4	<ul style="list-style-type: none"> • Economy loss • Crop and Bale loss • Graze land loss • Farm equipment loss • Livestock loss • Potential loss of life • Potential injury • Potential hazardous material release • Health hazard due to poor air quality • Loss of wildlife habitat • Farm equipment, lightning strikes, power line sparks, and controlled burns cause fires
Frequency	2	<ul style="list-style-type: none"> • Wildland fires occur annually due to climate and economy.
Likelihood	3	<ul style="list-style-type: none"> • With continued controlled burns by farmers there is always a possibility for the hazard in the future • Dry conditions experienced annually for a couple weeks • Farm equipment, lightning strikes, power line sparks, and controlled burns cause fires annually.
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: Farmland and open areas • More vulnerable: Mutual aid fire department response times lengthen. • More vulnerable: Windy conditions each year • More vulnerable: Lack reliable source of water for fire suppression • More vulnerable: Strain on local fire departments and resources • More vulnerable: Lack of fire break around the city • More vulnerable: Age of structures and wiring • Less vulnerable: Decreasing CRP • Less vulnerable: City maintains overgrown lots
Capability	2	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance

		<ul style="list-style-type: none"> • Lacks resources to accomplish projects independently • There are few certified trained and equipped citizens in the community • Mutual Aid with Ellendale and Fredrick, SD
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Windstorm - 12

Impact	3	<ul style="list-style-type: none"> • Downed trees • Buildings loss • Downed power poles and lines • Economy loss • Damage to homes and community buildings such as broken windows, loss of shingles • Potential loss of life • Potential injury • Potential structure fires • Contributes to spread of wildland fire • City has lost many trees, buildings and structures due to high winds. • Straight line winds occur in summer months
Frequency	3	<ul style="list-style-type: none"> • Hazard occurs multiple times each year and is a secondary result from severe summer weather or severe winter weather. • Strong winds are common in the city in all weather conditions • Blizzard conditions occur frequently in winter months due to climate • Power lines are damaged causing outages annually
Likelihood	3	<ul style="list-style-type: none"> • Strong winds are common in the city in all weather conditions
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: There are two trailer homes in the city • More vulnerable – loss of trees leads to more ground blizzard conditions • More vulnerable: Power lines providing power to the city are not buried • Less vulnerable: Residents have equipment to clear debris or move snow • More vulnerable: Age of structures and housing stock • More vulnerable: Has not adopted state building codes • Less vulnerable: City has an inert landfill for debris and branches
Capability	1	<ul style="list-style-type: none"> • Mutual aid agreements for emergency services • Active county commission • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

8.2.3 Mitigation Strategy

Problem Statement

The city of Forbes identified its high senior population and isolated populations in the surrounding countryside as necessary to mitigate impacts from severe summer weather, severe winter weather, windstorm, flood, and shortage or outage of critical materials or infrastructure. The lack of a storm water system is inadequate as overland flooding occurs on an annual basis in certain areas. The emergency siren is located at the fire hall. It is radio control activated but needs to be upgraded with a siren that could be activated by dispatch. There are no dispatch fire sirens in our area. The siren is radio controlled for remote storm warning. Due to the location of the city, isolation from severe weather and shortage or

outage of critical materials or infrastructure such as emergency services, power, and roads is frequent. The number of abandoned buildings, single-family homes, and aging structures increase the impact of and vulnerability to communicable disease, urban fire/structure collapse, wildland fire and windstorm. The increase in economic activity in the area, farmers hauling anhydrous and other materials to and from farm sites through the City, and increased storage of chemicals on farm sites used for agriculture production increases the impact of and vulnerability to hazardous material release, homeland security incident, and transportation accident.

8.2.4 Mitigation Capability Assessment

Capability for mitigation is divided into four categories: Administrative and Technical, Education and Outreach, Financial, and Planning and Regulatory.

Administrative and Technical: Identification of administrative and technical capabilities, which include: staff, their skills and tools for mitigation planning to implement specific mitigation actions.

Education and Outreach: Identification of education and outreach programs, and methods already in place to implement mitigation activities and communicate hazard-related information.

Financial: Identification of access to or eligibility to use funding resources for hazard mitigation for jurisdictions.

Planning and Regulatory: Jurisdictional plans, policies, codes, and ordinances adopted and in place that prevent and reduce the impacts of hazards.

Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. Information on the capabilities of the city was gathered at its jurisdictional meeting, committee meetings, and interviews during the planning process. Tables comparing the mitigation capabilities of the city of Forbes with all other jurisdictions in the county can be found in Chapter 7, County Mitigation Capability Assessment.

Administrative and Technical

The following narrative details the administrative and technical capabilities of the city of Forbes.

The city of Forbes has an active city council. The city does not have a chief building official or inspector. The city has an LEPC through the county. The city does not have a civil engineer on staff but does have the option to contract for engineering services when needed. Emergency management is available through the county. The city can contract with the SCDRC or a private firm for planning, grant writing and grant administration services. The city conducts infrastructure maintenance on an as-needed basis. The city council staff and fire department volunteers have administration capabilities for mitigation. The Dickey County Sheriff and the N.D. State Highway Patrol assist in law enforcement. The city has an emergency siren located on top of the fire hall, is adequate as it is radio-activated. The city does not have generators. The city fire department does have a fire index sign. There is no ambulance service in the city of Forbes. The auditor reports hazard data to the emergency manager.

Education and Outreach

The following narrative details the education and outreach capabilities of the city of Forbes.

The city does not have non-profit organizations providing education on hazards, but has access to the NDSU/Dickey County Extension Service. The city does not maintain a website with hazard education. The city does not have any entities providing public education on hazards, but has access to the

NDSU/Dickey County Extension Service, Dickey District Health Unit, and Dickey County Emergency Management for public education on hazards. The city does not conduct events on hazard education. There are no public-private partnerships providing education and outreach on hazards. Dickey County Emergency Management conducts education and outreach on hazards in the city.

Financial

The following narrative details the financial capabilities of the city of Forbes.

The city does not set aside tax revenue for capital improvements. The city does not have storm water utility fees as it lacks a storm water system. The city does not levy special assessments for new development. Forbes meets the low-to-moderate income ratio requirement of the CDBG program. The city does not have any private entities providing funding for mitigation. The rural electric cooperative for the surrounding area, water resource board, and surrounding township and school district are other sources of funding for mitigation.

Planning and Regulatory

The following narrative details the planning and regulatory capabilities of the city of Forbes.

The city does not have a capital improvements, comprehensive, drought management, land use, storm water, strategic, or water conservation plan. The city does not have a flood damage reduction study, flood insurance study, or impact fees. The city has not adopted state building codes. The city is not FEMA flood mapped.

Plan Maintenance

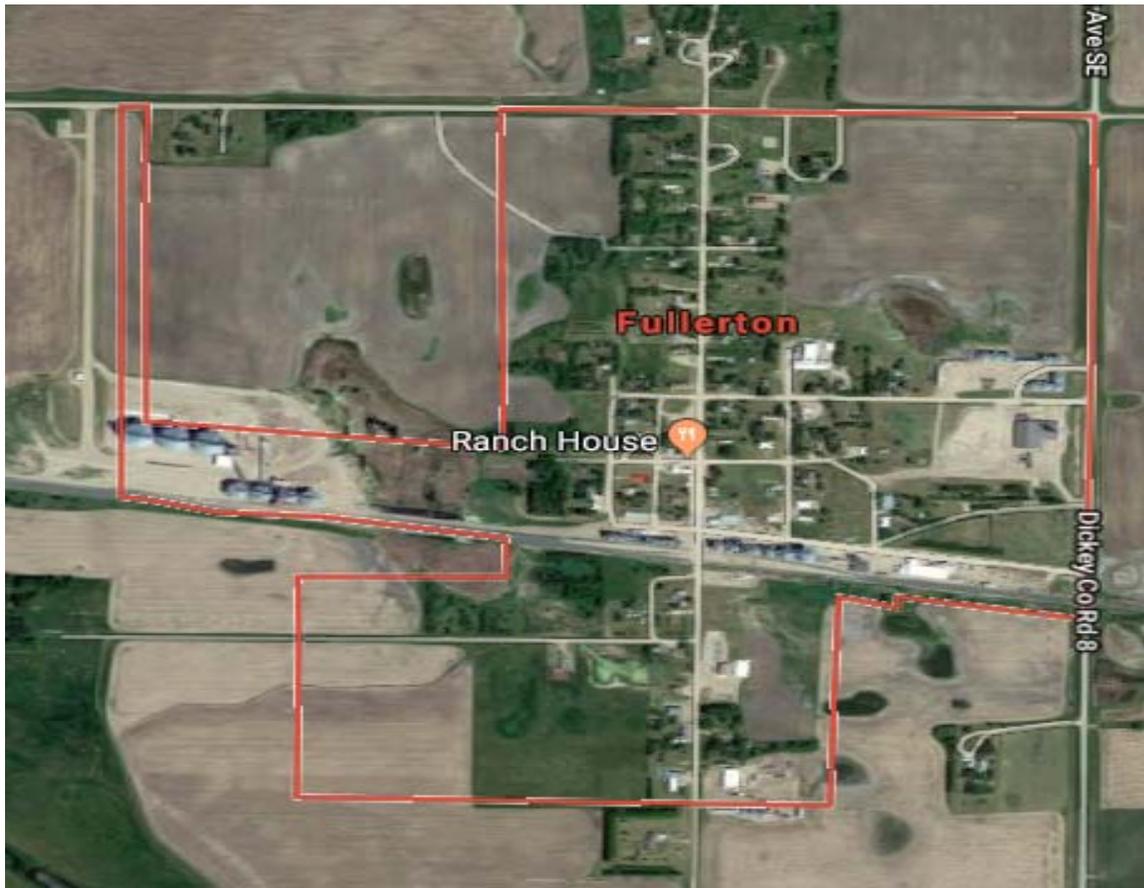
An important aspect of any useable plan is the maintenance and upkeep of the document. At any given time, planning, risk analysis, updating the situation assessment, research, coordinating, disaster response or other activity is occurring. Plan maintenance ensures the plan will remain useful in the county for many years. A mitigation action progress report form to conduct plan maintenance is in Chapter 10 of this plan.

DRAFT

8.3 City of Fullerton

The profile and inventory, risk assessment and hazard scoring notes, mitigation projects, and capabilities for mitigation are shown in sections 8.3.1, 8.3.2, 8.3.3, and 8.3.4. Figure 8.3.1 shows an aerial view of the city of Fullerton.

Figure 8.3.1 – City of Fullerton



8.3.1 Profile and Inventory

The location, total population, vulnerable populations, housing units, services, jurisdictional buildings, emergency response services and utilities of the city of Fullerton. Detailed narratives follow each section heading to profile the city. Additional information on the city of Fullerton and Dickey County can be found in Chapter 4, Profile and Inventory.

Location

The city of Fullerton is located at the intersections of 94th Ave SE and 87th Street SE, approximately 16 miles northeast of Ellendale and about 17 miles west of Oakes in Dickey County.

Population

The population is 54 per the 2010 U.S. Decennial Census.

Vulnerable Populations

As of the census[2] of 2010, there were 54 people, 31 households, and 14 families residing in the city. The population density was 138.5 inhabitants per square mile (53.5/km²). There were 39 housing units at an average density of 100.0 per square mile (38.6/km²).

There were 31 households of which 9.7% had children under the age of 18 living with them, 32.3% were married couples living together, 3.2% had a female householder with no husband present, 9.7% had a male householder with no wife present, and 54.8% were non-families. 51.6% of all households were made up of individuals and 16.2% had someone living alone who was 65 years of age or older. The average household size was 1.74 and the average family size was 2.50.

The median age in the city was 49 years. 14.8% of residents were under the age of 18; 7.5% were between the ages of 18 and 24; 22.2% were from 25 to 44; 29.7% were from 45 to 64; and 25.9% were 65 years of age or older. The gender makeup of the city was 57.4% male and 42.6% female.

Housing Units and Household Size

As of the census of 2000, there were 85 people, 36 households, and 20 families residing in the city. The population density was 238.1 people per square mile (91.2/km²). There were 39 housing units at an average density of 109.2 per square mile (41.8/km²).

There were 36 households out of which 33.3% had children under the age of 18 living with them, 44.4% were married couples living together, 5.6% had a female householder with no husband present, and 44.4% were non-families. 41.7% of all households were made up of individuals and 27.8% had someone living alone who was 65 years of age or older. The average household size was 2.36 and the average family size was 3.40.

Publicly Owned Jurisdictional Buildings

There are no public buildings in the city of Fullerton and no official Red Cross storm shelter, or armory.

Nothing generated

Services Provided

The city of Fullerton obtains potable water from SE water coop. The city has a sanitary sewer system and lagoon. The sanitary sewer system is served by two lift stations. The city does not have a storm water system. Gahner Sanitation - Fullerton provides garbage sanitation services. The official newspaper is the Dickey County Leader.

Emergency Response Services

Law enforcement is provided by Oakes and Fullerton, ND The sheriff's office is located in Ellendale, ND. The city has no fire department or EMS available. Fire and ambulance service come from Oakes.

Utility Providers

Potable water is provided by the city SE Water Coop. Water. Electricity is provided by Montana Dakota Utilities. Natural gas is not available in the city of Fullerton. Fuel oil and propane are used as an alternative heating source and is provided by companies chosen by the individual consumer. Cable,

internet, and phone service is provided by DRN, AT&T and Verizon. Individual homes may choose to subscribe to direct broadcast satellite service providers or use an antenna to receive over the air programming.

8.3.2 Risk Assessment and Hazard Scoring Notes

Table 8.3.2 summarizes the risk assessment scoring of the city of Fullerton. The risk assessment and hazard scoring notes from the jurisdictional meeting for each hazard are shown after Table 8.3.2.

Table 8.3.2 – City of Fullerton Jurisdiction Risk Assessment Scoring Summary

Risk Assessment						
<u>Hazard</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<u>Total</u>
Communicable Disease	1	2	2	1	1	5
Drought	4	1	2	3	1	9
Flood	4	4	4	1	1	12
Hazardous Material Release	4	1	2	2	2	7
Homeland Security Incident	3	1	1	1	1	5
Severe Summer Weather	3	4	4	4	1	14
Severe Winter Weather	3	4	4	4	2	13
Shortage or Outage of Critical Materials or Infrastructure	4	4	4	1	1	12
Transportation Accident	4	2	3	1	1	9
Urban Fire/Structure Collapse	3	2	3	4	2	10
Wildland Fire	3	2	3	4	2	10
Windstorm	3	4	4	2	1	12

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

City of Fullerton– Hazard Scoring

Communicable Disease - 5

Impact	1	<ul style="list-style-type: none"> • U.S. declared an H1N1 was a declared pandemic in 2009. • U.S. experienced a vaccine shortage in 2009. • Potential loss of life • Entire City could be impacted by an outbreak
Frequency	2	<ul style="list-style-type: none"> • Seasonal flu happens every year. • Crop and localized livestock loss occur every year to a varying degree
Likelihood	2	<ul style="list-style-type: none"> • Seasonal flu happens every year • Tuberculosis and rabies are very low numbers for the area
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: 25.9% of population is over 65 • More vulnerable: Some abandoned buildings and homes in town • More vulnerable: No stockpile of medical supplies • More vulnerable: The city has no medical facilities, public fueling capacity or public lodging. • More vulnerable: Some lots in town are overgrown with vegetation • More vulnerable: Blighted structures occupied by individuals who hoard or collect • More vulnerable: Dependent on vaccines being developed for any new viruses and picking the right strains of flu for the flu vaccine. • Less vulnerable: Residents mow lawns to keep vegetation under control

		<ul style="list-style-type: none"> • Less vulnerable: Small gathering spaces such as Ranch House and Carroll House, limiting spread of disease as gathering of large crowds does not occur • Less vulnerable: Increased awareness and education of city residents • Less vulnerable: City mows overgrown lots • Less vulnerable: Internet connections and TV help inform residents • Less vulnerable: Fire Service and First Responders
Capability	1	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish large projects independently

Drought - 9

Impact	4	<ul style="list-style-type: none"> • Possible economic loss • Range Land Fire Index Used • Burn bans happened in 2016 • Hay shortages during times of drought impact livestock. • Loss of farm economy impacts service industries • Water holes that supply livestock are impacted
Frequency	1	<ul style="list-style-type: none"> • Drought possible every year. • Last dry conditions were spring 2013, but last real drought was in 1988 • Dickey County was very dry during the 1980's. • 1988 was an especially dry year, along with 2016.
Likelihood	2	<ul style="list-style-type: none"> • Cyclical pattern to rains normally wetter in the east than in the west. 2016 this pattern was reversed. • High possibility of drought in any year due to the soil conditions.
Vulnerability	3	<ul style="list-style-type: none"> • Depending on duration, vulnerability changes. • More vulnerable: 25.9% of population is over 65 • More vulnerable: There are several ag fires a year (tractors, hay bales, field fires) Fire response is 20 min away coming from Oakes • More vulnerable: The city has no public works personnel or equipment. All maintenance is contracted out as needed. • More vulnerable: There is no fire, EMS or law in Fullerton. All responders come from Oakes with a 20 minute average response • More vulnerable: There is no public works personnel or equipment-all maintenance is contracted out as needed. • More vulnerable: Economy relies heavily on farming • More vulnerable: City does not have water reserves, such as a water tower • Less vulnerable: City purchased floating pumps and discharge hoses to use in pumping water for general use. • Less vulnerable: Burn bans implemented during dry periods
Capability	1	<ul style="list-style-type: none"> • The city has NO fire protection, however, is dependent on access to water. • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

Flood - 12

<p>Impact</p>	<p>4</p>	<ul style="list-style-type: none"> • Overland flooding is not much of an issue for the town as it is on high ground directly off the major North/South county road DC8. Areas surrounding the town suffer from damaged roads, bridges and culverts creating emergency access problems as well as the occasional downed power lines • Washed out culverts • Water seepage into basements • Blocked roads limit access for emergency services and daily routines. • Increased mosquito population and transmitting of diseases from standing water. • Property and crop damage or loss • Potential loss of life • Flooded roads block bus routes transporting kids to school • Wastewater outage • Flat terrane and lakes filled to capacity result in overland flooding due to the lack of rivers.
<p>Frequency</p>	<p>4</p>	<ul style="list-style-type: none"> • Depends largely on weather patterns • City has lost power lines three times in recent years from flooding
<p>Likelihood</p>	<p>4</p>	<ul style="list-style-type: none"> • Heavy spring melting and heavy rains cause flooding.
<p>Vulnerability</p>	<p>1</p>	<ul style="list-style-type: none"> • More vulnerable: Ambulances, school buses, fire protection having to detour around flooding. • More vulnerable: Individuals driving on flooded highways • More vulnerable: 25.9% of population is over 65 • More vulnerable: City lacks equipment and infrastructure and has no public works personnel or equipment. All maintenance is contracted out as needed. • More vulnerable: septic tanks can become inundated • More vulnerable: Lack of proper storm water system • More vulnerable: Lack of drain tile in the area • More vulnerable: Individuals living on a road must go 10-20 miles instead of 5 to go through dry roads. • More vulnerable: Flat area at the base of the hills drain a huge area through town which inundates the town and leaves puddles in low areas and ditches which breeds mosquitos. Overland flooding has dropped the occasional power pole resulting in power outages. • More vulnerable: City becomes an island for up to a week or more when the Maple River leaves its banks. Often this occurs with accompanying power failures due to down lines. • More vulnerable: Lack of manpower by the city and public • Less vulnerable: No school within city • Less vulnerable: City has installed drain tile on Monroe Street and the likelihood of overland flooding in the city is somewhat diminished
<p>Capability</p>	<p>1</p>	<ul style="list-style-type: none"> • No flood plan • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

Hazardous Material Release - 7

Impact	4	<ul style="list-style-type: none"> • Potential loss of life • Crop loss • Livestock loss • Economy loss • Fire potential • Blocked roads leading to loss of mobility • Small size of city could lead to large percentage of population affected
Frequency	1	<ul style="list-style-type: none"> • Minor spills happen yearly • No major occurrences or incidences
Likelihood	2	<ul style="list-style-type: none"> • Minor spills will happen
Vulnerability	2	<ul style="list-style-type: none"> • More vulnerable: 25.9% of population is over 65 • More vulnerable: Propane is used for heating alternative • More vulnerable: Trucks and farmers transporting larger tanks more frequently on highways through the city limits. • More vulnerable: Anhydrous tanks driven through and parked in the city. • More vulnerable: The city has no public works personnel or equipment- all maintenance is contracted out as needed. • More vulnerable: No stockpile of medical supplies
Capability	2	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

Homeland Security Incident – 5

Impact	3	<ul style="list-style-type: none"> • Potential loss of life • Loss of economy • Loss of livestock • Potential for large percentage of population loss • Emergency services could be overwhelmed
Frequency	1	<ul style="list-style-type: none"> • Always a possibility of an event occurring. • No incidents have occurred
Likelihood	1	<ul style="list-style-type: none"> • Always a possibility of an event occurring.
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: Limited mental health services or medical facilities • More vulnerable: 25.9% of population is over 65 • More vulnerable: Small town, everyone is impacted, fearful and anxious • More vulnerable: Influx of population from other parts of the U.S. • More vulnerable: No local law enforcement, depends on County Sheriff • Less vulnerable: Sparse population and rural nature of the city • Less vulnerable: City has neighborhood watch program in place • Less vulnerable: No school in city
Capability	1	<ul style="list-style-type: none"> • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

Severe Summer Weather - 14

Impact	3	<ul style="list-style-type: none"> • Hail damage to homes and community buildings including broken windows, siding and shingles. • Power outages • Economy loss • Lightning strikes cause fires • Potential injury • Potential loss of life • High winds damage property • Heavy rain produces flash flooding • Fire potential if lightning occurs during drought. • Prolonged response times and limited access for emergency services
Frequency	4	<ul style="list-style-type: none"> • Multiple storms are experienced annually causing property damage. • Extreme summer weather seasons occur every two to three years.
Likelihood	4	<ul style="list-style-type: none"> • Multiple storms are experienced annually causing property damage. • More intense weather in recent years • More rapid, heavy rain events occurring each year
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: 25.9% of population is elderly over 65 • More vulnerable: Lack of manpower at emergency services • More vulnerable: Populations that lack a backup power source. • More vulnerable: No local law enforcement, depends on County Sheriff • More vulnerable: No generated public building or storm shelter in town. Area receives 4-5 power outages lasting more than 8 hours and usually at least one which lasts 2-3 days. In 2010 we bused vulnerable people to Ellendale and sheltered them in a local restaurant meeting area during the days for warmth and hot food. • Less vulnerable: Sparse population and rural nature of the city • Less vulnerable: City lacks early warning system and has a radio controlled for remote storm warning. • Less vulnerable: Roads in and out of town are well maintained • Less vulnerable: Residents possess equipment to clean up debris
Capability	1	<ul style="list-style-type: none"> • Limited tax base • No Building Code enforcement • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • City has a radio operated storm siren operated by Dickey County Emergency Management.

Severe Winter Weather - 13

Impact	3	<ul style="list-style-type: none"> • Ice storms, heavy and blowing snow cause travel issues, power outages, and property damage • Potential isolation of community • Severe low temperatures increase utility costs and affect alternative fuel • Potential loss of life • Potential injury • Economy loss • Increased cost for snow removal
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		<ul style="list-style-type: none"> • Highways and city streets become icy and blocked • Heavy snow results in potential flooding in the spring • City streets build up with compacted snow causing damage to streets • Increased potential for hazardous material release • Temporary outage of emergency services
Frequency	4	<ul style="list-style-type: none"> • Occurs annually, few years without severe winter weather • Years with multiple winter events are the normal
Likelihood	4	<ul style="list-style-type: none"> • Will happen in the future due to the climate, occurs annually
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: 25.9% of population is elderly over 65 • More vulnerable: Lack of manpower at emergency services • More vulnerable: No city equipment • More vulnerable: No local law enforcement, depends on County Sheriff • More vulnerable: Removal of shelter belts increases ground blizzard • Less vulnerable: City lacks early warning system and has a radio controlled for remote storm warning. • Less vulnerable: Small community where neighbors help neighbors
Capability	2	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • There are a few certified, trained and equipped citizens in the community • City has a radio operated storm siren operated by Dickey County Emergency Management

Shortage or Outage of Critical Materials or Infrastructure – 12

Impact	4	<ul style="list-style-type: none"> • Long periods of time without power or water could lead to loss of life, due to the winter climate and high population over 65. • Reduced mobility from blocked roads • Limited drinking water and functionality of sanitary sewer • City could be left without power for heating and cooling • Loss of power can limit accessibility to fuel sources • Loss of food sources as refrigeration units are without power • Loss of economy • Loss of internet affects individuals and businesses • Delayed emergency services • Mail outages for a day or longer in winter of 2016-2017
Frequency	4	<ul style="list-style-type: none"> • Short-term power outages are experienced annually
Likelihood	4	<ul style="list-style-type: none"> • No improvements to power infrastructure planned • Power poles and wires of the power grid are outdated/suspended
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: 25.9% of population is elderly over 65 • More vulnerable: No backup generator for city infrastructure may cause sewer backup or outage of drinking water • More vulnerable: 11 electricity dependent vulnerable populations that need electricity to run medical devices to live. Per the publichealthemergency.gov Empower map. • More vulnerable: No public fueling capacity or public lodging • More vulnerable: No fire, EMS or law in town. • More vulnerable: Access to rural areas limited during a blizzard

		<ul style="list-style-type: none"> • More vulnerable: No generated public building or storm shelter in town. • Less vulnerable: Some residents grow local food supply • Less vulnerable: Water is provided by the city • Less vulnerable: Some residents have their own generator
Capability	1	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • City has a radio operated storm siren operated by Dickey County Emergency Management

Transportation Accident - 9

Impact	4	<ul style="list-style-type: none"> • Potential loss of life • Potential injury • Economy loss • Property loss • Potential hazardous materials release • Potential fire
Frequency	2	<ul style="list-style-type: none"> • No major accidents in the area in recent years
Likelihood	3	<ul style="list-style-type: none"> • No major accidents in the area in recent years
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: 25.9% of population is over 65 • More vulnerable: Increased amount of time students spend on buses • More vulnerable: Trucks and farmers transporting larger tanks more frequently on highways and through the city limits. • More vulnerable: Anhydrous tanks driven through and parked in the city • More vulnerable: No medical supplies in stock • More vulnerable: Fire Department has no equipment for extraction • More vulnerable: No local law enforcement, depends on County Sheriff • Less vulnerable: No airport • Less vulnerable: City lacks early warning system
Capability	1	<ul style="list-style-type: none"> • First Responder Group in Ellendale and Oakes • City has a radio operated storm siren operated by Dickey County Emergency Management • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

Urban Fire/Structure Collapse - 10

Impact	3	<ul style="list-style-type: none"> • Potential loss of life • Property loss • Building loss • Economy loss • Loss of community assets • Loss of critical facilities and infrastructure • Potential temporary homeless population due to lack of alternative housing
Frequency	2	<ul style="list-style-type: none"> • Two house fires have occurred annually in the past five years.

		<ul style="list-style-type: none"> • Bans are issued frequently according to the ND Fire Index
Likelihood	3	<ul style="list-style-type: none"> • City has experienced dryer fires at the elevator • Bans are issued frequently according to the ND Fire Index.
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: Older homes with older wiring • More vulnerable: Seasonal homes unoccupied • More vulnerable: Spacing of houses could lead to loss of multiple structures • More vulnerable: No crop break around the city and crops grown in city limits • More vulnerable: Lack of alternative housing for displaced residents • More vulnerable: Distance from neighboring fire departments can lead to more issues and prolonged response times. • Less vulnerable: City has a radio controlled for remote storm warning. • Less vulnerable: Have been able to contain fires to one building • Less vulnerable: City Fire Department • Less vulnerable: Elevator in the city has a 3,000 gallon water tank • Less vulnerable: Fire department has 300, 500, and 2,000 gallon trucks • Less vulnerable: City participates in mutual aid agreements
Capability	2	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • Mutual Aid with Ellendale • City has a radio operated storm siren operated by Dickey County Emergency Management

Wildland Fire - 7

Impact	3	<ul style="list-style-type: none"> • Economy loss • Crop and Bale loss • Graze land loss • Farm equipment loss • Livestock loss • Potential loss of life • Potential injury • Potential hazardous material release • Health hazard due to poor air quality • Loss of wildlife habitat • Farm equipment, lightning strikes, power line sparks, and controlled burns cause fires
Frequency	2	<ul style="list-style-type: none"> • Wildland fires occur annually due to climate and economy.
Likelihood	3	<ul style="list-style-type: none"> • With continued controlled burns by farmers there is always a possibility for the hazard in the future • Dry conditions experienced annually for a couple weeks • Farm equipment, lightning strikes, power line sparks, and controlled burns cause fires annually.
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: Farmland and open areas • More vulnerable: Mutual aid fire department response times lengthen. • More vulnerable: Windy conditions each year

		<ul style="list-style-type: none"> • More vulnerable: Lack reliable source of water for fire suppression • More vulnerable: Strain on local fire departments and resources • More vulnerable: Spacing of houses could lead to loss of multiple structures • More vulnerable: Lack of fire break around the city • More vulnerable: Age of structures and wiring • More vulnerable: Lack reliable source of water for fire suppression • More vulnerable: Slough with cattails on one side and corn is grown • Less vulnerable: City has a volunteer fire department • Less vulnerable: 300, 500 and 2,000 gallon water trucks • Less vulnerable: Elevator in the city also has a 3,000 gallon water holding tank.
Capability	2	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • There are few certified trained and equipped citizens in the community • Mutual Aid with Ellendale

Windstorm - 12

Impact	3	<ul style="list-style-type: none"> • Downed trees • Buildings loss • Downed power poles and lines • Economy loss • Damage to homes and community buildings such as broken windows, loss of shingles • Potential loss of life • Potential injury • Potential structure fires • Contributes to spread of wildland fire • City has lost many trees, buildings and structures due to high winds. • Increase in traffic accidents from low visibility during severe summer and/or winter weather • Straight line winds occur in summer months
Frequency	3	<ul style="list-style-type: none"> • Hazard occurs multiple times each year and is a secondary result from severe summer weather or severe winter weather. • Strong winds are common in the city in all weather conditions • Blizzard conditions occur frequently in winter months due to climate • Power lines are damaged causing outages annually
Likelihood	3	<ul style="list-style-type: none"> • Strong winds are common in the city in all weather conditions
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: There are two trailer homes in the city • More vulnerable: Loss of trees leads to more ground blizzard conditions • More vulnerable: Power lines providing power to the city are not buried • Less vulnerable: Residents have equipment to clear debris or move snow • More vulnerable: Age of structures and housing stock • More vulnerable: Has not adopted state building codes • Less vulnerable: City has an inert landfill for debris and branches • Less vulnerable: City has a volunteer fire department

Capability	1	<ul style="list-style-type: none"> • Capabilities to respond, but nothing can be done to prepare. • LEPC – Local Emergency Planning Committee • Mutual aid agreements for emergency services • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • City has a radio operated storm siren operated by Dickey County Emergency Management
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8.3.3 Mitigation Strategy

This update of the Dickey County Multi-Jurisdictional Multi-Hazard Plan includes a mitigation strategy consisting of five goals in Chapter 6.

Problem Statement

The city of Fullerton identified its high senior population and isolated populations in the surrounding countryside as necessary to mitigate impacts from severe summer weather, severe winter weather, windstorm, flood, and shortage or outage of critical materials or infrastructure. The lack of a storm water system is inadequate as overland flooding occurs on an annual basis in certain areas. The emergency siren is located at the fire hall. It is radio control activated but needs to be upgraded with a siren that could be activated by dispatch. The siren is radio controlled for remote storm warning. Due to the location of the city, isolation from severe weather and shortage or outage of critical materials or infrastructure such as emergency services, power, and roads is frequent. The number of abandoned buildings, single-family homes, and aging structures increase the impact of and vulnerability to communicable disease, urban fire/structure collapse, wildland fire and windstorm. The increase in economic activity in the area, farmers hauling anhydrous and other materials to and from farm sites through the City, and increased storage of chemicals on farm sites used for agriculture production increases the impact of and vulnerability to hazardous material release, homeland security incident, and transportation accident.

8.3.4 Mitigation Capability Assessment

Capability for mitigation is divided into four categories: Administrative and Technical, Education and Outreach, Financial, and Planning and Regulatory.

Administrative and Technical: Identification of administrative and technical capabilities, which include: staff, their skills and tools for mitigation planning to implement specific mitigation actions.

Education and Outreach: Identification of education and outreach programs, and methods already in place to implement mitigation activities and communicate hazard-related information.

Financial: Identification of access to or eligibility to use funding resources for hazard mitigation for jurisdictions.

Planning and Regulatory: Jurisdictional plans, policies, codes, and ordinances adopted and in place that prevent and reduce the impacts of hazards.

Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. Information on the capabilities of the city was gathered at its jurisdictional meeting, committee meetings, and interviews during the planning process. Tables comparing the mitigation capabilities of the city of Fullerton with all other jurisdictions in the county can be found in Chapter 7, County Mitigation Capability Assessment.

Administrative and Technical

The following narrative details the administrative and technical capabilities of the city of Fullerton.

The city of Fullerton has an active city council. The city does not have a chief building official or inspector. The city has an LEPC through the county. The city does not have a civil engineer on staff but does have the option to contract for engineering services when needed. Emergency management is available through the county. The city can contract with the SCDRC or a private firm for planning, grant writing and grant administration services. The city conducts infrastructure maintenance on an as-needed basis. The city council staff and fire department volunteers have administration capabilities for mitigation. The Dickey County Sheriff and the N.D. State Highway Patrol assist in law enforcement. The city does not have generators. There is no ambulance service in the city of Fullerton. The auditor reports hazard data to the emergency manager. There is no fire, EMS or law enforcement in Fullerton.

Education and Outreach

The following narrative details the education and outreach capabilities of the city of Fullerton.

The city does not have non-profit organizations providing education on hazards but has access to the NDSU/Dickey County Extension Service; does not maintain a website with hazard education; have any entities providing public education on hazards but has access to the NDSU/Dickey County Extension Service, Dickey District Health Unit, and Dickey County Emergency Management for public education on hazards. The city does not conduct events on hazard education and no public-private partnerships providing education and outreach on hazards. Dickey County Emergency Management conducts education and outreach on hazards in the city.

Financial

The following narrative details the financial capabilities of the city of Fullerton.

The city does not set aside tax revenue for capital improvements. The city does not have storm water utility fees as it lacks a storm water system. The city does not levy special assessments for new development. Fullerton meets the low-to-moderate income ratio requirement of the CDBG program. The city does not have any private entities providing funding for mitigation. The rural electric cooperative for the surrounding area, water resource board, and surrounding township and school district are other sources of funding for mitigation.

Planning and Regulatory

The city does not have a capital improvement, comprehensive, drought management, land use, storm water, strategic, or water conservation plan. The city does not have a flood damage reduction study, flood insurance study, or impact fees. The city is FEMA flood mapped.

Plan Maintenance

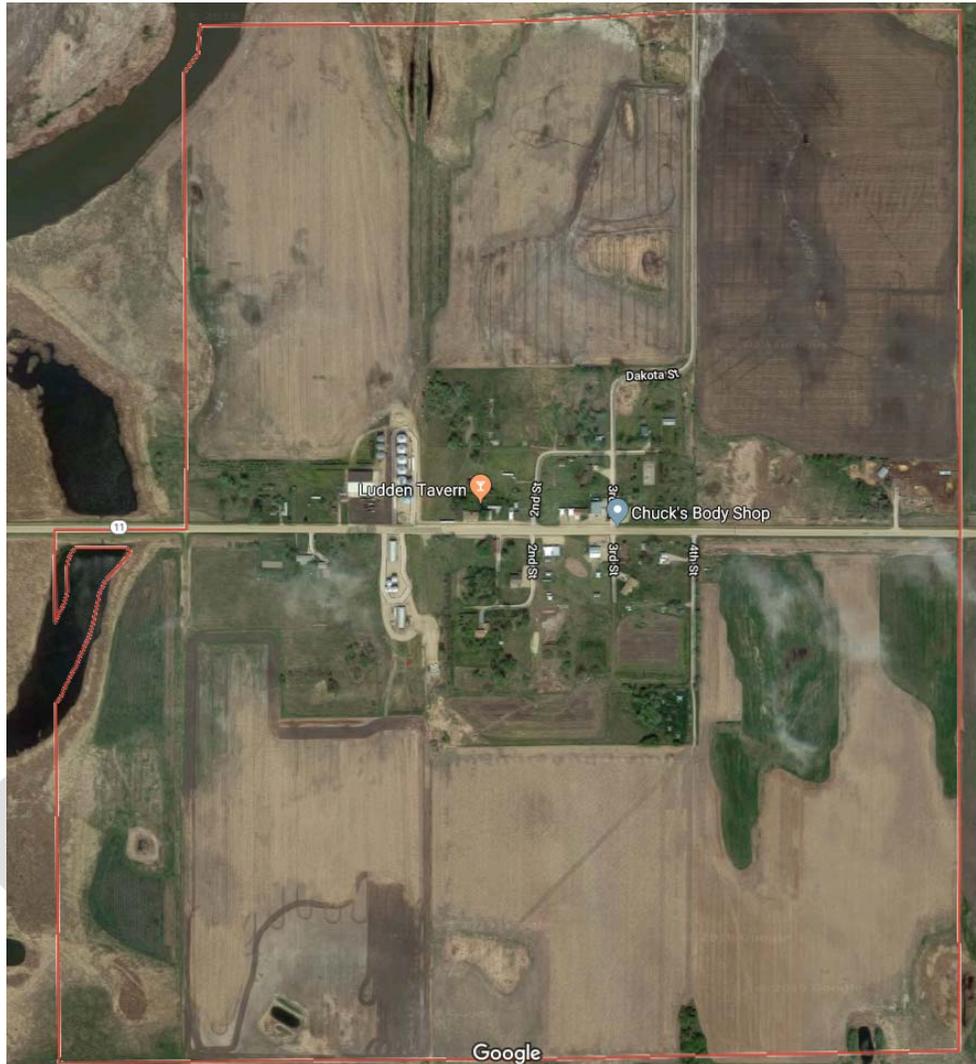
An important aspect of any useable plan is the maintenance and upkeep of the document. At any given time, planning, risk analysis, updating the situation assessment, research, coordinating, disaster response or other activity is occurring. Plan maintenance ensures the plan will remain useful in the county for many years. A mitigation action progress report form to conduct plan maintenance is in Chapter 10 of this plan.

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8.4 City of Ludden

The profile and inventory, risk assessment and hazard scoring notes, mitigation projects, and capabilities for mitigation are shown in sections 8.4.1, 8.4.2, 8.4.3, and 8.4.4. Figure 8.4.1 shows an aerial view of the city of Ludden.

Figure 8.4.1 – City of Ludden



8.4.1 Profile and Inventory

The location, total population, vulnerable populations, housing units, services, jurisdictional buildings, emergency response services and utilities of the city of Ludden. Detailed narratives follow each section heading to profile the city. Additional information on the city of Ludden and Dickey County can be found in Chapter 4, Profile and Inventory.

Location

The city of Ludden is located between Hwy ND 11 and County Road 5, approximately 10.5 miles south of Oakes and about 19.8 miles east of Ellendale in Dickey County.

Population

The population is 23 per the 2010 U.S. Decennial Census.

Vulnerable Populations

As of the Decennial Census of 2010, there were 23 people, 13 households, and 7 families residing in the city. The median age in the city was 59.8 years. 13% of residents were under the age of 18; 0.0% were between the ages of 18 and 24; 17.3% were from 25 to 44; 34.7% were from 45 to 64; and 34.8% were 65 years of age or older. The gender makeup of the city was 60.9% male and 39.1% female.

Housing Units and Household Size

There were 13 households of which 15.4% had children under the age of 18 living with them, 46.2% were married couples living together, 7.7% had a male householder with no wife present, and 46.2% were non-families. 46.2% of all households were made up of individuals and 15.4% had someone living alone who was 65 years of age or older. The average household size was 1.77 and the average family size was 2.43.

Publicly Owned Jurisdictional Buildings

There are no generated public buildings in the city of Ludden and no official Red Cross storm shelter, or armory.

Services Provided

The city of Ludden obtains potable water from WEB Water. The city has a sanitary sewer system and lagoon. The sanitary sewer system is served by two lift stations. The city does not have a storm water system. Gahner Sanitation - Ludden provides garbage sanitation services. The official newspaper is the Dickey County Leader.

Emergency Response Services

Law enforcement is provided by the Dickey County Sheriff. The sheriff's office is located in Ellendale, ND. The city has no fire department, medical or EMS available. Fire and ambulance service come from Oakes.

Utility Providers

Potable water is provided by the city WEB Water. Electricity is provided by Montana Dakota Utilities. Natural gas is not available in the city of Ludden. Fuel oil and propane are used as an alternative heating source and is provided by companies chosen by the individual consumer. Cable, internet, and phone service is provided by DRN, AT&T and Verizon. Individual homes may choose to subscribe to direct broadcast satellite service providers or use an antenna to receive over the air programming.

8.4.2 Risk Assessment and Hazard Scoring Notes

Table 8.4.2 summarizes the risk assessment scoring of the city of Ludden. The risk assessment and hazard scoring notes from the jurisdictional meeting for each hazard are shown after Table 8.4.2.

Table 8.4.2 – City of Ludden Jurisdiction Risk Assessment Scoring Summary

Risk Assessment						
Hazard	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Communicable Disease	3	2	1	1	1	6
Drought	2	2	2	2	3	5
Flood	3	2	2	1	2	6
Hazardous Material Release	3	2	2	1	1	7
Homeland Security Incident	3	2	1	1	2	5
Severe Summer Weather	3	4	4	4	2	13
Severe Winter Weather	3	4	4	1	2	10
Shortage or Outage of Critical Materials or Infrastructure	3	2	2	1	2	6
Transportation Accident	3	2	2	1	2	6
Urban Fire/Structure Collapse	3	2	2	1	1	7
Wildland Fire	4	2	2	1	1	8
Windstorm	3	3	4	4	1	13

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

City of Ludden– Hazard Scoring

Communicable Disease - 6

Impact	2	<ul style="list-style-type: none"> • U.S. declared an H1N1 was a declared pandemic in 2009. • U.S. experienced a vaccine shortage in 2009. • Potential loss of life • Entire City could be impacted by an outbreak
Frequency	4	<ul style="list-style-type: none"> • Seasonal flu happens every year. • Crop and localized livestock loss occur every year to a varying degree
Likelihood	4	<ul style="list-style-type: none"> • Seasonal flu happens every year • Tuberculosis and rabies are very low numbers for the area
Vulnerability	2	<ul style="list-style-type: none"> • More vulnerable: 34% of population is over 65 • More vulnerable: Some abandoned buildings and homes in town • More vulnerable: No stockpile of medical supplies • More vulnerable: The city has no medical facilities, public fueling capacity or public lodging • More vulnerable: Some lots in town are overgrown with vegetation • More vulnerable: Blighted structures and by individuals who hoard or collect • More vulnerable: Dependent on vaccines being developed for any new viruses and picking the right strains of flu for the flu vaccine • More vulnerable: No local ambulance, prolonged response times • Less vulnerable: Residents mow lawns to keep vegetation under control • Less vulnerable: City mows overgrown lots • Less vulnerable: Internet connections and TV help inform residents • Less vulnerable: Fire Service and First Responders
Capability	2	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish large projects independently

Drought - 5

Impact	2	<ul style="list-style-type: none"> • Range Land Fire Index Used • Burn bans happened in 2016 • Hay shortages during times of drought impact livestock. • Loss of farm economy impacts service industries • Water holes that supply livestock are impacted
Frequency	2	<ul style="list-style-type: none"> • High possibility of drought in any year due to the clay soil in the county. • Dickey County was very dry during the 1980's. • 1988 was an especially dry year, along with 2016.
Likelihood	2	<ul style="list-style-type: none"> • Cyclical pattern to rains normally wetter in the east than in the west. • 2016 this pattern was reversed. • High possibility of drought in any year due to the clay soil.
Vulnerability	2	<ul style="list-style-type: none"> • Depending on duration, vulnerability changes. • More vulnerable: 34% of population is over 65 • More vulnerable: There are several ag fires a year (tractors, hay bales, field fires) most all are mutual aided to Ellendale when Ludden doesn't answer two pages adding up to 15 minutes before Ellendale Fire is paged. • The city has no public works personnel or equipment. All maintenance is contracted out as needed. • More vulnerable: There is no fire, EMS or law in Ludden. All responders come from Oakes with a 20-minute average response • More vulnerable: There is no public works personnel or equipment-all maintenance is contracted out as needed. • More vulnerable: City does not have water reserves, like a water tower • More vulnerable: Economy relies heavily on farming • Less vulnerable: Burn bans implemented during dry periods • Less vulnerable: City located adjacent to James River and surrounding sloughs, which acts as a source of backup water if necessary • Less vulnerable: City purchased floating pumps and discharge hoses to use in pumping water for general use
Capability	3	<ul style="list-style-type: none"> • Active city council • The elevator in town has some manpower, heavy equipment and work with area farmers to be pro-active in protecting the city • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

Flood - 6

Impact	3	<ul style="list-style-type: none"> • Areas surrounding the town suffer from damaged roads, bridges and culverts creating emergency access problems as well as the occasional downed power lines • Washed out culverts • Cemeteries under water • Water seepage into basements • Water table is high in Ludden • Blocked roads limit access for emergency services and daily routines.
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		<ul style="list-style-type: none"> • Increased mosquito population and transmitting of diseases from standing water. • Property and crop damage or loss • Potential loss of life • Flooded roads block bus routes transporting kids to school • Wastewater outage • Flat terrane and lakes filled to capacity result in overland flooding due to the lack of rivers.
Frequency	2	<ul style="list-style-type: none"> • Depends largely on weather patterns
Likelihood	2	<ul style="list-style-type: none"> • Heavy spring melting and heavy rains cause flooding.
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: Ambulances, school buses, fire protection having to detour around flooding. • More vulnerable: Individuals driving on flooded highways • More vulnerable: 34% of population is over 65 • More vulnerable: City lacks equipment and infrastructure and has no public works personnel or equipment. All maintenance is contracted out as needed. • More vulnerable: Lift Station and lagoon would be inundated • More vulnerable: Lack of proper storm water system • More vulnerable: Lack of drain tile in the area • More vulnerable: Individuals living on a road must go 10 miles instead of 5 to go through dry roads. • More vulnerable: Overland flooding and yearly snow melt are huge issues in this low-lying town. They have invested in ditches and pumps to remove water. Overland flooding can damage roads and impede access to rural farms as well as the town. This event happens to some level every spring and after significant rain events • More vulnerable: James River flooding is an issue for Ludden • More vulnerable: 2009 and 2010 flooding saw the river within five feet of the houses • More vulnerable: Lack of manpower by the city and public • Less vulnerable: No school within city • Less vulnerable: Elevation of city would protect from flood waters
Capability	2	<ul style="list-style-type: none"> • No flood plan • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • Have a radio operated storm siren operated by Dick County Emergency Management • The elevator in town has some manpower, heavy equipment and work with area farmers to be pro-active in protecting the city

Hazardous Material Release - 7

Impact	3	<ul style="list-style-type: none"> • Potential loss of life • Crop loss • Livestock loss • Economy loss • Fire potential • Blocked roads leading to loss of mobility • Small size of city could lead to large percentage of population affected
Frequency	2	<ul style="list-style-type: none"> • Minor spills happen yearly • No major occurrences or incidences
Likelihood	2	<ul style="list-style-type: none"> • Minor spills will happen
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: 34% of population is over 65 • More vulnerable: Propane is used for heating alternative • More vulnerable: Trucks and farmers transporting larger tanks more frequently on highways through the city limits. • More vulnerable: High Risk of Hazardous chemical release or transportation accident as it is on state highway • More vulnerable: The city has no public works personnel or equipment- all maintenance is contracted out as needed. • More vulnerable: There is no public fueling capacity or public lodging • More vulnerable: No stockpile of medical supplies
Capability	1	<ul style="list-style-type: none"> • Active city council • City has a radio-operated storm siren operated by Dickey County Emergency Management • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

Homeland Security Incident – 5

Impact	3	<ul style="list-style-type: none"> • Potential loss of life • Loss of economy • Loss of livestock • Potential for large percentage of population loss • Emergency services could be overwhelmed
Frequency	2	<ul style="list-style-type: none"> • Always a possibility of an event occurring. • No incidents have occurred
Likelihood	1	<ul style="list-style-type: none"> • Always a possibility of an event occurring.
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: Limited mental health services. • More vulnerable: 34% of population is over 65 • More vulnerable: Small town, everyone is impacted, fearful and anxious • More vulnerable: Influx of population from other parts of the U.S. • More vulnerable: No local law enforcement, depends on County Sheriff • More vulnerable: Located at the crossroads of two major highways • Less vulnerable: Sparse population and rural nature of the city
Capability	2	<ul style="list-style-type: none"> • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

Severe Summer Weather - 13

Impact	3	<ul style="list-style-type: none"> • Hail damage to homes and community buildings including broken windows, siding and shingles. • Power outages • Economy loss • Lightning strikes cause fires • Potential injury • Potential loss of life • High winds damage property • Heavy rain produces flash flooding • Fire potential if lightning occurs during drought. • Prolonged response times and limited access for emergency services
Frequency	4	<ul style="list-style-type: none"> • Multiple storms are experienced annually causing property damage. • Extreme summer weather seasons occur every two to three years.
Likelihood	4	<ul style="list-style-type: none"> • Multiple storms are experienced annually causing property damage. • More intense weather in recent years • More rapid, heavy rain events occurring each year
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: 34% of population is elderly over 65 • More vulnerable: No fire, EMS in the town. All responders come from Oakes with a 20-minute average response on a good weather day. • More vulnerable: Populations that lack a backup power source. • More vulnerable: No local law enforcement, depends on County Sheriff • More vulnerable: No generated public building or storm shelter in town. Area receives 4-5 power outages lasting more than 8 hours and usually at least one which lasts 2-3 days. • More vulnerable: City has no public works personnel or equipment. All maintenance is contracted out as needed • More vulnerable: No medical facilities, public fueling capacity or lodging • More vulnerable: The immediate area surrounding the city is grassland and farmland allowing wind direct access on the community. • More vulnerable: The city does not have a shelter or an emergency siren. • Less vulnerable: Sparse population and rural nature of the city • Less vulnerable: City lacks early warning system and has a radio controlled for remote storm warning. • Less vulnerable: Roads in and out of town are well maintained • Less vulnerable: The City purchased discharge hoses to pump excess water out of the city.
Capability	2	<ul style="list-style-type: none"> • Limited tax base • No Building Code enforcement • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • City has a radio operated storm siren operated by Dickey County Emergency Management.

Severe Winter Weather - 10

Impact	3	<ul style="list-style-type: none"> • Ice storms, heavy and blowing snow cause travel issues, power outages, and property damage • Potential isolation of community • Severe low temperatures increase utility costs and affect alternative fuel • Potential loss of life • Potential injury • Economy loss • Increased cost for snow removal • Highways and city streets become icy and blocked • Heavy snow results in potential flooding in the spring • City streets build up with compacted snow causing damage to streets • Increased potential for hazardous material release • Temporary outage of emergency services
Frequency	4	<ul style="list-style-type: none"> • Occurs annually, few years without severe winter weather • Years with multiple winter events are the normal
Likelihood	4	<ul style="list-style-type: none"> • Will happen in the future due to the climate, occurs annually
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: 34% of population is elderly over 65 • More vulnerable: No fire, medical facilities or EMS. All responders come from Oakes with a 20-minute average response • More vulnerable: No local law enforcement, depends on County Sheriff which takes a minimum of one-half hour to arrive. • More vulnerable: Removal of shelter belts increases ground blizzard conditions • More vulnerable: No siren or shelter • More vulnerable: City has no public works personnel or equipment. • More vulnerable: No public fueling capacity or public lodging • Less vulnerable: City lacks early warning system and has a radio controlled for remote storm warning • Less vulnerable: Small community where neighbors help neighbors
Capability	2	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • There are a few certified, trained and equipped citizens in the community • City has a radio operated storm siren operated by Dickey County Emergency Management • The elevator in town has some manpower, heavy equipment and work with area farmers to be pro-active in protecting the city

Shortage or Outage of Critical Materials or Infrastructure – 6

Impact	3	<ul style="list-style-type: none"> • Long periods of time without power or water could lead to loss of life, due to the winter climate and high population over 65. • Reduced mobility from blocked roads • Limited drinking water and functionality of sanitary sewer • City could be left without power for heating and cooling • Loss of power can limit accessibility to fuel sources • Loss of food sources as refrigeration units are without power
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		<ul style="list-style-type: none"> • Loss of economy • Loss of internet affects individuals and businesses • Delayed emergency services • Mail outages for a day or longer in winter of 2016-2017
Frequency	2	<ul style="list-style-type: none"> • Short-term power outages are experienced annually but are infrequent
Likelihood	2	<ul style="list-style-type: none"> • No improvements to power infrastructure planned • Power poles and wires of the power grid are outdated/suspended
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: 34% of population is elderly over 65 • More vulnerable: No backup generator for city infrastructure may cause sewer backup or outage of drinking water • More vulnerable: No public fueling capacity or public lodging • More vulnerable: No fire, medical facilities, EMS or law in town. • More vulnerable: Access to rural areas limited during a blizzard • More vulnerable: No generated public building or storm shelter in town. • Less vulnerable: Some residents grow local food supply • Less vulnerable: Water is provided by the city • Less vulnerable: Some residents have their own generator
Capability	2	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • City has a radio operated storm siren operated by Dickey County Emergency Management

Transportation Accident - 6

Impact	3	<ul style="list-style-type: none"> • Potential loss of life • Potential injury • Economy loss • Property loss • Potential hazardous materials release • Potential fire
Frequency	2	<ul style="list-style-type: none"> • No major accidents in the area in recent years • Many cars to deer accidents in the past several years • Plan crash involving an area farmer
Likelihood	2	<ul style="list-style-type: none"> • No major accidents in the area in recent years
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: 34% of population is over 65 • More vulnerable: Increased amount of time students spend on buses • More vulnerable: Trucks and farmers transporting larger tanks more frequently on highway through the city limits. • More vulnerable: Anhydrous tanks driven through and parked in the city. • More vulnerable: High risk of hazardous chemical release or transportation accident as it is located close to highway • More vulnerable: No fire, EMS, medical facility in town • More vulnerable: No local law enforcement, depends on County Sheriff • Less vulnerable: No airport • Less vulnerable: City lacks early warning system and has a radio controlled for remote storm warning.
Capability	2	<ul style="list-style-type: none"> • First Responder Group in Ellendale and Oakes

		<ul style="list-style-type: none"> • City has a radio operated storm siren operated by Dickey County Emergency Management • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently
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Urban Fire/Structure Collapse - 7

Impact	3	<ul style="list-style-type: none"> • Potential loss of life • Property loss • Building loss • Economy loss • Loss of community assets • Loss of critical facilities and infrastructure • Potential temporary homeless population due to lack of alternative housing
Frequency	2	<ul style="list-style-type: none"> • Always possible • Bans are issued frequently according to the ND Fire Index
Likelihood	2	<ul style="list-style-type: none"> • Always possible • Bans are issued frequently according to the ND Fire Index.
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: Older homes with older wiring • More vulnerable: Seasonal homes unoccupied • More vulnerable: Lack of alternative housing for displaced residents • More vulnerable: Distance from neighboring fire departments can lead to more issues and prolonged response times. • More vulnerable: Abandoned buildings and single-family homes • More vulnerable: Lack of manpower for fire department, many volunteers work out of the area during daytime hours. • More vulnerable: Lack of crop break around city • More vulnerable: Lack of fire department • Less vulnerable: Have been able to contain fires to one building
Capability	1	<ul style="list-style-type: none"> • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

Wildland Fire - 8

Impact	4	<ul style="list-style-type: none"> • Economy loss • Crop and Bale loss • Graze land loss • Farm equipment loss • Livestock loss • Potential loss of life • Potential injury • Potential hazardous material release • Health hazard due to poor air quality • Loss of wildlife habitat • Farm equipment, lightning strikes, power line sparks, and controlled burns cause fires
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Frequency	2	<ul style="list-style-type: none"> • Wildland fires occur annually due to climate and economy.
Likelihood	2	<ul style="list-style-type: none"> • With continued controlled burns by farmers there is always a possibility for the hazard in the future • Dry conditions experienced annually for a couple weeks • Farm equipment, lightning strikes, power line sparks, and controlled burns cause fires annually.
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: Farmland and open areas • More vulnerable: Windy conditions each year • More vulnerable: Lack reliable source of water for fire suppression • More vulnerable: Strain on surrounding fire departments and resources • More vulnerable: Spacing of houses could lead to loss of multiple structures • More vulnerable: Lack of fire break around the city • More vulnerable: Age of structures and wiring • More vulnerable: Lack reliable source of water for fire suppression • Less vulnerable: Decreasing CRP • Less vulnerable: City maintains overgrown lots • Less vulnerable: City has a radio operated storm siren operated by Dickey County Emergency Management
Capability	1	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • There are few certified trained and equipped citizens in the community • Mutual Aid with Ellendale and Oakes

Windstorm - 13

Impact	3	<ul style="list-style-type: none"> • Downed trees • Buildings loss • Downed power poles and lines • Economy loss • Damage to homes and community buildings such as broken windows, loss of shingles • Potential loss of life • Potential injury • Potential structure fires • Contributes to spread of wildland fire • City has lost many trees, buildings and structures due to high winds. • Increase in traffic accidents from low visibility during severe summer and/or winter weather • Straight line winds occur in summer months
Frequency	3	<ul style="list-style-type: none"> • Hazard occurs multiple times each year and is a secondary result from severe summer weather or severe winter weather. • Strong winds are common in the city in all weather conditions • Approximately 50 incidents of windstorms between 1960 and 2016 • Blizzard conditions occur frequently in winter months due to climate • Power lines are damaged causing outages annually
Likelihood	4	<ul style="list-style-type: none"> • Strong winds are common in the city in all weather conditions

Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable – loss of trees leads to more ground blizzard conditions • More vulnerable: Power lines providing power to the city are not buried and outdated • More vulnerable: There is no fire, EMS, medical or Law in the town. All responders come from Oakes with a 20-minute average response on a good weather day. • Less vulnerable: Residents have equipment to clear debris or move snow • More vulnerable: Age of structures and housing stock • More vulnerable: Has not adopted state building codes • Less vulnerable: City has an inert landfill for debris and branches
Capability	1	<ul style="list-style-type: none"> • Capabilities to respond, but nothing can be done to prepare. • LEPC – Local Emergency Planning Committee • Mutual aid agreements for emergency services • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • Elevator in town has some manpower, heavy equipment and work with area farmers to be pro-active in protecting the city • City has a radio operated storm siren operated by Dickey County Emergency Management

8.4.3 Mitigation Strategy

This update of the Dickey County Multi-Jurisdictional Multi-Hazard Plan includes a mitigation strategy consisting of five goals in Chapter 6.

Problem Statement

The city of Ludden identified its high senior population and isolated populations in the surrounding countryside as necessary to mitigate impacts from severe summer weather, severe winter weather, windstorm, flood, and shortage or outage of critical materials or infrastructure. The lack of a storm water system is inadequate as overland flooding occurs on an annual basis in certain areas. The emergency siren is located at the fire hall. It is radio control activated but needs to be upgraded with a siren that could be activated by dispatch. There are no dispatch fire sirens in our area. The siren is radio controlled for remote storm warning. Due to the location of the city, isolation from severe weather and shortage or outage of critical materials or infrastructure such as emergency services, power, and roads is frequent. The number of abandoned buildings, single-family homes, and aging structures increase the impact of and vulnerability to communicable disease, urban fire/structure collapse, wildland fire and windstorm. The increase in economic activity in the area, farmers hauling anhydrous and other materials to and from farm sites through the City, and increased storage of chemicals on farm sites used for agriculture production increases the impact of and vulnerability to hazardous material release, homeland security incident, and transportation accident.

8.4.4 Mitigation Capability Assessment

Capability for mitigation is divided into four categories: Administrative and Technical, Education and Outreach, Financial, and Planning and Regulatory.

Administrative and Technical: Identification of administrative and technical capabilities, which include: staff, their skills and tools for mitigation planning to implement specific mitigation actions.

Education and Outreach: Identification of education and outreach programs, and methods already in place to implement mitigation activities and communicate hazard-related information.

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Planning and Regulatory: Jurisdictional plans, policies, codes, and ordinances adopted and in place that prevent and reduce the impacts of hazards.

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Administrative and Technical

The following narrative details the administrative and technical capabilities of the city of Ludden.

The city of Ludden has an active city council. The city does not have a chief building official or inspector. The city has an LEPC through the county. The city does not have a civil engineer on staff but does have the option to contract for engineering services when needed. Emergency management is available through the county. The city can contract with the SCDRC or a private firm for planning, grant writing and grant administration services. The city conducts infrastructure maintenance on an as-needed basis. The city council staff and fire department volunteers have administration capabilities for mitigation. The Dickey County Sheriff and the N.D. State Highway Patrol assist in law enforcement. The city does not have generators. There is no ambulance service in the city of Ludden. The auditor reports hazard data to the emergency manager. There is no fire, medical, EMS or law enforcement in Ludden.

Education and Outreach

The following narrative details the education and outreach capabilities of the city of Ludden.

The city does not have non-profit organizations providing education on hazards but has access to the NDSU/Dickey County Extension Service. The city does not maintain a website with hazard education. The city does not have any entities providing public education on hazards but has access to the NDSU/Dickey County Extension Service, Dickey District Health Unit, and Dickey County Emergency Management for public education on hazards. The city does not conduct events on hazard education. There are no public-private partnerships providing education and outreach on hazards. Dickey County Emergency Management conducts education and outreach on hazards in the city.

Financial

The following narrative details the financial capabilities of the city of Ludden.

The city does not set aside tax revenue for capital improvements. The city does not have storm water utility fees as it lacks a storm water system. Ludden meets the low-to-moderate income ratio requirement of the CDBG program. The rural electric cooperative for the surrounding area, water resource board, and surrounding township and school district are other sources of funding for mitigation.

Planning and Regulatory

The following narrative details the planning and regulatory capabilities of the city of Ludden.

The city does not have a capital improvement, comprehensive, drought management, land use, storm water, strategic, or water conservation plan. The city is not FEMA flood mapped, but is in the process

Plan Maintenance

An important aspect of any useable plan is the maintenance and upkeep of the document. At any given time, planning, risk analysis, updating the situation assessment, research, coordinating, disaster response or other activity is occurring.

DRAFT

8.5 City of Monango

The profile and inventory, risk assessment and hazard scoring notes, mitigation projects, and capabilities for mitigation are shown in sections 8.5.1, 8.5.2, 8.5.3, and 8.5.4. Figure 8.5.1 shows an aerial view of the city of Monango.

Figure 8.5.1 – City of Monango



8.5.1 Profile and Inventory

The location, total population, vulnerable populations, housing units, services, jurisdictional buildings, emergency response services and utilities of the city of Monango. Detailed narratives follow each section heading to profile the city

Location

The city of Monango is located at the intersections of Hwy 281 and 86th Street SE, approximately 12 miles north of Ellendale and about 11 miles southeast of Fullerton in Dickey County.

Population

The population is 36 per the 2010 U.S. Decennial Census.

According to the 2010 U.S. Decennial Census, the population of the city of Monango consists of 35.7% of households with children under the age of 18 living with them, 50% are married couples living together and 50% were non-families. 21.4% of all households were made up of individuals and 7.1% had someone living alone who was 65 years of age or older. The average household size was 2.57 and the average family size was 3.0.

Housing Units and Household Size

The 2011 to 2015 American Community Survey 5-Year Estimate shows there is a total of 23 housing units in the city consisting of 9 Owner Occupied, 0 Renter Occupied and 14 Vacant Housing units. Of the 23 single-family homes, and two mobile homes. = any mobile homes?

Publicly Owned Jurisdictional Buildings

There are no public buildings in the city of Monango and no official Red Cross storm shelter, or armory.

There is a community owned WPA gym in the center of town.

Services Provided

The city of Monango obtains potable water from SE water coop. The city has a sanitary sewer system and lagoon. The sanitary sewer system is served by two lift stations. The city does not have a storm water system. Gahner Sanitation - Monango provides garbage sanitation services. The official newspaper is the Dickey County Leader.

Emergency Response Services

Law enforcement is provided by the Dickey County Sheriff. The sheriff's office is located in Ellendale, ND. The city has no fire department or EMS available. Fire and ambulance service come from Ellendale.

Utility Providers

Potable water is provided by the city SE Water Coop. Water. Electricity is provided by Montana Dakota Utilities. Natural gas is not available in the city of Monango. Fuel oil and propane are used as an alternative heating source and is provided by companies chosen by the individual consumer. Cable, internet, and phone service is provided by DRN, AT&T and Verizon. Individual homes may choose to subscribe to direct broadcast satellite service providers or use an antenna to receive programming.

8.5.2 Risk Assessment and Hazard Scoring Notes

Table 8.5.2 summarizes the risk assessment scoring of the city of Monango. The risk assessment and hazard scoring notes from the jurisdictional meeting for each hazard are shown after Table 8.5.2.

Table 8.5.2 – City of Monango Jurisdiction Risk Assessment Scoring Summary

Risk Assessment						
<u>Hazard</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<u>Total</u>
Communicable Disease	2	1	1	1	1	4
Drought	1	2	2	1	1	5
Flood	1	2	2	1	1	5
Hazardous Material Release	4	2	3	1	1	9
Homeland Security Incident	1	1	1	2	1	4
Severe Summer Weather	4	3	3	3	1	10
Severe Winter Weather	4	4	4	1	1	12
Shortage or Outage of Critical Materials or Infrastructure	3	3	3	2	1	10
Transportation Accident	4	2	2	1	1	8
Urban Fire/Structure Collapse	3	3	3	1	1	9
Wildland Fire	4	2	2	1	1	8
Windstorm	3	3	3	4	1	12

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

City of Monango– Hazard Scoring

Communicable Disease - 10

Impact	2	<ul style="list-style-type: none"> • U.S. declared an H1N1 was a declared pandemic in 2009. • U.S. experienced a vaccine shortage in 2009. • Potential loss of life • Entire City could be impacted by an outbreak
Frequency	4	<ul style="list-style-type: none"> • Seasonal flu happens every year. • Crop and localized livestock loss occur every year to a varying degree
Likelihood	4	<ul style="list-style-type: none"> • Seasonal flu happens every year • Tuberculosis and rabies are very low numbers for the area
Vulnerability	2	<ul style="list-style-type: none"> • More vulnerable: 40% of population is over 65 • More vulnerable: Some abandoned buildings and homes in town • More vulnerable: No stockpile of medical supplies • More vulnerable: The city has no medical facilities • More vulnerable: Some lots in town are overgrown with vegetation • More vulnerable: Blighted structures occupied by individuals who hoard or collect • More vulnerable: Dependent on vaccines being developed for any new viruses and picking the right strains of flu for the flu vaccine • More vulnerable: Located on U.S. Highway 281 • Less vulnerable: Residents mow lawns to keep vegetation under control • Less vulnerable: City mows overgrown lots • Less vulnerable: Internet connections and TV help inform residents • Less vulnerable: Fire Service and First Responders
Capability	2	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish large projects independently

Drought - 11

Impact	3	<ul style="list-style-type: none"> • Range Land Fire Index Used • Hay shortages during times of drought impact livestock • Loss of farm economy impacts service industries • Water holes that supply livestock are impacted
Frequency	3	<ul style="list-style-type: none"> • High possibility of drought in any year due to the clay soil in the county. Dickey County was very dry during the 1980's. • 1988 was an especially dry year, along with 2016.
Likelihood	3	<ul style="list-style-type: none"> • Cyclical pattern to rains normally wetter in the east than in the west. 2016 this pattern was reversed. • High possibility of drought in any year due to the clay soil.
Vulnerability	3	<ul style="list-style-type: none"> • Depending on duration, vulnerability changes. • More vulnerable: 40% of population is over 65 • More vulnerable: There are several ag fires a year (tractors, hay bales, field fires) Fire response is 20 min away coming from Ellendale • The city has no public works personnel or equipment. All maintenance is contracted out as needed. • More vulnerable: There is no fire, EMS or law in Monango. All responders come from Ellendale with a 20 minute average response on a good weather

		<p>day.</p> <ul style="list-style-type: none"> • More vulnerable: There is no public works personnel or equipment-all maintenance is contracted out as needed. • More vulnerable: There is no water storage within the city • More vulnerable: Economy relies heavily on farming • Less vulnerable: Burn bans implemented during dry periods
Capability	1	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

Flood - 10

Impact	4	<ul style="list-style-type: none"> • There are no rivers. Overland flooding is not much of an issue for the town as it is on high ground directly off of US Hwy 281. Areas surrounding the town suffer from damaged roads, bridges and culverts creating emergency access problems as well as the occasional downed power lines • Washed out culverts • Cemeteries under water • Water seepage into basements • Blocked roads limit access for emergency services and daily routines. • Increased mosquito population and transmitting of diseases from standing water. • Property and crop damage or loss • Potential loss of life • Flooded roads block bus routes transporting kids to school • Wastewater outage
Frequency	2	<ul style="list-style-type: none"> • Depends largely on weather patterns
Likelihood	2	<ul style="list-style-type: none"> • Heavy spring melting and heavy rains cause flooding.
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: Ambulances, school buses, fire protection having to detour • More vulnerable: Individuals driving on flooded highways • More vulnerable: 40% of population is over 65 • More vulnerable: City lacks equipment and infrastructure and has no public works personnel or equipment. All maintenance is contracted out as needed. • More vulnerable: septic tanks can become inundated • More vulnerable: Lack of proper storm water system • More vulnerable: Lack of drain tile in the area • More vulnerable: Individuals living on a road must go 10 miles instead of 5 to go through dry roads. • More vulnerable: Lack of manpower by the city and public • Less vulnerable: No school within city • Less vulnerable: No river or large body of water and therefore is not vulnerable to severe flooding • Less vulnerable: Elevation of city would protect from flood waters
Capability	1	<ul style="list-style-type: none"> • No flood plan • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

Hazardous Material Release - 12

Impact	3	<ul style="list-style-type: none"> • Potential loss of life • Crop loss • Livestock loss • Economy loss • Fire potential • Blocked roads leading to loss of mobility • Small size of city could lead to large percentage of population affected
Frequency	3	<ul style="list-style-type: none"> • Minor spills happen yearly • No major occurrences or incidences
Likelihood	3	<ul style="list-style-type: none"> • Minor spills will happen
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: 40% of population is over 65 • More vulnerable: Propane is used for heating alternative • More vulnerable: Trucks and farmers transporting larger tanks more frequently on highways through the city limits. • More vulnerable: The city has no public works personnel or equipment- all maintenance is contracted out as needed. • More vulnerable: No stockpile of medical supplies
Capability	1	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

Homeland Security Incident – 8

Impact	3	<ul style="list-style-type: none"> • Potential loss of life • Loss of economy • Loss of livestock • Potential for large percentage of population loss • Emergency services could be overwhelmed
Frequency	1	<ul style="list-style-type: none"> • Always a possibility of an event occurring. • No incidents have occurred
Likelihood	1	<ul style="list-style-type: none"> • Always a possibility of an event occurring.
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: Limited mental health services. • More vulnerable: 40% of population is over 65 • More vulnerable: Small town, everyone is impacted, fearful and anxious • More vulnerable: Influx of population from other parts of the U.S. • More vulnerable: No local law enforcement, depends on County Sheriff • More vulnerable: Located on Hwy 281 • Less vulnerable: Sparse population and rural nature of the city
Capability	1	<ul style="list-style-type: none"> • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

Severe Summer Weather - 11

Impact	4	<ul style="list-style-type: none"> • Hail damage to homes and community buildings including broken windows, siding and shingles. • Power outages • Economy loss • Lightning strikes cause fires • Potential injury • Potential loss of life • High winds damage property • Heavy rain produces flash flooding • Fire potential if lightning occurs during drought. • Prolonged response times and limited access for emergency services
Frequency	3	<ul style="list-style-type: none"> • Multiple storms are experienced annually causing property damage. • Extreme summer weather seasons occur every two to three years. • 2011 storm took out half of the city's trees
Likelihood	3	<ul style="list-style-type: none"> • Multiple storms are experienced annually causing property damage. • More intense weather in recent years • More rapid, heavy rain events occurring each year
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: 40% of population is elderly over 65 • More vulnerable: Lack of manpower at emergency services • More vulnerable: Populations that lack a backup power source. • More vulnerable: No local law enforcement, depends on County Sheriff • More vulnerable: No generated public building or storm shelter in town. • Area receives 4-5 power outages lasting more than 8 hours and usually at least one which lasts 2-3 days. • Less vulnerable: Sparse population and rural nature of the city • Less vulnerable: City lacks early warning system and has a radio controlled for remote storm warning. • Less vulnerable: Roads in and out of town are well maintained
Capability	1	<ul style="list-style-type: none"> • Limited tax base • No Building Code enforcement • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • City has a radio operated storm siren operated by Dickey County Emergency Management.

Severe Winter Weather - 14

Impact	3	<ul style="list-style-type: none"> • Ice storms, heavy and blowing snow cause travel issues, power outages, and property damage • Potential isolation of community • Severe low temperatures increase utility costs and affect alternative fuel • Potential loss of life • Potential injury • Economy loss • Increased cost for snow removal • Highways and city streets become icy and blocked • Heavy snow results in potential flooding in the spring
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		<ul style="list-style-type: none"> • City streets build up with compacted snow causing damage to streets • Increased potential for hazardous material release • Temporary outage of emergency services
Frequency	4	<ul style="list-style-type: none"> • Occurs annually, few years without severe winter weather • Years with multiple winter events are the normal
Likelihood	4	<ul style="list-style-type: none"> • Will happen in the future due to the climate, occurs annually
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: 40% of population is elderly over 65 • More vulnerable: Lack of manpower at emergency services • More vulnerable: No local law enforcement, depends on County Sheriff which takes a minimum of one-half hour to arrive. EMS is out of Ellendale again twenty-minute response on a good weather day. • More vulnerable: Removal of shelter belts increases ground blizzard • More vulnerable: No gas station • More vulnerable: No city shelter • More vulnerable: No grocery store • Less vulnerable: City lacks early warning system and has a radio controlled for remote storm warning. • Less vulnerable: Small community where neighbors help neighbors
Capability	1	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • There are a few certified, trained and equipped citizens in the community • City has a radio operated storm siren operated by Dickey County Emergency Management

Shortage or Outage of Critical Materials or Infrastructure – 9

Impact	3	<ul style="list-style-type: none"> • Long periods of time without power or water could lead to loss of life, due to the winter climate and high population over 65. • Reduced mobility from blocked roads • Limited drinking water and functionality of sanitary sewer • City could be left without power for heating and cooling • Loss of power can limit accessibility to fuel sources • Loss of food sources as refrigeration units are without power • Loss of economy • Loss of internet affects individuals and businesses • Delayed emergency services • Mail outages for a day or longer in winter of 2016-2017
Frequency	2	<ul style="list-style-type: none"> • Short-term power outages are experienced annually
Likelihood	2	<ul style="list-style-type: none"> • No improvements to power infrastructure planned • Power poles and wires of the power grid are outdated and suspended overhead
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: 40% of population is elderly over 65 • More vulnerable: No backup generator for city infrastructure may cause sewer backup or outage of drinking water • More vulnerable: 18 electricity dependent vulnerable populations that need electricity to run medical devices to live. Per the publichealthemergency.gov Empower map.

		<ul style="list-style-type: none"> • More vulnerable: No public fueling capacity or • More vulnerable: No public fueling capacity • More vulnerable: No fire, EMS or law in town. • More vulnerable: Access to rural areas limited during a blizzard • More vulnerable: No generated public building or storm shelter in town • Less vulnerable: Some residents grow local food supply • Less vulnerable: Water is provided by the city • Less vulnerable: Some residents have their own generator
Capability	1	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • City has a radio operated storm siren operated by Dickey County Emergency Management

Transportation Accident - 7

Impact	3	<ul style="list-style-type: none"> • Potential loss of life • Potential injury • Economy loss • Property loss • Potential hazardous materials release • Potential fire
Frequency	2	<ul style="list-style-type: none"> • No major accidents in the area in recent years
Likelihood	2	<ul style="list-style-type: none"> • No major accidents in the area in recent years
Vulnerability	2	<ul style="list-style-type: none"> • More vulnerable: 40% of population is over 65 • More vulnerable: Increased amount of time students spend on buses • More vulnerable: Anhydrous tanks driven through and parked in the city. • More vulnerable: High risk of hazardous chemical release or transportation accident as it is on US Hwy 281. There is a fertilizer, seed operation in town. • More vulnerable: Vehicles speed through town on US Hwy 281 • More vulnerable: No medical supplies in stock • More vulnerable: Fire Department has no equipment for accident extraction • More vulnerable: No local law enforcement, depends on County Sheriff • Less vulnerable: No airport
Capability	2	<ul style="list-style-type: none"> • First Responder Group in Ellendale • City has a radio operated storm siren operated by Dickey County Emergency Management • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

Urban Fire/Structure Collapse - 5

Impact	3	<ul style="list-style-type: none"> • Potential loss of life • Property loss • Building loss • Economy loss • Loss of community assets • Loss of critical facilities and infrastructure • Potential temporary homeless population due to lack of alternative housing
Frequency	3	<ul style="list-style-type: none"> • Bans are issued frequently according to the ND Fire Index
Likelihood	3	<ul style="list-style-type: none"> • Bans are issued frequently according to the ND Fire Index
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: Older homes with older wiring • More vulnerable: Seasonal homes unoccupied • More vulnerable: Spacing of houses could lead to loss of multiple structures • More vulnerable: Lack of alternative housing for displaced residents • More vulnerable: Distance from neighboring fire departments can lead to more issues and prolonged response times. • More vulnerable: Abandoned buildings and single-family homes • Less vulnerable: City has a radio controlled for remote storm warning.
Capability	1	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

Wildland Fire - 8

Impact	4	<ul style="list-style-type: none"> • Economy loss • Crop and Bale loss • Graze land loss • Farm equipment loss • Livestock loss • Potential loss of life • Potential injury • Potential hazardous material release • Health hazard due to poor air quality • Loss of wildlife habitat • Farm equipment, lightning strikes, power line sparks, and controlled burns cause fires
Frequency	2	<ul style="list-style-type: none"> • Wildland fires occur annually due to climate and economy.
Likelihood	2	<ul style="list-style-type: none"> • With continued controlled burns by farmers there is always a possibility for the hazard in the future • Dry conditions experienced annually for a couple weeks • Farm equipment, lightning strikes, power line sparks, and controlled burns cause fires annually.
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: Farm land and open areas • More vulnerable: Mutual aid fire department response times lengthen. No fire, EMS or law in the city. All responders come from Ellendale with a 20 minute average response on a good weather day

		<ul style="list-style-type: none"> • More vulnerable: Windy conditions each year • More vulnerable: Lack reliable source of water for fire suppression • More vulnerable: Strain on local fire departments and resources • More vulnerable: Spacing of houses could lead to loss of multiple structures • More vulnerable: Lack of fire break around the city • More vulnerable: State building codes not adopted or enforced • More vulnerable: Age of structures and wiring • More vulnerable: Lack reliable source of water for fire suppression
Capability	1	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • There are few certified trained and equipped citizens in the community • Mutual Aid with Ellendale

Windstorm - 8

Impact	4	<ul style="list-style-type: none"> • Downed trees • Downed power poles and lines • Economy loss • Damage to homes and community buildings such as broken windows, loss of shingles • Potential loss of life • Potential injury • Potential structure fires • Contributes to spread of wildland fire • City has lost many trees, buildings and structures due to high winds. • Straight line winds occur in summer months
Frequency	2	<ul style="list-style-type: none"> • Hazard occurs multiple times each year and is a secondary result from severe summer weather or severe winter weather. • Strong winds are common in the city in all weather conditions • Blizzard conditions occur frequently in winter months due to climate • Power lines are damaged causing outages annually
Likelihood	2	<ul style="list-style-type: none"> • Strong winds are common in the city in all weather conditions
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: There are two trailer homes in the city • More vulnerable – loss of trees leads to more ground blizzard conditions • More vulnerable: Power lines providing power to the city are not buried • Less vulnerable: Residents have equipment to clear debris or move snow • More vulnerable: Age of structures and housing stock • More vulnerable: Has not adopted state building codes • Less vulnerable: City has an inert landfill for debris and branches • Less vulnerable: Fire hall has truck for fire suppression and assistance
Capability	1	<ul style="list-style-type: none"> • Capabilities to respond, but nothing can be done to prepare. • LEPC – Local Emergency Planning Committee • Mutual aid agreements for emergency services • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

8.5.3 Mitigation Strategy

This update of the Dickey County Multi-Jurisdictional Multi-Hazard Plan includes a mitigation strategy consisting of five goals in Chapter 6.

Problem Statement

The city of Monango identified its high senior population and isolated populations in the surrounding countryside as necessary to mitigate impacts from severe summer weather, severe winter weather, windstorm, flood, and shortage or outage of critical materials or infrastructure. The lack of a storm water system is inadequate as overland flooding occurs on an annual basis in certain areas. The emergency siren is located at the fire hall. It is radio control activated but needs to be upgraded with a siren that could be activated by dispatch. The siren is radio controlled for remote storm warning. Due to the location of the city, isolation from severe weather and shortage or outage of critical materials or infrastructure such as emergency services, power, and roads is frequent. The number of abandoned buildings, single-family homes, and aging structures increase the impact of and vulnerability to communicable disease, urban fire/structure collapse, wildland fire and windstorm. The increase in economic activity in the area, farmers hauling anhydrous and other materials to and from farm sites through the City, and increased storage of chemicals on farm sites used for agriculture production increases the impact of and vulnerability to hazardous material release, homeland security incident, and transportation accident.

8.5.4 Mitigation Capability Assessment

Capability for mitigation is divided into four categories: Administrative and Technical, Education and Outreach, Financial, and Planning and Regulatory.

Administrative and Technical: Identification of administrative and technical capabilities, which include: staff, their skills and tools for mitigation planning to implement specific mitigation actions.

Education and Outreach: Identification of education and outreach programs, and methods already in place to implement mitigation activities and communicate hazard-related information.

Financial: Identification of access to or eligibility to use funding resources for hazard mitigation for jurisdictions.

Planning and Regulatory: Jurisdictional plans, policies, codes, and ordinances adopted and in place that prevent and reduce the impacts of hazards.

Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. Information on the capabilities of the city was gathered at its jurisdictional meeting, committee meetings, and interviews during the planning process. Tables comparing the mitigation capabilities of the city of Monango with all other jurisdictions in the county can be found in Chapter 7, County Mitigation Capability Assessment.

Administrative and Technical

The following narrative details the administrative and technical capabilities of the city of Monango.

The city of Monango has an active city council. The city does not have a chief building official or inspector. The city has an LEPC through the county. The city does not have a civil engineer on staff but does have the option to contract for engineering services when needed. Emergency management is available through the county. The city can contract with the SCDRC or a private firm for planning, grant writing and grant administration services. The city conducts infrastructure maintenance on an as-needed

basis. The city council staff and fire department volunteers have administration capabilities for mitigation. The Dickey County Sheriff and the N.D. State Highway Patrol assist in law enforcement. The city does not have generators. There is no ambulance service in the city of Monango. The auditor reports hazard data to the emergency manager. There is no fire, EMS or law enforcement in Monango.

Education and Outreach

The following narrative details the education and outreach capabilities of the city of Monango.

The city does not have non-profit organizations providing education on hazards but has access to the NDSU/Dickey County Extension Service. The city does not maintain a website with hazard education. The city does not have any entities providing public education on hazards but has access to the NDSU/Dickey County Extension Service, Dickey District Health Unit, and Dickey County Emergency Management for public education on hazards. The city does not conduct events on hazard education. There are no public-private partnerships providing education and outreach on hazards. Dickey County Emergency Management conducts education and outreach on hazards in the city.

Financial

The following narrative details the financial capabilities of the city of Monango.

The city does not set aside tax revenue for capital improvements. The city does not have storm water utility fees as it lacks a storm water system. The city does not levy special assessments for new development. Monango meets the low-to-moderate income ratio requirement of the CDBG program. The city does not have any private entities providing funding for mitigation. The rural electric cooperative for the surrounding area, water resource board, and surrounding township and school district are other sources of funding for mitigation.

Planning and Regulatory

The following narrative details the planning and regulatory capabilities of the city of Monango.

The city does not have a capital improvement, comprehensive, drought management, land use, storm water, strategic, or water conservation plan. The city does not have a flood damage reduction study, flood insurance study, or impact fees. The city has not adopted state building codes. The city is FEMA flood mapped.

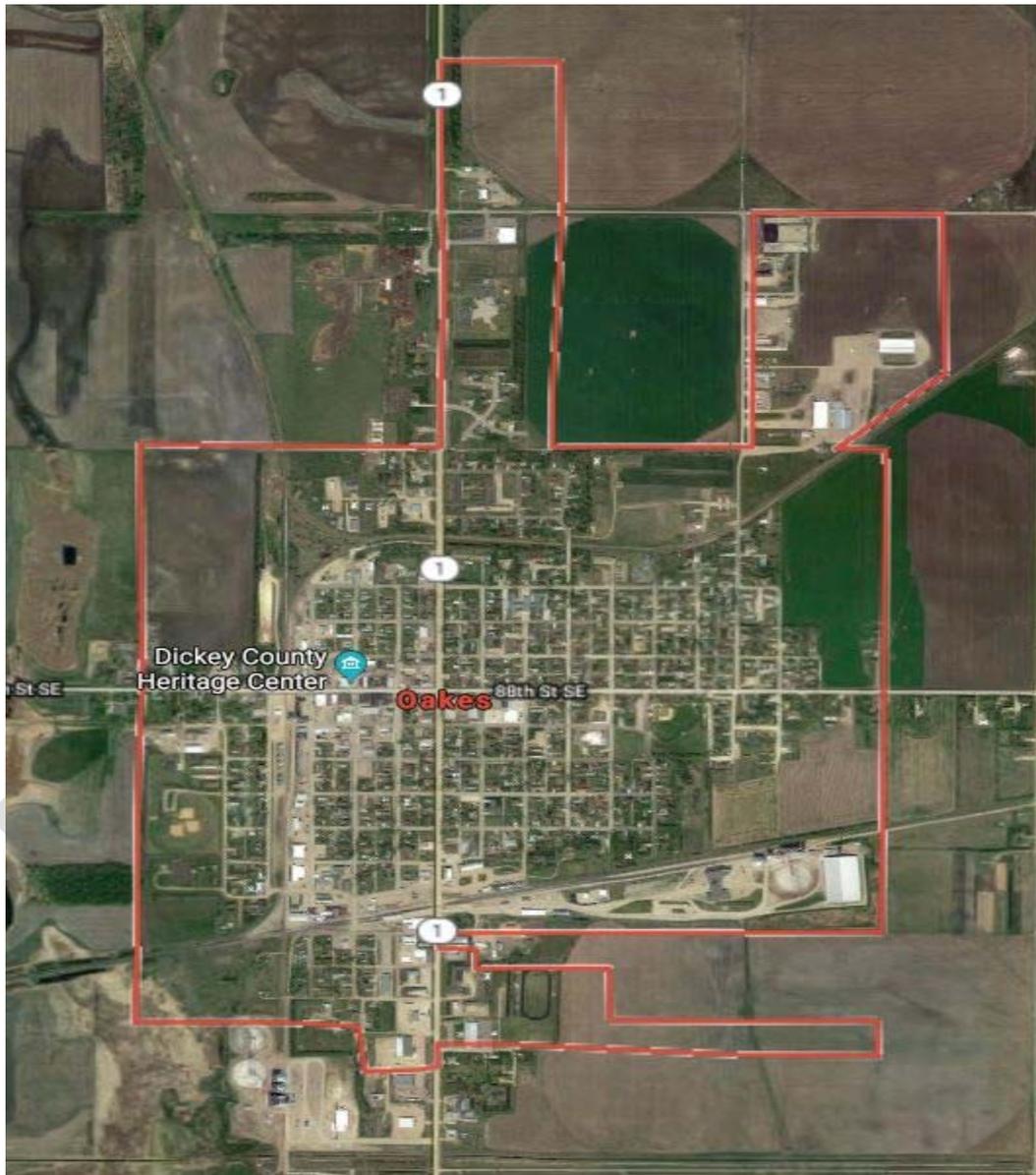
Plan Maintenance

An important aspect of any useable plan is the maintenance and upkeep of the document. At any given time, planning, risk analysis, updating the situation assessment, research, coordinating, disaster response or other activity is occurring. Plan maintenance ensures the plan will remain useful in the county for many years. A mitigation action progress report form to conduct plan maintenance is located in Chapter 10 of this plan.

8.6 City of Oakes

The profile and inventory, risk assessment and hazard scoring notes, mitigation projects, and capabilities for mitigation are shown in sections 8.6.1, 8.6.2, 8.6.3, and 8.6.4. Figure 8.6.1 shows an aerial view of the city of Oakes.

Figure 8.6.1 – City of Oakes



8.6.1 Profile and Inventory

The location, total population, vulnerable populations, housing units, services, jurisdictional buildings, emergency response services and utilities of the city of Oakes. Detailed narratives follow each section heading to profile the city. Additional information on the city of Oakes and Dickey County can be found in Chapter 4, Profile and Inventory.

Location

The city of Oakes is located in southeastern North Dakota. Oakes is located 30.4 miles northeast of Ellendale, ND in Dickey County.

Population

The population is 1,856 per the 2010 U.S. Decennial Census.

Vulnerable Populations

As of the Decennial Census of 2010, there were 1,856 people, 807 households, and 476 families residing in the city. The population density was 1,131.7 inhabitants per square mile (437.0/km²). There were 912 housing units at an average density of 556.1 per square mile (214.7/km²).

Housing Units and Household Size

There were 807 households of which 26.8% had children under the age of 18 living with them, 51.2% were married couples living together, 4.5% had a female householder with no husband present, 3.3% had a male householder with no wife present, and 41.0% were non-families. 36.9% of all households were made up of individuals and 19.4% had someone living alone who was 65 years of age or older. The average household size was 2.19 and the average family size was 2.89. The median age in the city was 45.7 years. 23% of residents were under the age of 18; 6% were between the ages of 18 and 24; 20.2% were from 25 to 44; 26.7% were from 45 to 64; and 24.1% were 65 years of age or older. The gender makeup of the city was 48.1% male and 51.9% female.

Publicly Owned Jurisdictional Buildings

The city of Oakes has a post office, fire department, three public fueling facilities, municipal airport and a municipal police force.

Services Provided

The city of Oakes has their own water modern plant and new city water and sewer infrastructure as well as a well-equipped city public works crew. The city has a sanitary sewer system and lagoon. The sanitary sewer system is served by two lift stations. The Gahner Sanitation - Oakes provides garbage sanitation services. The city maintains an inert landfill. The official newspaper is The Oakes Times.

Emergency Response Services

Law enforcement is provided by the municipal police force. The sheriff's office is located in Ellendale, ND. The city has a fire department, medical, ambulance and EMS available.

Utility Providers

Potable water is provided by the city WEB Water. Electricity is provided by Montana Dakota Utilities. Natural gas is not available in the city of Oakes. Fuel oil and propane are used as an alternative heating source and is provided by companies chosen by the individual consumer. Cable, internet, and phone service is provided by DRN, AT&T and Verizon. Individual homes may choose to subscribe to direct broadcast satellite service providers or use an antenna to receive over the air programming.

8.6.2 Risk Assessment and Hazard Scoring Notes

Table 8.2.2 summarizes the risk assessment scoring of the city of Oakes. The risk assessment and hazard scoring notes from the jurisdictional meeting for each hazard are shown after Table 8.6.2.

Table 8.6.2 – City of Oakes Jurisdiction Risk Assessment Scoring Summary

Risk Assessment						
<u>Hazard</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	Total
Communicable Disease	3	4	4	3	3	11
Drought	4	2	2	3	3	8
Flood	3	4	2	2	3	8
Hazardous Material Release	3	4	4	2	2	11
Homeland Security Incident	2	1	1	2	2	4
Severe Summer Weather	3	4	4	3	3	11
Severe Winter Weather	3	4	4	4	4	11
Shortage or Outage of Critical Materials or Infrastructure	3	2	2	3	3	7
Transportation Accident	4	4	4	3	3	12
Urban Fire/Structure Collapse	2	1	1	3	3	4
Wildland Fire	3	2	2	3	3	7
Windstorm	3	3	3	4	1	12

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

City of Oakes– Hazard Scoring

Communicable Disease - 12

Impact	3	<ul style="list-style-type: none"> • U.S. declared an H1N1 was a declared pandemic in 2009. • U.S. experienced a vaccine shortage in 2009. • Potential loss of life • Entire City could be impacted by an outbreak
Frequency	4	<ul style="list-style-type: none"> • Seasonal flu happens every year. • West Nile Disease occurs frequently • Crop and localized livestock loss occur every year to a varying degree
Likelihood	4	<ul style="list-style-type: none"> • Seasonal flu happens every year • West Nile has happened in the past few years • Tuberculosis and rabies are very low numbers for the area
Vulnerability	2	<ul style="list-style-type: none"> • More vulnerable: 24.1% of population is over 65 • More vulnerable: Some abandoned buildings and homes in town • More vulnerable: No stockpile of medical supplies, vaccines • More vulnerable: Some lots in town are overgrown with vegetation

		<ul style="list-style-type: none"> • More vulnerable: Blighted structures occupied by individuals who hoard or collect • More vulnerable: Dependent on vaccines being developed for any new viruses and picking the right strains of flu for the flu vaccine. • Less vulnerable: City mows overgrown lots • Less vulnerable: Internet connections and TV help inform residents • Less vulnerable: Fire Service and First Responders
Capability	2	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish large projects independently

Drought - 11

Impact	3	<ul style="list-style-type: none"> • Hay shortages during times of drought impact livestock. • Loss of farm economy impacts service industries • Water holes that supply livestock are impacted
Frequency	3	<ul style="list-style-type: none"> • High possibility of drought in any year due to type of soil in the county. • Dickey County was very dry during the 1980's. • 1988 was an especially dry year, along with 2016.
Likelihood	3	<ul style="list-style-type: none"> • Cyclical pattern to weather patterns makes it possible
Vulnerability	3	<ul style="list-style-type: none"> • Depending on duration, vulnerability changes. • More vulnerable: 24.1% of population is over 65 • More vulnerable: There are several ag fires a year (tractors, hay bales, field fires) • More vulnerable: Economy relies heavily on farming • Less vulnerable: Burn bans implemented during dry periods
Capability	1	<ul style="list-style-type: none"> • The city has fire protection, however, is dependent on access to water. • Active city council • The elevator in town has some manpower and equipment • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance

Flood - 8

Impact	3	<ul style="list-style-type: none"> • Areas surrounding the town suffer from damaged roads, bridges and culverts creating emergency access problems • Downed power lines • Washed out culverts • Cemeteries under water • Water seepage into basements • Blocked roads limit access for emergency services and daily routines. • Increased mosquito population and transmitting of diseases from standing water. • Property and crop damage or loss • Potential loss of life • Flooded roads block bus routes transporting kids to school • Waste water outage
Frequency	4	<ul style="list-style-type: none"> • Depends largely on weather patterns

		<ul style="list-style-type: none"> • Always possible as culverts and drainage have become blocked from flash flooding due to heavy precipitation and low-lying areas filling with water that lack proper drainage.
Likelihood	2	<ul style="list-style-type: none"> • Heavy spring melting and heavy rains cause flooding
Vulnerability	2	<ul style="list-style-type: none"> • More vulnerable: Ambulances, school buses, fire protection having to detour around flooding. • More vulnerable: Individuals driving on flooded highways • More vulnerable: 24.1% of population is over 65 • More vulnerable: Lift Station and lagoon would be inundated • More vulnerable: Lack of proper storm water system • More vulnerable: Lack of drain tile in the area • More vulnerable: When James River floods it cuts the county in half requiring the redistricting of all emergency services causing a huge strain in the system and citizens. • More vulnerable: Overland flooding and yearly snow melt are huge issues in this low-lying town. They have invested in ditches and pumps to remove water. Overland flooding can damage roads and impede access to rural farms as well as the town. This event happens to some level every spring and after significant rain events • More vulnerable: James River flooding is also a major issue for Oakes. • More vulnerable: 2009 and 2010 flooding saw the river within five feet of the houses • More vulnerable: Lack of manpower by the city and public • Less vulnerable: Elevation of city would protect from flood waters • Less vulnerable: City has their own water modern plant, city water and sewer infrastructure
Capability	3	<ul style="list-style-type: none"> • The City also participates in the NFIP, which requires communities to adopt and enforce ordinances that meet or exceed the requirements of FEMA. • Active city council and well-equipped City Public works crew • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

Hazardous Material Release - 13

Impact	4	<ul style="list-style-type: none"> • Potential loss of life • Crop loss • Livestock loss • Economy loss • Fire potential • Blocked roads leading to loss of mobility • Small size of city could lead to large percentage of population affected
Frequency	4	<ul style="list-style-type: none"> • Minor spills happen yearly • No major occurrences or incidences
Likelihood	4	<ul style="list-style-type: none"> • Minor spills will happen
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: 24.1% of population is over 65 • More vulnerable: Propane is used for heating alternative

		<ul style="list-style-type: none"> • More vulnerable: Trucks and farmers transporting larger tanks more frequently on highways through the city limits. • More vulnerable: High Risk of Hazardous chemical release or transportation accident as it is on ND Hwy 1 and there is a fertilizer, seed, two railroad tracks and elevator operation in town • More vulnerable: City has a bulk propane plant, bulk fuels plant and storage facility. • More vulnerable: City does not have hazardous material route • Less vulnerable: There is public lodging and three public fueling facilities. • More vulnerable: No stockpile of medical supplies
Capability	2	<ul style="list-style-type: none"> • Active city council • City has a radio-operated storm siren operated by Dickey County Emergency Management • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

Homeland Security Incident - 8

Impact	3	<ul style="list-style-type: none"> • Potential loss of life • Loss of economy • Loss of livestock • Potential for large percentage of population loss • Emergency services could be overwhelmed
Frequency	1	<ul style="list-style-type: none"> • Always a possibility of an event occurring. • No incidents have occurred
Likelihood	1	<ul style="list-style-type: none"> • Always a possibility of an event occurring.
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: Limited mental health services. • More vulnerable: 24.1% of population is over 65 • More vulnerable: Small town, everyone is impacted, fearful and anxious • More vulnerable: Influx of population from other parts of the U.S. • More vulnerable: City has assisted living and rest home services. The rest home is not generated. • More vulnerable: The K-12 School and vocational tech are not generated • Less vulnerable: City has a hospital, two clinics and a dialysis center. • Less vulnerable: Sparse population and rural nature of the city
Capability	1	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

Severe Summer Weather - 13

Impact	3	<ul style="list-style-type: none"> • Hail damage to homes and community buildings including broken windows, siding and shingles. • Power outages • Economy loss • Lightning strikes cause fires • Potential injury
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		<ul style="list-style-type: none"> • Potential loss of life • High winds damage property • Heavy rain produces flash flooding • Fire potential if lightning occurs during drought.
Frequency	4	<ul style="list-style-type: none"> • Multiple storms are experienced annually causing property damage. • Extreme summer weather seasons occur every two to three years.
Likelihood	4	<ul style="list-style-type: none"> • Multiple storms are experienced annually causing property damage. • More intense weather in recent years • More rapid, heavy rain events occurring each year
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: 24.1% of population is elderly over 65 • More vulnerable: Populations that lack a backup power source. • More vulnerable: Rest home, K-12 school and vocational tech are not generated • More vulnerable: City contains fuel and propane tanks within city limits adjacent to infrastructure and critical facilities • Less vulnerable: Sparse population and rural nature of the city • Less vulnerable: City has a shelter • Less vulnerable: Building codes and ordinances in place to assure safety in construction of buildings • Less vulnerable: City has clinic • Less vulnerable: Siren system can be radio actuated by law enforcement or Dickey County Emergency Management. • Less vulnerable: Roads in and out of town are well maintained
Capability	1	<ul style="list-style-type: none"> • Limited tax base • No Building Code enforcement • The elevator in town has some manpower, heavy equipment and work with area farmers to be pro-active in protecting the city. • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • The siren can be radio actuated by law enforcement or Dickey County Emergency Management.

Severe Winter Weather - 14

Impact	3	<ul style="list-style-type: none"> • Ice storms, heavy and blowing snow cause travel issues, power outages, and property damage • Potential isolation of community • Severe low temperatures increase utility costs and affect alternative fuel sources • Potential loss of life • Potential injury • Economy loss • Increased cost for snow removal • Highways and city streets become icy and blocked • Heavy snow results in potential flooding in the spring • City streets build up with compacted snow causing damage to streets • Increased potential for hazardous material release • Temporary outage of emergency services
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Frequency	4	<ul style="list-style-type: none"> Occurs annually, few years without severe winter weather Years with multiple winter events are the normal
Likelihood	4	<ul style="list-style-type: none"> Will happen in the future due to the climate, occurs annually
Vulnerability	4	<ul style="list-style-type: none"> More vulnerable: 24.1% of population is elderly over 65 More vulnerable: Removal of shelter belts increases ground blizzard More vulnerable: K-12 and Vocational tech are not generated More vulnerable: The rest home is not generated Less vulnerable: City possesses street cleaning equipment Less vulnerable: Generators for critical facilities Less vulnerable: City shelter Less vulnerable: City maintains a capital improvements plan Less vulnerable: City has adopted building codes and ordinances Less vulnerable: Only hospital in Dickey County Less vulnerable: Small community where neighbors help neighbors
Capability	1	<ul style="list-style-type: none"> Active city council Lacks technical, administrative and financial resources for mitigation Relies on county, regional, state and other agencies for assistance There are a few certified, trained and equipped citizens in the community City siren can be radio actuated by law enforcement or by Dickey County Emergency Management The elevator in town has some manpower, heavy equipment and work with area farmers to be pro-active in protecting the city

Shortage or Outage of Critical Materials or Infrastructure - 9

Impact	3	<ul style="list-style-type: none"> Long periods of time without power or water could lead to loss of life, due to the winter climate and high population over 65. Reduced mobility from blocked roads Limited drinking water and functionality of sanitary sewer City could be left without power for heating and cooling Loss of power can limit accessibility to fuel sources Loss of food sources as refrigeration units are without power Loss of economy Loss of internet affects individuals and businesses Delayed emergency services Mail outages for a day or longer in winter of 2016-2017
Frequency	2	<ul style="list-style-type: none"> Oakes hospital has experienced a shortage of medical supplies in the past Roads have been blocked Short-term power outages are experienced annually
Likelihood	2	<ul style="list-style-type: none"> No improvements to power infrastructure planned Power poles and wires of the power grid are outdated and suspended overhead
Vulnerability	3	<ul style="list-style-type: none"> More vulnerable: 24.1% of population is elderly over 65 More vulnerable: No backup generator for city infrastructure may cause sewer backup or outage of drinking water More vulnerable: 18 electricity dependent vulnerable populations that need electricity to run medical devices to live. Per the publichealthemergency.gov Empower map.

		<ul style="list-style-type: none"> • More vulnerable: Access to rural areas limited during a blizzard or ice storm. • More vulnerable: The K-12 school, Vocational Tech and the rest home is not generated • Less vulnerable: Hospital is generated • Less vulnerable: Some residents grow local food supply • Less vulnerable: Water is provided by the city • Less vulnerable: Some residents have their own generator
Capability	1	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • City siren system can be radio actuated by law enforcement or by Dickey County Emergency Management

Transportation Accident - 12

Impact	4	<ul style="list-style-type: none"> • Potential loss of life • Potential injury • Economy loss • Property loss • Potential hazardous materials release • Potential fire
Frequency	4	<ul style="list-style-type: none"> • Accidents happen in the area each year
Likelihood	4	<ul style="list-style-type: none"> • Accidents happen in the area each year
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: 24.1% of population is over 65 • More vulnerable: Increased amount of time students spend on buses • More vulnerable: Trucks and farmers transporting larger tanks more frequently on highway through the city limits. • More vulnerable: Anhydrous tanks driven through and parked in the city. • More vulnerable: N.D. Highway 1 runs through the city • More vulnerable: High risk of hazardous chemical release or transportation accident as it is located close to highway • More vulnerable: City has an airport • Less vulnerable: City has a hospital, two clinics and a dialysis center • Less vulnerable: City lacks early warning system and has a radio controlled for remote storm warning.
Capability	3	<ul style="list-style-type: none"> • First Responder Group in Oakes and public works crew • Siren system can be radio actuated by Law enforcement or by Dickey County Emergency Management • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently

Urban Fire/Structure Collapse - 7

Impact	2	<ul style="list-style-type: none"> • Potential loss of life • Property loss • Building loss
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		<ul style="list-style-type: none"> • Economy loss • Loss of community assets • Loss of critical facilities and infrastructure • Potential temporary homeless population due to lack of alternative housing
Frequency	3	<ul style="list-style-type: none"> • House fires have occurred in the past five years. • Bans are issued frequently according to the ND Fire Index
Likelihood	3	<ul style="list-style-type: none"> • Bans are issued frequently according to the ND Fire Index.
Vulnerability	2	<ul style="list-style-type: none"> • More vulnerable: Older homes with older wiring • More vulnerable: Seasonal homes unoccupied • More vulnerable: City has a well trained and equipped fire department often over stretched by mutual aid requests • More vulnerable: Lack of alternative housing for displaced residents • Less vulnerable: Enforces building codes and zoning ordinances • Less vulnerable: Newer structures are being built with better technology and safe design • Less vulnerable: Less CRP near the city • Less vulnerable: City lacks early warning system and has a radio controlled for remote storm warning.
Capability	3	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Mutual Aid with surrounding communities • Siren system can be radio actuated by law enforcement or Dickey County Emergency Management

Wildland Fire - 7

Impact	3	<ul style="list-style-type: none"> • Economy loss • Crop and Bale loss • Graze land loss • Farm equipment loss • Livestock loss • Potential loss of life • Potential injury • Potential hazardous material release • Health hazard due to poor air quality • Loss of wildlife habitat • Farm equipment, lightning strikes, power line sparks, and controlled burns cause fires
Frequency	2	<ul style="list-style-type: none"> • Wildland fires occur annually due to climate and economy.
Likelihood	2	<ul style="list-style-type: none"> • With continued controlled burns by farmers there is always a possibility for the hazard in the future • Dry conditions experienced annually for a couple weeks • Farm equipment, lightning strikes, power line sparks, and controlled burns cause fires annually.
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: Farmland and open areas • More vulnerable: Mutual aid fire department response times lengthen • More vulnerable: Windy conditions each year

		<ul style="list-style-type: none"> • More vulnerable: Lack reliable source of water for fire suppression • More vulnerable: Strain on surrounding fire departments and resources • More vulnerable: Spacing of houses could lead to loss of multiple structures • More vulnerable: Lack of fire break around the city • More vulnerable: Age of structures and wiring • More vulnerable: Lack reliable source of water for fire suppression • Less vulnerable: Decreasing CRP • Less vulnerable: City maintains overgrown lots • Less vulnerable: City has a radio operated storm siren operated by law enforcement or Dickey County Emergency Management
Capability	3	<ul style="list-style-type: none"> • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Lacks resources to accomplish projects independently • Mutual Aid with surrounding communities

Windstorm

Impact	3	<ul style="list-style-type: none"> • Downed trees • Buildings loss • Downed power poles and lines • Economy loss • Damage to homes and community buildings such as broken windows, loss of shingles • Potential loss of life • Potential injury • Potential structure fires • Contributes to spread of wildland fire • City has lost many trees, buildings and structures due to high winds. • Increase in traffic accidents from low visibility during severe summer and/or winter weather • Straight line winds occur in summer months
Frequency	4	<ul style="list-style-type: none"> • Hazard occurs multiple times each year and is a secondary result from severe summer weather or severe winter weather. • Strong winds are common in the city in all weather conditions • Blizzard conditions occur frequently in winter months due to climate • Power lines are damaged causing outages annually
Likelihood	4	<ul style="list-style-type: none"> • Strong winds are common in the city in all weather conditions
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable – loss of trees leads to more ground blizzard conditions • More vulnerable: Power lines providing power to the city are not buried and outdated • More vulnerable: EMS is over stretched by mutual aid requests with surrounding cities • Less vulnerable: Residents have equipment to clear debris or move snow • More vulnerable: Age of structures and housing stock • More vulnerable: Has not adopted state building codes • Less vulnerable: City has an inert landfill for debris and branches
Capability	1	<ul style="list-style-type: none"> • Capabilities to respond, but nothing can be done to prepare.

	<ul style="list-style-type: none"> • LEPC – Local Emergency Planning Committee • Mutual aid agreements for emergency services with surrounding communities • Active city council • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies for assistance • Has a well-equipped city public works crew • Siren system can be radio actuated by law enforcement or Dickey County Emergency Management
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8.6.3 Mitigation Strategy

This update of the Dickey County Multi-Jurisdictional Multi-Hazard Plan includes a mitigation strategy consisting of five goals in Chapter 6.

Problem Statement

The city of Oakes identified its high senior population and isolated populations in the surrounding countryside as necessary to mitigate impacts from severe summer weather, severe winter weather, windstorm, flood, and shortage or outage of critical materials or infrastructure. The lack of a storm water system is inadequate as overland flooding occurs on an annual basis in certain areas. The emergency siren is located at the fire hall. It is radio control activated but needs to be upgraded with a siren that could be activated by dispatch. There are no dispatch fire sirens in our area. The siren is radio controlled for remote storm warning. Due to the location of the city, isolation from severe weather and shortage or outage of critical materials or infrastructure such as emergency services, power, and roads is frequent. The number of abandoned buildings, single-family homes, and aging structures increase the impact of and vulnerability to communicable disease, urban fire/structure collapse, wildland fire and windstorm. The increase in economic activity in the area, farmers hauling anhydrous and other materials to and from farm sites through the City, and increased storage of chemicals on farm sites used for agriculture production increases the impact of and vulnerability to hazardous material release, homeland security incident, and transportation accident.

8.6.4 Mitigation Capability Assessment

Capability for mitigation is divided into four categories: Administrative and Technical, Education and Outreach, Financial, and Planning and Regulatory.

Administrative and Technical: Identification of administrative and technical capabilities, which include: staff, their skills and tools for mitigation planning to implement specific mitigation actions.

Education and Outreach: Identification of education and outreach programs, and methods already in place to implement mitigation activities and communicate hazard-related information.

Financial: Identification of access to or eligibility to use funding resources for hazard mitigation for jurisdictions.

Planning and Regulatory: Jurisdictional plans, policies, codes, and ordinances adopted and in place that prevent and reduce the impacts of hazards.

Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. Information on the capabilities of the city was gathered at its jurisdictional meeting, committee meetings, and interviews during the planning process. Tables comparing the mitigation

capabilities of the city of Oakes with all other jurisdictions in the county can be found in Chapter 7, County Mitigation Capability Assessment.

Administrative and Technical

The following narrative details the administrative and technical capabilities of the city of Oakes.

The city of Oakes has an active city council. The city does not have a chief building official or inspector. The city has an LEPC through the county. The city does not have a civil engineer on staff but does have the option to contract for engineering services when needed. Emergency management is available through the county. The city can contract with the SCDRC or a private firm for planning, grant writing and grant administration services. The city conducts infrastructure maintenance on an as-needed basis. The city council staff and fire department volunteers have administration capabilities for mitigation. The Dickey County Sheriff and the N.D. State Highway Patrol assist in law enforcement. The city has an emergency siren located on top of the fire hall, is adequate as it is radio-activated. The city does not have generators. There is no ambulance service in the city of Oakes. The auditor reports hazard data to the emergency manager.

Education and Outreach

The following narrative details the education and outreach capabilities of the city of Oakes.

The city does not have non-profit organizations providing education on hazards but has access to the NDSU/Dickey County Extension Service. The city does not maintain a website with hazard education. The city does not have any entities providing public education on hazards but has access to the NDSU/Dickey County Extension Service, Dickey District Health Unit, and Dickey County Emergency Management for public education on hazards. The city does not conduct events on hazard education. There are no public-private partnerships providing education and outreach on hazards. Dickey County Emergency Management conducts education and outreach on hazards in the city.

Financial

The following narrative details the financial capabilities of the city of Oakes.

The city does set aside tax revenue for capital improvements. The city does levy special assessments for new development. The city has incurred debt through USDA and Bank of ND for maintenance and emergency repairs to the City's infrastructure. The city does not have any private entities providing funding for mitigation. The rural electric cooperative for the surrounding area, water resource board, and surrounding township and school district are other sources of funding for mitigation.

Planning and Regulatory

The following narrative details the planning and regulatory capabilities of the city of Oakes.

The city does not have a capital improvement, comprehensive, drought management, land use, storm water, strategic, or water conservation plan. The city is FEMA flood mapped.

Plan Maintenance

An important aspect of any useable plan is the maintenance and upkeep of the document. At any given time, planning, risk analysis, updating the situation assessment, research, coordinating, disaster response or other activity is occurring. Plan maintenance ensures the plan will remain useful in the county for many years. A mitigation action progress report form to conduct plan maintenance is located in Chapter 10 of this plan.

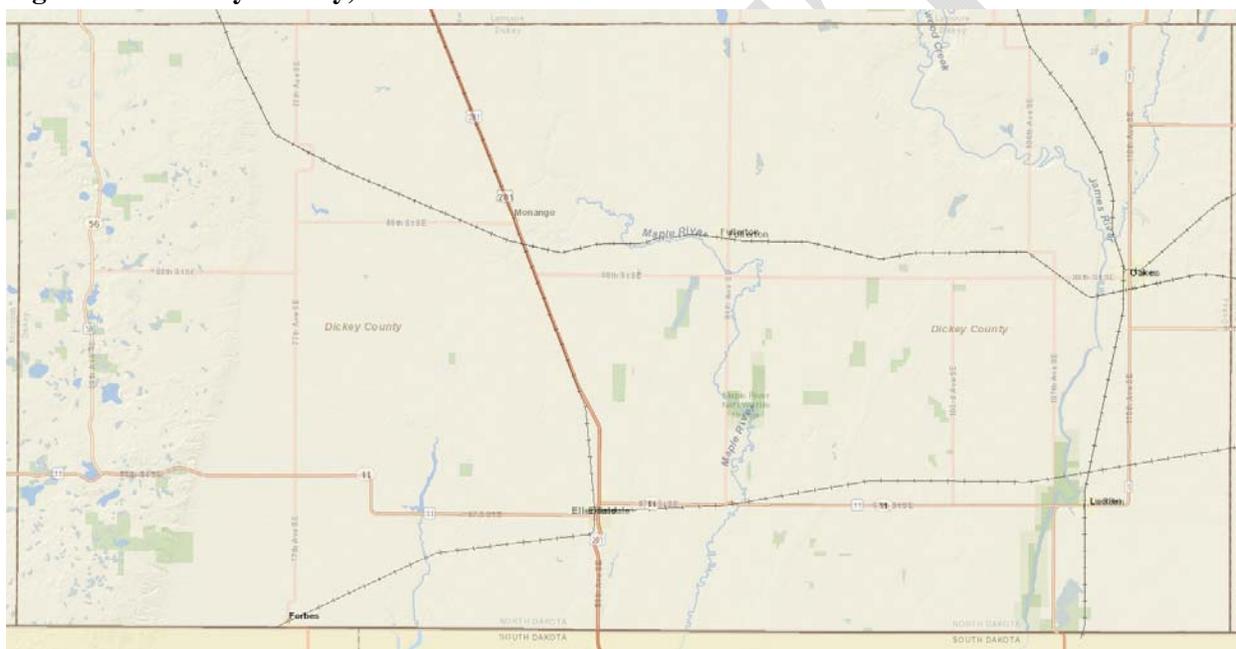
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9. Maps

Maps provide visual illustrations of the geography of the Dickey County and assist in mitigation by providing details of the inventory of the county, where critical facilities and infrastructure are located, geographic coverage of emergency services, and each incorporated jurisdiction. Maps are drawings, depictions, and illustrations and are commonly referred to as figures in planning documents.

Figure 9.1 is of Dickey County and illustrates where each jurisdiction is in reference to one another; national, state and county highways; railroads; and bodies of water and rivers. Information on the transportation system, including freight railroad, bridges and airports is important for understanding the transportation system and potential risk involved with transportation accidents, among other hazards.

Figure 9.1 – Dickey County, North Dakota



Source: North Dakota Geographic Information Systems

Figure 9.2 is a map of the waterfowl production areas (WPAs) in Dickey County under management of the Kulm Wetland Management District. These unique areas are key assets to the development, growth and sustainability of the tourism industry. They also limit some industrial development projects that could damage these areas and their missions. It is important to understand the extent and location of WPAs for mitigating hazard such as hazardous material release by restricting agriculture and industrial development in environmentally sensitive areas.

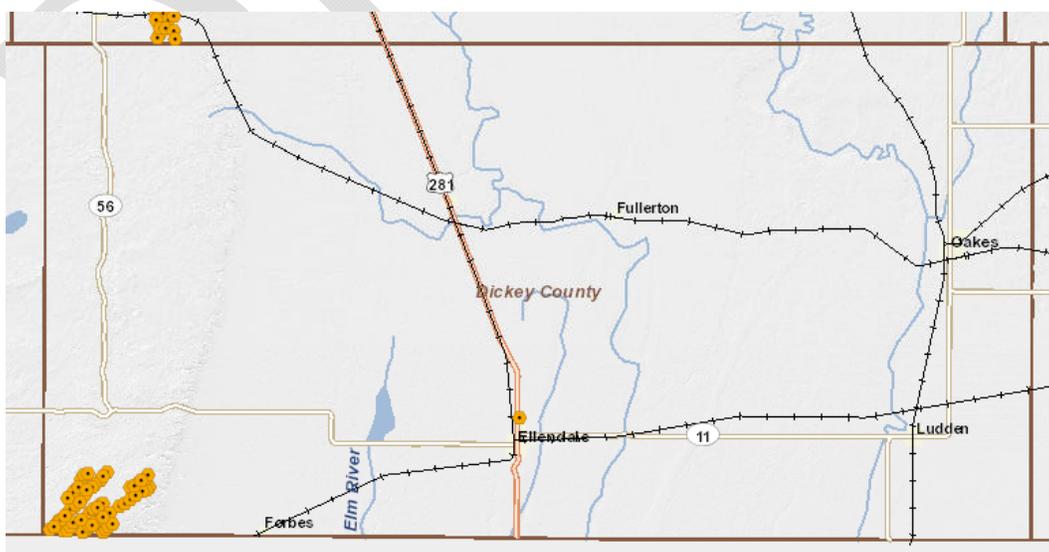
Figure 9.2 –Dickey County Waterfowl Production and National Wildlife Refuges



Sources: U.S. Fish & Wildlife Service, South Central Dakota Regional Council Comprehensive Economic Development Strategy

Figure 9.3 shows the location of wind turbines in and around the county. These wind turbines could entail rescue and communication with the company, urban fire/structure collapse and wildland fires.

Figure 9.3 – Dickey County Wind Turbine Map



Source: North Dakota GIS

Figures 9.4 and 9.5 are the two municipal airports in Dickey County, located in the cities of Ellendale and Oakes. Aerial Maps of the airports in Dickey County are shown and were obtained from the North Dakota Aeronautics Commission (NDAC). The NDAC was established in 1947 by the state legislature, assigning responsibility for state aviation functions and serves the public by providing economic and technical assistance for the aviation community.

Figure 9.4 - Ellendale Municipal Airport



Source: North Dakota Aeronautics Commission

Figure 9.5 - Oakes Municipal Airport

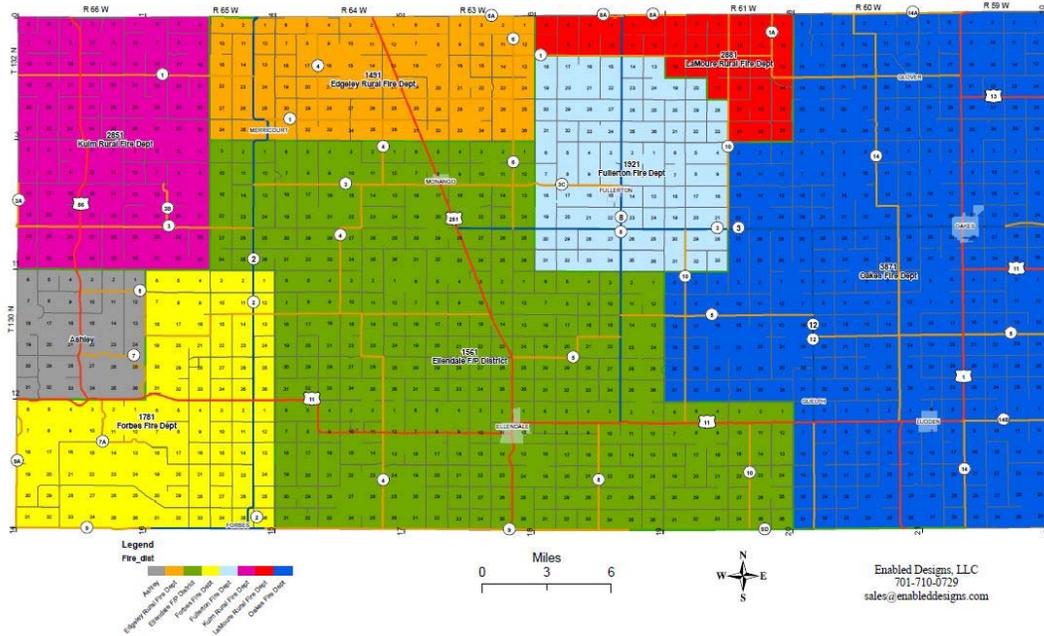


Source: North Dakota Aeronautics Commission

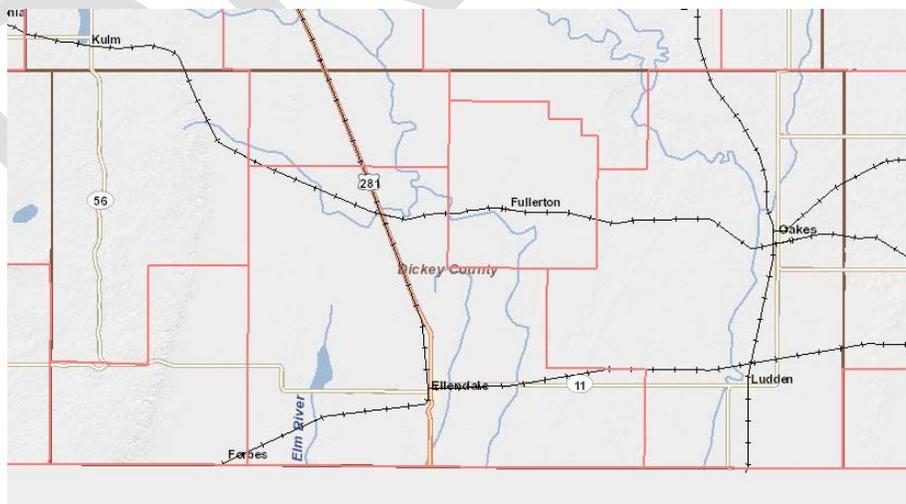
Figures 9.6 and 9.7 - Dickey County Fire District

A figure of the geographic extent of the fire districts and departments in Dickey County is important to illustrate which areas are the responsibility of each district or department. The figure is also important for mitigation purposes show which departments would be responsible for mitigation projects in specific areas of the county.

DICKEY COUNTY FIRE DISTRICT



Source: Dickey County Emergency Management



Source: North Dakota GIS

Figure 9.8 shows the geographic extent of school districts covering Dickey County. Understanding the boundaries of school districts is important for mitigation to help identify where vulnerable populations are located that would need evacuation assistance in the event of a hazard.

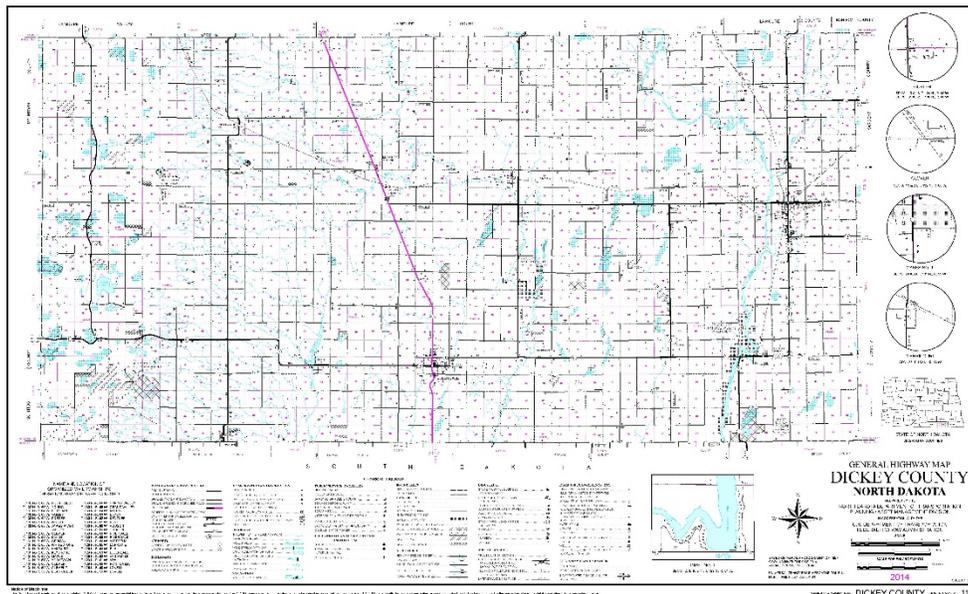
Figure 9.8 – Dickey County School Districts



Source: North Dakota Geographic Information Systems

Figure 9.9 illustrates Griggs County Townships in relation to national, state and county highways; railroads; and bodies of water and rivers.

Figure 9.9 – Dickey County Township Map



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10. Plan Maintenance

The Dickey County multi-hazard mitigation planning is continuous. An important aspect of any useable plan is the maintenance and upkeep of the document. At any given time planning, risk analysis, updating the situation assessment, research, coordinating, disaster response or other activity is occurring. Thus, ensuring the plan will remain useful in the county for many years.

Plan Monitoring

The Dickey County emergency manager and the LEPC are responsible for monitoring, evaluating and updating the plan. All disaster and emergency incidents will be evaluated for general and specific hazard history and mitigation strategy recommendations to be added to the plan.

The plan will be updated and submitted to ND DES and FEMA within five years to assure the county maintains a FEMA-approved mitigation plan.

Plan Evaluation

At its February meeting each year each city and emergency response entity will review actions taken on mitigation projects and losses due to hazards in the past year. Sample forms for reporting are included in Chapter 10.1. The annual reports are due back to the emergency manager by March 15.

The comments about the plan, project implementation, and information will be shared through each jurisdiction's minutes, and these minutes will be sent to the county emergency management office. The emergency manager will share this information with the Dickey County Commission. The fire departments, law enforcement departments, county health department, and emergency medical services will be encouraged to constantly inform the emergency management office of incidents as they occur so that the data can be considered immediately to better understand the risks in the county and enable accurate updating of hazard information.

Public Involvement

The public will be informed of the opportunity to comment on plan updates through the advertising of the jurisdictional meetings. The plan will be available to the public at the Dickey County Courthouse and at the city halls in each of the jurisdictions. The public is encouraged to share input on the plan.

10.1. Annual Review of Hazard Impacts, Mitigation Projects and Report to Emergency Manager

Return to: Charles Russell
PO Box 215
Ellendale, ND 58436

Due: March 15

List injuries or property losses due to hazards in past year:

List new vulnerable areas that need to be addressed:

Identify what actions on jurisdiction's mitigation projects were taken in past year:

If no action, why:

Additional pages may be added if necessary.

**Appendix 1
Resolutions of Plan Adoption**

**Appendix 2
Attendance**

**Appendix 3
Invitation Documentation**

**Appendix 4
Media Coverage**

**Appendix 5
Meeting Notes**

**Appendix 6
Definitions**

**Appendix 7
Hazard History**

**Appendix 8
Storm Data**

1. Adoption Documentation

Authority

Federal: Public Law 93-288 as amended, established the basis for federal mitigation activity in 1974. A section of this Act requires the identification, evaluation, and mitigation of hazards as a prerequisite for state receipt of future disaster assistance outlays. Since 1974, many additional programs, regulations, and laws have expanded on the original Stafford Act, several additional provisions were also added that provided for the availability of significant mitigation measures in the aftermath or presidentially declared disasters. Civil preparedness Guide 1-3, Chapter 6-Hazard Mitigation Assistance Programs places emphasis on hazard mitigation planning directed towards hazards with a high impact and threat potential.

Legislative: The North Dakota Century Code, Chapter 37-17.1 requires North Dakota Division of Emergency Management to coordinate the development of a Hazard Mitigation Plan. Other state laws require various state agencies to mitigate the effects or impacts of hazards in regard to public safety, environment, etc. The North Dakota State Water Commission is responsible for assisting in the flood insurance program and is the lead agency in flood hazard mitigation actions.

Executive: The Governor has the leadership role in the issuance of guidance to all state agencies to minimize the effects of hazards on the citizens of North Dakota. In state and federal recovery agreements following a presidentially declared disaster, the Governor initiates updating of the state and local mitigation plans based on federal requirements or state and presidentially declared disaster (see State Administrative Recovery Handbook for Mitigation Assistance).

Local: Local governments play an essential role in implementing effective mitigation, both before and after disaster events. Each local government will review all damages, losses, and related impacts to determine the need or requirement for mitigation action and planning whenever seriously affected by a disaster, or when applying for state or federal recovery assistance. In McIntosh County, the local governing body responsibility for carrying out plans and policies is the County Commission. The McIntosh County Commission and each incorporated city in the county – Ashley, Lehr, Venturia, Wishek and Zeeland – are responsible for reviewing and updating ordinances. The County Commission represents all townships and unincorporated communities in the county for planning purposes. Budgets are limited and do not allow the county and jurisdictions the ability to complete as many projects as desired. All incorporated city jurisdictions are included in the 2017 update.

Promulgation Statement

Government at all levels has the responsibility for the protection of life, property, and the environment from hazards and threats which are known to impact jurisdictions. The jurisdictions of McIntosh County, by resolution, hereby adopt the concepts and conditions set forth by the McIntosh County Multi-Hazard Mitigation Plan (MHMP).

County of Dickey, ND

Dickey County Commission

Ellendale, ND 58433

Resolution No. _____

A RESOLUTION OF THE COUNTY OF DICKEY ADOPTING THE DICKEY COUNTY, NORTH DAKOTA, MULTI-JURISDICTIONAL MULTI-HAZARD MITIGATION PLAN, 2018

Whereas, the County Commission recognizes the threat that natural hazards pose to people and property within Dickey County; and

Whereas, the County of Dickey has prepared a multi-hazard mitigation plan, hereby known as Dickey County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2018 in accordance with the Disaster Mitigation Act 2000; and

Whereas, Dickey County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2018 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Dickey County from the impacts of future hazards and disasters; and

Whereas, adoption by the County Commission demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the Dickey County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2018.

NOW THEREFORE, BE IT RESOLVED BY THE COUNTY OF DICKEY, NORTH DAKOTA, THAT:

Section 1. In accordance with County Ordinances, the County of Dickey adopts the Dickey County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2018.

ADOPTED by a vote of _____ in favor and _____ against, and _____ abstaining, this _____ day of _____, 2018.

By: _____

_____, Dickey County Commission Chair

Attest:

By: _____

Wanda Zimmerman, Auditor

City of Ellendale, ND

Ellendale City Council

Ellendale, ND 58436

Resolution No. _____

A RESOLUTION OF THE COUNTY OF DICKEY ADOPTING THE DICKEY COUNTY, NORTH DAKOTA, MULTI-JURISDICTIONAL MULTI-HAZARD MITIGATION PLAN, 2018

Whereas, the City Council recognizes the threat that natural hazards pose to people and property within Dickey County; and

Whereas, the County of Dickey has prepared a multi-hazard mitigation plan, hereby known as Dickey County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2018 in accordance with the Disaster Mitigation Act 2000; and

Whereas, Dickey County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2018 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Dickey County from the impacts of future hazards and disasters; and

Whereas, adoption by the County Commission demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the Dickey County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2018.

NOW THEREFORE, BE IT RESOLVED BY THE CITY OF ELLENDALE, NORTH DAKOTA, THAT:

Section 1. In accordance with County Ordinances, the City of Ellendale adopts the Dickey County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2018.

ADOPTED by a vote of ___ in favor and ___ against, and ___ abstaining, this ___ day of ___, 2018.

By: _____

, Mayor

Attest:

By: _____

Candace Middlestead, Auditor

City of Forbes, ND

Forbes City Council

Forbes, ND 58433

Resolution No. _____

A RESOLUTION OF THE CITY OF FORBES ADOPTING THE DICKEY COUNTY, NORTH DAKOTA, MULTI-JURISDICTIONAL MULTI-HAZARD MITIGATION PLAN, 2018

Whereas, the City Council recognizes the threat that natural hazards pose to people and property within Forbes; and

Whereas, the City of Forbes has prepared a multi-hazard mitigation plan, hereby known as Dickey County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2018 in accordance with the Disaster Mitigation Act 2000; and

Whereas, Dickey County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2018 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Forbes from the impacts of future hazards and disasters; and

Whereas, adoption by the City Council demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the Dickey County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2018.

NOW THEREFORE, BE IT RESOLVED BY THE CITY OF FORBES, NORTH DAKOTA, THAT:

Section 1. In accordance with City Ordinances, the City of Forbes adopts the Dickey County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2018.

ADOPTED by a vote of _____ in favor and _____ against, and _____ abstaining, this _____ day of _____, 2018.

By: _____

, Mayor

Attest:

By: _____

, Auditor

City of Fullerton, ND
Fullerton City Council
Fullerton, ND 58441

Resolution No. _____

A RESOLUTION OF THE CITY OF FULLERTON ADOPTING THE DICKEY COUNTY, NORTH DAKOTA, MULTI-JURISDICTIONAL MULTI-HAZARD MITIGATION PLAN, 2018

Whereas, the City Council recognizes the threat that natural hazards pose to people and property within Fullerton; and

Whereas, the City of Fullerton has prepared a multi-hazard mitigation plan, hereby known as Dickey County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2018 in accordance with the Disaster Mitigation Act 2000; and

Whereas, Dickey County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2018 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Fullerton from the impacts of future hazards and disasters; and

Whereas, adoption by the City Council demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the Dickey County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2018.

NOW THEREFORE, BE IT RESOLVED BY THE CITY OF FULLERTON, NORTH DAKOTA, THAT:

Section 1. In accordance with City Ordinances, the City of Fullerton adopts the Dickey County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2018.

ADOPTED by a vote of ____ in favor and ____ against, and ____ abstaining, this ____ day of ____, 2018.

By: _____

Dean Simek, Mayor

Attest:

By: _____

Virginia Hagen, Auditor

City of Ludden, ND
Ludden City Council
Ludden, ND 58474

Resolution No. _____

A RESOLUTION OF THE CITY OF LUDDEN ADOPTING THE DICKEY COUNTY, NORTH DAKOTA, MULTI-JURISDICTIONAL MULTI-HAZARD MITIGATION PLAN, 2018

Whereas, the City Council recognizes the threat that natural hazards pose to people and property within Ludden; and

Whereas, the City of Ludden has prepared a multi-hazard mitigation plan, hereby known as Dickey County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2018 in accordance with the Disaster Mitigation Act 2000; and

Whereas, Dickey County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2018 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Ludden from the impacts of future hazards and disasters; and

Whereas, adoption by the City Council demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the Dickey County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2018.

NOW THEREFORE, BE IT RESOLVED BY THE CITY OF LUDDEN, NORTH DAKOTA, THAT:

Section 1. In accordance with City Ordinances, the City of Ludden adopts the Dickey County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2018.

ADOPTED by a vote of ____ in favor and ____ against, and ____ abstaining, this ____ day of ____, 2018.

By: _____

Chuck German, Mayor

Attest:

By: _____

Susan German, Auditor

City of Monango, ND

Monango City Council

Monango, ND 58436

Resolution No. _____

A RESOLUTION OF THE CITY OF MONANGO ADOPTING THE DICKEY COUNTY, NORTH DAKOTA, MULTI-JURISDICTIONAL MULTI-HAZARD MITIGATION PLAN, 2018

Whereas, the City Council recognizes the threat that natural hazards pose to people and property within Monango; and

Whereas, the City of Monango has prepared a multi-hazard mitigation plan, hereby known as Dickey County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2018 in accordance with the Disaster Mitigation Act 2000; and

Whereas, Dickey County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2018 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Monango from the impacts of future hazards and disasters; and

Whereas, adoption by the City Council demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the Dickey County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2018.

NOW THEREFORE, BE IT RESOLVED BY THE CITY OF MONANGO, NORTH DAKOTA, THAT:

Section 1. In accordance with City Ordinances, the City of Monango adopts the Dickey County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2018.

ADOPTED by a vote of ____ in favor and ____ against, and ____ abstaining, this ____ day of ____, 2018.

By: _____

Tyler Kinzler, Mayor

Attest:

By: _____

Sue Kinzler, Auditor

City of Oakes, ND
Oakes City Council
Oakes, ND 58474

Resolution No. _____

A RESOLUTION OF THE CITY OF OAKES ADOPTING THE DICKEY COUNTY, NORTH DAKOTA, MULTI-JURISDICTIONAL MULTI-HAZARD MITIGATION PLAN, 2018

Whereas, the City Council recognizes the threat that natural hazards pose to people and property within Oakes; and

Whereas, the City of Oakes has prepared a multi-hazard mitigation plan, hereby known as Dickey County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2018 in accordance with the Disaster Mitigation Act 2000; and

Whereas, Dickey County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2018 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Oakes from the impacts of future hazards and disasters; and

Whereas, adoption by the City Council demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the Dickey County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2018.

NOW THEREFORE, BE IT RESOLVED BY THE CITY OF OAKES, NORTH DAKOTA, THAT:

Section 1. In accordance with City Ordinances, the City of Oakes adopts the Dickey County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2018.

ADOPTED by a vote of ___ in favor and ___ against, and ___ abstaining, this ___ day of ___, 2018.

By: _____

Monty Zimmer, Mayor

Attest:

By: _____

April Haring, Auditor

Appendix 2 Attendance

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Attendance Record
February 12, 2019 – Planning Meeting
February 19, 2019 – Planning Meeting
March 12, 2019 – Planning Meeting
DATE – Public Meeting

DRAFT

DRAFT

**ATTENDANCE AT:
Update of Dickey Multi-Jurisdiction Multi-Hazard Mitigation Plan**

Date: February 12, 2019 **Location:** Fireside Steak house, Ellendale

NAME	Title	Agency Representing	Address
Chris Ester	Sheriff	Dickey County	PO Box 297 Ellendale ND
Richard Wadholm	City Council Man	City of Ellendale	PO Box 31 Ellendale
Todd Staley	Facilities Coordinator	Trinity Bible College	50 6TH AVE South
Don Flaherty	City Councilman	City of Ellendale	PO Box 551 Ellendale, ND 58436
Corey Gault	Ellendale - Amb/Fire	Ellendale Amb	Box 66
Steven Harris	Deputy Sheriff	Ellendale Fire	Ellendale ND 58436
Paul Wenden	Fire Chief	Dickey County SO	PO Box 297 Ellendale ND
Michael Kaiser	Ellendale Public School Superintendent	Ellendale Public School	P.O. Box 352 EVENING ND
Joel Hamar	Dickey County Councilman	Dickey County Commission	PO Box 400 Ellendale ND 9913 85th Ave SE Ellendale, ND 58436

Chairman
Ellendale Township

**ATTENDANCE AT:
Update of Dickey Multi-Jurisdiction Multi-Hazard Mitigation Plan**

Date: February 12, 2019 **Location:** Fireside Steakhouse, Ellendale

NAME	Title	Agency Representing	Address
Lucas Van Zee	Police Officer	Ellendale PD	PO Box 267 Ellendale, ND 58438
Matt O'Brien	Police Chief	Oakes PD	174 S 5th St Oakes, ND 58474
Kraig Steinhoff	Oakes Superintendent	Oakes Public School	427 N 10th St Oakes, ND 58474
Mike Thorpe	Ellendale Fire Dept. Asst. Chief	Ellendale Fire	8910 99th St SE Ellendale ND 58436
Charles Rasau	DC EM Ellendale EMS		PO Box 537 Ellendale ND 58436

February 19, 2019

Please print clearly. Initial if information is correct.

Initial	NAME	Mailing Address	Phone	Email
MC	Monty Zimmer	115 5th St S	710-0327	OakesMAN@gmail.com
MB	Mike Sonty	615 Ivy Ave Dukes	210-0088	mike@dakes-sambulance.com
EM	EMMAN MANN	100 55th St Apt 1 DUKES	408-9041	EMMANMAN334@gmail.com
DF	Don Flaherty	PO Box 551 Ellendale, ND 58436	701-710-1268	Flaherty@dnet.net
	Charles Russell	PO Box 533 ELLENDALE ND 58436	701-320-6299	CRussell@nd.gov
	Wanda Sheppard	PO Box 215 Ellendale	701-819-8249	wsheppard@nd.gov

**ATTENDANCE AT:
Update of Dickey Multi-Jurisdiction Multi-Hazard Mitigation Plan**

Date: March 12, 2019

Location: Dickey County Highway Dept

NAME	Title	Agency Representing	Address
Corey Gilke	Speed Leader	Ellendale Community Ambulance	P.O. Box 267 Ellendale ND 58436
Corey Gilke	Fire Fighter	Ellendale Fire Dept.	P.O. Box 267 Ellendale ND 58436
Lori Novack	Quality/Risk Infection Prevention	CHI Oakes Hospital	1200 N 7th St Oakes ND 58474
Tina Ochsner	Workforce Safety	CHI Oakes Hospital	1200 N. 7th St. Oakes ND 58474
Mary Quast	EP	CHI Oakes Hospital	" "
Michael Kaiser	Supt. of Ellendale School	Ellendale Publi. School	321 N 1st Street Ellendale ND 58436
Amber Miller	RN	Dickey County HD	205 15th St N Ellendale ND
Laure Wang	RN - DON	Dickey City Health Dept.	205 15th St N Ellendale
Frank Bobak	EPR Coordinator	Central Valley Health District	122 2nd St NW James Town ND 58401

**ATTENDANCE AT:
Update of Dickey Multi-Jurisdiction Multi-Hazard Mitigation Plan**

Date: March 12, 2019 **Location:** Dickey County Highway Department

NAME	Title	Agency Representing	Address
Michele Thorpe	RN, DON	Prince of Peace Care Center/ Evergreen Place	201 8th St North Ellendale ND 58436
Michele Thorpe	NREMT	Ellendale Ambulance	PO Box 267 Ellendale ND 58436
Michele Thorpe	School board VP	Ellendale Public School	PO Box 400 Ellendale ND 58436
Tony Hansen	ADM	Hammes Public Health	201 8th St. North Ellendale, ND
Charlene Russell	EMERGENCY MEMBER	Dickey Co EMT	PO Box 533 Ellendale ND
Charlene Russell	ELLENDALE Ambulance	Ellendale EMT	PO Box 533 Ellendale ND

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2/11/2019 – Reminder E-mail for 2/12/2019 Meeting	3-9,10
2/13/2019 – Thank You E-mail and Invite to 2/19/2019 Meeting	3-11
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DRAFT

Traci Redlin

From: Charlie Russell <crussell@nd.gov>
Sent: Monday, January 7, 2019 11:14 AM
To: 'City Ellendale'; 'City of Oakes'; Traci Redlin; amcmedic02@gmail.com; COLTON; dalosure@yahoo.com; dnation48@gmail.com; DON FLAHERTY; gman8567@gmail.com; Heupel, Erick; keithloep@catholicehealth.net; LAWANG@ND.GOV; LoriNovak@catholicehealth.net; michele.thorpe@bhshealth.org; Mike; OAKESpd; chestes@nd.gov; dcso@nd.gov; Ellendale Police Department; lcpeterson@nd.gov; mobrien@nd.gov; Dean Simek; Forbes; Fullerton Fire; M & M Thorpe; Oakes Fire; Wedel, Paul; Ian O'Brien; Jbosse@Trinitybiblecollege.edu; Kraig Steinhoff; lana.norton@ellendale.k12.nd.us; michael.kaiser@ellendale.k12.nd.us; scott townsend; dmolson@nd.gov; ajkingzett@nd.gov; amasse@nd.gov; amber.miller@nd.gov; arall; aschimke@ndcourts.gov; Barb; breana.s.kiser.3@ndsu.edu; cbrokaw@nd.gov; chelsey; 'Cindy R'; clerk11@nd.gov; cmiller@ndcourts.gov; 'DC Extension office'; dces@nd.gov; dcfema@nd.gov; dchighway@nd.gov; ddanderson@nd.gov; Deb; 'Deb K'; debbiemae2@yahoo.com; dickeypjo@nd.gov; Ellinger, Aimee; hhokana@nd.gov; 'j hokanna'; jeff@glynnlaw.net; Jessy; jhagen@nd.gov; 'Jodi Bruns'; 'Joel Hamar'; jtg@drtrl.net; kkschmidt@nd.gov; Kschimke@drtel.com; rholm@nd.gov; scott wertz; Thompson, Autum D.; 'Thor Sand'; 'Veland, Gail'; Wagner, Harley; 'Wanda Sheppard'
Subject: Haz-mit planning
Follow Up Flag: Follow up
Flag Status: Flagged

Good Morning and Happy New Year!

With the beginning of the year we are required to re-do the FEMA / DHS Hazard mitigation plan we did two years ago. We plan on organizing it much the same way we did two years ago. Ellendale and Forbes will be one meeting and Fullerton, Ludden and Oakes will be the other big meeting.

These meetings (once scheduled) will be public, so I encourage everyone to help get the word out before each meeting. We will go over the hazards we have previously established and add or delete capabilities as necessary to assure our threats are identified and our planning is up to date. At some point, our cities will have private meetings to address local issues and concerns which may not have been picked up in the large meetings.

This process is critical to identify what threats [fire-storm-floods-tornados-terroristic etc] we are worried about, and what we have or need to take care of our cities and county.

ALSO, Identifying these hazards and assigning threat levels is required to compete for today's federal / state grant dollars. IE If you are seeking cameras for your facilities and have not previously identified the threat, the chance of getting grant help is very poor.

South Central Dakota Regional Council will again be spearheading this planning process with Traci Redlin at the helm. They did an excellent job last time and I am looking forward to working with them again. Below is Traci's contact information and she will be setting up these meetings soon. Any questions please contact Traci or myself..<CR>

Traci Redlin
Project Coordinator

South Central Dakota Regional Council

419 5th St NE/PO Box 903

Jamestown ND 58402

701-952-8060

tredlin@scdrc.org

Charlie Russell

Emergency Manager

9-1-1 Coordinator

DICKEY COUNTY

po box 302 Ellendale ND, 58436

PH: 701-320-6299

FAX: 701-349-3960

KC5ZCH

Traci Redlin

From: Charlie Russell <crussell@nd.gov>
Sent: Friday, February 1, 2019 1:19 PM
To: 'DC LEADER'; 'City Ellendale'; 'City of Oakes'; Traci Redlin; amcmedic02@gmail.com; COLTON; dalosure@yahoo.com; dnation48@gmail.com; DON FLAHERTY; gman8567@gmail.com; Heupel, Erick; keithloepp@catholicehealth.net; LAWANG@ND.GOV; LoriNovak@catholicehealth.net; michele.thorpe@bhshealth.org; Mike; OAKESpd; chestes@nd.gov; dcso@nd.gov; Ellendale Police Department; lcpeterson@nd.gov; mobrien@nd.gov; Dean Simek; Forbes; Fullerton Fire; M & M Thorpe; Oakes Fire; Wedel, Paul; april.haring@k12.nd.us; Ian O'Brien; Jbosse@Trinitybiblecollege.edu; Kraig Steinhoff; lana.norton@ellendale.k12.nd.us; michael.kaiser@ellendale.k12.nd.us; scott townsend; Fr. John Fisher Kizito ; Gunther, Larry; Henschen/Simle; Pastor Galen Sylvester; Pastor Raynor; pastoreck@gmail.com; Shawn Tayon; zionlutheran@drtel.net; dmolson@nd.gov; acgibbs@nd.gov; ajkingzett@nd.gov; amasse@nd.gov; amber.miller@nd.gov; arall; aschimke@ndcourts.gov; Barb; breana.s.kiser.3@ndsu.edu; cbrokaw@nd.gov; chelsey; 'Cindy R'; clerk11@nd.gov; cmiller@ndcourts.gov; 'DC Extension office'; dces@nd.gov; dcfema@nd.gov; dchighway@nd.gov; ddanderson@nd.gov; Deb; 'Deb K'; debbiemae2@yahoo.com; dickeypio@nd.gov; Ellinger, Aimee; hhokana@nd.gov; 'j hokanna'; jeff@glynnlaw.net; Jessy; jhagen@nd.gov; 'Jodi Bruns'; 'Joel Hamar'; jtg@drtrl.net; kkschmidt@nd.gov; Kschimke@drtel.com; rholm@nd.gov; scott wertz; Thompson, Autum D.; 'Thor Sand'; 'Veland, Gail'; Wagner, Harley; 'Wanda Sheppard'
Subject: Hazarn Mitigation meetings

Public Hazardous Mitigation and Planning Meetings

Dickey County is holding their Hazardous Mitigation Planning meetings to identify disaster threats, both, natural and manmade, to our citizens. These meetings create strategies and set priorities on how we plan to defeat them. These meetings are critical to assure our limited preparedness money gets the "best bang for the buck" across the spectrum of responders, cities, hospitals and the general public needs.

These meetings are open to the public and should include representatives from all of our responder groups, hospital, clinics, industries, schools, church groups, city and county governments as well as the general public.

Mark your calendars and try to attend one of the two public meetings to be held near you.

- (1) The Fireside Steak house 415 1st Ave North in Ellendale on February 12th 2019
- (2) The Oakes Community Center 124 South 5th St in Oakes on February 19th 2019

Both meetings will start at 6:30 PM. For more information contact Charlie Russell crussell@nd.gov or call 701-320-6299

-30-

Roberta, could you please get this in both the Leader and the Oakes Times... and let me know the cost Thanks <CR>

Charlie Russell

Emergency Manager

9-1-1 Coordinator

DICKEY COUNTY

po box 302 Ellendale ND, 58436

PH: 701-320-6299

FAX: 701-349-3960

KC5ZCH

Traci Redlin

From: Charlie Russell <crussell@nd.gov>
Sent: Friday, February 1, 2019 3:01 PM
To: Traci Redlin; alicia.glynn@bhshealth.org; amber.miller@nd.gov; b.schwartz@nd.gov; dickeypio@nd.gov; Frank Balak (fbalak@nd.gov); gman8567@gmail.com; jhankel@goodsam.com; keithloepp@catholicealth.net; LAWANG@ND.GOV; LoriNovak@catholicealth.net; michele.thorpe@bhshealth.org; Mike; pam.kosel@bhshealth.org; Roxanne Holm; taylor.hack@bhshealth.org; Tony Hanson
Subject: FW: Hazarn Mitigation meetings

Charlie Russell

Emergency Manager
9-1-1 Coordinator
DICKEY COUNTY
po box 302 Ellendale ND, 58436
PH: 701-320-6299
FAX: 701-349-3960
KC5ZCH

Subject: Hazarn Mitigation meetings

Public Hazardous Mitigation and Planning Meetings

Dickey County is holding their Hazardous Mitigation Planning meetings to identify disaster threats, both, natural and manmade, to our citizens. These meetings create strategies and set priorities on how we plan to defeat them. These meetings are critical to assure our limited preparedness money gets the "best bang for the buck" across the spectrum of responders, cities, hospitals and the general public needs.

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-30-

Roberta, could you please get this in both the Leader and the Oakes Times... and let me know the cost Thanks <CR>

Charlie Russell

Emergency Manager

9-1-1 Coordinator

DICKEY COUNTY

po box 302 Ellendale ND, 58436

PH: 701-320-6299

FAX: 701-349-3960

KC5ZCH

Traci Redlin

From: Traci Redlin
Sent: Tuesday, February 5, 2019 1:59 PM
To: 'Charlie Russell'; 'DC LEADER'; 'City Ellendale'; 'City of Oakes'; amcmedic02@gmail.com; COLTON; dalosure@yahoo.com; dnation48@gmail.com; DON FLAHERTY; gman8567@gmail.com; Heupel, Erick; keithloep@catholichealth.net; LAWANG@ND.GOV; LoriNovak@catholichealth.net; michele.thorpe@bhshealth.org; Mike; OAKESpd; chestes@nd.gov; dcso@nd.gov; Ellendale Police Department; lcpeterson@nd.gov; mobrien@nd.gov; Dean Simek; Forbes; Fullerton Fire; M & M Thorpe; Oakes Fire; Wedel, Paul; april.haring@k12.nd.us; Ian O'Brien; Jbosse@Trinitybiblecollege.edu; Kraig Steinhoff; lana.norton@ellendale.k12.nd.us; michael.kaiser@ellendale.k12.nd.us; scott townsend; Fr. John Fisher Kizito ; Gunther, Larry; Henschen/Simle; Pastor Galen Sylvester; Pastor Raynor; pastoreck@gmail.com; Shawn Tayon; zionlutheran@drtel.net; dmolson@nd.gov; acgibbs@nd.gov; ajkingzett@nd.gov; amasse@nd.gov; amber.miller@nd.gov; arall; aschimke@ndcourts.gov; Barb; breana.s.kiser.3@ndsu.edu; cbrokaw@nd.gov; chelsey; 'Cindy R'; clerk11@nd.gov; cmiller@ndcourts.gov; 'DC Extension office'; dces@nd.gov; dcfema@nd.gov; dchighway@nd.gov; ddanderson@nd.gov; Deb; 'Deb K'; debbiemae2@yahoo.com; dickeyp@nd.gov; Ellinger, Aimee; hhokana@nd.gov; 'j hokanna'; jeff@glynnlaw.net; Jessy; jhagen@nd.gov; 'Jodi Bruns'; 'Joel Hamar'; jtg@drtrl.net; kkschmidt@nd.gov; Kschimke@drtel.com; rholm@nd.gov; scott wertz; Thompson, Autum D.; 'Thor Sand'; 'Veland, Gail'; Wagner, Harley; 'Wanda Sheppard'
Subject: RE: Hazarn Mitigation meetings

Please feel free to forward this meeting notice to anyone we may have missed that you feel should be at the meetings. We would like to get a good turnout at both meetings.
Thank you,

Traci Redlin
Project Coordinator
South Central Dakota Regional Council
419 5th St NE/PO Box 903
Jamestown ND 58402
701-952-8060
tredlin@scdrc.org

Public Hazardous Mitigation and Planning Meetings

Dickey County is holding their Hazardous Mitigation Planning meetings to identify disaster threats, both, natural and manmade, to our citizens. These meetings create strategies and set priorities on how we plan to defeat them. These meetings are critical to assure our limited preparedness money gets the "best bang for the buck" across the spectrum of responders, cities, hospitals and the general public needs.

These meetings are open to the public and should include representatives from all of our responder groups, hospital, clinics, industries, schools, church groups, city and county governments as well as the general public.

Mark your calendars and try to attend one of the two public meetings to be held near you.

(1) The Fireside Steak house 415 1st Ave North in Ellendale on February 12th 2019

(2) The Oakes Community Center 124 South 5th St in Oakes on February 19th 2019

Both meetings will start at 6:30 PM. For more information contact Charlie Russell crussell@nd.gov or call 701-320-6299

-30-

Roberta, could you please get this in both the Leader and the Oakes Times... and let me know the cost Thanks <CR>

Charlie Russell

Emergency Manager

9-1-1 Coordinator

DICKEY COUNTY

po box 302 Ellendale ND, 58436

PH: 701-320-6299

FAX: 701-349-3960

KC5ZCH

Traci Redlin

From: Charlie Russell <crussell@nd.gov>
Sent: Monday, February 11, 2019 6:51 AM
To: 'City Ellendale'; 'City of Oakes'; Traci Redlin; amcmedic02@gmail.com; COLTON; dalosure@yahoo.com; dnation48@gmail.com; DON FLAHERTY; gman8567@gmail.com; Heupel, Erick; keithloepp@catholicehealth.net; LAWANG@ND.GOV; LoriNovak@catholicehealth.net; michele.thorpe@bhshealth.org; Mike; OAKESpd; chestes@nd.gov; dcso@nd.gov; Ellendale Police Department; lcpeterson@nd.gov; mobrien@nd.gov; Dean Simek; Forbes; Fullerton Fire; M & M Thorpe; Oakes Fire; Wedel, Paul; april.haring@k12.nd.us; lan O'Brien; Jbosse@Trinitybiblecollege.edu; Kraig Steinhoff; lana.norton@ellendale.k12.nd.us; michael.kaiser@ellendale.k12.nd.us; scott townsend; dmolson@nd.gov; acgibbs@nd.gov; ajkingzett@nd.gov; amasse@nd.gov; amber.miller@nd.gov; arall; aschimke@ndcourts.gov; Barb; breana.s.kiser.3@ndsu.edu; cbrokaw@nd.gov; chelsey; 'Cindy R'; clerk11@nd.gov; cmiller@ndcourts.gov; 'DC Extension office'; dces@nd.gov; dcfema@nd.gov; dchighway@nd.gov; ddanderson@nd.gov; Deb; 'Deb K'; debbiemae2@yahoo.com; dickeyp@nd.gov; Ellinger, Aimee; hhokana@nd.gov; 'j hokanna'; jeff@glynnlaw.net; Jessy; jhagen@nd.gov; 'Jodi Bruns'; 'Joel Hamar'; jtg@drtrl.net; kkschmidt@nd.gov; Kschimke@drtel.com; rholm@nd.gov; scott wertz; 'Thor Sand'; 'Veland, Gail'; Wagner, Harley; 'Wanda Sheppard'
Subject: Haz mit meeting west

REMINDER- West meeting tomorrow evening- anyone can come (east or west) if this date is easier to attend that the east mtg. next week...<CR>

Public Hazardous Mitigation and Planning Meetings

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Both meetings will start at 6:30 PM. For more information contact Charlie Russell crussell@nd.gov or call 701-320-6299

Charlie Russell

Emergency Manager

9-1-1 Coordinator

DICKEY COUNTY

po box 302 Ellendale ND, 58436

PH: 701-320-6299

FAX: 701-349-3960

KC5ZCH

Traci Redlin

From: Charlie Russell <crussell@nd.gov>
Sent: Wednesday, February 13, 2019 7:25 AM
To: 'City Ellendale'; 'City of Oakes'; Traci Redlin; amcmedic02@gmail.com; COLTON; dalosure@yahoo.com; dnation48@gmail.com; DON FLAHERTY; gman8567@gmail.com; Heupel, Erick; keithloep@calholichealth.net; LAWANG@ND.GOV; LoriNovak@calholichealth.net; michele.thorpe@bhshealth.org; Mike; OAKESpd; chestes@nd.gov; dcso@nd.gov; Ellendale Police Department; lcpeterson@nd.gov; mobrien@nd.gov; Dean Simek; Forbes; Fullerton Fire; M & M Thorpe; Oakes Fire; Wedel, Paul; april.haring@k12.nd.us; lan O'Brien; Jbosse@Trinitybiblecollege.edu; Kraig Steinhoff; lana.norton@ellendale.k12.nd.us; michael.kaiser@ellendale.k12.nd.us; scott townsend; dmolson@nd.gov; acgibbs@nd.gov; ajkingzett@nd.gov; amasse@nd.gov; amber.miller@nd.gov; arall; aschimke@ndcourts.gov; Barb; breana.s.kiser.3@ndsu.edu; cbrokaw@nd.gov; chelsey; 'Cindy R'; clerk11@nd.gov; cmiller@ndcourts.gov; 'DC Extension office'; dces@nd.gov; dcfema@nd.gov; dchighway@nd.gov; ddanderson@nd.gov; Deb; 'Deb K'; debbiemae2@yahoo.com; dickeyp@nd.gov; Ellinger, Aimee; hhokana@nd.gov; 'j hokanna'; jeff@glynnlaw.net; Jessy; jhagen@nd.gov; 'Jodi Bruns'; 'Joel Hamar'; jtg@drtrl.net; kkschmidt@nd.gov; Kschimke@drtel.com; rholm@nd.gov; scott wertz; 'Thor Sand'; 'Veland, Gail'; Wagner, Harley; 'Wanda Sheppard'; alicia.glynn@bhshealth.org; b.schwartz@nd.gov; Frank Balak (fbalak@nd.gov); jhankel@goodsam.com; pam.kosel@bhshealth.org; taylor.hack@bhshealth.org; 'Tony Hanson'
Subject: Meetings round 2

Good Morning- Last night's meeting went great...Thank You! It is important work to get this done (even if is a little dry at times)as it sets the priorities for Federal and state granting and documents our concerns and needs to protect our citizens.

Remember #2 meeting will be in the community center in Oakes City Hall complex 6:30 next Tues. We should be able to finish the draft plan at that point. We will schedule a separate meeting with the hospital, rest homes and DC Health to do the Communicable Disease block {Roxanne can we use your conference room for that- please suggest a day and time}. All of course will be welcome at that meeting also.

Thanks again for all of the support and feedback..<CR>

Charlie Russell

Emergency Manager

9-1-1 Coordinator

DICKEY COUNTY

po box 302 Ellendale ND, 58436

PH: 701-320-6299

FAX: 701-349-3960

KC5ZCH

Traci Redlin

From: Charlie Russell <crussell@nd.gov>
Sent: Tuesday, February 19, 2019 5:34 AM
To: 'City Ellendale'; 'City of Oakes'; Traci Redlin; amcmedic02@gmail.com; COLTON; dalosure@yahoo.com; dnation48@gmail.com; DON FLAHERTY; gman8567@gmail.com; Heupel, Erick; keithloep@calholichealth.net; LAWANG@ND.GOV; LoriNovak@calholichealth.net; michele.thorpe@bhshealth.org; Mike; OAKESpd; chestes@nd.gov; dcso@nd.gov; Ellendale Police Department; lcpeterson@nd.gov; mobrien@nd.gov; Dean Simek; Forbes; Fullerton Fire; M & M Thorpe; Oakes Fire; Wedel, Paul; april.haring@k12.nd.us; Ian O'Brien; Jbosse@Trinitybiblecollege.edu; Kraig Steinhoff; lana.norton@ellendale.k12.nd.us; michael.kaiser@ellendale.k12.nd.us; scott townsend; alicia.glynn@bhshealth.org; amber.miller@nd.gov; b.schwartz@nd.gov; dickeypio@nd.gov; Frank Balak (fbalak@nd.gov); jhankel@goodsam.com; pam.kosel@bhshealth.org; Roxanne Holm; taylor.hack@bhshealth.org; 'Tony Hanson; dmolson@nd.gov; acgibbs@nd.gov; ajkingzett@nd.gov; amasse@nd.gov; arall; aschimke@ndcourts.gov; Barb; breana.s.kiser.3@ndsu.edu; cbrokaw@nd.gov; chelsey; 'Cindy R'; clerk11@nd.gov; cmiller@ndcourts.gov; 'DC Extension office'; dces@nd.gov; dcfema@nd.gov; dchighway@nd.gov; ddanderson@nd.gov; Deb; 'Deb K'; debbiemae2@yahoo.com; Ellinger, Aimee; hhokana@nd.gov; 'j hokanna'; jeff@glynnlaw.net; Jessy; jhagen@nd.gov; 'Jodi Bruns'; 'Joel Hamar'; jtg@drtrl.net; kkschmidt@nd.gov; Kschimke@drtel.com; scott wertz; 'Thor Sand'; 'Veland, Gail'; Wagner, Harley; 'Wanda Sheppard'
Subject: Haz-mit Oakes meeting

REMINDER: Haz-Mitigation meeting tonight in Oakes at the Community Center 6:30 pm- we will try to finish the draft county plan tonight. We are still working on a date to do the medical communicable disease block in a separate meeting. I will forward the date as soon as Roxanne (hint-hint) gets it to me. Public is welcome to attend any and all meetings <CR>

Charlie Russell

Emergency Manager

9-1-1 Coordinator

DICKEY COUNTY

po box 302 Ellendale ND, 58436

PH: 701-320-6299

FAX: 701-349-3960

KC5ZCH

Traci Redlin

From: Charlie Russell <crussell@nd.gov>
Sent: Thursday, February 21, 2019 7:27 AM
To: 'City Ellendale'; Traci Redlin; april.haring@k12.nd.us; Ian O'Brien; Jbosse@Trinitybiblecollege.edu; Kraig Steinhoff; lana.norton@ellendale.k12.nd.us; michael.kaiser@ellendale.k12.nd.us; scott townsend; amcmedic02@gmail.com; COLTON; dalosure@yahoo.com; dnation48@gmail.com; DON FLAHERTY; gman8567@gmail.com; Heupel, Erick; keithloep@catholichealth.net; LAWANG@ND.GOV; LoriNovak@catholichealth.net; michele.thorpe@bhshealth.org; Mike; OAKESpd; chestes@nd.gov; dcso@nd.gov; Ellendale Police Department; lcpeterson@nd.gov; mobrien@nd.gov; Dean Simek; Forbes; Fullerton Fire; M & M Thorpe; Oakes Fire; Wedel, Paul; 'City of Oakes'; oakesmayor@gmail.com; dmolson@nd.gov; acgibbs@nd.gov; ajkingzett@nd.gov; amasse@nd.gov; amber.miller@nd.gov; arall; aschimke@ndcourts.gov; Barb; breana.s.kiser.3@ndsu.edu; cbrokaw@nd.gov; chelsey; 'Cindy R'; clerk11@nd.gov; cmiller@ndcourts.gov; 'DC Extension office'; dces@nd.gov; dcfema@nd.gov; dchighway@nd.gov; ddanderson@nd.gov; Deb; 'Deb K'; debbiemae2@yahoo.com; dickeyp@nd.gov; Ellinger, Aimee; hhokana@nd.gov; 'j hokanna'; jeff@glynnlaw.net; Jessy; jhagen@nd.gov; 'Jodi Bruns'; 'Joel Hamar'; jtg@drtrl.net; kkschmidt@nd.gov; Kschimke@drtel.com; rholm@nd.gov; scott wertz; 'Thor Sand'; 'Veland, Gail'; Wagner, Harley; 'Wanda Sheppard'; channel61@drtel.com; 'DC LEADER (E-mail)'; 'Edgley Paper'; 'jamestown sun'; ksteiner@jamestownsun.com; kddrstudio@drtel.net; 'kqlx'; 'ksjb'; 'Kulm Paper'; 'Lamoure Paper'; ndoem@bnonews.com; news@newsdakota.com; newsdirector@kvrr.com; 'Oakes Times (E-mail)'; 'valley news'; alicia.glynn@bhshealth.org; b.schwartz@nd.gov; dcarda@good-sam.com; Frank Balak (fbalak@nd.gov); jhankel@goodsam.com; lpeter21@good-sam.com; maryquandt@catholichealth.net; pam.kosel@bhshealth.org; taylor.hack@bhshealth.org; 'Tony Hanson
Subject: updates

- 1) Dickey County seeks a person to fill an upcoming vacancy in the Treasurer's Office for the position of Dickey County Treasurer. Details to be discussed at the time of interview. Submit application and resume by e-mail at wsheppard@nd.gov or by mail to Dickey County Auditor, PO Box 215, Ellendale, ND 58436. Applications must be postmarked or received by e-mail no later than March 15, 2019. Call 701-349-3249, extension 111 if you have questions.
Dickey County is an equal opportunity employer. Dickey County does not discriminate on the basis of age, color, disability, gender, marital status, national origin, public assistance status, race, religion, or sexual orientation
- 2) It looks good that with the snow we have, we will overland flooding this year. Dickey County is seeking contractors to pre-register for disaster work. Needed resources are back hoe, track hoe, dump trucks (with operators) pumps, generators and snow removal equipment. To Pre-register go to the DickeyND.com, look for "Equipment Resources" fill out the sheet and email it to me. Pre-registering is a key required component to be used in any disaster.

Also, Every year we get bids for "BOX Lunches" for disaster operations. The signup sheet, as well as the description of what's in a "box lunch" is also located on the Dickeynd.com under Disaster resource providers under "Food Resource's". To provide food products, you will need to be a restaurant or a commercial kitchen following the standard NDOH licensing criteria. Any questions –Please call me at 701-320-6299

- 3) The contagious disease block for the Hazardous mitigation planning meeting has had a date change- It will be Tuesday March 12th at 2PM at the Emergency Operations Center located in the Dickey County Highways Building <CR>

Charlie Russell

Emergency Manager

9-1-1 Coordinator

DICKEY COUNTY

po box 302 Ellendale ND, 58436

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KC5ZCH

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Sent: Thursday, February 21, 2019 7:27 AM
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Charlie Russell

Emergency Manager

9-1-1 Coordinator

DICKEY COUNTY

po box 302 Ellendale ND, 58436

PH: 701-320-6299

FAX: 701-349-3960

KC5ZCH

Traci Redlin

From: Charlie Russell <crussell@nd.gov>
Sent: Tuesday, March 12, 2019 6:12 AM
To: 'City Ellendale'; Traci Redlin; 'John Paul Martin'; 'Corey King'; amcmedic02@gmail.com; COLTON; dalosure@yahoo.com; dnation48@gmail.com; DON FLAHERTY; gman8567@gmail.com; Heupel, Erick; keithloep@ catholichealth.net; LAWANG@ND.GOV; LoriNovak@catholichealth.net; michele.thorpe@bhshealth.org; Mike; OAKESpd; chestes@nd.gov; dcso@nd.gov; Ellendale Police Department; lcpeterson@nd.gov; mobrien@nd.gov; Dean Simek; Forbes; Fullerton Fire; M & M Thorpe; Oakes Fire; Wedel, Paul; april.haring@k12.nd.us; Ian O'Brien; Jbosse@Trinitybiblecollege.edu; Kraig Steinhoff; lana.norton@ellendale.k12.nd.us; michael.kaiser@ellendale.k12.nd.us; scott townsend; alicia.glynn@bhshealth.org; amber.miller@nd.gov; b.schwartz@nd.gov; dcarda@good-sam.com; dickeypio@nd.gov; Frank Balak; jhankel@goodsam.com; lpeter21@good-sam.com; maryquandt@catholichealth.net; pam.kosel@bhshealth.org; Roxanne Holm; taylor.hack@bhshealth.org; 'Tony Hanson; dmolson@nd.gov; acgibbs@nd.gov; ajkingzett@nd.gov; amasse@nd.gov; arall; aschimke@ndcourts.gov; Barb; breana.s.kiser.3@ndsu.edu; cbrokaw@nd.gov; chelsey; 'Cindy R'; clerk11@nd.gov; cmiller@ndcourts.gov; 'DC Extension office'; dces@nd.gov; dcfema@nd.gov; dchighway@nd.gov; ddanderson@nd.gov; Deb; 'Deb K'; debbiemae2@yahoo.com; Ellinger, Aimee; hhokana@nd.gov; 'j hokanna'; jeff@glynnlaw.net; Jessie; jhagen@nd.gov; 'Jodi Bruns'; 'Joel Hamar'; jtg@drtrl.net; kkschmidt@nd.gov; Kschimke@drtel.com; scott wertz; 'Thor Sand'; 'Veland, Gail'; Wagner, Harley; 'Wanda Sheppard'; 'City of Oakes'; oakesmayor@gmail.com
Subject: UPDATES
Importance: High

Good morning-

- (A) Reminder the Hazardous mitigation block for medical (contagious disease) is today in my office at 2 pm...All are welcome- but it is critical that I have medical facilities representation (hospital-public health-rest home- assisted living, schools and ems) present. We are doing only one block so it shouldn't take long. It is critical Dickey County speaks as one if you want federal grant money in the future. Also, we need to address the concerns and mandates coming down to our folks from vastly different agencies and agendas.
- (B) There is still a serious concern on the "timing" for the start of tomorrows storm. I was warned yesterday afternoon by NWS Bismarck that it had been moved up to a mid-morning start vs Wed evening start. This is critical information needed by our courthouse, schools and health care for scheduling changes to assure we don't trap people in town or fail to get needed folks in safely for shift coverages

I studied all of the info again this morning and NOTHING seems to match- graphics still elude to evening start- the written forecast- doesn't match the graphic timeline (wind & snow at 1030) etc when looking for a for start time. I know this is due to the guidance algorithms at NWS and the definitions "START" but we need to watch this closely or we could end up in a real rodeo

Today's meeting will be in my office in the DC Highways building just north of John Deer- HWY 281 in Ellendale for those folks unfamiliar with its location.

Stay safe out there and thanks for all you do for Dickey County..<CR>

Charlie Russell

Emergency Manager

9-1-1 Coordinator

DICKEY COUNTY

po box 302 Ellendale ND, 58436

PH: 701-320-6299

FAX: 701-349-3960

KC5ZCH

Traci Redlin

From: Charlie Russell <crussell@nd.gov>
Sent: Monday, January 7, 2019 11:14 AM
To: 'City Ellendale'; 'City of Oakes'; Traci Redlin; amcmedic02@gmail.com; COLTON; dalosure@yahoo.com; dnation48@gmail.com; DON FLAHERTY; gman8567@gmail.com; Heupel, Erick; keithloebb@catholichealth.net; LAWANG@ND.GOV;

LoriNovak@catholichealth.net; michele.thorpe@bhshealth.org; Mike; OAKESpd; chestes@nd.gov; dceso@nd.gov; Ellendale Police Department; lcpeterson@nd.gov; mobrien@nd.gov; Dean Simek; Forbes; Fullerton Fire; M & M Thorpe; Oakes Fire; Wedel, Paul; Ian O'Brien; Jboosse@Trinitybiblecollege.edu; Craig Steinhoff; lana.norton@ellendale.k12.nd.us; michael.kaiser@ellendale.k12.nd.us; scott townsend; dmlson@nd.gov; ajkingzett@nd.gov; amasse@nd.gov; amber.miller@nd.gov; arall; aschimke@ndcourts.gov; Barb; breana.s.kiser.3@ndsu.edu; cbrokaw@nd.gov; chelsey; 'Cindy R'; clerk11@nd.gov; cmiller@ndcourts.gov; 'DC Extension office'; dces@nd.gov; dcfema@nd.gov; dchighway@nd.gov; ddanderson@nd.gov; Deb; 'Deb K'; debbiemae2@yahoo.com; dickeypio@nd.gov; Ellinger, Aimee; hhokana@nd.gov; 'j hokanna'; jeff@glynrlaw.net; jessy; jhagen@nd.gov; 'Jodi Bruns'; 'Joel Hamar'; jig@drtrl.net; kkschmidt@nd.gov; Kschimke@drtrl.com; rholm@nd.gov; scott wertz; Thompson, Autumn D.; 'Thor Sand'; 'Veland, Gail'; Wagner, Harley; 'Wanda Sheppard'
Haz-mit planning

Follow Up Flag: Follow up
Flag Status: Flagged

Good Morning and Happy New Year!

With the beginning of the year we are required to re-do the FEMA / DHS Hazard mitigation plan we did two years ago. We plan on organizing it much the same way we did two years ago. Ellendale and Forbes will be one meeting and Fullerton, Ludden and Oakes will be the other big meeting.

These meetings (once scheduled) will be public, so I encourage everyone to help get the word out before each meeting. We will go over the hazards we have previously established and add or delete capabilities as necessary to assure our threats are identified and our planning is up to date. At some point, our cities will have private meetings to address local issues and concerns which may not have been picked up in the large meetings.

This process is critical to identify what threats [fire-storm-floods-tornados-terroristic etc] we are worried about, and what we have or need to take care of our cities and county.

ALSO, Identifying these hazards and assigning threat levels is required to compete for today's federal / state grant dollars. IE If you are seeking cameras for your facilities and have not previously identified the threat, the chance of getting grant help is very poor.

South Central Dakota Regional Council will again be spearheading this planning process with Traci Redlin at the helm. They did an excellent job last time and I am looking forward to working with them again. Below is Traci's contact information and she will be setting up these meetings soon. Any questions please contact Traci or myself..<CR>

 **Traci Redlin**
Project Coordinator

South Central Dakota Regional Council

419 5th St NE/PO Box 903

Jamestown ND 58402

701-952-8060

fredlin@scdrc.org

Charlie Russell

Emergency Manager

9-1-1 Coordinator

DICKEY COUNTY

po box 302 Ellendale ND, 58436

PH: 701-320-6299

FAX: 701-349-3960

K05Z0H

Traci Redlin

From:
Sent:
To:

Charlie Russell <crussell@nd.gov>
Friday, February 1, 2019 1:19 PM
'DC LEADER'; 'City Ellendale'; 'City of Oakes'; Traci Redlin; amcmcdic02@gmail.com; COLTON; dalosure@yahoo.com; dnation48@gmail.com; DON FLAHERTY; gman8567@gmail.com; Heupel, Erick; keithlopp@catholichealth.net; LAWANG@ND.GOV; LorinNovak@catholichealth.net; michele.thorpe@bhshealth.org; Mike; OAKESpd; chestes@nd.gov; dcso@nd.gov; Ellendale Police Department; lcpeterson@nd.gov; mobrien@nd.gov; Dean Simek; Forbes; Fullerton Fire; M & M Thorpe; Oakes Fire; Wedel, Paul; april.haring@k12.nd.us; Ian O'Brien; Jbosse@Trinitybiblecollege.edu; Kraig Steinhoff; lana.norton@ellendale.k12.nd.us; michael.kaiser@ellendale.k12.nd.us; scott townsend; Fr. John Fisher Kizito ; Gunther, Larry; Henschen/Simle; Pastor Galen Sylvester; Pastor Raynor; pastoreck@gmail.com; Shawn Tayon; zionlutheran@drtel.net; dmolson@nd.gov; acgibbs@nd.gov; ajkingzett@nd.gov; amasse@nd.gov; amber.miller@nd.gov; arali; aschimke@ndcourts.gov; Barb; breana.s.kiser.3@ndsu.edu; chrokaw@nd.gov; chelsey; 'Cindy R'; clerk11@nd.gov; cmiller@ndcourts.gov; 'DC Extension office'; dces@nd.gov; dcfema@nd.gov; dchighway@nd.gov; ddanderson@nd.gov; Deb; 'Deb K'; debbiemae2@yahoo.com; dickeypio@nd.gov; Ellinger, Aimee; hokkana@nd.gov; 'j hokanna'; jeff@glynlaw.net; Jessy; jhagen@nd.gov; 'Jodi Bruns'; 'Joel Hamar'; jig@drtrl.net; kkschmidt@nd.gov; Kschimke@drtel.com; rholm@nd.gov; scott wertz; Thompson, Autum D.; 'Thor Sand'; 'Veland, Gail'; Wagner, Harley; 'Wanda Sheppard'
Hazzam Mitigation meetings

Subject:

Public Hazardous Mitigation and Planning Meetings

Dickey County is holding their Hazardous Mitigation Planning meetings to identify disaster threats, both, natural and manmade, to our citizens. These meetings create strategies and set priorities on how we plan to defeat them. These meetings are critical to assure our limited preparedness money gets the "best bang for the buck" across the spectrum of responders, cities, hospitals and the general public needs.

These meetings are open to the public and should include representatives from all of our responder groups, hospital, clinics, industries, schools, church groups, city and county governments as well as the general public.

Mark your calendars and try to attend one of the two public meetings to be held near you.

- (1) The Fireside Steak house 415 1st Ave North in Ellendale on February 12th 2019
- (2) The Oakes Community Center 124 South 5th St in Oakes on February 19th 2019

Both meetings will start at 6:30 PM. For more information contact Charlie Russell crussell@nd.gov or call 701-320-6299

Roberta, could you please get this in both the Leader and the Oakes Times... and let me know the cost Thanks <CR>

-30-

Charlie Russell

Emergency Manager
9-1-1 Coordinator

DICKEY COUNTY

po box 302 Ellendale ND, 58436

PH: 701-320-6299

FAX: 701-349-3960

K05ZCH

Traci Redlin

From: Charlie Russell <crussell@nd.gov>
sent: Friday, February 1, 2019 3:01 PM
To: Traci Redlin; alicia.glynn@bhshealth.org; amber.miller@nd.gov; b.schwartz@nd.gov; dickeypio@nd.gov; Frank Balak (fbalak@nd.gov); gman8567@gmail.com; jhankel@goodsam.com; keithlopp@catholichealth.net; LAWANG@ND.GOV; LoriNovak@catholichealth.net; michele.thorpe@bhshealth.org; Mike: pam.kosel@bhshealth.org; Roxanne Holm; taylor.hack@bhshealth.org; Tony Hanson
Subject: FW: Hazarn Mitigation meetings

Charlie Russell
Emergency Manager
9-1-1 Coordinator
DICKEY COUNTY
po box 302 Ellendale ND, 58436
PH: 701-320-6299
FAX: 701-349-3960
KC5ZCH

Subject: Hazarn Mitigation meetings

Public Hazardous Mitigation and Planning Meetings

Dickey County is holding their Hazardous Mitigation Planning meetings to identify disaster threats, both, natural and manmade, to our citizens. These meetings create strategies and set priorities on how we plan to defeat them. These meetings are critical to assure our limited preparedness money gets the "best bang for the buck" across the spectrum of responders, cities, hospitals and the general public needs.

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-30-

Roberta, could you please get this in both the Leader and the Oakes Times... and let me know the cost Thanks <CR>

Charlie Russell

Emergency Manager

9-1-1 Coordinator

DICKEY COUNTY

po box 302 Ellendale ND, 58436

PH: 701-320-6299

FAX: 701-349-3960

KC5ZQH

Traci Redlin

From:
Sent:
To:

Traci Redlin
Tuesday, February 5, 2019 1:59 PM
'Charlie Russell'; 'DC LEADER'; 'City Ellendale'; 'City of Oakes'; amcmedic02@gmail.com;
COLTON; dalosure@yahoo.com; dration48@gmail.com; DON FLAHERTY; gman8567
@gmail.com; Heupel, Erick; keithloeppl@catholichealth.net; LAWANG@ND.GOV;
LoriNovak@catholichealth.net; michele.thorpe@bhshealth.org; Mike; OAKESpd;
chestes@nd.gov; dcso@nd.gov; Ellendale Police Department; lcpeterson@nd.gov;
mobrien@nd.gov; Dean Simek; Forbes; Fullerton Fire; M & M Thorpe; Oakes Fire; Wedel,
Paul; april.haring@k12.nd.us; Ian O'Brien; Jbosse@Trinitybiblecollege.edu; Kraig
Steinhoff; lana.norton@ellendale.k12.nd.us; michael.kaiser@ellendale.k12.nd.us; scott
townsend; Fr. John Fisher Kizito ; Gunther, Larry; Henschen/Simle; Pastor Galen
Sylvester, Pastor Raynor, pastoreck@gmail.com; Shawn Tayon; zionlutheran@dtel.net;
dramolson@nd.gov; acglibbs@nd.gov; ajkingzett@nd.gov; amasse@nd.gov;
amber.miller@nd.gov; aralli; aschimke@ndcourts.gov; Barb; breana.s.kiser.3@ndsu.edu;
cbrokaw@nd.gov; chelsey; 'Cindy R'; clerk11@nd.gov; cmiller@ndcourts.gov; 'DC
Extension office'; dces@nd.gov; dcfema@nd.gov; dchighway@nd.gov;
ddanderson@nd.gov; Deb; 'Deb K'; debbiemae2@yahoo.com; dickeypio@nd.gov;
Ellinger, Aimee; hokana@nd.gov; 'j hokana'; jeff@glynlaw.net; Jessy;
jhagen@nd.gov; 'Jodi Bruns'; 'Joel Hamar'; jtig@dtel.net; Kkschmidt@nd.gov;
Kschimke@dtel.com; rholm@nd.gov; scott wertz; Thompson, Autumn D.; 'Thor Sand';
'Veland, Gail'; Wagner, Harley; 'Wanda Sheppard'
RE: Hazarn Mitigation meetings

Subject:

Please feel free to forward this meeting notice to anyone we may have missed that you feel should be at the meetings. We would like to get a good turnout at both meetings.
Thank you,

Traci Redlin

Project Coordinator
South Central Dakota Regional Council
419 5th St NE/PO Box 903
Jamestown ND 58402
701-952-8060
tredlin@scdrc.org

Public Hazardous Mitigation and Planning Meetings

Dickey County is holding their Hazardous Mitigation Planning meetings to identify disaster threats, both, natural and manmade, to our citizens. These meetings create strategies and set priorities on how we plan to defeat them. These meetings are critical to assure our limited preparedness money gets the "best bang for the buck" across the spectrum of responders, cities, hospitals and the general public needs.

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-30-

Robertra, could you please get this in both the Leader and the Oakes Times... and let me know the cost Thanks <CR>

Charlie Russell

Emergency Manager

9-1-1 Coordinator

DICKEY COUNTY

po box 302 Ellendale ND, 58436

PH: 701-320-6299

FAX: 701-349-3960

KC5ZCH

Traci Redlin

From:

Charlie Russell <crussell@nd.gov>
Monday, February 11, 2019 6:51 AM

Sent:

'City Ellendale'; 'City of Oakes'; Traci Redlin; amcmedic02@gmail.com; COLTON;

dalosure@yahoo.com; dnaton48@gmail.com; DON FLAHERTY; gman8567@gmail.com;
Heupel, Erick; keithloebb@catholichealth.net; LAWANG@ND.GOV;

LoriNovak@catholichealth.net; michele.thorpe@bhshealth.org; Mike; OAKESpd;
chestes@nd.gov; dcsa@nd.gov; Ellendale Police Department; lcpeterson@nd.gov;

mobrien@nd.gov; Dean Simek; Forbes; Fullerton Fire; M & M Thorpe; Oakes Fire; Wedel,
Paul; april.haring@k12.nd.us; Ian O'Brien; jbosse@Trinitybiblecollege.edu; Kraig

Steinhoff; lana.norton@ellendale.k12.nd.us; michael.kaiser@ellendale.k12.nd.us; scott
townsend; dnmolson@nd.gov; acgibbs@nd.gov; alkingzett@nd.gov; amasse@nd.gov;

amber.miller@nd.gov; arali; aschimke@ndcourts.gov; Barb; breana.s.kiser.3@ndsu.edu;
cbrokaw@nd.gov; chelsey; 'Cindy R'; clerk11@nd.gov; cmiller@ndcourts.gov; 'DC

Extension office'; dces@nd.gov; dcfema@nd.gov; dchighway@nd.gov;
ddanderson@nd.gov; Deb; 'Deb K'; debbiemae2@yahoo.com; dickeypio@nd.gov;

Ellinger, Aimee; hhokana@nd.gov; 'j hokanna'; jeff@glynlaw.net; Jessy;
jhagen@nd.gov; 'Jodi Brunst'; 'Joel Hammar'; jtg@drtrl.net; kkschmidt@nd.gov;

Kschimke@drtel.com; rholm@nd.gov; scott wertz; 'Thor Sand'; 'Veland, Gail'; Wagner,
Harley; 'Wanda Sheppard'

Haz mit meeting west

Subject:

REMINDER- West meeting tomorrow evening- anyone can come (east or west) if this date is easier to attend that the east mtg. next week...<CR>

Public Hazardous Mitigation and Planning Meetings

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2. The Oakes Community Center 124 South 5th St in Oakes on February 19th 2019

Both meetings will start at 6:30 PM. For more information contact Charlie Russell crussell@nd.gov or call 701-320-6299

Charlie Russell

Emergency Manager
9-1-1 Coordinator
DICKEY COUNTY
po box 302 Ellendale ND, 58436
PH: 701-320-6299
FAX: 701-349-3960
KC5ZOH

Traci Redlin

From:
Sent:
To:

Charlie Russell <crussell@nd.gov>
Wednesday, February 13, 2019 7:25 AM
'City Ellendale'; 'City of Oakes'; Traci Redlin; amcmedic02@gmail.com; COLTON; dalosure@yahoo.com; dnation48@gmail.com; DON FLAHERTY; gman8567@gmail.com; Heupel, Erick; keithloebb@catholichealth.net; LAWANG@ND.GOV; LoriNovak@catholichealth.net; michele.thorpe@bhshealth.org; Mike; OAKESpd; chestes@nd.gov; dcso@nd.gov; Ellendale Police Department; lpeterson@nd.gov; mobrien@nd.gov; Dean Simek; Forbes; Fullerton Fire; M & M Thorpe; Oakes Fire; Wedel, Paul; april.haring@k12.nd.us; Ian O'Brien; Jbosse@Trinitybiblecollege.edu; Craig Steinhoff; lana.norton@ellendale.k12.nd.us; michael.kaiser@ellendale.k12.nd.us; scott townsend; dmolson@nd.gov; acgibbs@nd.gov; alkingzett@nd.gov; amasse@nd.gov; amber.miller@nd.gov; arali; aschinke@ndcourts.gov; Barb; breana.s.kiser.3@ndsu.edu; cbrokaw@nd.gov; chelsey; 'Cindy R'; clerk11@nd.gov; cmiller@ndcourts.gov; 'DC Extension office'; dces@nd.gov; dcfema@nd.gov; dchighway@nd.gov; ddanderson@nd.gov; Deb; 'Deb K'; debbiemae2@yahoo.com; dickeypio@nd.gov; Ellinger, Aimee; hkokana@nd.gov; 'j hokanna'; jeff@glynrlaw.net; Jessy; jhagen@nd.gov; 'Jodi Brunst'; 'Joel Hamar'; jtj@drtrl.net; kkschmidt@nd.gov; Kschimke@drtel.com; rholm@nd.gov; scott wertz; 'Thor Sand'; 'Veland, Gail'; Wagner, Harley; 'Wanda Sheppard'; alicia.glynn@bhshealth.org; b.schwartz@nd.gov; Frank Balak (fbalak@nd.gov); jhankel@goodsam.com; pam.kosel@bhshealth.org; taylor.hack@bhshealth.org; 'Tony Hanson Meetings round 2

Subject:

Good Morning- Last night's meeting went great...Thank You! It is important work to get this done (even if is a little dry at times)as it sets the priorities for Federal and state granting and documents our concerns and needs to protect our citizens.

Remember #2 meeting will be in the community center in Oakes City Hall complex 6:30 next Tues. We should be able to finish the draft plan at that point. We will schedule a separate meeting with the hospital, rest homes and DC Health to do the Communicable Disease block (Roxanne can we use your conference room for that- please suggest a day and time). All of course will be welcome at that meeting also.

Thanks again for all of the support and feedback.<CR>

Charlie Russell

Emergency Manager
9-1-1 Coordinator

DICKEY COUNTY

po box 302 Ellendale ND, 58436

PH: 701-320-6299

FAX: 701-349-3960

KC5ZGH

Traci Redlin

From:
Sent:
To:

Charlie Russell <crussell@nd.gov>
Tuesday, February 19, 2019 5:34 AM
'City Ellendale'; 'City of Oakes'; Traci Redlin; amcmedic02@gmail.com; COLTON; dalosure@yahoo.com; dnation48@gmail.com; DON FLAHERTY; gman8567@gmail.com; Heupel, Erick; keithloepf@catholichealth.net; LAWANG@ND.GOV; LoriNovak@catholichealth.net; michele.thorpe@bhshealth.org; Mike; OAKESpd; chestes@nd.gov; dcs0@nd.gov; Ellendale Police Department; lcpeterson@nd.gov; mobrien@nd.gov; Dean Simek; Forbes; Fullerton Fire; M & M Thorpe; Oakes Fire; Wedel, Paul; april.haring@k12.nd.us; Ian O'Brien; Jbosse@Trinitybiblecollege.edu; Kraig Steinhoff; lana.norton@ellendale.k12.nd.us; michael.kaiser@ellendale.k12.nd.us; scott townsend; alicia.glynn@bhshealth.org; amber.miller@nd.gov; b.schwartz@nd.gov; dickeypio@nd.gov; Frank Balak (fbalak@nd.gov); jhankel@goodsam.com; pam.kosel@bhshealth.org; Roxanne Holm; taylor.hack@bhshealth.org; 'Tony Hanson; dmoison@nd.gov; acgibbs@nd.gov; ajkingzett@nd.gov; amasse@nd.gov; arall; aschinke@ndcourts.gov; Barb; breana.s.kiser.3@ndsu.edu; cbrokaw@nd.gov; chelsey; 'Cindy R'; clerk11@nd.gov; cmiller@ndcourts.gov; 'DC Extension office'; dcs@nd.gov; dcfema@nd.gov; dchighway@nd.gov; ddanderson@nd.gov; Deb; 'Deb K'; debbiemae2@yahoo.com; Ellinger, Aimee; hhokana@nd.gov; j.hokanna; jeff@glynnlaw.net; Jessy; jhagen@nd.gov; 'Jodi Bruns'; 'Joel Hamar'; jtg@drtrl.net; kkschmidt@nd.gov; Kschimke@drtel.com; scott wertz; 'Thor Sand'; 'Veland, Gail'; Wagner, Harley; 'Wanda Sheppard'
Haz-mit Oakes meeting

Subject:

REMINDER: Haz-Mitigation meeting tonight in Oakes at the Community Center 6:30 pm- we will try to finish the draft county plan tonight. We are still working on a date to do the medical communicable disease block in a separate meeting. I will forward the date as soon as Roxanne (hint-hint) gets it to me. Public is welcome to attend any and all meetings <CR>

Charlie Russell

Emergency Manager
9-1-1 Coordinator

DICKEY COUNTY

po box 302 Ellendale ND, 58436

PH: 701-320-6299

FAX: 701-349-3960

KC5ZGH

Traci Redlin

From:
Sent:
To:

Charlie Russell <crussell@nd.gov>
Thursday, February 21, 2019 7:27 AM
'City Ellendale'; Traci Redlin; april.haring@k12.nd.us; lan O'Brien;
Jbosse@Trinitybiblecollege.edu; Kraig Steinhoff; lana.norton@ellendale.k12.nd.us;
michael.kaiser@ellendale.k12.nd.us; scott townsend; amcmmedic02@gmail.com; COLTON;
dalosure@yahoo.com; dnation48@gmail.com; DON FLAHERTY; gman8567@gmail.com;
Heupel, Erick; keithlopp@catholichealth.net; LAWANG@ND.GOV;

LoriNovak@catholichealth.net; michele.thorpe@bhshealth.org; Mike; OAKESpd;
chestes@nd.gov; dcs@nd.gov; Ellendale Police Department; lcpeterson@nd.gov;
mobrien@nd.gov; Dean Simek; Forbes; Fullerton Fire; M & M Thorpe; Oakes Fire; Wedel,
Paul; 'City of Oakes'; oakesmayor@gmail.com; dmolson@nd.gov; acgibbs@nd.gov;
ajkingzett@nd.gov; amasse@nd.gov; amber.miller@nd.gov; arali;
aschimke@ndcourts.gov; Barb; breana.s.kiser.3@ndsu.edu; cbrokaw@nd.gov; chelsey;
'Cindy R'; clerk11@nd.gov; cmiller@ndcourts.gov; 'DC Extension office'; dces@nd.gov;
dcfema@nd.gov; dchighway@nd.gov; ddanderson@nd.gov; Deb; 'Deb K'; debbiemae2
@yahoo.com; dickeypio@nd.gov; Ellinger, Aimee; hhokana@nd.gov; 'j hokanna';
jeff@glynlaw.net; Jessy; jhagen@nd.gov; 'Jodi Bruns'; 'Joel Hamar'; jig@drtrl.net;
kkschmidt@nd.gov; Kschimke@drtrl.com; rholm@nd.gov; scott wertz; 'Thor Sand';
'Veland, Gail'; Wagner, Harley; 'Wanda Sheppard'; channel61@drtrl.com; 'DC LEADER (E-
mail)'; 'Edgley Paper'; 'jamestown sun'; ksteiner@jamestownsun.com;
kddrstudio@drtrl.net; 'kqix'; 'ksjb'; 'Kulm Paper'; 'Lamoure Paper';
ndoem@bnonews.com; news@newsdakota.com; newsdirector@kvrr.com; 'Oakes Times
(E-mail)'; 'valley news'; alicia.glynn@bhshealth.org; b.schwartz@nd.gov; dcarda@good-
sam.com; Frank Balak (fbalak@nd.gov); jhankel@goodsam.com; ipeter21@good-
sam.com; maryquandt@catholichealth.net; pam.kosel@bhshealth.org;
taylor.hack@bhshealth.org; 'Tony Hanson
updates

Subject:

- 1) Dickey County seeks a person to fill an upcoming vacancy in the Treasurer's Office for the position of Dickey County Treasurer. Details to be discussed at the time of interview. Submit application and resume by e-mail at wsheppard@nd.gov or by mail to Dickey County Auditor, PO Box 215, Ellendale, ND 58436. Applications must be postmarked or received by e-mail no later than March 15, 2019. Call 701-349-3249, extension 111 if you have questions.
 - 2) Dickey County is an equal opportunity employer. Dickey County does not discriminate on the basis of age, color, disability, gender, marital status, national origin, public assistance status, race, religion, or sexual orientation
 - 3) It looks good that with the snow we have, we will overland flooding this year. Dickey County is seeking contractors to pre-register for disaster work. Needed resources are back hoe, track hoe, dump trucks (with operators) pumps, generators and snow removal equipment. To Pre-register go to the DickeyND.com, look for "Equipment Resources" fill out the sheet and email it to me. Pre-registering is a key required component to be used in any disaster.
- Also, Every year we get bids for "BOX Lunches" for disaster operations. The signup sheet, as well as the description of what's in a "box lunch" is also located on the Dickeynd.com under Disaster resource providers under "Food Resource's". To provide food products, you will need to be a restaurant or a commercial kitchen following the standard NDOH licensing criteria. Any questions—Please call me at 701-320-6299

- 3) The contagious disease block for the Hazardous mitigation planning meeting has had a date change- It will be Tuesday March 12th at 2PM at the Emergency Operations Center located in the Dickey County Highways Building <CR>

Charlie Russell

Emergency Manager

9-1-1 Coordinator

DICKEY COUNTY

po box 302 Ellendale ND, 58436

PH: 701-320-6299

FAX: 701-349-3960

KC5ZCH

Traci Redlin

From: Charlie Russell <crussell@nd.gov>
Sent: Tuesday, March 12, 2019 6:12 AM
To: 'City Ellendale'; Traci Redlin; 'John Paul Martin'; 'Corey King'; amcmedic02@gmail.com; COLTON; dalosure@yahoo.com; dnation48@gmail.com; DON FLAHERTY; gman8567@gmail.com; Heupel, Erick; keithloepf@catholichealth.net; LAWANG@ND.GOV; LorinNovak@catholichealth.net; michele.thorpe@bhshealth.org; Mike; OAKESpd; chestes@nd.gov; dcoo@nd.gov; Ellendale Police Department; lcpeterson@nd.gov; mobrien@nd.gov; Dean Simek; Forbes; Fullerton Fire; M & M Thorpe; Oakes Fire; Wedel, Paul; april.haring@k12.nd.us; Ian O'Brien; Jbosse@Trinitybiblecollege.edu; Craig Steinhoff; lana.norton@ellendale.k12.nd.us; michael.kaiser@ellendale.k12.nd.us; scott townsend; alicia.glynn@bhshealth.org; amber.miller@nd.gov; b.schwartz@nd.gov; dcarda@good-sam.com; dickeypio@nd.gov; Frank Balak; jhanke@goodsam.com; lpeter21@good-sam.com; maryquandt@catholichealth.net; pam.kosel@bhshealth.org; Roxanne Holm; taylor.hack@bhshealth.org; 'Tony Hanson; dmdison@nd.gov; acgibbs@nd.gov; ajkingzett@nd.gov; amasse@nd.gov; arali; aschimke@ndcourts.gov; Barb; breana.s.kiser.3@ndsu.edu; cbrokaw@nd.gov; chelsey; 'Cindy R'; clerk11@nd.gov; cmiller@ndcourts.gov; 'DC Extension office'; dces@nd.gov; dcfema@nd.gov; dchighway@nd.gov; ddanderson@nd.gov; Deb; 'Deb K'; debbiemae2@yahoo.com; Ellinger, Aimee; hokkana@nd.gov; j.jeff@glynlaw.net; Jessy; jhagen@nd.gov; 'Jodi Brunst'; 'Joel Hamar'; jtg@drtrl.net; kkschmidt@nd.gov; Kschimke@drtel.com; scott wertz; 'Thor Sand'; 'Veland, Gail'; Wagner, Harley; 'Wanda Sheppard'; 'City of Oakes'; oakesmayor@gmail.com

Subject:

UPDATES

Importance:

High

Good morning-

(A) Reminder the Hazardous mitigation block for medical (contagious disease) is today in my office at 2 pm...All are welcome- but it is critical that I have medical facilities representation (hospital-public health-rest home- assisted living, schools and ems) present. We are doing only one block so it shouldn't take long. It is critical Dickey County speaks as one if you want federal grant money in the future. Also, we need to address the concerns and mandates coming down to our folks from vastly different agencies and agendas.

(B) There is still a serious concern on the "timing" for the start of tomorrows storm. I was warned yesterday afternoon by NWS Bismarck that it had been moved up to a mid-morning start vs Wed evening start. This is critical information needed by our courthouse, schools and health care for scheduling changes to assure we don't trap people in town or fail to get needed folks in safely for shift coverages

I studied all of the info again this morning and NOTHING seems to match- graphics still elude to evening start- the written forecast- doesn't match the graphic timeline (wind & snow at 1030) etc when looking for a for start time. I know this is due to the guidance algorithms at NWS and the definitions "START" but we need to watch this closely or we could end up in a real rodeo

Today's meeting will be in my office in the DC Highways building just north of John Deer- HWY 281 in Ellendale for those folks unfamiliar with its location.

Stay safe out there and thanks for all you do for Dickey County.<CR>

Charlie Russell

Emergency Manager

9-1-1 Coordinator

DICKEY COUNTY

po box 302 Ellendale ND, 58436

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FAX: 701-349-3960

KC5ZCH

Appendix 4 Media Coverage

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DRAFT

June 24, 2010 Jamestown Sun No place to go

Sloughs in area are bloated with water as heavy rains have left the ground saturated on top of precipitation from last winter. With nowhere else to go, the water has flowed onto roads.

--The road to the Scott Muggli farm covered by 4 ½ foot waters that stretch for miles/Spent 30,000 of own money to fix roads leading to property/kept from planting 40% of 5,000 acre crop/ the 4 ½ foot deep slough stretches 3 miles and covers 700 acres by his home owned by US Fish and Wildlife Service not allowed to divert water onto

--Kevin and Teresa Kasprick home is an island on roughly 2 ½ acres with a flooded-out basement/no place for water to go except into home/septic failed once if four more inched of water would fail again/ two sloughs connected into one and kept gaining size/Teresa lost business that ran out of her basement/can't keep up with water coming into house/nothing covered by insurance because pipes didn't break

Charlie Russell—in the southern parts of county, the water can be diverted in the James or Maple Rivers, the central part bigger risk because no close location for the water to go



April 14, 2011 Dickey County Leader Charlie's pictures Flood Waters a big problem for Dickey County

Dickey County being affected by flood waters/urge motorist to be aware and drive careful ND Department of Transportation "Don't go out and sight-see because the additional traffic only causes more problems for County and State officials"

Ellendale Public Schools buses are putting on more miles on their routes/routes in morning may not be available by afternoon



April 14, 2011 Oakes Times watch for water on area roads

Law enforcement asking everyone to be careful-never know when water covering the road is also covering a wash out **1 flag take care 2 flags its closed**



July 7, 2011 Oakes Times Dickey County Highway 3 West of Oakes remains closed

Continue to be closed/appears water surrounding the road and the residence nearby has increased in size and depth/buildings water home major damage no one living there/other county township roads have water on them and damage from water



September 15, 2011 Oakes Times Work has begun on Dickey County Road 3

County Roads 3 has been closed since the snow started to melt in March.

County 3 is one on the well-traveled roads in DC. –Fullerton residents come to Oakes to work and do business –farmers haul millions of bushels of grain to the Oakes Elevator –Fuel and propane is delivered –school bus routes are altered –emergency vehicles ambulance, fire department, and law enforcement are affected by road closure and need to find alternative routes

Economic Effects

--Columbia Grain commented road being closed has had an economic impact on the economy in the Oakes area

--Farmland Co-op extra mile have had to drive to service customers is very costly

--The Ranch House, Fullerton drop in customers not wanting to make the extra 50 plus mile drive to get there

--School buses adding more miles to routes and more time to get students to school at a greater cost to district

October 20, 2011 Oakes Times County Home Destroyed by Water County Road 3 wets of Oakes, where the road has been under water since early last spring stands the former Kasprick home the farm and out buildings are destroyed



December 1, 2011 Oakes Times Pickup in water on flooded road Yorktown Township Road



May 24, 2012 Dickey County Leader Insurance Claim Denied

ND Insurance Reserve Fund denied Fireside Restaurant claim for damage from a sewer backup- Council reiterated the need for the city to clean the sewer main adjacent to the Fireside Restaurant at least once a calendar year.

Appendix 5 Meeting Notes

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DATE – Public Meeting	

**Meeting Notes from the February 12, 2019, Dickey County 1st Committee Meeting
to update the Dickey County Multi-Hazard Mitigation Plan**

Attendance: Dickey County Emergency Manager Charlie Russell; Dickey County Sheriff Chris Estes; Ellendale City Councilman Richard Wadholm; Trinity Bible College Facilities Coordinator Todd Staley; Ellendale City Councilman Don Flaherty; Ellendale Ambulance and Fire Department Corey Gulle; Dickey County Deputy Sheriff Steven Harmer; Ellendale Fire Protection District Fire Chief Paul Wedell; Ellendale Public School Superintendent Michael Kaiser; Dickey County Commissioner and Ellendale Township Joel Hamar; Ellendale Police Officer Lucas VanZee; Oakes Police Chief Matt O'Brien; Oakes Public School Superintendent Kraig Steinhoff; Ellendale Fire Asst. Chief Mike Thorpe; South Central Dakota Regional Council (SCDRC) Plan Facilitators Jennifer Schultes and Traci Reldin.

The first meeting of the Dickey County Planning Committee was held from 6:30 to 8:30 p.m., Tuesday, February 12, 2019, at the Fireside Steakhouse, Ellendale, ND. An invitational e-mail was sent out to the members of the community, including the mayor and auditor of each of the 6 jurisdictions in Dickey County and the local Chambers, Fire Halls, Police Station, Sheriff's Office, water board, schools and more.

The meeting was called to order at 6:30 p.m. by Dickey County Emergency Manager Charlie Russell. Charlie introduced South Central Dakota Regional Council (SCDRC) Facilitators, Jennifer Schultes and Traci Redlin. Schultes explained the Council's role in helping to facilitate the update to the Multi-Hazard Mitigation Plan (MHMP) for Dickey County. Schultes gave an overview of the process to update the MHMP for Dickey County and what the responsibilities will be of each planning team member. Each participant introduced themselves and whom they represented.

Schultes reviewed the agenda, which included the purpose of mitigation and the plan update, what mitigation is, why a mitigation plan is needed, and how the current mitigation plan is used. Schultes reviewed who needs to be involved in the planning process and how to get public involvement, when to schedule meetings, a review of the county's and state's hazards and vulnerabilities and identified the steps to be taken in the planning process.

The official plan update committee will be the Dickey County LEPC and members from each jurisdiction in Dickey County. The group decided that each member present would be eligible to vote. Decisions will be made by a simple-majority vote.

The location of the next meeting will be at the Oakes Community Center, Oakes, ND. Reminder e-mails will be sent out before each meeting.

The committee completed the first review of hazards impacting Dickey County and its jurisdictions as listed in the 2014 ND state mitigation plan draft and in the 2014 Dickey County mitigation plan. The committee voted to make changes to hazards and eliminate other hazards for Dickey County where necessary.

The committee completed scoring and ranking of the hazards “Drought, Flood, Hazardous Material Release, Homeland Security, Severe Summer Weather, Severe Winter Weather, Shortage or Outage of Critical Materials and Transportation Accident” and their impact on Dickey County.

Next committee meeting is set for 6:30 p.m., February 29, 2019, at the Oakes Community Center.

The meeting was adjourned at 8:30 pm.

DRAFT

**Meeting Notes from the February 19, 2019, Dickey County 2nd Committee Meeting
to update the Dickey County Multi-Hazard Mitigation Plan**

Attendance: Dickey County Emergency Manager Charlie Russell; Oakes Mayor Monty Zimmer; Oakes Ambulance Mike Sandy; Emma Mann, Oakes, ND; Ellendale City Councilman Don Flaherty; Dickey County Auditor Wanda Sheppard; South Central Dakota Regional Council (SCDRC) Plan Facilitators Jennifer Schultes and Traci Reldin.

The second meeting of the Dickey County Planning Committee was held from 6:30 to 8:30 p.m., Tuesday, February 12, 2019, at the Oakes Community Center, Oakes, ND. An invitational e-mail was sent out to the members of the community, including the mayor and auditor of each of the 6 jurisdictions in Dickey County and the local Chambers, Fire Halls, Police Station, Sheriff's Office, water board, schools and more.

The meeting was called to order at 6:30 p.m. by Dickey County Emergency Manager Charlie Russell. Charlie introduced South Central Dakota Regional Council (SCDRC) Facilitators, Jennifer Schultes and Traci Redlin. Schultes explained the Council's role in helping to facilitate the update to the Multi-Hazard Mitigation Plan (MHMP) for Dickey County. Schultes gave an overview of the process to update the MHMP for Dickey County and what the responsibilities will be of each planning team member. Each participant introduced themselves and whom they represented.

Schultes reviewed the agenda, which included the purpose of mitigation and the plan update, what mitigation is, why a mitigation plan is needed, and how the current mitigation plan is used.

The location of the next meeting will be at the Dickey County Highway Department, Ellendale, ND. Reminder e-mails will be sent out before each meeting.

The committee completed scoring and ranking of the hazards "Urban Fire Structure/Collapse; Wildland Fire and Windstorm" and their impact on Dickey County. The committee completed a review of the projects from the 2014 MHMP.

Next committee meeting is set for 6:30 p.m., March 12, 2019, at the Dickey County Highway Department, Ellendale, ND.

The meeting was adjourned at 8:30 pm.

**Meeting Notes from the March 12, 2019, Dickey County 3rd Committee Meeting
to update the Dickey County Multi-Hazard Mitigation Plan**

Attendance: Dickey County Emergency Manager and Ellendale Ambulance Charlie Russell; Ellendale Ambulance and Fire Department Corey Gulke; CHI Oakes Hospital Quality/Risk Lori Novak; CHI Oakes Hospital Infection Prevention/Workforce Safety Tina Ochsner; CHI Oakes Hospital Mary Quandt; Ellendale Public School Superintendent Michael Kaiser; Dickey County Health Department RN Amber Miller; Dickey County Health Department RN-DON Laurie Wang; Central Valley Health District EPR Coordinator Frank Balak; Prince of Peace Care Center/Evergreen Place RN-DON, Ellendale Ambulance, Ellendale Public School board Michele Thorpe; LaMoure County Public Health ADM Tony Hanson; South Central Dakota Regional Council (SCDRC) Plan Facilitator Traci Reldin.

The third meeting of the Dickey County Planning Committee was held from 6:30 to 8:30 p.m., Tuesday, March 12, 2019, at the Dickey County Highway Department. An invitational e-mail was sent out to the members of the community, including the mayor and auditor of each of the 6 jurisdictions in Dickey County and the local Chambers, Fire Halls, Police Station, Sheriff's Office, water board, schools and more.

The meeting was called to order at 6:30 p.m. by Dickey County Emergency Manager Charlie Russell. Charlie introduced South Central Dakota Regional Council (SCDRC) Facilitator, Traci Redlin. Redlin gave an overview of the process to update the MHMP for Dickey County and what the responsibilities will be of each planning team member. Each participant introduced themselves and whom they represented.

Redlin reviewed the agenda, which included the purpose of mitigation and the plan update, what mitigation is, why a mitigation plan is needed, and how the current mitigation plan is used.

The committee completed scoring and ranking of the hazard "Communicable Disease" and its impact on Dickey County.

The meeting was adjourned at 8:30 pm.

Appendix 6 Definitions

American Red Cross is a humanitarian organization that provides emergency assistance, disaster relief and education inside the United States. It is the designated U.S. affiliate of the International Federation of Red Cross and Red Crescent Societies.

Association of State Dam Safety Officials (ASDSO) is a national non-profit organization serving state dam safety programs and the broad dam safety community, which includes federal dam safety professionals, dam owners and operators, engineering consultants, emergency managers, manufacturers, suppliers, academia, contractors, and others interested in improving dam safety.

Capability is existing authorities, policies, programs, and resources available to accomplish hazard mitigation. Capabilities for mitigation are divided into four categories: administrative and technical, education and outreach, financial, and planning and regulatory.

- Administrative and Technical capabilities refer to the staff, their skill, and told the community has for mitigation planning and implementing specific mitigation actions.
- Education and Outreach capabilities refer to programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information.
- Financial capabilities are the resources that a jurisdiction has access to or is eligible to use to fund mitigation actions.
- Planning and Regulatory capabilities are plans, policies and ordinances such as comprehensive plans, capital improvement programs, zoning ordinances, or building codes that assist in mitigating the impacts of hazards or threats.

Catastrophic Emergency or Disaster: A National Security emergency caused by any occurrence—natural disaster, attack by foreign powers, act of domestic or international terrorism, technological emergency, or other emergency—that seriously degrades or threatens the national security of the United States.

A mass casualty incident, dam failure, or other natural or technological emergency that causes an immediate and devastating disruption to life, property, and the environment; and immediately surpasses the ability of local and State capabilities to respond effectively to the disaster/emergency.

A combination of several related or unrelated emergencies/hazards, which when occurring individually, can be responded to effectively by local and State agencies, but when occurring simultaneously, surpass the response capabilities of local and State agencies.

Climate Change is a long-term shift in the statistics of the weather (including its averages). For example, it could show up as a change in climate normals (expected average values for temperature and precipitation) for a given place and time of year, from one decade to the next.

Community Assets are the people, structures, facilities, and systems that have value to the community.

Conservation Reserve Program (CRP) is a cost-share and rental payment program operating under the United States Department of Agriculture (USDA), administered by the USDA Farm Service Agency

(FSA). The purpose of the CRP is to encourage farmers to convert highly erodible cropland and other environmentally sensitive areas to nature vegetative cover.

Dakota, Missouri Valley & Western (D.M.V.W.) is a railroad company operating approximately 75 miles of track in North Dakota leased from Canadian Pacific Railway. The company's headquarters is located in Bismarck, N.D.

Exposure Analysis identifies the existing and future community assets located in identified hazard areas.

Farm Service Agency (FSA) is part of the USDA and handles implementation of farm conservation and regulation laws in the United States. The FSA was the agency formed after the Agricultural Stabilization and Conservation Service (ASCS) and other federal agencies merged.

Federal Emergency Management Agency (FEMA) is a federal agency responsible for coordination of government relief efforts for natural disaster assistance for state and local governments and provides aid to citizens of the United States.

Federal Hazard Mitigation Assistance Grants are grants to State and local governments to support mitigation projects. Specific funding availability varies from year to year, and some program verification may be required. The types of mitigation assistance grants are Flood Mitigation Assistance, Hazard Mitigation Grant Program, and Pre-Disaster Mitigation.

- **Flood Mitigation Assistance (FMA)** provides funds to mitigate the effects of flooding. FMA is available annually depending on appropriations. FMA can be used to fund mitigation projects, but not plans. The non-Federal share ranges from 10 percent to 25 percent. Applications for FMA grants are generally due to the State in August or September.
- **Hazard Mitigation Grant Program (HMGP)** is a post-disaster source of funding which can be used to mitigate any natural hazard and can be used for planning as well as for a project. The non-Federal share is 25 percent. Local jurisdictions must generally apply to the State for HMGP funds within a year of a disaster declaration.
- **Pre-Disaster Mitigation (PDM)** provides mitigation funding and can be used to mitigate any natural hazard and can be used for planning as well as for a project. The non-Federal share ranges from 10 percent to 25 percent. Applications for PDM funds are generally due to the State in August or September.

Federal Hazard Mitigation Officer (FHMO) is the FEMA employee responsible for representing the agency for each declaration in carrying out the overall responsibilities for hazard mitigation, including coordinating post-disaster hazard mitigation actions with other agencies of government at all levels.

Frequency is how often a natural hazard or threat occurs measured over any given period of time.

Hazard Mitigation is defined as any cost-effective action(s) that have the effect of reducing, limiting, or preventing vulnerability of people, property, and the environment to potentially damaging, harmful, or costly hazards. Hazard mitigation measures, which can be used to eliminate or minimize the risk to life and property, fall into three categories. First, are those which keep the hazard away from life and property, e.g., dams or levees. Second, are those which keep life and property away from the hazard, e.g.,

land use practices. Third, are those that do not address the hazard at all, but rather reduce the impact of the hazard on victims, e.g., insurance and disaster relief.

Hazard mitigation measures must be practical, cost-effective, and environmentally and politically acceptable. Actions taken to limit the vulnerability of society to hazards must not in themselves be more costly than the value of anticipated damages. If the cost of a flood control project exceeds the value of flooding damages that could be prevented, community warning, evacuation and other operational procedures may be the only available means of limiting the adverse impacts of a hazard. Such plans and procedures are not generally considered mitigation actions because they do nothing to reduce or limit the actual vulnerability of a community to a hazard. However, they may generate some savings in property losses. In addition, such actions are an important contribution to the protection of population.

Often, there are no economic means of avoiding the effects of future damages. This may occur when it is impossible to predict with any certainty the location, frequency, or severity of a hazard. This is generally the case with tornadoes.

The primary focus of hazard mitigation actions must be at the point at which capital investment decisions are made. Capital investments, whether for homes, roads, public utilities, pipelines, power plants, chemical plants/warehouses, or public works, determine to a large extent the nature and degree of hazard vulnerability of a community. Accordingly, mechanisms such as zoning ordinances, which can be used to restrict new development in other high hazard areas, or building codes, which can insure that new buildings are built to withstand the damaging forces or impacts of the hazards, are the most useful mitigation approaches.

The National Flood Insurance Program, for example, requires communities to adopt ordinances that control new development and substantial improvements in floodplains as a condition for making flood insurance available in the community.

Once capital facilities are in place, very few opportunities will occur over the useful life of those facilities to correct any errors that may have been made in terms of their location or quality of construction with respect to hazard vulnerability. One opportunity that occasionally presents itself, however, is the instant depreciation of structures and facilities that accompanies the occurrence of a disaster. To replace damaged facilities, new capital investment is required from such sources as insurance payments, governmental disaster assistance grants or loans, or other sources.

Hazard Mitigation Assistance (HMA) is a grant program providing funding for eligible mitigation activities that reduce disaster losses and protect life and property from future disaster damages.

Hazard Mitigation Plan means the plan resulting from a systematic evaluation of the nature and extent of vulnerability to the effects of hazards present in society and includes the actions needed to minimize future vulnerability to those hazards.

Hazard Mitigation Planning is to identify community policies and actions that can be implemented over the long-term to reduce risk and future losses.

Hazard Mitigation Survey Team (HMST) means the FEMA/State/Local survey team that is activated following disasters to identify immediate mitigation opportunities and issues to be addressed in the

Section 409 Hazard Mitigation plan. The HMST may include representatives of other Federal agencies, as appropriate.

HHS emPOWER Map 2.0 is provided to inform and support community partner emergency preparedness, mitigation, response, recovery, and resilience activities. Over 2.5 million Medicare beneficiaries rely upon electricity-dependent medical and assistive equipment, such as ventilators and wheel chairs, and cardiac devices in our communities.

High Plains Regional Climate Center is a regional center at the University of Nebraska-Lincoln working with the NCDC to provide real-time and historical climate data and products.

Historical Analysis uses information on impacts and losses from previous hazard events to predict potential impacts and losses in a similar type of future event.

Household is a house and its occupants regarded as a unit.

Housing Unit is a residence such as a house, apartment, mobile home, or room(s) within a larger structure that provides space for occupants making up a single household to live and eat.

Impact is the consequences or effects of a hazard on the community and its assets, or the resulting issue related to a hazard. Impacts can range from blocked roads from flooding or fallen trees to power outages.

Interagency Hazard Mitigation Team (IHMT) means the mitigation team that is activated following flood related disasters pursuant to the July 10, 1980, Office of Management and Budget directive on Nonstructural Flood Protection Measures and Flood Disaster Recovery, and the subsequent December 15, 1980, Interagency Agreement for Nonstructural Damage Reduction.

Likelihood is how probable it is that a hazard or threat will happen.

Local Emergency Planning Committee (LEPC) is the Dickey County emergency planning committee. This group is comprised of individuals representing: elected officials, public health and safety, media, community groups, and facility owners and operators.

Local Hazard Mitigation means the local government input to the planning and implementation of pre- and post-disaster mitigation activities. The local governmental officials, e.g., county and city commissioners, city and county planners, public works and facility directors or managers, etc., will provide this input. Since hazard mitigation is a function of comprehensive emergency management, the overall local hazard mitigation planning effort is coordinated by the city/county emergency manager.

Mitigation is the effort to reduce loss of life and property by lessening the impact of disasters. Mitigation is taking action *now*—before the next disaster—to reduce human and financial consequences later (analyzing risk, reducing risk, insuring against risk).

Mitigation Actions are specific projects and activities that help achieve mitigation goals. The actions form the core of the plan and are key to the outcome of the planning process. Mitigation actions are organized into four categories: education and awareness programs, local plans and regulations, natural systems protection, and structure and infrastructure projects.

- Education and Awareness Programs are mitigation actions to inform and educate the public, elected officials, and property owners about hazards and potential ways to mitigate them.
- Local Plans and Regulations are mitigation actions that pertain to government authorities, policies, or codes that influence the way land and buildings are developed and built.
- Natural Systems Protection are mitigation actions that minimize damage and losses and also preserve or restore the functions of natural systems.
- Structure and Infrastructure Projects are mitigation actions that involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area.

Mitigation Goals are general guidelines that explain what the community wants to achieve with the mitigation plan. Goals are broad, policy-type statements that are long-term, and represent visions for reducing or avoiding losses from identified hazards and threats.

Mitigation Strategy is a set of actions serving as the long-term blueprint for reducing the potential losses identified in the risk assessment of a mitigation plan. The mitigation strategy describes how the community will accomplish the overall purpose, or mission, of the planning process. The mitigation strategy is comprised of three main components: mitigation goals, mitigation actions, and an action plan for implementation.

National Climatic Data Center (NCDC) maintains climate data archives and provides climatological services and data in the United States, making it available to the public, business, industry, government, and researchers.

National Inventory of Dams (NID) is a congressionally authorized database, which documents dams in the U.S. and its territories.

National Flood Insurance Program (NFIP) is a federal program to help property owners financially protect themselves from flooding since standard homeowners insurance does not cover flooding. The program offers insurance to homeowners, renters, and business owners if their respective community participates in the program. City's participating in the NFIP must agree to adopt and enforce ordinances that meet or exceed the requirements from FEMA.

National Oceanic and Atmospheric Administration (NOAA) is a federal agency that focuses on the conditions of the oceans and the atmosphere, and provides daily weather forecasts, storm warnings and climate monitoring.

National Resources Conservation Service (NRCS) is a federal agency within the United States Department of Agriculture (USDA), formerly known as the Soil Conservation Service (SCS), and provides technical assistance to farmers, private landowners, and land managers. The NRCS aims to improve, protect, and conserve natural resources through cooperation with state and local agencies on privately owned lands.

National Weather Service (NWS) is a component of the National Oceanic and Atmospheric Administration (NOAA). NWS provides weather, water, and climate data, forecasts and warning for the protection of life and property and enhancement of the national economy.

Natural Hazard is a source of harm or difficulty created by a meteorological, environmental or geological event.

North Dakota Aeronautics Commission is a five-member commission appointed by the governor, which was established by the North Dakota State Legislature in 1947. The commission serves the public by provided economic and technical assistance for the aviation community while ensuring the safe and cost-effective advancement of aviation in North Dakota.

North Dakota Department of Agriculture is the lead agency committed to promoting a healthy economic, environmental and social climate for agriculture and the rural community through leadership, advocacy, education, regulation and other services.

North Dakota Department of Commerce is the lead agency charged with growing the state and improving the quality of life. The department is divided into four divisions - Tourism, Economic Development, Workforce Development and Community Services.

North Dakota Department of Emergency Services (NDDDES) provides 24-hour emergency communications and resource coordination with more than 50 lead and support agencies, private enterprise, and voluntary organizations to assist local jurisdictions in disaster and emergency response activities. It administers federal disaster recovery programs and the Homeland Security Grant Program. NDDDES also manages the Emergency Management Assistance Compact (EMAC) that serves as a national clearinghouse through which member states may request and provide mutual aid assistance.

North Dakota Department of Health is the lead agency providing community health, emergency preparedness, medical services, health resources, environmental health resources and administrative support to local government and agencies in North Dakota.

North Dakota Department of Public Instruction is the lead agency enforcing all state statutes and federal regulations pertaining to the establishment and maintenance of public schools and related programs, supervise the ND Schools for the Deaf and Blind, and the State Library, operate the Department of Public Instruction efficiently and effectively, expand the delivery options that increase educational opportunities for all North Dakota citizens, evaluate and communicate educational policy and vision to all North Dakota residents and serve as an advocate for adequate financial resources to support public education.

North Dakota Department of Transportation (NDDOT) is the lead agency charged with the responsibility of assuring people and goods are moved safely in North Dakota to support continued economic activity and growth.

North Dakota Insurance Department is a state regulatory agency headed by the Insurance Commissioner which focuses on insurance regulation.

North Dakota Public Service Commission is a constitutional agency with varying degrees of statutory authority over: electric and gas utilities, telecommunications companies, energy plant and transmission siting, railroads, grain elevators, auctioneers and auction clerks, weighing and measuring devices, pipeline safety, coal mine reclamation and abandoned mine lands, and damage prevention.

North Dakota State Fire Marshal is a state agency responsible for emergency responses to hazardous materials incidents, and for enforcing state laws for prevention of fires; storage, sale, and use of combustibles and explosives, including fireworks; fire safety inspections and regulations, arson investigations, hazardous materials training, and fire prevention education.

North Dakota State Water Commission, commonly referred to as the State Water Commission, is the lead agency charged with providing effective management of North Dakota's water resources.

Plan Maintenance is a process to ensure the hazard mitigation plan remains an active and relevant document. Plan maintenance describes methods and schedules for monitoring, evaluating, and updating the plan, and identifying method for keeping the public involved.

Planning Team is the core group responsible for making decisions, guiding the planning process, and agreeing upon the final contents of the plan.

Population is a summation of the number of people living in a particular geographical area.

Probability is the measure of the likeliness an event will occur.

Problem Statements summarize particular vulnerabilities or problems that support findings of the risk assessment.

Repetitive Loss Property is an NFIP insured structure that has had at least two paid flood losses of more than \$1,000 each in any 10-year period since 1978.

Resiliency is the ability to adapt to changing conditions and prepare for, withstand, and rapidly recover from disruption.

Risk is the potential for damage, loss, or other impacts created by the interaction of natural hazard with community assets. Risks can be involved in everything from economic, health, safety, environmental, security, business, human and emergency services, and financial obligations.

Risk Assessment is the product or process that collects information and assigns values to risks for the purpose of informing priorities, developing or comparing courses of action, and informing decision making.

Scenario Analysis asks, “what if” a particular event occurred and predicts potential impacts and losses in terms of monetary costs, casualties, infrastructure down time, and other elements of risk.

Scour is the removal of streambed material caused by swiftly moving water from around a bridge abutment or pier.

South Central Dakota Regional Council (SCDRC) is one of eight planning districts in the state of North Dakota. SCDRC provides planning and development services, technical assistance, information coordination, and program administration to facilitate the needs of local units of government in the areas of community development, economic development, and public infrastructure.

Special Hazard Events and Losses Database for the United States (SHELDUS) is a county-level hazard data set for 18 different natural hazard events types in the United States Data and maps were

compiled and geo-referenced by the Hazards & Vulnerability and Research Institute at the University of South Carolina. SHELDUS was affected by government sequestration and is no longer in operation.

Stakeholders are individuals or groups that affect or can be affected by a mitigation action or policy.

State Hazard Mitigation Officer (SHMO) is the representative of State Government who serves on the HMST and who is the primary point of contact with FEMA, other Federal agencies, and local units of government in the planning and implementation of post-disaster mitigation activities.

Subject Matter Experts (SMEs) are stakeholders in the planning process that inform the planning team on specific topics and provide input from different points of view in the community. Examples of SMEs are representatives of businesses, academia, and neighboring jurisdictions.

Threat (human-caused incident) is an intentional action of an adversary, such as a threatened or actual chemical or biological attack or cyber event.

Threat and Hazard Identification and Risk Assessment (THIRA) incorporates technological and human-caused threats in addition to natural hazards. The THIRA results in a set of capability targets for all stages of emergency management with a goal to identify, build and sustain needed capabilities to achieve security and resiliency.

United States Army Corps. of Engineers (USACE) is a U.S. federal agency under the Department of Defense and a major Army command made up of approximately 37,000 civilian and military personnel, making it one of the world's largest public engineering, design, and construction management agencies. Although generally associated with dams, canals and flood protection in the United States, USACE is involved in a wide range of public works throughout the world.

United States Census Bureau is the lead federal agency serving as the lead source of quality data about the people and economy of the United States.

United States Department of Agriculture (USDA) is a United States federal executive department responsible for development and executing policy on farming, agriculture, forestry and food derived by the federal government.

United States Department of Agriculture Risk Management Agency (USDA RMA) is the Federal Crop Insurance Corporation (FCIC) to provide innovative crop insurance products to America's farmers and ranchers. Approved Insurance Providers (AIP) sell and service Federal crop insurance policies in every state and in Puerto Rico through a public-private partnership with RMA. RMA backs the AIPs who share the risks associated with catastrophic losses due to major weather events.

United States Drought Monitor is a weekly map of drought conditions that is produced jointly by the National Oceanic and Atmospheric Administration, the U.S. Department of Agriculture, and the National Drought Mitigation Center (NDMC) at the University of Nebraska-Lincoln.

Vulnerability is the characteristics of community assets that makes them susceptible to damage from a given hazard.

7. Hazard Profile and History

Communicable Disease

Crop Year	County	Crop	Crop Type	Net Acres	Liability	Indemnity
2013	Dickey	Corn	Silage	223.10	94,688	940
2013	Dickey	Forage Production	Alfalfa	1,885.98	257,788	3,375
2013	Dickey	Forage Production	Grass Alfalfa Mix	2,260.60	149,695	5,149
2013	Dickey	Oats	No Type Specified	1,442.77	193,544	5,422
2013	Dickey	Sunflowers	Confectionery	662.40	169,687	6,556
2013	Dickey	Barley	Spring All Others	217.10	43,587	11,219
2013	Dickey	Barley	Spring Malting	1,190.50	264,800	31,697
2013	Dickey	Dry Beans	Pinto	1,804.70	782,781	54,561
2013	Dickey	Sunflowers	Oil	971.10	237,852	107,163
2013	Dickey	Soybeans	Large Seeded Food Grade	1,241.00	674,892	174,997
2013	Dickey	Wheat	Spring	13,494.23	3,583,625	350,752
2013	Dickey	Potatoes	Russets Non-Seed	1,537.10	2,671,680	406,507
2013	Dickey	Soybeans	Commodity	182,301.96	65,101,705	6,381,362
2013	Dickey	Corn	Grain	204,632.00	121,297,742	26,450,673
2012	Dickey	Oats	No Type Specified	1,979.75	266,307	1,634
2012	Dickey	Sunflowers	Confectionery	780.00	235,253	12,812
2012	Dickey	Sunflowers	Oil	794.30	192,049	14,443
2012	Dickey	Dry Beans	Black	644.70	326,739	15,157
2012	Dickey	Dry Beans	Pea (Navy)	1,119.70	671,141	38,471
2012	Dickey	Forage Production	Alfalfa	1,942.84	233,046	44,394
2012	Dickey	Forage Production	Grass Alfalfa Mix	2,394.80	170,895	49,581
2012	Dickey	Dry Beans	Pinto	2,402.10	1,303,839	74,372
2012	Dickey	Wheat	Spring	12,335.07	2,866,656	128,768
2012	Dickey	Potatoes	Russets Non-Seed	1,721.30	2,726,963	166,366
2012	Dickey	Soybeans	Commodity	179,826.41	61,987,139	2,340,269
2012	Dickey	Corn	Grain	190,162.74	113,786,528	3,144,303
2011	Dickey	Forage Production	Grass Alfalfa Mix	3,051.30	146,850	
2011	Dickey	Forage Production	Alfalfa	2,200.54	230,866	11,939
2011	Dickey	Oats	No Type Specified	1,508.01	136,820	38,091
2011	Dickey	Dry Beans	Pea (Navy)	438.70	152,475	53,742
2011	Dickey	Dry Beans	Black	810.90	247,995	87,590

2011	Dickey	Corn	Silage	524.40	142,438	123,642
2011	Dickey	Potatoes	Russets Non-Seed	1,508.70	2,269,860	137,826
2011	Dickey	Barley	Spring All Others	1,384.40	338,499	137,951
2011	Dickey	Sunflowers	Oil	2,208.50	559,478	259,656
2011	Dickey	Dry Beans	Pinto	1,631.52	537,881	393,529
2011	Dickey	Sunflowers	Confectionery	2,192.74	703,008	615,179
2011	Dickey	Wheat	Spring	31,771.57	9,371,950	3,099,243
2011	Dickey	Soybeans	All Others	165,963.20	56,114,708	13,272,282
2011	Dickey	Corn	Grain	194,118.74	109,593,682	24,868,919
2010	Dickey	Forage Production	Alfalfa Grass Mix	338.50	26,241	
2010	Dickey	Forage Production	Grass Alfalfa Mix	3,620.72	151,703	
2010	Dickey	Forage Production	Alfalfa	3,947.35	384,535	6,317
2010	Dickey	Barley	Spring All Others	1,237.54	178,690	9,147
2010	Dickey	Oats	No Type Specified	2,124.30	138,521	16,850
2010	Dickey	Barley	Spring Malting	856.20	91,962	28,974
2010	Dickey	Dry Beans	Black	953.38	307,945	58,642
2010	Dickey	Potatoes	Russets Non-Seed	1,760.20	2,574,094	123,658
2010	Dickey	Dry Beans	Pea (Navy)	2,651.08	964,499	155,035
2010	Dickey	Sunflowers	Oil	2,031.95	424,576	194,605
2010	Dickey	Sunflowers	Confectionery	2,417.82	533,278	604,641
2010	Dickey	Dry Beans	Pinto	5,823.46	1,885,514	794,730
2010	Dickey	Wheat	Spring	34,793.26	5,422,658	1,058,748
2010	Dickey	Soybeans	All Others	175,282.57	38,910,212	7,904,374
2010	Dickey	Corn	Grain	183,848.82	62,250,762	29,150,431
2009	Dickey	Forage Production	Alfalfa	4,787.65	341,489	
2009	Dickey	Forage Production	Alfalfa Grass Mix	761.80	34,758	
2009	Dickey	Forage Production	Grass Alfalfa Mix	5,134.10	158,543	
2009	Dickey	Oats	No Type Specified	1,567.69	135,258	10,585
2009	Dickey	Barley	Spring	2,039.30	304,315	25,446
2009	Dickey	Dry Beans	Black	513.30	154,718	43,943
2009	Dickey	Dry Beans	Pea (Navy)	678.40	197,983	114,976
2009	Dickey	Sunflowers	Oil	2,417.53	413,160	232,866
2009	Dickey	Potatoes	Russets Non-Seed	1,471.60	2,338,508	336,294
2009	Dickey	Sunflowers	Confectionery	1,852.87	361,177	363,717
2009	Dickey	Wheat	Spring	33,587.59	5,905,300	532,325
2009	Dickey	Dry Beans	Pinto	6,175.60	1,848,184	893,964

2009	Dickey	Soybeans	No Type Specified	174,546.82	38,215,874	4,068,902
2009	Dickey	Corn	Grain	179,629.86	61,125,752	16,975,507
2008	Dickey	Potatoes	Russets Non-Seed	1,755.90	2,535,220	
2008	Dickey	Forage Production	Grass Alfalfa Mix	866.80	45,816	1,301
2008	Dickey	Oats	No Type Specified	1,758.53	194,017	4,735
2008	Dickey	Forage Production	Alfalfa	513.80	70,554	8,436
2008	Dickey	Dry Beans	Black	1,337.16	374,581	16,634
2008	Dickey	Dry Beans	Pea (Navy)	1,592.30	484,074	23,127
2008	Dickey	Barley	Spring	2,397.10	465,582	26,215
2008	Dickey	Corn	Silage	787.50	238,782	73,251
2008	Dickey	Sunflowers	Confectionery	618.71	233,855	73,271
2008	Dickey	Sunflowers	Oil	2,686.97	833,560	218,877
2008	Dickey	Dry Beans	Pinto	4,786.93	1,616,207	219,683
2008	Dickey	Wheat	Spring	44,221.45	13,064,050	1,093,872
2008	Dickey	Corn	Grain	166,084.55	74,890,589	8,606,099
2008	Dickey	Soybeans	No Type Specified	171,874.59	56,248,740	10,911,576
2007	Dickey	Forage Production	Alfalfa	577.60	68,804	
2007	Dickey	Forage Production	Grass Alfalfa Mix	1,674.00	78,138	
2007	Dickey	Oats	No Type Specified	2,798.88	189,101	34,083
2007	Dickey	Barley	Spring	1,541.70	160,183	116,728
2007	Dickey	Sunflowers	Oil	3,568.85	523,980	155,359
2007	Dickey	Dry Beans	Pea (Navy)	2,167.06	501,834	159,738
2007	Dickey	Corn	Silage	1,011.10	317,794	175,058
2007	Dickey	Potatoes	Russets Non-Seed	1,924.30	2,366,011	192,805
2007	Dickey	Sunflowers	Confectionery	2,798.06	446,314	410,497
2007	Dickey	Dry Beans	Pinto	8,125.63	1,713,674	790,988
2007	Dickey	Wheat	Spring	46,980.75	6,684,868	1,159,049
2007	Dickey	Soybeans	No Type Specified	137,350.44	25,632,245	4,801,598
2007	Dickey	Corn	Grain	172,743.01	56,040,657	8,034,762
2006	Dickey	Corn	Silage	318.70	42,244	
2006	Dickey	Forage Production	Grass Alfalfa Mix	1,659.60	73,177	1,303
2006	Dickey	Forage Production	Alfalfa Grass Mix	184.90	15,562	3,759
2006	Dickey	Oats	No Type Specified	3,196.55	165,205	12,413
2006	Dickey	Dry Beans	Black	349.00	60,464	24,449
2006	Dickey	Forage Production	Alfalfa	1,173.30	132,203	29,804

2006	Dickey	Barley	Spring	2,361.64	204,101	34,917
2006	Dickey	Dry Beans	Dark Red Kidney	651.50	157,195	157,195
2006	Dickey	Dry Beans	Pea (Navy)	2,621.98	451,869	170,471
2006	Dickey	Sunflowers	Oil	6,055.40	700,231	224,684
2006	Dickey	Sunflowers	Confectionery	3,365.73	442,835	254,809
2006	Dickey	Wheat	Spring	46,576.37	5,123,861	348,579
2006	Dickey	Dry Beans	Pinto	8,997.51	1,843,513	609,552
2006	Dickey	Soybeans	No Type Specified	159,557.27	22,186,645	1,906,803
2006	Dickey	Corn	Grain	141,736.98	27,519,936	6,493,995
2005	Dickey	Forage Production	Alfalfa Grass Mix	184.90	10,945	
2005	Dickey	Wheat	Durum	776.47	48,607	3,342
2005	Dickey	Forage Production	Grass Alfalfa Mix	5,399.10	219,609	4,032
2005	Dickey	Forage Production	Alfalfa	4,732.60	394,435	10,814
2005	Dickey	Oats	No Type Specified	3,878.54	248,550	29,715
2005	Dickey	Dry Beans	Dark Red Kidney	575.27	173,195	87,135
2005	Dickey	Barley	Spring	3,831.80	312,074	92,810
2005	Dickey	Dry Beans	Pea (Navy)	3,354.63	595,897	149,949
2005	Dickey	Sunflowers	Confectionery	4,387.35	544,899	257,972
2005	Dickey	Sunflowers	Oil	7,591.57	617,871	397,945
2005	Dickey	Dry Beans	Pinto	10,891.97	1,870,411	730,218
2005	Dickey	Potatoes	Russets Non-Seed	1,661.50	1,496,120	853,136
2005	Dickey	Wheat	Spring	70,204.33	6,175,485	960,121
2005	Dickey	Soybeans	No Type Specified	134,279.45	15,641,007	2,094,699
2005	Dickey	Corn	Grain	132,498.70	21,700,425	3,285,130
2004	Dickey	Dry Beans	Black	404.60	76,455	
2004	Dickey	Forage Production	Grass Alfalfa Mix	5,659.20	201,818	
2004	Dickey	Oats	No Type Specified	2,767.50	139,548	
2004	Dickey	Corn	Silage	369.10	30,622	279
2004	Dickey	Forage Production	Alfalfa	4,477.70	325,769	2,065
2004	Dickey	Barley	Spring	2,618.67	220,485	16,365
2004	Dickey	Dry Beans	Pea (Navy)	1,444.40	240,503	52,476
2004	Dickey	Dry Beans	Dark Red Kidney	956.70	296,205	71,154
2004	Dickey	Sunflowers	Confectionery	1,752.33	238,080	82,794
2004	Dickey	Wheat	Spring	54,086.83	5,406,968	135,373
2004	Dickey	Sunflowers	Oil	5,349.53	600,343	261,477
2004	Dickey	Dry Beans	Pinto	7,830.57	1,403,853	268,029

2004	Dickey	Soybeans	No Type Specified	153,177.56	22,572,584	2,606,432
2004	Dickey	Corn	Grain	138,665.01	28,373,562	4,465,160
2003	Dickey	Corn	Silage	277.04	21,825	
2003	Dickey	Forage Production	Alfalfa	280.20	21,124	1,964
2003	Dickey	Oats	No Type Specified	4,353.83	226,606	15,099
2003	Dickey	Dry Beans	Black	299.18	36,158	27,036
2003	Dickey	Barley	Spring	6,964.88	770,146	86,204
2003	Dickey	Dry Beans	Dark Red Kidney	765.70	208,077	141,385
2003	Dickey	Potatoes	Russets Non-Seed	2,040.30	2,223,945	215,599
2003	Dickey	Dry Beans	Pea (Navy)	2,477.40	389,922	264,376
2003	Dickey	Sunflowers	Confectionery	5,114.13	593,041	554,837
2003	Dickey	Dry Beans	Pinto	10,377.91	1,874,844	664,477
2003	Dickey	Sunflowers	Oil	14,610.79	1,353,484	744,827
2003	Dickey	Wheat	Spring	67,989.67	6,281,956	863,702
2003	Dickey	Soybeans	No Type Specified	126,154.83	14,035,515	2,721,500
2003	Dickey	Corn	Grain	125,749.72	20,792,008	4,343,626
2002	Dickey	Corn	Silage	308.70	16,886	
2002	Dickey	Dry Beans	Dark Red Kidney	543.40	143,578	116,748
2002	Dickey	Barley	Spring	6,964.48	415,168	195,769
2002	Dickey	Dry Beans	Pea (Navy)	6,881.26	1,017,323	200,662
2002	Dickey	Sunflowers	Confectionery	2,408.81	274,678	201,612
2002	Dickey	Oats	No Type Specified	7,461.76	349,167	214,655
2002	Dickey	Dry Beans	Pinto	14,223.21	2,426,128	427,214
2002	Dickey	Sunflowers	Oil	15,933.81	1,406,692	434,032
2002	Dickey	Soybeans	No Type Specified	105,937.74	11,027,848	866,948
2002	Dickey	Wheat	Spring	88,765.13	7,195,529	1,838,922
2002	Dickey	Potatoes	Russets Non-Seed	2,898.50	2,812,960	2,020,826
2002	Dickey	Corn	Grain	109,614.10	16,986,004	3,003,176
2001	Dickey	Forage Production	Alfalfa	631.40	98,517	
2001	Dickey	Corn	Silage	242.85	19,498	1,905
2001	Dickey	Oats	No Type Specified	4,715.54	174,216	10,479
2001	Dickey	Barley	Spring	5,662.35	295,490	64,788
2001	Dickey	Dry Beans	Dark Red Kidney	673.30	163,869	145,520
2001	Dickey	Dry Beans	Pea (Navy)	3,465.59	519,174	274,739
2001	Dickey	Sunflowers	Confectionery	5,284.29	526,455	417,455

2001	Dickey	Soybeans	No Type Specified	100,734.45	8,956,453	546,807
2001	Dickey	Wheat	Spring	91,424.40	6,975,738	634,094
2001	Dickey	Sunflowers	Oil	24,967.07	1,875,870	841,447
2001	Dickey	Dry Beans	Pinto	11,906.94	1,831,952	847,602
2001	Dickey	Potatoes	Russets Non-Seed	2,928.40	2,948,670	1,806,180
2001	Dickey	Corn	Grain	104,632.60	14,138,445	4,281,146
2000	Dickey	Corn	Silage	423.30	22,020	
2000	Dickey	Oats	No Type Specified	5,820.42	193,841	12,858
2000	Dickey	Wheat	Durum	714.60	56,033	14,912
2000	Dickey	Barley	Spring	8,876.82	398,504	44,302
2000	Dickey	Soybeans	No Type Specified	85,212.03	7,036,443	235,631
2000	Dickey	Dry Beans	Dark Red Kidney	1,323.07	312,590	250,324
2000	Dickey	Dry Beans	Pea (Navy)	3,117.96	517,630	332,703
2000	Dickey	Sunflowers	Confectionery	6,637.91	563,757	352,975
2000	Dickey	Wheat	Spring	92,734.35	6,812,857	636,836
2000	Dickey	Dry Beans	Pinto	13,171.38	2,159,215	648,830
2000	Dickey	Sunflowers	Oil	31,579.26	2,191,060	736,425
2000	Dickey	Corn	Grain	101,110.13	12,037,265	1,822,456
1999	Dickey	Corn	Silage	1,056.10	35,272	7,850
1999	Dickey	Oats	No Type Specified	4,055.51	101,606	15,423
1999	Dickey	Barley	Spring	8,740.11	363,291	81,455
1999	Dickey	Dry Beans	Dark Red Kidney	995.18	281,824	118,599
1999	Dickey	Soybeans	No Type Specified	32,670.09	2,246,426	164,425
1999	Dickey	Dry Beans	Pea (Navy)	5,472.56	748,970	291,728
1999	Dickey	Sunflowers	Confectionery	11,052.46	1,018,340	720,630
1999	Dickey	Dry Beans	Pinto	13,490.87	2,029,031	928,240
1999	Dickey	Wheat	Spring	99,084.02	6,780,735	1,781,105
1999	Dickey	Sunflowers	Oil	65,646.15	4,475,888	1,806,665
1999	Dickey	Corn	Grain	73,251.58	6,657,851	1,814,838
1999	Dickey	Wheat	Durum	19,832.53	3,110,515	2,192,320
1998	Dickey	Corn	Silage	822.25	26,663	
1998	Dickey	Oats	No Type Specified	5,861.42	191,639	770
1998	Dickey	Dry Beans	Pea (Navy)	1,367.39	111,822	34,355
1998	Dickey	Dry Beans	Dark Red Kidney	478.18	128,960	49,926
1998	Dickey	Barley	Spring	10,822.83	498,006	98,128
1998	Dickey	Dry Beans	Pinto	16,700.26	1,956,893	103,380

1998	Dickey	Soybeans	No Type Specified	25,580.89	1,731,862	161,036
1998	Dickey	Sunflowers	Confectionery	8,479.15	649,858	200,177
1998	Dickey	Sunflowers	Oil	67,395.92	3,893,958	290,024
1998	Dickey	Corn	Grain	64,792.02	4,839,208	400,957
1998	Dickey	Wheat	No Type Specified	107,966.19	7,014,551	515,425
1998	Dickey	Potatoes	Russets Non-Seed	2,541.80	2,068,317	557,325
1997	Dickey	Corn	Silage	1,192.29	34,441	
1997	Dickey	Dry Beans	Dark Red Kidney	522.01	120,426	
1997	Dickey	Potatoes	Russets Non-Seed	1,326.50	877,529	
1997	Dickey	Dry Beans	Pea (Navy)	2,561.57	336,657	17,445
1997	Dickey	Oats	No Type Specified	7,981.46	206,159	34,340
1997	Dickey	Dry Beans	Pinto	9,664.43	1,027,211	63,739
1997	Dickey	Corn	Grain	53,849.67	3,497,219	184,464
1997	Dickey	Barley	Spring	15,310.44	601,679	215,325
1997	Dickey	Sunflowers	Confectionery	10,196.73	613,030	238,757
1997	Dickey	Wheat	No Type Specified	141,692.80	8,530,883	290,810
1997	Dickey	Sunflowers	Oil	62,323.23	3,915,389	302,519
1997	Dickey	Soybeans	No Type Specified	27,629.51	1,435,573	393,808
1996	Dickey	Corn	Silage	2,721.51	204,512	
1996	Dickey	Dry Beans	Dark Red Kidney	677.51	165,441	
1996	Dickey	Dry Beans	Pea (Navy)	2,124.90	254,036	
1996	Dickey	Dry Beans	Pinto	10,125.91	1,127,372	8,171
1996	Dickey	Oats	No Type Specified	7,291.59	184,993	9,292
1996	Dickey	Sunflowers	Confectionery	7,712.97	413,383	16,057
1996	Dickey	Soybeans	No Type Specified	8,300.71	493,000	37,123
1996	Dickey	Potatoes	Russets Non-Seed	2,941.40	1,831,711	47,625
1996	Dickey	Barley	Spring	13,517.73	473,138	82,739
1996	Dickey	Corn	Grain	57,117.39	3,475,066	100,924
1996	Dickey	Wheat	No Type Specified	162,679.55	8,416,311	128,191
1996	Dickey	Sunflowers	Oil	53,061.55	2,527,845	167,519
1995	Dickey	Corn	Silage	1,411.81	43,585	
1995	Dickey	Dry Beans	Pea (Navy)	2,199.33	173,883	
1995	Dickey	Dry Beans	Pinto	7,645.95	767,780	3,938
1995	Dickey	Dry Beans	Dark Red Kidney	893.22	206,494	18,862
1995	Dickey	Oats	No Type Specified	9,802.86	215,361	63,931

1995	Dickey	Soybeans	No Type Specified	8,534.31	334,056	72,477
1995	Dickey	Barley	Spring	19,972.99	550,553	160,625
1995	Dickey	Sunflowers	No Type Specified	89,352.99	3,722,084	215,302
1995	Dickey	Corn	Grain	56,810.96	2,560,867	239,792
1995	Dickey	Wheat	No Type Specified	144,469.82	6,563,843	490,928
1994	Dickey	Soybeans	No Type Specified	1,146.10	53,027	
1994	Dickey	Oats	No Type Specified	3,147.22	128,769	10,446
1994	Dickey	Dry Beans	Pinto	5,404.38	601,270	14,671
1994	Dickey	Corn	Grain	38,520.38	1,451,948	31,274
1994	Dickey	Barley	Spring	8,171.47	381,509	31,291
1994	Dickey	Sunflowers	No Type Specified	26,523.97	1,446,833	34,006
1994	Dickey	Wheat	No Type Specified	74,917.46	4,161,812	161,036
1993	Dickey	Oats	No Type Specified	3,249.02	118,750	3,044
1993	Dickey	Dry Beans	Pinto	3,892.12	446,834	16,967
1993	Dickey	Soybeans	No Type Specified	2,312.25	125,029	18,813
1993	Dickey	Barley	Spring	11,419.70	537,492	38,927
1993	Dickey	Sunflowers	No Type Specified	17,734.17	1,107,603	62,824
1993	Dickey	Wheat	No Type Specified	82,782.21	3,858,214	151,368
1993	Dickey	Corn	Grain	32,703.48	1,257,040	368,828
1992	Dickey	Sunflowers	Confectionery	1,529.61	98,185	414
1992	Dickey	Oats	No Type Specified	5,171.32	182,706	7,627
1992	Dickey	Barley	Spring	11,434.09	557,166	19,398
1992	Dickey	Soybeans	No Type Specified	2,531.30	132,076	29,747
1992	Dickey	Dry Beans	Pinto	3,696.49	423,154	51,370
1992	Dickey	Sunflowers	Oil	11,587.76	721,232	51,758
1992	Dickey	Wheat	No Type Specified	96,039.71	4,479,876	139,456
1992	Dickey	Corn	Grain	23,395.89	1,738,921	445,575
1991	Dickey	Soybeans	No Type Specified	1,968.40	95,925	2,424
1991	Dickey	Sunflowers	Confectionery	3,407.80	243,311	7,675
1991	Dickey	Dry Beans	Pinto	3,515.14	385,258	7,767
1991	Dickey	Sunflowers	Oil	15,694.10	1,105,968	20,796
1991	Dickey	Oats	No Type Specified	4,592.02	157,573	26,051
1991	Dickey	Corn	Grain	20,832.27	1,587,343	92,889
1991	Dickey	Wheat	No Type Specified	85,406.95	3,879,862	159,489

1991	Dickey	Barley	Spring	19,091.20	994,934	215,384
1990	Dickey	Dry Beans	Pinto	2,542.65	244,123	233
1990	Dickey	Soybeans	No Type Specified	1,903.53	96,782	4,417
1990	Dickey	Oats	No Type Specified	9,630.58	441,513	19,533
1990	Dickey	Sunflowers	Oil	11,105.09	690,437	22,800
1990	Dickey	Barley	Spring	26,467.83	1,326,814	26,634
1990	Dickey	Sunflowers	Confectionery	6,397.14	396,508	28,309
1990	Dickey	Dry Beans	Pea (Navy)	1,302.81	158,676	38,509
1990	Dickey	Wheat	No Type Specified	142,927.57	7,354,331	71,358
1990	Dickey	Dry Beans	Dark Red Kidney	977.00	238,147	123,226
1990	Dickey	Corn	Grain	33,116.29	2,504,950	349,423

Source: United States Department of Agriculture Risk Management Agency

Drought

	Begin Date	Injuries	Fatalities	Property Damage	Crop Damage	Remarks	Source
1	6/1/1988	0.00	0.00	\$94,339.62	\$94,339.62	Drought - Heat	SHELDUS

Source: Spatial Hazard Events and Losses Data in the United States (SHELDUS)

Flood

June 24, 2010 Jamestown Sun No place to go

Sloughs in area are bloated with water as heavy rains have left the ground saturated on top of precipitation from last winter. With nowhere else to go, the water has flowed onto roads.

--The road to the Scott Muggli farm covered by 4 ½ foot waters that stretch for miles/Spent 30,000 of own money to fix roads leading to property/kept from planting 40% of 5,000 acre crop/ the 4 ½ foot deep slough stretches 3 miles and covers 700 acres by his home owned by US Fish and Wildlife Service not allowed to divert water onto

--Kevin and Teresa Kasprick home is an island on roughly 2 ½ acres with a flooded-out basement/no place for water to go except into home/septic failed once if four more inches of water would fail again/two sloughs connected into one and kept gaining size/Teresa lost business that ran out of her basement/can't keep up with water coming into house/nothing covered by insurance because pipes didn't break

Charlie Russell—in the southern parts of county, the water can be diverted in the James or Maple Rivers, the central part biggest risk because no close location for the water to go



April 14, 2011 Dickey County Leader Charlie's pictures Flood Waters a big problem for Dickey County

Dickey County being affected by flood waters/urge motorists to be aware and drive careful ND Department of Transportation "Don't go out and sight-see because the additional traffic only causes more problems for County and State officials"

Ellendale Public Schools buses are putting on more miles on their routes/routes in morning may not be available by afternoon



April 14, 2011 Oakes Times watch for water on area roads

Law enforcement asking everyone to be careful-never know when water covering the road is also covering a wash out **1 flag take care 2 flags its closed**



July 7, 2011 Oakes Times Dickey County Highway 3 West of Oakes remains closed

Continue to be closed/appears water surrounding the road and the residence nearby has increased in size and depth/buildings water home major damage no one living there/other county township roads have water on them and damage from water



September 15, 2011 Oakes Times Work has begun on Dickey County Road 3

County Road 3 has been closed since the snow started to melt in March.

County 3 is one of the well-traveled roads in DC. –Fullerton residents come to Oakes to work and do business –farmers haul millions of bushels of grain to the Oakes Elevator –Fuel and propane is delivered –school bus routes are altered –emergency vehicles ambulance, fire department, and law enforcement are affected by road closure and need to find alternative routes

Economic Effects

--Columbia Grain commented road being closed has had an economic impact on the economy in the Oakes area

--Farmland Co-op extra mile have had to drive to service customers is very costly

--The Ranch House, Fullerton drop in customers not wanting to make the extra 50 plus mile drive to get there

--School buses adding more miles to routes and more time to get students to school at a greater cost to district

October 20, 2011 Oakes Times County Home Destroyed by Water County Road 3 wets of Oakes, where the road has been under water since early last spring stands the former Kasprick home the farm and out buildings are destroyed



December 1, 2011 Oakes Times Pickup in water on flooded road Yorktown Township Road



May 24, 2012 Dickey County Leader Insurance Claim Denied

ND Insurance Reserve Fund denied Fireside Restaurant claim for damage from a sewer backup-

Council reiterated the need for the city to clean the sewer main adjacent to the Fireside

Restaurant at least once a calendar year.

Begin Date	Injuries	Fatalities	Property Damage	Crop Damage	Remarks	Source
1979	0	0	4113812.95	0	FLOOD	SHELDUS
1993	0	0	806079.59	806079.6	FLOOD	SHELDUS
1997	0	0	290289.1	0	FLOOD	SHELDUS
2005	0	0	894612.14	0	FLOOD	SHELDUS
2007	0	0	112353.99	0	FLOOD	SHELDUS
2009	0	0	123787.96	0	FLOOD	SHELDUS
2009	0	0	271464.83	0	FLOOD	SHELDUS
2011	0	0	517822.61	0	FLOOD	SHELDUS
2013	0	0	20000	25000	FLOOD	SHELDUS
2016	0	0	12.26072	60000	FLOOD	SHELDUS

Event	Flash Flood
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	06/22/2002 19:20:00 CST
Begin Location	OAKES
End Date	06/22/2002 19:20:00 CST
End Location	OAKES
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Property Damage	
Crop Damage	
Event Narrative	Street flooding with water running into yards.
Event	Flash Flood
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	06/07/2005 21:45:00 CST
Begin Range	3
Begin Azimuth	S
Begin Location	MERRICOURT
Begin Lat/Lon	46.15/-98.75
End Date	06/07/2005 23:15:00 CST
End Range	3
End Azimuth	S
End Location	MERRICOURT
End Lat/Lon	46.15/-98.75
Deaths Direct/Indirect	0/0 (fatality details below, when available...)

Injuries Direct/Indirect	0/0
Property Damage	750K
Crop Damage	
Episode Narrative	A foot of water reported over many roads destroying several county and township roads. Several fences washed out.
Event	Flash Flood
-- Flood Cause	Heavy Rain
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	05/05/2007 21:30:00 CST-6
Begin Range	7
Begin Azimuth	E
Begin Location	ELLEDALE
Begin Lat/Lon	46/-98.37
End Date	05/06/2007 02:00:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Property Damage	100.00K
Crop Damage	0.00K
Episode Narrative	A surface low pressure system along with a strong upper level disturbance brought continuous showers and thunderstorms over portions of central North Dakota Saturday May 5th. The heaviest rainfall amounts (3 to 5 inches) occurred across eastern LaMoure and Dickey counties, along with numerous flash flood reports.
Event Narrative	Reported rainfall amounts up to 5 inches caused street flooding, basement flooding, and water standing in fields.
Event	Flood
-- Flood Cause	Heavy Rain / Snow Melt
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	03/06/2009 00:00:00 CST-6
Begin Range	12
Begin Azimuth	WNW
Begin Location	MERRICOURT
Begin Lat/Lon	46.27/-98.99
End Date	03/31/2009 23:59:00 CST-6
End Range	6
End Azimuth	ENE
End Location	GLOVER
End Lat/Lon	46.27/-98.03
Deaths Direct/Indirect	0/0 (fatality details below, when available...)

Injuries Direct/Indirect	0/0
Property Damage	99.00K
Crop Damage	0.00K
Episode Narrative	<p>This devastating flooding continued into April, and in some cases worsened.</p> <p>Western and central North Dakota experienced a snowy winter of 2008-2009. Bismarck, for example, had the snowiest December on record, which was also the snowiest month ever on record, with 33.3 inches of snow in December 2008. March 2009 was the fifth snowiest month on record with 29.7 inches. For the entire season Bismarck ended up the second snowiest on record with 100.3 inches. A similar scenario played out all across the west and central parts of North Dakota with locations receiving two to three times the normal snowfall. This set the stage for devastating flooding.</p> <p>A warm up over the southwest early in March resulted in flooding there. Much more significant and widespread warming came toward the middle of March. It occurred ahead of a storm that brought thunderstorms and heavy rain that resulted in rapid snow melt and ice jams, followed by heavy snow and a blizzard.</p> <p>For most areas the flooding, some of it river and stream related and some overland flooding away from rivers and streams, was the worst in a dozen years, rivaling and in some cases surpassing that following the winter of 1996-1997. For a few places it was the worst flooding ever. Ice jams, which occur most springs in North Dakota, were more numerous and severe than what would be considered normal.</p> <p>Losses were tremendous with hundreds of homes flooded, some completely destroyed, and many roads and some bridges washed out. County and township roads, already damaged by the winter plowing of snow, suffered more damage by the flooding. Sections of major state highways were closed due to flooding, including interstate 94.</p> <p>Agriculture was hard hit. It has been estimated by the Farm Services Agency that because of the flooding over west and central North Dakota, around 1.7 million acres would not be planted in 2009. Using an average value of \$300 an acre, that amounts to a potential loss through non planting of around \$490 million. The ranching industry was also hard hit. It has been estimated by the Farm Services Administration that the harsh winter, including blizzards, and the flooding, resulted in 78,000 calves being killed, along with 19,100 cows, 180 horses, and 3,000 other farm and ranch animals. It was estimated that this number of beef cows, had they lived to slaughter, could have fed 800,000 people for one year. The cost loss would be around \$50 million. Economic impact to society, impact on communities, uses a multiplier of four to seven times the loss, so \$200 million to \$350 million.</p>
Event Narrative	Overland flooding damaged state, county and township roads. The James River spilled and flooded two homes. Flooding continued into April.
Event	Flash Flood
-- Flood Cause	Heavy Rain / Snow Melt

State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	03/22/2009 14:30:00 CST-6
Begin Range	0
Begin Azimuth	N
Begin Location	OAKES
Begin Lat/Lon	46.13/-98.08
End Date	03/22/2009 18:00:00 CST-6
End Range	5
End Azimuth	N
End Location	ELLENDALE
End Lat/Lon	46.07/-98.52
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Property Damage	15.00K
Crop Damage	0.00K
Episode Narrative	<p>A significant low pressure system developed in the lee of the Rocky Mountains over Colorado and Wyoming Sunday, March 22nd, strengthening and ejecting northeast into the upper Midwest by Tuesday, March 24th. Strong southerly flow ahead of this storm system brought ample Gulf of Mexico moisture all the way into southern Canada, setting the stage for significant precipitation accumulations across the region. Winter storm and blizzard watches and warnings were posted well in advance of the storm. Warning lead time averaged nearly 25 hours.</p> <p>Precipitation started in the form of rain and thunderstorms Sunday into Monday morning, before changing over to all snow west to east Monday afternoon through Tuesday morning. Additionally, strong northwest winds of 20 to 45 mph accompanying the snow, produced widespread blizzard conditions west during the day on Monday, then across central North Dakota Monday evening and into Tuesday morning. Further east, around the James River Basin area, winter storm warnings were in effect due to a wintry mix of rain, snow, and sleet and for lighter snow accumulations.</p> <p>Blizzard conditions continued across much of southwestern and central North Dakota on Tuesday, with conditions then gradually improving Tuesday night as the snow ended and the winds subsided. Storm total snow amounts ranged from 12 to 22.5 inches across southwest North Dakota, to five to 11 inches central. No travel advisories, road closures, power outages, and school and business closures were common during this significant spring storm.</p>
Event Narrative	Minor damage occurred to county roads due to the flash flooding. Action by county crews kept flash flood waters away from a few homes that were threatened.
Event	Flood
-- Flood Cause	Heavy Rain / Snow Melt
State	NORTH DAKOTA
County/Area	DICKEY

WFO	BIS
Begin Date	04/01/2009 00:00:00 CST-6
Begin Range	12
Begin Azimuth	WNW
Begin Location	MERRICOURT
Begin Lat/Lon	46.27/-98.99
End Date	04/25/2009 23:59:00 CST-6
End Range	6
End Azimuth	ENE
End Location	GLOVER
End Lat/Lon	46.27/-98.03
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Property Damage	250.00K
Crop Damage	0.00K
Episode Narrative	<p>Western and central North Dakota experienced a snowy winter of 2008-2009. Bismarck, for example, had the snowiest December on record, which was also the snowiest month ever on record, with 33.3 inches of snow in December 2008. March 2009 was the fifth snowiest month on record with 29.7 inches. For the entire season Bismarck ended up the second snowiest on record with 100.3 inches. A similar scenario played out all across the west and central parts of North Dakota with locations receiving two to three times the normal snowfall. This set the stage for devastating flooding.</p> <p>Continued moderating temperatures, along with additional heavy snowfall in late March across southern North Dakota, and April snowfall in northern South Dakota, resulted in a second round of flooding over much of west and central North Dakota during the month of April.</p> <p>For most areas the flooding, some of it river and stream related and some overland flooding away from rivers and streams, was the worst in a dozen years, rivaling and in some cases surpassing that following the winter of 1996-1997. For a few places it was the worst flooding ever. Ice jams, which occur most springs in North Dakota, were more numerous and severe than what would be considered normal.</p> <p>Losses were tremendous with hundreds of homes flooded, some completely destroyed, and many roads and some bridges washed out. County and township roads, already damaged by the winter plowing of snow, suffered more damage by the flooding. Sections of major state highways were closed due to flooding, including interstate 94.</p> <p>Agriculture was hard hit. It has been estimated by the Farm Services Agency that because of the flooding over west and central North Dakota, around 1.7 million acres would not be planted in 2009. Using an average value of \$300 an acre, that amounts to a potential loss through non planting of around \$490 million.</p> <p>The ranching industry was also hard hit. It has been estimated by the Farm Services Administration that the harsh winter, including blizzards, and the</p>

	flooding, resulted in 78,000 calves being killed, along with 19,100 cows, 180 horses, and 3,000 other farm and ranch animals. It was estimated that this number of beef cows, had they lived to slaughter, could have fed 800,000 people for one year. The cost loss would be around \$50 million. Economic impact to society, impact on communities, uses a multiplier of four to seven times the loss, so \$200 million to \$350 million.
Event Narrative	Rapid snowmelt created overland flooding and flooding along the James River resulting in damage to numerous county and local roads and two homes.
Event	Flood
-- Flood Cause	Heavy Rain
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/10/2011 15:00:00 CST-6
Begin Range	6
Begin Azimuth	W
Begin Location	FORBES
Begin Lat/Lon	45.94/-98.9
End Date	07/10/2011 23:00:00 CST-6
End Range	9
End Azimuth	WNW
End Location	MERRICOURT
End Lat/Lon	46.26/-98.91
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Property Damage	500.00K
Crop Damage	0.00K
Episode Narrative	<p>A strong upper level jet streak moving into the region triggered scattered elevated thunderstorm activity during the late morning hours of July 10th over southwest North Dakota. Large hail up to two inches in diameter was reported with these storms. As the aerial coverage of storms became more widespread, Severe Thunderstorm Watch number 616 was issued. Once the storms advected to the east into south central and southeast North Dakota during the afternoon, they became rooted in the boundary layer and became much more intense necessitating the issuance of Tornado Watch number 617. Considerable veering winds with height, strong instability, and favorable deep layer sheer produced a favorable environment for very large hail, damaging winds, and isolated tornadoes.</p> <p>Multiple severe thunderstorm warnings and several tornado warnings were issued during this event. Numerous reports of large hail and destructive thunderstorm winds were received. After in depth investigation including two separate storm damage surveys, it was concluded that four confirmed tornadoes occurred during this event, including EF2 tornado damage seven miles south of Napoleon.</p>
Event Narrative	Persistent thunderstorms with heavy rain over a long period of time brought widespread flooding to many county and township roads across Dickey County.

Source: NOAA National Climatic Data Center

	Begin Date	Injuries	Fatalities	Property Damage	Crop. Damage	Remarks	Source
1	7/10/2011	0.00	0.00	\$ 500,000.00	0.00K	Flood	NOAA & NCDC
2	4/1/2009	0.00	0.00	\$ 250,000.00	0.00K	Flood	NOAA & NCDC
3	3/22/2009	0.00	0.00	\$ 15,000.00	0.00K	Flash Flood	NOAA & NCDC
4	3/6/2009	0.00	0.00	\$ 99,000.00	0.00K	Flood	NOAA & NCDC
5	5/5/2007	0.00	0.00	\$ 100,000.00	0.00K	Flash Flood	NOAA & NCDC
6	6/7/2005	0.00	0.00	\$ 750,000.00		Flash Flood	NOAA & NCDC
7	6/22/2002	0.00	0.00			Flash Flood	NOAA & NCDC
8	3/21/1997	0.00	0.00	\$ 200,000.00	0.00K	Flood	SHELDUS
9	7/24/1993	0.00	0.00	\$ 500,000.00	\$ 500,000.00	Flood	SHELDUS
10	4/12/1979	0.00	0.00	\$ 1,282,051.28	0.00K	Flood	SHELDUS

Sources: National Oceanic and Atmospheric Administration (NOAA)

Information Service/National Climatic Data Center (NCDC)

Spatial Hazard Events and Losses Data in the United States (SHELDUS)

Hazardous Material Release

	Begin Date	Injuries	Fatalities	Property Damage	Crop Damage	Remarks	Source
1	12/28/2012	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
2	12/20/2012	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
3	9/22/2012	Unknown	Unknown	Unknown	Unknown	Vehicle	OFDIR
4	9/21/2012	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
5	8/29/2012	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
6	7/25/2012	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
7	7/21/2012	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
8	7/8/2012	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR

9	6/26/2012	Unknown	Unknown	Unknown	Unknown	Hazardous Materials	OFDIR
10	3/31/2012	Unknown	Unknown	Unknown	Unknown	Hazardous Materials	OFDIR
11	11/21/2011	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
12	11/6/2011	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
13	11/5/2011	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
14	10/6/2011	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
15	9/27/2011	Unknown	Unknown	Unknown	Unknown	Hazardous Materials	OFDIR
16	9/17/2011	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
17	9/9/2011	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
18	7/18/2011	Unknown	Unknown	Unknown	Unknown	Vehicle	OFDIR
19	7/11/2011	Unknown	Unknown	Unknown	Unknown	Hazardous Materials	OFDIR
20	7/10/2011	Unknown	Unknown	Unknown	Unknown	Hazardous Materials	OFDIR
21	6/26/2011	Unknown	Unknown	Unknown	Unknown	Hazardous Materials	OFDIR
22	3/11/2011	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
23	1/28/2011	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
24	12/7/2010	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
25	11/6/2010	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
26	9/16/2010	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
27	7/17/2010	Unknown	Unknown	Unknown	Unknown	Hazardous Materials	OFDIR
28	3/31/2010	Unknown	Unknown	Unknown	Unknown	Hazardous Materials	OFDIR
29	1/31/2010	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
30	10/8/2009	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR

31	9/15/2009	Unknown	Unknown	Unknown	Unknown	Hazardous Materials	OFDIR
32	8/2/2009	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
33	7/5/2009	Unknown	Unknown	Unknown	Unknown	Hazardous Materials	OFDIR
34	6/11/2009	Unknown	Unknown	Unknown	Unknown	Hazardous Materials	OFDIR
35	5/23/2009	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
36	5/17/2009	Unknown	Unknown	Unknown	Unknown	Hazardous Materials	OFDIR
37	4/8/2009	Unknown	Unknown	Unknown	Unknown	Hazardous Materials	OFDIR
38	3/23/2009	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
39	2/13/2009	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
40	1/6/2009	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
41	11/5/2008	Unknown	Unknown	Unknown	Unknown	Vehicle	OFDIR
42	10/2/2008	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
43	9/5/2008	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
44	7/1/2008	Unknown	Unknown	Unknown	Unknown	Hazardous Materials	OFDIR
45	6/30/2008	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
46	6/27/2008	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
47	6/27/2008	Unknown	Unknown	Unknown	Unknown	Hazardous Materials	OFDIR
48	6/22/2008	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
49	4/25/2008	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
50	4/17/2008	Unknown	Unknown	Unknown	Unknown	Hazardous Materials	OFDIR
51	1/5/2008	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
52	12/1/2007	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR

53	10/29/2007	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
54	10/8/2007	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
55	9/20/2007	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
56	7/11/2007	Unknown	Unknown	Unknown	Unknown	Hazardous Materials	OFDIR
57	7/6/2007	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
58	6/25/2007	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
59	3/4/2007	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
60	1/25/2007	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
61	11/19/2006	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
62	9/4/2006	Unknown	Unknown	Unknown	Unknown	Vehicle	OFDIR
63	6/11/2006	Unknown	Unknown	Unknown	Unknown	Hazardous Materials	OFDIR
64	12/22/2005	Unknown	Unknown	Unknown	Unknown	Hazardous Materials	OFDIR
65	11/27/2005	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
66	11/6/2005	Unknown	Unknown	Unknown	Unknown	Hazardous Materials	OFDIR
67	7/9/2005	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
68	7/5/2005	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
69	11/9/2004	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
70	11/1/2004	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
71	6/23/2004	Unknown	Unknown	Unknown	Unknown	Hazardous Materials	OFDIR
72	6/12/2004	Unknown	Unknown	Unknown	Unknown	Hazardous Materials	OFDIR
73	5/4/2004	Unknown	Unknown	Unknown	Unknown	Hazardous Materials	OFDIR
74	1/24/2004	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR

Source: Oakes Fire Department Incident Report (OFDIR)

Shortage or Outage of Critical Materials or Infrastructure

	Begin Date	Injuries	Fatalities	Property Damage	Crop. Damage	Remarks	Source
1	10/17/2012	0.00	0.00	0.00K	0.00K	High Wind	NOAA & NCDC
2	7/22/2012	0.00	0.00	0.00K	0.00K	Thunder Storm Wind	NOAA & NCDC
3	7/22/2012	0.00	0.00	\$3,000.00	0.00K	Thunder Storm Wind	NOAA & NCDC
4	7/22/2012	0.00	0.00	0.00K	0.00K	Thunder Storm Wind	NOAA & NCDC
5	7/22/2012	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC
6	7/6/2012	0.00	0.00	0.00K	0.00K	Thunder Storm Wind	NOAA & NCDC
7	5/2/2012	0.00	0.00	0.00K	0.00K	Thunder Storm Wind	NOAA & NCDC
8	10/7/2011	0.00	0.00	0.00K	0.00K	High Wind	NOAA & NCDC
9	9/20/2011	0.00	0.00	0.00K	0.00K	High Wind	NOAA & NCDC
10	7/30/2011	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC
11	7/26/2011	0.00	0.00	0.00K	0.00K	Heavy Rain	NOAA & NCDC
12	7/26/2011	0.00	0.00	0.00K	0.00K	Thunder Storm Wind	NOAA & NCDC
13	7/17/2011	0.00	0.00	0.00K	0.00K	Funnel Cloud	NOAA & NCDC
14	7/17/2011	0.00	0.00	0.00K	0.00K	Funnel Cloud	NOAA & NCDC
15	7/17/2011	0.00	0.00	0.00K	0.00K	Tornado	NOAA & NCDC
16	7/17/2011	0.00	0.00	\$15,000.00	0.00K	Thunder Storm Wind	NOAA & NCDC
17	7/16/2011	0.00	0.00	0.00K	0.00K	Excessive Heat	NOAA & NCDC
18	7/10/2011	0.00	0.00	\$1,250,000.00	\$1,000,000.00	Thunder Storm Wind	NOAA & NCDC

19	7/10/2011	0.00	0.00	\$15,000.00	0.00K	Thunder Storm Wind	NOAA & NCDC
20	7/10/2011	0.00	0.00	\$75,000.00	0.00K	Tornado	NOAA & NCDC
21	7/10/2011	0.00	0.00	0.00K	0.00K	Tornado	NOAA & NCDC
22	7/10/2011	0.00	0.00	\$25,000.00	0.00K	Thunder Storm Wind	NOAA & NCDC
23	7/10/2011	0.00	0.00	0.00K	0.00K	Tornado	NOAA & NCDC
24	7/10/2011	0.00	0.00	\$15,000.00	0.00K	Thunder Storm Wind	NOAA & NCDC
25	7/10/2011	0.00	0.00	\$50,000.00	0.00K	Thunder Storm Wind	NOAA & NCDC
26	6/21/2011	0.00	0.00	0.00K	0.00K	Heavy Rain	NOAA & NCDC
27	6/21/2011	0.00	0.00	0.00K	0.00K	Heavy Rain	NOAA & NCDC
28	5/31/2011	0.00	0.00	0.00K	0.00K	High Wind	NOAA & NCDC
29	5/22/2011	0.00	0.00	0.00K	0.00K	Funnel Cloud	NOAA & NCDC
30	8/30/2010	0.00	0.00	0.00K	0.00K	Thunder Storm Wind	NOAA & NCDC
31	7/17/2010	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC
32	7/17/2010	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC
33	7/17/2010	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC
34	7/17/2010	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC
35	7/17/2010	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC
36	6/18/2010	0.00	0.00	0.00K	0.00K	High Wind	NOAA & NCDC
37	6/3/2010	0.00	0.00	0.00K	0.00K	Funnel Cloud	NOAA & NCDC
38	5/24/2010	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC

39	5/22/2010	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC
40	4/12/2010	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC
41	8/14/2009	0.00	0.00	\$50,000.00	0.00K	Thunder Storm Wind	NOAA & NCDC
42	8/14/2009	0.00	0.00	0.00K	0.00K	Thunder Storm Wind	NOAA & NCDC
43	6/18/2009	0.00	0.00	0.00K	0.00K	Thunder Storm Wind	NOAA & NCDC
44	6/18/2009	0.00	0.00	0.00K	0.00K	Funnel Cloud	NOAA & NCDC
45	10/26/2008	0.00	0.00	0.00K	0.00K	High Wind	NOAA & NCDC
46	7/31/2008	0.00	0.00	\$85,000.00	\$50,000.00	Thunder Storm Wind	NOAA & NCDC
47	7/31/2008	0.00	0.00	\$10,000.00	0.00K	Thunder Storm Wind	NOAA & NCDC
48	7/27/2008	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC
49	7/10/2008	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC
50	7/10/2008	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC
51	6/14/2008	0.00	0.00	0.00K	0.00K	Thunder Storm Wind	NOAA & NCDC
52	6/11/2008	0.00	0.00	\$4,000.00	0.00K	Thunder Storm Wind	NOAA & NCDC
53	6/11/2008	0.00	0.00	\$5,000.00	0.00K	High Wind	NOAA & NCDC
54	5/24/2008	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC
55	5/24/2008	0.00	0.00	\$10,000.00	0.00K	Tornado	NOAA & NCDC
56	5/24/2008	0.00	0.00	\$10,000.00	0.00K	Tornado	NOAA & NCDC
57	5/24/2008	0.00	0.00	\$10,000.00	0.00K	Tornado	NOAA & NCDC
58	7/15/2007	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC

59	7/15/2007	0.00	0.00	\$250,000.00	\$500,000.00	Thunder Storm Wind	NOAA & NCDC
60	6/26/2007	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC
61	6/21/2007	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC
62	6/17/2007	0.00	0.00	0.00K	0.00K	Thunder Storm Wind	NOAA & NCDC
63	6/17/2007	0.00	0.00	\$450,000.00	\$50,000.00	Thunder Storm Wind	NOAA & NCDC
64	4/20/2007	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC
65	4/20/2007	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC
66	8/24/2006	0.00	0.00			Hail	NOAA & NCDC
67	8/22/2006	0.00	0.00			Thunder Storm Wind	NOAA & NCDC
68	8/20/2006	0.00	0.00			Hail	NOAA & NCDC
69	8/20/2006	0.00	0.00			Hail	NOAA & NCDC
70	8/20/2006	0.00	0.00			Hail	NOAA & NCDC
71	8/20/2006	0.00	0.00			Hail	NOAA & NCDC
72	8/20/2006	0.00	0.00			Tornado	NOAA & NCDC
73	6/26/2005	0.00	0.00			Thunder Storm Wind	NOAA & NCDC
74	6/8/2005	0.00	0.00			Hail	NOAA & NCDC
75	6/7/2005	0.00	0.00			Hail	NOAA & NCDC
76	6/7/2005	0.00	0.00			Tornado	NOAA & NCDC
77	6/7/2005	0.00	0.00			Thunder Storm Wind	NOAA & NCDC
78	6/7/2005	0.00	0.00			Thunder Storm Wind	NOAA & NCDC

79	6/7/2005	0.00	0.00			Thunder Storm Wind	NOAA & NCDC
80	5/8/2005	0.00	0.00			Hail	NOAA & NCDC
81	5/8/2005	0.00	0.00			Hail	NOAA & NCDC
82	5/8/2005	0.00	0.00			Hail	NOAA & NCDC
83	5/8/2005	0.00	0.00			Hail	NOAA & NCDC
84	8/26/2004	0.00	0.00			Hail	NOAA & NCDC
85	7/20/2003	0.00	0.00			Tornado	NOAA & NCDC
86	7/3/2003	0.00	0.00			Hail	NOAA & NCDC
87	7/3/2003	0.00	0.00			Thunder Storm Wind	NOAA & NCDC
88	7/3/2003	0.00	0.00			Thunder Storm Wind	NOAA & NCDC
89	6/27/2003	0.00	0.00			Tornado	NOAA & NCDC
90	6/27/2003	0.00	0.00			Tornado	NOAA & NCDC
91	9/18/2002	0.00	0.00			Hail	NOAA & NCDC
92	8/31/2002	0.00	0.00			Hail	NOAA & NCDC
93	7/9/2002	0.00	0.00			Hail	NOAA & NCDC
94	7/9/2002	0.00	0.00			Hail	NOAA & NCDC
95	7/9/2002	0.00	0.00			Thunder Storm Wind	NOAA & NCDC
96	6/23/2002	0.00	0.00			Hail	NOAA & NCDC
97	6/22/2002	0.00	0.00			Hail	NOAA & NCDC
98	6/22/2002	0.00	0.00			Hail	NOAA & NCDC

99	6/22/2002	0.00	0.00			Hail	NOAA & NCDC
100	6/19/2002	0.00	0.00			Thunder Storm Wind	NOAA & NCDC
101	9/6/2001	0.00	0.00			Hail	NOAA & NCDC
102	9/6/2001	0.00	0.00			Hail	NOAA & NCDC
103	8/15/2001	0.00	0.00			Hail	NOAA & NCDC
104	8/8/2001	0.00	0.00			Thunder Storm Wind	NOAA & NCDC
105	8/8/2001	0.00	0.00			Thunder Storm Wind	NOAA & NCDC
106	8/8/2001	0.00	0.00			Thunder Storm Wind	NOAA & NCDC
107	8/8/2001	0.00	0.00			Thunder Storm Wind	NOAA & NCDC
108	7/30/2001	0.00	0.00			Hail	NOAA & NCDC
109	7/18/2001	0.00	0.00			Hail	NOAA & NCDC
110	6/9/2001	0.00	0.00			Thunder Storm Wind	NOAA & NCDC
111	6/9/2001	0.00	0.00			Thunder Storm Wind	NOAA & NCDC
112	7/27/1999	0.00	0.00	\$5,000.00	\$0.00	Hail	SHELDUS
113	7/27/1999	0.00	0.00	\$800,000.00	\$0.00	Tornado	SHELDUS
114	6/26/1998	0.00	0.00	\$500,000.00	\$1,000,000.00	Hail	SHELDUS
115	8/7/1993	0.00	0.00	\$50,000.00	\$50,000.00	Hail	SHELDUS
116	7/18/1992	0.00	0.00	\$150,000.00	\$150,000.00	Hail	SHELDUS
117	6/18/1992	0.00	0.00	\$50,000.00	\$50,000.00	Hail	SHELDUS
118	7/21/1991	0.00	0.00	\$50,000.00	\$50,000.00	Hail	SHELDUS
119	7/12/1988	0.00	0.00	\$50,000.00	\$50,000.00	Hail - Severe Storm/Thunder Storm	SHELDUS
120	6/1/1988	0.00	0.00	\$94,339.62	\$94,339.62	Drought - Heat	SHELDUS
121	8/7/1982	0.00	0.00	\$500.00	\$0.00	Lightning	SHELDUS
122	6/21/1981	0.00	0.00	\$50.00	\$0.00	Lightning	SHELDUS

123	9/11/1978	0.00	0.00	\$16,666.67	\$166.67	Lightning - Severe Storm/Thunder Storm - Wind	SHELDUS
124	8/26/1977	7.00	0.00	\$50,000.00	\$5,000.00	Hail - Wind	SHELDUS
125	9/6/1970	0.00	0.00	\$714.29	\$0.00	Lightning - Tornado - Wind	SHELDUS
126	5/28/1970	0.00	0.00	\$3,125.00	\$312,500.00	Severe Storm/Thunder Storm - Tornado - Wind	SHELDUS
127	8/5/1969	0.00	0.00	\$94.34	\$943.40	Hail - Tornado - Wind	SHELDUS
128	6/30/1967	0.00	0.00	\$5,000.00	\$0.00	Tornado - Wind	SHELDUS
129	7/31/1966	0.83	0.00	\$41,666.67	\$41,666.67	Hail - Severe Storm/Thunder Storm - Tornado - Wind	SHELDUS
	TOTAL	7.83	0.00	\$4,199,156.59	\$3,404,616.36		

Sources:

Information Service/National Climatic Data Center (NCDC)

National Oceanic and Atmospheric Administration (NOAA)

Spatial Hazard Events and Losses Data in the United States (SHELDUS)

National Oceanic and Atmospheric Administration

Event	Hail
Magnitude	0.75 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/18/2001 22:04:00 CST
Begin Location	MONANGO
Begin Lat/Lon	46.17/-98.58
End Date	07/18/2001 22:04:00 CST
End Location	MONANGO
End Lat/Lon	46.17/-98.58
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0

Event	Hail
Magnitude	1.00 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/30/2001 06:30:00 CST
Begin Location	OAKES
Begin Lat/Lon	46.13/-98.08
End Date	07/30/2001 06:30:00 CST
End Location	OAKES
End Lat/Lon	46.13/-98.08
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Event	Hail
Magnitude	0.75 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	08/15/2001 01:05:00 CST
Begin Range	2
Begin Azimuth	W
Begin Location	LUDDEN
Begin Lat/Lon	46.00/-98.18
End Date	08/15/2001 01:05:00 CST
End Range	2
End Azimuth	W
End Location	LUDDEN
End Lat/Lon	46.00/-98.18
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Property Damage	
Crop Damage	
Event	Hail
Magnitude	1.00 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	09/06/2001 18:25:00 CST
Begin Range	9
Begin Azimuth	NW
Begin Location	FORBES
Begin Lat/Lon	46.05/-98.92

End Date	09/06/2001 18:25:00 CST
End Range	9
End Azimuth	NW
End Location	FORBES
End Lat/Lon	46.05/-98.92
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Event	Hail
Magnitude	1.75 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	09/06/2001 19:30:00 CST
Begin Range	5
Begin Azimuth	E
Begin Location	MERRICOURT
Begin Lat/Lon	46.20/-98.65
End Date	09/06/2001 19:30:00 CST
End Range	5
End Azimuth	E
End Location	MERRICOURT
End Lat/Lon	46.20/-98.65
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Event Narrative	A wind shield of a vehicle smashed from the hail.
Event	Hail
Magnitude	0.88 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	06/22/2002 17:04:00 CST
Begin Location	ELLENDALE
Begin Lat/Lon	46.00/-98.52
End Date	06/22/2002 17:04:00 CST
End Location	ELLENDALE
End Lat/Lon	46.00/-98.52
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Event	Hail
Magnitude	0.75 in.

State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	06/22/2002 18:30:00 CST
Begin Range	5
Begin Azimuth	N
Begin Location	GUELPH
Begin Lat/Lon	46.08/-98.23
End Date	06/22/2002 18:30:00 CST
End Range	5
End Azimuth	N
End Location	GUELPH
End Lat/Lon	46.08/-98.23
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Event	Hail
Magnitude	0.75 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	06/22/2002 18:45:00 CST
Begin Location	ELLENDALE
Begin Lat/Lon	46.00/-98.52
End Date	06/22/2002 18:45:00 CST
End Location	ELLENDALE
End Lat/Lon	46.00/-98.52
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Event	Hail
Magnitude	0.75 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	06/23/2002 22:40:00 CST
Begin Location	ELLENDALE
Begin Lat/Lon	46.00/-98.52
End Date	06/23/2002 22:40:00 CST
End Location	ELLENDALE
End Lat/Lon	46.00/-98.52
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0

Event	Hail
Magnitude	1.75 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/09/2002 17:30:00 CST
Begin Range	1
Begin Azimuth	W
Begin Location	FORBES
Begin Lat/Lon	45.95/-98.80
End Date	07/09/2002 17:30:00 CST
End Range	1
End Azimuth	W
End Location	FORBES
End Lat/Lon	45.95/-98.80
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Event	Hail
Magnitude	1.00 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/09/2002 17:35:00 CST
Begin Range	2
Begin Azimuth	N
Begin Location	FORBES
Begin Lat/Lon	45.98/-98.78
End Date	07/09/2002 17:35:00 CST
End Range	2
End Azimuth	N
End Location	FORBES
End Lat/Lon	45.98/-98.78
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Event	Hail
Magnitude	1.75 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	08/31/2002 23:05:00 CST
Begin Range	2
Begin Azimuth	N

Begin Location	FORBES
Begin Lat/Lon	45.98/-98.78
End Date	08/31/2002 23:05:00 CST
End Range	2
End Azimuth	N
End Location	FORBES
End Lat/Lon	45.98/-98.78
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Event	Hail
Magnitude	1.75 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	09/18/2002 18:45:00 CST
Begin Range	11
Begin Azimuth	W
Begin Location	MERRICOURT
Begin Lat/Lon	46.20/-98.98
End Date	09/18/2002 18:45:00 CST
End Range	11
End Azimuth	W
End Location	MERRICOURT
End Lat/Lon	46.20/-98.98
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Event	Hail
Magnitude	1.00 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/03/2003 21:10:00 CST
Begin Range	11
Begin Azimuth	W
Begin Location	FORBES
Begin Lat/Lon	45.95/-99.02
End Date	07/03/2003 21:20:00 CST
End Range	11
End Azimuth	W
End Location	FORBES
End Lat/Lon	45.95/-99.02
Deaths Direct/Indirect	0/0 (fatality details below, when available...)

Injuries Direct/Indirect	0/0
Event	Hail
Magnitude	1.00 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	08/26/2004 17:01:00 CST
Begin Range	1
Begin Azimuth	E
Begin Location	FULLERTON
Begin Lat/Lon	46.17/-98.40
End Date	08/26/2004 17:05:00 CST
End Range	1
End Azimuth	E
End Location	FULLERTON
End Lat/Lon	46.17/-98.40
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Event	Hail
Magnitude	1.00 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	05/08/2005 15:00:00 CST
Begin Location	FORBES
Begin Lat/Lon	45.95/-98.78
End Date	05/08/2005 15:08:00 CST
End Location	FORBES
End Lat/Lon	45.95/-98.78
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Event	Hail
Magnitude	0.75 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	05/08/2005 15:30:00 CST
Begin Range	2
Begin Azimuth	N
Begin Location	FORBES
Begin Lat/Lon	45.98/-98.78

End Date	05/08/2005 15:32:00 CST
End Range	2
End Azimuth	N
End Location	FORBES
End Lat/Lon	45.98/-98.78
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Event	Hail
Magnitude	0.75 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	05/08/2005 16:30:00 CST
Begin Location	ELLENDALE
Begin Lat/Lon	46.00/-98.52
End Date	05/08/2005 16:43:00 CST
End Location	ELLENDALE
End Lat/Lon	46.00/-98.52
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Event	Hail
Magnitude	0.88 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	05/08/2005 16:35:00 CST
Begin Location	FORBES
Begin Lat/Lon	45.95/-98.78
End Date	05/08/2005 16:40:00 CST
End Location	FORBES
End Lat/Lon	45.95/-98.78
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Event Narrative	Reported by a NWS cooperative observer.
Event	Hail
Magnitude	0.88 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	06/07/2005 22:59:00 CST

Begin Range	3
Begin Azimuth	S
Begin Location	MERRICOURT
Begin Lat/Lon	46.15/-98.75
End Date	06/07/2005 23:04:00 CST
End Range	3
End Azimuth	S
End Location	MERRICOURT
End Lat/Lon	46.15/-98.75
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Event Narrative	Heavy rain accompanied the hail flooding several roads and washing out fences.
Event	Hail
Magnitude	0.88 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	06/08/2005 16:35:00 CST
Begin Location	FORBES
Begin Lat/Lon	45.95/-98.78
End Date	06/08/2005 16:40:00 CST
End Location	FORBES
End Lat/Lon	45.95/-98.78
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Event	Hail
Magnitude	1.00 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	08/20/2006 16:30:00 CST
Begin Range	3
Begin Azimuth	SSE
Begin Location	MERRICOURT
Begin Lat/Lon	46.17/-98.73
End Date	08/20/2006 16:37:00 CST
End Range	3
End Azimuth	SSE
End Location	MERRICOURT
End Lat/Lon	46.17/-98.73
Deaths Direct/Indirect	0/0 (fatality details below, when available...)

Injuries Direct/Indirect	0/0
Event Narrative	2.40 inches of rain accompanied the hail. Branches down with estimated wind gusts around 55 mph.
Event	Hail
Magnitude	1.00 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	08/20/2006 17:09:00 CST
Begin Location	MONANGO
Begin Lat/Lon	46.17/-98.58
End Date	08/20/2006 17:15:00 CST
End Location	MONANGO
End Lat/Lon	46.17/-98.58
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Event Narrative	Dickey County Sheriff deputy report.
Event	Hail
Magnitude	0.88 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	08/20/2006 17:16:00 CST
Begin Location	FULLERTON
Begin Lat/Lon	46.17/-98.42
End Date	08/20/2006 17:20:00 CST
End Location	FULLERTON
End Lat/Lon	46.17/-98.42
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Event	Hail
Magnitude	0.88 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	08/20/2006 17:16:00 CST
Begin Location	FULLERTON
Begin Lat/Lon	46.17/-98.42
End Date	08/20/2006 17:20:00 CST
End Location	FULLERTON
End Lat/Lon	46.17/-98.42

Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Event	Hail
Magnitude	0.88 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	08/24/2006 17:50:00 CST
Begin Range	6
Begin Azimuth	NW
Begin Location	ELLENDALE
Begin Lat/Lon	46.07/-98.60
End Date	08/24/2006 18:00:00 CST
End Range	6
End Azimuth	NW
End Location	ELLENDALE
End Lat/Lon	46.07/-98.60
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Event	Hail
Magnitude	1.00 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	04/20/2007 17:00:00 CST-6
Begin Range	1
Begin Azimuth	SW
Begin Location	FULLERTON
Begin Lat/Lon	46.16/-98.43
End Date	04/20/2007 17:05:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Property Damage	0.00K
Crop Damage	0.00K
Episode Narrative	An isolated severe thunderstorm produced 1 inch hail in Dickey County.
Event	Hail
Magnitude	0.75 in.
State	NORTH DAKOTA

County/Area	DICKEY
WFO	BIS
Begin Date	04/20/2007 17:50:00 CST-6
Begin Range	5
Begin Azimuth	SE
Begin Location	ELLENDALE
Begin Lat/Lon	45.95/-98.45
End Date	04/20/2007 17:55:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Property Damage	0.00K
Crop Damage	0.00K
Episode Narrative	An isolated severe thunderstorm produced 1 inch hail in Dickey County.
Event Narrative	
Event	Hail
Magnitude	1.25 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	06/21/2007 03:10:00 CST-6
Begin Range	3
Begin Azimuth	WNW
Begin Location	FORBES
Begin Lat/Lon	45.97/-98.84
End Date	06/21/2007 03:20:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Property Damage	0.00K
Crop Damage	0.00K
Episode Narrative	In the early morning of Thursday June 21st, Severe Thunderstorm Watch 431 was issued for ongoing thunderstorms, and in anticipation of severe thunderstorms continuing along and north of a stalled frontal boundary over northern South Dakota, and in association with an upper level short wave approaching North Dakota. Numerous severe thunderstorm warnings were issued. Five reports of large hail were received during the early morning through the mid- morning hours.
Event Narrative	No damage was reported.
Event	Hail
Magnitude	1.00 in.
State	NORTH DAKOTA
County/Area	DICKEY

WFO	BIS
Begin Date	06/26/2007 00:00:00 CST-6
Begin Range	10
Begin Azimuth	NW
Begin Location	FORBES
Begin Lat/Lon	46.05/-98.93
End Date	06/26/2007 00:10:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Property Damage	0.00K
Crop Damage	0.00K
Episode Narrative	In the late evening of the 25th and early morning hours of the 26th, scattered severe thunderstorms moved across parts of central North Dakota. A dozen severe thunderstorm warnings were issued during this time. Several reports of large hail and severe thunderstorm wind gusts were received.
Event Narrative	
Event	Hail
Magnitude	0.88 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/15/2007 22:05:00 CST-6
Begin Range	3
Begin Azimuth	W
Begin Location	ELLENDALE
Begin Lat/Lon	46/-98.58
End Date	07/15/2007 22:12:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Episode Narrative	In the late afternoon of Sunday July 15th, Severe Thunderstorm Watch 521 was issued in anticipation of severe thunderstorms developing in the vicinity of a stalled surface front over eastern North Dakota and downstream from an embedded mid-level vorticity maximum over southern Manitoba. Three severe thunderstorm warnings and one tornado warning were issued. Reports of large hail, severe thunderstorm wind gusts, and a tornado, were received as a super cell thunderstorm raced through Foster, Stutsman, LaMoure, and Dickey counties, and into South Dakota.
Event Narrative	
Event	Hail
Magnitude	1.00 in.
State	NORTH DAKOTA
County/Area	DICKEY

WFO	BIS
Begin Date	05/24/2008 18:35:00 CST-6
Begin Range	4
Begin Azimuth	SSE
Begin Location	ELLENDALE
Begin Lat/Lon	45.95/-98.49
End Date	05/24/2008 18:59:00 CST-6
End Range	7
End Azimuth	W
End Location	OAKES
End Lat/Lon	46.13/-98.23
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Property Damage	0.00K
Crop Damage	0.00K
Episode Narrative	In the late afternoon of May 24th, Tornado Watch 352 was issued in anticipation of severe thunderstorms and possible tornadoes developing along and ahead of a strong closed upper level low and associated surface low and cold frontal boundary over southern North Dakota. Numerous severe thunderstorm warnings and tornado warnings were issued. Reports included multiple tornadoes in both Morton and Dickey counties. A National Weather Service storm damage survey was completed in Morton County, and the Dickey County Emergency Manager conducted a storm damage survey in Dickey County.
Event Narrative	Law enforcement also reported rotation in the thunderstorm west of Oakes.
Event	Tornado
-- Scale	F0
-- Length	5
-- Width	30
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	06/27/2003 15:48:00 CST
Begin Range	10
Begin Azimuth	W
Begin Location	OAKES
Begin Lat/Lon	46.13/-98.30
End Date	06/27/2003 15:58:00 CST
End Range	15
End Azimuth	W
End Location	OAKES
End Lat/Lon	46.13/-98.40
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0

Property Damage	
Crop Damage	
Event Narrative	Tornado dipped up and down remaining over open country.
Event	Tornado
-- Scale	F0
-- Length	0
-- Width	40
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	06/27/2003 16:30:00 CST
Begin Range	2
Begin Azimuth	SE
Begin Location	LUDDEN
Begin Lat/Lon	45.98/-98.10
End Date	06/27/2003 16:35:00 CST
End Range	2
End Azimuth	SE
End Location	LUDDEN
End Lat/Lon	45.98/-98.10
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Property Damage	
Crop Damage	
Event Narrative	Tornado touched down in open country just north of the South Dakota border. Tornado lifted before crossing into South Dakota.
Event	Tornado
-- Scale	F1
-- Length	2
-- Width	40
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/20/2003 01:50:00 CST
Begin Range	1
Begin Azimuth	W
Begin Location	OAKES
Begin Lat/Lon	46.13/-98.10
End Date	07/20/2003 02:02:00 CST
End Range	2
End Azimuth	NNE
End Location	OAKES
End Lat/Lon	46.17/-98.07

Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Event Narrative	Tornado touched down in open country and traveled north...northeast reaching the municipal airport causing damage to the airport roof and extensive damage to three 44,000 thousand bushel bins and minor damage to other bins. Hail up to one and three-quarter inch (1.75) caused extensive damage to crops.
Event	Tornado
-- Scale	F0
-- Length	0
-- Width	20
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	06/07/2005 22:10:00 CST
Begin Range	2
Begin Azimuth	S
Begin Location	MERRICOURT
Begin Lat/Lon	46.17/-98.75
End Date	06/07/2005 22:12:00 CST
End Range	2
End Azimuth	S
End Location	MERRICOURT
End Lat/Lon	46.17/-98.75
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Event Narrative	Tornado briefly touched down in open country.
Event	Tornado
-- Scale	F0
-- Length	.3
-- Width	35
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	08/20/2006 16:50:00 CST
Begin Range	1
Begin Azimuth	N
Begin Location	MONANGO
Begin Lat/Lon	46.18/-98.58
End Date	08/20/2006 16:52:00 CST
End Range	1
End Azimuth	N
End Location	MONANGO
End Lat/Lon	46.18/-98.58
Deaths Direct/Indirect	0/0 (fatality details below, when available...)

Event Narrative	Brief touchdown in open field. No damage as no structures were impacted. Reported by Dickey County Sheriff deputy.
Event	Tornado
-- Scale	EF0
-- Length	4
-- Width	50
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	05/24/2008 18:38:00 CST-6
Begin Range	6
Begin Azimuth	SW
Begin Location	GUELPH
Begin Lat/Lon	45.96/-98.32
End Date	05/24/2008 18:45:00 CST-6
End Range	2
End Azimuth	SW
End Location	GUELPH
End Lat/Lon	46/-98.26
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Property Damage	10.00K
Episode Narrative	In the late afternoon of May 24th, Tornado Watch 352 was issued in anticipation of severe thunderstorms and possible tornadoes developing along and ahead of a strong closed upper level low and associated surface low and cold frontal boundary over southern North Dakota. Numerous severe thunderstorm warnings and tornado warnings were issued. Reports included multiple tornadoes in both Morton and Dickey counties. A National Weather Service storm damage survey was completed in Morton County, and the Dickey County Emergency Manager conducted a storm damage survey in Dickey County.
Event Narrative	The Dickey County Emergency Manager conducted a storm survey in the area and found evidence of a weak tornado. Tree branches were broken in parts of tree rows. No other structures were impacted. This was the first of three tornadoes in Dickey County this evening. An EF scale rating of middle EF0 was assigned with estimated wind speeds around 75 mph.
Event	Tornado
-- Scale	EF0
-- Length	5.64
-- Width	100
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	05/24/2008 18:50:00 CST-6
Begin Range	4
Begin Azimuth	NW
Begin Location	GUELPH

Begin Lat/Lon	46.06/-98.29
End Date	05/24/2008 19:00:00 CST-6
End Range	7
End Azimuth	W
End Location	OAKES
End Lat/Lon	46.13/-98.23
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Property Damage	10.00K
Episode Narrative	In the late afternoon of May 24th, Tornado Watch 352 was issued in anticipation of severe thunderstorms and possible tornadoes developing along and ahead of a strong closed upper level low and associated surface low and cold frontal boundary over southern North Dakota. Numerous severe thunderstorm warnings and tornado warnings were issued. Reports included multiple tornadoes in both Morton and Dickey counties. A National Weather Service storm damage survey was completed in Morton County, and the Dickey County Emergency Manager conducted a storm damage survey in Dickey County.
Event Narrative	A Dickey County Deputy Sheriff originally reported this tornado and indicated that it was visible only as debris rotating on the ground with little if any visible condensation funnel. The Dickey County Emergency Manager later conducted a storm damage survey. There was minor damage to one side of a farm house near the tornado starting point about 4 miles northwest of Guelph. No other damage was observed as the tornado then remained over open areas. This was the second of three tornadoes in Dickey County this evening. An EF scale rating of higher end EF0 was assigned with estimated wind speeds around 80 mph.
Event	Tornado
-- Scale	EF0
-- Length	7.9
-- Width	100
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	05/24/2008 18:59:00 CST-6
Begin Range	3
Begin Azimuth	W
Begin Location	OAKES
Begin Lat/Lon	46.13/-98.14
End Date	05/24/2008 19:13:00 CST-6
End Range	1
End Azimuth	NNE
End Location	GLOVER
End Lat/Lon	46.24/-98.12
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Property Damage	10.00K

Episode Narrative	In the late afternoon of May 24th, Tornado Watch 352 was issued in anticipation of severe thunderstorms and possible tornadoes developing along and ahead of a strong closed upper level low and associated surface low and cold frontal boundary over southern North Dakota. Numerous severe thunderstorm warnings and tornado warnings were issued. Reports included multiple tornadoes in both Morton and Dickey counties. A National Weather Service storm damage survey was completed in Morton County, and the Dickey County Emergency Manager conducted a storm damage survey in Dickey County.
Event Narrative	The Dickey County Emergency Manager conducted a storm damage survey. This tornado remained in open areas, uprooting smaller trees and breaking branches. This was the third of three tornadoes in Dickey County this evening. An EF scale rating of middle EF0 was assigned with estimated wind speeds around 75 mph.
Event	Thunderstorm Wind
Magnitude	74 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	06/09/2001 20:30:00 CST
Begin Location	OAKES
Begin Lat/Lon	46.13/-98.08
End Date	06/09/2001 20:30:00 CST
End Location	OAKES
End Lat/Lon	46.13/-98.08
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Event Narrative	Empty railroad cars moved down the tracks by the wind. A large garbage dumpster blown down a street. Numerous trees' uprooted and roof blown off building.
Event	Thunderstorm Wind
Magnitude	65 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	08/08/2001 21:15:00 CST
Begin Range	15
Begin Azimuth	W
Begin Location	ELLENDALE
Begin Lat/Lon	46.00/-98.83
End Date	08/08/2001 21:15:00 CST
End Range	15
End Azimuth	W
End Location	ELLENDALE
End Lat/Lon	46.00/-98.83
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Event Narrative	Cooperative observer reported shingles stripped off house. Tree's down.
Event	Thunderstorm Wind

Magnitude	61 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	08/08/2001 21:50:00 CST
Begin Location	ELLENDALE
Begin Lat/Lon	46.00/-98.52
End Date	08/08/2001 21:50:00 CST
End Location	ELLENDALE
End Lat/Lon	46.00/-98.52
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Event Narrative	Numerous trees's and branches down in the city of Ellendale. A 90,000 bushel bin at Monango was ripped down and two 2400-bushel hopper bins were damaged. One was tipped over on its side.
Event	Thunderstorm Wind
Magnitude	52 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	06/19/2002 05:00:00 CST
Begin Range	2
Begin Azimuth	NE
Begin Location	FORBES
Begin Lat/Lon	45.97/-98.75
End Date	06/19/2002 05:00:00 CST
End Range	2
End Azimuth	NE
End Location	FORBES
End Lat/Lon	45.97/-98.75
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Event	Thunderstorm Wind
Magnitude	52 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/09/2002 17:55:00 CST
Begin Range	7
Begin Azimuth	NE
Begin Location	FULLERTON
Begin Lat/Lon	46.23/-98.32
End Date	07/09/2002 17:55:00 CST
End Range	7
End Azimuth	NE
End Location	FULLERTON
End Lat/Lon	46.23/-98.32

Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Event Narrative	Several trees blown over.
Event	Thunderstorm Wind
Magnitude	70 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/03/2003 21:10:00 CST
Begin Range	1
Begin Azimuth	S
Begin Location	MONANGO
Begin Lat/Lon	46.15/-98.58
End Date	07/03/2003 21:10:00 CST
End Range	1
End Azimuth	S
End Location	MONANGO
End Lat/Lon	46.15/-98.58
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Event Narrative	Two grain bins, 25 feet tall, received damage
Event	Thunderstorm Wind
Magnitude	70 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/03/2003 21:20:00 CST
Begin Location	FULLERTON
Begin Lat/Lon	46.17/-98.42
End Date	07/03/2003 21:20:00 CST
End Location	FULLERTON
End Lat/Lon	46.17/-98.42
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Event Narrative	The wind destroyed five (5) grain bins with the debris landing on several vehicles which sustained damage. Ten inch diameter trees snapped. The storm was accompanied by one and three-quarter inch hail (1.75).
Event	Thunderstorm Wind
Magnitude	59 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	06/07/2005 00:30:00 CST
Begin Location	FULLERTON
Begin Lat/Lon	46.17/-98.42
End Date	06/07/2005 00:35:00 CST

End Location	FULLERTON
End Lat/Lon	46.17/-98.42
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Event	Thunderstorm Wind
Magnitude	61 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	06/07/2005 00:38:00 CST
Begin Range	7
Begin Azimuth	N
Begin Location	ELLENDALE
Begin Lat/Lon	46.10/-98.52
End Date	06/07/2005 00:45:00 CST
End Range	7
End Azimuth	N
End Location	ELLENDALE
End Lat/Lon	46.10/-98.52
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Event Narrative	Quarter inch hail accompanied the high winds.
Event	Thunderstorm Wind
Magnitude	52 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	06/07/2005 21:55:00 CST
Begin Location	ELLENDALE
Begin Lat/Lon	46.00/-98.52
End Date	06/07/2005 21:57:00 CST
End Location	ELLENDALE
End Lat/Lon	46.00/-98.52
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Event Narrative	Reported by a NWS cooperative observer.
Event	Thunderstorm Wind
Magnitude	61 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	06/26/2005 19:15:00 CST
Begin Location	OAKES
Begin Lat/Lon	46.13/-98.08
End Date	06/26/2005 19:15:00 CST
End Location	OAKES

End Lat/Lon	46.13/-98.08
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Event Narrative	Roof damage on home from winds.
Event	Thunderstorm Wind
Magnitude	52 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	08/22/2006 21:55:00 CST
Begin Range	8
Begin Azimuth	W
Begin Location	FULLERTON
Begin Lat/Lon	46.17/-98.58
End Date	08/22/2006 21:55:00 CST
End Range	8
End Azimuth	W
End Location	FULLERTON
End Lat/Lon	46.17/-98.58
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Event Narrative	Also had very heavy rain.
Event	Thunderstorm Wind
Magnitude	50 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	06/17/2007 21:00:00 CST-6
Begin Range	0
Begin Azimuth	N
Begin Location	FORBES
Begin Lat/Lon	45.95/-98.78
End Date	06/17/2007 21:09:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Property Damage	0.00K
Episode Narrative	In the late afternoon of Sunday, June 17th, Tornado Watch 412 was issued in anticipation of severe thunderstorms and possible tornadoes developing ahead of a strong surface cold front and low pressure center approaching. Numerous severe thunderstorm warnings and several tornado warnings were issued. Many reports of large hail and severe thunderstorm wind gusts, along with 1 funnel cloud report, were received during the episode.
Event	Thunderstorm Wind
Magnitude	74 kts.
State	NORTH DAKOTA

County/Area	DICKEY
WFO	BIS
Begin Date	06/17/2007 21:10:00 CST-6
Begin Range	2
Begin Azimuth	SW
Begin Location	ELLENDALE
Begin Lat/Lon	45.98/-98.55
End Date	06/17/2007 21:25:00 CST-6
End Range	25
End Azimuth	NE
End Location	ELLENDALE
End Lat/Lon	46.26/-98.15
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Property Damage	450.00K
Crop Damage	50.00K
Episode Narrative	In the late afternoon of Sunday, June 17th, Tornado Watch 412 was issued in anticipation of severe thunderstorms and possible tornadoes developing ahead of a strong surface cold front and low pressure center approaching. Numerous severe thunderstorm warnings and several tornado warnings were issued. Many reports of large hail and severe thunderstorm wind gusts, along with 1 funnel cloud report, were received during the episode.
Event Narrative	NWS storm survey completed on Monday, June 18, and confirmed the findings of emergency management officials, that very high thunderstorm winds and not a tornado caused the damage in Dickey County. Over most of the wind damage area the damage was consistent with wind speeds of 70 mph. However, in an area inside the city limits of Ellendale, from the elevator toward the northeast, damage was consistent with wind speeds of 85 mph. Damage was mainly to trees throughout the area and to grain bins in the immediate Ellendale area, along with a few power lines and a cell phone communications tower. Part of the elevator was completely toppled onto the street below. Note that some of the large diameter trees uprooted in Ellendale would have been consistent with 90 or 95 mph winds, and that speeds were reduced due to saturated soils. The area had received 16.7 inches of rain since March 1. There were no deaths or injuries.
Event	Thunderstorm Wind
Magnitude	83 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/15/2007 21:45:00 CST-6
Begin Range	5
Begin Azimuth	NE
Begin Location	MERRICOURT
Begin Lat/Lon	46.25/-98.68
End Date	07/15/2007 22:25:00 CST-6
End Range	4
End Azimuth	S

End Location	ELLENDALE
End Lat/Lon	45.94/-98.52
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Property Damage	250.00K
Crop Damage	500.00K
Episode Narrative	In the late afternoon of Sunday July 15th, Severe Thunderstorm Watch 521 was issued in anticipation of severe thunderstorms developing in the vicinity of a stalled surface front over eastern North Dakota, and downstream from an embedded mid level vorticity maximum over southern Manitoba. Three severe thunderstorm warnings and one tornado warning were issued. Reports of large hail, severe thunderstorm wind gusts, and a tornado, were received as a supercell thunderstorm raced through Foster, Stutsman, LaMoure, and Dickey counties, and into South Dakota.
Event Narrative	Combined severe thunderstorm winds and hail as large as half dollars (1.25 inch diameter) resulted in very significant crop damage through Dickey County. Damage extended from near the Lamoure County line northeast of Merricourt, through Dickey County, into Brown County, South Dakota. Dickey County Emergency Management reported an average 4 mile wide hail swath in the vicinity of Highway 281 with nearly 100 percent crop damage in some areas. At 1100 PM CDT an estimated 95 mph wind 1 mile west of Monango damaged many outbuildings on a hog farm. Some buildings were significantly damaged at the farm. This same storm crossed into Brown County, South Dakota, and did extensive damage there. See the StormData entry from the Aberdeen National Weather Service office.
Event	Thunderstorm Wind
Magnitude	65 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	06/11/2008 02:15:00 CST-6
Begin Range	0
Begin Azimuth	N
Begin Location	ELLENDALE
Begin Lat/Lon	46/-98.52
End Date	06/11/2008 02:30:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Property Damage	4.00K
Episode Narrative	An upper level jet streak and an inverted surface trough stretching into southern North Dakota were the focus for thunderstorms developing across southwest and south central North Dakota. Several reports of large hail and severe thunderstorm wind gusts were received during the morning and early afternoon hours of Wednesday, June 11th.
Event Narrative	Estimated thunderstorm wind gusts of 75 miles per hour blew down a tree one foot in diameter, and also snapped three inch in diameter branches.
Event	High Wind

Magnitude	61 kts.
State	NORTH DAKOTA
County/Area	Dickey
WFO	BIS
Begin Date	06/11/2008 06:00:00 CST-6
End Date	06/11/2008 07:00:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Property Damage	5.00K
Episode Narrative	High winds developed across Stutsman, Lamoure, and Dickey counties in the early morning hours of Wednesday, June 11th. An area of showers moving across south central and into southeast North Dakota enabled a strong low level jet to reach the surface, resulting in widespread high winds and some damage across these three counties. No lightning was detected and no thunderstorms were reported with these high winds.
Event Narrative	Tree branches four to five inches in diameter were broken one mile north-northwest of Fullerton.
Event	Thunderstorm Wind
Magnitude	52 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	06/14/2008 15:50:00 CST-6
Begin Range	5
Begin Azimuth	NE
Begin Location	GUELPH
Begin Lat/Lon	46.07/-98.16
End Date	06/14/2008 15:54:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Episode Narrative	In the early afternoon of Saturday, June 14th, Severe Thunderstorm Watch 529 was issued in anticipation of severe thunderstorms developing in the vicinity of low level convergence boundaries and an approaching vorticity maximum. In addition, strong diabatic heating and cold air aloft produced steep mid-level lapse rates which resulted in destabilization of the atmosphere. Multiple severe thunderstorm warnings were issued. Several reports of large hail and severe thunderstorm wind gusts were received during the afternoon and early evening hours.
Event	Hail
Magnitude	1.75 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/10/2008 18:56:00 CST-6
Begin Range	6
Begin Azimuth	ENE
Begin Location	FORBES

Begin Lat/Lon	46/-98.67
End Date	07/10/2008 19:07:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Episode Narrative	In the late afternoon of Thursday, July 10th, Tornado Watch 678 was issued for much of the Bismarck County Warning Area in anticipation of severe thunderstorms with tornado potential developing along a warm frontal boundary that stretched across central North Dakota. An upper level trough was also advecting into the region resulting in cooling temperatures aloft and eroding the afternoon cap. Numerous severe thunderstorm warnings and several tornado warnings were issued. Multiple reports of large hail and two tornado reports were received across south central North Dakota during the late afternoon and early evening hours.
Event	Hail
Magnitude	0.75 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/10/2008 19:30:00 CST-6
Begin Range	3
Begin Azimuth	N
Begin Location	FULLERTON
Begin Lat/Lon	46.21/-98.43
End Date	07/10/2008 19:38:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Episode Narrative	In the late afternoon of Thursday, July 10th, Tornado Watch 678 was issued for much of the Bismarck County Warning Area in anticipation of severe thunderstorms with tornado potential developing along a warm frontal boundary that stretched across central North Dakota. An upper level trough was also advecting into the region resulting in cooling temperatures aloft and eroding the afternoon cap. Numerous severe thunderstorm warnings and several tornado warnings were issued. Multiple reports of large hail and two tornado reports were received across south central North Dakota during the late afternoon and early evening hours.
Event	Hail
Magnitude	0.88 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/27/2008 05:25:00 CST-6
Begin Range	0
Begin Azimuth	N
Begin Location	FULLERTON
Begin Lat/Lon	46.17/-98.42
End Date	07/27/2008 05:27:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)

Episode Narrative	In the late evening hours of Saturday, July 26th, Severe Thunderstorm Watch 756 was issued for southwest and south central North Dakota as a band of intense storms intensified over eastern Montana, in response to a low amplitude short wave trough cresting a broad upper level ridge. These storms moved into southern North Dakota. Most of the severe reports were of high wind. Other storms developed and quickly intensified over Emmons County, ahead of the main line of storms. Significant hail damage was reported at Linton, Emmons County. These storms weakened somewhat, but remained severe as they moved east.
Event	Thunderstorm Wind
Magnitude	74 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	06/09/2001 20:30:00 CST
Begin Location	OAKES
Begin Lat/Lon	46.13/-98.08
End Date	06/09/2001 20:30:00 CST
End Location	OAKES
End Lat/Lon	46.13/-98.08
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Event Narrative	Empty railroad cars moved down the tracks by the wind. A large garbage dumpster blown down a street. Numerous trees' uprooted and roof blown off building.
Event	Thunderstorm Wind
Magnitude	65 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	08/08/2001 21:15:00 CST
Begin Range	15
Begin Azimuth	W
Begin Location	ELLENDALE
Begin Lat/Lon	46.00/-98.83
End Date	08/08/2001 21:15:00 CST
End Range	15
End Azimuth	W
End Location	ELLENDALE
End Lat/Lon	46.00/-98.83
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Event Narrative	Cooperative observer reported shingles stripped off house. Tree's down.
Event	Thunderstorm Wind
Magnitude	61 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS

Begin Date	08/08/2001 21:50:00 CST
Begin Location	ELLENDALE
Begin Lat/Lon	46.00/-98.52
End Date	08/08/2001 21:50:00 CST
End Location	ELLENDALE
End Lat/Lon	46.00/-98.52
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Event Narrative	Numerous trees' and branches down in the city of Ellendale. A 90,000 bushel bin at Monango was ripped down and two 2400-bushel hopper bins were damaged. One was tipped over on its side.
Event	Thunderstorm Wind
Magnitude	70 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/31/2008 02:00:00 CST-6
Begin Range	0
Begin Azimuth	N
Begin Location	ELLENDALE
Begin Lat/Lon	46/-98.52
End Date	07/31/2008 02:12:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Property Damage	85.00K
Crop Damage	50.00K
Episode Narrative	<p>In the mid-afternoon hours of Wednesday, July 30th, Severe Thunderstorm Watch 775 was issued for much of western and central North Dakota due to intensification of thunderstorms developing along a pre-frontal trough situated over western North Dakota. Later Wednesday evening Severe Thunderstorm Watch 777 was issued to expand the watch area east and to extend portions of WW 775 into the early morning hours of Thursday, July 31st.</p> <p>The end result was a large severe weather outbreak experienced across much of southwest and south central North Dakota, lasting from the late afternoon hours of the 30th, into the early morning hours of the 31st. Multiple severe thunderstorm warnings, several tornado warnings, and one flash flood warning were issued. Numerous reports of large hail and severe thunderstorm wind gusts were received throughout this event, along with one flash flooding event.</p>
Event Narrative	Severe thunderstorm wind gusts overturned several grain bins and destroyed them. Tree limbs were broken and crops were damaged.
Event	Thunderstorm Wind
Magnitude	52 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS

Begin Date	07/31/2008 03:04:00 CST-6
Begin Range	0
Begin Azimuth	N
Begin Location	ELLENDALE
Begin Lat/Lon	46/-98.52
End Date	07/31/2008 03:15:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Property Damage	10.00K
Episode Narrative	<p>In the mid-afternoon hours of Wednesday, July 30th, Severe Thunderstorm Watch 775 was issued for much of western and central North Dakota due to intensification of thunderstorms developing along a pre-frontal trough situated over western North Dakota. Later Wednesday evening Severe Thunderstorm Watch 777 was issued to expand the watch area east and to extend portions of WW 775 into the early morning hours of Thursday, July 31st.</p> <p>The end result was a large severe weather outbreak experienced across much of southwest and south central North Dakota, lasting from the late afternoon hours of the 30th, into the early morning hours of the 31st. Multiple severe thunderstorm warnings, several tornado warnings, and one flash flood warning were issued. Numerous reports of large hail and severe thunderstorm wind gusts were received throughout this event, along with one flash flooding event.</p>
Event Narrative	A second wave of severe thunderstorm wind gusts caused damage to trees in the city of Ellendale.
Event	High Wind
Magnitude	35 kts.
State	NORTH DAKOTA
County/Area	Dickey
WFO	BIS
Begin Date	10/26/2008 11:00:00 CST-6
End Date	10/26/2008 16:30:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Episode Narrative	Strong high pressure building into the Northern Plains and low pressure pushing east into the Great Lakes produced a tight pressure gradient over west and central North Dakota, resulting in sustained winds of 40 to 45 mph and wind gusts as high as 65 mph. The high winds occurred during the morning and afternoon hours of Sunday, October 26th. Scattered reports of property damage from the high winds were received over south central portions of North Dakota.
Event	Thunderstorm Wind
Magnitude	52 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	06/18/2009 15:00:00 CST-6
Begin Range	3
Begin Azimuth	S

Begin Location	MERRICOURT
Begin Lat/Lon	46.16/-98.74
End Date	06/18/2009 15:05:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Episode Narrative	In the early afternoon of June 18th, Severe Thunderstorm Watch 465 was issued due to thunderstorms developing, and expected to be severe, in the vicinity of an approaching upper level low pressure system. Multiple severe thunderstorm warnings were issued. Several reports of large hail and severe thunderstorm wind gusts were received during the afternoon hours. In addition, flash flooding from very heavy rainfall was reported over far north central North Dakota, where slow moving thunderstorms produced rainfall amounts of up to four inches in one hour.
Event Narrative	The wind speed was estimated.
Event	Funnel Cloud
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	06/18/2009 15:40:00 CST-6
Begin Range	2
Begin Azimuth	SSW
Begin Location	OAKES MUNI ARPT
Begin Lat/Lon	46.07/-98.09
End Date	06/18/2009 15:43:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Episode Narrative	In the early afternoon of June 18th, Severe Thunderstorm Watch 465 was issued due to thunderstorms developing, and expected to be severe, in the vicinity of an approaching upper level low pressure system. Multiple severe thunderstorm warnings were issued. Several reports of large hail and severe thunderstorm wind gusts were received during the afternoon hours. In addition, flash flooding from very heavy rainfall was reported over far north central North Dakota, where slow moving thunderstorms produced rainfall amounts of up to four inches in one hour.
Event	Thunderstorm Wind
Magnitude	53 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	08/14/2009 17:27:00 CST-6
Begin Range	0
Begin Azimuth	W
Begin Location	ELLENDALE
Begin Lat/Lon	46/-98.53
End Date	08/14/2009 17:32:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Property Damage	50.00K

Episode Narrative	In the late afternoon of August 14th, Severe Thunderstorm Watch 704 was issued for ongoing strong to severe thunderstorms moving along a surface cold front over portions of southeastern North Dakota. Two reports of severe thunderstorm wind gusts were received, along with one report of heavy rain.
Event Narrative	Numerous tree damage was reported in the city of Ellendale due to the severe thunderstorm winds.
Event	Thunderstorm Wind
Magnitude	54 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	08/14/2009 18:00:00 CST-6
Begin Range	1
Begin Azimuth	NW
Begin Location	OAKES
Begin Lat/Lon	46.14/-98.09
End Date	08/14/2009 18:05:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Property Damage	0.00K
Crop Damage	0.00K
Episode Narrative	In the late afternoon of August 14th, Severe Thunderstorm Watch 704 was issued for ongoing strong to severe thunderstorms moving along a surface cold front over portions of southeastern North Dakota. Two reports of severe thunderstorm wind gusts were received, along with one report of heavy rain.
Event	Hail
Magnitude	1.00 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	04/12/2010 11:10:00 CST-6
Begin Range	4
Begin Azimuth	E
Begin Location	FORBES
Begin Lat/Lon	45.94/-98.7
End Date	04/12/2010 11:14:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Episode Narrative	Thunderstorms developed during the mid-morning hours of April 12th across portions of south central North Dakota in response to an approaching short wave trough and isentropic ascent ahead of a warm front draped across northern South Dakota. Three reports of large hail were received from the mid-morning through the early afternoon.

Event	Hail
Magnitude	1.00 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	05/22/2010 20:27:00 CST-6
Begin Range	1
Begin Azimuth	NE
Begin Location	GUELPH
Begin Lat/Lon	46.03/-98.22
End Date	05/22/2010 20:33:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Episode Narrative	Tornado Watch number 202 and Severe Thunderstorm Watch number 204 were issued for portions of central and eastern North Dakota for the late afternoon and evening hours of Saturday, May 22nd. Surface low pressure over central South Dakota, combined with high instability and favorable wind shear, resulted in the development of strong to severe thunderstorms across south central North Dakota Saturday evening. Two reports of large hail were received.
Event	Hail
Magnitude	1.25 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	05/24/2010 17:15:00 CST-6
Begin Range	0
Begin Azimuth	W
Begin Location	ELLENDALE
Begin Lat/Lon	46/-98.53
End Date	05/24/2010 17:21:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Episode Narrative	<p>A surface warm front continued to lift slowly north across southern North Dakota during the day on Monday, May 24th, in advance of a potent upper level trough racing northeast across the Rocky Mountains and towards the Northern Plains. Tornado Watch number 215 was issued by mid-afternoon in anticipation of rapid thunderstorm development and intensification once mass divergence associated with the upper wave spread across the region. An elevated threat for tornadoes existed along the warm front due to favorable low level vertical shear parameters.</p> <p>Numerous severe thunderstorm and tornado warnings were issued from late in the afternoon till later in the evening. Several reports of large hail, multiple reports of severe thunderstorm winds, and several reports of funnel clouds and tornadoes were received during this event. The number of confirmed tornadoes was two.</p>
Event	Funnel Cloud
State	NORTH DAKOTA
County/Area	DICKEY

WFO	BIS
Begin Date	06/03/2010 20:30:00 CST-6
Begin Range	2
Begin Azimuth	W
Begin Location	ELLENDALE ARPT
Begin Lat/Lon	46.02/-98.56
End Date	06/03/2010 20:32:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Episode Narrative	A surface cold front pushing east across North Dakota resulted in scattered thunderstorms developing from the late afternoon through the mid-evening hours of Thursday, June 3rd. Non-severe hail reports were received along with one funnel cloud report.
Event Narrative	The funnel cloud did not reach the surface.
Event	High Wind
Magnitude	35 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	06/18/2010 09:00:00 CST-6
End Date	06/18/2010 16:00:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Episode Narrative	A deep low pressure system lifting north into south central Canada brought strong westerly winds to the Northern Plains Friday, June 18th. A strong pressure gradient was in place across southwest and south central North Dakota, where sustained winds of 40 miles per hour and gusts to around 60 miles per hour were common.
Event Narrative	Sustained winds to 40 mph were common across portions of Dickey County during the late morning and afternoon.
Event	Hail
Magnitude	1.50 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/17/2010 14:49:00 CST-6
Begin Range	0
Begin Azimuth	W
Begin Location	FULLERTON
Begin Lat/Lon	46.17/-98.43
End Date	07/17/2010 14:58:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Episode Narrative	A shortwave trough moving across northern North Dakota forced a baroclinic zone southeastward through the Dakotas during the afternoon hours of Saturday, July 17th. This caused the erosion of a capping inversion in place across southeastern North Dakota, leading to the development and intensification of thunderstorms in the James River Valley region south of Jamestown.

	Several reports of large hail were received over Dickey County.
Event	Hail
Magnitude	1.75 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/17/2010 15:08:00 CST-6
Begin Range	3
Begin Azimuth	ESE
Begin Location	CLEMENT
Begin Lat/Lon	46.14/-98.19
End Date	07/17/2010 15:17:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Episode Narrative	A shortwave trough moving across northern North Dakota forced a baroclinic zone southeastward through the Dakotas during the afternoon hours of Saturday, July 17th. This caused the erosion of a capping inversion in place across southeastern North Dakota, leading to the development and intensification of thunderstorms in the James River Valley region south of Jamestown. Several reports of large hail were received over Dickey County.
Event	Hail
Magnitude	2.75 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/17/2010 15:15:00 CST-6
Begin Range	3
Begin Azimuth	ESE
Begin Location	CLEMENT
Begin Lat/Lon	46.14/-98.19
End Date	07/17/2010 15:22:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Episode Narrative	A shortwave trough moving across northern North Dakota forced a baroclinic zone southeastward through the Dakotas during the afternoon hours of Saturday, July 17th. This caused the erosion of a capping inversion in place across southeastern North Dakota, leading to the development and intensification of thunderstorms in the James River Valley region south of Jamestown. Several reports of large hail were received over Dickey County.
Event	Hail
Magnitude	1.75 in.
State	NORTH DAKOTA
County/Area	DICKEY

WFO	BIS
Begin Date	07/17/2010 15:21:00 CST-6
Begin Range	1
Begin Azimuth	NW
Begin Location	OAKES
Begin Lat/Lon	46.14/-98.09
End Date	07/17/2010 15:28:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Episode Narrative	A shortwave trough moving across northern North Dakota forced a baroclinic zone southeastward through the Dakotas during the afternoon hours of Saturday, July 17th. This caused the erosion of a capping inversion in place across southeastern North Dakota, leading to the development and intensification of thunderstorms in the James River Valley region south of Jamestown. Several reports of large hail were received over Dickey County.
Event	Hail
Magnitude	1.00 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/17/2010 15:47:00 CST-6
Begin Range	1
Begin Azimuth	NE
Begin Location	GUELPH
Begin Lat/Lon	46.03/-98.22
End Date	07/17/2010 15:55:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Episode Narrative	A shortwave trough moving across northern North Dakota forced a baroclinic zone southeastward through the Dakotas during the afternoon hours of Saturday, July 17th. This caused the erosion of a capping inversion in place across southeastern North Dakota, leading to the development and intensification of thunderstorms in the James River Valley region south of Jamestown. Several reports of large hail were received over Dickey County.
Event	Thunderstorm Wind
Magnitude	52 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	08/30/2010 16:20:00 CST-6
Begin Range	6
Begin Azimuth	SW
Begin Location	GUELPH
Begin Lat/Lon	45.96/-98.32
End Date	08/30/2010 16:26:00 CST-6

Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Episode Narrative	Severe Thunderstorm Watch number 635 was issued for south central and southeastern North Dakota during the late afternoon hours of Monday, August 30th. This was in anticipation of rapid thunderstorm development near a frontal boundary lifting northeast into eastern North Dakota. One report of a severe thunderstorm wind gust was received during this episode.
Event Narrative	An estimated wind gust of 60 mph was received.
Event	Funnel Cloud
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	05/22/2011 16:48:00 CST-6
Begin Range	4
Begin Azimuth	NW
Begin Location	MONANGO
Begin Lat/Lon	46.21/-98.64
End Date	05/22/2011 16:51:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Episode Narrative	The combination of low level instability and large scale ascent associated with a large upper level low over the Northern Plains led to one confirmed weak tornado touchdown over north central North Dakota. Two funnel cloud reports were also received.
Event	High Wind
Magnitude	35 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	05/31/2011 09:00:00 CST-6
End Date	05/31/2011 17:00:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Episode Narrative	Deep low pressure lifting north into southern Canada resulted in strong winds across all of west and central North Dakota May 31st. Sustained winds of 40 mph and peak gusts up to 60 mph were reported during the morning and afternoon.
Event	Heavy Rain
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	06/21/2011 15:15:00 CST-6
End Date	06/21/2011 15:15:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)

Episode Narrative	Two reports of heavy rain were received over Dickey County in southeastern North Dakota.
Event Narrative	A 24 hour rainfall of 2.65 inches was reported.
Event	Heavy Rain
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	06/21/2011 17:30:00 CST-6
End Date	06/21/2011 17:30:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Episode Narrative	Two reports of heavy rain were received over Dickey County in southeastern North Dakota.
Event Narrative	A 24 hour rainfall of 2.98 inches was reported.
Event	Thunderstorm Wind
Magnitude	109 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/10/2011 14:40:00 CST-6
Begin Range	10
Begin Azimuth	NW
Begin Location	MERRICOURT
Begin Lat/Lon	46.28/-98.92
End Date	07/10/2011 15:50:00 CST-6
End Range	4
End Azimuth	ESE
End Location	OAKES
End Lat/Lon	46.12/-98
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Property Damage	1.25M
Crop Damage	1.00M
Episode Narrative	<p>A strong upper level jet streak moving into the region triggered scattered elevated thunderstorm activity during the late morning hours of July 10th over southwest North Dakota. Large hail up to two inches in diameter was reported with these storms. As the aerial coverage of storms became more widespread, Severe Thunderstorm Watch number 616 was issued. Once the storms advected to the east into south central and southeast North Dakota during the afternoon, they became rooted in the boundary layer and became much more intense necessitating the issuance of Tornado Watch number 617. Considerable veering winds with height, strong instability, and favorable deep layer sheer produced a favorable environment for very large hail, damaging winds, and isolated tornadoes.</p> <p>Multiple severe thunderstorm warnings and several tornado warnings were issued during this event. Numerous reports of large hail and destructive thunderstorm</p>

	winds were received. After in depth investigation including two separate storm damage surveys, it was concluded that four confirmed tornadoes occurred during this event, including EF2 tornado damage seven miles south of Napoleon.
Event Narrative	A National Weather Service Storm Survey was conducted across Dickey County. Widespread mature hardwood trees were snapped or uprooted along a 45 mile long and 4 mile wide damage swath, along with thousands of acres of crop damage due to wind driven hail. Several communities along the damage path also had severe wind damage. Near Merricourt, damage was observed to a home and to several farm vehicles. In Monango, extensive tree damage was observed, including a large hardwood tree with the diameter of 22 inches. A pole barn and two grain bins were destroyed two miles south of Fullerton, along with several large trees snapped or uprooted. Around Oakes, numerous buildings sustained heavy damage, along with the destruction of a 200 foot radio station tower. Damage across Dickey County was extensive.
Event	Thunderstorm Wind
Magnitude	70 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/10/2011 14:40:00 CST-6
Begin Range	11
Begin Azimuth	W
Begin Location	MERRICOURT
Begin Lat/Lon	46.21/-98.97
End Date	07/10/2011 14:49:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Property Damage	15.00K
Episode Narrative	<p>A strong upper level jet streak moving into the region triggered scattered elevated thunderstorm activity during the late morning hours of July 10th over southwest North Dakota. Large hail up to two inches in diameter was reported with these storms. As the aerial coverage of storms became more widespread, Severe Thunderstorm Watch number 616 was issued. Once the storms advected to the east into south central and southeast North Dakota during the afternoon, they became rooted in the boundary layer and became much more intense necessitating the issuance of Tornado Watch number 617. Considerable veering winds with height, strong instability, and favorable deep layer sheer produced a favorable environment for very large hail, damaging winds, and isolated tornadoes.</p> <p>Multiple severe thunderstorm warnings and several tornado warnings were issued during this event. Numerous reports of large hail and destructive thunderstorm winds were received. After in depth investigation including two separate storm damage surveys, it was concluded that four confirmed tornadoes occurred during this event, including EF2 tornado damage seven miles south of Napoleon.</p>
Event Narrative	Strong thunderstorm winds blew over a grain bin.
Event	Tornado
-- Scale	EF1

-- Length	0.49
-- Width	25
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/10/2011 14:48:00 CST-6
Begin Range	6
Begin Azimuth	NW
Begin Location	MERRICOURT
Begin Lat/Lon	46.26/-98.84
End Date	07/10/2011 14:50:00 CST-6
End Range	6
End Azimuth	NW
End Location	MERRICOURT
End Lat/Lon	46.26/-98.83
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Property Damage	75.00K
Episode Narrative	<p>A strong upper level jet streak moving into the region triggered scattered elevated thunderstorm activity during the late morning hours of July 10th over southwest North Dakota. Large hail up to two inches in diameter was reported with these storms. As the aerial coverage of storms became more widespread, Severe Thunderstorm Watch number 616 was issued. Once the storms advected to the east into south central and southeast North Dakota during the afternoon, they became rooted in the boundary layer and became much more intense necessitating the issuance of Tornado Watch number 617. Considerable veering winds with height, strong instability, and favorable deep layer sheer produced a favorable environment for very large hail, damaging winds, and isolated tornadoes.</p> <p>Multiple severe thunderstorm warnings and several tornado warnings were issued during this event. Numerous reports of large hail and destructive thunderstorm winds were received. After in depth investigation including two separate storm damage surveys, it was concluded that four confirmed tornadoes occurred during this event, including EF2 tornado damage seven miles south of Napoleon.</p>
Event Narrative	A National Weather Service storm survey confirmed that an EF1 tornado on the Enhanced Fujita Scale briefly touched down five miles northwest of Merricourt. There was an eye witness to the tornado. A pole barn was damaged along with numerous trees snapped. The damage corresponded to low end EF1 on the Enhanced Fujita Scale. From that it was determined that wind speeds were on the order of 90 miles per hour.
Event	Tornado
-- Scale	EF0
-- Length	0.38
-- Width	25
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/10/2011 15:04:00 CST-6

Begin Range	0
Begin Azimuth	W
Begin Location	MONANGO
Begin Lat/Lon	46.17/-98.59
End Date	07/10/2011 15:06:00 CST-6
End Range	0
End Azimuth	SW
End Location	MONANGO
End Lat/Lon	46.17/-98.58
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Episode Narrative	<p>A strong upper level jet streak moving into the region triggered scattered elevated thunderstorm activity during the late morning hours of July 10th over southwest North Dakota. Large hail up to two inches in diameter was reported with these storms. As the aerial coverage of storms became more widespread, Severe Thunderstorm Watch number 616 was issued. Once the storms advected to the east into south central and southeast North Dakota during the afternoon, they became rooted in the boundary layer and became much more intense necessitating the issuance of Tornado Watch number 617. Considerable veering winds with height, strong instability, and favorable deep layer sheer produced a favorable environment for very large hail, damaging winds, and isolated tornadoes.</p> <p>Multiple severe thunderstorm warnings and several tornado warnings were issued during this event. Numerous reports of large hail and destructive thunderstorm winds were received. After in depth investigation including two separate storm damage surveys, it was concluded that four confirmed tornadoes occurred during this event, including EF2 tornado damage seven miles south of Napoleon.</p>
Event Narrative	A trained weather spotter reported a tornado on the ground near Monango. Very strong straight line winds were also reported. Damage was associated with the straight line winds. The tornado was reported in the open country with no damage attributed to it.
Event	Thunderstorm Wind
Magnitude	70 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/10/2011 15:31:00 CST-6
Begin Range	1
Begin Azimuth	NW
Begin Location	FULLERTON
Begin Lat/Lon	46.18/-98.43
End Date	07/10/2011 15:31:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Property Damage	25.00K

Episode Narrative	<p>A strong upper level jet streak moving into the region triggered scattered elevated thunderstorm activity during the late morning hours of July 10th over southwest North Dakota. Large hail up to two inches in diameter was reported with these storms. As the aerial coverage of storms became more widespread, Severe Thunderstorm Watch number 616 was issued. Once the storms advected to the east into south central and southeast North Dakota during the afternoon, they became rooted in the boundary layer and became much more intense necessitating the issuance of Tornado Watch number 617. Considerable veering winds with height, strong instability, and favorable deep layer sheer produced a favorable environment for very large hail, damaging winds, and isolated tornadoes.</p> <p>Multiple severe thunderstorm warnings and several tornado warnings were issued during this event. Numerous reports of large hail and destructive thunderstorm winds were received. After in depth investigation including two separate storm damage surveys, it was concluded that four confirmed tornadoes occurred during this event, including EF2 tornado damage seven miles south of Napoleon.</p>
Event Narrative	Strong thunderstorm winds blew numerous tree branches down.
Event	Tornado
-- Scale	EF0
-- Length	0.14
-- Width	20
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/10/2011 15:35:00 CST-6
Begin Range	3
Begin Azimuth	SSW
Begin Location	GLOVER
Begin Lat/Lon	46.19/-98.16
End Date	07/10/2011 15:36:00 CST-6
End Range	3
End Azimuth	SSW
End Location	GLOVER
End Lat/Lon	46.19/-98.16
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Episode Narrative	<p>A strong upper level jet streak moving into the region triggered scattered elevated thunderstorm activity during the late morning hours of July 10th over southwest North Dakota. Large hail up to two inches in diameter was reported with these storms. As the aerial coverage of storms became more widespread, Severe Thunderstorm Watch number 616 was issued. Once the storms advected to the east into south central and southeast North Dakota during the afternoon, they became rooted in the boundary layer and became much more intense necessitating the issuance of Tornado Watch number 617. Considerable veering winds with height, strong instability, and favorable deep layer sheer produced a favorable environment for very large hail, damaging winds, and isolated tornadoes.</p> <p>Multiple severe thunderstorm warnings and several tornado warnings were issued during this event. Numerous reports of large hail and destructive thunderstorm</p>

	winds were received. After in depth investigation including two separate storm damage surveys, it was concluded that four confirmed tornadoes occurred during this event, including EF2 tornado damage seven miles south of Napoleon.
Event Narrative	A visual confirmation of a brief tornado touchdown was received. The tornado was reported to have touched down in open fields northwest of Oakes, with no damage attributed to it.
Event	Thunderstorm Wind
Magnitude	70 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/10/2011 15:35:00 CST-6
Begin Range	0
Begin Azimuth	E
Begin Location	ELLEDALE
Begin Lat/Lon	46/-98.51
End Date	07/10/2011 15:35:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Property Damage	15.00K
Episode Narrative	<p>A strong upper level jet streak moving into the region triggered scattered elevated thunderstorm activity during the late morning hours of July 10th over southwest North Dakota. Large hail up to two inches in diameter was reported with these storms. As the aerial coverage of storms became more widespread, Severe Thunderstorm Watch number 616 was issued. Once the storms advected to the east into south central and southeast North Dakota during the afternoon, they became rooted in the boundary layer and became much more intense necessitating the issuance of Tornado Watch number 617. Considerable veering winds with height, strong instability, and favorable deep layer sheer produced a favorable environment for very large hail, damaging winds, and isolated tornadoes.</p> <p>Multiple severe thunderstorm warnings and several tornado warnings were issued during this event. Numerous reports of large hail and destructive thunderstorm winds were received. After in depth investigation including two separate storm damage surveys, it was concluded that four confirmed tornadoes occurred during this event, including EF2 tornado damage seven miles south of Napoleon.</p>
Event Narrative	Strong thunderstorm winds resulted in roof damage.
Event	Thunderstorm Wind
Magnitude	70 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/10/2011 15:42:00 CST-6
Begin Range	1
Begin Azimuth	N
Begin Location	LUDDEN
Begin Lat/Lon	46.01/-98.13

End Date	07/10/2011 15:42:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Property Damage	50.00K
Episode Narrative	<p>A strong upper level jet streak moving into the region triggered scattered elevated thunderstorm activity during the late morning hours of July 10th over southwest North Dakota. Large hail up to two inches in diameter was reported with these storms. As the aerial coverage of storms became more widespread, Severe Thunderstorm Watch number 616 was issued. Once the storms advected to the east into south central and southeast North Dakota during the afternoon, they became rooted in the boundary layer and became much more intense necessitating the issuance of Tornado Watch number 617. Considerable veering winds with height, strong instability, and favorable deep layer sheer produced a favorable environment for very large hail, damaging winds, and isolated tornadoes.</p> <p>Multiple severe thunderstorm warnings and several tornado warnings were issued during this event. Numerous reports of large hail and destructive thunderstorm winds were received. After in depth investigation including two separate storm damage surveys, it was concluded that four confirmed tornadoes occurred during this event, including EF2 tornado damage seven miles south of Napoleon.</p>
Event Narrative	Strong thunderstorm winds resulted in numerous trees and branches blown down around Ludden.
Event	Funnel Cloud
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/17/2011 17:42:00 CST-6
Begin Range	5
Begin Azimuth	N
Begin Location	FULLERTON
Begin Lat/Lon	46.24/-98.43
End Date	07/17/2011 17:42:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Episode Narrative	<p>A prolonged severe weather event materialized July 17th with an extremely unstable atmosphere present and supportive mid-level dynamics. The first wave of storms occurred from the mid-morning through the early afternoon hours as a short wave mid-level impulse crested the central plains upper ridge across North Dakota. Storms intensified ahead of this feature, prompting the issuance of several severe thunderstorm and tornado warnings. Numerous reports of large hail and severe thunderstorm wind gusts were received. In addition, 3 confirmed tornadoes occurred with this first wave.</p> <p>The second wave occurred from the mid-afternoon through the mid-evening hours. This mainly consisted of one super cell thunderstorm. Severe weather reports included very large hail, strong winds, and two confirmed tornadoes. This included an EF3 tornado in Lamoure County.</p>

Event	Funnel Cloud
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/17/2011 17:45:00 CST-6
Begin Range	3
Begin Azimuth	WNW
Begin Location	OAKES
Begin Lat/Lon	46.14/-98.15
End Date	07/17/2011 17:45:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Episode Narrative	<p>A prolonged severe weather event materialized July 17th with an extremely unstable atmosphere present and supportive mid-level dynamics. The first wave of storms occurred from the mid-morning through the early afternoon hours as a short wave mid-level impulse crested the central plains upper ridge across North Dakota. Storms intensified ahead of this feature, prompting the issuance of several severe thunderstorm and tornado warnings. Numerous reports of large hail and severe thunderstorm wind gusts were received. In addition, 3 confirmed tornadoes occurred with this first wave.</p> <p>The second wave occurred from the mid-afternoon through the mid- evening hours. This mainly consisted of one super cell thunderstorm. Severe weather reports included very large hail, strong winds, and two confirmed tornadoes. This included an EF3 tornado in Lamoure County.</p>
Event	Tornado
-- Scale	EF0
-- Length	0.05
-- Width	25
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/17/2011 18:06:00 CST-6
Begin Range	3
Begin Azimuth	N
Begin Location	FULLERTON
Begin Lat/Lon	46.21/-98.43
End Date	07/17/2011 18:07:00 CST-6
End Range	3
End Azimuth	N
End Location	FULLERTON
End Lat/Lon	46.21/-98.43
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Episode Narrative	<p>A prolonged severe weather event materialized July 17th with an extremely unstable atmosphere present and supportive mid-level dynamics. The first wave of storms occurred from the mid-morning through the early afternoon hours as a short wave mid-level impulse crested the central plains upper ridge across North Dakota.</p>

	<p>Storms intensified ahead of this feature, prompting the issuance of several severe thunderstorm and tornado warnings. Numerous reports of large hail and severe thunderstorm wind gusts were received. In addition, 3 confirmed tornadoes occurred with this first wave.</p> <p>The second wave occurred from the mid-afternoon through the mid- evening hours. This mainly consisted of one super cell thunderstorm. Severe weather reports included very large hail, strong winds, and two confirmed tornadoes. This included an EF3 tornado in Lamoure County.</p>
Event Narrative	This tornado touched down in the open country. There were no impacts to structures and so no reports of damage. This was the same storm complex that produced the EF3 tornado earlier in Lamoure County.
Event	Thunderstorm Wind
Magnitude	61 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/17/2011 18:18:00 CST-6
Begin Range	1
Begin Azimuth	NW
Begin Location	MERRICOURT
Begin Lat/Lon	46.21/-98.76
End Date	07/17/2011 18:24:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Property Damage	15.00K
Crop Damage	0.00K
Episode Narrative	<p>A prolonged severe weather event materialized July 17th with an extremely unstable atmosphere present and supportive mid-level dynamics. The first wave of storms occurred from the mid-morning through the early afternoon hours as a short wave mid-level impulse crested the central plains upper ridge across North Dakota. Storms intensified ahead of this feature, prompting the issuance of several severe thunderstorm and tornado warnings. Numerous reports of large hail and severe thunderstorm wind gusts were received. In addition, 3 confirmed tornadoes occurred with this first wave.</p> <p>The second wave occurred from the mid-afternoon through the mid- evening hours. This mainly consisted of one super cell thunderstorm. Severe weather reports included very large hail, strong winds, and two confirmed tornadoes. This included an EF3 tornado in Lamoure County.</p>
Event	Evergreen trees were snapped in the city of Merricourt.
Event	Heavy Rain
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS

Begin Date	07/26/2011 18:30:00 CST-6
Begin Range	1
Begin Azimuth	SE
Begin Location	FULLERTON
Begin Lat/Lon	46.16/-98.41
End Date	07/26/2011 19:30:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Property Damage	0.00K
Crop Damage	0.00K
Episode Narrative	An extensive area of low clouds which persisted well into the afternoon prevented a much larger outbreak of severe weather from occurring over west and central North Dakota during the afternoon and evening of July 26th. Only one report of a severe thunderstorm wind gust was received. Severe Thunderstorm Watch number 688 and Tornado Watch number 689 were in effect for this event.
Event Narrative	A heavy rain amount of 2.7 inches falling in one hour was reported. There was no report of flooding.
Event	Thunderstorm Wind
Magnitude	52 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/26/2011 18:50:00 CST-6
Begin Range	1
Begin Azimuth	N
Begin Location	LUDDEN
Begin Lat/Lon	46.01/-98.13
End Date	07/26/2011 18:55:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Property Damage	0.00K
Crop Damage	0.00K
Episode Narrative	An extensive area of low clouds which persisted well into the afternoon prevented a much larger outbreak of severe weather from occurring over west and central North Dakota during the afternoon and evening of July 26th. Only one report of a severe thunderstorm wind gust was received. Severe Thunderstorm Watch number 688 and Tornado Watch number 689 were in effect for this event.
Event Narrative	The strong winds blew down several tree branches.
Event	Hail
Magnitude	1.50 in.
State	NORTH DAKOTA

County/Area	DICKEY
WFO	BIS
Begin Date	07/30/2011 05:20:00 CST-6
Begin Range	8
Begin Azimuth	ESE
Begin Location	ELLENDALE
Begin Lat/Lon	45.96/-98.37
End Date	07/30/2011 05:29:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Property Damage	0.00K
Crop Damage	0.00K
Episode Narrative	<p>Two waves of severe weather struck west and central North Dakota from the evening of the 29th through the early morning hours of the 30th.</p> <p>The first wave of storms occurred along a surface warm front over the south and along a cool front across the north during the evening hours to just after midnight central time. Several severe thunderstorm warnings were issued, with multiple reports of large hail and strong winds received. Severe Thunderstorm Watch number 702 was in effect for this period.</p> <p>The second wave of storms occurred along the cool front as it moved south into south central and southeast North Dakota, with support from a short wave trough and a strengthening low level jet. Several severe thunderstorm warnings were issued, with reports of large hail, strong winds, and heavy rain received.</p>
Event	High Wind
Magnitude	35 kts.
State	NORTH DAKOTA
County/Area	Dickey
WFO	BIS
Begin Date	09/20/2011 03:00:00 CST-6
End Date	09/20/2011 17:00:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Property Damage	0.00K
Crop Damage	0.00K
Episode Narrative	<p>A strong low pressure system moving across the Northern Plains brought a prolonged period of strong winds to west and central North Dakota from the evening of the 19th through the afternoon of the 20th. The first round of the stronger winds impacted southwest North Dakota during the evening of the 19th along the initial pressure rises behind a cold front. The second round of the stronger winds lasted through the morning hours and into the early afternoon of the 20th.</p>
Event Narrative	Estimated sustained winds up to 40 mph occurred across Dickey County.

Event	High Wind
Magnitude	35 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	10/07/2011 10:00:00 CST-6
End Date	10/07/2011 17:00:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Property Damage	0.00K
Crop Damage	0.00K
Episode Narrative	Deep low pressure pushing north into south central Canada resulted in strong winds over southern North Dakota on October 7th. Peak wind gusts reached 61 miles per hour over the southeast.
Event Narrative	Strong winds occurred over the area.
Event	Thunderstorm Wind
Magnitude	52 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	05/02/2012 21:11:00 CST-6
Begin Range	0
Begin Azimuth	W
Begin Location	FULLERTON
Begin Lat/Lon	46.17/-98.43
End Date	05/02/2012 21:16:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Property Damage	0.00K
Crop Damage	0.00K
Episode Narrative	A mid-level disturbance lifting into the Dakotas triggered scattered strong to severe thunderstorms along a surface warm front over far southern North Dakota during the evening hours of May 2nd. The severe storms produced large hail and high winds.
Event Narrative	Pea size hail was also reported.
Event	Thunderstorm Wind
Magnitude	51 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/06/2012 04:40:00 CST-6

Begin Range	3
Begin Azimuth	N
Begin Location	OAKES
Begin Lat/Lon	46.17/-98.07
End Date	07/06/2012 04:50:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Property Damage	0.00K
Crop Damage	0.00K
Episode Narrative	An area of showers and scattered thunderstorms over south central North Dakota produced several reports of severe downburst winds over McIntosh, LaMoure, and Dickey Counties early in the morning, before sunrise.
Event	Thunderstorm Wind
Magnitude	52 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/22/2012 17:20:00 CST-6
Begin Range	12
Begin Azimuth	W
Begin Location	MERRICOURT
Begin Lat/Lon	46.22/-98.99
End Date	07/22/2012 17:25:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Property Damage	0.00K
Crop Damage	0.00K
Episode Narrative	Severe Thunderstorm Watch number 503 was in effect during this event. A slow moving surface cold front over far southern North Dakota moving south into northern South Dakota was the focus for strong to severe thunderstorms in the late afternoon and early evening hours. High instability combined with effective wind shear to 40 knots supported super cellular storms. Several reports of large hail and severe thunderstorm wind gusts were received.
Event Narrative	Heavy rain accompanied the strong winds.
Event	Thunderstorm Wind
Magnitude	52 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/22/2012 17:56:00 CST-6

Begin Range	0
Begin Azimuth	W
Begin Location	ELLENDALE
Begin Lat/Lon	46/-98.53
End Date	07/22/2012 18:01:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Property Damage	3.00K
Crop Damage	0.00K
Episode Narrative	Severe Thunderstorm Watch number 503 was in effect during this event. A slow moving surface cold front over far southern North Dakota moving south into northern South Dakota was the focus for strong to severe thunderstorms in the late afternoon and early evening hours. High instability combined with effective wind shear to 40 knots supported super cellular storms. Several reports of large hail and severe thunderstorm wind gusts were received.
Event Narrative	Numerous small tree limbs were blown down by the strong winds.
Event	Thunderstorm Wind
Magnitude	52 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/22/2012 18:00:00 CST-6
Begin Range	1
Begin Azimuth	NW
Begin Location	FULLERTON
Begin Lat/Lon	46.18/-98.43
End Date	07/22/2012 18:05:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Property Damage	0.00K
Crop Damage	0.00K
Episode Narrative	Severe Thunderstorm Watch number 503 was in effect during this event. A slow moving surface cold front over far southern North Dakota moving south into northern South Dakota was the focus for strong to severe thunderstorms in the late afternoon and early evening hours. High instability combined with effective wind shear to 40 knots supported super cellular storms. Several reports of large hail and severe thunderstorm wind gusts were received.
Event Narrative	Large hail accompanied the strong wind gust.
Event	Hail

Magnitude	1.00 in.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/22/2012 18:00:00 CST-6
Begin Range	1
Begin Azimuth	NW
Begin Location	FULLERTON
Begin Lat/Lon	46.18/-98.43
End Date	07/22/2012 18:05:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Property Damage	0.00K
Crop Damage	0.00K
Episode Narrative	<p>Severe Thunderstorm Watch number 503 was in effect during this event.</p> <p>A slow moving surface cold front over far southern North Dakota moving south into northern South Dakota was the focus for strong to severe thunderstorms in the late afternoon and early evening hours. High instability combined with effective wind shear to 40 knots supported super cellular storms. Several reports of large hail and severe thunderstorm wind gusts were received.</p>
Event	High Wind
Magnitude	35 kts.
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	10/17/2012 03:00:00 CST-6
End Date	10/18/2012 18:00:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Property Damage	0.00K
Crop Damage	0.00K
Episode Narrative	<p>Strong low pressure moved across the Dakotas October 17th, and remained over Minnesota through October 18th. This resulted in a prolonged period of strong northwest winds across western and central North Dakota. Peak gusts were measured over sixty miles per hour across west and south central North Dakota, with sustained winds at or above forty miles per hour over north central North Dakota into the James River Valley.</p>

Event	Excessive Heat
State	NORTH DAKOTA
County/Area	DICKEY
WFO	BIS
Begin Date	07/16/2011 11:00:00 CST-6
End Date	07/19/2011 21:00:00 CST-6
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Property Damage	0.00K
Crop Damage	0.00K
Episode Narrative	<p>Upper level high pressure centered over the Central Plains, coupled with persistent low pressure over the Rockies, brought a prolonged period of above seasonal temperatures and high humidity to west and central North Dakota. Daytime temperatures in the 90s combined with the high humidity to produce heat index values well over 100 degrees for many locations for several days. Heat index values topped out between 110 and 120 degrees, not a common thing in North Dakota.</p> <p>Although no human life was lost and no injuries were reported, there were livestock losses associated with the heat. It is estimated that up to 700 head of cattle died from the heat wave. Estimated at near 1,000 dollars per head, monetary damages are estimated at near 700,000 dollars. A detailed breakdown by county was not available so the losses were all assigned to one county in southwest North Dakota, Slope.</p>

Begin Date	Injuries	Fatalities	Property Damage	Crop. Damage	Remarks	Source
1960	0	0	0	2181.988	Hail	SHELDUS
1960	0	0	0	109.3167	Hail	SHELDUS
1961	0	0	1363.46	136346.1	Hail	SHELDUS
1963	0	0	0	3172.1	Hail	SHELDUS
1966	0	0	74896.16	74896.16	Hail	SHELDUS
1967	0	0	0	116246	Hail	SHELDUS
1969	0	0	199.61	1996.11	Hail	SHELDUS
1971	0	0	13072.77	130727.8	Hail	SHELDUS
1971	0	0	0	1065.22	Hail	SHELDUS
1971	0	0	599.17	599.17	Hail	SHELDUS
1972	0	0	663.46	6634.69	Hail	SHELDUS
1977	0	0	105714.81	10571.48	Hail	SHELDUS
1981	0	0	0	128139.2	Hail	SHELDUS
1982	0	0	0	12070.31	Hail	SHELDUS
1983	0	0	0	11694.63	Hail	SHELDUS

1988	0	0	49230.135	49230.14	Hail	SHELDUS
1991	0	0	855.2	855.2	Hail	SHELDUS
1991	0	0	85520.19	85520.19	Hail	SHELDUS
1992	0	0	83021.03	83021.03	Hail	SHELDUS
1992	0	0	249063.08	249063.1	Hail	SHELDUS
1993	0	0	80607.96	80607.96	Hail	SHELDUS
1998	0	0	717450.4	1429184	Hail	SHELDUS
1999	0	0	6991.51	0	Hail	SHELDUS
2006	0	0	5777.7	0	Hail	SHELDUS
2013	0	0	0	30000	Hail	SHELDUS
2014	0	0	0	0	Hail	SHELDUS
2015	0	0	10.30941	50000	Hail	SHELDUS
2017	0	0	33.94363	165000	Hail	SHELDUS
1988	0	0	92887.045	92887.05	Heat	SHELDUS
1970	0	0	1429.54	0	Lightning	SHELDUS
1978	0	0	19849.78	198.5033	Lightning	SHELDUS
1981	0	0	128.14	0	Lightning	SHELDUS
1982	0	0	1207.03	0	Lightning	SHELDUS
1960	0	0	0	163.975	Severe Storm/Thunder Storm	SHELDUS
1966	0	0	3391.54	0	Severe Storm/Thunder Storm	SHELDUS
1966	0	0	74896.16	74896.16	Severe Storm/Thunder Storm	SHELDUS
1970	0	0	6254.22	625421.5	Severe Storm/Thunder Storm	SHELDUS
1971	0	0	599.17	599.17	Severe Storm/Thunder Storm	SHELDUS
1972	0	0	663.46	6634.687	Severe Storm/Thunder Storm	SHELDUS
1973	0	0	37477.01	374.78	Severe Storm/Thunder Storm	SHELDUS
1975	0	0	2460.25	0	Severe Storm/Thunder Storm	SHELDUS
1978	0	0	19849.78	198.5033	Severe Storm/Thunder Storm	SHELDUS
1983	0	0	110326.68	0	Severe Storm/Thunder Storm	SHELDUS
1984	0	0	5605.32	0	Severe Storm/Thunder Storm	SHELDUS
1988	0	0	49230.13	49230.14	Severe Storm/Thunder Storm	SHELDUS
1989	1	0	46967.13	46967.14	Severe Storm/Thunder Storm	SHELDUS
1989	0	0	9393.43	0	Severe Storm/Thunder Storm	SHELDUS
1990	0	0	4455.95	0	Severe Storm/Thunder Storm	SHELDUS
1991	0	0	17104.04	17104.04	Severe Storm/Thunder Storm	SHELDUS
1991	0	0	89796.2	89796.2	Severe Storm/Thunder Storm	SHELDUS
1993	0	0	1520904.89	1520905	Severe Storm/Thunder Storm	SHELDUS
1997	0	0	725.72	0	Severe Storm/Thunder Storm	SHELDUS
2007	0	0	252796.46	28088.5	Severe Storm/Thunder Storm	SHELDUS
2007	0	0	140442.48	280885	Severe Storm/Thunder Storm	SHELDUS

2008	0	0	2163.99	0	Severe Storm/Thunder Storm	SHELDUS
2008	0	0	51394.81	27049.9	Severe Storm/Thunder Storm	SHELDUS
2009	0	0	27146.48	0	Severe Storm/Thunder Storm	SHELDUS
2011	0	0	709416.98	517822.6	Severe Storm/Thunder Storm	SHELDUS
2012	0	0	1521.97	0	Severe Storm/Thunder Storm	SHELDUS
2013	0	0	20000	0	Severe Storm/Thunder Storm	SHELDUS
2014	0	0	0	4000	Severe Storm/Thunder Storm	SHELDUS
2016	0	0	5.10863	25000	Severe Storm/Thunder Storm	SHELDUS
1960	0	0		2018.013	Tornado	SHELDUS
1960	0	0	163.975	19784.78	Tornado	SHELDUS
1960	0	0	3771.15	155763.8	Tornado	SHELDUS
1965	0	0	36977.3	0	Tornado	SHELDUS
1966	0	0	74896.16	74896.16	Tornado	SHELDUS
1967	0	0	17436.9	0	Tornado	SHELDUS
1969	0	0	199.61	1996.11	Tornado	SHELDUS
1970	0	0	6254.22	625421.5	Tornado	SHELDUS
1970	0	0	1429.54	0	Tornado	SHELDUS
1991	0	0	85.52	85.52	Tornado	SHELDUS
1992	0	0	4151.05	4151.05	Tornado	SHELDUS
1999	0	0	1118641.06	0	Tornado	SHELDUS
2008	0	0	32459.88	0	Tornado	SHELDUS
2011	0	0	77673.39	0	Tornado	SHELDUS

	Begin Date	Injuries	Fatalities	Property Damage	Crop. Damage	Remarks	Source
1	10/17/2012	0.00	0.00	0.00K	0.00K	High Wind	NOAA & NCDC
2	7/22/2012	0.00	0.00	0.00K	0.00K	Thunder Storm Wind	NOAA & NCDC
3	7/22/2012	0.00	0.00	\$ 3,000.00	0.00K	Thunder Storm Wind	NOAA & NCDC
4	7/22/2012	0.00	0.00	0.00K	0.00K	Thunder Storm Wind	NOAA & NCDC
5	7/22/2012	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC
6	7/6/2012	0.00	0.00	0.00K	0.00K	Thunder Storm Wind	NOAA & NCDC
7	5/2/2012	0.00	0.00	0.00K	0.00K	Thunder Storm Wind	NOAA & NCDC
8	10/7/2011	0.00	0.00	0.00K	0.00K	High Wind	NOAA & NCDC
9	9/20/2011	0.00	0.00	0.00K	0.00K	High Wind	NOAA & NCDC

10	7/30/2011	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC
11	7/26/2011	0.00	0.00	0.00K	0.00K	Heavy Rain	NOAA & NCDC
12	7/26/2011	0.00	0.00	0.00K	0.00K	Thunder Storm Wind	NOAA & NCDC
13	7/17/2011	0.00	0.00	0.00K	0.00K	Funnel Cloud	NOAA & NCDC
14	7/17/2011	0.00	0.00	0.00K	0.00K	Funnel Cloud	NOAA & NCDC
15	7/17/2011	0.00	0.00	0.00K	0.00K	Tornado	NOAA & NCDC
16	7/17/2011	0.00	0.00	\$ 15,000.00	0.00K	Thunder Storm Wind	NOAA & NCDC
17	7/16/2011	0.00	0.00	0.00K	0.00K	Excessive Heat	NOAA & NCDC
18	7/10/2011	0.00	0.00	\$ 1,250,000.00	\$ 1,000,000.00	Thunder Storm Wind	NOAA & NCDC
19	7/10/2011	0.00	0.00	\$ 15,000.00	0.00K	Thunder Storm Wind	NOAA & NCDC
20	7/10/2011	0.00	0.00	\$ 75,000.00	0.00K	Tornado	NOAA & NCDC
21	7/10/2011	0.00	0.00	0.00K	0.00K	Tornado	NOAA & NCDC
22	7/10/2011	0.00	0.00	\$ 25,000.00	0.00K	Thunder Storm Wind	NOAA & NCDC
23	7/10/2011	0.00	0.00	0.00K	0.00K	Tornado	NOAA & NCDC
24	7/10/2011	0.00	0.00	\$ 15,000.00	0.00K	Thunder Storm Wind	NOAA & NCDC
25	7/10/2011	0.00	0.00	\$ 50,000.00	0.00K	Thunder Storm Wind	NOAA & NCDC
26	6/21/2011	0.00	0.00	0.00K	0.00K	Heavy Rain	NOAA & NCDC
27	6/21/2011	0.00	0.00	0.00K	0.00K	Heavy Rain	NOAA & NCDC
28	5/31/2011	0.00	0.00	0.00K	0.00K	High Wind	NOAA & NCDC
29	5/22/2011	0.00	0.00	0.00K	0.00K	Funnel Cloud	NOAA & NCDC
30	8/30/2010	0.00	0.00	0.00K	0.00K	Thunder Storm Wind	NOAA & NCDC
31	7/17/2010	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC
32	7/17/2010	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC

33	7/17/2010	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC
34	7/17/2010	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC
35	7/17/2010	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC
36	6/18/2010	0.00	0.00	0.00K	0.00K	High Wind	NOAA & NCDC
37	6/3/2010	0.00	0.00	0.00K	0.00K	Funnel Cloud	NOAA & NCDC
38	5/24/2010	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC
39	5/22/2010	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC
40	4/12/2010	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC
41	8/14/2009	0.00	0.00	\$ 50,000.00	0.00K	Thunder Storm Wind	NOAA & NCDC
42	8/14/2009	0.00	0.00	0.00K	0.00K	Thunder Storm Wind	NOAA & NCDC
43	6/18/2009	0.00	0.00	0.00K	0.00K	Thunder Storm Wind	NOAA & NCDC
44	6/18/2009	0.00	0.00	0.00K	0.00K	Funnel Cloud	NOAA & NCDC
45	10/26/2008	0.00	0.00	0.00K	0.00K	High Wind	NOAA & NCDC
46	7/31/2008	0.00	0.00	\$ 85,000.00	\$ 50,000.00	Thunder Storm Wind	NOAA & NCDC
47	7/31/2008	0.00	0.00	\$ 10,000.00	0.00K	Thunder Storm Wind	NOAA & NCDC
48	7/27/2008	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC
49	7/10/2008	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC
50	7/10/2008	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC
51	6/14/2008	0.00	0.00	0.00K	0.00K	Thunder Storm Wind	NOAA & NCDC
52	6/11/2008	0.00	0.00	\$ 4,000.00	0.00K	Thunder Storm Wind	NOAA & NCDC
53	6/11/2008	0.00	0.00	\$ 5,000.00	0.00K	High Wind	NOAA & NCDC
54	5/24/2008	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC
55	5/24/2008	0.00	0.00	\$ 10,000.00	0.00K	Tornado	NOAA & NCDC

56	5/24/2008	0.00	0.00	\$ 10,000.00	0.00K	Tornado	NOAA & NCDC
57	5/24/2008	0.00	0.00	\$ 10,000.00	0.00K	Tornado	NOAA & NCDC
58	7/15/2007	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC
59	7/15/2007	0.00	0.00	\$ 250,000.00	\$ 500,000.00	Thunder Storm Wind	NOAA & NCDC
60	6/26/2007	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC
61	6/21/2007	0.00	0.00	0.00K	0.00K	Hail	SHELDUS
62	6/17/2007	0.00	0.00	0.00K	0.00K	Thunder Storm Wind	NOAA & NCDC
63	6/17/2007	0.00	0.00	\$ 450,000.00	\$ 50,000.00	Thunder Storm Wind	NOAA & NCDC
64	4/20/2007	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC
65	4/20/2007	0.00	0.00	0.00K	0.00K	Hail	NOAA & NCDC
66	8/24/2006	0.00	0.00			Hail	NOAA & NCDC
67	8/22/2006	0.00	0.00			Thunder Storm Wind	NOAA & NCDC
68	8/20/2006	0.00	0.00			Hail	NOAA & NCDC
69	8/20/2006	0.00	0.00			Hail	NOAA & NCDC
70	8/20/2006	0.00	0.00			Hail	NOAA & NCDC
71	8/20/2006	0.00	0.00			Hail	NOAA & NCDC
72	8/20/2006	0.00	0.00			Tornado	NOAA & NCDC
73	6/26/2005	0.00	0.00			Thunder Storm Wind	NOAA & NCDC
74	6/8/2005	0.00	0.00			Hail	NOAA & NCDC
75	6/7/2005	0.00	0.00			Hail	NOAA & NCDC
76	6/7/2005	0.00	0.00			Tornado	NOAA & NCDC
77	6/7/2005	0.00	0.00			Thunder Storm Wind	NOAA & NCDC
78	6/7/2005	0.00	0.00			Thunder Storm Wind	NOAA & NCDC

79	6/7/2005	0.00	0.00			Thunder Storm Wind	NOAA & NCDC
80	5/8/2005	0.00	0.00			Hail	NOAA & NCDC
81	5/8/2005	0.00	0.00			Hail	NOAA & NCDC
82	5/8/2005	0.00	0.00			Hail	NOAA & NCDC
83	5/8/2005	0.00	0.00			Hail	NOAA & NCDC
84	8/26/2004	0.00	0.00			Hail	NOAA & NCDC
85	7/20/2003	0.00	0.00			Tornado	NOAA & NCDC
86	7/3/2003	0.00	0.00			Hail	NOAA & NCDC
87	7/3/2003	0.00	0.00			Thunder Storm Wind	NOAA & NCDC
88	7/3/2003	0.00	0.00			Thunder Storm Wind	NOAA & NCDC
89	6/27/2003	0.00	0.00			Tornado	NOAA & NCDC
90	6/27/2003	0.00	0.00			Tornado	NOAA & NCDC
91	9/18/2002	0.00	0.00			Hail	NOAA & NCDC
92	8/31/2002	0.00	0.00			Hail	NOAA & NCDC
93	7/9/2002	0.00	0.00			Hail	NOAA & NCDC
94	7/9/2002	0.00	0.00			Hail	NOAA & NCDC
95	7/9/2002	0.00	0.00			Thunder Storm Wind	NOAA & NCDC
96	6/23/2002	0.00	0.00			Hail	NOAA & NCDC
97	6/22/2002	0.00	0.00			Hail	NOAA & NCDC
98	6/22/2002	0.00	0.00			Hail	NOAA & NCDC
99	6/22/2002	0.00	0.00			Hail	NOAA & NCDC
100	6/19/2002	0.00	0.00			Thunder Storm Wind	NOAA & NCDC
101	9/6/2001	0.00	0.00			Hail	NOAA & NCDC

102	9/6/2001	0.00	0.00			Hail	NOAA & NCDC
103	8/15/2001	0.00	0.00			Hail	NOAA & NCDC
104	8/8/2001	0.00	0.00			Thunder Storm Wind	NOAA & NCDC
105	8/8/2001	0.00	0.00			Thunder Storm Wind	NOAA & NCDC
106	8/8/2001	0.00	0.00			Thunder Storm Wind	NOAA & NCDC
107	8/8/2001	0.00	0.00			Thunder Storm Wind	NOAA & NCDC
108	7/30/2001	0.00	0.00			Hail	NOAA & NCDC
109	7/18/2001	0.00	0.00			Hail	NOAA & NCDC
110	6/9/2001	0.00	0.00			Thunder Storm Wind	NOAA & NCDC
111	6/9/2001	0.00	0.00			Thunder Storm Wind	NOAA & NCDC
112	7/27/1999	0.00	0.00	\$ 5,000.00	\$ -	Hail	SHELDUS
113	7/27/1999	0.00	0.00	\$ 800,000.00	\$ -	Tornado	SHELDUS
114	6/26/1998	0.00	0.00	\$ 500,000.00	\$ 1,000,000.00	Hail	SHELDUS
115	8/7/1993	0.00	0.00	\$ 50,000.00	\$ 50,000.00	Hail	SHELDUS
116	7/18/1992	0.00	0.00	\$ 150,000.00	\$ 150,000.00	Hail	SHELDUS
117	6/18/1992	0.00	0.00	\$ 50,000.00	\$ 50,000.00	Hail	SHELDUS
118	7/21/1991	0.00	0.00	\$ 50,000.00	\$ 50,000.00	Hail	SHELDUS
119	7/12/1988	0.00	0.00	\$ 50,000.00	\$ 50,000.00	Hail - Severe Storm/Thunder Storm	SHELDUS
120	6/1/1988	0.00	0.00	\$ 94,339.62	\$ 94,339.62	Drought - Heat	SHELDUS
121	8/7/1982	0.00	0.00	\$ 500.00	\$ -	Lightning	SHELDUS
122	6/21/1981	0.00	0.00	\$ 50.00	\$ -	Lightning	SHELDUS
123	9/11/1978	0.00	0.00	\$ 16,666.67	\$ 166.67	Lightning - Severe Storm/Thunder Storm - Wind	SHELDUS
124	8/26/1977	7.00	0.00	\$ 50,000.00	\$ 5,000.00	Hail - Wind	SHELDUS

125	9/6/1970	0.00	0.00	\$ 714.29	\$ -	Lightning - Tornado - Wind	SHELDUS
126	5/28/1970	0.00	0.00	\$ 3,125.00	\$ 312,500.00	Severe Storm/Thunder Storm - Tornado - Wind	SHELDUS
127	8/5/1969	0.00	0.00	\$ 94.34	\$ 943.40	Hail - Tornado - Wind	SHELDUS
128	6/30/1967	0.00	0.00	\$ 5,000.00	\$ -	Tornado - Wind	SHELDUS
129	7/31/1966	0.83	0.00	\$ 41,666.67	\$ 41,666.67	Hail - Severe Storm/Thunder Storm - Tornado - Wind	SHELDUS

Sources: National Oceanic and Atmospheric Administration (NOAA)

Information Service/National Climatic Data Center (NCDC)

Spatial Hazard Events and Losses Data in the United States (SHELDUS)

Transportation Accident

	Begin Date	Injuries	Fatalities	Property Damage	Crop. Damage	Remarks	Source
1	3/16/2014	2	0	Damage to single-family home	None	Truck crashed into home in Oakes due to suspicion of driver being under the influence.	Fargo Forum
2	12/28/2012	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
3	12/20/2012	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
4	9/22/2012	Unknown	Unknown	Unknown	Unknown	Vehicle	OFDIR
5	9/21/2012	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
6	8/29/2012	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
7	7/25/2012	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
8	7/21/2012	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
9	7/8/2012	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
10	11/21/2011	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
11	11/6/2011	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
12	11/5/2011	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
13	10/6/2011	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
14	9/17/2011	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR

15	9/9/2011	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
16	7/18/2011	Unknown	Unknown	Unknown	Unknown	Vehicle	OFDIR
17	3/11/2011	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
18	1/28/2011	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
19	12/7/2010	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
20	11/6/2010	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
21	9/16/2010	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
22	1/31/2010	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
23	10/8/2009	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
24	8/2/2009	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
25	5/23/2009	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
26	3/23/2009	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
27	2/13/2009	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
28	1/6/2009	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
29	11/5/2008	Unknown	Unknown	Unknown	Unknown	Vehicle	OFDIR
30	10/2/2008	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
31	9/5/2008	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
32	6/30/2008	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
33	6/27/2008	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
34	6/22/2008	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
35	4/25/2008	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
36	1/5/2008	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
37	12/1/2007	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
38	10/29/2007	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
39	10/8/2007	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR

40	9/20/2007	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
41	7/6/2007	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
42	6/25/2007	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
43	3/4/2007	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
44	1/25/2007	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
45	11/19/2006	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
46	9/4/2006	Unknown	Unknown	Unknown	Unknown	Vehicle	OFDIR
47	6/22/2006	Unknown	Unknown	Unknown	Unknown	Grass Fire Transportation Accident	OFDIR
48	11/27/2005	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
49	7/9/2005	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
50	7/5/2005	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
51	11/9/2004	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
52	11/1/2004	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
53	1/24/2004	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR

Source: Oakes Fire Department Incident Report (OFDIR)

Severe Winter Weather

Begin Date	Injuries	Fatalities	Property Damage	Crop Damage	Remarks	Source
1960	0	0	742.47	0	Winter Weather	SHELDUS
1960	0	0	7424.72	0	Winter Weather	SHELDUS
1960	0	0	15134.96	0	Winter Weather	SHELDUS
1961	0	0	13775	0	Winter Weather	SHELDUS
1963	0	0	0	0	Winter Weather	SHELDUS
1964	0	0	7089.41	0	Winter Weather	SHELDUS
1966	0	0	73367.65	0	Winter Weather	SHELDUS
1966	0	0	3391.54	0	Winter Weather	SHELDUS
1967	0	0	658	0	Winter Weather	SHELDUS

1967	0	0	81372.23	0	Winter Weather	SHELDUS
1968	0	0	7607.015	0	Winter Weather	SHELDUS
1968	0	0	257.46	0	Winter Weather	SHELDUS
1969	0	0	0	0	Winter Weather	SHELDUS
1969	0	0	5988.33	0	Winter Weather	SHELDUS
1972	0	0	0	525.77	Winter Weather	SHELDUS
1975	0	0	0	0	Winter Weather	SHELDUS
1975	0	0	0	0	Winter Weather	SHELDUS
1975	0	0	0	0	Winter Weather	SHELDUS
1975	0	0	408.5	0	Winter Weather	SHELDUS
1976	0	0	386.24	0	Winter Weather	SHELDUS
1977	0	0	8677.895	0	Winter Weather	SHELDUS
1977	0	0	362658	0	Winter Weather	SHELDUS
1978	0	0	0	0	Winter Weather	SHELDUS
1978	0	0	0	0	Winter Weather	SHELDUS
1979	0	0	3027.16	0	Winter Weather	SHELDUS
1979	0	0	3027.16	0	Winter Weather	SHELDUS
1980	0	0	2667.13	0	Winter Weather	SHELDUS
1981	0	0	241.77	0	Winter Weather	SHELDUS
1982	0	0	250.5	0	Winter Weather	SHELDUS
1982	0	0	75.44	0	Winter Weather	SHELDUS
1983	0	0	110326.68	0	Winter Weather	SHELDUS
1983	0	0	2206.54	0	Winter Weather	SHELDUS
1986	0	0	25920.97	0	Winter Weather	SHELDUS
1986	0	0	20052.07	0	Winter Weather	SHELDUS
1988	0	0	328.21	0	Winter Weather	SHELDUS
1988	0	0	468.87	0	Winter Weather	SHELDUS
1988	0	0	189.34	0	Winter Weather	SHELDUS

1988	0	0	351.64	0	Winter Weather	SHELDUS
1989	0	0	0	0	Winter Weather	SHELDUS
1990	0	0	1681.5	0	Winter Weather	SHELDUS
1991	0	0	7062.48	7062.48	Winter Weather	SHELDUS
1991	0	0	4072.39	0	Winter Weather	SHELDUS
1993	0	0	2066.87	0	Winter Weather	SHELDUS
1994	0	0	1482.94	0	Winter Weather	SHELDUS
1997	0	0	5196981.21	0	Winter Weather	SHELDUS
1997	0	0	946.59	0	Winter Weather	SHELDUS
1997	0	0	1966048.88	0	Winter Weather	SHELDUS
2006	0	0	7477.03	0	Winter Weather	SHELDUS
2007	0	0	936.28	0	Winter Weather	SHELDUS
2016	0	0	153.25902	750000	Winter Weather	SHELDUS
2010	0	0	75851.83	0	Winter Weather	SHELDUS

	Begin Date	Injuries	Fatalities	Property Damage	Crop. Damage	Remarks	Source
1	2/28/2012	0.00	0.00	0.00K	0.00K	Heavy Snow	NOAA & NCDC
2	1/18/2012	0.00	0.00	0.00K	0.00K	Extreme Cold/Wind Chill	NOAA & NCDC
3	4/30/2011	0.00	0.00	0.00K	0.00K	High Winds, Ice and Heavy Wet Snow	NOAA & NCDC
4	4/14/2011	0.00	0.00	0.00K	0.00K	Heavy Snow	NOAA & NCDC
5	3/22/2011	0.00	0.00	0.00K	0.00K	Winter Storm and Heavy Snow	NOAA & NCDC
6	3/11/2011	0.00	0.00	0.00K	0.00K	Blizzard	NOAA & NCDC
7	2/20/2011	0.00	0.00	0.00K	0.00K	Blizzard	NOAA & NCDC
8	2/13/2011	0.00	0.00	\$ 20,000.00	0.00K	High Winds	NOAA & NCDC
9	2/8/2011	0.00	0.00	0.00K	0.00K	Extreme Cold/Wind Chill	NOAA & NCDC
10	2/1/2011	0.00	0.00	0.00K	0.00K	Extreme Cold/Wind Chill	NOAA & NCDC
11	1/1/2011	0.00	0.00	0.00K	0.00K	Blizzard	NOAA & NCDC
12	12/30/2010	0.00	0.00	0.00K	0.00K	Blizzard	NOAA & NCDC
13	12/20/2010	0.00	0.00	0.00K	0.00K	Heavy Snow	NOAA & NCDC
14	12/15/2010	0.00	0.00	0.00K	0.00K	Heavy Snow	NOAA & NCDC

15	12/3/2010	0.00	0.00	0.00K	0.00K	Heavy Snow	NOAA & NCDC
16	11/22/2010	0.00	0.00	0.00K	0.00K	Heavy Snow	NOAA & NCDC
17	5/6/2010	0.00	0.00	0.00K	0.00K	Winter Weather and Wet Snow	NOAA & NCDC
18	1/25/2010	0.00	0.00	\$ 71,000.00	0.00K	Blizzard	NOAA & NCDC
19	1/22/2010	0.00	0.00	0.00K	0.00K	Freezing Rain, Sleet and Snow	NOAA & NCDC
20	1/7/2010	0.00	0.00	0.00K	0.00K	Extreme Cold/Wind Chill	NOAA & NCDC
21	1/5/2010	0.00	0.00	0.00K	0.00K	Heavy Snow, Strong Winds, Near Blizzard Conditions	NOAA & NCDC
22	12/25/2009	0.00	0.00	0.00K	0.00K	Blizzard	NOAA & NCDC
23	12/23/2009	0.00	0.00	0.00K	0.00K	Wet Snow and High Winds	NOAA & NCDC
24	3/31/2009	0.00	0.00	0.00K	0.00K	Heavy Snow	NOAA & NCDC
25	3/29/2009	0.00	0.00	0.00K	0.00K	Blizzard, Heavy Snow	NOAA & NCDC
26	3/10/2009	0.00	0.00	0.00K	0.00K	Blizzard, Heavy Snow	NOAA & NCDC
27	2/27/2009	0.00	0.00	0.00K	0.00K	Heavy Snow	NOAA & NCDC
28	1/31/2009	0.00	0.00	0.00K	0.00K	High Winds	NOAA & NCDC
29	1/16/2009	0.00	0.00	0.00K	0.00K	Winter Weather	NOAA & NCDC
30	1/11/2009	0.00	0.00	0.00K	0.00K	Blizzard	NOAA & NCDC
31	12/29/2008	0.00	0.00	0.00K	0.00K	Heavy Snow	NOAA & NCDC
32	12/20/2008	0.00	0.00	0.00K	0.00K	Extreme Cold/Wind Chill	NOAA & NCDC
33	12/14/2008	0.00	0.00	0.00K	0.00K	Extreme Cold/Wind Chill	NOAA & NCDC
34	12/13/2008	0.00	0.00	0.00K	0.00K	Blizzard, Extreme Cold/Wind Chill	NOAA & NCDC
35	4/6/2008	0.00	0.00	0.00K	0.00K	Heavy Snow	NOAA & NCDC
36	3/20/2008	0.00	0.00	0.00K	0.00K	Heavy Snow	NOAA & NCDC
37	2/19/2008	0.00	0.00	0.00K	0.00K	Extreme Cold/Wind Chill	NOAA & NCDC
38	2/10/2008	0.00	0.00	0.00K	0.00K	Extreme Cold/Wind Chill	NOAA & NCDC
39	2/9/2008	0.00	0.00	0.00K	0.00K	Blizzard	NOAA & NCDC
40	1/29/2008	0.00	0.00	0.00K	0.00K	Extreme Cold/Wind Chill	NOAA & NCDC
41	3/1/2007	2 indirect	0.00	0.00K	0.00K	Heavy Snow, Light Freezing Rain, and Sleet	NOAA & NCDC
42	2/28/2007	0.00	0.00	0.00K	0.00K	Freezing Drizzle and Blowing, Drifting Heavy Snow	NOAA & NCDC

43	12/29/2005	0.00	0.00			Freezing rain, Ice, and Heavy Wet Snow	NOAA & NCDC
44	2/10/2004	0.00	0.00			Blizzard	NOAA & NCDC
45	1/24/2004	0.00	0.00			Freezing Rain, Sleet, and Wind Chill	NOAA & NCDC
46	12/17/2002	0.00	0.00			Freezing Rain and Heavy Snow	NOAA & NCDC
47	11/7/2000	0.00	0.00			Heavy Snow	NOAA & NCDC
48	3/8/2000	0.00	0.00			Freezing Rain, Ice, Wet Snow, and Winds	NOAA & NCDC
49	4/3/1999	Unknown	Unknown	Unknown	Unknown	Heavy Snow	2004 Dickey MHMP
50	1/26/1999	Unknown	Unknown	Unknown	Unknown	Heavy Snow	2004 Dickey MHMP
51	1/1/1999	Unknown	Unknown	Unknown	Unknown	Heavy Snow	2004 Dickey MHMP
52	11/18/1998	Unknown	Unknown	Unknown	Unknown	Heavy Snow	2004 Dickey MHMP
53	4/4/1997	0.48	0.06	\$ 1,354,545.45	0.00	Winter Weather	SHELDUS
54	3/12/1997	Unknown	Unknown	\$ 15,000.00	Unknown	Winter Storm	2004 Dickey MHMP
55	1/21/1997	1.43	0.00	\$ 900,000.00	0.00	Winter Weather	SHELDUS
56	1/15/1997	1.43	0.00	\$ 900,000.00	0.00	Winter Weather	SHELDUS
57	1/9/1997	1.25	0.06	\$ 1,530,555.56	0.00	Winter Weather	SHELDUS
58	1/4/1997	0.38	0.00	\$ 250,000.00	0.00	Winter Weather	SHELDUS
59	11/5/1996	Unknown	Unknown	Unknown	Unknown	Rain Turned to Snow	2004 Dickey MHMP
60	3/23/1996	Unknown	Unknown	Unknown	Unknown	Severe Winter Weather	2004 Dickey MHMP
61	4/12/1995	Unknown	Unknown	Unknown	Unknown	Heavy Snow	2004 Dickey MHMP
62	3/26/1995	Unknown	Unknown	Unknown	Unknown	Light Rain and Snow	2004 Dickey MHMP
63	1/16/1995	Unknown	Unknown	Unknown	Unknown	Freezing Rain, Ice, Heavy Snow, and Winds	2004 Dickey MHMP
64	4/25/1994	Unknown	Unknown	\$ 50,000.00	Unknown	Winter Storm	2004 Dickey MHMP
65	11/22/1993	Unknown	Unknown	\$ 500,000.00	Unknown	Heavy Snow	2004 Dickey MHMP

Sources: National Oceanic and Atmospheric Administration (NOAA)

Information Service/National Climatic Data Center (NCDC)

Spatial Hazard Events and Losses Data in the United States (SHELDUS)

Urban Fire/Structure Collapse

	Begin Date	Injuries	Fatalities	Property Damage	Crop. Damage	Remarks	Source
1	10/26/2015	Unknown	Unknown	Unknown	Unknown	Structure	OFDIR
2	12/28/2012	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
3	12/25/2012	Unknown	Unknown	Unknown	Unknown	Electrical Fire Structure Fire	OFDIR
4	12/20/2012	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
5	12/3/2012	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
6	12/2/2012	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
7	11/26/2012	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
8	11/21/2012	Unknown	Unknown	Unknown	4 hay bales	Hay Bale Fire	OFDIR
9	11/16/2012	Unknown	Unknown	Unknown	Unknown	Vehicle	OFDIR
10	11/15/2012	Unknown	Unknown	Unknown	Unknown	Vehicle	OFDIR
11	10/26/2012	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
12	10/18/2012	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
13	10/16/2012	Unknown	Unknown	Unknown	2 acres	Grass Fire	OFDIR
14	10/10/2012	Unknown	Unknown	Unknown	Unknown	Vehicle	OFDIR
15	10/8/2012	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
16	10/7/2012	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
17	10/5/2012	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
18	10/4/2012	Unknown	Unknown	Unknown	Unknown	Electrical	OFDIR
19	10/2/2012	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
20	9/29/2012	Unknown	Unknown	Unknown	40 acres burned	Farm Equipment Grass Fire	OFDIR
21	9/28/2012	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
22	9/25/2012	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
23	9/22/2012	Unknown	Unknown	Unknown	Unknown	Vehicle	OFDIR

24	9/21/2012	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
25	9/19/2012	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
26	9/19/2012	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
27	9/17/2012	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
28	9/16/2012	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
29	9/16/2012	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
30	9/15/2012	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
31	9/15/2012	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
32	9/14/2012	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
33	9/8/2012	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
34	8/29/2012	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
35	7/26/2012	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
36	7/25/2012	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
37	7/21/2012	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
38	7/20/2012	Unknown	Unknown	Unknown	Unknown	Structure Fire Lightning	OFDIR
39	7/9/2012	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
40	7/8/2012	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
41	7/5/2012	Unknown	Unknown	Unknown	Unknown	Electrical Fire Grass Fire	OFDIR
42	6/30/2012	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
43	6/22/2012	Unknown	Unknown	Unknown	Unknown	Electrical Fire Grass Fire	OFDIR
44	5/29/2012	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
45	5/21/2012	Unknown	Unknown	Unknown	Unknown	Structure Fire Grass Fire	OFDIR
46	5/17/2012	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR

47	5/11/2012	Unknown	Unknown	Unknown	Unknown	Structure	OFDIR
48	4/6/2012	Unknown	Unknown	Unknown	5 acres	Grass Fire	OFDIR
49	3/20/2012	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
50	3/16/2012	Unknown	Unknown	Unknown	Unknown	Structure Fire Grass	OFDIR
51	3/13/2012	Unknown	Unknown	Unknown	1/2 acre burned	Grass Fire	OFDIR
52	2/19/2012	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
53	1/20/2012	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
54	12/31/2011	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
55	12/23/2011	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
56	12/11/2011	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
57	11/26/2011	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
58	11/24/2011	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
59	11/21/2011	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
60	11/6/2011	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
61	11/5/2011	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
62	11/5/2011	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
63	10/31/2011	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
64	10/18/2011	Unknown	Unknown	Unknown	Unknown	Farm Equipment	OFDIR
65	10/7/2011	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
66	10/6/2011	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
67	9/28/2011	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
68	9/17/2011	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
69	9/9/2011	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR

70	8/30/2011	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
71	8/15/2011	Unknown	Unknown	Unknown	Unknown	Electrical Structure Fire	OFDIR
72	7/18/2011	Unknown	Unknown	Unknown	Unknown	Vehicle	OFDIR
73	7/15/2011	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
74	7/14/2011	Unknown	Unknown	Unknown	Unknown	Electrical	OFDIR
75	7/2/2011	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
76	3/11/2011	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
77	1/28/2011	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
78	1/21/2011	Unknown	Unknown	Unknown	Unknown	Farm Equipment	OFDIR
79	12/7/2010	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
80	11/6/2010	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
81	10/12/2010	Unknown	Unknown	Unknown	Unknown	Vehicle	OFDIR
82	10/1/2010	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
83	9/21/2010	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
84	9/16/2010	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
85	9/5/2010	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
86	8/5/2010	Unknown	Unknown	Unknown	Unknown	Hay Bale Fire	OFDIR
87	7/22/2010	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
88	7/17/2010	Unknown	Unknown	Unknown	Unknown	Lightning	OFDIR
89	7/7/2010	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
90	7/4/2010	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
91	6/2010	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
92	4/8/2010	Unknown	Unknown	Unknown	Unknown	Vehicle	OFDIR
93	3/25/2010	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR

94	3/17/2010	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
95	2/18/2010	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
96	2/4/2010	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
97	1/31/2010	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
98	12/31/2009	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
99	12/12/2009	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
100	12/9/2009	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
101	10/23/2009	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
102	10/8/2009	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
103	9/21/2009	Unknown	Unknown	Unknown	Unknown	Lightning	OFDIR
104	8/6/2009	Unknown	Unknown	Unknown	Unknown	Hay Bales	OFDIR
105	8/2/2009	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
106	7/22/2009	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
107	7/17/2009	Unknown	Unknown	Unknown	Unknown	Vehicle	OFDIR
108	5/23/2009	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
109	3/23/2009	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
110	3/14/2009	Unknown	Unknown	Unknown	Unknown	Vehicle	OFDIR
111	2/13/2009	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
112	1/6/2009	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
113	1/2/2009	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
114	12/7/2008	Unknown	Unknown	Unknown	Unknown	Infrastructure	OFDIR
115	11/29/2008	Unknown	Unknown	Unknown	Unknown	Farm Equipment	OFDIR
116	11/20/2008	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR

117	11/5/2008	Unknown	Unknown	Unknown	Unknown	Vehicle	OFDIR
118	11/1/2008	Unknown	Unknown	Unknown	Unknown	Electrical Fire Structure Fire	OFDIR
119	10/31/2008	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
120	10/18/2008	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
121	10/2/2008	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
122	9/19/2008	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
123	9/5/2008	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
124	8/9/2008	Unknown	Unknown	Unknown	Unknown	-	OFDIR
125	8/8/2008	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
126	7/26/2008	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
127	7/11/2008	Unknown	Unknown	Unknown	Unknown	-	OFDIR
128	7/5/2008	Unknown	Unknown	Unknown	Unknown	Lightning	OFDIR
129	6/30/2008	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
130	6/27/2008	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
131	6/22/2008	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
132	5/21/2008	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
133	5/16/2008	Unknown	Unknown	Unknown	Unknown	Wildland Fire	OFDIR
134	5/11/2008	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
135	5/7/2008	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
136	5/6/2008	Unknown	Unknown	Unknown	Unknown	Farm Equipment Fire	OFDIR
137	4/29/2008	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
138	4/25/2008	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
139	4/18/2008	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR

140	3/13/2008	Unknown	Unknown	Unknown	Unknown	Electrical Fire Structure Fire	OFDIR
141	3/11/2008	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
142	2/26/2008	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
143	2/1/2008	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
144	1/5/2008	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
145	12/29/2007	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
146	12/24/2007	Unknown	Unknown	Unknown	Unknown	-	OFDIR
147	12/21/2007	Unknown	Unknown	Unknown	Unknown	-	OFDIR
148	12/3/2007	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
149	12/1/2007	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
150	11/13/2007	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
151	10/29/2007	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
152	10/25/2007	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
153	10/17/2007	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
154	10/8/2007	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
155	10/5/2007	Unknown	Unknown	Unknown	Unknown	Vehicle	OFDIR
156	10/4/2007	Unknown	Unknown	Unknown	Unknown	Vehicle	OFDIR
157	10/3/2007	Unknown	Unknown	Unknown	Unknown	Structure	OFDIR
158	9/20/2007	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
159	9/3/2007	Unknown	Unknown	Unknown	Unknown	-	OFDIR
160	8/31/2007	Unknown	Unknown	Unknown	Unknown	-	OFDIR
161	8/27/2007	Unknown	Unknown	Unknown	Unknown	-	OFDIR
162	7/26/2007	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR

163	7/25/2007	Unknown	Unknown	Unknown	Unknown	Electrical Fire Structure Fire	OFDIR
164	7/6/2007	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
165	6/25/2007	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
166	3/22/2007	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
167	3/13/2007	Unknown	Unknown	Unknown	Unknown	Vehicle	OFDIR
168	3/4/2007	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
169	1/25/2007	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
170	1/14/2007	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
171	12/28/2006	Unknown	Unknown	Unknown	Unknown	Structure Fire Grass Fire Vehicle	OFDIR
172	12/19/2006	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
173	12/9/2006	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
174	12/4/2006	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
175	11/19/2006	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
176	10/26/2006	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
177	10/9/2006	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
178	10/2/2006	Unknown	Unknown	Unknown	Unknown	Farm Equipment Electrical fire	OFDIR
179	9/26/2006	Unknown	Unknown	Unknown	Unknown	Structure	OFDIR
180	9/16/2006	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
181	9/15/2006	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
182	9/4/2006	Unknown	Unknown	Unknown	Unknown	Vehicle	OFDIR
183	8/30/2006	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
184	8/24/2006	Unknown	Unknown	Unknown	Unknown	-	OFDIR
185	8/14/2006	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR

186	8/11/2006	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
187	8/10/2006	Unknown	Unknown	Unknown	Unknown	-	OFDIR
188	8/4/2006	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
189	7/26/2006	Unknown	Unknown	Unknown	Unknown	Electrical Fire Grass Fire	OFDIR
190	7/2/2006	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
191	6/30/2006	Unknown	Unknown	Unknown	Unknown	Lightning	OFDIR
192	6/22/2006	Unknown	Unknown	Unknown	Unknown	Grass Fire Transportation Accident	OFDIR
193	6/16/2006	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
194	6/7/2006	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
195	4/23/2006	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
196	4/16/2006	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
197	4/14/2006	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
198	4/2006	Unknown	Unknown	Unknown	Unknown	Structure Fire Grass Fire	OFDIR
199	2/23/2006	Unknown	Unknown	Unknown	Unknown	Structure	OFDIR
200	12/22/2005	Unknown	Unknown	Unknown	Unknown	Hazardous Materials	OFDIR
201	12/8/2005	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
202	11/27/2005	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
203	11/10/2005	Unknown	Unknown	Unknown	Unknown	Farm Equipment	OFDIR
204	11/8/2005	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
205	10/29/2005	Unknown	Unknown	Unknown	Unknown	Farm Equipment Fire	OFDIR
206	9/18/2005	Unknown	Unknown	Unknown	Unknown	Vehicle	OFDIR
207	8/10/2005	Unknown	Unknown	Unknown	Unknown	Vehicle	OFDIR
208	8/3/2005	Unknown	Unknown	Unknown	Unknown	Structure	OFDIR

209	7/9/2005	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
210	7/5/2005	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
211	5/26/2005	Unknown	Unknown	Unknown	Unknown	-	OFDIR
212	5/12/2005	Unknown	Unknown	Unknown	Unknown	-	OFDIR
213	2/17/2005	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
214	2/13/2005	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
215	2/6/2005	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
216	1/6/2005	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
217	11/24/2004	Unknown	Unknown	Unknown	Unknown	Farm Equipment	OFDIR
218	11/15/2004	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
219	11/10/2004	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
220	11/9/2004	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
221	11/6/2004	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
222	11/1/2004	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR
223	10/23/2004	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
224	9/27/2004	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
225	9/27/2004	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
226	9/15/2004	Unknown	Unknown	Unknown	Unknown	Structure	OFDIR
227	8/5/2004	Unknown	Unknown	Unknown	Unknown	Farm Equipment	OFDIR
228	8/4/2004	Unknown	Unknown	Unknown	Unknown	Farm Equipment	OFDIR
229	7/27/2004	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
230	7/27/2004	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
231	7/21/2004	Unknown	Unknown	Unknown	Unknown	Farm Equipment	OFDIR
232	7/8/2004	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR

233	6/23/2004	Unknown	Unknown	Unknown	Unknown	Hazardous Materials	OFDIR
234	6/12/2004	Unknown	Unknown	Unknown	Unknown	Hazardous Materials	OFDIR
235	5/4/2004	Unknown	Unknown	Unknown	Unknown	Hazardous Materials	OFDIR
236	4/17/2004	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
237	4/16/2004	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
238	4/16/2004	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
239	4/13/2004	Unknown	Unknown	Unknown	Unknown	Structure Fire	OFDIR
240	4/6/2004	Unknown	Unknown	Unknown	Unknown	Grass Fire	OFDIR
241	3/10/2004	Unknown	Unknown	Unknown	Unknown	Vehicle	OFDIR
242	1/24/2004	Unknown	Unknown	Unknown	Unknown	Transportation Accident	OFDIR

Source: Oakes Fire Department Incident Report (OFDIR)

7.10 Severe Winter Weather

7.11 Windstorm

Begin Date	Injuries	Fatalities	Property Damage	Crop Damage	Remarks	Source
1960	0	0		2018.013	WIND	SHELDUS
1960	0	0	163.975	16505.52	WIND	SHELDUS
1960	0	0	2810.75	0	WIND	SHELDUS
1961	0	0	973.9	97390.05	WIND	SHELDUS
1965	0	0	6976.88	0	WIND	SHELDUS
1966	0	0	74896.1625	74896.16	WIND	SHELDUS
1967	0	0	17436.9	0	WIND	SHELDUS
1968	0	0	7607.015	0	WIND	SHELDUS
1969	0	0	199.61	1996.11	WIND	SHELDUS
1970	0	0	6254.216667	625421.5	WIND	SHELDUS
1970	0	0	1429.543333	0	WIND	SHELDUS
1971	0	0	13072.77	130727.8	WIND	SHELDUS
1971	0	0	599.17	599.17	WIND	SHELDUS
1972	0	0	663.4633333	6634.687	WIND	SHELDUS
1975	0	0	2460.25	0	WIND	SHELDUS

1977	3.5	0	124935.68	10571.48	WIND	SHELDUS
1977	0	0	8677.895	0	WIND	SHELDUS
1978	0	0	19849.78333	198.5033	WIND	SHELDUS
1978	0	0	337.07	0	WIND	SHELDUS
1978	0	0	1786.48	0	WIND	SHELDUS
1979	0	0	3.02	0	WIND	SHELDUS
1982	0	0	227.74	0	WIND	SHELDUS
1983	0	0	48.72	0	WIND	SHELDUS
1984	0	0	5605.32	0	WIND	SHELDUS
1985	0	0	360.85	0.00E+00	WIND	SHELDUS
1986	0	0	25920.97	25920.97	WIND	SHELDUS
1988	0	0	273.5	0	WIND	SHELDUS
1989	1	0	46967.135	46967.14	WIND	SHELDUS
1989	0	0	9393.43	0	WIND	SHELDUS
1990	0	0	1681.5	0	WIND	SHELDUS
1990	0	0	4455.95	0	WIND	SHELDUS
1991	0	0	89796.2	89796.2	WIND	SHELDUS
1991	0	0	356.33	0	WIND	SHELDUS
1993	0	0	11515.43	0	WIND	SHELDUS
1997	0	0	725.725	0	WIND	SHELDUS
2004	0	0	1027.69	0	WIND	SHELDUS
2007	0	0	252796.465	28088.5	WIND	SHELDUS
2007	0	0	140442.48	280885	WIND	SHELDUS
2008	0	0	2163.99	0	WIND	SHELDUS
2008	0	0	51394.815	27049.9	WIND	SHELDUS
2008	0	0	2393.51	0	WIND	SHELDUS
2009	0	0	2961.43	0	WIND	SHELDUS
2009	0	0	27146.485	0	WIND	SHELDUS
2011	0	0	20712.9	0	WIND	SHELDUS
2011	0	0	709416.98	517822.6	WIND	SHELDUS
2012	0	0	1521.97	0	WIND	SHELDUS
2013	0	0	20000	0	WIND	SHELDUS
2014	0	0	0.81836	4000	WIND	SHELDUS
2016	0	0	5.10863	25000	WIND	SHELDUS

Flood**March 1, 1995**

Record high temperatures led to a rapid snow melt. This in addition to saturated soil, and above normal precipitation led to flooding in much of eastern and central North Dakota. Several homes were evacuated and many homes and businesses experienced water seepage. Many city streets and county, state, and US Highways were closed because of water over the roadway and washouts. Some residents had to use boats to get to and from their homes. Water flooded thousands of acres of cropland, pasture and residential property. Drinking water and sewer lift stations were damaged. This event resulted in a Presidential Disaster Declaration, DR-1001, and accounted for approximately \$49,000,000 worth of damage statewide.

March 21, 1997

Warm weather lead to rapid snow melt and flooding across south central North Dakota. This event resulted in a Presidential Disaster Declaration, DR-1174, damages statewide amounted to \$537,000,000 (Public Entity Risk Institute, 2009).

May 6, 1997

Received 2.5 to 3.5 inches of rain throughout the county.

April 23, 1997

A Disaster Declaration was issued due to excessive water that has been accumulating for the past six years and made worst by excessive runoff.

May 11, 1999

Venturia's water supply was in jeopardy due to the transformer almost being under water.

May 12, 1999

Received .6 inches of rain in 15-20 minutes resulting in flash flooding.

March 6, 2009

Significant overland flooding damaged county and township roads. One home was flooded. Flooding continued into April. This devastating flooding continued into April, and in some cases worsened. Record snowfall \$94,000 in damages were reported in Wishek.

April 1, 2009

A second round of overland flooding due to snowmelt resulted additional damages to several county and local roads. \$33,000 worth of damages were reported in Wishek. This event resulted in a Presidential Disaster Declaration, DR-1829. McIntosh County Commissioned declared a Flood Emergency. Damage was primarily limited to roadways throughout the county. Approximately 25-30 homes sustained some type of damage, ranging from water in basements to one home that sustained major damage.

May 29, 2010

Heavy rainfall near two inches in less than one hour resulted in flash flood conditions in the city of Ashley. Many homes had water in their basements, resulting in severe carpet damage and other moisture related damages. Damage estimates at \$225,000.

Hazardous Material Release

- 12/30/1981** – 48 barrels of gasoline and 42 barrels of diesel fuel spilled during a semi accident 1.5 miles east of Ashley.
- 1993** – Two anhydrous ammonia releases from spray co-ops.
- 3/29/1995** – 50 gallons of gasoline and five gallons of diesel fuel, near Green Lake. A truck overturned and spilled fuel in a slough. Burned slough, game and fish investigated.
- 1995** – Ten-gallon fuel oil and 50-gallon gasoline spill at Jake’s Fuel Oil in Wishek.
- 1996** – Propane spill from a tanker 15 miles east of Ashley. Traffic had to be rerouted.
- 1997** – 50-100-gallon diesel fuel spill from Co-op Oil.
- 2/19/1999** – A water tower leak at Lehr was reported to the NDDEM React Officer
- 12/10/2005** – A semi-hauling propane overturned nine miles north of Ashley on County Hwy 23 due to icy conditions on the road. 40-50 gallons of diesel was spilled according to the Fire Chief, Jim Delzer. No injuries or deaths were reported. The spill site was cleaned by Cenex (Owner of the Semi).
- 5/4/2007** – An Anhydrous spill occurred seven miles west of Ashley on Hwy 11. A farm tractor pulling four anhydrous tanks hooked onto two trailers overcorrected and caused the anhydrous tanks to overturn. One tank was leaking, but quickly dissipated as a result of the wind and rain. No injuries/deaths, no damages reported.
- 5/12/2007** – 1000-gallon spill of anhydrous ammonia 14 miles south of Wishek on Hwy 3. Strong winds caused tow vehicle to lose control and cause the trailer to roll, breaking the valve on the tank. Most of the product vented to atmosphere, but some drained to road ditch. Roadside vegetation browned in area 10’x10’.
- 6/21/2012** – 25 gallons of Monsanto RT3 leaked from a company owned chemical tote. 302 West Main, Ashley, ND.
- 11/12/2012** – 15-gallon diesel fuel spill at 313 1st ST SW, Ashley, ND. A hose from fuel transport came unhooked while pumping. Transport driver was off loading semi-trailer into bulk plant when the hose detached from the bulk head releasing about 15 gallons of diesel fuel onto the loading pad.
- 5/2/2014** – Diesel and used motor oil spill. Diesel had been leaking from a tank and five gallon pails of used oil had been tipped over. Possible oil changing area for heavy equipment used to repair/raise township road. Approximately 9 miles east and ½ mile north of Ashley, ND.
- 9/21/16** – 20 gallons of road master diesel spilled because of overflow by CHS Transportation, driver misread gauge or it did not work and the tank overflowed at Rocky’s Bulk Fuel in Wishek.

Severe Summer Weather

Date	Description
June 9, 1958; August 5, 1964; August 4, 1969; June 3, 1974; June 11, 1976; July 4, 1977; June 15, 1978; July 10, 1981; July 12, 1981; June 16, 1987; June 20, 1991; August 19, 1991;	A thunderstorm with wind was reported in McIntosh County. No damages reported.
August 25, 1998	The County received 2 to 4 inches of heavy rain in a short period of time
September 15, 1998	Strong winds and heavy rain.
August 29, 1993	A thunderstorm with wind was reported 1 mile N of Ashley in McIntosh County. \$5,000 worth of damages were reported.
May 21, 1995	A thunderstorm with wind was reported 10 miles SW of Wishek. Strong thunderstorm winds tore the doors off a barn and blew a 1000-gallon water tank one and one-half miles away.
July 12, 1995	A thunderstorm with wind was reported in Wishek and Ashley. No damages reported.
August 24, 1995	A thunderstorm with wind was reported in Wishek. The strong thunderstorm winds tipped over a grain truck estimated to weigh about 8,000 lbs.
August 2, 1996	\$5,000 worth of damages was reported when a thunderstorm with high winds was reported @5 miles W of Wishek. Thunderstorm winds blew roof off a pole barn.
June 26, 1998	\$1,500,000 in crop damages was reported in Zeeland from hail damage that accompanied a thunderstorm with high winds. Hail covered the ground with total crop loss. Wind damage to trees, wind speed unknown.
April 5, 2000	0A low-pressure system over Alberta Canada moved southeast and intensified along the Canadian/North Dakota border. A very tight pressure gradient resulted in very high winds causing injuries and property damages throughout western and central North Dakota. Wind gust of 55 to 70mph were common.
June 9, 2001	A thunderstorm with high winds blew the roof off a farm shed and town trees and powerlines in Wishek.
June 10, 2001	Severe rainstorm lasting about 10 minutes blew through the county around 8:45 PM with baseball to golf ball sized hail. Short time later another blew through with heavy rain and small pea size hail. This storm caused extensive damage to trees, roofs and vehicles. Rain total about 1.70 inches.
July 14, 2001	A thunderstorm with wind was reported in Ashley. Thunderstorm dropped around 4.0 inches of rain.
July 21, 2001	Thunderstorm uprooted trees in Wishek.
July 28, 2001	Severe rainstorm damaging crops, blowing roofs of buildings and uprooting trees. Some pea sized hail. Rain average from 2.5 to 3.0 inches throughout the county.
July 31, 2001	A thunderstorm with wind was reported in Wishek. NCDC data indicates that there was roof damage to commercial building, semi-truck blown over, and playground equipment scattered.
August 8, 2001	A thunderstorm with high winds was reported 7 miles NE of Ashley. An observer reported that doors were ripped off barn, heavy equipment rolled over, and numerous branches down

Appendix 8

Date	Description
August 9, 2001	Severe thunderstorm with wind speeds in excess of 70 mph and rain knocked down lots of trees, telephone lines and some power lines. Rain averaged from 1 to 1.5 inches.
February 11, 2002	22 counties, including McIntosh County, were impacted when a strong low-pressure system moving across southern Canada produced a tight surface pressure gradient over North Dakota. Wind speeds averaged 50 to 70 miles an hour beginning early in the day and ending late in the evening.
June 19, 2002	A thunderstorm with strong winds was reported 10 miles E of Ashley.
July 8, 2002	Severe thunderstorm raged across an erratic path west of Ashley damaging buildings and machinery on six farms.
July 9, 2002	A thunderstorm with strong winds was reported 6 miles NE of Ashley.
July 10, 2002	Thunderstorm North East of Ashley along with hail and rain. Funnel cloud was seen by a spotter NE of Ashley.
July 24, 2002	A thunderstorm with strong winds was reported in Wishek.
August 1, 2002	During a thunderstorm, lightning struck a stack of 60 large bales and burned at the Steve & Art Spitzer farm. A bale was burned at the Robert Meidinger farm also due to lightning strike.
August 8, 2002	A thunderstorm with strong winds downed large tree branches in Wishek and Ashley.
June 21, 2003	A strong thunderstorm with high winds was reported in Ashley. No injuries, deaths, or dollar estimate on the damages was provided by NCDC. 11 N. of Ashley they reported 3 inches of rain, and small hail. Eastern part of the county reported some wind and branches down.
July 3, 2003	Thunderstorm in the Ashley area with heavy rains in short period of time in early evening. Rainfall amounts up to 2 inches. Some downed trees, branches scattered about. Some pea sized. In the city of Wishek, fire destroyed a home. It is thought it was attributed to a possible power strip on the computer hook-up. (Approximate value of the house \$70,000.00) Some crop damage in the area as well.
July 20, 2004	Strong winds and hail in Wishek area. Damage to crops and farm buildings, roofs blown off.
July 10, 2004	32 counties, including McIntosh County, were impacted when a fast-moving cold front brought strong to high winds to western and central North Dakota in the late morning hours and continued through the early evening hours. Sustained winds of 40 mph with gust to 60 mph were common over western and central North Dakota. The winds subsided late in the evening of the 10th.
July 20, 2004	\$25,000 in property damages was reportedly caused by strong thunderstorms 6 miles W of Wishek. Wind accompanied by 1 inch hail. Hail and wind damage to crops. A roof was torn off a farm building and grain bins were blown over.
June 8, 2005	Heavy rain was reported throughout the County. Ashley area – Heavy rains – up to 2 inches, some small hail, damage to crops due to washing from heavy downpour. Wishek area - Heavy rains- hail damage to gardens and crops, 2 -3 inches of rain. Venturia area - Reports from 2 – 3 inches of rain, strong winds Lehr area – 1 – 3 inches of rain, crop damage due to hail, strong winds Zeeland area – 3 inches of rain- heavy rain at times, thunderstorms. Commissioner Meidinger stated that his farm land next to Beaver Creek is saturated, and the creek is up 5 -6 feet right now.

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Date	Description
July 19, 2005	A thunderstorm accompanied by high winds struck 13 miles E of Ashley. A sturdy wooden machine shed was destroyed. A 4500-pound Bobcat skid-steer loader flipped over. A mixer mill, fishing boat and motor tossed in a pile of rubble. Marble size hail accompanied the wind. There was wind damage to farm buildings in various parts of the county, that same evening.
June 12, 2006	A fast-moving storm ripped thru the Ashley, Venturia and Lehr area on Monday, May 29th, around 2 AM. Hail ranging from nickel to golf ball size with raging winds. At the Art Spitzer farm, 12 N. of Ashley McIntosh County Multi-Hazard Mitigation Plan June 2009 they reported hail in clumps the next day at 5 PM. Farmers in the Lehr area had windows broken, and campers at Hoskins Lake had their tents shredded. Reports of .20 of rain was reported in the Ashley area. Power was interrupted from 12:45 AM to 9:15 AM in the Venturia area affecting KEM customers.
June 30, 2006	A thunderstorm with high winds struck 10 miles N of Ashley. \$25,000 in damages were reported when door and roof damage was sustained by a Quonset. No other information was recorded by NCDC. The same storm hit 17 miles E. NE of Ashley blowing over a large tree and breaking windows. Approximately \$2,000 in damages were reported.
August 4, 2006	A thunderstorm accompanied by high winds hit 4 miles NE of Ventura.
August 9, 2006	Severe Thunderstorms swept through our county, reports of hail damage to crops, some Being 100%, one party reported hail the size of golf balls, W. of Ashley in the Venturia area. North of Ashley there was also extensive damage to crops as well. Rainfall totals averaged anywhere from .20 to 3 inches in the county. Dangerous lightning starting approximately at 2:45 and lasting throughout the night, coming at several different intervals, with rain.
August 24, 2006	A thunderstorm accompanied by high winds struck Ashley.
July 27, 2005	In the NW Corner of McIntosh County, they have received 8 inches of rain in the last week, fields are saturated.
June 17, 2007	Severe Thunderstorms in McIntosh County, some areas of the county reported as much as 5 inches of rain in a very short period of time. This caused flash flooding across the road out by Lake Hoskins. Sheriff Laurie Spitzer stated that traffic had to be rerouted for several hours, starting at 10 PM Sunday evening. Basement flooding was reported in the Lake Hoskins area. High winds were reported in the Wishek area. Trees and branches were scattered all over in the city of Ashley, rainfall in the city was 1 inch.
September 22, 2007	Strong winds and hail, some sunflower fields were flattened, these sunflowers were expected to yield 3000 lbs. per acre. Early evening rain and wind raged through an area W and N of Ashley Sunday Evening. Several farmers in the area sustained considerable damage. 6 miles S of Lehr at the Kranzler farm, wind leveled a well house, the roof was taken off a pole barn, roof was taken off the aeration bins and splinters of wood were found in hay bales. Sheriff Spitzer stated she had to stop on the highway because of poor visibility and torrential rain and hail. While she was sitting on the highway, a gust of wind grabbed her vehicle and spun it around a half turn. Clyde Wetzel, 8 miles N. of Ashley reported the loss of a roof on his farm. Various people in the Venturia area stated they had damage to grain bins, one grain bin cleared a shelterbelt, traveled an eighth of a mile and landed in the cornfield 2 ½ miles SE of his farm. Windows were blown out of one farmers barn, also in the Venturia area. Prior to the storm survey the highest wind speed for this event had been estimated at 70 mph. Because of the survey the National Weather Service in Bismarck had increased that to 85mph. The largest hail stone reported was 0.75-inch diameter – penny size. Also, a funnel cloud was reported about 4 S. of Lehr. Eye witnesses said it did not touch the ground.

Appendix 8

Date	Description
September 23, 2007 (Event reported locally on September 22, 2007)	A thunderstorm, starting near Zeeland and traveling into Wishek caused non-tornadic thunderstorm winds estimated up to 85 mph caused significant damage along a 27-mile path in McIntosh County. Damage was sustained to crops and farm outbuildings, and large trees were uprooted. Specifically, 4 miles east of Zeeland the roof was torn from a farm outbuilding, large trees were uprooted, a camper trailer was moved, and damage was done to sunflower crops. 5 miles east of Zeeland a farm outbuilding roof was torn off. 7 miles east of Zeeland to 4 west Venturia, tree limbs were down, Quonsets damaged, and a large outbuilding was nearly collapsed. Along Danzig Road tree limbs were broken, trees uprooted, large barn wall pushed 2 inches off foundation, and large outbuilding roofs torn off and walls collapsed. Finally, 3 miles south of Lehr, a cattle barn was completely destroyed, tree limbs were broken, and wooden and metal fences were blown over. Several severe thunderstorm warnings were issued. Large hail and severe thunderstorm wind gust reports were received during the early and mid-evening hours over McIntosh and Logan Counties. McIntosh County was hit hard by this event with a 27-mile-long stretch of damage from southwest to northeast across the county. \$300,000 in property damage and \$400,000 in crop damage was reported.
June 11, 2008	Thunderstorms and high winds struck 5 miles NE of Ashley causing \$10,000 in property damage. Estimated thunderstorm wind speed gusts up to 70 miles per hour resulted in trees being blown down and shingles blown off a house five miles northeast of Ashley. Several reports of large hail and severe thunderstorm wind gusts were received during the morning and early afternoon hours of Wednesday, June 11th.
July 7, 2008	Severe Thunderstorm in our county – High winds, believed to be up to 60 MPH, downed power lines, some businesses and residents were without power from 8:30 PM to 2:00 AM. This occurred around 5:30 PM power was restored temporarily. Wishek received 1.10 in. of rain in about 20 minutes, damage to trees, according to Larry, President of the City Council, Wishek.
July 19, 2008	Severe thunderstorm - Zeeland - several farmers involved, 700 acres of cropland lost due to hail.
July 27, 2008	Thunderstorms and high winds struck 9 miles W of Ashley. In the late evening hours of Saturday, July 26 th .
July 28, 2008	A thunderstorm with high winds struck 16 miles E of the Ashley Airport causing approximately \$5,000 in damages. Several reports of tree damage and minor structural damage due to severe thunderstorm wind gusts were reported. An incoming upper level trough and its associated surface cold front continued the development of additional severe thunderstorms for several hours Monday evening. Numerous severe thunderstorm warnings and several tornado warnings were issued. Numerous reports of severe weather, including funnel clouds and a tornado, were received. Damages in McIntosh County included: Excessive wind out at Gary Elaine Hoffman farm, eastern part of county, 15E. of Ashley. Small hail along with wind. Large cottonwood tree blown down. Damage to a corn field in their area belonging to a neighbor, field was totally stripped. Art Spitzer farm reported golf ball size hail for a very short time. Damage to buildings, crops is minimal. In Ashley, we had approximately one inch of rain, not much wind, no hail, lots of lightning and thunder.

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Date	Description
July 30, 2008	Commissioner, Neil Meidinger reported there was wind damage to crops in the Zeeland area. Severe thunderstorm, high winds, rainfall totals 1.20. Tree branches down all over town, no damage to houses in the vicinity. A report from 4 miles S. of Ashley a steel grain bin was lifted off its foundation and carried out to a pasture where it slammed into a KEM electric power pole. The pole needed to be replaced.
July 31, 2008	A thunderstorm with high winds struck 8 miles NE of Danzig, causing @\$1,000 in damages. Thunderstorm wind gusts broke three inch in diameter tree branches. Numerous reports of large hail and severe thunderstorm wind gusts were received, along with one flash flood.
October 26, 2008	11 counties, including McIntosh County were struck by a thunderstorm with high winds. Sustained winds of 40 to 45 mph and wind gusts as high as 65 mph. The high winds occurred during the morning and afternoon hours of Sunday, October 26th. Scattered reports of property damage from the high winds were received over south central portions of North Dakota.
January 31, 2009	High winds were reported in Logan and McIntosh Counties. Winds were sustained over 40 mph across the north and central. The highest wind gust was measured at 60 mph in Ward County.
June 3, 1974; August 5, 1987; May 26, 1988; June 20, 1988; July 6, 1991; May 16, 1996 (x2); June 21, 1999; July 22, 1999; June 9, 2001; August 28, 2002; July 3, 2003(x2); May 29, 2004; July 18, 2004; June 7, 2005; August 16, 2006	.75 inches of hail fell in McIntosh County
April 30, 2010	.75 inch of hail fell in Ashely.
September 18, 2002; May 29, 2004 (x2); August 20, 2006; May 3, 2012; July 26, 2016;	.88 inches of hail fell in Ashley.
April 30, 2010; July 16, 2015	.88 inches of hail fell in Wishek.
July 24, 1960; June 16, 1973; June 15, 1978; July 5, 1978; August 13, 1986; August 24, 1991; July 18, 2001; September 18, 2002; May 8, 2005; May 29, 2006; June 14, 2006; April 12, 2010; April 30, 2010; March 29, 2012; May 2, 2012; July 22, 2012; June 21, 2014; August 7, 2015	1 inch of hail fell on McIntosh County.
June 8, 2005; April 12, 2010; July 15, 2015; August 3, 2016	1.5 inches of hail fell on McIntosh County.
June 25, 2010	1.5 inches of hail fell in Zeeland.
July 6, 1976; July 4, 1978; August 3, 1985; July 5, 1988; June 13, 1991; June 13, 1991; August 28, 1993; June 24, 1998 (x2); July 18, 2001; July 18, 2001; July 301, 2001; July 9, 2002; July 18, 2004; June 7, 2005; May 29, 2006; June 20, 2016	1.75 inches of hail fell on McIntosh County.

Appendix 8

Date	Description
July 6, 1962; August 17, 1964; July 21, 1967; May 27, 1980; July 20, 1987; July 14, 1992; May 22, 2012; July 9, 2013	2 inches of hail fell on McIntosh County.
September 2, 1962; August 28, 1993; June 21, 1999; July 10, 2002	2.5 inches of hail fell on McIntosh County.
June 3, 1986	2.75 inches of hail fell in McIntosh County
June 26, 1998	In Zeeland, hail covered the ground with total crop loss. Crop losses estimated at \$1,500,000. Wind damage to trees, wind speed unknown.
June 9, 2001	Another 2.75 inches of hail fell in Ashley. \$100,000 in damages were reported throughout the city. Widespread car and roof damages reported.
June 10, 2001	Golf ball to baseball size hail in Ashley
September 18, 2002; May 29, 2004	.88 inches of hail fell in Ashley.
July 20, 2004	Pea sized and later to quarter sized hail in Wishek and surrounding areas with strong shifting winds in all directions. Severe damage to crops West of Wishek areas. Damage to farm buildings.
August 9, 2006	1.75 inches of hail fell about 15 miles east southeast of Ashley. Broken windows plus shingle and siding damage were reported on three farms. In one case, broken glass was imbedded in a wall 25 feet away. Hail was 5 inches deep, and was described by one farmer as a sea of white as far as the eye could see. Hail was accompanied by 60+ mph winds and heavy rain
August 10, 2006	1.75 inches of hail fell in Wishek resulting in approximately \$30,000 in damages—primarily broken windows.
August 22, 2006	Description: 1 inch of hail fell in Ashley. Approximately \$35,000 occurred when hail swath 1/2-mile-long and 1/4-mile-wide went through Ashley. Wind gust to 65 mph estimated. Windows broken in town.
August 22, 2006	1.25 inches of hail fell in Wishek; 1 .75 inches of hail fell in Ashley; 1 inch of hail fell in Ashley.
June 6, 2007	.75 inches of hail fell in Ashley. Hail fell from 430 AM CDT to 455 AM CDT and covered the ground. The largest stone was penny size. An isolated severe thunderstorm produced large hail in McIntosh County.
June 16, 2007	1 inch of hail fell in Danzig. Numerous severe thunderstorm warnings and three tornado warnings were issued. Reports included large hail, tornadoes, and a flash flood.
August 13, 2007	Around daybreak on Monday, August 13th, scattered thunderstorms developed across north central North Dakota in response to low level warm air advection and large scale ascent from an incoming upper level short wave trough. Severe Thunderstorm Watch 591 was issued by mid-morning in anticipation of continued severe thunderstorm development through the morning hours over the eastern parts of the Bismarck CWA (County Warning Area). .75 inches of hail fell in/near Ashley. No dollar losses/damages reported.
September 23, 2007	.75 inches of hail fell in Ashley. Large hail and severe thunderstorm wind gust reports with a 27-mile-long stretch of damage from southwest to northeast across the county.

Appendix 8

Date	Description
July 10, 2008	An inch of hail fell near Wishek. Scattered thunderstorms moving across south central North Dakota prompted several severe thunderstorm warnings during the late evening of Wednesday, July 9th, through the early morning hours of Thursday, July 10th. One report of large hail was received from McIntosh County early Thursday morning. Losses unknown.
July 19, 2008	.88 inches of hail fell in Zeeland. Numerous severe thunderstorm warnings were issued, along with two tornado warnings. Numerous reports of large hail, and one report each of severe winds and a tornado were received during the afternoon and evening. Another inch of hail was reported 11 miles north of Zeeland. No damages were reported. \$50,000 in crop damage was reported in Ventura when 1.25 inches of hail fell in the city. Dakota. Numerous severe thunderstorm warnings were issued, along with two tornado warnings. Numerous reports of large hail, and one report each of severe winds and a tornado were received during the afternoon and evening.
July 26, 2008	Hail damage to crop and a farmer's pickup at the Ralph Neu Farm. 12 E. 2 N. of Ashley.
July 28, 2008	1.25 inches of hail was reported 1 mile southeast of Wishek Municipal Airport. No reports of damage were received. An incoming upper level trough and its associated surface cold front continued the development of additional severe thunderstorms for several hours Monday evening. Numerous severe thunderstorm warnings and several tornado warnings were issued. Numerous reports of severe weather, including funnel clouds and a tornado, were received. No damages/dollar losses reported. 1.75 inches of hail fell 7 miles northeast of Danzig. 1.75 inches of hail fell in Ashley. Hail up to golf ball size fell in Ashley for around fifteen minutes. 1.75 inches of hail fell in Danzig. No reports of damage were received.
July 6, 1962	An F2 Tornado struck McIntosh County causing \$25,000 in damages. NCDC
May 5, 1964	A tornado struck briefly, entered McIntosh County and went onward to Emmons County. There was damage near the County line. Damages reported in McIntosh County included the following: Duane Ketterling, Ron Ketterling, farmsteads were destroyed. Christoph Just farm totaled. The Edwin Meidinger family farm, gone. This one was on 55,- 5.5 South of hwy 13 and 1 W. According to JP Martin, with NWS, this is recorded in Emmons County, property damage at 250K, so this was quite a sizeable storm.
July 31, 1966	An F3 tornado struck McIntosh County, causing @\$25,000 in damages. It was 33 yards wide and 1 mile long.
June 9, 1971	An F0 tornado, approximately 10 yards wide caused \$2,500 in damages.
April 19, 1973	An F0 tornado caused approximately \$25,000 in damages in McIntosh County
May 27, 1980	An F1 tornado, approximately 33 yards wide and 1 mile long struck McIntosh County causing @\$25,000 in damages
June 6, 1986	A 10-yard-wide F0 tornado was reported in McIntosh County.
August 1, 1987	An F0 tornado, 13 yards wide, struck McIntosh County causing @\$25,000 in damages.
June 20, 1991	A 10-yard-wide F1 tornado struck McIntosh County causing \$250,000 in property damage.

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Date	Description
June 12, 1993	A F1 (73-112 mph) tornado touched down in McIntosh County. The width of the path was 70 yards. Property damage as a result of this tornado is estimated at \$50,000.
August 6, 1994	An F0 tornado that was 2 miles long and 50 yards wide caused @\$25,000 in damages near Wishek.
July 19, 1997	An F0 tornado @ 3miles long and 20 yards wide struck 4 miles northeast of Zeeland.
June 24, 1998	A F0 (40-72 mph) tornado touched down 5 miles northwest of Ashley. The width of the path was 33 yards. The tornado was nearly stationary and there were numerous reports from all directions.
June 25, 1998	Funnel clouds were reported west of Ashley between 6:30 PM and 10:00 PM. Several funnel clouds touched down causing very little damage. These funnel clouds were accompanied by pea to marble sized hail.
July 24, 1998	An F0 tornado, approximately 33 yards wide, struck 5 miles NW of Ashley. The tornado was nearly stationary, numerous reports from all directions.
July 18, 2001	An F0 tornado struck 7 miles S of Ventura destroying 137 bales of hay.
July 31, 1966	An F3 tornado struck McIntosh County, causing @\$25,000 in damages. It was 33 yards wide and 1 mile long.
June 9, 1971	An F0 tornado, approximately 10 yards wide caused \$2,500 in damages.
April 19, 1973	An F0 tornado caused approximately \$25,000 in damages in McIntosh County.
May 27, 1980	An F1 tornado, approximately 33 yards wide and 1 mile long struck McIntosh County causing @\$25,000 in damages.
June 6, 1986	A 10-yard-wide F0 tornado was reported in McIntosh County.
August 1, 1987	An F0 tornado, 13 yards wide, struck McIntosh County causing @\$25,000 in damages.
June 20, 1991	A 10 yard wide F1 tornado struck McIntosh County causing \$250,000 in property damage.
June 12, 1993	A F1 (73-112 mph) tornado touched down in McIntosh County. The width of the path was 70 yards. Property damage as a result of this tornado is estimated at \$50,000.
August 6, 1994	An F0 tornado that was 2 miles long and 50 yards wide caused @\$25,000 in damages near Wishek.
July 19, 1997	An F0 tornado @ 3miles long and 20 yards wide struck 4 miles northeast of Zeeland.
June 24, 1998	A F0 (40-72 mph) tornado touched down 5 miles northwest of Ashley. The width of the path was 33 yards. The tornado was nearly stationary and there were numerous reports from all directions.
June 25, 1998	Funnel clouds were reported west of Ashley between 6:30 PM and 10:00 PM. Several funnel clouds touched down causing very little damage. These funnel clouds were accompanied by pea to marble sized hail.
July 24, 1998	An F0 tornado, approximately 33 yards wide, struck 5 miles NW of Ashley. The tornado was nearly stationary.
July 18, 2001	An F0 tornado was spotted 9 miles SE of Ashley, ND.
July 9, 2002	An F0 tornado touches down 7 miles NE of Ashley. It was approximately 50 yards wide and 1 mile long and destroyed crops on 3 separate farms.

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Date	Description
July 10, 2002	Funnel cloud was spotted approx. 10 East and 5 North of Ashley. Reports of damage to farm buildings, crops and farm animals. The following day a farmer in that area reported severe injuries to his horses and cattle, and a 500 ft. stretch of fencing was torn out.
May 29, 2004	An F0 tornado touched down 4 miles SW of Ashley. Estimated width 20 yards. Nickel size hail was also reported – (wind speed 60 mph, estimated.)
May 29, 2004	Tornado approximately 3 to 4 miles South of Ashley between 5 & 6:30 PM. Damage consisted of uprooted trees, farm buildings, broken windows. Some fences were ripped due to excessive wind and dime to quarter sized hail. This was a separate and distinct tornado. Time- 5:14 PM CDT to 5:29 PM CDT – Path length 3 miles and 60 yards (estimated wind speed 75 mph)
July 18, 2004	Tornado warning and sightings in the Wishek area, along with rain and hail. No additional information is available.
August 4, 2006	An F0 tornado about 40 yards wide touched down 4 miles S. of Ashley. A report by McIntosh County Sheriff deputy reported that it was just north of the North Dakota and South Dakota border. No structures impacted and no damage.
July 3, 1994	Most of Eastern North Dakota and parts of Central and western North Dakota, including McIntosh County. Due to heavy rains on top of already saturated soil, 25 counties in North Dakota have been declared Presidential disaster areas. Many of these counties had July rainfall of four to nearly ten inches, which was on top of June's four to seven inches. July's average precipitation is from two to three inches. Damage occurred to basements, roads, bridges, and septic systems.
May 24, 2010	Numerous severe thunderstorm and tornado warnings were issued from late in the afternoon till later in the evening. Several reports of large hail, multiple reports of severe thunderstorm winds, and several reports of funnel clouds and tornadoes were received during this event. Strong straight line winds associated with a severe thunderstorm resulted in damage to farm outbuildings.
July 8, 2011	Strong thunderstorm winds resulted in several large trees and numerous branches blown down in Wishek.
July 10, 2011	A tornado touched down in a field near Ashley. No damage was reported with this tornado. Strong thunderstorm winds blew shingles off of a roof.
July 16-19, 2011	Daytime temperatures in the 90s combined with the high humidity to produce heat index values well over 100 degrees for many locations for several days. Heat index values topped out between 110 and 120 degrees, not a common thing in North Dakota.
July 22, 2011	large hail, high winds, tornadoes, and flash floods. Strong thunderstorm winds occurred north of Zeeland. A Quonset and pole barn were destroyed, shingle and siding damage was sustained to a home, and two trees were blown down. Strong thunderstorm winds resulted in damage to buildings on a farmstead, and damage to hay bales.
June 18, 2014	Severe thunderstorm winds resulted in a swath of damage around Ashley. Five miles northeast of Ashley on a ranch, the roof of a cattle barn was torn off and several cottonwood trees were snapped. Seven miles north of Ashley, several outbuildings were damaged on a ranch, including shingles torn off of a home and a trailer tipped over by the winds. Along the entire path of the damage, many tree branches were broken along with tree trunks snapped. There was also crop damage in the area north and east of Ashley. Tornado touched down briefly in open country just off of North Dakota Highway 3 south of Ashley. There was no damage so this tornado was rated EF0.
August 31, 2016	Thunderstorms developed during the early morning and continued into the mid-morning over south central North Dakota, with some becoming severe.

Severe Winter Weather

Date	Description
November 22, 1993	A Large Part of North Dakota a slow moving and enormous storm over North America brought record single-storm snowfall to much of North Dakota. Over two feet of snow fell over a large part of central and southeast North Dakota, and most of North Dakota had over a foot of snow from this storm. Out in the rural areas, some farm buildings collapsed in the heavy snow.
April 25, 1994	\$500,000 in damages was reported when a late season winter storm came a few days after temperatures of 80 degrees. Parts of southern North Dakota received almost a foot of heavy wet snow. Some thunder occurred with the snowfall. Winds of 25 to 45 mph caused blizzard conditions at times, and snow drifts three feet high. This late storm brought record seasonal snowfall to many parts of the state. Snowfall for the winter season topped 100 inches in some places. The storm closed schools and businesses, and shut down travel.
March 28, 1995	Several hours of light rain and drizzle preceded the snow. Six to eight inches of wet snow was common.
April 12, 1995	7 counties, including McIntosh County, were affected when heavy snow fell in parts of south-central and southeastern North Dakota. Six to eight inches were common in those areas with a maximum of 16 inches in Wishek
March 23, 1996	Approximately 39 counties were affected, including McIntosh County, when an early spring snow storm moved up out of the 4-corners region of the country to bring another round of severe winter weather to the northern plains.
November 5, 1996	Fourteen counties were affected, including McIntosh County, when a storm system that developed over northcentral Nebraska moved northeast into northwestern Minnesota. Although at first the storm appeared to be warm enough to only produce rain, once snow began to fall on the morning of the 5th, dynamic cooling lead to an all snow event across southcentral and east central North Dakota. Luckily, no wind accompanied the storm system and there were no major interruptions in day to day activities.
November 19, 1996	25 counties were affected, including McIntosh County, when another winter storm hit North Dakota bringing more unwanted snow to the state. Although there wasn't enough wind associated with the storm system to qualify the storm as a blizzard, the 10 to 20 mph winds were enough to create some blowing and drifting snow in open areas. Many school districts cancelled their rural bus routes after busses got stuck or slid into the ditch.
November 23, 1996	31 counties were affected, including McIntosh County, when for the 2nd time in less than 1 week, more snow fell on parts of western and central North Dakota. Again, the lack of wind made the storm more bearable than what it could have been. Bitter cold air also accompanied the storm system.
March 13, 1997	23 counties were affected, including McIntosh County, when winter storm that moved out of Montana brought yet more snow to a winter weary state. The snow was mainly confined in a band from the northwest part of the state to the southcentral.
November 9, 1998	23 counties were affected, including McIntosh County, when strong upper level low pressure and powerful surface system over Colorado ejected northeast into the northern plains during the early morning hours on the 9th and intensified during the day. A band of heavy wet snow extended from the southwest through much of central North Dakota ending early in the afternoon on the 10 th .
November 18, 1998	23 counties were affected, including McIntosh County when strong surface low pressure system over Wyoming moved into the northern plains on the 18th and intensified over South Dakota.

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Date	Description
January 1, 1999	34 counties were affected, including McIntosh County, when a trough of low pressure extended from the northern plains into an area of intense low-pressure system over the central plains. A strong upper level short wave accompanied the surface trough as it moved through the northern plains on New Year's Day. Heavy snow fell along and east of the surface trough with 6 to 8 inches of snowfall during the day. Northwest winds to 40 mph brought bitter cold wind chills to 65 below zero and low visibilities in blowing snow west of the surface trough.
January 26, 1999	24 counties were affected, including McIntosh County, when low pressure over the four corners of southwestern U.S. moved into the central plains and intensified. A small band of heavy snow fell over parts of east central North Dakota.
April 3, 1999	23 counties were affected, including McIntosh County, when strong low pressure over the central Rockies moved into the northern plains on the morning of the 3rd. The storm brought an area of heavy snow over western and central North Dakota. Snowfall ranged from 4 to 8 inches.
February 25, 2000	32 counties, including McIntosh County, were impacted by a severe winter storm.
February 26, 2000	32 counties, including McIntosh County, were impacted when low pressure intensified before moving into the northern plains during the early morning hours of the 25th. The storm moved quickly northeast to southern Manitoba Canada by the early morning hours on the 27th of February. The storm system maintained an abundant amount of moisture which began as rain. As colder air spilled on the back side of the storm system the rain turned to wet snow. A wide band of heavy wet snow fell from south central North Dakota through portions of extreme north central North Dakota. Winds with this storm generally ranged between 30 to 45 mph which caused some blowing and drifting snow.
March 8, 2000	An abundant amount of moisture accompanied this storm system which brought rain and scattered thunderstorms across southern North Dakota before turning to wet snow. Snow amounts ranged between 3 to 6 inches with the heaviest falling over south central North Dakota. Winds during the storm ranged between 40 to 50 mph which created dangerous winter conditions. Residents in the city of Ashley were out of power for 30 hours during the height of the storm. Winds and ice downed numerous power lines. The county was without power for an additional 5 hours when repairs were made to the poles at the end of the month.
November 7, 2000	Abundant amount of moisture was drawn northward with this system and wrapped around much colder air to the west and north of the low-pressure center. Heavy snow fell across western and central North Dakota with accumulations of 6 to 18 inches reported. The snow was accompanied by gusty northwest winds up to 40 mph causing widespread reduced visibilities less than a half mile and wind chills to 30 below zero.
April 23, 2001	The storm system produced a swath of heavy wet snow from west central South Dakota through parts of south central and much of southeastern North Dakota. Up to a foot of wet snow fell across this area. In south central North Dakota, 6 to 8 inches fell across southern Emmons, LaMoure, Dickey and McIntosh counties.

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Date	Description
December 17, 2002	A band of heavy snow fell across north central and parts of east central North Dakota on the 18th and 19th of December. In addition to the snow, winds of 25 to 40 mph caused considerable blowing and drifting of the snow. Areas of freezing rain preceded the snowfall. The heaviest snowfall occurred over north central North Dakota where 12 to 19 inches accumulated and drifts over 6 feet reported in some areas. Over east central North Dakota 6 to 8 inches of snow fell and in the far west and far south central North Dakota 3 to 5-inch snowfall was common. After a relatively mild autumn, it was the first major arrival of winter weather to affect the region.
January 24, 2004	A major winter storm impacted North Dakota on the weekend of January 24th and 25th. A persistent snow event produced 6 to 12 inches of snow over most of western and central North Dakota. The heaviest band of snow fell from the northwest through central North Dakota where snowfall amounts ranged from 9 to 12 inches. The storm began as freezing rain and sleet over north central North Dakota before turning over to all snow. Gusty winds of 15 to 25 mph accompanied the storm resulting in considerable blowing and drifting snow and wind chills to 30 below zero. Travel throughout the region was impacted due to reduced visibilities and blocked roads.
April 10, 2004	strong northwest winds and snow over western and central North Dakota. Wind gust to 50 mph were reported over various locations of the region. Conditions deteriorated rapidly in the early afternoon hours on the 10th when visibilities lowered to less than a quarter mile producing "white out" conditions
November 28, 2005	Three counties, including McIntosh County, were impacted when light freezing rain iced area roads before changing to snow during the day as colder air rushed in. The wind gusted to 35 mph in Ashley. This caused reduced visibility in blowing snow.
December 30, 2005	Freezing rain began falling over most of the area by early afternoon on the 29th with rain along the South Dakota border. Most areas had a coating of ice before precipitation changed to heavy wet snow.
December 30, 2006	Eight to 10 inches of snow fell in the western part of the county. Snow plows were pulled off the highways across the state due to low visibility. A unique meteorological condition led to very significant heavy snow.
February 28, 2007	Eight inches of snow fell from late Tuesday night February 27th into Wednesday night February 28 th . Accumulating snow, along with freezing drizzle and blowing and drifting snow, continued into Thursday morning of March 1st.
March 1, 2007	Six inches of total snow accumulation.
January 16, 2009	significant travel problems developed due to blowing and drifting snow as a result of 15 to 30 mph gusts through the entire weekend of Friday, January 16 th . Law enforcement, Department of Transportation officials, and media reported numerous accidents and rollovers on North Dakota highways due to the icy roadway conditions throughout the weekend.

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Date	Description
February 27, 2009	Dickey and McIntosh County were impacted when a low-pressure system developing over the high plains of Montana and Wyoming, pushed southeast into the central plains during the evening hours of the 25th and into the morning hours of the 26th. As this occurred, strong frontogenetical forcing resulted in a band of moderate to heavy snow developing along the North Dakota and South Dakota border area, with snowfall rates upwards of three inches per hour.
March 10, 2009	McIntosh County was impacted when a storm total snowfall of nine inches was reported at Ashley. The moderate to heavy snow combined with gusty northerly winds resulted in road closures and the issuance of no travel advisories by local officials.
March 22, 2009	Calls started coming in at 7AM on Sunday morning March 22nd. Yards flooded in the western part of Ashley, this involved about 5 or 6 homes in that area. This was due to rapid snowmelt from fields directly behind these homes that brought in flood waters very quickly. The culvert in front of these homes were blocked. These homes are located on hwy. 11 – 2 miles west of Ashley. The culvert was opened by the state highway supervisor, he dug a trench along the ditch so water could flow freely.
March 23, 2009	McIntosh County Commission declared a Snow Emergency.
March 24, 2009	A mixture of rain, freezing rain, sleet, and snow greatly affected travel across the county. A storm total snow amount of six inches was reported. Winter storm and blizzard watches and warnings were posted well in advance of the storm. Precipitation started in the form of rain and thunderstorms Sunday into Monday morning, before changing over to all snow west to east Monday afternoon through Tuesday morning. Additionally, strong northwest winds of 20 to 45 mph accompanying the snow, produced widespread blizzard conditions west during the day on Monday. Storm total snow amounts ranged from 12 to 22.5 inches.
March 25, 2009	Ashley experienced a power outage last evening for a few hours (3-24-09) Lehr, Wishek and numerous farmers have been out of power since (3-24-09).
March 31, 2009	Excessive snowfall started on March 31 and continued to Tuesday, March 31. Snow fall in Ashley was 14 inches, Wishek was 19, Zeeland and Venturia stated around 20 to 25 inches. Schools have been closed all week due to buses unable to travel and blocked roads. No mail Monday or Tuesday.
February 2, 1996	Every county in North Dakota was impacted when dangerously cold weather once again hit the state. Many places reported lows from 35 to 45 below. Northwest winds up to 30 mph created wind chills to 100 below. Electric companies reported peak loads, while natural gas companies had trouble keeping gas flowing through pipelines. Numerous schools closed and many water main breaks occurred. There were also shortages of #1 diesel fuel.
December 25, 1996	The blizzard of the 16th-18th left in its wake very cold air. Lows across the state that morning varied from 20 to 30 below with highs from 10 to 20 below.
January 4, 2004	Extremely cold temperatures and gusty winds. Temperatures reached 20 to 30 below zero Sunday night and remained through Monday. West winds of 10 to 25 mph combined with subzero temperatures created wind chills of 45 to 58 below and low visibilities from blowing snow. The frigid temperatures lead to power outages and water line breaks.

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Date	Description
January 27, 2004	Ambient temperatures ranging 20 to 35 below zero combined with northwest winds to 30 mph resulted in widespread wind chill factors of 40 to 65 below zero.
January 13, 2005	The air temperatures overnight dropped between 20 to 35 below zero with daytime temperatures ranging 10 to 20 below zero. The subzero temperatures lasted through the morning of the 15th. Northwest winds up to 20 mph accompanied the cold air producing extreme wind chills of 40 to 60 below zero across the region. Many schools and outdoor activities were cancelled due to the bitter cold.
February 16, 2006	Temperatures were in the 15 to 25 degree below zero range with wind speeds of 15 to 25 mph resulting in wind chills mainly in the 40s below.
January 30, 2008	wind chills of 40 to 55 below zero with wind speeds of 30 to 50 mph persisted for over 30 hours. Cold arctic air with temperatures of 10 to 25 below zero, and winds of 30 to 40 mph with gusts up to 55 mph, resulted in wind chills of 40 to 60 below zero.
February 9, 2008	Wind chills of 40 to 50 below zero with wind speeds of 15 to 35 mph
February 14, 2008	Wind chill temperatures of 40 below to near 55 below zero. After a significant winter storm that brought a blizzard to western and central North Dakota moved out of the Northern Plains, wind chill continued to be a problem. Strong cold air advection combined with gusty northwest winds and resulted in wind chill temperatures of 40 to 55 below zero from Sunday night the 14th, through Monday morning the 15 th .
December 20-21, 2008	Cold Arctic air combined with winds of 15 to 25 mph to create wind chill of 40 below to near 50 below zero. Wind chill temperatures of 40 below to near 50 below zero from Saturday the 20th, through Sunday morning the 21st.
January 12, 2009	Strong northwest winds of 25 to 35 mph, with gusts up to 45 mph, combined with falling snow and existing loose snow cover to create widespread and prolonged blizzard conditions across the county. Storm total snowfall accumulations by Monday morning ranged from one to three inches.
January 16-18, 2009	Significant travel problems developed due to blowing and drifting snow through the entire weekend of Friday, January 16th, through Sunday, January 18th. North to northwest winds of 15 to 30 mph with a few higher gusts were common Friday, Saturday, and Sunday. Due to these winds and daytime temperatures near freezing, blowing and drifting snow developed resulting in low visibilities and snow sticking to roadways.
January 31, 2009	Winds were sustained over 40 mph across the north and central.
February 27, 2009	snowfall rates upwards of three inches per hour. Storm total snow amounts ranged from six to 18 inches by the morning of the 26th. The heavy snow resulted in several highways being closed and county officials issuing numerous no travel advisories across southwest and south central North Dakota.
March 10, 2009	A band of moderate to heavy snow developed and persisted until slowly abating. Heavy snow combined with gusty northerly winds resulted in road closures and the issuance of no travel advisories by local officials. Many school were closed. A storm total snowfall of nine inches was reported at Ashley.
March 24, 2009	A mixture of rain, freezing rain, sleet, and snow greatly impacted travel across the county. A storm total snow amount of six inches was reported. Power outages were reported in rural areas of the county during the storm.

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Date	Description
March 29 – 31, 2009	snow amounts of 13.7 inches in Ashley and 19 inches at Wishek. The heavy snow combined with strong northwest winds resulting in widespread blizzard conditions.
March 31, 2009	strong northwest winds of 20 to 45 mph accompanied snow and produced widespread blizzard conditions mainly south of Interstate 94 closer to the North Dakota and South Dakota border. Storm total snow amounts of 13.7 inches in Ashley and 19 inches at Wishek.
December 23 – 25, 2009	A significant and prolonged winter storm impacted all of west and central North Dakota beginning Wednesday, December 23rd, lasting into Saturday, December 26th. Ten to twenty inches of wet snow, coupled with winds of 20 to 30 mph, caused major transportation problems leading up to Christmas Day. Storm total snow seven miles northeast of Ashley was 24 inches.
January 5-7, 2010	Four to seven inches of snow fell across McIntosh County. Strong northwest winds of 20 to 40 mph created areas of significant blowing and drifting snow, resulting in near blizzard conditions.
January 21 - 23, 2010	A prolonged period of freezing fog along with periods of freezing drizzle resulted in moderate to heavy ice accumulations on power lines. This caused several overhead power lines and power poles to snap, resulting in scattered power outages across the county. A wintry mix of freezing rain, sleet, and snow spread north across the local area. Precipitation eventually changed over to all snow, with up to three inches of accumulations reported by Saturday morning. Hazardous travel conditions and continued power outages resulted.
May 6-7, 2010	A spring storm system brought several inches of wet snow to portions of McIntosh County. Accumulations remained under warning criteria amounts.
October 26, 2010	Sustained winds more than 40 mph, and wind gusts up to 62 mph, were reported for several hours. Snow then combined with the high winds Wednesday, October 27th to create blizzard conditions. Storm total snowfall amounts ranged from one to three inches.
December 30, 2010 – January 1, 2011	A storm total snowfall of 6.9 inches was reported in Ashley. Strong northerly winds up to 45 mph combined with the snow to produce a prolonged period of blizzard conditions. The blizzard conditions continued January 1st, 2011.
February 1-2, 2011	The combination of winds and cold Arctic air resulted in wind chill temperatures of 40 below to near 50 below zero.
February 8, 2011	The combination of winds and cold Arctic air resulted in wind chill temperatures of 40 below to near 50 below zero.
February 20, 2011	Blizzard conditions developed as strong northerly winds with gusts up to 50 mph combined with falling snow and the fresh snow cover on the ground.
March 11-12, 2011	Widespread and severe blizzard conditions developed as strong northwesterly winds up to 65 mph combined with falling snow and fresh snow cover on the ground. Travel was significantly impacted due to near zero visibilities, strong winds, and ice-covered road surfaces.
March 22-23, 2011	An estimated storm total snowfall of six to eight inches fell across McIntosh County.
April 14-15, 2011	Cooperative observers across McIntosh County reported storm total snowfall amounts from 7.2 inches at Ashley to 13 inches at Wishek.
January 18-19, 2012	air temperatures and wind chill temperatures to fall to 30 below zero and colder

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Date	Description
February 28-29, 2012	Seven inches of snow was reported at Wishek.
December 8-9, 2012	Strong winds gusting to over 40 miles per hour combined with several inches of snow to result in widespread blizzard conditions across McIntosh County.
January 20-21, 2013	Wind chill temperatures of around forty below zero were observed.
January 30-31, 2013	Wind Chill temperatures around fifty below zero were recorded.
February 10-11, 2013	Up to five inches of new snowfall combined with frequent wind gusts to near forty miles per hour to result in prolonged blizzard conditions across McIntosh County. County officials advised no travel due to near zero visibilities.
April 14-15, 2013	McIntosh County received up to seventeen inches of snow. Very heavy snow combined with winds gusting to 40 miles per hour to create a blizzard for much of the day on the 14th.
December 3-4, 2013	An estimated snowfall of six inches occurred.
December 6-7, 2013	Subzero temperatures combined with winds up to 15 miles per hour to produce wind chill temperatures as low as fifty below zero during the evening of the 6th and the morning of the 7th.
December 28-29, 2013	Subzero temperatures combined with winds to around 15 miles per hour to produce wind chill temperatures as low as 40 below zero during the evening of the 28th and the morning of the 29th.
January 4-6, 2014	Subzero temperatures as cold as 25 below zero combined with winds gusting to around 30 miles per hour to produce life threatening wind chill temperatures colder than 40 below zero for a period of three days. Lowest wind chills observed were as cold as 62 below zero.
January 15-16, 2014	Peak wind gusts as high as 75 miles per hour were recorded, with many locations gusting in excess of 60 miles per hour.
January 22-23, 2014	Wind speeds of 10 to 20 miles per hour combined with subzero temperatures to produce wind chill temperatures as low as 45 below zero during the evening of the 22nd and early morning of the 23rd.
January 26, 2014	Winds gusting to around 55 miles per hour combined with fresh snow on the ground and falling snow to produce a blizzard.
January 26-28, 2014	Subzero temperatures as low as 15 below zero combined with winds up to 20 miles per hour to produce life threatening wind chill temperatures as low as 45 below zero over a three-day period.
March 1-2, 2014	wind chill temperatures as cold as 45 below zero February 28th - March 2nd.
March 31, 2014	Anywhere from 5 inches up to a foot of snow was observed. strong northerly winds developed across the region, with peak gusts recorded around 55 miles per hour at some locations. Combined with the fresh loose snow and continued falling snow, blizzard conditions were observed.
December 15-16, 2015	Locations near Ashley and Zeeland received eight inches of snow.
November 27-29, 2016	Rain preceded the snow over many locations, with a gradual transition to snow during the late evening of November 27 into the early morning of November 28. Snow then continued through November 28 into November 29. The snowfall was very heavy and wet due to a relatively warm atmosphere which led to low snow-to-liquid ratios. Western McIntosh County received an estimated ten inches of snow.

Date	Description
December 5-6, 2016	Snow began to fall on the morning of December 5, with several inches of accumulation noted by mid-day. As the cold front swept through, winds greatly increased from northwest to southeast with visibility rapidly deteriorating as wind gusts increased to around 50 mph. Many roads were closed or blocked. Falling snow started to taper off very gradually from west to east on December 6, though strong winds continued to bring widespread blowing snow and blizzard conditions.
December 25-26, 2016	Freezing rain developed in the warmer air over the southern James River Valley. Cold air wrapped into the system through the day which lead to strong winds and a widespread blizzard. Most roads were closed or blocked throughout the state of North Dakota by the morning of December 26. Power outages occurred throughout the county. The power cooperative that serves mainly rural portions of McIntosh County reported 15-three phased poles near Lehr were snapped, along with multiple other poles and lines. 1,050 meter-services in rural areas experienced outages which are served by nine substations. The investor owned utility which serves many of the communities reported multiple primary and secondary feeds down, with some communities going without power until December 29.
January 1-3, 2017	McIntosh County received seven inches of snow.

Windstorm

June 18, 2010 - Sustained winds of 40 mph and gusts to around 60 miles per hour were common.

February 13, 2011 - A peak sustained wind of 40 mph was recorded by the North Dakota Department of Transportation sensor at Wishek.

April 29 – May 1, 2011 - A powerful late spring storm system swept across the Northern Plains region April 29th into May 1st. Far south central and eastern North Dakota received very little snowfall but still experienced the high winds.

May 31, 2011 - Strong winds across all of west and central North Dakota May 31st. Sustained winds of 40 mph and peak gusts up to 60 mph were reported during the morning and afternoon.

September 20, 2011 - prolonged period of strong winds

October 7, 2011 - Peak wind gusts reached 61 miles per hour.

May 2, 2012 - The strong thunderstorm winds blew over a basketball pole cemented in the ground.

July 6, 2012 - An area of showers and scattered thunderstorms over south central North Dakota produced several reports of severe downburst winds over McIntosh, LaMoure, and Dickey Counties early in the morning, before sunrise. The strong winds blew down several trees and blew the roof off a large building.

July 22, 2012 - strong to severe thunderstorms in the late afternoon and early evening hours. The strong winds blew down a few tree branches in Zeeland. Prolonged period of strong northwest winds across western and central North Dakota. Peak gusts were measured over sixty miles per hour. Sustained winds at or above forty miles per hour.

July 9, 2013 - The severe thunderstorm winds blew two empty grain bins into a house causing damage, and destroyed a small wooden building.

September 9, 2013 - Several farm outbuildings were damaged or destroyed. A barn was blown off its foundation, wind breaks were destroyed, and a grain bin and pig barn were destroyed. Many tree branches were blown down.

July 16, 2014 - Severe thunderstorm wind gusts to 70 mph in McIntosh County.

October 11-12, 2015 - Wishek NDDOT site reported a wind gust of 60 mph.

November 18, 2015 - Wishek NDDOT site reported a wind gust of 63 mph.

August 10, 2016 - Storms developed very strong wind gusts. The greatest amount of damage occurred in the city of Strasburg, where multiple structures were damaged. Tree branches around four inches in diameter were snapped.