

DRAFT

**2015 Barnes County
Multi-Jurisdictional
Multi-Hazard
Mitigation Plan**



2015 Barnes County Multi-Jurisdictional Multi-Hazard Mitigation Plan

Barnes County



Plan Development Managed by:
Barnes County Commission
Barnes County Emergency Management
1525 12th St. NW
Valley City, ND 58072
Email: kfranklin@barnescounty.us
Phone: (701) 845-8508; (701) 845-8510

Plan Prepared by:

South Central
DAKOTA
Regional Council

P.O. Box 903
Jamestown, ND 58402-0903
Email: dkantrud@scdrc.org
Phone: (701) 952-8060

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Executive Summary

The updating of the Barnes County Multi-Jurisdictional Multi-Hazard Mitigation Plan (MHMP) was conducted over an 18-month period (per FEMA grant timeline). It included the review of hazards, risks, vulnerabilities, and capabilities of the county, and resulting mitigation actions in Barnes 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. A mitigation survey was administered during the planning process, which sampled 6.0 percent of households in the county.

The hazards profiled in this plan include communicable disease, dam failure, drought, flood, geologic hazard, 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 Barnes County Multi-Jurisdictional Multi-Hazard Plan develops a mitigation strategy consisting of six goals and 86 mitigation projects based on an assessment of risks.

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

Goal 1: Improve public awareness of hazards.

Goal 2: Implement education programs for people to protect themselves.

Goal 3: Improve planning and regulation in jurisdictions to mitigate hazards.

Goal 4: Reduce impact of hazards.

Goal 5: Improve resiliency of critical facilities and infrastructure.

Goal 6: Provide places of refuge and early warnings for public and vulnerable populations to take protective action during hazard events.

To assist in the use, implementation, and updating of this documentation, 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.

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 Barnes County, the local governing body responsibility for carrying out plans and policies is the County Commission. The Barnes County Commission and each incorporated city in the county – Dazey, Fingal, Kathryn, Leal, Litchville, Nome, Oriska, Pillsbury, Rogers, Sanborn, Sibley, Valley City and Wimbeldon – 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. The city of Rogers was not included in the 2010 update, but did participate in 2005 and is participating in 2015. All incorporated city jurisdictions and the Barnes Rural Water District are included in the 2015 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 Barnes County, by resolution, hereby adopt the concepts and conditions set forth by the Barnes County Multi-Hazard Mitigation Plan (MHMP).

County of Barnes, ND

Barnes County Commission

Barnes ND 58072

Resolution No. _____

A RESOLUTION OF THE COUNTY OF BARNES ADOPTING THE BARNES COUNTY, NORTH DAKOTA, MULTI-JURISDICTIONAL MULTI-HAZARD MITIGATION PLAN, 2015

Whereas, the County Commission recognizes the threat that natural hazards pose to people and property within Barnes County; and

Whereas, the County of Barnes has prepared a multi-hazard mitigation plan, hereby known as Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015 in accordance with the Disaster Mitigation Act 2000; and

Whereas, Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Barnes 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 Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015.

NOW THEREFORE, BE IT RESOLVED BY THE COUNTY OF BARNES, NORTH DAKOTA, THAT:

Section 1. In accordance with County Ordinances, the County of Barnes adopts the Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015.

ADOPTED by a vote of _____ in favor and _____ against, and _____ abstaining, this _____ day of _____, 2015.

By: _____

, Barnes County Commission Chairman

Attest:

By: _____

, Barnes County Auditor

City of Dazey, ND

Dazey City Council

Dazey, ND 58429

Resolution No. _____

A RESOLUTION OF THE CITY OF DAZEY ADOPTING THE BARNES COUNTY, NORTH DAKOTA, MULTI-JURISDICTIONAL MULTI-HAZARD MITIGATION PLAN, 2015

Whereas, the City Council recognizes the threat that natural hazards pose to people and property within Dazey; and

Whereas, the City of Dazey has prepared a multi-hazard mitigation plan, hereby known as Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015 in accordance with the Disaster Mitigation Act 2000; and

Whereas, Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Dazey 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 Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015.

NOW THEREFORE, BE IT RESOLVED BY THE CITY OF DAZEY, NORTH DAKOTA, THAT:

Section 1. In accordance with City Ordinances, the City of Dazey adopts the Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015.

ADOPTED by a vote of ____ in favor and ____ against, and ____ abstaining, this ____ day of ____, 2015.

By: _____

Gary Hare, Mayor

Attest:

By: _____

Darlene Hare, Auditor

City of Fingal, ND

Fingal City Council

Fingal, ND 58031

Resolution No. _____

A RESOLUTION OF THE CITY OF FINGAL ADOPTING THE BARNES COUNTY, NORTH DAKOTA, MULTI-JURISDICTIONAL MULTI-HAZARD MITIGATION PLAN, 2015

Whereas, the City Council recognizes the threat that natural hazards pose to people and property within Fingal; and

Whereas, the City of Fingal has prepared a multi-hazard mitigation plan, hereby known as Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015 in accordance with the Disaster Mitigation Act 2000; and

Whereas, Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Fingal 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 Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015.

NOW THEREFORE, BE IT RESOLVED BY THE CITY OF FINGAL, NORTH DAKOTA, THAT:

Section 1. In accordance with City Ordinances, the City of Fingal adopts the Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015.

ADOPTED by a vote of _____ in favor and _____ against, and _____ abstaining, this _____ day of _____, 2015.

By: _____

John Behm, Mayor

Attest:

By: _____

Corrine Ertelt, Auditor

City of Kathryn, ND

Kathryn City Council

Kathryn, ND 58049

Resolution No. _____

A RESOLUTION OF THE CITY OF KATHRYN ADOPTING THE BARNES COUNTY, NORTH DAKOTA, MULTI-JURISDICTIONAL MULTI-HAZARD MITIGATION PLAN, 2015

Whereas, the City Council recognizes the threat that natural hazards pose to people and property within Kathryn; and

Whereas, the City of Kathryn has prepared a multi-hazard mitigation plan, hereby known as Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015 in accordance with the Disaster Mitigation Act 2000; and

Whereas, Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Kathryn 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 Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015.

NOW THEREFORE, BE IT RESOLVED BY THE CITY OF KATHRYN, NORTH DAKOTA, THAT:

Section 1. In accordance with City Ordinances, the City of Kathryn adopts the Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015.

ADOPTED by a vote of _____ in favor and _____ against, and _____ abstaining, this _____ day of _____, 2015.

By: _____

Paul Fisher, Mayor

Attest:

By: _____

Shirley Sivertson, Auditor

City of Leal, ND

Leal City Council

Leal, ND 58479

Resolution No. _____

A RESOLUTION OF THE CITY OF LEAL ADOPTING THE BARNES COUNTY, NORTH DAKOTA, MULTI-JURISDICTIONAL MULTI-HAZARD MITIGATION PLAN, 2015

Whereas, the City Council recognizes the threat that natural hazards pose to people and property within Leal; and

Whereas, the City of Leal has prepared a multi-hazard mitigation plan, hereby known as Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015 in accordance with the Disaster Mitigation Act 2000; and

Whereas, Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Leal 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 Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015.

NOW THEREFORE, BE IT RESOLVED BY THE CITY OF LEAL, NORTH DAKOTA, THAT:

Section 1. In accordance with City Ordinances, the City of Leal adopts the Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015.

ADOPTED by a vote of _____ in favor and _____ against, and _____ abstaining, this _____ day of _____, 2015.

By: _____

David Lokken, Jr., Mayor

Attest:

By: _____

Mary Undem, Auditor

City of Litchville, ND

Litchville City Council

Litchville, ND 58461

Resolution No. _____

A RESOLUTION OF THE CITY OF LITCHVILLE ADOPTING THE BARNES COUNTY, NORTH DAKOTA, MULTI-JURISDICTIONAL MULTI-HAZARD MITIGATION PLAN, 2015

Whereas, the City Council recognizes the threat that natural hazards pose to people and property within Litchville; and

Whereas, the City of Litchville has prepared a multi-hazard mitigation plan, hereby known as Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015 in accordance with the Disaster Mitigation Act 2000; and

Whereas, Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Litchville 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 Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015.

NOW THEREFORE, BE IT RESOLVED BY THE CITY OF LITCHVILLE, NORTH DAKOTA, THAT:

Section 1. In accordance with City Ordinances, the City of Litchville adopts the Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015.

ADOPTED by a vote of _____ in favor and _____ against, and _____ abstaining, this _____ day of _____, 2015.

By: _____

Brad Botner, Mayor

Attest:

By: _____

Connie Smith, Auditor

City of Nome, ND

Nome City Council

Nome, ND 58062

Resolution No. _____

A RESOLUTION OF THE CITY OF NOME ADOPTING THE BARNES COUNTY, NORTH DAKOTA, MULTI-JURISDICTIONAL MULTI-HAZARD MITIGATION PLAN, 2015

Whereas, the City Council recognizes the threat that natural hazards pose to people and property within Nome; and

Whereas, the City of Nome has prepared a multi-hazard mitigation plan, hereby known as Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015 in accordance with the Disaster Mitigation Act 2000; and

Whereas, Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Nome 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 Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015.

NOW THEREFORE, BE IT RESOLVED BY THE CITY OF Nome, NORTH DAKOTA, THAT:

Section 1. In accordance with City Ordinances, the City of Nome adopts the Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015.

ADOPTED by a vote of ___ in favor and ___ against, and ___ abstaining, this ___ day of ___, 2015.

By: _____

Lance Capman, Mayor

Attest:

By: _____

Alice Capman, Auditor

City of Oriska, ND

Oriska City Council

Oriska, ND 58063

Resolution No. _____

A RESOLUTION OF THE CITY OF ORISKA ADOPTING THE BARNES COUNTY, NORTH DAKOTA, MULTI-JURISDICTIONAL MULTI-HAZARD MITIGATION PLAN, 2015

Whereas, the City Council recognizes the threat that natural hazards pose to people and property within Oriska; and

Whereas, the City of Oriska has prepared a multi-hazard mitigation plan, hereby known as Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015 in accordance with the Disaster Mitigation Act 2000; and

Whereas, Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Oriska 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 Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015.

NOW THEREFORE, BE IT RESOLVED BY THE CITY OF ORISKA, NORTH DAKOTA, THAT:

Section 1. In accordance with City Ordinances, the City of Oriska adopts the Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015.

ADOPTED by a vote of _____ in favor and _____ against, and _____ abstaining, this _____ day of _____, 2015.

By: _____

Rick Pommerer, Mayor

Attest:

By: _____

Katie Pommerer, Auditor

City of Pillsbury, ND

Pillsbury City Council

Pillsbury, ND 58065

Resolution No. _____

A RESOLUTION OF THE CITY OF PILLSBURY ADOPTING THE BARNES COUNTY, NORTH DAKOTA, MULTI-JURISDICTIONAL MULTI-HAZARD MITIGATION PLAN, 2015

Whereas, the City Council recognizes the threat that natural hazards pose to people and property within Pillsbury; and

Whereas, the City of Pillsbury has prepared a multi-hazard mitigation plan, hereby known as Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015 in accordance with the Disaster Mitigation Act 2000; and

Whereas, Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Pillsbury 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 Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015.

NOW THEREFORE, BE IT RESOLVED BY THE CITY OF PILLSBURY, NORTH DAKOTA, THAT:

Section 1. In accordance with City Ordinances, the City of Pillsbury adopts the Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015.

ADOPTED by a vote of _____ in favor and _____ against, and _____ abstaining, this _____ day of _____, 2015.

By: _____

Dan Lindsith, Mayor

Attest:

By: _____

Dennis McGuire, Auditor

City of Rogers, ND

Rogers City Council

Rogers, ND 58479

Resolution No. _____

A RESOLUTION OF THE CITY OF ROGERS ADOPTING THE BARNES COUNTY, NORTH DAKOTA, MULTI-JURISDICTIONAL MULTI-HAZARD MITIGATION PLAN, 2015

Whereas, the City Council recognizes the threat that natural hazards pose to people and property within Rogers; and

Whereas, the City of Rogers has prepared a multi-hazard mitigation plan, hereby known as Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015 in accordance with the Disaster Mitigation Act 2000; and

Whereas, Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Rogers 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 Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015.

NOW THEREFORE, BE IT RESOLVED BY THE CITY OF ROGERS, NORTH DAKOTA, THAT:

Section 1. In accordance with City Ordinances, the City of Rogers adopts the Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015.

ADOPTED by a vote of _____ in favor and _____ against, and _____ abstaining, this _____ day of _____, 2015.

By: _____

Lynn Koebernick, Mayor

Attest:

By: _____

Tina Vincent, Auditor

City of Sanborn, ND

Sanborn City Council

Sanborn, ND 58480

Resolution No. _____

A RESOLUTION OF THE CITY OF SANBORN ADOPTING THE BARNES COUNTY, NORTH DAKOTA, MULTI-JURISDICTIONAL MULTI-HAZARD MITIGATION PLAN, 2015

Whereas, the City Council recognizes the threat that natural hazards pose to people and property within Sanborn; and

Whereas, the City of Sanborn has prepared a multi-hazard mitigation plan, hereby known as Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015 in accordance with the Disaster Mitigation Act 2000; and

Whereas, Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Sanborn 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 Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015.

NOW THEREFORE, BE IT RESOLVED BY THE CITY OF SANBORN, NORTH DAKOTA, THAT:

Section 1. In accordance with City Ordinances, the City of Sanborn adopts the Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015.

ADOPTED by a vote of _____ in favor and _____ against, and _____ abstaining, this _____ day of _____, 2015.

By: _____

Nikki Grebel, Mayor

Attest:

By: _____

Julie Franklin, Auditor

City of Sibley, ND

Sibley City Council

Sibley, ND 58429

Resolution No. _____

A RESOLUTION OF THE CITY OF SIBLEY ADOPTING THE BARNES COUNTY, NORTH DAKOTA, MULTI-JURISDICTIONAL MULTI-HAZARD MITIGATION PLAN, 2015

Whereas, the City Council recognizes the threat that natural hazards pose to people and property within Sibley; and

Whereas, the City of Sibley has prepared a multi-hazard mitigation plan, hereby known as Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015 in accordance with the Disaster Mitigation Act 2000; and

Whereas, Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Sibley 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 Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015.

NOW THEREFORE, BE IT RESOLVED BY THE CITY OF SIBLEY, NORTH DAKOTA, THAT:

Section 1. In accordance with City Ordinances, the City of Sibley adopts the Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015.

ADOPTED by a vote of _____ in favor and _____ against, and _____ abstaining, this _____ day of _____, 2015.

By: _____

Allen Bender, Mayor

Attest:

By: _____

Typhanny Schuler, Auditor

City of Wimbledon, ND

Wimbledon City Council

Wimbledon, ND 58581

Resolution No. _____

A RESOLUTION OF THE CITY OF WIMBLEDON ADOPTING THE BARNES COUNTY, NORTH DAKOTA, MULTI-JURISDICTIONAL MULTI-HAZARD MITIGATION PLAN, 2015

Whereas, the City Council recognizes the threat that natural hazards pose to people and property within Wimbledon; and

Whereas, the City of Wimbledon has prepared a multi-hazard mitigation plan, hereby known as Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015 in accordance with the Disaster Mitigation Act 2000; and

Whereas, Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Wimbledon 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 Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015.

NOW THEREFORE, BE IT RESOLVED BY THE CITY OF WIMBLEDON, NORTH DAKOTA, THAT:

Section 1. In accordance with City Ordinances, the City of Wimbledon adopts the Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015.

ADOPTED by a vote of _____ in favor and _____ against, and _____ abstaining, this _____ day of _____, 2015.

By: _____

Roger Pickar, Mayor

Attest:

By: _____

Leon Doyle, Auditor

Barnes County Water Resource District

Barnes County Water Resource District Board

Valley City, ND 58072

Resolution No. _____

A RESOLUTION OF THE BARNES COUNTY WATER RESOURCE DISTRICT ADOPTING THE BARNES COUNTY, NORTH DAKOTA, MULTI-JURISDICTIONAL MULTI-HAZARD MITIGATION PLAN, 2015

Whereas, the Water Resource District recognizes the threat that natural hazards pose to people and property within Wimbledon; and

Whereas, the Barnes County Water Resource District has prepared a multi-hazard mitigation plan, hereby known as Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015 in accordance with the Disaster Mitigation Act 2000; and

Whereas, Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Wimbledon from the impacts of future hazards and disasters; and

Whereas, adoption by the Water Resource District demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015.

NOW THEREFORE, BE IT RESOLVED BY THE BARNES COUNTY WATER RESOURCE DISTRICT, BARNES COUNTY, NORTH DAKOTA, THAT:

Section 1. In accordance with District Bylaws, the Barnes County Water Resource District adopts the Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2015.

ADOPTED by a vote of ____ in favor and ____ against, and ____ abstaining, this ____ day of ____, 2015.

By: _____

Bruce Anderson, Manager

Attest:

By: Jerry Hieb, Chairman

2. Introduction

The Barnes County Multi-Jurisdictional Multi-Hazard Mitigation Plan (MHMP) was developed and approved by Federal Management Agency (FEMA) in 2005 and updated in 2010. The plan was again updated and submitted for FEMA approval in 2015 to address the needs of people living and working in Barnes County and its incorporated cities: Dazey, Fingal, Kathryn, Leal, Litchville, Nome, Oriska, Pillsbury, Rogers, Sanborn, Sibley, Valley City and Wimbledon.

This document includes a profile of Barnes 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 2014 and 2015 to update the 2010 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 Barnes 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.

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

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 Barnes 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 Barnes County Multi-Hazard Mitigation Plan.

3. Planning Process

3.1 Background

The Barnes County Commission initiated the process to update its multi-hazard mitigation plan (MHMP) by applying for and receiving a grant to assist in the cost of the planning process. The current Barnes County Multi-Jurisdictional Multi-Hazard Mitigation Plan was approved by the North Dakota Department of Emergency Services and the Federal Emergency Management Agency in February 2010 and expires June 2015. The grant to update the Barnes County MHMP was awarded in January 2013 with an initial grant end date of June 22, 2014. An extension request was filed May 2014 by Barnes County Emergency Manager, Kim Franklin. The extension request was granted June 2014, with a new grant end date of January 31, 2015.

The 13 jurisdictions in the 2010-approved plan, the city of Rogers, and the Barnes County Water Resource District participated in the planning process for the 2015 plan. (See Table 3.1) All 13 of the cities participating in the plan update are incorporated cities. The city of Rogers did not participate in the 2010 mitigation plan, but did participate in the 2005 plan and signed a letter of commitment to be an active participant in the 2015 update of the Barnes County Mitigation Plan.

Table 3.1 – Jurisdictional Continued Participation in Mitigation Planning

Jurisdictions Represented in Plan	Participation
Barnes County	Continued Participation (2005-2015)
City of Dazey	Continued Participation (2005-2015)
City of Fingal	Continued Participation (2005-2015)
City of Kathryn	Continued Participation (2005-2015)
City of Leal	Continued Participation (2005-2015)
City of Litchville	Continued Participation (2005-2015)
City of Nome	Continued Participation (2005-2015)
City of Oriska	Continued Participation (2005-2015)
City of Pillsbury	Continued Participation (2005-2015)
City of Rogers	Participation in 2005. Declined participation in 2010. Participation in 2015.
City of Sanborn	Continued Participation (2005-2015)
City of Sibley	Continued Participation (2005-2015)
City of Valley City	Continued Participation (2005-2015)
City of Wimbledon	Continued Participation (2005-2015)
Barnes Co. Water Resource District	Participation in 2015.

Whereas, the jurisdictions have limited capability to undertake extensive participation in the preparation of a hazard mitigation plan, with the exception of Valley City and Barnes County Emergency Management, the Barnes County Commission contracted with the South Central Dakota Regional Council of Jamestown, N.D., to act on behalf of the county’s jurisdictions to facilitate the planning process for the analysis and development of a hazard mitigation plan.

Building the Planning Committee: Meetings to begin the planning process to update the 2010 Barnes County Multi-Jurisdictional Multi-Hazard Mitigation Plan began December, 2012. Deb Kantrud, executive director of South Central Dakota Regional Council, met with the Barnes County Commission to

discuss the process to update the plan. Emergency Manager Kim Franklin was named the point of contact for the planning process. Kantrud worked with County Emergency Manager Franklin to identify a list of representatives from each jurisdiction and stakeholders to be part of the planning process. Invitations were sent to 42 representatives. For the planning process, the Barnes County Commission established a 13-person LEPC Committee from the following entities: county commissioner, Barnes County Ambulance, City-County Health District, Mercy Hospital, Central Valley Health District, Valley City Fire Department, Sanborn Fire Department, Barnes County Sheriff’s Office, Valley City Police Department, Agrium and Dakota Plains Co-op, as well as the mayor and auditor for each city jurisdiction in Barnes County. An invitation for participation was sent to representatives from Valley City State University prior to the third LEPC meeting held on March 24, 2014. In addition, representatives from the United States Army Corps of Engineers, the National Guard, Baldhill Dam, Barnes County Water Resource District, and the North Dakota Department of Transportation were invited to attend and participate in the fourth committee meeting on May 19, 2014, which specifically focused on flooding.

See Appendix 2 for attendance records for committee meetings and jurisdictional meetings. In addition, stakeholders were identified. Invitations via mail and email were sent to 60 individuals prior to each committee meeting. News releases were sent to the media prior to committee and jurisdictional meetings. (See Appendix 4)

Plan committee members included the following individuals shown on Table 3.2.

Table 3.2 – Planning Committee Members

Representing	Name
Barnes County Emergency Manager, City of Sanborn Alderman	Kimberly Franklin
Barnes County Commission	Eldred Knutson, Phil Leitner, Rodger Berntson, John Froelich
City of Valley City	Dave Schelkoph
Valley City Mayor	Bob Werkhoven
City of Fingal Mayor	John Behm
City of Sibley Mayor	Allen Bender
Rogers City Council	Gordon Johnson
City of Kathryn Mayor	Dave Majerus
Oriska City Council	Rob Marshall
Fingal City Council	Terri Meyer
City of Oriska Mayor	Rick Pommerer
Businesses	
KLJ Engineering	Chad Petersen
Dakota Plains Cooperative	Casey Wieck
Agriculture/Farmer	LeRoy Triebold
Emergency Medical Services	
Barnes County Ambulance	Scott Miller
Mercy Hospital	JoAnn Trader
Fire Departments	
Dazey Fire Department	Daryl Kunze
Sanborn Fire Department	DuWayne Didier, John Schwehr
Valley City Fire Department	Gary Retterath, Ron Burchill

Table 3.2 – Planning Committee Members - Continued

Higher Education	
Valley City State University	Ron Pommer
Law Enforcement	
Barnes County Sheriff’s Department	Daniel D. Anderson, Randy McClafin, Jed Reile
Valley City Police Department	Fred Thompson
Public	
--	Ryan Mathias
Alta Township	LeRoy Triebold
Regional/County Entities	
Barnes County Water Resource District	Bruce Anderson, Ken Evenson, Linda McKenna
Barnes County Highway Department	Kerry Johnson
Barnes Rural Water District	Perry Kapaun
Central Valley Health District	Frank Balak
City-County Health District	Theresa Will
State/Federal Entities	
U.S.D.A-NRCS	Erica Althoff
State Water Commission	Jeff Klein
FEMA	Charlie Jackson
United States Army Corps. of Engineers	Rich Schueneman
N.D. Dept. of Transportation – District 2	John Thompson
N.D. Game and Fish Department	Gene Van Eeckhout
N.D. National Guard	Major Anna Wittrock

The committee had the authority in Barnes County to review, update, and create mitigation strategies, objectives and projects for the plan. In addition to the committee meetings, jurisdictional meetings were held with the city councils of Dazey, Fingal, Kathryn, Leal, Litchville, Nome, Oriska, Pillsbury, Rogers, Sanborn, Sibley, Valley City, and Wimbledon. The agendas included a review of hazard history, risk assessment, and review and updating of mitigation projects. Meeting participation and individual discussion were also held with emergency services, school leaders, law enforcement, chamber, and businesses. (See Appendix 5)

Summary

The Barnes County planning included nine committee meetings. All meetings were open to the public meetings and news releases encouraged the public to attend. A public hearing was held in August to accept comments on the draft plan. It was held at the Barnes County Highway Department in Valley City. One jurisdictional meeting was held in the cities of Dazey, Fingal, Kathryn, Leal, Litchville, Nome, Oriska, Pillsbury, Rogers, Sanborn, Sibley, Valley City, and Wimbledon. In addition, face-to-face, phone and e-mail interviews were conducted to gather data and input from public and private sector individuals and entities and state and federal agencies. Also, a community hazard survey was conducted. Hundreds of surveys were distributed to businesses, churches, employers, community organizations, and community events. Three hundred and two responses were received.

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

- Communicable Disease
- Dam Failure
- Drought
- Flood – Riverine and Overland
- Geologic Hazards
- 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
- Windstorm

The goals from the 2010 Barnes County MHMP were as follows:

- Goal 1: Save Lives and Reduce Injuries.
- Goal 2: Avoid Damage to Property.
- Goal 3: Protect the Environment.
- Goal 4: Promote Hazard Mitigation as an Integrated Policy.

The Planning Committee revised and expanded the goals to six. A total of 86 projects were identified and included in this plan update to mitigate future loss of life and property. Problem statements were formulated and used to identify specific actionable mitigation projects for each incorporated jurisdiction.

The six goals are:

- Goal 1: Improve public awareness of hazards.
- Goal 2: Implement education programs for people to protect themselves and property.
- Goal 3: Improve planning and regulations in jurisdictions to mitigate hazards.
- Goal 4: Reduce impact of hazards.
- Goal 5: Improve resiliency of critical facilities and infrastructure.
- Goal 6: Provide places of refuge and early warnings for public and vulnerable populations to take protective action during hazard events.

The 86 projects are identified and ranked in Chapter 6 of this plan. The status of each mitigation project from the 2010 Barnes 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 Barnes County 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 and potentially implement zoning. The data in this plan is being used in the county's 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 – 2010 Barnes County Multi-Hazard Mitigation Plan Mitigation Project Status

Location	Project/Goal	Hazard Mitigated	Lead Agency / Funding Source	Cost	Priority	2015 Status
Barnes County	Barnes County Hazard Mitigation buyouts of landslide and flood threatened homes. To purchase and turn to green way unsuitable lots because of water.	Flood	Barnes County, Emergency Management, Planning and Zoning	\$500,000 / On-going	High	Ongoing and continue. Areas still up by Lake Ashtabula remain a threat to structures and homes. Barnes County Projects 16 and 17.
Barnes County	Barnes County Sanborn Lake Sheet Water Drainage project or Grade Raise Old 10. To protect Old Highway 10 from water on the road bed and road bed instability.	Flood	Barnes County, Emergency Management, Planning and Zoning	\$80,000 / Repetitive Loss / Estimated time of completion 2013	Medium	Completed. Done in 2012. Grade raised on Old Hwy 10.
Barnes County	Barnes County buyouts of homes that have intractable water problems. To turn homes on lots with water, structural problems, and mold into greenway.	Flood	Barnes County, Emergency Management, Planning and Zoning	\$750,000 / Estimated time of completion 2013	Medium	Ongoing and continue. Some homes have been bought out, but more still need to be moved. Barnes County Project 16.
Barnes County	Barnes County riprap of Old Highway 10 west of ND 1. To prevent erosion of roadbed.	Flood	Barnes County, Emergency Management, Planning and Zoning	\$40,000 / Increase estimate to \$250,000/ Estimated time of completion 2013	Medium	Completed. Completed in 2012 and is no longer an issue.

Table 3.3 – 2010 Barnes County Multi-Hazard Mitigation Plan Mitigation Project Status - Continued

Location	Project/Goal	Hazard Mitigated	Lead Agency / Funding Source	Cost	Priority	2015 Status/Plan Update Project Number
Barnes County	Barnes County road stabilization and/or grade raises. To protect road infrastructure.	Flood	Barnes County, Emergency Management, Planning and Zoning	\$1 M / On-going	High	Ongoing and continue. Barnes County Projects 25 and 16.
Barnes County	Barnes County river channel clean out. To clear the channel so flood water can flow easier.	Flood	Barnes County, Emergency Management, Planning and Zoning	\$50,000 / per location / Estimated time of completion 2013	Medium	Ongoing and continue. Barnes County Project 28.
Barnes County	Barnes County deep bore or continuous pipe flooded areas for Barnes Rural Water. To prevent water supply pipe breaks.	Flood	Barnes County, Emergency Management, Planning and Zoning	\$500,000 / Estimated time of completion 2013	Medium	Completed. Work was done on major areas with issues crossing the river. Ongoing to solve smaller problem spots.
Barnes County	Public education through the media and inserts in bills. Goal to lessen damage from drought.	Drought	Barnes County Emergency Management and Public Works	Free / On-going	Low	Ongoing and continue. Barnes County Project 2.

Table 3.3 – 2010 Barnes County Multi-Hazard Mitigation Plan Mitigation Project Status - Continued

Location	Project/Goal	Hazard Mitigated	Lead Agency / Funding Source	Cost	Priority	2015 Status
Barnes County	Public information and weather spotting. Goal to prevent loss of human life.	Summer Storm	National Weather Service	Free / On-going	Low	Ongoing and continue. Barnes County Project 6.
Barnes County	Public information, have public listen to television and radio for weather information. Individuals encouraged yearly to keep at least five days of non-perishable food, medicines, and specialty items like diapers and formula on hand. Individuals encouraged to use snow tires, have travel kits and extra blankets and maintain own generators. Goal to protect human life.	Winter Storm	National Weather Service, the media, and Barnes County Emergency Management	Up to \$1000 / On-going	Low	Ongoing and continue. Barnes County Projects 1 and 23.
Barnes County	Monitor the dam, the Corps of Engineers monitors the dam. The goal is to protect human life and prevent property damage. Clausen Springs is monitored by Barnes County Parks.	Dam Failure	Corps of Engineers and Barnes County Parks	Free up to overtime – Cost easily in excess of \$10,000,000 / On-going	Low	Ongoing and continue. Barnes County Project 27.

Table 3.3 – 2010 Barnes County Multi-Hazard Mitigation Plan Mitigation Project Status - Continued

Location	Project/Goal	Hazard Mitigated	Lead Agency / Funding Source	Cost	Priority	2015 Status
Barnes County	Hazardous Materials training for responders to protect citizen and first responder lives.	Hazardous Materials	Fire Departments	Free to over \$1500 / On-going	Low	Cancel. Training is not mitigation.
Barnes County	Public education on dangers of hazardous materials to protect human life.	Hazardous Materials	Barnes County Emergency Management	Free through media / On-going	Low	Continue. Barnes County Projects 5 and 21. Valley City Project 4.
Barnes County	Infrastructure changes: Inert landfill expansion to protect human life from pollution	Hazardous Materials	Barnes County	\$200,000 / On-going	Low	Continue. Change to create inert landfill, not expand. Barnes County Project 15.
Barnes County	Public information: Clear areas next to houses and keep grass short and green to prevent loss of human life and protect property.	Urban Fire	Media, Barnes County Emergency Management, and Fire Departments	Free through media / On-going	Low	Continue. Revise strategy as wording is poor. Barnes County Project 8.

Table 3.3 – 2010 Barnes County Multi-Hazard Mitigation Plan Mitigation Project Status - Continued

Location	Project/Goal	Hazard Mitigated	Lead Agency / Funding Source	Cost	Priority	2015 Status
Barnes County	Fire Codes to protect human life and lessen property damage.	Urban Fire	Media, Barnes County Emergency Management, and Fire Departments	\$5000 / On-going	Low	Continue. Change to strengthen fire codes/building codes. Barnes County Projects 9, 11, and 13.
Barnes County	Public Information: Keep areas clear around buildings to protect human life.	Rural Fire	Barnes County Emergency Management, Forest Service, and local Fire Departments	Free through media / On-going	Low	Ongoing and continue. Barnes County Project 8.
Barnes County	Monitor public actions: Law enforcement monitors activities, targeted patrols at unspecified times, engage public in reporting suspicious activities and extra security at Baldhill Dam and National Guard Armory to prevent terrorist acts.	Civil Disorder/Terrorism	Sheriff's Department and Police Department	\$0 unless there is overtime / On-going	Low	Cancel. Not mitigation.

Table 3.3 – 2010 Barnes County Multi-Hazard Mitigation Plan Mitigation Project Status - Continued

Location	Project/Goal	Hazard Mitigated	Lead Agency / Funding Source	Cost	Priority	2015 Status
Barnes County	Mutual aid, organization of agencies, on scene commanders, and exercises through training and mutual aid agreements to protect human life.	Transportation Accidents	Sheriff's Department, Highway Patrol, Police Department, Fire Department	\$0 to \$1500 per class / On-going	Low	Completed. County-wide mutual aid agreements signed. Mutual aid with Cass, Stutsman, Steele, Ransom, LaMoure, Griggs Counties.
Barnes County	Purchase properties that are on landslide lots. Deep bore water lines to go under the slide and prevent breakage. Abandon roads and streets that slide and barricade them.	Landslides	Barnes County Planning and zoning, public works, emergency management	\$10,000,000 / Estimated time of completion 2013	Medium	Ongoing and continue. Some buyouts have been done. Barnes County Project 17.
Barnes County	Public Information: Encourage public to keep extra medications, baby needs, food, etc. on hand to prevent hardship on citizens and possibly save lives.	Shortage of Critical Materials	Barnes County Emergency management, Public Information Officer	Free through media / On-going	Low	Continue. Combine with other project. Barnes County Project 3.
Barnes County	Education and outreach of the NFIP program to insurance agents, building permit office, and Realtors in the county.	Flooding	Unknown / Barnes County Emergency Management	Unknown/ On-going	High	Ongoing. Continue. Barnes County Projects 18 and 19. Valley City Projects 9 and 10.

Table 3.3 – 2010 Barnes County Multi-Hazard Mitigation Plan Mitigation Project Status - Continued

Location	Project/Goal	Hazard Mitigated	Lead Agency / Funding Source	Cost	Priority	2015 Status
Barnes County	Security can range from a nuclear accident, or deliberate bombing, to a mere threat, problems include the lack of security, minimal warning, and the inability to get information out to the public because some people do not read newspapers, watch television or listen to the radio. Heightened security is critical during periods of high risk. Volunteer help will be needed. Goal is to protect human life.	National Security	Barnes County Emergency Management, dispatch, law enforcement, military, and the public information officer	Free through media unless overtime involved / On-going	Low	Cancel. Not mitigation.
Dazey	Dazey Lagoon Slough Area Drainage Project. To reduce water seeping into basements causing structural damage, mold, and rusting of furnace and appliances.	Flood	Barnes County, Dazey, Emergency Management, Planning and Zoning	\$10,000 / Estimated time of completion 2015	Low	Continue. Dazey Project 1.
Fingal	Generators and power hookups at lift station to prevent water flooding homes.	Flooding	Barnes County, Fingal	\$20,000 / Estimated time of completion 2012	Low	Completed. City received grant funding assistance for the project. Has portable generator only. Fingal Project 1.

Table 3.3 – 2010 Barnes County Multi-Hazard Mitigation Plan Mitigation Project Status - Continued

Location	Project/Goal	Hazard Mitigated	Lead Agency / Funding Source	Cost	Priority	2015 Status
Kathryn	Repair the Clausen Springs Dam to stop the flood or complete destruction of the city of Kathryn (another option would be to buyout the city).	Flooding	\$3.5 million to \$5 million/ Barnes County and City of Kathryn	Unknown/ Estimated time of completion 2012	High	Done. Rip rap installed, spillway all around the Dam with concrete pads was installed.
Kathryn	Clean out creek and widen through the city of Kathryn. Water runoff from hills flows into the creek, the debris prevents the flow of water downstream which causes flooding of homes.	Flooding	Unknown/ City of Kathryn	Unknown/ Estimated time of completion 2012	Medium	Not completed. Continue. Never moved forward. Kathryn Project 3.
Leal	Generator for lift station during power outages. To prevent sewer backup into homes.	Flooding, and Communicable Disease	Barnes County, Leal, Emergency Management, Planning and Zoning	\$25,000 / Estimated time of completion 2012	Low	Cancel. Does not apply as there is not a lift station in the community. Residents have septic systems.
Litchville	Litchville generator for lift station in power outages. To prevent sewer backup into homes.	Flood	Barnes County, Litchville, Emergency Management, Planning and Zoning	\$89,000 / Estimated time of completion 2012	Low	Completed. Purchased and installed generator independently without grants or outside asst.
Nome	Nome street drainage project. To keep water from running into people’s homes.	Flood	Barnes County	\$8,000 / Estimated time of completion 2012	Low	Completed.

Table 3.3 – 2010 Barnes County Multi-Hazard Mitigation Plan Mitigation Project Status - Continued

Location	Project/Goal	Hazard Mitigated	Lead Agency / Funding Source	Cost	Priority	2015 Status
Oriska	Generator for lift station in power outages. To prevent sewer backup into homes and streets.	Flooding, and Communicable Disease	Barnes County, Oriska, Emergency Management, Planning and Zoning	\$25,000 / Estimated time of completion 2012	Low	Not completed. Continue. Administrative capabilities to apply for the grant was limited. Oriska Project 2.
Pillsbury	Generator and hookups for generator for lift station in power outages. To prevent sewer backup into homes.	Flooding, and Communicable Disease	Barnes County, Pillsbury, Emergency Management, Planning and Zoning	\$25,000 / Estimated time of completion 2012	Low	Cancel. Does not apply as there is not a lift station in the community. Residents have septic systems.
Sanborn	Sanborn ditch and drainage project. To prevent water in the streets from getting into homes.	Flood	Barnes County, Sanborn, Emergency Management, Planning and Zoning	\$20,000 / Estimated time of completion 2015	Low	Continue.
Sibley	Build a levee on the west side of town that is five feet wide, two feet high, and a ½ mile long. The levee would divert the runoff from the hills that flood town repeatedly.	Flooding	City of Sibley	Unknown / Estimated time of completion 2012	High	Continue. Partially completed as levee was built on the lake side of the city but not the west. The landowner to the west did not agree to allow the levee to be built on his land. Sibley Project 2.

Table 3.3 – 2010 Barnes County Multi-Hazard Mitigation Plan Mitigation Project Status - Continued

Location	Project/Goal	Hazard Mitigated	Lead Agency / Funding Source	Cost	Priority	2015 Status
Sibley	Grade raise of Lake Avenue along with the addition of three culverts. Divert runoff into town between homes.	Flooding	City of Sibley	Unknown / Estimated time of completion 2012	Medium	Cancel. Not feasible and only provides protection to properties on the lake side of the street.
Sibley	Build a retaining wall around the west side of the fire hall. This will divert the runoff away from the city's lift station which causes seepage.	Flooding	City of Sibley	Unknown / Estimated time of completion 2012	Medium	Cancel. Combined with Sibley Project 2 to reduce repetition.
Sibley	Raise fire hall 2 ½ feet, fill in, and landscape. This would help divert water away from the lift station instead of letting it pool and seep into the lift station.	Flooding	City of Sibley	Unknown / Estimated time of completion 2012	Medium	Cancel. Cannot physically raise the Sibley Fire Hall. Not feasible.
Valley City	Provide hand washing education in schools. Provide automatic soap dispensers and paper towel dispensers in all public restrooms, including county schools, provide hand sanitizers and dispensers in public offices, classrooms, etc.	Communicable Disease	Valley City	\$5000 / Estimated time of completion 2012	Low	Continue. Barnes County Project 4. Valley City Project 3.
Valley City	Valley City NW storm sewer and retention basin. To still water so that storm sewers are not silted in. To control the amount of water flowing into storm sewers to prevent damage to sewers.	Flood	Barnes County, Valley City, Emergency Management, Planning and Zoning	\$2.5 M / Estimated time of completion 2013	High	Continue. KLJ and previous public works director said the project wouldn't retain enough water. Valley City Project 11.

Table 3.3 – 2010 Barnes County Multi-Hazard Mitigation Plan Mitigation Project Status - Continued

Location	Project/Goal	Hazard Mitigated	Lead Agency / Funding Source	Cost	Priority	2015 Status
Valley City	Valley City buyout of landslide and flood damage homes. To purchase homes in floodway, flood plain, or on landslide lots to protect people and give the river room to flood.	Flood	Barnes County, Valley City, Emergency Management, Planning and Zoning	\$1.5 M / Ongoing	High	Ongoing and continue. Phase 1 of buyouts is ongoing, construction of dikes and flood control measures and structures is ongoing. Valley City Projects 7 and 8.
Valley City	Infrastructure changes: Redoing 4 th and 5th Avenue truck route in Valley City to protect human life and lessen chance of spills in residential areas.	Hazardous Materials	Barnes County	\$2.25 M / Completed 2009		Completed.
Valley City	Targeted patrols to protect human life.	National Security	Barnes County Emergency Management, dispatch, law enforcement, military, and the public information officer	Up to \$500,000 for security and overtime / depending on event	Low	Cancel. Not mitigation.
Valley City	Replace warning sirens within the city limits (2). To reduce risk of not being able to hear warning for disasters.	All Hazards	Valley City	\$32,500 / Estimated time of completion 2013	Low	Completed. 5 sirens installed.

Table 3.3 – 2010 Barnes County Multi-Hazard Mitigation Plan Mitigation Project Status - Continued

Location	Project/Goal	Hazard Mitigated	Lead Agency / Funding Source	Cost	Priority	2015 Status
Valley City	Construct permanent engineered flood control protection throughout Valley City on the Sheyenne River.	Flooding	Valley City	\$35 Million / Estimated time of completion 2015	High	Ongoing and continue. Some sections are completed, some in the construction phase and others proposed. Valley City Project 12.
Valley City	Install storm sewer (6th Avenue and Valley Avenue SE) to relieve storm water runoff reduce overland flooding to downstream properties.	Flooding, Summer Storms	Valley City	Unknown / Estimated time of completion 2014	Low	Continue. Valley City Project 13.
Valley City	Replace lift station Lakeshore Acres. Threat of failure causing sanitary sewer backup into homes.	Communicable Disease	Valley City	Completed 2009 / Project cost \$3.2 Mil. Corps of Engineers and local funds	Low	Completed.
Valley City	Repair erosion of drainage ditch to eliminate continued erosion of land next to ditch at lagoon.	Flooding, Summer and Winter Storms	Valley City	Unknown / Estimated time of completion 2013	Low	Completed.

Table 3.3 – 2010 Barnes County Multi-Hazard Mitigation Plan Mitigation Project Status - Continued

Location	Project/Goal	Hazard Mitigated	Lead Agency / Funding Source	Cost	Priority	2015 Status
Valley City	Replace existing 4” cast iron water mains to improve available water flow to fight residential fires.	Urban Fire	Valley City	Unknown / Estimated time of completion 2013	Low	Ongoing and continue. Projects in northeast portion of city scheduled for next year. 4 th Street South of downtown was done. 10 blocks will be completed in 2014. Upgrading to 8” pipes. Valley City Project 14.
Valley City	To install 2 UPS battery backup systems and generator at PSAP/dispatch center to reduce risk of equipment failure due to power outage.	All Hazards	Valley City	\$62,500 / Estimated time of completion 2013	Low	Done.
Valley City	Replace undersized storm sewer mains from 10 th Avenue SW East to the river (6 blocks). To reduce street flooding.	Flooding, Summer and Winter Storms	Valley City	Unknown / Estimated time of completion 2013	Low	Continue. Valley City 15.
Valley City	Reconstruct road, installation of underground storm sewer and grade change. Reduce ice buildup on 4 th Avenue SW from Winter Show Rd. North to Viking Drive.	Winter Storms	Valley City	Unknown / Estimated time of completion 2013	Low	Done.

Table 3.3 – 2010 Barnes County Multi-Hazard Mitigation Plan Mitigation Project Status - Continued

Location	Project/Goal	Hazard Mitigated	Lead Agency / Funding Source	Cost	Priority	2015 Status
Valley City	Remove old mill site buildings and structures from floodway to eliminate health hazards.	Communicable disease	Valley City	Unknown / Estimated time of completion 2013	Low	Continue. Valley City Project 16.
Valley City	Along river bank on Main Street and in southwest part of Valley City. Install four new sluice gates along the Sheyenne River to eliminate river from backing up into the storm sewer.	Flooding	Valley City and Barnes County	\$65,000 before spring 2010	High	Done.
Valley City	Expand of inert landfill to prevent water runoff and infiltration of ground water	Flooding, Summer and Winter Storms	Valley City	Unknown / Estimated time of completion 2013	Low	Continue. Expanded in 2011, needs further expansion. Valley City Project 17.
Wimbledon	Wimbledon street drainage project. Drains standing water from town. To prevent water from streets from getting into homes.	Flood	Barnes County, Wimbledon, Emergency Management, Planning and Zoning	\$20,000 / Estimated time of completion 2015	Low	Completed. Street drainage project was completed around 10 years ago.

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, and news releases were sent to the local media. 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 Barnes County Planning Committee Meeting was held on November 25, 2013, at the Barnes County Highway Department. At the November LEPC meeting, the LEPC accepted the responsibility of being the Planning Committee for the mitigation plan update. They identified stakeholders to participate in the plan updating process. Stakeholders were invited to attend all meetings. In addition, many were contacted to obtain information for the planning process. The Planning Committee met the months of November, February, March, May, July, August, September and October.

Discussion at the meeting included the purpose of mitigation and the update of the Barnes 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 2010 Barnes 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 15 jurisdictions in the county: the Barnes County Commission, the cities of Dazey, Fingal, Kathryn, Leal, Litchville, Nome, Oriska, Pillsbury, Rogers, Sanborn, Sibley, Valley City and Wimbledon, and the Barnes County Water Resource District. 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 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 Barnes County Water Resource District (Barnes County Water Board) participated in the planning process.

After consideration of days for meetings, the committee voted to meet monthly from 6:30 to 8:30 p.m. on the fourth Monday of each month for planning meetings and public meetings. The committee identified the distance of travel required to attend all meetings could limit attendance and participation. To encourage public participation, the committee voted to hold all Planning Committee meetings at the Barnes County Highway Department in Valley City due to its central location.

The 2010 Barnes County MHMP was posted on the website: www.scdrc.org, as well as linked by the Barnes County website: <http://www.co.barnes.nd.us/Dept/emmm/>. The resource from FEMA and N.D. Department of Emergency Services: Mitigation Ideas was also distributed and posted on the website: www.scdrc.org as a planning resource.

The Planning Committee had its first review of the Barnes County and Jurisdictions' hazards. The committee compared the hazards and their rankings in the 2011 State of North Dakota MHMP and the 2014 State of North Dakota MHMP Draft to the county's 2010 identified hazards and rankings. The committee compared the ranking of the frequency and likelihood of hazards in the state plan and in the 2010 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)

The second meeting of the Barnes County Planning Committee was held on February 24, 2014, at the Barnes County Highway Department in Valley City. A news release was published in the Valley City Times-Record and the Litchville Bulletin. (See Appendix 4) A reminder email was sent out the day of the meeting. (See Appendix 3) Phone calls were made to LEPC members and the mayors and auditors of each jurisdiction as a postcard was not sent the week prior. The agenda included review of last meeting actions, discussion of the purpose of mitigation and the plan update, a review of the Barnes County Hazards, input from meeting participants on the Barnes County survey and public input strategy, review of the mitigation strategies in the 2010 MHMP and identification of vulnerabilities to specific hazards in the county.

At the meeting, Kantrud and Schwartz described how the Barnes County MHMP can be used as a tool for education of the public and use by jurisdictional officials and employees for decision making, planning and zoning, or for a capital improvements plan.

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. Meeting participants also made changes to the survey. Participants agreed to distribute the survey through businesses, organizations, churches, and individuals.

The committee was divided into two groups where Kantrud and Schwartz identified areas of vulnerability, what has been done, and what should be done regarding impacts of hazards. Kantrud discussed communicable disease, shortage or outage of critical materials or infrastructure. Schwartz discussed flooding, severe winter weather, and dam failure.

The third meeting of the Barnes County Planning Committee was held March 24, 2014, at the Barnes County Highway Department in Valley City. A news release was emailed to Valley City Times-Record and the Litchville Bulletin on March 14, 2014. The news release was published in the Litchville Bulletin. (See Appendix 4) A reminder email was sent on March 17, 2014. (See Appendix 3) The agenda included welcome and introductions, review of mitigation and the Barnes County hazards, a discussion on geologic hazards and subsidence impacts, vulnerable areas to hazards in the county, an update on the survey, and the next steps in the planning process.

A definition of geologic hazards and subsidence, which encompasses landslides and earthquakes, and erosion to was presented meeting participants. It was indicated that landslide only applies to the cities of Sibley and Valley City as earthquakes and erosion does not apply to Barnes County.

To identify areas of concern relating to impacts, the Planning Committee conducted a dot exercise. The committee placed sticky dots on areas where hazards have the greatest impact, cause the most amount of damage, are most vulnerable, and are most likely to experience issues in the future. Kantrud and Schwartz reviewed each dot and noted the details of each dot placement.

The committee meeting scheduled the next meeting from 6:30 p.m., May 19, 2014, which is the third Monday of the month, at the Barnes County Highway Department, as the fourth Monday is a holiday.

The fourth committee meeting for the update of the Barnes County MHMP was May 19, 2014, at the Barnes County Highway Department. A news release was emailed to the Valley City Times-Record and the Litchville Bulletin on May 5, 2014. (See Appendix 4) A reminder email was sent on March 13, 2014, to the Planning Committee. (See Appendix 3) The agenda included welcome and introductions, a presentation by Barnes County Emergency Manager Kim Franklin reviewing completed flooding mitigation projects since 2010, and a panel of guest speakers discussing various methods of mitigation for flooding.

The guest speaker panel featured the Baldhill Dam Manager, N.D. National Guard Office in Charge, Barnes County Rural Water District Manager, N.D. State Water Commission NFIP Coordinator, N.D. Department of Transportation District 2 Engineer, Barnes County Water Resource District Manager, and Barnes County Highway Department Superintendent. Each guest speaker provided information regarding mitigation flooding done in their respective field to assist in the planning process for the plan update. Based on information presented, potential mitigation projects were discussed upon conclusion of the meeting with a few of the meeting participants. Mitigation projects were taken formulated from information by the guest speakers and are included in the mitigation strategy for the county shown in Chapter 6. **FEMA Hazard Mitigation Program Specialist Charlie Jackson attended the meeting.**

The fifth meeting of the Barnes County Planning Committee was held from 6:30 to 8:30 p.m., Monday, July 28, 2014, at the Barnes County Highway Department. A postcard reminder and email reminder was sent to the Planning Committee the week of July 14, 2014, and the week of July 21, 2014, respectively. (See Appendix 3) A news release was published in the Valley City Times-Record. (See Appendix 4) The agenda included welcome and introductions, an update on the progress of jurisdictional meetings, status of the 2010 mitigation plan projects, proposed mitigation projects from jurisdictional meetings, an update of the Barnes County Mitigation Survey, a presentation of information and statistics on railroads, a presentation by John Thompson, and a breakout session identifying mitigation projects based on the information presented.

Schwartz interviewed a representative from Canadian Pacific Rail and Mike Bachmeier, Chief Inspector for the Federal Railroad Administration to gather information on transportation issues involving the railroad. Transport of freight railroad is an increasing concern among communities in Barnes County due to the boom in energy development in the western part of the state, which has drastically increased the number of trains carrying hazardous materials and chemicals in recent years.

John Thompson presented a Powerpoint presentation on the results of a strategic highway safety plan (SHSP). The SHSP is a statewide, coordinated safety plan providing a comprehensive framework and specific goals and objectives to reduce fatalities and serious injuries on all public roads. The presentation included a discussion on identified safety strategies, both behavioral and infrastructure, aimed at increasing safety on state and local roadways. Meeting participants conducted the risk assessment of transportation accident after the presentation by Thompson. Mitigation projects were taken from the SHSP and are included in the mitigation strategy for the county shown in Chapter 6.

The sixth meeting of the Barnes County Planning Committee was held from 6:30 to 8:30 p.m., Monday, August 25, 2014, at the Barnes County Highway Department. A postcard reminder and email reminder was sent to the Planning Committee the week of August 11, 2014, and the week of August 18, 2014, respectively. (See Appendix 3) A news release was published in the Litchville Bulletin. (See Appendix 4) The agenda included an update on the progress of the Barnes County Mitigation Survey, an update on the jurisdictional meetings, a presentation on and completion of the risk assessment of Barnes County hazards. The Planning Committee scored and ranked the hazards in Barnes County using the risk assessment handout shown in this chapter following Table 3.11.

The seventh meeting of the Barnes County Planning Committee was held from 6:30 to 8:30 p.m., Monday, September 22, 2014, at the Barnes County Highway Department. A postcard reminder and email reminder was sent to the Planning Committee the week of September 8, 2014, and September 15, 2014, respectively. (See Chapter 3) A second email reminder was sent the day of the meeting. A news release was published in the Valley City Times-Record and Litchville Bulletin. The agenda included welcome and introductions, results from the Barnes County Mitigation Survey, review of goals and projects, scoring and ranking of mitigation projects, and next steps in the planning process.

Schwartz presented the results from the Barnes County Mitigation Survey. A total of 302 responses were collected. (See Appendix 7) The Planning Committee reviewed the 2010 MHMP goals and revised the goals based on the planning process in previous committee meetings. Schwartz reviewed the STAPLEE method for scoring mitigation projects and scored one project with the Planning Committee as an example. The Planning Committee was divided into three groups and reviewed each mitigation strategy, and used the STAPLEE method.

Jurisdictional Meetings

Dazey: The Dazey City Council, mayor, fire district/department fire chief, and the Barnes County Emergency Manager participated in the meeting to update the Barnes County Multi-Jurisdictional Multi-Hazard Mitigation Plan on June 16, 2014. The meeting was called to order and facilitated by Daniel Schwartz. The agenda included: introductions and sign-in, the purpose of mitigation and review of Barnes County hazards, review of jurisdiction projects from the 2010 MHMP, review of community inventory and capabilities, scoring and ranking of hazards, consideration of future mitigation needs and the Barnes County survey. (See Appendix 5 Meeting Notes, Chapter 4 Profile and Inventory)

The city council and mayor reviewed the mitigation projects from the previous plan for the city and discussed information to develop the community profile and inventory. Hazards were scored and ranked by city council members. Dam failure and geologic hazard were hazards identified as not applicable to the city. New development in the city includes: renovation of the community center using CDBG funds

completed in 2014, lift station installed in 2011, connected to the rural water system in 2008, and new playground equipment in the city park in 2006. Meeting participants completed the 2015 Barnes County Mitigation Survey. Meeting participants identified future mitigation needs based on the risk assessment and formulated projects for the plan update. The city does not have ordinances that address natural and man-made hazards or a building inspector.

Fingal: The Fingal City Council, mayor, and the Barnes County Emergency Manager participated in the meeting to update the Barnes County Multi-Jurisdictional Multi-Hazard Mitigation Plan on August 5, 2014. The meeting was called to order and facilitated by Daniel Schwartz. South Central Dakota Regional Council Administrative Assistant Georgia Miller assisted in facilitation. The agenda included: introductions and sign-in, the purpose of mitigation and review of Barnes County hazards, review of jurisdiction projects from the 2010 MHMP, review of community inventory and capabilities, scoring and ranking of hazards, consideration of future mitigation needs and the Barnes County survey. (See Appendix 5 Meeting Notes, Chapter 4 Profile and Inventory)

The city council and mayor reviewed the mitigation projects from the previous plan for the city and discussed information to develop the community profile and inventory. Hazards were scored and ranked by city council members. Dam failure and geologic hazard were hazards identified as not applicable to the city. No new development has occurred in the city since the 2010 plan. Meeting participants completed the 2015 Barnes County Mitigation Survey. Meeting participants identified future mitigation needs based on the risk assessment and formulated projects for the plan update. The city does not have ordinances that address natural and man-made hazards or a building inspector.

Kathryn: The Kathryn City Council and mayor participated in the meeting to update the Barnes County Multi-Jurisdictional Multi-Hazard Mitigation Plan on July 16, 2014. The meeting was called to order and facilitated by Daniel Schwartz. The agenda included: introductions and sign-in, the purpose of mitigation and review of Barnes County hazards, review of jurisdiction projects from the 2010 MHMP, review of community inventory and capabilities, scoring and ranking of hazards, consideration of future mitigation needs and the Barnes County survey. (See Appendix 5 Meeting Notes, Chapter 4 Profile and Inventory)

The city council and mayor reviewed the mitigation projects from the previous plan for the city and discussed information to develop the community profile and inventory. Hazards were scored and ranked by city council members. Geologic hazard was identified as not applicable to the city. Meeting participants identified the construction of a new fire hall in 2003 and the former bank being converted into a museum in 2014/2015. Meeting participants completed the 2015 Barnes County Mitigation Survey. Meeting participants identified future mitigation needs based on the risk assessment and formulated projects for the plan update. The city does not have ordinances that address natural and man-made hazards or a building inspector. Geologic hazard was identified as not applicable to the city.

Leal: The Leal City Council and mayor participated in the meeting to update the Barnes County Multi-Jurisdictional Multi-Hazard Mitigation Plan on July 8, 2014. The meeting was called to order and facilitated by Daniel Schwartz. The agenda included: introductions and sign-in, the purpose of mitigation and review of Barnes County hazards, review of jurisdiction projects from the 2010 MHMP, review of community inventory and capabilities, scoring and ranking of hazards, consideration of future mitigation needs and the Barnes County survey. (See Appendix 5 Meeting Notes, Chapter 4 Profile and Inventory)

The city council and mayor reviewed the mitigation projects from the previous plan for the city and discussed information to develop the community profile and inventory. Hazards were scored and ranked by city council members. Dam failure and geologic hazard were hazards identified as not applicable to the city. No new development has occurred in the city since the 2010 plan. Meeting participants completed the 2015 Barnes County Mitigation Survey. Meeting participants identified future mitigation needs based on the risk assessment and formulated projects for the plan update. The city does not have ordinances that address natural and man-made hazards or a building inspector.

Litchville: The Litchville City Council and mayor participated in the meeting to update the Barnes County Multi-Jurisdictional Multi-Hazard Mitigation Plan on July 7, 2014. The meeting was called to order and facilitated by Daniel Schwartz. The agenda included: introductions and sign-in, the purpose of mitigation and review of Barnes County hazards, review of jurisdiction projects from the 2010 MHMP, review of community inventory and capabilities, scoring and ranking of hazards, consideration of future mitigation needs and the Barnes County survey. (See Appendix 5 Meeting Notes, Chapter 4 Profile and Inventory)

The city council and mayor reviewed the mitigation projects from the previous plan for the city and discussed information to develop the community profile and inventory. Hazards were scored and ranked by city council members. Dam failure and geologic hazard were hazards identified as not applicable to the city. No new development has occurred in the city since the 2010 plan. Meeting participants completed the 2015 Barnes County Mitigation Survey. Meeting participants identified future mitigation needs based on the risk assessment and formulated projects for the plan update. The city does not have ordinances that address natural and man-made hazards or a building inspector.

Nome: The Nome City Council, mayor, and fire district/department chief participated in the meeting to update the Barnes County Multi-Jurisdictional Multi-Hazard Mitigation Plan on September 7, 2014. The meeting was called to order and facilitated by Daniel Schwartz. The agenda included: introductions and sign-in, the purpose of mitigation and review of Barnes County hazards, review of jurisdiction projects from the 2010 MHMP, review of community inventory and capabilities, scoring and ranking of hazards, consideration of future mitigation needs and the Barnes County survey. (See Appendix 5 Meeting Notes, Chapter 4 Profile and Inventory)

The city council and mayor reviewed the mitigation projects from the previous plan for the city and discussed information to develop the community profile and inventory. Hazards were scored and ranked by city council members. Dam failure and geologic hazard were hazards identified as not applicable to the city. No new development has occurred in the city since the 2010 plan. Meeting participants completed the 2015 Barnes County Mitigation Survey. Future mitigation projects were identified based on the risk assessment. The city does not have ordinances that address natural and man-made hazards or a building inspector.

Nome: The Nome City Council, mayor, and fire district/department chief participated in the meeting to update the Barnes County Multi-Jurisdictional Multi-Hazard Mitigation Plan on September 7, 2014. The meeting was called to order and facilitated by Daniel Schwartz. The agenda included: introductions and sign-in, the purpose of mitigation and review of Barnes County hazards, review of jurisdiction projects from the 2010 MHMP, review of community inventory and capabilities, scoring and ranking of hazards,

consideration of future mitigation needs and the Barnes County survey. (See Appendix 5 Meeting Notes, Chapter 4 Profile and Inventory)

The city council and mayor reviewed the mitigation projects from the previous plan for the city and discussed information to develop the community profile and inventory. Hazards were scored and ranked by city council members. Dam failure and geologic hazard were hazards identified as not applicable to the city. No new development has occurred in the city since the 2010 plan. Meeting participants completed the 2015 Barnes County Mitigation Survey. Future mitigation projects were identified based on the risk assessment. The city does not have ordinances that address natural and man-made hazards or a building inspector.

Oriska: The Oriska City Council, mayor, and Barnes County Emergency Manager Kim Franklin participated in the meeting to update the Barnes County Multi-Jurisdictional Multi-Hazard Mitigation Plan on June 19, 2014. The meeting was called to order and facilitated by Daniel Schwartz. The agenda included: introductions and sign-in, the purpose of mitigation and review of Barnes County hazards, review of jurisdiction projects from the 2010 MHMP, review of community inventory and capabilities, scoring and ranking of hazards, consideration of future mitigation needs and the Barnes County survey. (See Appendix 5 Meeting Notes, Chapter 4 Profile and Inventory)

The city council and mayor reviewed the mitigation projects from the previous plan for the city and discussed information to develop the community profile and inventory. Hazards were scored and ranked by city council members. Dam failure and geologic hazard were hazards identified as not applicable to the city. No new development has occurred in the city since the 2010 plan. Meeting participants completed the 2015 Barnes County Mitigation Survey. Future mitigation projects were identified based on the risk assessment. The city does not have ordinances that address natural and man-made hazards or a building inspector.

Pillsbury: The Pillsbury City Council, mayor, and Barnes County Emergency Manager Kim Franklin participated in the meeting to update the Barnes County Multi-Jurisdictional Multi-Hazard Mitigation Plan on June 23, 2014. The meeting was called to order and facilitated by Daniel Schwartz. The agenda included: introductions and sign-in, the purpose of mitigation and review of Barnes County hazards, review of jurisdiction projects from the 2010 MHMP, review of community inventory and capabilities, scoring and ranking of hazards, consideration of future mitigation needs and the Barnes County survey. (See Appendix 5 Meeting Notes, Chapter 4 Profile and Inventory)

The city council and mayor reviewed the mitigation projects from the previous plan for the city and discussed information to develop the community profile and inventory. Hazards were scored and ranked by city council members. Dam failure and geologic hazard were hazards identified as not applicable to the city. No new development has occurred in the city since the 2010 plan. Meeting participants completed the 2015 Barnes County Mitigation Survey. Future mitigation projects were identified based on the risk assessment. The city does not have ordinances that address natural and man-made hazards or a building inspector.

Rogers: The Rogers City Council, mayor, fire district/department chief and assistant chief, park board member, and Barnes County Emergency Manager Kim Franklin participated in the meeting to update the Barnes County Multi-Jurisdictional Multi-Hazard Mitigation Plan on July 7, 2014. The meeting was

called to order and facilitated by Daniel Schwartz. The agenda included: introductions and sign-in, the purpose of mitigation and review of Barnes County hazards, review of jurisdiction projects from the 2010 MHMP, review of community inventory and capabilities, scoring and ranking of hazards, consideration of future mitigation needs and the Barnes County survey. (See Appendix 5 Meeting Notes, Chapter 4 Profile and Inventory)

The city council and mayor reviewed the mitigation projects from the previous plan for the city and discussed information to develop the community profile and inventory. Hazards were scored and ranked by city council members. Dam failure and geologic hazard were hazards identified as not applicable to the city. No new development has occurred in the city since the 2010 plan. Meeting participants completed the 2015 Barnes County Mitigation Survey. Schwartz mailed 15 copies of the survey to Fire Chief Wanzek for completion by employees at ADM-Benson Quinn. Future mitigation projects were identified based on the risk assessment. The city does not have ordinances that address natural and man-made hazards or a building inspector.

Sanborn: A member of the Sanborn City Council, Sanborn Fire Department volunteer, and Barnes County Emergency Manager Kim Franklin participated in the meeting to update the Barnes County Multi-Jurisdictional Multi-Hazard Mitigation Plan on September 15, 2014. The meeting was called to order and facilitated by Daniel Schwartz. The agenda included: introductions and sign-in, the purpose of mitigation and review of Barnes County hazards, review of jurisdiction projects from the 2010 MHMP, review of community inventory and capabilities, scoring and ranking of hazards, consideration of future mitigation needs and the Barnes County survey. (See Appendix 5 Meeting Notes, Chapter 4 Profile and Inventory)

The city council and mayor reviewed the mitigation projects from the previous plan for the city and discussed information to develop the community profile and inventory. Hazards were scored and ranked by city council members. Dam failure and geologic hazard were hazards identified as not applicable to the city. No new development has occurred in the city since the 2010 plan. Meeting participants completed the 2015 Barnes County Mitigation Survey. Future mitigation projects were identified based on the risk assessment. The city does not have ordinances that address natural and man-made hazards or a building inspector.

Sibley: The Sibley City Council, mayor, fire department secretary, park board chairman and Barnes County Emergency Manager Kim Franklin participated in the meeting to update the Barnes County Multi-Jurisdictional Multi-Hazard Mitigation Plan on August 20, 2014. The meeting was called to order and facilitated by Daniel Schwartz. The agenda included: introductions and sign-in, the purpose of mitigation and review of Barnes County hazards, review of jurisdiction projects from the 2010 MHMP, review of community inventory and capabilities, scoring and ranking of hazards, consideration of future mitigation needs and the Barnes County survey. (See Appendix 5 Meeting Notes, Chapter 4 Profile and Inventory)

The city council and mayor reviewed the mitigation projects from the previous plan for the city and discussed information to develop the community profile and inventory. Hazards were scored and ranked by city council members. According to meeting participants, a vacant six-plex was recently renovated and is now occupied. In addition, lots on the north side of town were bought and a six to eight camp site is being building adjacent to the six-plex. Meeting participants completed the 2015 Barnes County

Mitigation Survey. Future mitigation projects were identified based on the risk assessment. The city does not have ordinances that address natural and man-made hazards or a building inspector.

Valley City: South Central Dakota Regional Council Regional Planner Daniel Schwartz interviewed city staff and heads of specific departments to update the Barnes County Multi-Jurisdictional Multi-Hazard Mitigation Plan on September 16, 2014. Due to the size of the city, a meeting with the city council, similar to other jurisdictions in the county, was not feasible.

Schwartz interviewed City-County Health Director Theresa Will to review projects from the 2010 MHMP and score and rank communicable disease. Schwartz and Will identified future mitigation projects for the city and county pertaining to communicable disease.

Schwartz interviewed personnel from the Valley City Public Works department to review projects from the 2010 MHMP and score and rank homeland security. Public works personnel identified capabilities of the city for all hazards except communicable disease, homeland security incident, urban fire/structure collapse and wildland fire. Schwartz and public works personnel identified future mitigation projects for the city and county pertaining to the hazards not scored by other city departments and staff.

Schwartz interviewed Valley City Police Department Police Chief Fred Thompson to review projects from the 2010 MHMP and score and rank homeland security. Thompson discussed capabilities of the city for homeland security and other hazards. Schwartz and Thompson identified future mitigation projects for the city and county pertaining to communicable disease.

Schwartz interviewed Valley City Fire Department Captain Ron Burchill to review projects from the 2010 MHMP and score and rank urban fire/structure collapse and wildland fire. Burchill discussed capabilities of the city for the hazards. Schwartz and Burchill identified future mitigation projects for the city and county pertaining to communicable disease.

Schwartz interviewed Valley City City Administrator Dave Schelkoph to review the profile of the city and inventory capabilities. The city has a building inspector, contract for engineer services, infrastructure maintenance programs in place, staff for grant writing purposes, planning and regulatory capabilities to guide development in place, ordinances to address storm water runoff, and adopted state building codes.

Surveys were emailed to major employers and entities in the city to increase public participation in Valley City. Surveys were emailed to Dakota Plains, Blue Cross Blue Shield, Drugs Plastics and Glass, Heartland Flax, FEI, Inc., KLJ, LaFarge Dakota, Sheyenne Care Center, Sanford Clinic, and Valley City Public Schools. Approximately 75 surveys were delivered to the John Deere Seeding Group location and 25 copies were delivered to Eagle Creek Software Services and Valley City City Hall.

Wimbledon: The Wimbledon City Council, mayor, fire department fire chief, assistant fire chief, volunteers, and Barnes County Emergency Manager Kim Franklin participated in the meeting to update the Barnes County Multi-Jurisdictional Multi-Hazard Mitigation Plan on August 4, 2014. The meeting was called to order and facilitated by Daniel Schwartz. The agenda included: introductions and sign-in, the purpose of mitigation and review of Barnes County hazards, review of jurisdiction projects from the 2010 MHMP, review of community inventory and capabilities, scoring and ranking of hazards, consideration of future mitigation needs and the Barnes County survey. (See Appendix 5 Meeting Notes, Chapter 4 Profile and Inventory)

The city council and mayor reviewed the mitigation projects from the previous plan for the city and discussed information to develop the community profile and inventory. Hazards were scored and ranked by city council members. According to meeting participants, the former school was converted into an apartment building with five rental units and one owner-occupied unit. The city also updated its trailer park ordinances. Meeting participants completed the 2015 Barnes County Mitigation Survey. Future mitigation projects were identified based on the risk assessment. The city does not have ordinances that address natural and man-made hazards aside from trailer park ordinances. The city also does not have a building inspector.

Roles and Responsibilities

Table 3.4 indicates who participated and how they participated in the mitigation planning process from each Barnes County jurisdiction in 2010 and 2015.

Table 3.4 – Jurisdictional Participation in Planning Process

Jurisdictions Represented	Name and Title	Form of Participation	Status of Plan Participation
Barnes County	Kim Franklin Emergency Manager	Comments Information Review Survey	2010, 2015
Barnes County	Eldred Knutson Barnes County Commissioner	Comments Information Review Survey	2015
Barnes County	Scott Miller Barnes County Ambulance Director	Comments Information Survey	2015
Barnes County/ Valley City	Theresa Will City-County Health Director	Comments Information Survey	2010, 2015
Barnes County	Betty Koslofsky Tax Director	Comments Information	2010, 2015
Barnes County	Bruce Anderson Barnes County Water Resource District Manager	Comments Information Survey	2015
Barnes County	Rodger Berntson Barnes County Commissioner	Comments Information Survey	2010, 2015
Barnes County	Phil Leitner Barnes County Commissioner	Comments Information Survey	2015
Barnes County	John Froelich Barnes County Commissioner	Comments Information Survey	2010, 2015
Barnes County	Kerry Johnson Barnes County Highway Superintendent	Comments Information	2015

Table 3.4 – Jurisdictional Participation in Planning Process - Continued

Jurisdictions Represented	Name and Title	Form of Participation	Status of Plan Participation
Barnes County	Scott Miller Barnes County Ambulance Director	Comments Information Survey	2015
City of Dazey	Gary Hare Dazey Mayor	Comments Information Survey	2015
City of Dazey	Darlene Hare Dazey Auditor	Comments Information Survey	2010, 2015
City of Dazey	Barbara Heinze Dazey City Council member	Comments Information Survey	2015
City of Dazey	Adam Mashburn Dazey City Council member elect	Comments Information Survey	2015
City of Dazey	Daryl Kunze Dazey Fire Department and Dazey Rural Fire District Fire Chief	Comments Information Survey	2015
City of Fingal	John Behm Fingal Mayor	Comments Information Survey	2015
City of Fingal	Corinne Ertelt Fingal Auditor	Comments Information Survey	2010, 2015
City of Fingal	Terri L. Meyer Fingal City Council member	Comments Information Survey	2015
City of Kathryn	Paul Fisher Kathryn Mayor and Water Operator	Comments Information Survey	2015
City of Kathryn	Kathryn Auditor Shirley Sivertson	Comments Information Survey	2010, 2015
City of Kathryn	Jim Gilbertson City Council member	Comments Information Survey	2015
City of Kathryn	Duane Pollert City Council member	Comments Information Survey	2015
City of Kathryn	Ruth Nelson City Council member	Comments Information Survey	2015
City of Kathryn	Delray Trzpuc City Council member	Comments Information Survey	2015

Table 3.4 – Jurisdictional Participation in Planning Process - Continued

Jurisdictions Represented	Name and Title	Form of Participation	Status of Plan Participation
City of Leal	David Lokken, Jr. Mayor	Comments Information Survey	2015
City of Leal	Steve Udem City Alderman	Comments Information Survey	2015
City of Leal	Mary Udem Auditor	Comments Information Survey	2010, 2015
City of Leal	Dale Udem City Alderman	Comments Information Survey	2015
City of Litchville	Brad Botner Mayor Litchville Fire Department	Comments Information Survey	2015
City of Litchville	Connie Smith Auditor	Comments Information Survey	2010, 2015
City of Nome	Jennifer Capman City Alderman	Comments Information Survey	2015
City of Nome	Lance Capman Mayor	Comments Information Survey	2015
City of Nome	Bruce Storhoff City Alderman	Comments Information Survey	2015
City of Nome	Charles Russell City Alderman	Comments Information Survey	2015
City of Oriska	Rick Pommerer Mayor	Comments Information Survey	2015
City of Oriska	Katie Pommerer Auditor	Comments Information Survey	2015
City of Oriska	Rob Marshall City Council member	Comments Information Survey	2015
City of Oriska	Buck Trader Oriska Fire Department Fire Chief	Comments Information	2015
City of Pillsbury	Dan Lindsith Mayor	Comments Information Survey	2015

Table 3.4 – Jurisdictional Participation in Planning Process - Continued

Jurisdictions Represented	Name and Title	Form of Participation	Status of Plan Participation
City of Pillsbury	Denns McGuire Auditor	Comments Information Survey	2015
City of Pillsbury	Jim Volk Alderman	Comments Information Survey	2015
City of Pillsbury	Carol McGuire Alderman	Comments Information Survey	2015
City of Rogers	Lynn Koebernick Mayor	Comments Information Survey	2015
City of Rogers	Tina Vincent Auditor	Comments Information Survey	2015
City of Rogers	Gordon Johnson City Council member Rogers Volunteer Fire Department Assistant Fire Chief	Comments Information Survey	2015
City of Rogers	Fred Wanzek City Council member Rogers Volunteer Fire Department Fire Chief	Comments Information Survey	2015
City of Rogers	Arvin Hoffman City Council member	Comments Information Survey	2015
City of Rogers	Kaye Omdahl City Council member Rogers Park Board member	Comments Information Survey	2015
City of Sanborn	Jim Berntson Sanborn Fire Department Volunteer	Comments Information Survey	2015
City of Sanborn	Kim Franklin Barnes County Emergency Manager City Alderman	Comments Information Survey	2015
City of Sibley	Allen Bender Mayor	Comments Information Survey	2015
City of Sibley	Dave Blaser City Council member	Comments Information Survey	2015
City of Sibley	Conrad Huber Public	Comments Information Survey	2015
City of Sibley	Janice Huber Public	Comments Information Survey	2015

Table 3.4 – Jurisdictional Participation in Planning Process - Continued

Jurisdictions Represented	Name and Title	Form of Participation	Status of Plan Participation
City of Sibley	Typhanny Schuler Auditor, Sibley Fire Department Secretary	Comments Information Survey	2010, 2015
City of Sibley	Rhonda Will Sibley Park Board Chairman	Comments Information Survey	2015
City of Valley City	Ron Burchill Valley City Fire Department Captain	Comments Information Survey	2015
City of Valley City	Jeff Differding Valley City Public Works Operations Specialist	Comments Information	2015
City of Valley City	Stanley Hansen Electrical Superintendent	Comments Information	2015
City of Valley City	Wade Hesch Valley City Public Works Water Treatment Plant Superintendent	Comments Information	2015
City of Valley City	Dave Schelkoph Valley City Administrator	Comments Information Survey	2015
City of Valley City	Fred Thompson Valley City Police Department Chief of Police	Comments Information Survey	2015
City of Valley City	Theresa Will City-County Health Department Director	Comments Information Survey	2015
City of Wimbledon	Leon Doyle Wimbledon Auditor	Comments Information Survey	2010, 2015
City of Wimbledon	Roger Pickar Wimbledon Mayor	Comments Information Survey	2015
City of Wimbledon	Kurt Wagner Wimbledon Fire Department Fire Chief	Comments Information Survey	2015
City of Wimbledon	Steve Guscette City Council member	Comments Information Survey	2015
City of Wimbledon	Chad Bakken City Council member, Wimbledon Fire Department Fireman	Comments Information Survey	2015
City of Wimbledon	Mark McClean Wimbledon Fire Department Assistant Fire Chief	Comments Information Survey	2015

As part of the planning process and the gathering of information for the updating of the risk assessment, emergency managers from the neighboring counties were invited to all committee meetings and were sent a link to review the draft Barnes County Multi-Jurisdictional Multi-Hazard Mitigation Plan.

Table 3.5 – Participation of Neighboring Emergency Services

Other Participation	Name and Title	Form of Participation	Status of Plan Participation
Cass County	Dave Rogness Cass County Emergency Manager	Review	2015
Griggs County	Robert Hook Griggs County Emergency Manager	Review	2015
LaMoure County	Kimberly Robbins LaMoure County Emergency Manager	Review	2015
Ransom County	Tricia Kiel Ransom County Emergency Manager	Review	2015
Steele County	Kim Franklin Steele County Emergency Manager	Review	2015
Stutsman County	Jerry Bergquist Stutsman County Emergency Manager	Review	2015

Additional participants in the plan development are listed in the table below; each was allowed the opportunity to comment on the plan.

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

Other Participation	Representing	Name and Title	Form of Participation	Status of Plan Participation
Business/Industry	McGuire’s Pub and Grub	Carol McGuire, Owner	Comments Information Survey	2015
Business/Industry	ADM Benson-Quinn	Fred Wanzek	Comments Information Survey	2015
Business/Industry	John Deere Seeding Group	Jill Molder Human Resources	Survey Information	2015
Business/Industry	FEI, Inc.	Matt Klabo, VP Fertilizer Division	Survey	2015
Business/Industry	Agroline, Inc.	Roger Pickar	Survey Information	2015
Business/Industry	Dakota Plains Cooperative	Ken Astrup Human Resources	Survey	2015
Business/Industry	Blue Cross Blue Shield	Linda Skramstad Human Resources	Survey	2015
Business/Industry	Drug Plastics and Glass	Krystle Hartsell Human Resources	Survey	2015
Business/Industry	Eagle Creek Software Services	Jeff Rash Human Resources	Survey	2015
Business/Industry	Heartland Flax	Tara	Survey	2015

Table 3.6 – Federal, State, Regional, Local and Business Participation in Planning Process-Continued

Other Participation	Representing	Name and Title	Form of Participation	Status of Plan Participation
Business/Industry	LaFarge Dakota	Andrea Larson Human Resources	Survey	2015
Business/Industry	Sheyenne Care Center	Craig Christianson	Survey	2015
Business/Industry	Sanford Clinic	Linda Lane Head Nurse	Survey	2015
Business/Industry	Valley City Public School	Dean A. Koppelman Superintendent	Survey	2015
Business/Industry	KLJ Engineering	Chad Peterson, Engineer	Comment Information	2015
Business/Industry	Valley City State University	Ron Pommer, Director of Facilities	Comment Information	2015
Economic Development Corporation	Valley City Development Group	Jennifer Feist Director of Development	Comment Information	2015
Federal	Farm Services Agency	Judy Nohrenberg, County Executive Director	Comments Information	2015
Federal	National Weather Service	Greg Gust Meteorologist-In-Charge	Comments Information	2015
Federal	U.S. Army Corps of Engineers	Rich Schueneman, N.D. Flood Control Project Section Supervisor and Baldhill Dam Manager	Comments Information	2015
Federal	FEMA	Charlie Jackson, Hazard Mitigation Program Specialist	Comments Information	2015
Federal	U.S. Department of Agriculture, Risk Management Agency	Faron Thompson, Risk Management Analyst	Comments Information	2015
Federal	U.S. Geological Survey	Ed Murphy	Information	2015
Federal	U.S. Department of Agriculture, Natural Resources Conservation Program	Erica Althoff, Area Engineer	Comments Information Survey	2015
Federal	U.S. National Guard	Major Anna Wittrock, Office in Charge	Comments Information	2015
Local	Barnes County Highway Department	Kerry Johnson, Barnes County Highway Superintendent	Comments Information Survey	2015
Local	Barnes County Highway Department	Jamie Smith, Administrative Assistant III	Comments Information	2015

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

Other Participation	Representing	Name and Title	Form of Participation	Status of Plan Participation
Local	Valley City Times-Record	Heidi Harris Reporter	Information	2015
Local	Barnes County	Betty Koslofsky, Tax Director, Planning and Zoning Administrator	Comments Information	2015
Local	Barnes County	Karen Duffy, Barnes County Auditor’s Office-Administrative Assistant	Comments Information	2015
Local	Barnes County Water Resource District	Bruce Anderson, Manager	Comments Information	2015
Local	Barnes County Water Resource District	Linda McKenna, Secretary/Treasurer	Comments Information	2015
Local	Barnes County	Rodger Berntson, County Commissioner	Comments Information	2015
Local	Barnes County	Eldred Knutson, County Commissioner	Comments Information	2015
Local	Barnes County	Phil Leitner, County Commissioner	Comments Information	2015
Local	Barnes County Rural Water District	Perry Kapaun, Manager	Comments Information	2015
Regional	Central Valley Health District	Frank Balak Regional Emergency Preparedness and Response Coordinator	Comments Information	2015
State	N.D. Association of Counties	Jeff Eslinger Communications Manager	Comments Information	2015
State	N.D. Aeronautics Commission	Website	Information	2015
State	N.D. League of Cities	Jerry Hjemlstad	Comments Information	2015
State	N.D. Department of Mineral Resources	Elroy Kadrmas, GIS Specialist	Information	2015
State	N.D. Department of Transportation	John Thompson, District 2 Engineer	Comments Information	2015
State	N.D. State Water Commission	Jeff Klein, NFIP Coordinator	Comments Information	2015

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 October 27, 2014, at the Barnes County Highway Department in Valley City. The agenda for the public meeting included review and acceptance of public comments. See Appendix 5 for meeting notes.

Representatives from various state and local agencies were invited to attend the fourth LEPC Meeting on May 19, 2014, at the Barnes County Highway Department as this meeting focused specifically on flooding and dam failure. The LEPC said inviting these entities to participate were crucial to understanding the impact from these hazards. Schwartz contacted John Thompson, District Engineer at the North Dakota Department of Transportation, District 2 office; Major Anna Wittrock, officer in charge at the National Guard in Valley City; Rich Schueneman, Baldhill Dam Manager at the United States Army Corp of Engineers field office in Valley City; Bruce Anderson, Manager at the Barnes County Water Resource District; Ken Evenson, Vice President at the Barnes County Water Resource District; Kerry Johnson, County Road Superintendent for the Barnes County Highway Department; Gene Vaneeckhout, North Dakota Game and Fish Department; Erica Althoff, Area Engineer at the Natural Resources Conservation Service; Jeff Klein, NFIP Coordinator at the North Dakota State Water Commission; and Perry Kapaun, Manager at the Barnes Rural Water District on to attend the meeting. All invitees confirmed attendance. Invitations were sent to these representatives to ensure the public was involved in the planning process during the drafting stage.

Kantrud attended the annual spring meeting of Barnes County Township Officers Association (BCTOA). Kantrud discussed the process to update the Barnes County MHMP and the impacts involved with each hazard identified for the update. The Barnes County Multi-Hazard Mitigation Survey (MHMS) was distributed to participants with 28 copies completed and given to Kantrud. Kantrud attended the BCTOA to ensure public participation during the drafting stage of the plan.

Community Hazard Mitigation Survey

A two-page Barnes County Community Hazard Survey was created by the plan consultant, emergency manager, and the LEPC for distribution to encourage more public input. Hundreds of surveys were distributed to meetings, businesses, churches, employers, community organizations, and community events. Three hundred and two surveys were returned. Of the 302 surveys, 288 were residents of Barnes County, which represented 6.0 percent of all households in the county based on the 2010 U.S. Census. See Appendix 7 for complete survey results. Plan consultants contacted and send the survey to major employers, businesses and organizations to increase survey participation. See table 3.6 for detailed participation. The Barnes County MHMS was added to the South Central Dakota Regional Council's website on March 28, 2014. At the Planning Committee Meeting on March 24, 2014, the mayor of Fingal and the mayor of Sibley requested that 50 copies of the survey be mailed to them for distribution in their communities.

To further increase public participation and outreach, plan consultants contacted major employers and organizations in Valley City for distribution of the survey. Electronic copies of the survey were emailed to Dakota Plains Cooperative, Blue Cross Blue Shield, Drug Plastics and Glass, Heartland Flax, FEI, Inc., KLJ Engineering, LaFarge Dakota, Sheyenne Care Center, Sanford Clinic, and Valley City Public

Schools. In addition, prior to the Fingal Jurisdictional Meeting, plan consultants delivered hard copies of the survey to John Deere Seeding Group, Eagle Creek Software Services, and city hall. Approximately 75 copies of the survey were delivered to John Deere Seeding Group and Eagle Creek Software Services each and 25 were delivered to the city hall in Valley City.

A majority of survey respondents, 52 percent, have lived in Barnes County for more than 16 years and another 20 percent have lived in the county for one to five years. Approximately 79 percent of respondents have been affected by winter storms, followed by summer storms and flooding both at 56 percent, and windstorm at 45 percent. Dam failure and homeland security incident were identified as the hazards affecting the least amount of respondents with one percent of respondents, respectively. Winter storms, flooding and summer storms were identified as top three major concerns from respondents at 57 percent, 44 percent and 32 percent, respectively.

Table 3.7 shows the amount of damage respondents identified in the past five years impacting their household.

Table 3.7 – Monetary Damage Experienced by Households in Barnes County

How much monetary damage has your household experienced due to the natural or man-made disasters in the last 5 years?		
Damage Range	Number of Respondents	Percent
<\$500	35	12%
<\$1,000	57	19%
<\$10,000	73	24%
<\$25,000	17	6%
<\$50,000	4	1%
>\$100,000	1	0%
None	96	32%
No Answer	19	6%

Source: Barnes County Multi-Hazard Mitigation Survey

Table 3.8 shows the response to the question asking the type of mitigation actions that would help defend against natural and man-made disasters.

Table 3.8 – Changes or Additions Survey Respondents Would Make to Their Community

Are there any changes or additions to your community that in your opinion would help defend against or help cope with natural or man-made disasters? (example shelters, generators, sirens, road grade raises)		
Change or Addition	Number of Respondents	Percent
Clear roads/Snow removal	6	2%
Dikes	32	11%
Generators	46	15%
No Answer	173	57%
Notification phone calls	8	3%
Road grade raises	18	6%
Sirens	34	11%
Supportive resources	11	4%
Water	1	0%

Source: Barnes County Multi-Hazard Mitigation Survey

A majority of survey respondents did not answer the question. Approximately 15 percent of survey respondents indicated generators as mitigation actions that would help defend against natural and man-made disasters, followed by dikes and sirens at 11 percent each.

Approximately 47 percent of survey respondents indicated they were interested in receiving information on protecting their household against natural or man-made disasters while 43 percent said no and 10 percent did not answer the question.

Table 3.9 shows how individuals who said they would like to receive information would prefer to have the information delivered to their household. Not one form of communication was prevalent over the other. Approximately 17 percent indicated written correspondence as the preferred method, followed by newspaper and website with 15 percent each, radio and television with 13 percent each and smart phone/tablet with 11 percent. Only six percent of respondents indicated social media as the preferred method. Approximately 48 percent of respondents did not answer the question.

Table 3.9 – Method by Which Survey Respondents Would like to Receive Information

If yes, how would you like to receive that information?		
Source	Number of Respondents	Percent
E-mail	36	12%
Newspaper	45	15%
Radio	39	13%
Smartphone/Tablet	32	11%
Social media	18	6%
Television	39	13%
Website	44	15%
Written correspondence	50	17%
No Answer	144	48%

Source: Barnes County Multi-Hazard Mitigation Survey

Table 3.10 shows the response to the question if familiarity with shelter-in-place. A majority of respondents, 68 percent, indicated they were not familiar with shelter-in-place.

Table 3.10 – Are you Familiar with Shelter-in-Place?

Are you familiar with Shelter-in-Place?		
Response	Number of Respondents	Percent
Yes	77	25%
No	205	68%
No Answer	20	7%

Source: Barnes County Multi-Hazard Mitigation Survey

The information from the survey was incorporated into the mitigation strategies for education. It will also be used for future surveys to gather data from the public in the updating process of the county’s mitigation plan.

Review and Incorporation of Existing Plans and Information

The Barnes County plan was developed with the consultation of local, state and federal agencies, local businesses, educational institutions, and nonprofits. The 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 3.11. 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 the projects.

Table 3.11 – Existing Plans and Information Incorporated into Plan

Organization	Existing Plans and Information
Barnes County Emergency Manager	<ul style="list-style-type: none"> • Barnes County Emergency Operations Plan • Accident Reports • Emergency Action Plan-Baldhill Dam
Barnes County Highway Department	<ul style="list-style-type: none"> • Capital improvements information • Hazardous areas information
Barnes County Multi-Hazard Mitigation Plan, 2010	<ul style="list-style-type: none"> • Reviewed and Updated
City-County Health District	<ul style="list-style-type: none"> • Information and Statistics
Barnes County Tax Equalization	<ul style="list-style-type: none"> • Maps and Statistics
Litchville Bulletin	<ul style="list-style-type: none"> • Photos and County Hazard History Events
Marion Fire Department	<ul style="list-style-type: none"> • Fire Incident Statistics
Montana-Dakota Utilities Co.	<ul style="list-style-type: none"> • Power Outage 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 Sites

Table 3.11 – Existing Plans and Information Incorporated into Plan

Organization	Existing Plans and Information
National Weather Service	<ul style="list-style-type: none"> • Weather Event History Data • North Dakota Fire Danger Index
North Dakota Association of Counties	<ul style="list-style-type: none"> • County Jurisdiction Statistics
North Dakota Department of Emergency Services	<ul style="list-style-type: none"> • Technical Assistance Provided • THIRA • Information/Data
North Dakota Department of Health	<ul style="list-style-type: none"> • Disease Prevention/Statistics • Public Health • Influenza History • Terrorism Information
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 Rail Plan 2007 • Traffic accident history • Strategic Highway Safety Plan
North Dakota Game and Fish	<ul style="list-style-type: none"> • Wildlife Data
North Dakota League of Cities	<ul style="list-style-type: none"> • Technical Assistance Provided • Jurisdiction Statistics
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 Water Commission	<ul style="list-style-type: none"> • Dam Safety • National Flood Insurance Program • Drought Disaster • Flood Control
Otter Tail Power Company	<ul style="list-style-type: none"> • Power Outage Statistics
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/American Community Survey	<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 Agriculture-Risk Management Agency	<ul style="list-style-type: none"> • Crop Loss Data and Statistics
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 and Statistics
Valley City Fire Department	<ul style="list-style-type: none"> • Fire Incident Statistics
Valley City Times-Record	<ul style="list-style-type: none"> • Photos and County Hazard History Events
Mercy Hospital	<ul style="list-style-type: none"> • Health Care Services and Statistics

Information in this mitigation plan will be incorporated into the county’s emergency operations plan, plans for Mercy Hospital and City-County Health, and planning and zoning for Barnes County and the city of Valley City.

Risk Assessment Methodologies

The methodology for assessing risks involved looking at each identified hazard and threat in Barnes County separately and looking at what it will do to the community. Each jurisdiction scored impact, frequency, likelihood, and vulnerability and capability using the following scoring criteria. The plan consultant scored capability based on the same criteria independently after each jurisdictional meeting.

Impact is what damage or losses the hazard causes in a community.

- Scored 1 Negligible – less than 10% of the jurisdiction affected
- Scored 2 Limited – 10% to 25% of jurisdiction affected
- Scored 3 Critical – 25% to 50% of the jurisdiction affected
- Scored 4 Catastrophic – More than 50% of the jurisdiction affected

Impact per hazard: Ranked _____. Why:

Frequency is how often the hazard occurs.

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

Frequency per hazard: Ranked _____. Why:

Likelihood is how probable it is that the hazard will happen.

- 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

Likelihood per hazard: Ranked _____. Why:

Vulnerability is the amount of

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

Who and what is affected? When? Identify specific areas of vulnerability. Who will handle dealing with the hazard impact? What you have or lack: equipment, vehicles, services available, shelters, buildings, and infrastructure.

- Scored 1 Low vulnerability: Adequate resources in the jurisdiction to address any hazard
- Scored 2 Moderate vulnerability: Various resources in the jurisdiction
- Scored 3 Highly 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

Capability per hazard: Ranked _____. Why:

Hazard Identification

Table 3.12 shows the hazards included in the plan, how identified and why identified to be included in the plan.

Table 3.12 – Barnes County Major Hazards

Hazard Profile	How Identified	Why Identified
Communicable Disease (including human, animal, and plant disease)	<ul style="list-style-type: none"> • N.D. Department of Agriculture • N.D. Department of Health • U.S. Department of Agriculture-Risk Management Agency 	<ul style="list-style-type: none"> • Agricultural community • Disease statistics for Barnes County
Dam Failure	<ul style="list-style-type: none"> • U.S. Army Corps of Engineers • National Inventory of Dams • Association of State Dam Safety 	<ul style="list-style-type: none"> • 18 dams located in county, including one significant hazard dam, dams located outside county could have potential impact
Drought	<ul style="list-style-type: none"> • National Climatic Data Center • U.S. Drought Monitor • U.S. Department of Agriculture 	<ul style="list-style-type: none"> • Drought history • Current drought conditions • Presidential Disaster Declarations • Agricultural community
Geologic Hazard (Landslide)	<ul style="list-style-type: none"> • Barnes County Emergency Manager 	<ul style="list-style-type: none"> • Landslide history
Flood	<ul style="list-style-type: none"> • National Climatic Data Center • Barnes County Emergency Manager • National Weather Service 	<ul style="list-style-type: none"> • History events • Presidential Disaster Declarations • County flooding events

Table 3.12 – Barnes County Major Hazards - Continued

Hazard Profile	How Identified	Why Identified
Hazardous Material Release	<ul style="list-style-type: none"> • Barnes County Emergency Manger • N.D. Department of Transportation • Farm Service Agency 	<ul style="list-style-type: none"> • Hazardous material routes through county • History of hazardous material incidents • High truck traffic through county on U.S. Highway 281 • Pipeline located in county • Agricultural community and high fertilizer/chemical use
Homeland Security Incidents	<ul style="list-style-type: none"> • Barnes County Emergency Manager 	<ul style="list-style-type: none"> • Possibility for incidents at any given time
Severe Summer Weather	<ul style="list-style-type: none"> • National Climatic Data Center • National Weather Service • Barnes County Emergency Manager • The Spatial Hazard Events and Losses Database for the United States (SHELDUS) 	<ul style="list-style-type: none"> • Presidential Disaster Declarations history • History of extensive damage from summer storms • Barnes County severe summer weather history
Severe Winter Weather	<ul style="list-style-type: none"> • National Climatic Data Center • National weather Service • Barnes County Emergency Manager • The Spatial Hazard Events and Losses Database for the United States (SHELDUS) 	<ul style="list-style-type: none"> • Winter storm history in county • Presidential Disaster Declaration for severe winter weather • Barnes County severe winter weather history
Shortage or Outage of Critical Materials or Infrastructure	<ul style="list-style-type: none"> • Barnes County Emergency Manager • N.D. Public Service Commission • Stakeholder input Montana-Dakota Utilities, Dakota Valley Electric Cooperative, Dickey Rural Networks, Otter Tail Power Company 	<ul style="list-style-type: none"> • History of power outages • Shortage of critical materials history • Communication outages
Transportation Accident	<ul style="list-style-type: none"> • N.D. Department of Transportation • Barnes County Sheriff’s Office • Barnes County Emergency Manager • North Dakota Department of Transportation 	<ul style="list-style-type: none"> • Accident history in county

Table 3.12 – Barnes County Major Hazards - Continued

Hazard Profile	How Identified	Why Identified
Urban Fire/Structure Collapse Wildland Fire	<ul style="list-style-type: none"> • N.D. State Fire Marshal’s Office • County Fire Districts and Departments 	<ul style="list-style-type: none"> • National Fire Reporting Incident Report (NFIRS) • County fire history
Windstorm	<ul style="list-style-type: none"> • National Climatic Data Center • National Weather Service • Barnes County Emergency Manager • The Spatial Hazard Events and Losses Database for the United States (SHELDUS) 	<ul style="list-style-type: none"> • Presidential Disaster Declarations history • History of extensive damage from summer storms • Barnes County summer storm history

Hazards eliminated from the plan update are shown in Table 3.13 and the reason for its exclusion in the planning process.

Table 3.13 – Hazards Excluded from Plan

Hazard	Why Excluded
Avalanche	<ul style="list-style-type: none"> • Barnes County does not have a history of avalanche disaster • There is no area in county at a severe enough grade to produce an avalanche • No past incident reports
Coastal Erosion	<ul style="list-style-type: none"> • Barnes County does not have an ocean coastline
Coastal Storm	<ul style="list-style-type: none"> • Barnes County does not have an ocean coastline
Expansive Soils	<ul style="list-style-type: none"> • No incident report • No historical data
Geological Earthquake	<ul style="list-style-type: none"> • No historical data • No incident reports • No past emergency declarations
Hurricane	<ul style="list-style-type: none"> • Barnes County does not have an ocean coastline
Levee Failure	<ul style="list-style-type: none"> • No historical data • No incident reports • No past emergency declarations
Tsunami	<ul style="list-style-type: none"> • Barnes County does not have an ocean coastline
Volcano	<ul style="list-style-type: none"> • Barnes County does not have a history of volcanic disaster • No past incident reports • No past disaster declarations

4. County and Jurisdictions Profile and Inventory

Barnes County and Jurisdictions Overview

Barnes County is located in east-central North Dakota and is the 15th largest county in land area of the 53 counties in the state, encompassing 1,513 square miles. Of the 1,513 square miles, approximately 1,470 square miles of it is land areas (97.16 percent) and 43 square miles (2.84 percent) is water surface area. The county is approximately forty-two (42) miles from north to south and approximately thirty-five (35) miles from east to west. The 2010 population of the County is 11,066 people and has a population density of 7.6 people per square mile. Figure 9.1 in Chapter 9 is a general map of the county showing jurisdiction locations, transportation routes, airports and bodies of water.

The county is bordered on the north by Griggs County, on the northeast by Steele County, on the east by Cass County, on the west by Stutsman County, on the southwest by LaMoure County, and on the southeast by Ransom County. Interstate 94, a major trade route extending from the Seattle, Washington to Detroit, Michigan, traverses east and west through the county. Other major highways in the county include N.D. Highway 1, N.D. Highway 9, N.D. Highway 26, N.D. Highway 32 and N.D. Highway 46. There are forty-two (42) townships in the county. All are organized townships. They are from northwest to southeast: Pierce, Lake Town, Dazey, Sibley, Baldwin, Ellsbury, Uxbridge, Edna, Rogers, Ashtabula, Prairie, Minnie Lake, Brimer, Anderson, Stewart, Getchell, Noltimier, Weimer, Eckelson, Potter, Hobart, Valley, Alta, Oriska, Mansfield, Hemen, Green, Marsh, Cuba, Springvale, Meadow Lake, Svea, Skandia, Nelson, Norma, Binghampton, Greenland, Rosebud, Spring Creek, Oak Hill, Thordenskjold and Raritan. Figure 9.2 in Chapter 9 shows the geographic location of the townships in the county.

Figure 4.1 – Location of Barnes County in the State of North Dakota



The incorporated jurisdictions in the county included in this plan are Dazey, Fingal, Kathryn, Leal, Litchville, Nome, Oriska, Pillsbury, Rogers, Sanborn, Sibley, Valley City and Wimbledon. Figures 9.23 to 9.35 in Chapter 9 show aerials of each incorporated jurisdiction in the county. Unincorporated communities in the county include: Berea, Cuba, Daily, Eastedge, Eckelson, Hastings, Koldok, Lucca, North Valley City, Peak, and Urbana.

Barnes County features numerous waterfowl production areas (WPAs) and national wildlife refuges. The District conserves wetland and grassland habitat for waterfowl and other wildlife species. The United States Fish and Wildlife Service manages wildlife refuges, which are public lands and waters set aside to conserve fish, wildlife and plants. The WPAs are scattered throughout the county while the wildlife refuges are located in the central portion of the county. Figure 9.3 in Chapter 9 shows a map of the WPAs and wildlife refuges in Barnes County.

Climate

Barnes County has 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, amount, and area of 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.

Average high temperatures in January are 5 to 15 F with average lows 4.7 below to 5 F above. The coldest averages at lower valley locations. In winter, temperatures often vary significantly from the averages. Temperatures around -47 F have been recorded while typical extreme winter minimum temperatures are between 9 and 19 F. The coldest temperatures occur at open valley locations when winds are light, but extreme wind chill situations occur nearly every winter when windy conditions coincide with very low temperatures. Rapid warm-ups during the winter and early spring can lead to significant snow melt and flooding of small streams and rivers, and/or ice jam flood problems.

Average high temperatures in July are in the 70s with average lows 56 to 83. Averages are fairly uniform across the county. Brief spells with temperatures above 100 F can occur, but are often short in duration. Temperatures above 118 F have been reported on rare occasion. Extended periods with temperatures above 90 F occur every few years. Freezing temperatures can occur, but are rare in June and August.

Annual average precipitation is 10 to 28 inches with over 70% of the precipitation falling from May through September. Precipitation can vary from year to year and location to location within a given year. The extreme southeast portion of the county can have precipitation averages over 19 inches. November through March, are on average dry with average monthly precipitation of 0.62" or less. Average annual precipitation does not vary significantly across the county. The heaviest precipitation often occurs with localized downpours associated with thunderstorms in June through August. Significant flash flooding can result from these downpours with over 3 inches of precipitation reported in a few events. Widespread heavy precipitation events of 1 to 2 inches can occur every few years and is most common from April through June and September through early November.

Average winter snowfall ranges from 18 to 64 inches with the highest averages over the higher elevations over the southeastern part of the county. The heaviest snowstorms often occur from late March through May, or mid-October to mid-November. These storms can produce more than 12 inches of snow and are

often made more severe as temperatures are warmer, and, therefore, snow is heavier and difficultly in travel and snow removal arises. These storms are often accompanied by high winds resulting in blizzard conditions. In spring these storms can coincide with the calving season resulting in livestock loss. Mid-winter snowstorms produce less than 6 inches of snow, but heavier amounts of 10 inches or more have occurred. Even without falling snow, in the colder conditions of mid-winter, high winds can pick up loose snow, resulting in local ground blizzards.

Severe thunderstorms are common from June into early September. Typically, the greatest impacts associated with these thunderstorms are very high winds and large hail. Damage to structures and crops occur every summer from these storms. Tornadoes have been reported, but are relatively rare.

An important element of the climate in Barnes County is windy conditions. Average wind speeds range from 10 to 15 mph, depending on the exposure of the location. The average and peak sustained winds tend to be stronger over higher and more exposed terrain. The highest wind gusts often occur with thunderstorms during the summer with gusts over 60 mph occurring every year. The highest sustained winds tend to occur in the spring and fall with sustained winds over 40 mph occurring every year. The county has twice reached straight line wind speeds in excess of 110 mph within the last 15 years.

Table 4.1 shows the average snowfall and depth, precipitation, and temperatures at an observation point three miles north-northwest of Valley City in Barnes County. The averages for snowfall, snow depth and precipitation are in inches and the average maximum and minimum temperatures are in Fahrenheit.

Table 4.1 – 7/1/1948 to 6/30/2007 Barnes County Snowfall, Snow Depth, Temperature, and Precipitation Averages

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	16.9	23.8	35.5	53.9	68.2	76.6	82.2	81.3	70.7	57.8	37.6	23.3	52.3
Average Min. Temperature (F)	-3.9	2.1	14.6	29.1	41.5	51.7	56.5	53.5	43.1	31.7	17.5	3.7	28.4
Average Total Precipitation (in.)	0.53	0.43	0.78	1.38	2.66	3.47	2.93	2.47	1.99	1.38	0.68	0.50	19.20
Average Total Snowfall (in.)	7.8	4.8	5.9	2.8	0.1	0.0	0.0	0.0	0.0	0.7	4.9	6.1	33.1
Average Snow Depth (in.)	6	7	3	0	0	0	0	0	0	0	1	3	2

Source: High Plains Regional Climate Center

Population

Population statistics for Barnes County for the years 1980, 1990, 2000, and 2010 were obtained through the U.S. Census Bureau-Decennial Census. Population 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 Barnes County. Statistics on population trends and projections are needed to

understand the distribution of people across the county. These statistics also highlight where potential future needs will be for emergency services based on population distribution growth and density.

The population of Barnes County has been declining for the past several decades despite efforts to create new businesses and new jobs. The decline in population is primarily due to mechanization of the agriculture sector and decreases in family size. Between 1990 and 2000, the county lost 6.1 percent of its population and an additional 6.0 percent between 2000 and 2010. However, the county is estimated to grow in future decades, increasing to 11,279 people between 2010 and 2015, adding roughly 216 people, which is an increase of 1.9 percent. By 2030, the population of Barnes County is projected to grow to 12,093 people, adding roughly 1,027, an increase of 9.3 percent from 2010.

Table 4.2 – 1980 to 2030 Barnes County Population Statistics

	1980	1990	2000	2010	Percent Change 1990 to 2000	Percent Change 2000 to 2010	Projections		
							2015	2020	2030
Barnes County	13,960	12,545	11,775	11,066	-6.1 percent	-6.0 percent	11,279	11,642	12,093
Dazey	143	129	91	104	-29.5 percent	+14.3 percent	--	--	--
Fingal	151	138	133	97	-3.6 percent	-27.1 percent	--	--	--
Kathryn	95	72	63	52	-12.5 percent	-17.5 percent	--	--	--
Leal	45	35	36	20	+2.9 percent	-44.4 percent	--	--	--
Litchville	251	205	191	172	-6.8 percent	-9.9 percent	180	185	200
Nome	67	67	70	62	+4.5 percent	-11.4 percent	--	--	--
Oriska	125	103	128	118	+24.3 percent	-7.8 percent	--	--	--
Pillsbury	46	31	24	12	-22.6 percent	-50.0 percent	--	--	--
Rogers	68	69	61	46	-11.6 percent	-24.6 percent	--	--	--
Sanborn	237	164	194	192	+18.3 percent	-1.0 percent	200	205	220
Sibley	21	41	46	30	+12.2 percent	-34.8 percent	--	--	--
Valley City	7,774	7,163	6,826	6,585	-4.7 percent	-3.5 percent	6,675	3,950	7,200
Wimbledon	330	275	237	216	-13.8 percent	-8.9 percent	218	220	225

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

Poverty Statistics

Statistics on poverty in Barnes County and Valley City are provided by the 2012 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. The 5-year estimate shows data that was collected by sampling households in Barnes County and Valley City between 2008 and 2012. 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 Barnes County and Valley City.

According to the 2012 American Community Survey, 5-Year Estimate, there are 1,115 individuals in Barnes County with incomes below the poverty level, representing 10.6 percent of individuals in Barnes County. Conversely, there are 9,394 individuals with incomes above the poverty level, representing 89.4 percent of people in Barnes County. There are 789 individuals in the city of Valley City with incomes below the poverty level, representing 13.0 percent of individuals in the city. Conversely, there are 5,258

individuals with incomes above the poverty level, representing 87.0 percent of people in the city. Individuals living below the poverty level in Valley City represent 70.8 percent of the total in Barnes County.

Table 4.3 – 2012 American Community Survey - 5-Year Estimate Poverty Statistics

Jurisdiction	TOTAL	Income Below Poverty Level	Income Above Poverty Level	Percent Below Poverty Level	Percent Above Poverty Level
Barnes County	10,509	1,115	9,394	10.6 percent	89.4 percent
Valley City	6,047	789	5,258	13.0 percent	87.0 percent

Source: 2008-2012 American Community Survey 5-Year Estimates

Major Recreation Areas

Lake Ashtabula. Lake Ashtabula is located 12 miles northwest of Valley City, N.D. offering a wide range of recreation opportunities. The lake offers activities for every season of the year. Fishing and snowmobiling are available in the winter. The spring and fall attract migrating waterfowl. Activities available in the summer include fishing, boating, camping, swimming, and picnicking.

Clausen Springs Dam Recreation Area. The Clausen Springs Dam Recreation Area is located 17 miles south of I-94 near the city of Kathryn. The lake is managed by the North Dakota Game and Fish Department in cooperation with the Barnes County Park Board. There is a boat dock, swimming beach, three vault toilets, and a new shower house. The park is managed by the Barnes County Park Board. It provides numerous camping sites with or without electricity and plenty of day use opportunities.

Little Yellowstone Park. Little Yellowstone Park is managed by the Barnes County Park Board. It is a 27-acre campground and multi-use recreation area located 4 miles south and 1 mile east of Kathryn on State Highway 46. It provides 34 campsites – 14 electrical and 20 more secluded primitive (non-electrical) campsites.

Sheyenne River Valley National Scenic Byway. The Sheyenne River Valley National Scenic Byway is located in Barnes County. The first nationally designated byway in North Dakota interprets the theme: "Hidden Treasure of the Great Plains the Sheyenne River and the interaction of the people with the land over time." In a state known for its flat, endless horizon, you can take a swim in the river along a nationally designated scenic byway. The human relationship with the river and land is explored in 29 interpretive panels over a 63 mile drive from Baldhill Dam (twelve miles north of Valley City) south to Lisbon. The Sheyenne River Valley is a major fishing and hunting area for the county. Figure 9.4 in Chapter 9 illustrates the extent of the Sheyenne River Valley National Scenic Byway and snowmobile trails in Barnes County.

Historical Setting

When planning mitigation measures it must be established that historic archeological sites will not be negatively impacted. According to the N.D. State Historical Society, Barnes County has 823 historic/archeological sites, 64 prehistoric archeological sites, 14 historic archeological sites, 523 architectural standing structures and 222 prehistoric/historic sites not yet confirmed.

Profile of Barnes County Jurisdictions

Tables 4.4 to 4.8 profile the services, housing units, jurisdictional buildings, emergency response services, and utilities of Barnes County and incorporated jurisdictions. An “X” indicates if the jurisdiction offers the utility or service (either through contract or employees) or possesses the building or resource.

Narratives following each table further detail the profile of Barnes County and incorporated jurisdictions. Information on the profile of each jurisdiction was gathered at jurisdictional meetings during the planning process.

Table 4.4 shows the services provided in the county and city jurisdictions.

Table 4.4 – Services Provided in Barnes County Jurisdictions

Services	Barnes County	Dazey	Fingal	Kathryn	Leal	Litchville	Nome	Oriska	Pillsbury	Rogers	Sanborn	Sibley	Valley City	Wimbledon
Garbage Collection: Waste Management	X							X						
Garbage Collection: Sanitation Specialists	X	X				X					X			
Garbage Collection: Fraedrich Transport	X		X	X			X							
Garbage Collection: City Sanitation	X												X	
Garbage Collection: Dakota Sanitation	X				X					X				
Garbage Collection: Brager Disposal Service, Inc.	X								X			X		
Garbage Collection: Central Dakota Sanitation	X													X
Inert Landfill							X	X			X	X	X	
Lagoon		X	X	X		X	X	X			X	X	X	X
Lift Station		X	X	X		X	X	X			X	X	X	X
Recycling: Valley Recycling													X	
Septic Systems	X				X				X	X				
Sanitary Sewer System		X	X	X		X	X	X			X	X	X	X
Storm Water System													X	X
Water: Barnes Rural Water District	X	X	X		X	X	X	X		X	X			X
Water: Dakota Rural Water District	X								X			X		
Water: City Service		X		X									X	
Water: City Well		X		X										
Water: Individual Wells	X													
Water: Reservoir				X										

Barnes County. Residents of Barnes County receive water from Dakota Rural Water District, Barnes Rural 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 not a landfill in the county, yet various rural areas are served by garbage-sanitation collection. The official newspaper of the county is the Valley City Times-Record.

Dazey. The city of Dazey receives water from Barnes Rural Water District and also maintains a city well. There are no septic systems used by city residents. The city has a sanitary sewer system and a lagoon with two cells. The city does not have a storm water system. The city has a lift station for the sanitary sewer system. Sanitation Specialists provides sanitation services. The city does not maintain an inert landfill. The official newspaper is the Valley City Times-Record.

Fingal. The city of Fingal receives water from Barnes Rural Water District. There are no septic systems used by city residents. The city has a sanitary sewer system and a lagoon. The city does not have a storm water system. The city has a lift station for the sanitary sewer system located behind the community center. Fraedrich Transport provides sanitation services. The city does not maintain an inert landfill. The official newspaper is the Valley City Times-Record.

Kathryn. The city of Kathryn receives water from a city well and a reservoir fed by a natural spring. There are no septic systems used by city residents. The city has a sanitary sewer system and a lagoon. The city does not have a storm water system. The city has a lift station for the sanitary sewer system located on the east side of town on 2nd Avenue. Fraedrich Transport provides sanitation services. The city does not maintain an inert landfill. The official newspaper is the Litchville Bulletin.

Leal. The city of Leal receives water from Barnes Rural Water District. The city does not have a sanitary sewer system or lagoon. City residents maintain septic systems. The city does not have a storm water system. There are no lift stations in the city as it does not have a sanitary sewer system. Dakota Sanitation provides sanitation services. The city does not maintain an official inert landfill, but inert debris is disposed of in fields to the east of the city. The official newspaper is the Valley City Times-Record.

Litchville. The city of Litchville receives water from Barnes Rural Water District. There are no septic systems used by city residents. The city has a sanitary sewer system and a lagoon. The city does not have a storm water system. The city has a lift station for the sanitary sewer system and lagoon. Sanitation Specialists provides sanitation services. The city does not maintain an inert landfill. The official newspaper is the Litchville Bulletin.

Nome. The city of Nome receives water from Barnes Rural Water District. There are no septic systems used by city residents. The city has a sanitary sewer system and a lagoon. The city does not have a storm water system. The city has a lift station with two pumps located on the north side of 5th Avenue for the sanitary sewer system and lagoon. Fraedrich Transport provides sanitation services. The city maintains an inert landfill located one mile south of the city on the west side of N.D. Highway 32. The official newspaper is the Enderlin Independent.

Oriska. The city of Oriska receives water from Barnes Rural Water District. There are no septic systems used by city residents. The city has a sanitary sewer system and a lagoon with two ponds. The city does

not have a storm water system. The city has a lift station located on the south end of the railroad tracks. Waste Management provides sanitation services. The city maintains an inert landfill located on the east side of the city. The official newspaper is the Valley City Times-Record.

Pillsbury. The city of Pillsbury receives water from Dakota Rural Water District. The city does not have a sanitary sewer system or lagoon. City residents maintain septic systems. The city does not have a storm water system. There are no lift stations in the city as it does not have a sanitary sewer system. Brager Disposal Service, Inc. provides sanitation services. The city does not maintain an inert landfill. The official newspaper is the Valley City Times-Record.

Rogers. The city of Rogers receives water from Barnes Rural Water District. The city does not have a sanitary sewer system or lagoon. City residents maintain septic systems. The city does not have a storm water system. There are no lift stations in the city as it does not have a sanitary sewer system. Dakota Sanitation provides sanitation services. The city does not maintain an official inert landfill, but disposes of inert debris at the former softball diamond on the north side of the city. The official newspaper is the Valley City Times-Record.

Sanborn. The city of Sanborn receives water from Barnes Rural Water District. There are no septic systems used by city residents. The city has a sanitary sewer system, lagoon and lift station. The city does not have a storm water system. Sanitation Specialists provides sanitation services. The city maintains an inert landfill located east of the city. The official newspaper is the Valley City Times-Record.

Sibley. The city of Sibley receives water from Dakota Rural Water District. The city has a sanitary sewer system and lagoon located north of the city. The city does not have a storm water system. There city has a lift station located adjacent to the fire hall. Brager Disposal Service, Inc. provides sanitation services. The city maintains an inert landfill next to the lagoon. The official newspaper is the Valley City Times-Record.

Valley City. The city of Valley City receives its water from the Valley City Public Works Department. The city has a sanitary sewer system and lagoon. The city has a storm water system. There are 11 lift stations in the city: one master lift station and 10 satellite lift stations. Garbage and sanitation is provided by the public works department. Valley Recycling provides recycling services to city residents. An inert disposal site is also operated by the public works department. The official newspaper is the Valley City Times-Record.

Wimbledon. The city of Wimbledon receives water from Barnes Rural Water District. The city has a sanitary sewer system and lagoon. The city has a storm water system. The city has five lift stations. Three lift stations are for the sanitary sewer system and are located on the north side of town, west side of town and at the lagoon. Two lift stations are for the storm water system and are located on the northeast and southeast corner of town. Central Dakota Sanitation provides sanitation services. The city does not maintain an official inert landfill, but tree branch debris is disposed on the northeast side of town behind the water tower. The official newspaper is the Valley City Times-Record.

Structures

Housing units show where populations are located. Table 4.5 shows the number of single-family, multifamily and mobile home structures in the city.

Table 4.5 – Housing Units in Barnes County

Housing Units	County - outside incorporated cities	Dazey	Fingal	Kathryn	Leal	Litchville	Nome	Oriska	Pillsbury	Rogers	Sanborn	Sibley	Valley City	Wimbleton	TOTAL
Single-Family Homes	1,643	45	47	37	14	84	31	41	17	29	84	24	1,924	94	4,114
Mobile Homes	122	0	3	2	0	3	2	9	2	2	9	8	96	21	279
Multifamily Homes	8	8	13	0	0	13	0	12	0	0	0	12	1,247	0	1,313

Source: 2008-2012 American Community Survey 5-Year Estimates

Table 4.6 shows the public-owned buildings in each jurisdiction by type.

Table 4.6 – Barnes County Jurisdictional Buildings

Jurisdictional Buildings	Barnes County	Dazey	Fingal	Kathryn	Leal	Litchville	Nome	Oriska	Pillsbury	Rogers	Sanborn	Sibley	Valley City	Wimbleton
Airport	X*												X*	
American Red Cross Shelter	X*	X	X			X		X					X*	
Armory													X	
Barnes County Courthouse	X*												X*	
Barnes County Highway Dept.	X*												X*	
Barnes County Rural Water Dist.	X*												X*	
Barnes County Shop	X*	X		X		X							X*	
Barnes County Water Resource District	X*												X*	
City Hall						X	X						X	X
City Shop			X										X	X
Community Center		X	X	X		X		X					X	X
County Public Health	X*												X*	
Golf Course	X*												X*	
Library	X*							X					X*	X
N.D. Dept. of Transportation	X*												X*	
Park	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Public Health Department	X*												X*	
School	X					X		X					X	
Shelter		X	X	X	X	X		X		X	X	X	X	

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

Table 4.6 – Barnes County Jurisdictional Buildings - Continued

Jurisdictional Buildings	Barnes County	Dazey	Fingal	Kathryn	Leal	Litchville	Nome	Oriska	Pillsbury	Rogers	Sanborn	Sibley	Valley City	Wimbledon
Swimming pool													X	
U.S. Army Corps of Engineers	X*												X*	
U.S.D.A. Farm Service Agency	X*												X*	
U.S. National Guard	X*												X*	
U.S. Post Office		X	X	X		X	X	X		X			X	X
University	X*												X*	

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

Barnes County. Barnes County has a municipal airport located in Valley City. The Barnes County Courthouse, City-County Health District, highway department, and library are also located in Valley City. The county maintains shops in the cities of Dazey, Kathryn, Litchville and Valley City. The county maintains a park at Clausen Springs Dam near Kathryn. The county maintains Bjornson Public Golf Course in Valley City. The N.D. Department of Transportation maintains an office in the county located in Valley City. Barnes County North is a public school located between the cities of Wimbledon and Leal. The U.S. National Guard has a facility in the county located in Valley City. The Barnes County Rural Water District and Barnes County Water Resource District have offices located in Valley City. Valley City State University is the only institute of higher education in the county and is located in Valley City. The U.S. Department of Agriculture, Farm Services Agency and the U.S. Army Corps of Engineers has offices in Barnes County located in Valley City. The county has shelters located at Dazey Community Center, Barnes County North School, Sanborn Community Center, Oriska Elementary School, Litchville Elementary School, Holy Trinity Church in Fingal, and 10 in Valley City. Figures 9.6 and 9.6 show the locations in Barnes County and Valley City. The county does not have a county-specific community center, armory, or swimming pool. There are 4,114 single-family homes, 1,313 multifamily units and 279 mobile homes in Barnes County as of the 2012 American Community Survey. Outside of incorporated jurisdictions, there are 1,643 single-family homes, eight multifamily units and 122 mobile homes.

Dazey. The city of Dazey has a post office, county shop, park, and community center. The park contains playground equipment, basketball and tennis courts, picnic shelter, and baseball field. The community center serves as the official storm shelter and city hall. The city does not have a city shop, library, armory, swimming pool, school, airport or golf course. There are no state government buildings in the city. There are 45 single-family homes, eight multifamily units and no mobile homes in the city of Dazey as of the 2012 American Community Survey.

Fingal. The city of Fingal maintains a city hall/community center, but does not have a county or city shop, library, armory, swimming pool, airport or golf course. The city has a post office and city shop. The city once had a K-12 school, which closed in 2000. The city maintains a park with playground equipment. The Holy Trinity Catholic Church serves as the official storm shelter. There are no county or

state government buildings in the city. There are 47 single-family homes, 13 multifamily units and three mobile homes in the city of Fingal as of the 2012 American Community Survey.

Kathryn. The city of Kathryn maintains a city hall/community center, but does not have a city shop, library, armory, swimming pool, airport or golf course. The city has a post office and county shop. The city maintains a park with playground equipment, a picnic area and basketball court. The fire hall serves as the storm shelter. The city does not have a school. There are no state government buildings in the city. There are 37 single-family homes, no multifamily units and two mobile homes in the city of Kathryn as of the 2012 American Community Survey.

Leal. The city of Leal maintains a park with playground equipment, a picnic areas and a basketball court. The city does not have a city hall, community center, city shop, county shop, library, armory, post office, school, swimming pool, airport or golf course. The fire hall serves as the storm shelter and city hall. There are no county, state or federal government buildings in the city. There are 14 single-family homes and no multifamily units or mobile homes in the city of Leal as of the 2012 American Community Survey.

Litchville. The city of Litchville maintains a city hall/community center, but does not have a city shop, library, armory, swimming pool, airport or golf course. The city has a post office and county shop. The city maintains a park with playground equipment. The city hall/community serves as a storm shelter. The city has an elementary school, which also serves as an official storm shelter. There are no state government buildings in the city. There are 84 single-family homes, 13 multifamily units and three mobile homes in the city of Litchville as of the 2012 American Community Survey.

Nome. The city of Nome has a city hall and post office, and maintains a park with playground, basketball court, picnic shelter, bathroom, swing set, rocking toys, and merry-go-round. The city does not have a community center, city shop, county shop, shelter, library, armory, school, swimming pool, airport or golf course. There are no county or state government buildings in the city. There are 31 single-family homes, two multifamily units and no mobile homes in the city of Nome as of the 2012 American Community Survey.

Oriska. The city of Oriska has an elementary school, which serves as the community center as it has a gymnasium and multipurpose rooms. The school also serves as the official shelter. The St. Bernard Catholic church also serves as a shelter. The city has a post office. The city maintains a park with swings, playground equipment, slides and a baseball diamond. The city does not have a city shop, county shop, armory, swimming pool, airport or golf course. The city has a library at the elementary school. There are no county or state government buildings in the city. There are 41 single-family homes, 12 multifamily units and nine mobile homes in the city of Oriska as of the 2012 American Community Survey.

Pillsbury. The city of Pillsbury maintains a park with playground equipment, swing set, slides, barbeque area and awning with picnic tables. The city does not have a city hall, community center, city shop, county shop, library, armory, swimming pool, airport or golf course. The school closed in 1972 and the post office closed in 2011. There are no county, state or federal government buildings in the city. There

are 17 single-family homes, no multifamily units and two mobile homes in the city of Pillsbury as of the 2012 American Community Survey.

Rogers. The city of Rogers has a post office and maintains a park with playground equipment, grassy areas and bathroom. The city does not have a city hall, community center, city shop, county shop, library, armory, school, swimming pool, airport or golf course. The fire hall serves as the storm shelter. There are no county or state government buildings in the city. There are 29 single-family homes, no multifamily units and two mobile homes in the city of Rogers as of the 2012 American Community Survey.

Sanborn. The city of Sanborn has a post office and maintains a park with playground equipment, outhouse, basketball court, and volleyball court. The city has a city hall/community center and city shop. The city does not have a county shop, library, armory, school, swimming pool, airport or golf course. The fire hall, community center and Sacred Heart Catholic Church serves as the storm shelter. There are no county or state government buildings in the city. There are 84 single-family homes, no multifamily units and nine mobile homes in the city of Sanborn as of the 2012 American Community Survey.

Sibley. The city of Sibley maintains a park with playground equipment and volleyball net. The city does not have a community center, county shop, library, armory, post office, school, swimming pool, airport or golf course. The fire hall serves as the storm shelter and city hall/community center. There are no county, state or federal government buildings in the city. There are 24 single-family homes, 12 multifamily units and eight mobile homes in the city of Sibley as of the 2012 American Community Survey.

Valley City. The city of Valley City has a post office, city hall, community/wellness center, city shop, city/county library, armory, junior high/high school and two elementary schools, swimming pool, airport and two golf courses. The city is also the location of the Barnes County Courthouse, City-County Health District, Barnes County Highway Department, U.S. National Guard, U.S. Department of Agriculture, Farm Services Agency, U.S. Army Corps of Engineers, N.D. Department of Transportation office, Barnes County Rural Water District office, Barnes Rural Water District office, and Valley City State University. The city has a public library which also serves as the county library. The city has a county shop. Shelters are located at Jefferson Elementary School, Hi-Liner Activity Center, Veterans of Foreign Wars, City Auditorium, Valley City Rec Center, Graichen Gym, Robertson Hall, Washington Elementary School, Epworth United Methodist Church and WE Osmon Fieldhouse. For parks and recreation, the city has a campground, nine athletic facilities and 10 parks. The county golf course is located in Valley City. In Valley City, there are 1,924 single-family homes, 1,247 multifamily units and 96 mobile homes as of the 2012 American Community Survey.

Wimbledon. The city of Wimbledon maintains a city hall/community center, but does not have a county shop, library, swimming pool, airport or golf course. The city has a post office and city shop. The city maintains a park with playground equipment. The city has a library at Barnes County North and community books are also available at the post office. The city does not have an armory, but has an American Legion. The city had a school, which closed and was converted into residential units. There are no county or state government buildings in the city. There are 94 single-family homes, no

multifamily units and 21 mobile homes in the city of Wimbledon as of the 2012 American Community Survey. However, the former school was converted into multifamily housing and consists of six units.

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 – Barnes County Jurisdictional Emergency Response Services and Facilities

Emergency Response Services/Facilities	Barnes County	Dazey	Fingal	Kathryn	Leal	Litchville	Nome	Oriska	Pillsbury	Rogers	Sanborn	Sibley	Valley City	Wimbledon
Ambulance	X	*	*	*	*	*	*	*	*	*	*	*	X	*
Ambulance Hall	X												X	
County Sheriff	X												X	
Fire Department		X	X	X	X	X	X	X	*	X	X	X	X	
Fire District		X		X							X		X	X
Fire Hall		X	X	X	X	X	X	X		X	X	X	X	X
First Responders		X	X	X	X	X	X	X	*		X		X	X
Law Enforcement		*	*	*	*	*	*	*	*	*	*	*	X	*
Law Enforcement Building	X												X	

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

Barnes County. Barnes County has a sheriff’s department with its own headquarters in Valley City. The sheriff’s department provides law enforcement services to all jurisdictions in the county. The Valley City Police Department has been deputized by the sheriff’s department. A private company operates Barnes County Ambulance and maintains its own facility. The county does not maintain a county fire department or fire district as fire protection is provided by individual entities. The fire departments and districts also provide first response. The unincorporated jurisdiction of Hastings has a rural fire department.

Dazey. Law enforcement is provided by Barnes County Sheriff. The city does not have any law enforcement buildings. The Dazey Fire Department provides protection to the city and the Dazey Fire District provides fire protection to surrounding rural areas. The Dazey Quick Response Unit has two EMT’s and four first responders. The city has a fire hall. First responders are based in the fire hall. Ambulance service is provided by Barnes County.

Fingal. Law enforcement is provided by Barnes County Sheriff. The city does not have any law enforcement buildings. The Fingal Voluntary Fire Department provides fire protection to the city and has a fire hall. There are four first responders in the city and are based in the fire hall. Ambulance service is provided by Barnes County.

Kathryn. Law enforcement is provided by Barnes County Sheriff. The city does not have any law enforcement buildings. The Kathryn Fire Department provides fire protection to the city and the Oak Hill Fire District provides fire protection to areas surrounding the city. The fire department and district share

a fire hall. There is one first responder in the city and is based in the fire hall. Ambulance service is provided by Barnes County.

Leal. Law enforcement is provided by Barnes County Sheriff. The city does not have any law enforcement buildings. The Edna Township Rural Fire Department provides fire protection to the city and surrounding area and has a fire hall. There is one first responder in the city and is based in the fire hall. The first responder takes calls from Jamestown or Valley City and is certified through the Wimbledon Fire Department. Ambulance service is provided by Barnes County.

Litchville. Law enforcement is provided by Barnes County Sheriff. The city does not have any law enforcement buildings. The Litchville Fire Department provides fire protection to the city and has a fire hall located on east main. There are eight first responders in the city and are based in the fire hall. Ambulance service is provided by Barnes County.

Nome. Law enforcement is provided by Barnes County Sheriff. The city does not have any law enforcement buildings. The Nome Fire Department provides fire protection to the city and has a fire hall. There are first responders living south of the city and are based in the fire hall. Ambulance service is provided by Barnes County.

Oriska. Law enforcement is provided by Barnes County Sheriff. The city does not have any law enforcement buildings. The Oriska Fire Department provides fire protection to the city and has a fire hall. The city does not have any first responders. Ambulance service is provided by Barnes County.

Pillsbury. Law enforcement is provided by Barnes County Sheriff. The city does not have any law enforcement buildings. The Hope Fire Department in neighboring Steele County provides fire protection and first responders to the city. Ambulance service is provided by Barnes County.

Rogers. Law enforcement is provided by Barnes County Sheriff. The city does not have any law enforcement buildings. The Rogers Volunteer Fire Department provides fire protection to the city. Ambulance service is provided by Barnes County.

Sanborn. Law enforcement is provided by Barnes County Sheriff. The city does not have any law enforcement buildings. The Sanborn Volunteer Fire Department provides fire protection to the city and the Sanborn Rural Fire Protection District provides fire protection to the surrounding area. The fire department and district share a fire hall. The city has 18 first responders, which are based in the fire hall. Ambulance service is provided by Barnes County.

Sibley. Law enforcement is provided by Barnes County Sheriff. The city does not have any law enforcement buildings. The Sibley Fire Department provides fire protection to the city and has a fire hall. The city does not have any first responders. Ambulance service is provided by Barnes County.

Valley City. Law enforcement is provided by the Valley City Police Department. The police department has a police station adjacent to the Valley City City Hall. The Valley City Fire Department provides fire protection to the city while the Valley City Rural Fire Department provides fire protection to surrounding areas. The city has first responders and the fire department maintains a rescue squad. Both are based in

the Valley City Fire Hall located adjacent to the Valley City City Hall. Ambulance service is provided by Barnes County. The ambulance has a facility located near west main in Valley City.

Wimbledon. Law enforcement is provided by Barnes County Sheriff. The city does not have any law enforcement buildings. The Wimbledon Fire District provides fire protection to the city and surrounding areas. The fire district has a fire hall. The city has 12 first responders, which are based in the fire hall. Ambulance service is provided by Barnes County and the city of Jamestown.

Table 4.8 shows the utility providers for jurisdictions in Barnes 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 Barnes County

Utility Providers	Barnes County	Dazey	Fingal	Kathryn	Leal	Litchville	Nome	Oriska	Pillsbury	Rogers	Sanborn	Sibley	Valley City	Wimbledon
Barnes Rural Water District	X	X	X	*	X	X	X	X		X	X			X
Bek Communications	X							X					X	
Cable Service, Inc. (CSI)	X												X	
Dakota Central (Daktel)	X													X
Dakota Rural Water District									X			X		
Dickey Rural Networks (DRN)	X			X		X								
Fuel Oil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Individual Wells	X	X		X										
Inter-Community Telephone Company (ICTC)	X	X	X		X		X		X	X	X	X	X	
Mid-Continent	X													X
Montana-Dakota Utilities (MDU)	X							X			X		X	
Otter Tail Power	X	X	X	X	X	X	X	X	X	X	X	X		X
Propane	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Qwest	X												X	
Satellite/DirecTV	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Valley City Public Works													X	

*Denotes jurisdiction with utility provided by the marked entity scheduled for implementation in the future.

Barnes County. Drinking water is provided by Barnes Rural Water District, Dakota Rural Water District and individual wells. Electricity in Barnes County is provided by Otter Tail Power. Natural gas is provided Montana-Dakota Utilities (MDU). Fuel Oil and Propane is used as an alternative heating source and is provided by companies chosen by the individual consumer. Bek Communications, Cable Service, Inc. (CSI), Dakota Central (Daktel), Dickey Rural Networks (DRN), Inter-Community Telephone Company (ICTC), Mid-Continent, Qwest and satellite/DirecTV provide phone, internet and cable.

Dazey. Drinking water is provided by Barnes Rural Water District. The city always maintains a well. Electricity is provided by Otter Tail Power. Natural gas is not available in the city of Dazey. Fuel Oil

and Propane is used as an alternative heating source and is provided by companies chosen by the individual consumer. ICTC provides phone and internet. Cable is provided either through satellite or DirecTV.

Fingal. Drinking water is provided by Barnes Rural Water District. Electricity is provided by Otter Tail Power. Natural gas is not available in the city of Fingal. Fuel Oil and Propane is used as an alternative heating source and is provided by companies chosen by the individual consumer. ICTC provides phone and internet. Cable is provided either through satellite or DirecTV.

Kathryn. Drinking water is provided by a city well and reservoir fed by a natural spring. However, the city is scheduled to receive drinking water from Barnes Rural Water District in 2015. Electricity is provided by Otter Tail Power. Natural gas is not available in the city of Kathryn. Fuel Oil and Propane is used as an alternative heating source and is provided by companies chosen by the individual consumer. DRN provides phone and internet. Cable is provided either through satellite or DirecTV.

Leal. Drinking water is provided by Barnes Rural Water District. Electricity is provided by Otter Tail Power. Natural gas is not available in the city of Leal. Fuel Oil and Propane is used as an alternative heating source and is provided by companies chosen by the individual consumer. ICTC provides phone and internet. Cable is provided either through satellite or DirecTV.

Litchville. Drinking water is provided by Barnes Rural Water District. Electricity is provided by Otter Tail Power. Natural gas is not available in the city of Litchville. Fuel Oil and Propane is used as an alternative heating source and is provided by companies chosen by the individual consumer. DRN provides phone and internet. Cable is provided either through satellite or DirecTV.

Nome. Drinking water is provided by Barnes Rural Water District. Electricity is provided by Otter Tail Power. Natural gas is not available in the city of Nome. Fuel Oil and Propane is used as an alternative heating source and is provided by companies chosen by the individual consumer. ICTC provides phone and internet. Cable is provided either through satellite or DirecTV.

Oriska. Drinking water is provided by Barnes Rural Water District. Electricity is provided by Otter Tail Power. MDU provides natural gas to the city. Fuel Oil and Propane is used as an alternative heating source and is provided by companies chosen by the individual consumer. Bek Communications provides phone and internet. Cable is provided either through satellite or DirecTV.

Pillsbury. Drinking water is provided by Dakota Rural Water District. Electricity is provided by Otter Tail Power. Natural gas is not available in the city of Pillsbury. Fuel Oil and Propane is used as an alternative heating source and is provided by companies chosen by the individual consumer. ICTC provides phone and internet. Cable is provided either through satellite or DirecTV.

Rogers. Drinking water is provided by Barnes Rural Water District. Electricity is provided by Otter Tail Power. Natural gas is not available in the city of Rogers. Fuel Oil and Propane is used as an alternative heating source and is provided by companies chosen by the individual consumer. ICTC provides phone and internet. Cable is provided either through satellite or DirecTV.

Sanborn. Drinking water is provided by Barnes Rural Water District. Electricity is provided by Otter Tail Power. MDU provides natural gas to the city. Fuel Oil and Propane is used as an alternative heating source and is provided by companies chosen by the individual consumer. ICTC provides phone and internet. Cable is provided either through satellite or DirecTV.

Sibley. Drinking water is provided by Dakota Rural Water District. Electricity is provided by Otter Tail Power. Natural gas is not available in the city of Sibley. Fuel Oil and Propane is used as an alternative heating source and is provided by companies chosen by the individual consumer. ICTC provides phone and internet. Cable is provided either through satellite or DirecTV.

Valley City. Drinking water and electricity is provided by Valley City Public Works. Electricity is provided by Otter Tail Power. MDU provides natural gas to the city. Fuel Oil and Propane is used as an alternative heating source and is provided by companies chosen by the individual consumer. Bek Communications, CSI, ICTC, and Qwest provide phone and internet. Cable is provided either through Qwest, satellite or DirecTV.

Wimbledon. Drinking water is provided by Barnes Rural Water District. Electricity is provided by Otter Tail Power. Natural gas is not available in the city of Wimbledon. Fuel Oil and Propane is used as an alternative heating source and is provided by companies chosen by the individual consumer. Daktel and Mid-continent provide phone and internet. Cable is provided either through satellite or DirecTV.

County and City-Owned Buildings and Property

Information on county-owned buildings and the insurance limit valuation for the year 2013 was provided by the Barnes County Auditor’s Office and is summarized in Table 4.9. Information on county and city-owned buildings is important in mitigation to understand the potential losses and what public assets are at risk to hazards. The insurance limit valuation includes the building and all contents contained therein. The structure in Wimbledon also includes outdoor property.

Of the incorporated cities in Barnes County, the city of Valley City contains the most county-owned buildings with 19 valued at \$19,461,931. The city of Kathryn has two buildings while the cities of Dazey and Wimbledon, and unincorporated Eckelson has one building each.

Table 4.9 – 2013 County-Owned Buildings and Insurance Limit Valuation

Barnes County		
City	Number of Properties	Insurance Limit Valuation (total, all properties)
Dazey	1	\$68,148
Eckelson (unincorporated)	1	\$61,631
Kathryn	2	\$72,188
Valley City	19	\$19,461,931
Wimbledon	1	\$452,825
Total	24	\$20,116,723

Source: Barnes County Auditor’s Office; North Dakota Insurance Department

The following critical facilities and infrastructure shown in Table 4.10 are owned by local governments in Barnes 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. As listed in the 2014 NDMHMP, these facilities and infrastructure include the following: county courthouses, city halls, community centers, pump houses, ambulance buildings, road shops, lift stations, jails, park facilities, water and wastewater treatment plants, fire stations, museums, warning sirens, municipal airport facilities and storage buildings. However, a description of how these facilities were classified – whether they are buildings or outdoor properties – was not included.

A total of 104 building properties were identified with a total value of \$52,153,787 or \$511,094 per building. The local governments also own 49 personal property policies valued at \$6,742,328, or \$137,599 per policy. There is a total of 41 outdoor properties in the county valued at \$6,084,950, or \$148,413 per property. There are no trailer properties owned by local jurisdictions in Barnes County. The total value of buildings, personal property and outdoor properties is \$64,981,065.

Table 4.10 – 2013 Critical Facilities and Infrastructure Owned by Local Governments

County	# of Building Properties	Building Property Value	# of Personal Property Policies	Personal Property Value
Barnes	104	\$52,153,787	49	\$6,742,328
# of Outdoor Properties	Outdoor Property Value	# of Trailer Properties	Trailer Property Value	Total Value
41	\$6,084,950	0	\$0	\$64,981,065

Source: 2014 North Dakota Multi-Hazard Mitigation Plan

Comparison of data provided by the Barnes County Auditor’s Office and the 2014 NDMHMP on buildings and property owned by local governments reveals that local jurisdictions aside from the county own approximately 170 buildings and personal properties valued at approximately \$44,864,342, or roughly \$263,910 per building, including personal property.

Transportation System

The county is highly dependent upon its network of federal, state, county roads, and highways. Interstate 94 and N.D. State Highways 9, 26, and 46 are the major east-west bound routes across the county. N.D. State Highways 1 and 32 are major north-south bound routes. Figure 9.7 in Chapter 9 shows the highway system in Barnes County. Figure 9.19 shows the township grade raises that have been completed utilizing hazard mitigation funds and future road mitigation sites in the county in Chapter 9. Figure 9.20 in Chapter 9 shows the load restrictions of the Barnes County Road System.

Evacuation Routes

Barnes County Emergency Management has designated official evacuation routes for each incorporated jurisdiction in the county. Evacuation routes are necessary in mitigation to reduce or eliminate loss of life and injury during hazards. Figures 9.8 to 9.18 in Chapter 9 show the evacuation routes in incorporated jurisdictions in the county, which are highlighted in red.

Freight Railroad Operated in Barnes County

According to the 2007 North Dakota State Rail Plan, two railroad companies operate three freight rail lines in Barnes County. The Burlington Northern Santa Fe Railway (BNSF) operates the Surrey Junction-Mandan and the Fargo-Minot line, and the Canadian Pacific Railway (CPR) operates Enderlin-Harvey line. 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. The railroads in Barnes County are classified as short-line/regional rail lines. Table 4.11 summarizes information on freight railroads operated in Barnes County. Figure 9.1 in Chapter 9 shows the extent of the freight railroad transportation system in Barnes County.

The Fargo-Minot line, operated by the BNSF carrier, runs approximately 203.2 miles from Fargo to Minot and connects to the Jamestown Subdivision mainline at the Surrey Junction, and to the Devils Lake Subdivision mainline at the Surrey station. The line has a maximum speed of 60 mph. The maximum carload is 143 tons. Data from 2004 shows that 15.9 million bushels of grain were generated on the line in 2004, generating approximately 3,906 carloads of grain. The line traverses the extreme northeast corner of Barnes County and impacts the city of Pillsbury.

Table 4.11 – 2007 Freight Railroad Operated in Barnes County

Railroad	Rail Line	Subdivision	Length in Miles	Max Speed	Max. Carload	Tons Generated*
Burlington Northern Santa Fe (BNSF)	Fargo-Minot line	KO Subdivision	203.2	60 mph	143 tons	494,447
Burlington Northern Santa Fe (BNSF)	Surrey Junction-Mandan line	Jamestown Subdivision	200.3	60 mph	143 tons	723,304
Canadian Pacific Railway (CPR)	Enderlin-Harvey line	Carrington Subdivision	139.2	49 mph	143 tons	570,831

* Tons generated are based on a 3-year average from 2002 to 2004.

Source: North Dakota State Rail Plan, 2007

The Surrey Junction-Mandan line, operated by the BNSF carrier, connects to the KO Subdivision at Surrey Junction and traverses 169.1 miles to the Mandan station. The line has a maximum speed of 60 mph. The maximum carload capacity is 143 tons. Data from 2004 states that 23.8 million bushels of grain were transported on the line in 2004, generating approximately 6,332 carloads. The line bisects the county from west to east and impacts the incorporated cities of Sanborn, Valley City, and Oriska. The line impacts the unincorporated cities of Berea, Eckelson, Koldok, Peak, and Urbana.

The Enderlin-Harvey line, operated by the CPR carrier, extends diagonally across the state of North Dakota. The segment traversing through Barnes County is approximately 139.2 miles in length and impacts the incorporated cities of Fingal, Leal, Rogers, Valley City, and Wimbledon. The line also impacts the unincorporated cities of Cuba, Lucca, and North Valley City. The line has a maximum speed of 49 mph. and a maximum carload capacity of 143 tons. Data from 2004 shows that 22.3 million bushels of grain were transported on the line generating 5,795 carloads.

Barnes County Bridges

There are a total of 11 structurally deficient and functionally obsolete bridges in Barnes County as shown in the 2014 NDMHMP from information provided by the North Dakota Department of Transportation. A total of seven bridges are state structures; three are structurally deficient and four are functionally obsolete. A total of three bridges are county structures; two are structurally deficient and one is functionally obsolete. There is one functionally obsolete urban bridge in the county. In addition, there are a total of two scour bridges located in Barnes County as shown in the 2014 NDMHMP from information provided by the North Dakota Department of Transportation. Both bridges are county-owned. A bridge is scour critical if the bridge foundation is determined to be unstable for the calculated scour conditions and are especially vulnerable during flooding. Figures 9.19 and 9.20 in Chapter 9 show the township grade raises that have been completed utilizing hazard mitigation funds and future road mitigation sites, and the load restrictions of the Barnes County Road System.

Barnes County Airports

Information regarding airports in Barnes County is summarized in Table 4.12 and was obtained from the ND Aeronautics Commission (NDAC), the 2014 NDMHMP 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 that publishes aeronautical and airport information released by the Federal Aviation Administration (FAA).

There is one airport in Barnes County located in Valley City. The data shown for aircraft operations was collected for a 12-month period from Air NAV ending July 2011.

Table 4.12 – Barnes County Airports

Airport	Jurisdiction	Aircraft Operations July 2010 to July 2011			
Barnes County Municipal Airport	Valley City	Operations avg. 21/day	58 percent local general aviation	38 percent transient general aviation	3 percent air taxi, <1 percent military

Sources: ND Aeronautics Commission, AirNAV, 2014 NDMHMP

The Barnes County Municipal Airport reported an average of 21 aircraft operations per day, consisting of 58 percent local general aviation, 38 percent transient general aviation, three percent air taxi and less than one percent military. The airport is located approximately one-mile northwest of the city’s main street and is situated at an elevation of 1,402 feet above sea level.

It should be noted that information was available for one municipal airport in Barnes County. However, many private airstrips are located throughout the county and are used for spraying of crops for agricultural purposes. The location and size of these airstrips is not available. Oral history gathered from residents of Barnes County through jurisdiction meetings revealed that nearly all air crashes occurring in the county involved planes used for spraying of crops and originated from privately-owned air strips.

Figure 9.21 in Chapter 9 is an aerial photograph of the Barnes County Municipal Airport.

Medical Facilities

Locations of medical facilities in Barnes County was collected 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 4.13 summarizes these facilities.

Mercy Hospital located in Valley City is the only hospital in Barnes County and was founded in 1928. The hospital is a critical access hospital. The hospital is open 24/7 and provides 25 beds and two operating rooms. Services provided by the hospital are shown in Table 4.13. Areas of expertise provided by hospital by staff include: family medicine, general surgery, hematology/oncology, internal medicine, ophthalmology/cataract surgery, orthopedics and sports medicine, dentistry, and podiatry. An expanded list of services provided by the hospital are shown in Table 4.13.

The Sanford Health-Valley City Clinic is open 8 a.m. to 5 p.m. Monday through Friday and 9:30 a.m. to 12:00 p.m. Saturday. Mammography hours are 8:30 a.m. to 2:00 p.m. on Wednesdays. Services are shown in Table 4.13.

The Essentia Health-Valley City Clinic is open 8 a.m. to 5 p.m. Monday through Friday. Services are shown in Table 4.13.

Table 4.13 – 2014 Barnes County Medical Facilities

Facility Name	City	Capacity	Services
Mercy Hospital	Valley City	25 beds, two operating rooms	Ambulatory care, cardiac rehab, emergency services, home care, home medical equipment, imaging, inpatient, laboratory, nutritional, occupational therapy, organ & tissue donation, PADnet studies, physical therapy, respiratory therapy, sleep studies, social & behavioral, spiritual, stress testing, surgical services
Sanford Health	Valley City	20 exam rooms, 2 procedure rooms	Dermatology, family medicine, geriatric medicine, hematology, internal medicine, mammography, medical oncology, nephrology, nurse navigator, orthopedic surgery, pediatrics, podiatry, radiology, sleep medicine, surgery, urology, vascular surgery
Essentia Health	Valley City	--	Chiropractic, diabetes dietitian, family medicine, internal medicine, orthopedics/surgery, podiatry, sports medicine, general surgery

Source: Essentia Health-Valley City Clinic, Mercy Hospital, Sanford Health-Valley City Clinic

Special Needs/Age Restricted Facilities

Barnes County has nine facilities housing the elderly or individuals with special needs. Information on these facilities was provided by the Housing Needs Assessment for The North Dakota Planning Region VI. The needs assessment was conducted in 2013. Information to show populations that would need assistance in evacuation during times of hazards is included; facilities catering to special population groups such as the disabled, elderly and incarcerated are often more vulnerable during disasters. Information on these facilities is summarized in Table 4.14.

There are a total of 87 subsidized/affordable adult/few services senior housing units, 86 market rate adult/few services senior housing units and 87 market rate assisted living senior housing units for a total of 260 special needs/age-restricted housing units in Barnes County. No market rate independent/active adult rental or for-sale units, market rate congregate/optional services, memory care or skilled nursing units were identified in the county.

Table 4.14 – 2013 Special Needs/Age Restricted Facilities in Barnes County

Building Name	Type	City	Total Units
Rudolf Square Apartments	Subsidized/Affordable Adult/Few Services	Valley City	47
Sky Villa	Subsidized/Affordable Adult/Few Services	Valley City	40
Elks Apartments	Market Rate Adult/Few Services	Valley City	12
Landmark II Apartments	Market Rate Adult/Few Services	Valley City	28
Rainbow Apartments	Market Rate Adult/Few Services	Valley City	13
Greystone Apartments	Market Rate Adult/Few Services	Valley City	16
Landmark I Apartments	Market Rate Adult/Few Services	Valley City	17
Bridgeview Estates	Market Rate Assisted Living	Valley City	44
The Legacy Place	Market Rate Assisted Living	Valley City	43

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

Primary Education

Students in Barnes County attend six schools located in the county: Barnes County North Public School located in rural Barnes County between Wimbledon and Leal, Oriska Elementary School in Oriska, Litchville-Marion Elementary School in Litchville, Jefferson Elementary School in Valley City, Valley City Junior-Senior High School in Valley City, and Washington Elementary School in Valley City. Table 4.15 summarizes enrollments of the schools.

Table 4.15 – 2009 to 2014 Enrollment of Schools Located in Barnes County

Location	School	School District	Enrollment Year					
			2009	2010	2011	2012	2013	2014
Barnes County	Barnes County North Public School	Barnes County North 7	149	154	138	137	139	276
Litchville	Litchville-Marion Elem. School	Litchville-Marion 46	53	53	46	45	50	55
Oriska	Oriska Elem. School	Maple Valley 4	45	59	48	47	49	47
Valley City	Jefferson Elem. School	Valley City 2	304	318	354	358	344	332
Valley City	Valley City Jr.-Sr. High School	Valley City 2	552	519	567	527	526	517
Valley City	Washington Elem. School	Valley City 2	223	242	208	220	237	235

Source: North Dakota Department of Public Instruction

Information on the enrollment of the schools located in Barnes County was provided by the ND Office of Public Instruction. Enrollment figures for schools located in Barnes County are shown instead of school district totals to show the number of students physically attending instruction within county boundaries. Information on the number of students at education buildings in the county are needed for mitigation to identify vulnerable populations that would need assistance in evacuating during hazard events. School

buildings also can serve as an unofficial shelter for residents. Transportation of students to and from schools and for activities also increases transportation risks. Figure 9.22 in Chapter 9 shows the geographic extent of each school district serving Barnes County students.

The Barnes County North 7 School District covers areas in northwest Barnes County. The school opened in fall 2013 and combined North Central-Rogers and Wimbledon-Courtenay school districts.

The Litchville-Marion 46 School District covers areas of southwest Barnes County. The district's elementary school is located in the city of Litchville. The district's high school is located in Marion in neighboring LaMoure County.

The Maple Valley 4 School District covers areas of east-central Barnes County. The elementary school for the district is located in the city of Oriska. The high school for the district is located in Tower City in neighboring Cass County. The district also includes West Elementary School in Buffalo in neighboring Cass County and Wheatland Colony School on a hutterite colony near Tower City.

The Valley City 2 School District covers areas of central Barnes County. The district includes Jefferson Elementary School and Washington Elementary, and Valley City Junior-Senior High School in Valley City.

School districts covering geographic areas in Barnes County where students can attend instruction, but do not have school buildings in the county, include: Montpelier School District in Stutsman County, Griggs County School District, Enderlin School District in Ransom County, and the Hope-Page School District in Steele County.

Higher and Secondary Education

There is one public university and one vocational technology school in Barnes County. Both are located in Valley City. There are no public or private universities, colleges or vocational technology centers in Barnes County. Table 4.16 summarizes enrollments of the institutions in Barnes County. Information on the number of students living in campus housing is also shown for Valley City State University (VCSU). Information on the location of primary education buildings and then number of students living in campus dormitories are needed for mitigation to identify vulnerable populations that would need assistance in evacuating during hazard events. Buildings on campus of higher and secondary education also can serve as an unofficial shelter for residents.

Valley City State University in Valley City, Barnes County, is a four-year institution in the North Dakota University System, that offers more than 80 degree programs in teacher education, information technology, business, communication arts, social science, math, science, health, physical education, art, music, and fish and wildlife, and offers degrees in nursing in partnership with Dakota College in Bottineau. VCSU offers the only undergraduate software engineering degree in North Dakota. Online and distance education options include a Master of Education (M.Ed.), graduate and undergraduate programs in Technology Education, and an endorsement in English Language Learners (ELL)/English as a Second Language (ESL).

Enrollment numbers for VCSU show official census of total undergraduate headcount taken at the 4th week of fall semester. Graduate school students are not included as all graduate programs at VCSU are based online. The total capacity of on-campus housing beds at VCSU is shown to understand the highest number of possible students living on-campus despite occupancy rates averaging 70 percent per academic year.

Enrollment numbers for Sheyenne Valley Area Career & Tech Center show the number of student attending classes on campus and do not reflect students taking courses conducted via interactive television (ITV). The enrollment numbers shown represent totals for the fall of that academic school year (i.e. 2014-2015).

Table 4.16 – 2008 to 2013 Higher and Secondary Education Institution Enrollments and On-Campus Housing

Institution	Number of Students by School Year						
	2008	2009	2010	2011	2012	2013	2014
Sheyenne Valley Area Career & Tech Center	--	161	143	130	136	176	200
Valley City State University Enrollment	900	961	1,138	1,227	1,214	1,211	1,234
Valley City State University – On-Campus Student Housing Capacity (beds)					517	517	517

Source: Valley City State University Registrar's Office, Valley City State University Department of Housing, Sheyenne Valley Career & Technology Center

Housing Units

Information on housing units for Barnes 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 in 2010, and the 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.

As of 2010, Barnes County contained 5,704 housing units in a total area of 1,513 square miles, resulting in 3.8 housing units per square mile. The median year built for structures was 1962 and the median value of owner-occupied housing units was \$84,000. The densest jurisdictions in the county were, in descending order, the cities of Valley City, Wimbledon, Oriska, Dazey and Sanborn with 955.8, 225.5, 225.0, 147.4, and 145.5 housing units per square mile, respectively. Valley City had the highest median value of owner-occupied housing units at \$88,000. The city of Litchville had the lowest at \$26,300.

Data on the median year built for structures and median value of owner-occupied housing units was not available for the cities of Dazey, Fingal, Kathryn, Leal, Nome, Oriska, Pillsbury, Rogers, and Sibley. The median value of owner-occupied housing units was available for the city of Sanborn, but the median year built for structures was not.

Table 4.17 – 2010 & 2011 Barnes County Housing Units Statistics

	Number of Housing Units 2010	Total Area Per Square Mile	Number of Housing Units per Square Mile	Median Year Housing Unit Built 2011	Median Value of Owner-Occupied Housing Units 2011
Barnes Co.	5,704	1,513	3.8	1962	\$84,000
Dazey	56	0.38	147.4	–	–
Fingal	57	0.42	135.7	–	–
Kathryn	37	0.59	62.7	–	–
Leal	11	0.14	78.6	–	–
Litchville	98	1.48	66.2	1947	\$26,300
Nome	35	0.41	85.4	–	–
Oriska	63	0.28	225.0	–	–
Pillsbury	12	0.26	46.2	–	–
Rogers	28	0.98	28.6	–	–
Sanborn	80	0.55	145.5	–	\$43,800
Sibley	50	0.40	125.0	–	–
Valley City	3,307	3.46	955.8	1965	\$88,000
Wimbledon	119	0.53	225.5	1961	\$48,900

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

New Development

Building permits are required for value-added and new construction projects. This includes both inside and outside work on a home or business. Building permits are not required for maintenance work such as painting, replacement of windows, floor covering, or shingles. Trends in new development is critical to for mitigation to understand where potential mitigation projects are needed currently and in the future based on growth trends and the valuation in overall real estate and economic investments. Building permit data for Valley City is summarized in Table 4.18.

Table 4.18 – 2004 to October 2014 Valley City Building Permit Data

Historical Building Permit Report for the City of Valley City											
Year	# of Permits	BUILDER ESTIMATED COST									ANNUAL TOTALS
		Residential			Commercial			Institutional			
		New	Additions	Updates	New	Additions	Updates	New	Additions	Updates	
2004	115	\$ 535,560	\$ 262,950	\$ 230,027	\$ 1,377,200	\$ 1,224,000	\$ 114,389	\$ 770,000	\$ 445,000	\$ 2,125,849	\$ 7,084,975
2005	100	\$ 2,217,500	\$ 548,000	\$ 242,300	\$ 6,164,550	\$ 1,419,500	\$ 683,000	\$ 5,500	\$ -	\$ 82,000	\$ 11,362,350
2006	72	\$ 3,814,400	\$ 397,400	\$ 112,000	\$ 2,962,100	\$ 1,860,000	\$ 627,500	\$ 900,000	\$ -	\$ -	\$ 10,673,400
2007	88	\$ 1,477,400	\$ 397,200	\$ 162,700	\$ 1,818,000	\$ 1,210,000	\$ 459,500	\$ 415,000	\$ -	\$ 39,000	\$ 5,978,800
2008	83	\$ 2,524,400	\$ 396,500	\$ 386,021	\$ 2,145,209	\$ 216,359	\$ 75,000	\$ 5,175,000	\$ -	\$ 706,000	\$ 11,624,489
2009	146	\$ 1,654,210	\$ 251,900	\$ 231,610	\$ 550,000	\$ 796,500	\$ 543,790	\$ 600,000	\$ 1,556,854	\$ -	\$ 6,184,864
2010	113	\$ 1,070,980	\$ 159,300	\$ 161,150	\$ 1,307,000	\$ 361,300	\$ 189,500	\$ 145,260	\$ 950,000	\$ 3,262,030	\$ 7,606,520
2011	73	\$ 700,180	\$ 272,600	\$ 108,610	\$ 1,328,415	\$ 600,000	\$ 202,000	\$ 21,082,290	\$ -	\$ 118,900	\$ 24,412,995
2012	106	\$ 2,939,528	\$ 200,000	\$ 134,630	\$ 1,626,500	\$ 249,200	\$ 1,153,300	\$ 239,000	\$ -	\$ 269,570	\$ 6,811,728
2013	5	\$ 2,561,150	\$ 229,000	\$ 127,920	\$ 1,577,000	\$ 11,230,000	\$ 315,000	\$ 6,000	\$ -	\$ 15,000	\$ 16,061,070
2014	118	\$ 3,405,516	\$ 126,555	\$ 223,773	\$ 6,591,454	\$ 150,000	\$ 660,000	\$ 1,138,110	\$ 384,500	\$ 255,000	\$ 12,934,908
2015											\$ -
2016											\$ -
2017											\$ -
Total from 2004 to October 2014	1,019	\$ 22,900,824	\$ 3,241,405	\$ 2,120,741	\$ 27,447,428	\$ 19,316,859	\$ 5,022,979	\$ 30,476,160	\$ 3,336,354	\$ 6,873,349	\$ 120,736,099

Source: Valley City City Inspector Dave Andersen

Future Development

There are several development projects currently under construction or planned in Barnes County. Each development project is detailed below. Due to the amount of building and development in Valley City only major construction projects are discussed.

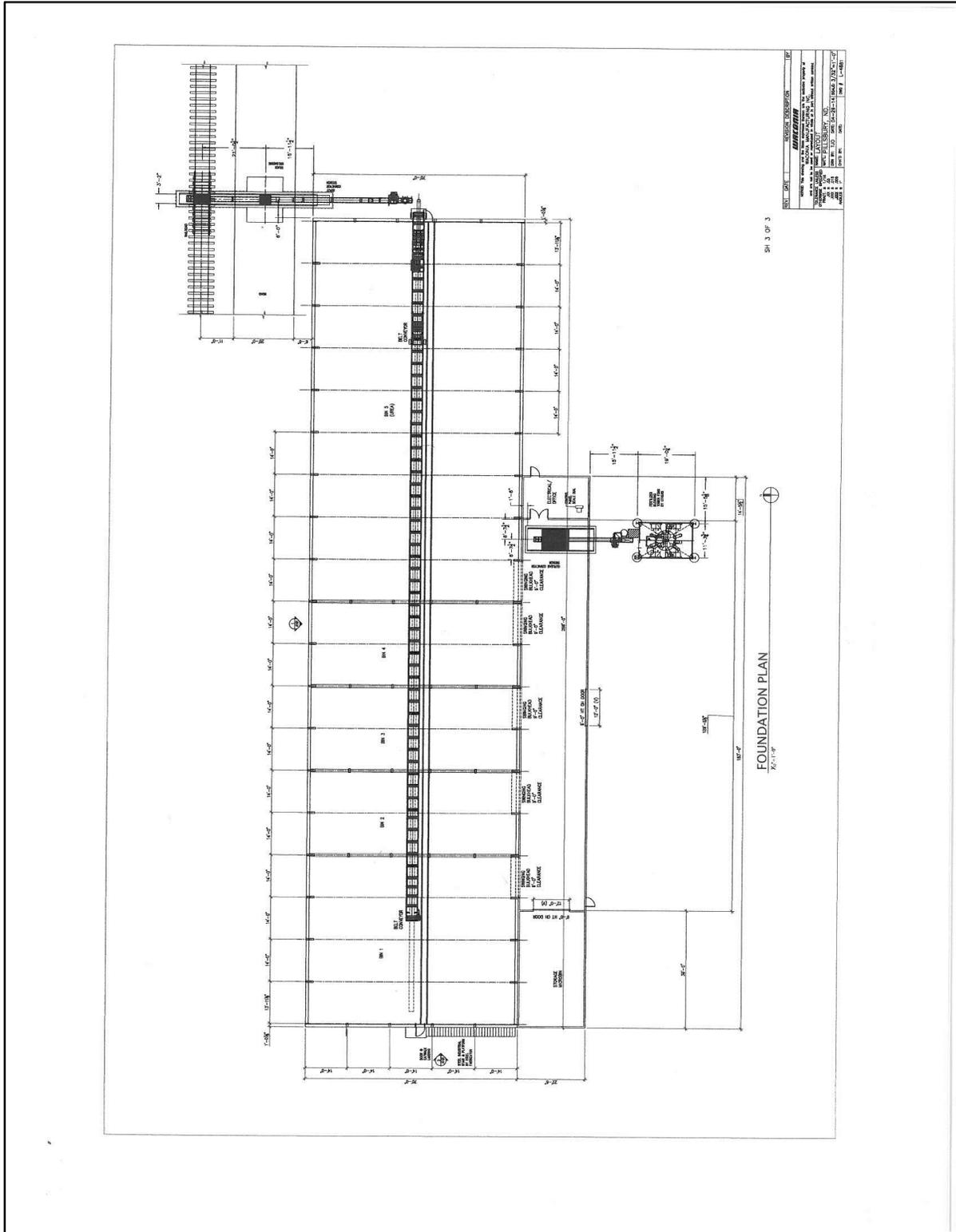
Valley City

- First Community Credit Union constructed a new bank located at 115 5th Avenue NE. The project started in early 2013 and is complete. The project was valued at \$760,000.
- Valley Realty is constructed a 42-plex located at 855 12th Street NW. The project will feature income-restricted housing units. The project is valued at \$3,000,000.
- Enterprise Sales is constructing a new building located at 325 Wintershow Road SW. The project is valued at \$865,000.
- John Deere Seeding Group built an addition onto their facility located at 1725 7th Street SE. The project started in 2013. The addition is valued at \$9,500,000

Ellsbury Township

- Arthur Grain Company is constructing a fertilizer sales building in Ellsbury Township. Figure 4.3 on the following page shows the layout of the fertilizer building, legs, and conveyors.

Figure 4.2 – Arthur Grain Company Fertilizer Sales Building Layout



Source: Barnes County Auditor's Office

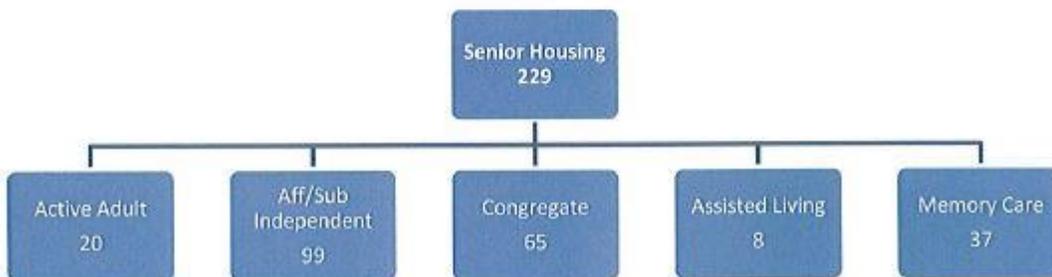
Figure 4.3 shows projected demand for housing in Barnes County from 2012 to 2020 from the Housing Needs Assessment for The North Dakota Planning Region VI. Projected increases in housing is critical to understanding where emergency services will be needed and where mitigation projects will have the great impact to mitigate hazards. Between 2012 and 2020, there will be a need for an additional 379 units of general occupancy housing, which consists of for-sale residential units and rental residents units, and 229 senior housing units. The need for additional of senior housing units indicates there will be growth in vulnerable populations in Barnes County if housing is built to accommodate this population.

Figure 4.3 – 2012 to 2020 Projected General Occupancy Demand Barnes County

Barnes County Projected General Occupancy Demand, 2012 – 2020



Barnes 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

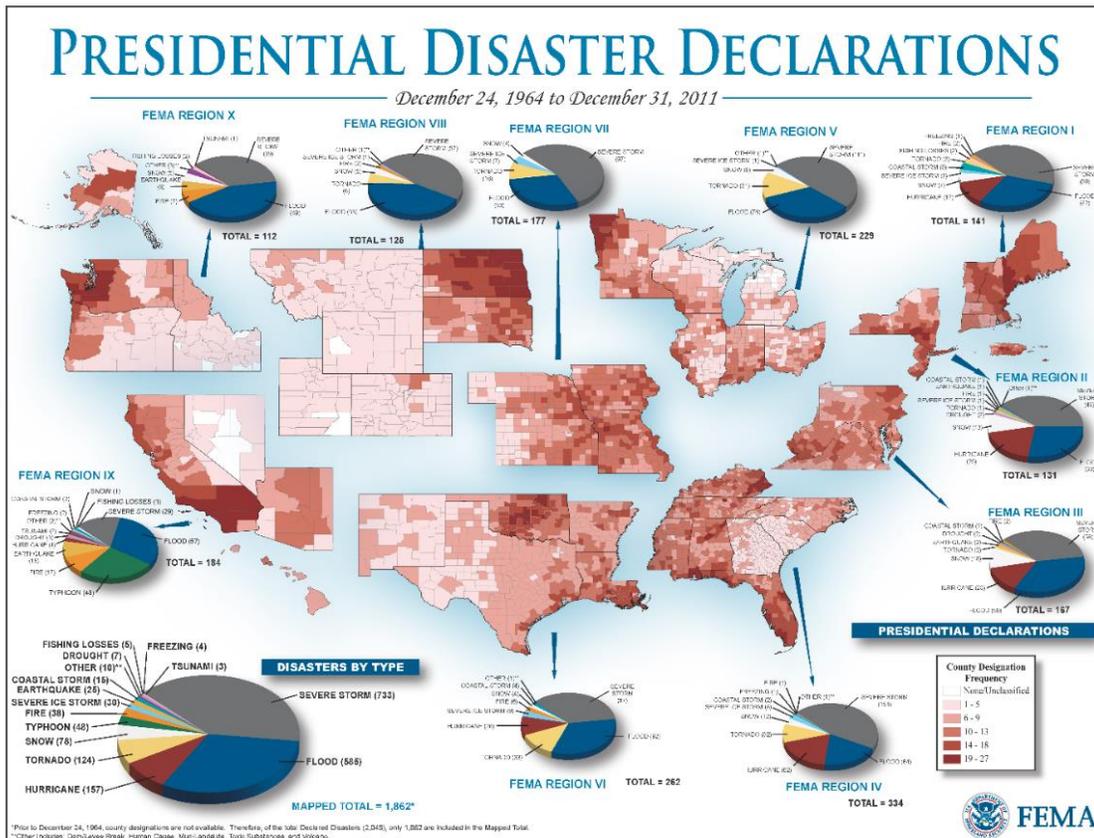
5. Threat and Hazard Identification and Risk Assessment

Barnes County has a history of damages to crops, livestock, people and property from natural and man-made disasters. In the updating of this plan, the Planning Committee and county and city officials identified 14 hazards and threats 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 Barnes County and its jurisdictions for each of the 14 hazards.

The 14 hazards and threats are:

- Communicable Disease
- Dam Failure
- Drought
- Flood
- Geologic Hazard
- 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
- Windstorm

Figure 5.1 – 1964 to 2011 Presidential Disaster Declaration Frequency by FEMA Region



Source: Federal Emergency Management Agency

Barnes 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 Barnes County are among areas in the nation with the most presidential disaster declarations in the past 50 years.

As indicated in Figure 5.1, Barnes County and the eastern third of North Dakota have had high frequencies of 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 Barnes County pertaining to these disasters.

Characteristics describing each hazard in the hazard profiles are in the risk assessment for Barnes County. Data for this plan was obtained from the 2014 North Dakota Multi-Hazard Mitigation Plan (ND MHMP), FEMA websites, and other agency sources. History in each hazard profile is a summation of data collected from National Oceanic and Atmosphere Administration (NOAA); National Climatic Data Center (NCDC); the Special Hazard Event and Losses Database for the United States (SHELDUS); local newspapers; city, county and state records; and oral history from county residents.

Data used to conduct the risk assessment included the 2010 Barnes County Multi-Hazard Mitigation Plan; updated hazard history based on information from NOAA, NCDC, SHELDUS, local newspapers, and state and local data; and a risk assessment conducted with each jurisdiction in Barnes County. Each risk assessment was conducted using the following process:

Impact is what damage or losses the hazard causes in a community.

- Scored 1 Negligible – less than 10% of the jurisdiction/people affected
- Scored 2 Limited – 10% to 25% of jurisdiction/people affected
- Scored 3 Critical – 25% to 50% of the jurisdiction/people affected
- Scored 4 Catastrophic – More than 50% of the jurisdiction/people affected

Impact per hazard: Ranked _____. Why:

Frequency is how often the hazard occurs.

- 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

Frequency per hazard: Ranked _____. Why:

Likelihood is how probable it is that the hazard will happen.

- 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

Likelihood per hazard: Ranked _____. Why:

Vulnerability is the amount of

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

Who and what is affected? When? Identify specific areas of vulnerability. Who will handle dealing with the hazard impact? What you have or lack: Equipment, vehicles, services available, shelters, buildings, and infrastructure

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

Capability per hazard: Ranked _____.Why:

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 5.1 summarizes the risk assessment scoring of each hazard at county and city jurisdictions. The individual results of each hazard assessment is repeated in each hazard section.

Table 5.1 – Barnes County Jurisdiction Risk Assessment Scoring Summary

Risk Assessment		Jurisdiction: Barnes County				
<u>Hazard</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<u>Total</u>
Communicable Disease	4	4	3	3	2	12
Dam Failure	4	2	2	4	2	10
Drought	3	2	2	3	2	8
Flood	4	3	3	4	2	12
Geologic Hazard	2	3	2	3	2	8
Hazardous Material Release	4	4	4	4	1	15
Homeland Security Incident	4	3	4	4	1	14
Severe Summer Weather	3	4	4	3	2	12
Severe Winter Weather	4	4	4	3	2	13
Shortage or Outage of Critical Materials or Infrastructure	3	4	4	3	2	12
Transportation Accident	4	3	4	3	2	12
Urban Fire/Structure Collapse	2	3	3	3	2	11
Wildland Fire	2	3	3	3	1	10
Windstorm	4	3	3	2	1	11

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

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

Table 5.1 – Barnes County Jurisdiction Risk Assessment Scoring Summary - Continued

Risk Assessment		Jurisdiction: Fingal				
<u>Hazard</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<u>Total</u>
Communicable Disease	2	2	2	4	1	9
Dam Failure	NA	NA	NA	NA	NA	NA
Drought	4	3	3	3	1	12
Flood	3	3	3	4	1	12
Geologic Hazard	NA	NA	NA	NA	NA	NA
Hazardous Material Release	4	3	4	4	1	14
Homeland Security Incident	4	2	3	3	1	11
Severe Summer Weather	4	3	3	3	1	12
Severe Winter Weather	4	4	4	4	1	15
Shortage or Outage of Critical Materials or Infrastructure	3	2	3	3	1	10
Transportation Accident	4	3	4	4	1	14
Urban Fire/Structure Collapse	3	3	3	4	1	12
Wildland Fire	3	3	3	3	1	11
Windstorm	4	3	3	4	1	13

Risk Assessment		Jurisdiction: Kathryn				
<u>Hazard</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<u>Total</u>
Communicable Disease	2	2	2	3	2	7
Dam Failure	4	3	3	3	1	12
Drought	3	3	3	3	2	10
Flood	3	2	3	3	2	9
Geologic Hazard	NA	NA	NA	NA	NA	NA
Hazardous Material Release	2	2	2	2	1	7
Homeland Security Incident	2	2	1	1	2	4
Severe Summer Weather	3	2	2	2	2	7
Severe Winter Weather	3	3	3	2	2	9
Shortage or Outage of Critical Materials or Infrastructure	3	2	2	2	2	7
Transportation Accident	1	2	2	2	1	6
Urban Fire/Structure Collapse	2	2	3	3	2	8
Wildland Fire	2	2	2	3	2	7
Windstorm	3	3	3	2	2	9

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

Table 5.1 – Barnes County Jurisdiction Risk Assessment Scoring Summary - Continued

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

Risk Assessment		Jurisdiction: Litchville				
<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	3	3
Dam Failure	NA	NA	NA	NA	NA	NA
Drought	3	2	2	2	3	6
Flood	2	2	2	2	2	6
Geologic Hazard	NA	NA	NA	NA	NA	NA
Hazardous Material Release	3	2	1	2	3	5
Homeland Security Incident	1	1	1	1	2	2
Severe Summer Weather	3	3	4	3	1	12
Severe Winter Weather	2	3	1	2	3	5
Shortage or Outage of Critical Materials or Infrastructure	2	1	2	2	2	5
Transportation Accident	1	1	1	2	3	2
Urban Fire/Structure Collapse	1	1	2	3	2	5
Wildland Fire	2	2	2	2	3	5
Windstorm	2	2	2	2	3	5

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

Table 5.1 – Barnes County Jurisdiction Risk Assessment Scoring Summary - Continued

Risk Assessment		Jurisdiction: Nome				
<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	1	3	1	6
Dam Failure	NA	NA	NA	NA	NA	NA
Drought	2	1	1	4	1	7
Flood	3	2	3	3	1	10
Geologic Hazard	NA	NA	NA	NA	NA	NA
Hazardous Material Release	4	1	2	3	1	9
Homeland Security Incident	4	1	1	2	1	7
Severe Summer Weather	4	3	3	4	1	13
Severe Winter Weather	3	3	3	3	1	11
Shortage or Outage of Critical Materials or Infrastructure	3	4	3	3	1	12
Transportation Accident	2	2	3	3	2	8
Urban Fire/Structure Collapse	3	2	3	3	2	9
Wildland Fire	3	2	2	2	2	7
Windstorm	4	3	3	3	1	12

Risk Assessment		Jurisdiction: Oriska				
<u>Hazard</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<u>Total</u>
Communicable Disease	2	2	4	4	1	11
Dam Failure	NA	NA	NA	NA	NA	NA
Drought	4	2	3	2	2	9
Geologic Hazard	NA	NA	NA	NA	NA	NA
Flood	3	3	4	4	2	12
Hazardous Material Release	4	1	4	4	1	12
Homeland Security Incident	2	2	2	2	1	7
Severe Summer Weather	3	3	4	3	2	11
Severe Winter Weather	3	4	4	3	3	11
Shortage or Outage of Critical Materials or Infrastructure	2	2	2	2	1	7
Transportation Accident	4	2	3	3	2	10
Urban Fire/Structure Collapse	2	3	3	3	1	10
Wildland Fire	4	2	2	2	2	8
Windstorm	3	2	2	3	4	6

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

Table 5.1 – Barnes County Jurisdiction Risk Assessment Scoring Summary - Continued

Risk Assessment		Jurisdiction: Pillsbury				
<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	3	1	7
Dam Failure	NA	NA	NA	NA	NA	NA
Drought	2	2	3	2	2	7
Flood	3	3	3	2	2	9
Geologic Hazard	NA	NA	NA	NA	NA	NA
Hazardous Material Release	4	2	4	3	1	12
Homeland Security Incident	2	2	2	2	1	7
Severe Summer Weather	2	4	3	2	1	10
Severe Winter Weather	3	4	4	3	1	13
Shortage or Outage of Critical Materials or Infrastructure	2	2	2	2	2	6
Transportation Accident	4	2	3	3	1	11
Urban Fire/Structure Collapse	2	2	2	2	1	7
Wildland Fire	2	2	2	4	2	8
Windstorm	2	3	3	3	1	13

Risk Assessment		Jurisdiction: Rogers				
<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	3	3	1	8
Dam Failure	NA	NA	NA	NA	NA	NA
Drought	4	2	2	3	1	10
Flood	3	3	4	3	1	12
Geologic Hazard	NA	NA	NA	NA	NA	NA
Hazardous Material Release	4	2	3	1	1	9
Homeland Security Incident	2	2	2	3	1	8
Severe Summer Weather	4	3	3	3	2	11
Severe Winter Weather	3	3	4	4	2	12
Shortage or Outage of Critical Materials or Infrastructure	3	3	3	3	2	10
Transportation Accident	3	2	4	4	1	12
Urban Fire/Structure Collapse	3	2	2	3	1	9
Wildland Fire	3	3	4	2	2	10
Windstorm	4	2	3	3	2	10

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

Table 5.1 – Barnes County Jurisdiction Risk Assessment Scoring Summary - Continued

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

Risk Assessment		Jurisdiction: Sibley				
<u>Hazard</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<u>Total</u>
Communicable Disease	4	2	2	3	1	10
Dam Failure	4	2	2	3	1	10
Drought	2	2	2	2	1	7
Flood	4	3	4	4	1	14
Geologic Hazard	4	2	4	4	1	13
Hazardous Material Release	4	2	1	2	1	8
Homeland Security Incident	4	2	1	3	1	9
Severe Summer Weather	4	2	3	4	1	12
Severe Winter Weather	4	4	4	3	1	14
Shortage or Outage of Critical Materials or Infrastructure	4	2	3	4	1	12
Transportation Accident	3	2	2	3	1	9
Urban Fire/Structure Collapse	3	2	4	3	1	11
Wildland Fire	4	2	3	4	1	12
Windstorm	4	4	2	4	1	13

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

Table 5.1 – Barnes County Jurisdiction Risk Assessment Scoring Summary - Continued

Risk Assessment		Jurisdiction: Valley City				
<u>Hazard</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<u>Total</u>
Communicable Disease	4	3	3	3	2	11
Dam Failure	4	1	1	4	2	8
Drought	1	2	2	2	3	4
Flood	4	4	4	4	1	15
Geologic Hazard	3	2	3	3	1	10
Hazardous Material Release	4	2	3	4	1	12
Homeland Security Incident	4	3	3	4	2	12
Severe Summer Weather	3	4	4	2	3	10
Severe Winter Weather	3	4	4	2	3	10
Shortage or Outage of Critical Materials or Infrastructure	3	2	3	4	2	10
Transportation Accident	4	4	4	4	1	13
Urban Fire/Structure Collapse	4	3	3	3	2	11
Wildland Fire	4	4	4	3	2	13
Windstorm	3	4	4	2	3	10

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

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

5. Threat and Hazard Identification and Risk Assessment

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

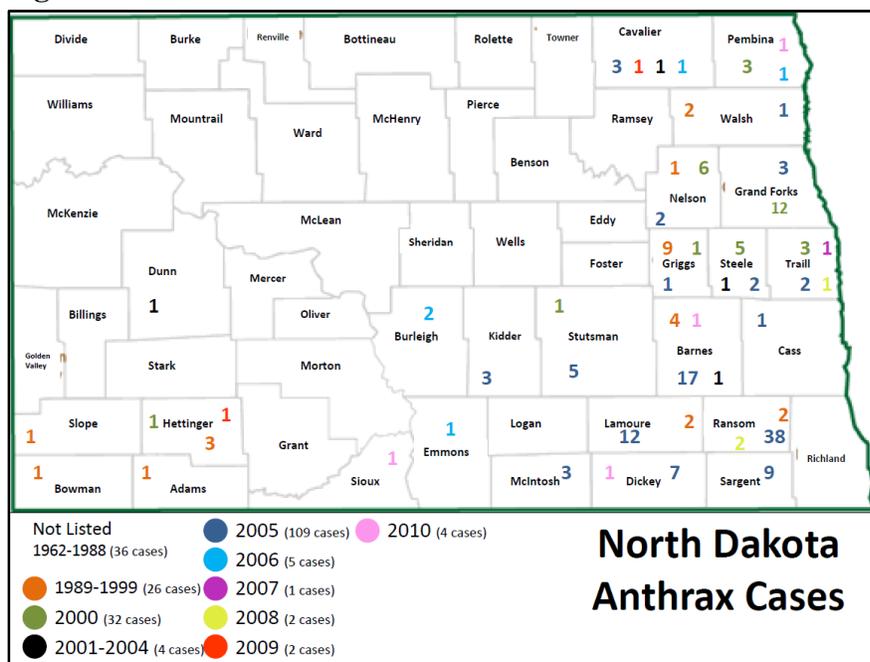
According to the City-County Health District, the city of Valley City experienced Pertussis issues in 2005 in school-age children due to exposure from an unimmunized child. An H1N1 pandemic occurred in 2009 and city-county health administered large amounts of vaccines to protect local populations. Seasonal influenza outbreaks do occur annually. Influenza is the most common type of communicable disease occurrence in Barnes County. Between 2005 and June, 2014, 251 cases of influenza and 16 cases of West Nile virus were reported in Barnes County. According to the 2010 Barnes County MHMP, the first recorded death from the West Nile virus occurred in Barnes County in 2006.

Table 8.1.1 in Appendix 8.1 shows incident history of 21 communicable diseases in Barnes County.

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. Barnes County had four reported cases between 1989 and 1999, one case between 2001 and 2004, 17 cases in 2005, and 1 case in 2010. Figure 5.1.1 shows the number of incidents of anthrax in Barnes County and the state. Dry pastures and short grass provided ideal conditions for livestock to ingest anthrax spores and develop the disease. Remarks regarding the case of anthrax in 2010 resulting in livestock loss is shown in Appendix 8.1, Table 8.1.2.

On October 11, 2012, Barnes County livestock producers were warned of anthrax danger, due to a confirmed case in western North Dakota; however, no cases were reported in 2012 in Barnes County. 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 N.D. Department of Agriculture.

Figure 5.1.1 – 1989 to 2010 North Dakota Anthrax Cases—Barnes 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. Indemnity is the amount paid to cover insurance claims from crop loss due to disease. The loss liability of crops was \$11,617,110 in Barnes County between 1990 and 2013 on 11,362 acres. Indemnity paid was \$5,520,049 resulting in losses of 48 percent of total liability. Crop loss indemnity paid over the 24-year period resulted in an annual average of \$230,002. Detailed data is available per crop for each year and can be found in Appendix 8.1, Table 8.1.3.

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

Probability and Magnitude

Hazard history was gathered from the N.D. Dept. of Health with data showing crop losses from communicable disease obtained from the USDA Risk Management Agency. Data from the N.D. Department of Health illustrates 251 cases of influenza and 16 cases of West Nile virus between 2005 and June 2014. Approximately 17 cases of anthrax occurred in 2005 and one livestock death was recorded in 2010. Crop loss data shows 39 instances of crop loss from disease over a 24-year period from 1990 through March 2013. Indemnity payments to cover crop loss averaged approximately \$230,000 each year. 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 a variety of weather and economic-related factors.

Risk Assessment

Table 5.1.1 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 5.1.1 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
Barnes County	4	4	3	3	2	12
Dazey	2	2	3	3	2	8
Fingal	2	2	2	4	1	9
Kathryn	2	2	2	3	2	7
Leal	2	2	2	1	2	5
Litchville	1	2	2	1	3	3
Nome	1	2	1	3	1	6
Oriska	2	2	4	4	1	11
Pillsbury	1	2	2	3	1	7
Rogers	1	2	3	3	1	8
Sanborn	4	2	3	3	1	11
Sibley	4	2	2	3	1	10
Valley City	4	3	3	3	3	10
Wimbledon	4	2	3	2	2	9

(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, livestock loss from the Valley City Times-Record, and crop loss data from plant disease from the Risk Management Agency, the frequency and likelihood of communicable disease in Barnes County varied based on site specific accounts by residents, the agriculture industry, and weather patterns for each specific year.

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.

Barnes County

Impact	4	<ul style="list-style-type: none"> • Loss of economy, livestock, and crops have been experienced • Total crop loss of \$11,617,110 between 1990 and 2013 • Some people get sick each year with fatalities being possible • Pandemic disease could result in mass casualties due to limited medical facilities/funeral homes and medical materials in county • Extended emergency response times due to rural nature of county • Overtime for departments/agencies for increase staff time • “Fear Factor” throughout the community and angst • Shortages of medical supplies at Mercy Hospital if outbreak occurred
Frequency	4	<ul style="list-style-type: none"> • Hazard has occurred in humans, plants and animals in the county each year to varying degrees of severity • Flu occurs more often than West Nile virus • Indemnity covering crop loss has averaged approximately \$230,000 per year between 1990 and 2013 • 17 cases of Anthrax in 2005 alone
Likelihood	3	<ul style="list-style-type: none"> • Disease in humans will continue to occur on an annual basis • Disease in plants and animals is a highly likely to occur every year depending on weather patterns and the amount of moisture • Flu has been occurring more often in recent years • Projected population growth through 2030 • Increase in vulnerable populations • Increase in traffic on all transportation modes • Increase in exposure to disease from migration of domestic and international people into the state and region
Vulnerability	3	<ul style="list-style-type: none"> • There are 2,632 people under the age of 20 and 2,170 people over the age of 65 in the city representing 24 percent and 20 percent of the total population, respectively, and are considered most vulnerable to the hazard and could need assistance if an outbreak did occur • More vulnerable: Vaccine shortages do occur at times • More vulnerable: Wildlife habitats • More vulnerable: One hospital in Barnes County • More vulnerable: Barnes County Ambulance – rural areas may have prolonged response • More vulnerable: No stockpile of medical supplies in small towns • More vulnerable: Smaller communities have no medical facilities • More vulnerable: Valley City State University senior facilities such as assisted living, congregate and skilled nursing • More vulnerable: Approximately 401 students living in on-campus housing at Valley City State University • More vulnerable: Approximately 260 units of senior apartments, assisted living, skilled nursing and congregate living • Less vulnerable: Better education and communication have increased awareness of hazard
Capability	2	<ul style="list-style-type: none"> • City-County Health District with grant writing staff and administration • Sizeable tax base • Central Valley City United in Jamestown

		<ul style="list-style-type: none"> • NDSU/Barnes County Extension Service • Planning and regulatory through infrastructure maintenance programs to control vegetative growth and storm water runoff regulations to limit standing water • Active emergency management department with detailed plans to educate the public on communicable disease available on the department’s website
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City of Dazey

Impact	2	<ul style="list-style-type: none"> • No real loss of economy • Some people get sick each year
Frequency	2	<ul style="list-style-type: none"> • Some people get sick each year, some crop and livestock loss
Likelihood	3	<ul style="list-style-type: none"> • Due to standing water possible increase in the West Nile virus cases and mosquito problems • Abandoned properties and overgrown lawns
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: Half of residents do not have health insurance • More vulnerable: High senior population, no school or kids • More vulnerable: Day care with six to eight kids each day • More vulnerable: Abandoned properties and overgrown lawns
Capability	2	<ul style="list-style-type: none"> • No clinic or hospital • Has quick response unit • Barnes County Ambulance • Internet connections, TV, etc.

City of Fingal

Impact	2	<ul style="list-style-type: none"> • Loss of economy, crops or livestock. • Some people get sick each year, possible death • Crop or animal losses would impact local economy
Frequency	2	<ul style="list-style-type: none"> • People get sick each year • Some crop loss and localized livestock loss
Likelihood	2	<ul style="list-style-type: none"> • Proper mowing of city lots and vegetation • Abandoned houses • Rodents are present in local structures
Vulnerability	4	<ul style="list-style-type: none"> • Not a large elderly population • More vulnerable: Children – 12 kids • More vulnerable: Some houses have overgrown vegetation • More vulnerable: House near Lutheran church has lots of vegetation • More vulnerable: Rodents living in some buildings, skunks, wildlife • More vulnerable: Skunk population is growing • More vulnerable: No clinic or hospital, no ambulance • Less vulnerable: Internet connections, TV, etc. • Less vulnerable: Not a large elderly population
Capability	1	<ul style="list-style-type: none"> • No clinic or hospital, no ambulance • Internet connections, TV, etc. • No stockpile of medical supplies

		<ul style="list-style-type: none"> • First responders have supplies • No education programs or outreach • Limited financial capabilities • Active city council • No plans in place
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City of Kathryn

Impact	2	<ul style="list-style-type: none"> • Loss of economy, crops or livestock. • Some people get sick each year, possible death
Frequency	2	<ul style="list-style-type: none"> • People get sick each year • Some crop loss and localized livestock loss
Likelihood	2	<ul style="list-style-type: none"> • Proper drainage of water into the creek • Vacant lots and buildings – biggest problem, not well maintained • Residents mows most lawns and keeps vegetation under control • Large junk pile in city limits
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: Vacant lots and abandoned buildings present in poor condition • More vulnerable: Large junk pile in city limits • More vulnerable: High elderly population • Less vulnerable: Very few children, 4 under the age of 18 • Less vulnerable: Trailer homes – 2
Capability	2	<ul style="list-style-type: none"> • No clinic or hospital, no ambulance • Internet connections, TV, etc. • No stockpile of medical supplies • Residents mows most lawns and keeps vegetation under control • First responder & EMT

City of Leal

Impact	2	<ul style="list-style-type: none"> • Loss of economy, crops or livestock. • Some people get sick each year, possible death
Frequency	2	<ul style="list-style-type: none"> • People get sick each year • Some crop loss and localized livestock loss
Likelihood	2	<ul style="list-style-type: none"> • Due to standing water possible increase in the West Nile virus cases and mosquito problems • Abandoned have been removed – decreases likelihood. • City mows most lawns and keeps vegetation under control.
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: Barnes County North located two miles to the west • Less vulnerable: One elderly resident and two under 18 • Less vulnerable: Abandoned have been removed – decreases vulnerability • Less vulnerable: Abandoned vehicles have been removed. • Less vulnerable: More vulnerable: Barnes County North located two miles to the west
Capability	2	<ul style="list-style-type: none"> • No clinic or hospital, no ambulance

		<ul style="list-style-type: none"> • Internet connections, TV, etc. • No stockpile of medical supplies • Mowing through special assessment to keep vegetation under control • First responder
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City of Litchville

Impact	1	<ul style="list-style-type: none"> • Loss of economy, crops or livestock. • Some people get sick each year, possible death
Frequency	2	<ul style="list-style-type: none"> • People get sick each year • Some crop loss and localized livestock loss
Likelihood	2	<ul style="list-style-type: none"> • Due to standing water possible increase in the West Nile virus cases and mosquito problems • Abandoned properties can lead to rodent infestation • City mows most lawns and keeps vegetation under control
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: Retired population – average population is 60. • More vulnerable: Abandoned properties can lead to rodent infestation • More vulnerable: Abandoned vehicles • More vulnerable: Elementary school – vulnerable population
Capability	3	<ul style="list-style-type: none"> • No clinic or hospital, county ambulance • First responders have some medical devices (AED) • Internet connections, TV, etc. • No stockpile of medical supplies

City of Nome

Impact	1	<ul style="list-style-type: none"> • Loss of economy from crops and/or livestock loss • Residents get sick each year • Always a possibility of human death • Communication between residents is rare limiting spread of diseases
Frequency	2	<ul style="list-style-type: none"> • People get sick each year • Some crop loss and localized livestock loss
Likelihood	1	<ul style="list-style-type: none"> • Improvements to 5th Avenue to allow proper drainage is complete and reduces standing water • Small size of community and low population limits the odds of outbreak • Residents mow most lawns and keeps vegetation under control • City of Enderlin sprays for mosquitos
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: Roughly five children under the age of 18 in town • More vulnerable: Some abandoned buildings in town • More vulnerable: No resources such an ambulance, hospital or clinic • More vulnerable: No stockpile of medical supplies • Less vulnerable: Internet connections and TV help inform residents • Less vulnerable: Residents mow most lawns and keeps vegetation under control • Less vulnerable: City of Enderlin sprays for mosquitos • Less vulnerable: Small elderly population decreases the vulnerability

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 • No active education or outreach programs • Lacks resources to accomplish projects independently
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City of Oriska

Impact	2	<ul style="list-style-type: none"> • Loss of economy, crops or livestock. • Some people get sick each year, possible death
Frequency	2	<ul style="list-style-type: none"> • People get sick each year • Some crop loss and localized livestock loss
Likelihood	4	<ul style="list-style-type: none"> • Due to standing water possible increase in the West Nile virus cases and mosquito problems • Abandoned properties, overgrown lawns, can lead to rodent infestation • People in town have overgrown lawns causing mosquitos and rodents. Natural vegetation too intense
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: 30% is senior population, school with kids, no day cares, up to 60 kids • More vulnerable: Abandoned properties, overgrown lawns, can lead to rodent infestation • More vulnerable: Abandoned vehicles
Capability	1	<ul style="list-style-type: none"> • No clinic or hospital • Internet connections, TV, etc. • No stockpile of medical supplies at school

City of Pillsbury

Impact	1	<ul style="list-style-type: none"> • Loss of economy, crops or livestock. • Some people get sick each year, possible death
Frequency	2	<ul style="list-style-type: none"> • People get sick each year • Some crop loss and localized livestock loss
Likelihood	2	<ul style="list-style-type: none"> • Due to standing water possible increase in the West Nile virus cases and mosquito problems • Two abandoned propertied can lead to rodent infestation • City mows most lawns and keeps vegetation under control
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: All retired population – average population is 60 • More vulnerable: Abandoned properties, can lead to rodent infestation • More vulnerable: Abandoned vehicles
Capability	1	<ul style="list-style-type: none"> • No clinic or hospital, no ambulance • Internet connections, TV, etc. • No stockpile of medical supplies

City of Rogers

Impact	1	<ul style="list-style-type: none"> • Loss of economy, crops or livestock. • Some people get sick each year, possible death
Frequency	2	<ul style="list-style-type: none"> • People get sick each year • Some crop loss and localized livestock loss
Likelihood	3	<ul style="list-style-type: none"> • Due to standing water possible increase in the West Nile virus cases and mosquito problems • Abandoned properties can lead to rodent infestation • Individuals mows most lawns and keeps vegetation under control • City is in a low-lying area and standing water is a problem • Mosquitos are a big problem
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: Retired population, elderly, and many children • More vulnerable: Abandoned properties, can lead to rodent infestation • More vulnerable: Abandoned vehicles • More vulnerable: City is in a low-lying area and standing water is a problem
Capability	1	<ul style="list-style-type: none"> • No clinic or hospital, county ambulance • No First responders • Internet connections, TV, etc. • No stockpile of medical supplies • Fire department has equipment to move water

City of Sanborn

Impact	4	<ul style="list-style-type: none"> • Loss of economy from crops and/or livestock loss • Residents get sick each year • Always a possibility of human death • Due to small size of city an outbreak would spread quickly and affect large numbers of city residents
Frequency	2	<ul style="list-style-type: none"> • Some people get sick each year • Crop loss and localized livestock loss occurs each year
Likelihood	3	<ul style="list-style-type: none"> • Installation of new culverts reduces standing water • Small size of community and low population limits the odds of outbreak • Residents mow most lawns and keeps vegetation under control • Standing water on the west side of town on private residence provides habitat for mosquitos • Presence of city resident collecting and storing cars and other expended materials in city limits
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: High elderly population • More vulnerable: Roughly 40 children under the age of 18 in town • More vulnerable: Some abandoned buildings in town • More vulnerable: No resources such an ambulance, hospital or clinic • More vulnerable: Medical supplies in stock at fire hall and at homes of first responders • More vulnerable: Internet connections and TV help inform residents of best methods for prevention

		<ul style="list-style-type: none"> • More vulnerable: Standing water on the west side of town on private residence provides habitat for mosquitos • Less vulnerable: Residents mow most lawns and keeps vegetation under control
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 • No active education or outreach programs • Lacks resources to accomplish projects independently

City of Sibley

Impact	4	<ul style="list-style-type: none"> • Loss of economy, crops or livestock • Loss of summer time population and economic activity • Some people get sick each year, possible death • Will experience loss of population if an outbreak did occur
Frequency	2	<ul style="list-style-type: none"> • Some people get sick each year • Some crop loss and localized livestock loss
Likelihood	2	<ul style="list-style-type: none"> • Temporary population maintains properties very well reducing the likelihood of an outbreak or event • Private company south of town with scrap iron can potentially contribute to an incident • Influx of people from the region may increase the likelihood
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: High elderly and retiree population • More vulnerable: Scrap yard south of town • More vulnerable: Campgrounds with high levels of vegetation • More vulnerable: Concentration of people using outhouses • More vulnerable: No medical clinic or hospital • More vulnerable: No local ambulance • More vulnerable: No stockpile of medical supplies • More vulnerable: Small population of stray animals and local wildlife may cause transmission of disease
Capability	1	<ul style="list-style-type: none"> • Active city council • Limited tax base • Designated evacuation routes with the County • Limited administrative and city staff

City of Valley City

Impact	4	<ul style="list-style-type: none"> • Loss of economy from crops and/or livestock loss • Residents get sick each year • Always a possibility of human death • An outbreak would spread and affect large numbers of city residents • Mercy Hospital can become overwhelmed and experience supply shortages • Mercy Hospital can experience staffing issues
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		<ul style="list-style-type: none"> • Shortage of funding limits ability of city-county health and Mercy Hospital to set up temporary immunization centers and train staff • Mass casualties can overwhelm funeral homes and hospital as morgue has limited space • City and county operations could experience difficulty in day-to-day operation if mass casualties occurred from an outbreak or pandemic • Outbreak in school-age children from unimmunized children exposing others to communicable diseases resulting in missed school days • Loss of vaccinations and medical supplies due to lack of refrigeration units and backup generator
Frequency	3	<ul style="list-style-type: none"> • Some people get sick each year • Crop loss and localized livestock loss occurs each year to a varying degree • City experienced Pertussis issues in 2005 in school-age children due to exposure from an unimmunized child • H1N1 pandemic occurred in 2009 and City-County Health administered large amount of vaccines to protect local population • State of North Dakota and City-County Health is conducting mitigation planning to track individuals who recently came from Africa to track the Ebola Virus
Likelihood	3	<ul style="list-style-type: none"> • Installation of new flood control measures reduces amount of standing water and flood damage to homes • Mercy Hospital and medical clinics in the city are well-prepared to handle general needs of local population but have limited supplies to handle a large outbreak • Staffing capacity of Mercy Hospital and medical clinics are adequate for every day needs but are not staffed for emergency situations such as an outbreak • Residents mow lawns and keeps vegetation under control • City mows public parks and open spaces to regulate growth and extent of vegetation • Increased air travel from domestic and international locations, in addition to the city being located on Interstate 94, increases likelihood of a communicable disease infecting the local population • Presence of international students at Valley City State University increases chances of a communicable disease being transmitted among the student population and general population • Lack of adequate storage space and refrigeration units for stockpile of medical supplies
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: 19.2 percent of population is over 65 compared to 14.2 percent in North Dakota • Less vulnerable: 20.5 percent of population is under 18 compared to 22.5 in North Dakota • More vulnerable: Presence of abandoned buildings and un-kept structures may contribute to spread of diseases • More vulnerable: Presence of populations living in trailer homes, subsidized housing, senior housing, and student-populations lack transportation options to access medical care

		<ul style="list-style-type: none"> • More vulnerable: Lack of adequate storage space and refrigeration units for stockpile of medical supplies • More vulnerable: Lack of generator for backup power may lead to loss of vaccines as they cannot be kept at appropriate temperatures • More vulnerable: New location of City-Couth Health offices lacks level of security system present at former location at Barnes County Courthouse • More vulnerable: Presence of day care centers in the city • More vulnerable: Shrinking available of funds for emergency preparedness and response planning limits ability of City-County Health to educate staff and general public • Less vulnerable: Well-trained and educated EMT and ambulance staff • Less vulnerable: Presence of mass media communication from internet and television increases awareness of communicable disease • Vulnerability depends largely on the type of disease and impacted population
Capability	3	<ul style="list-style-type: none"> • Active city council • City of Valley City has mass-shelter plan and evacuation plan • City-County Health conducts education or outreach programs through mass media (radio), education of in public schools, in Kiwanis, day care groups and of general daily clients served • City-County Health director and staff well-trained and educated on mitigation strategies for communicable disease • City-County Health possessed staff for administration of grants and education programs • Possesses staff and technical resources to accomplish projects independently

City of Wimbledon

Impact	4	<ul style="list-style-type: none"> • Loss of economy, crops or livestock • Some people get sick each year, possible death • 80 percent of income comes from crops
Frequency	2	<ul style="list-style-type: none"> • Some people get sick each year • Some crop loss and localized livestock loss
Likelihood	3	<ul style="list-style-type: none"> • Installed storm sewer 15 years ago • Some back yards have standing water if not pumped out independently by residents • Abandoned buildings • Absentee-owner buildings
Vulnerability	2	<ul style="list-style-type: none"> • More vulnerable: High elderly population – 80% of city is over 65 • More vulnerable: Children – around 25 • More vulnerable: Abandoned buildings • More vulnerable: Absentee-owner buildings • More vulnerable: Some back yards have standing water • More vulnerable: No clinic, county ambulance • Less vulnerable: Crop insurance • Less vulnerable: Mowing of empty lots is done

		<ul style="list-style-type: none"> • Less vulnerable: City sprays for mosquitos
Capability	2	<ul style="list-style-type: none"> • No clinic or hospital, no ambulance • Internet connections, TV, etc. • First responders have medical supplies, but not a stock pile • Special assessment to owners of lots needing mowed • Fire department does not have pumping equipment but city does

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, animals and plants are affected by communicable disease, critical facilities and infrastructure are 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. There is a hospital and two medical clinics in Barnes County located in Valley City. Information on these facilities is shown in Chapter 4, Profile and Inventory. Similarly, emergency services can also be stressed as the county and its population are spread out over a large geographic area. Other facilities at risk are those that house large populations in close quarters such as public schools, assisted living facilities and nursing homes. The vulnerability and exposure to communicable disease are likely to increase due to increasing frequency of the West Nile virus and Influenza, an aging population, growing enrollments at certain school districts (despite an overall decline in populations under 19) in Barnes County. The emergence of the Ebola virus may also increase vulnerability to communicable disease in Barnes County as the portion of the student body at Valley City State University has become increasingly international.

As shown in Table 5.1.2, youth populations age 19 and under consisted of 26.3 percent of the Barnes County population in 2000 and decreased to 23.8 percent by 2010. The 65 to 74 population consisted of 8.5 percent of the Barnes County population in 2000 and increased to 9.4 percent by 2010. Conversely, the 75+ population consisted of 11.3 percent of the Barnes County population in 2000 and decreased to 10.3 percent by 2010. A summary of county and city populations in Barnes County is shown in Chapter 4, Profile and Inventory.

Table 5.1.2 – 2000 to 2010 Barnes County Vulnerable Populations by Age

Age Group	2000	2010	Percent of Population 2000	Percent of Population 2010
Under 19	3,099	2,632	26.3 percent	23.8 percent
65 to 74	1,005	1,035	8.5 percent	9.4 percent
75+	1,327	1,135	11.3 percent	10.3 percent

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

Due to 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 counties with rural areas such as Barnes County.

Vulnerabilities to New and Future Development

New development would largely avoid impact by communicable disease and not be vulnerable. However, with the lack of building code 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 are a primary reasons for fewer losses from communicable disease. The lack of emergency action plans in most jurisdictions in Barnes County results 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.

- Barnes County Department of Health, Pandemic Influenza Response 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
- Barnes County Emergency Operations Plan

5.2 Dam Failure

Characteristics

A dam is any artificial man-made barrier that impounds or diverts water or underground streams. According to the 2014 NDMHMP, the purpose of a dam includes: the storage of water for irrigation, hydro-electric power generation, flood control, water supply, recreation, and wildlife. If a dam should fail, impacts can range from minimal to complete devastation, depending on location and volume of water impounded. The North Dakota State Water Commission and the State Engineer have the power, authority and general jurisdiction to regulate and control activity related to dams. The State Water Commission administers the Dam Safety Program.

A dam failure is defined as a sudden, rapid, and uncontrolled release of impounded water that will create a potential significant downstream hazard. The dam failure hazard is determined by the potential loss of life and downstream property damage it may cause, and not by any particulars of the dam itself.

There are many reasons and/or potential causes for dam failure such as terrorism, earthquakes, etc. However, according to the 2014 NDMHMP, the most common reasons are hydraulic inadequacy, seepage problems, and structural defects. Each is described below.

- **Hydraulic Failures** – Hydraulic failures result from the uncontrolled flow of water, over, around, and adjacent to the dam, the erosion action of the water on the dam and its foundation. Earthen dams are particularly susceptible to hydraulic failures since earthen material erodes at relatively low velocities. Hydraulic failures account for approximately 30 percent of all dam failures. A hydraulic failure may occur due to wave action, erosion, and excessive spillway erosion, and overtopping as a result of insufficient reservoir storage and insufficient spillway capacity.
- **Seepage Failure** – All dams do have some seepage. Seepage occurs through the structure and its foundation. Seepage, if uncontrolled, can erode material from the downstream slope or foundation and work backwards toward the upstream slope to form a “scour hole” which often leads to a complete failure of the structure. Seepage accounts for approximately 40 percent of all dam failures. Piping is a special seepage problem where soil particles are transported by a flow of water from one area to another. Soil particles are transported, the flow becomes larger and the soil particles move faster until a tunnel of flowing water is created.
- **Structural Failure** – Structural failures involve the rupture or movement of monolithic components of the dam and/or its foundation. This is a particularly important hazard on large earthen dams and on dams built of low strength material such as silts. Structural failure accounts for approximately 30 percent of all dam failures.

Generally speaking, these type of failures are interrelated and complex. For example, uncontrolled seepage may weaken the soil of an earthen dam and lead to an embankment failure. A structural failure may shorten the seepage path and lead to a “piping” failure. Surface erosion may lead to embankment failures.

Time itself can also have an impact on dam integrity. Such things as weathering, mechanical changes, and the influence of chemical agents can affect a dam in the following ways:

- Engineering properties of the foundation and materials composing the dam may change
- Chemical properties of the contents may change
- Concrete can gradually deteriorate and weaken from leaching and frost, and the amount of sulfate present in the surrounding soil
- Monolithic behavior is affected causing high stress concentrations and water pressure that has free access to the interior of the structure
- Freeze/thaw damage is accelerated by these cracks
- Metal components can corrode unless maintained
- Timber structures such as cribbing will eventually decay from the change of water content as well as infestation by insects or attack by other organisms

Few man-made facilities pose a greater potential for the loss of life and property than the failure of a dam. Pent-up waters suddenly unleashed can have catastrophic effects on life and property downstream. Homes, bridges, and roads can be demolished in minutes.

Dams are categorized according to the potential hazard for loss of life and property damage, should the dam suddenly fail. Existing development must be considered when categorizing a dam. The hazard category is based on potential hazard from failure and not on the selected design criteria or storage capacity.

Although it is recognized that loss of life is possible with any dam failure, the following categories of dams have been established for North Dakota:

- Low Hazard – Dams located in rural or agricultural areas where there is little possibility of future development. Failure of low hazard dams may result in damage to agricultural land, township and county roads, and farm buildings other than residences. No loss of life is expected if the dam fails.
- Medium Hazard – Dams located in predominantly rural or agricultural areas where failure may damage isolated homes, main highways, railroads or cause interruption of minor public utilities. The potential for the loss of lives may be expected if the dam fails.
- High Hazard – Dams located upstream of developed and urban areas where failure may cause serious damage to homes, industrial and commercial building, and major public utilities. There is a potential for the loss of more than a few lives if the dam fails. Source: Dam Safety Performance Report for the State of North Dakota

Barnes County has 52 dams listed with State Water Commission. A complete list of dams in Barnes County is shown in Appendix 8.2, Table 8.2.1.

According to the 2014 NDMHMP, Baldhill Dam and Clausen Springs Dam are high hazard dams.

History

According to the Association of State Dam Safety Officials, USA Dam Failure, Dam Incidents, neither Barnes County nor the State of North Dakota have had any reported failures or incidents since 1901. However, Clausen Springs Dam experienced significant erosion in 2009 after heavy snowmelt caused floodwaters to pour over the earthen spillway caused the downstream city of Kathryn to be evacuated. Details regarding the incident can be found in Appendix 8.2.

There has been one emergency pertaining to dam failure in Barnes County but no declared disaster.

Probability and Magnitude

Hazard history was gathered from Barnes County Emergency Management, NOAA, NCDC, SHELDUS, Stanford University National Performance of Dams Program (NPDP), and the previous FEMA-approved Barnes County Mitigation Plan. According to these sources, no known instances of dam failure have been recorded in Barnes County and therefore, the probability of the hazard in Barnes County is zero percent. However, the significant erosion of Clausen Springs Dam in 2009 caused the downstream city of Kathryn to be evacuated. The probability is still difficult to calculate as the occurrences were maintenance issues and did not result in total failure of the dam. There is always some probability of the hazard occurring in the future.

The dam failure of the Baldhill Dam would directly primarily impact the city of Valley City. The magnitude would be minimal in terms of loss of life as warning times would allow for proper evacuation of people in the inundation area. However, property loss would be catastrophic as nearly the entire city of Valley City lies within the inundation area.

Risk Assessment

Table 5.2.1 shows the risk assessment as determined by individual jurisdictions and the Plan Update Committee for Dam Failure. The risk assessment methodology can be found in the beginning of Chapter 5, Threat and Hazard Identification and Risk Assessment. The total in Table 5.2.1 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 5.2.1 – Risk Assessment Summary Dam Failure Scored Chart

Dam Failure	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Barnes County	4	2	2	4	2	10
Dazey	NA	NA	NA	NA	NA	NA
Fingal	NA	NA	NA	NA	NA	NA
Kathryn	4	3	3	3	1	12
Leal	NA	NA	NA	NA	NA	NA
Litchville	NA	NA	NA	NA	NA	NA
Nome	NA	NA	NA	NA	NA	NA
Oriska	NA	NA	NA	NA	NA	NA
Pillsbury	NA	NA	NA	NA	NA	NA
Rogers	NA	NA	NA	NA	NA	NA
Sanborn	NA	NA	NA	NA	NA	NA
Sibley	4	2	2	3	1	10
Valley City	4	1	1	4	2	8
Wimbledon	NA	NA	NA	NA	NA	NA

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

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

According to the 2014 NDMHMP, Barnes County's has five medium hazard dams and two high hazard dams. The dam failure risk is moderate-high. Figure 8.2.2 in Appendix 8.2 shows the medium hazard dams and high hazard dams in Barnes County in relation to the state.

Capabilities of and Vulnerabilities to Jurisdictions

Upon review of the statistics and oral history of residents, Barnes County and the jurisdictions of Kathryn, Sibley and Valley City were subject to impacts from dam failures. Dam failure did not pertain to the cities of Dazey, Fingal, Leal, Litchville, Nome, Oriska, Pillsbury, Rogers, Sanborn and Wimbledon.

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.

Barnes County

Impact	4	<ul style="list-style-type: none"> • Loss of 3,247 housing units in Valley City • Possible loss of life due to length of warning time • Displaced residents due to property loss could become homeless Loss of recreational activities and summer time population • Loss of recreational activities • Reduction drinking water supply services • Loss of crops and cropland • Loss of bridges and roads in and around inundation areas • Homes and farmsteads would be lost • Possibly temporary homeless population due to lack of facilities to shelter large numbers of people
Frequency	2	<ul style="list-style-type: none"> • No dam failures have occurred • Clausen Springs erosion 2009 – evacuation of the city of Kathryn
Likelihood	2	<ul style="list-style-type: none"> • The maintenance and security at the Baldhill Dam and all other dams are good and the likelihood of a failure is low • Possible” terrorist” action could target the dam
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: Lack of alternative housing or shelters to house displaced residents • More/Less vulnerable: Adequate window of warning • More vulnerable: Hospital is in the flood inundation area and medical facilities would be out of commission • More vulnerable: All of Valley City Emergency Response and government facilities are located in the inundation area • More vulnerable: Lack of facilities to shelter potentially large temporary homeless population
Capability	2	<ul style="list-style-type: none"> • U.S. Army Corps. of Engineers located in Valley City and monitors Baldhill dam closely • Emergency Action plan in place for Baldhill Dam • National Guard

City of Kathryn

Impact	4	<ul style="list-style-type: none"> • Kathryn is gone • Large property loss and mass casualties
Frequency	3	<ul style="list-style-type: none"> • Large chunk broke off from the dam in 2009 • In 1975 about 7 inches of rain fell and dam became overwhelmed
Likelihood	3	<ul style="list-style-type: none"> • Increased draining of water into Clausen Springs, built for 19 sections, now handles 90 sections and is ever increasing

		<ul style="list-style-type: none"> • Complete mitigation project strengthened the Dam and hopefully decreases the likelihood • Installation of drain tile will increase runoff into Clausen Springs
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: Large elderly population • More vulnerable: Trailer homes • More vulnerable: Dam is 4 to 7 miles from the city • More vulnerable: Little to no warning window • More vulnerable: Highway 21 would hold back water for period of time
Capability	1	<ul style="list-style-type: none"> • Low tax base and little financial resources of the city • No plans in place (evacuation, etc.) • National Guard can assist • Small town with good neighbors, helping hands, willing to help out

City of Sibley

Impact	4	<ul style="list-style-type: none"> • Loss of economy • Loss of recreational activities and summer time population • The town would be abandoned
Frequency	2	<ul style="list-style-type: none"> • Always a possibility of the event occurring
Likelihood	2	<ul style="list-style-type: none"> • Not likely to occur
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: Entire city is vulnerable as Lake Ashtabula is the lifeblood of the local economy
Capability	1	<ul style="list-style-type: none"> • Active city council • Limited tax base • Designated evacuation routes with the County • Limited administrative and city staff

City of Valley City

Impact	4	<ul style="list-style-type: none"> • Total loss of Valley City’s structures, businesses, infrastructure, and housing, transportation routes, schools, etc. • Loss of 3,247 housing units • Mass casualties will occur • Economic disruptions state-wide
Frequency	1	<ul style="list-style-type: none"> • No major incidents have occurred in the past
Likelihood	1	<ul style="list-style-type: none"> • Staff at Baldhill Dam and Army Corps of Engineers
Vulnerability	4	<ul style="list-style-type: none"> • All city infrastructure supporting health and quality of life is vulnerable
Capability	2	<ul style="list-style-type: none"> • City has an Evacuation Plan • Staff at Baldhill Dam and Army Corps of Engineers • Active city council • Educated public works and city departments to aid in evacuation

Vulnerabilities of County-Owned Buildings and Property

Significant hazard dams have the potential to impact county-owned buildings and property. A summary of county-owned buildings and property in Barnes County is provided in Chapter 4, Profile and Inventory. There are 19 county-owned buildings in the city of Valley City valued at \$19,461,931 and two county-owned buildings in the city of Kathryn valued at \$72,188.

Vulnerabilities of Critical Facilities and Infrastructure

Critical facilities and infrastructure are vulnerable to dam failures similar to county-owned buildings and property. Facilities and infrastructure located in inundation areas are highly susceptible to impacts from flood waters resulting from dam failures. Infrastructure such roads and rail in the transportation network and power lines in the utility network are vulnerable with the potential to be completely washed out. Chapter 4, Profile and Inventory provides information on county and city owned property in Barnes County and Chapter 9 provides maps of the transportation network in Barnes County. Major transportation routes such as Interstate 94, major freight railroad lines, the Hi-Line Bridge, and numerous county roads are vulnerable to dam failure.

Vulnerabilities to New and Future Development

New and future development located in the cities of Kathryn Valley City, which are geographically located along the Clausen Springs and Baldhill Dam inundation areas, are at risk from dam failures, respectively.

Vulnerabilities for new and future development for the city of Valley City has the potential to be reduced or eliminated if prohibited inside areas of the city located in the river valley and permitted on surrounding hillsides. However, the city is almost entirely located in the inundation area. Valley City and Barnes County does not have any known laws to prohibit or mitigate new development in dam inundation areas, with the exception of prohibiting development in areas located in designated floodplains. Although flood waters resulting from dam failures tend to flow along the floodplain, they can often extend beyond the floodplain due to the size and volume involved. Development located outside of the floodplain can still be at risk to a dam failure.

The city of Sibley is located geographically on Lake Ashtabula, which is formed by Baldhill Dam. New and future development would not be at risk to destruction from a dam failure. However, the city's economy is heavily dependent on the recreation activity provided by Lake Ashtabula. A dam failure would ultimately lead to emptying of the lake and devastate the local economy.

Data Limitations and Other Key Documents

Another source of data and statistics from dam failures and incidents was the Stanford University National Performance of Dams Program (NPDP). The NPDP, however, has been replaced by the Significant Incident Reporting Database (SIR), which is located within the Department of Homeland Security. The limitation in data from SIR is that search and retrieval methods for extracting data and incident details is not available. Information provided in the State of North Dakota MHMP 2013 stated that according to NPDP, there were 22 dam incidents in North Dakota between 1970 and April 2013, of which 11 were classified as dam failures and the remainder were classified as dam incidents.

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 Dam Design Handbook
- North Dakota Emergency Operations Plan, Dam Failure Annex

An Emergency Action Plan (EAP) specifies actions dam owners should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans. As stated in the 2014 NDMHMP, according to the North Dakota Century Code, dams with a storage capacity greater than 1,000 acre-feet are required to have an EAP. An EAP is in place for the Baldhill Dam.

5.3 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 three 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.

A number of 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. The chemical quality of river and lake water will change, and sediment transport regimes of streams will be altered, because of reduction in flow.

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. A few examples of direct impacts are 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. The consequences of direct impacts can result in 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, increased 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 determine financial estimates of damages.

The U.S. Department of Agriculture frequently declares agricultural disasters because of drought as noted in the history section. In Barnes County the impacts would first be felt from agricultural losses as the counties 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 Barnes 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 5.3.1 summarizes the history of drought in Barnes County. The data is also shown in Appendix 8.3.

Table 5.3.1 – Barnes County Drought Hazard History Summary

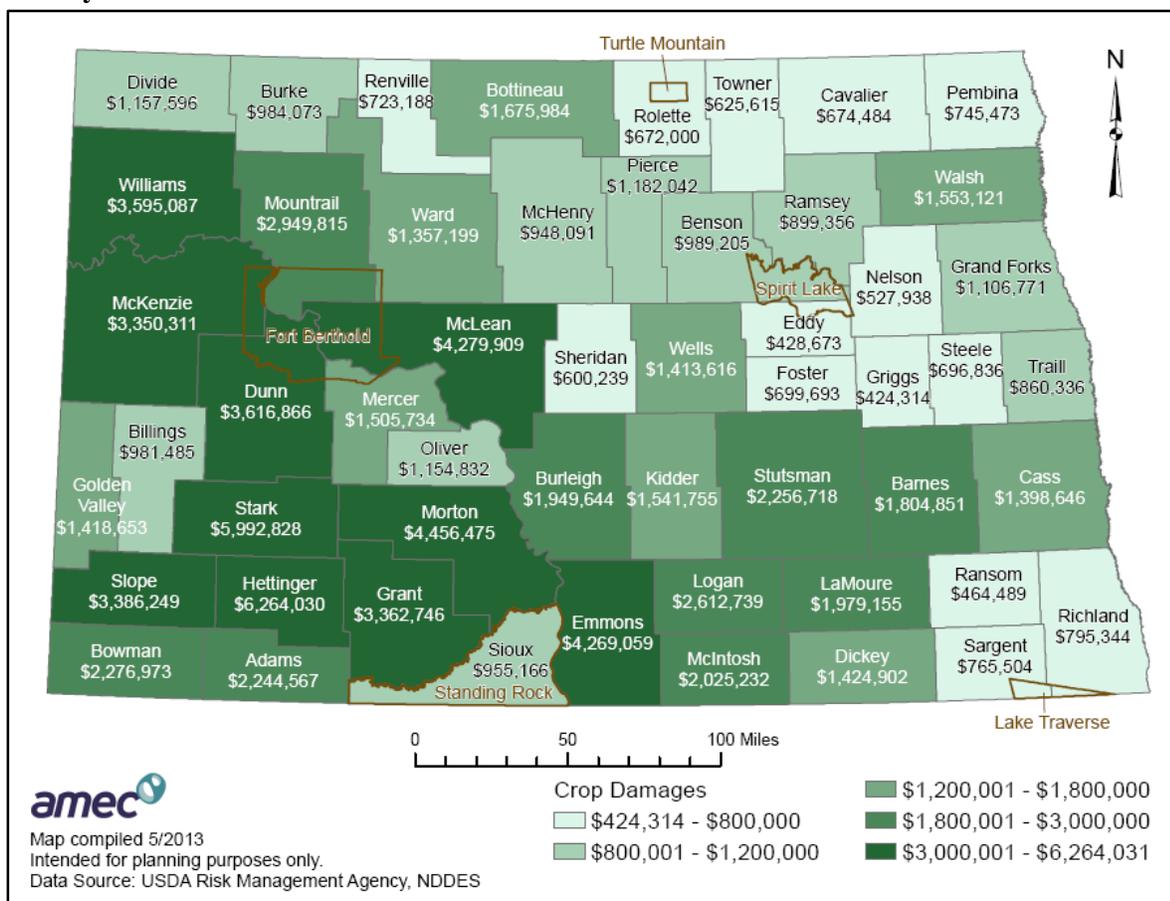
Begin Date	Injuries	Fatalities	Property Damage	Crop. Damage	Remarks	Source
6/1/1988	0	0	\$94,340	\$94,340	Drought - Heat	SHELDUS
8/4/2001	0	0	\$0	\$0	Head indices reached 115 to 125 degrees.	NCDC
8/6/2006	0	0	\$0	\$0	Barnes County received a D2 designation.	NCDC
7/10/2012	0	0	\$0	\$0	Lack of precipitation	NOAA, NCDC
8/1/2012	0	0	\$0	\$0	Lack of precipitation	NOAA, NCDC
8/1/2012	0	0	\$0	\$0	Dry conditions	NOAA, NCDC
10/1/2012	0	0	\$0	\$0	Dry conditions	NOAA, NCDC
Total	0	0	\$94,340	\$94,340		

Sources: Information Service/National Climatic Data Center (NCDC)
 National Oceanic and Atmospheric Administration (NOAA)
 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. Indemnity is the amount paid to cover insurance claims from crop loss due to drought. The total loss liability of crops was \$136,020,200 in Barnes County between 1990 and 2013 on 457,995 acres. Indemnity paid was \$38,680,556 resulting in losses of 28 percent of total liability. Crop loss indemnity paid from drought over the 24-year period resulted in an annual average of \$1,611,690. Detailed data is available per crop for each year and can be found in Appendix 8.3, Table 8.3.2.

Figure 5.3.1 shows the annualized estimated crop losses experienced in Barnes County from drought between 2003 and 2012 from the 2014 NDMHMP. Barnes County experienced an estimated \$1,804,851 in annual crop losses from drought, roughly \$193,000 less than 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 5.3.1 – 2003 to 2012 Annualized Estimated Crop Losses from Drought by North Dakota County



Source: North Dakota Department of Emergency Services

Barnes County has not had any Disaster Declarations for drought. North Dakota had three requests that were turned down. Table 5.3.2 summarizes this information. Categories of potential drought losses are shown in Appendix 8.3 and provide information on 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 Barnes County in years in addition to the official drought in 1988.

There have been no Presidential Disaster Declarations pertaining to drought in Barnes County.

Table 5.3.2 shows turned down requests for disaster declarations pertaining to drought in Barnes County.

Table 5.3.2 – Turned Down State Requested Presidential 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: <http://maggie6.cadsr.udel.edu/website/presdec/viewer.htm>, FEMA

Probability and Magnitude

Hazard history was gathered from the SHELDUS, NCDC, NOAA, and information from the 2010 Barnes County MHMP, which showed seven occurrences of drought between 1988 and 2012. The drought of 1988 was the only drought of magnitude to impact the county. Due to one instance of an official drought declaration, the probability of drought is very low in Barnes County. However, dry weather persists year to year and varies in intensity. Due to the local economy of small incorporated cities in the county 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 Barnes County averaged between \$1,611,690 and \$1,804,851 annually. Approximately 80 claims of indemnity were made from crop loss due to drought between 1990 and 2013. Therefore, the probability of crop loss from drought is 100 percent and magnitude depends on the weather conditions in the immediate area. Figure 8.3.1 in Appendix 8.3 shows the areas subject to drought in Barnes County.

The magnitude of drought can also be measured by employment. According to Quarterly Census of Employment and Wages data from the N.D. Workforce Intelligence Network, in 2013 there are 20 agriculture, forestry, fishing and hunting establishments in Barnes County with an average employment of 65 people and total wages of \$2,471,470. In addition, many wholesale trade companies such as farm equipment dealerships and agriculture supply companies are connected to the agriculture industry and would be impacted. In Barnes County, there are 38 wholesale trade establishments employing an average of 324 people with total wages of \$16,316,436. The magnitude of a severe drought on the local economy would be catastrophic to jobs in the agriculture and agriculture-related industries in the county.

Risk Assessment

Table 5.3.3 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, Threat and Hazard Identification Risk Assessment. The total in Table 5.3.3 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 5.3.3 – Risk Assessment Summary Drought Scored Chart

Drought	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Barnes County	3	2	2	3	2	8
Dazey	4	2	2	3	2	9
Fingal	4	3	3	3	1	12
Kathryn	3	3	3	3	2	10
Leal	2	2	1	1	3	3
Litchville	3	2	2	2	3	6
Nome	2	1	1	4	1	7
Oriska	4	2	3	2	2	9
Pillsbury	2	2	3	2	2	7
Rogers	4	2	2	3	1	10
Sanborn	4	1	2	2	1	8
Sibley	2	2	2	2	1	7
Valley City	1	2	2	2	3	4
Wimbledon	4	3	3	4	2	12

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

Seasonal Pattern	Starts with limited Snowfall/Summer
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 Barnes 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 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.

Barnes County

Impact	3	<ul style="list-style-type: none"> • Loss of crop, livestock, economy, lost jobs, casualties (possible) • Loss of economy and jobs as the county is agriculturally based • Shortages of water may occur • Increased fire hazards-overland fire, risk to buildings • Higher cost to cool homes, increased utilities • Impacts local food supplies • \$94,000 in property damage in 1988 • Total crop loss of \$136,020,200 in between 1990 and 2013 • Increase of insects which can further crop damage
Frequency	2	<ul style="list-style-type: none"> • Only one occurrence of severe drought occurred in 1988 • County received D2 drought designation in 2006 • In 2013, June to October experienced little to no rain • Dry conditions summer of 2014 • Indemnity covering crop loss has averaged approximately \$1,611,689 per year between 1990 and 2013
Likelihood	2	<ul style="list-style-type: none"> • Low possibility as history shows only one occurrence of severe drought • Always a possibility given cyclical pattern of rain and weather • Not a lot of drain tile in county but could influence drought conditions
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: Livestock and crops • More vulnerable: Lack of water sources for drought relief and for suppression of fires resulting from drought in some jurisdictions • More vulnerable: elderly and small children if water shortages did occur • More vulnerable: Length of a drought, which is difficult to predict, may increase vulnerability to the hazard • More vulnerable: Lack of aquifer to use as backup water source • More vulnerable: Unpredictable hazard due to speed of onset • Less vulnerable: Advanced warning systems such as reverse 911, cell phones, internet and TV • Less vulnerable: Burn bans implemented during dry periods
Capability	2	<ul style="list-style-type: none"> • Active county commission • Contracts for engineering, planning and grant writing • GIS services provided through state • County-wide mutual aid agreement • Maintains fire index signs at Litchville, Sanborn, Sibley and Valley City • Active emergency management department with education and outreach available on the departments website • Education and outreach provided by NDSU/Barnes County Extension Service

City of Dazey

Impact	4	<ul style="list-style-type: none"> • Loss of crop, livestock, economy • Higher cost to cool homes, increased utilities
Frequency	2	<ul style="list-style-type: none"> • Some dry conditions each year, couple weeks in length • In 2013, dry conditions for July and August, little to no rain
Likelihood	2	<ul style="list-style-type: none"> • Weather patterns are cyclical, weather patterns unpredictable • Not a lot of drain tile in the area thus far
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: High senior population • More vulnerable: Abandoned buildings may result in fires • More vulnerable: No crop break around the city • Less vulnerable with no school
Capability	2	<ul style="list-style-type: none"> • 25,000 gallon storage tank at the park, underground • Dazey fire department has pumper tanker, brush rigs, water moving equipment, all carry water and area always full

City of Fingal

Impact	4	<ul style="list-style-type: none"> • Loss of crop, livestock, economy, lost jobs, casualties (possible) • Increased fire hazards-overland fire, risk to buildings • Higher cost to cool homes, increased utilities • Lower water supplies/water shortages • Impacts local food supplies. • Agriculture based economy
Frequency	3	<ul style="list-style-type: none"> • 1988 • Some dry conditions each year, couple weeks in length. • In 2013, dry conditions for June to October - little to no rain
Likelihood	3	<ul style="list-style-type: none"> • Weather patterns are cyclical, weather patterns unpredictable • Not a lot of drain tile in the area • No over irrigation
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: Agriculture economy, not diversified • More vulnerable: No backup tanks or tower Less vulnerable: City connected to Barnes Rural Water • Less vulnerable: People (some) preserves rain water, uses river and creek as well • Less vulnerable: Low elderly population
Capability	1	<ul style="list-style-type: none"> • No education programs or outreach • Limited financial capabilities • Active city council • Barnes Rural Water District • No plans

City of Kathryn

Impact	3	<ul style="list-style-type: none"> • Loss of crop, livestock, economy, lost jobs, casualties (possible) • Increased fire hazards-overland fire, risk to buildings • Higher cost to cool homes, increased utilities • Lower water supplies/water shortages • Impacts local food supplies
Frequency	3	<ul style="list-style-type: none"> • 1988 • Some dry conditions each year, couple weeks in length. • In 2013, dry conditions for June to October - little to no rain • Around 1 inch of rain, same as 2014, soil is cracking and dry, currently a water shortage
Likelihood	3	<ul style="list-style-type: none"> • Weather patterns are cyclical, weather patterns unpredictable. • Not a lot of drain tile in the area – however farmers are started to install • Too much irrigation of cropland uses water resources • Leak of reservoir which is still unknown, up to 5,000 gallons lost per day
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: Elderly population • Less vulnerable: Residents have individuals wells and springs that run into the reservoir • Less vulnerable: Everyone preserves rain water, uses river and creek
Capability	2	<ul style="list-style-type: none"> • No water from Barnes Rural Water District – in the paper work phase • Individual wells and preserves rain water • People use river and creek as well • Fire department has equipment for moving of water • 28,000 gallon reservoir, but is currently leaking

City of Leal

Impact	2	<ul style="list-style-type: none"> • Loss of crop, livestock, economy, lost jobs, • Increased fire hazards-overland fire, risk to buildings • Higher cost to cool homes, increased utilities • Lower water supplies • Impacts local food supplies
Frequency	2	<ul style="list-style-type: none"> • 1988 • Some dry conditions each year, couple weeks in length. • In 2013, dry conditions for June to October - little to no rain • Around 1 inch of rain
Likelihood	1	<ul style="list-style-type: none"> • Weather patterns are cyclical, weather patterns unpredictable. • Not a lot of drain tile in the area – is not foreseen as future issue
Vulnerability	1	<ul style="list-style-type: none"> • More vulnerable: Elderly individual and two younger people • More vulnerable: Sloughs by railroad tracks-never mowed and could become start and spread if the wind is right. • Less vulnerable: Mowing through special assessment to keep vegetation under control • Less vulnerable: Residents have backup individuals wells
Capability	3	<ul style="list-style-type: none"> • Water from Barnes Rural Water District

		<ul style="list-style-type: none"> • Has truck to move water • Individual wells
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City of Litchville

Impact	3	<ul style="list-style-type: none"> • Loss of crop, livestock, economy, lost jobs • Increased fire hazards-overland fire, risk to buildings • Higher cost to cool homes and increased utilities • Lower water supplies
Frequency	2	<ul style="list-style-type: none"> • 1988 • Some dry conditions each year, couple weeks in length • In 2013, dry conditions for June to October
Likelihood	2	<ul style="list-style-type: none"> • Weather patterns are cyclical, weather patterns unpredictable. • Not a lot of drain tile in the area thus far – could lead to issues
Vulnerability	2	<ul style="list-style-type: none"> • More vulnerable: High senior population • More vulnerable: Abandoned buildings may result in fires • More vulnerable: Abandoned vehicles • More vulnerable: School-children
Capability	3	<ul style="list-style-type: none"> • Barnes Rural Water District • Water Tower-50,000 gallons • equipment to move water • No Individual wells • Farmers have wells • No separate water storage tanks

City of Nome

Impact	2	<ul style="list-style-type: none"> • Loss of crop, livestock, economic activity and jobs • Casualties possible • Increased risk to buildings from fire hazards • Higher cost to cool homes resulting in increased utilities • Lower water supplies may lead to water shortages • Impacts locally-grown food supplies as water shortages may occur
Frequency	1	<ul style="list-style-type: none"> • Severe drought in 1988 • Some dry conditions each year lasting a couple weeks in length • In 2013 and 2014, dry conditions lasted for June to October
Likelihood	1	<ul style="list-style-type: none"> • Weather patterns are cyclical and unpredictable • No drain tile in the area • Too much irrigation of cropland occurs and depletes water resources • City water is provided by Barnes County Rural Water District and decreases likelihood of impacts • High water content in the soil decreases likelihood of severe drought
Vulnerability	4	<ul style="list-style-type: none"> • Less vulnerable: Water is provided by Barnes County Rural Water District • More vulnerable: City is completely dependent on the water district

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		<ul style="list-style-type: none"> • More vulnerable: Abandoned structures are vulnerable to fire potential from dry conditions • Less vulnerable: Low elderly population • Less vulnerable: Fire department has equipment for moving of water • Lack of individual wells can decrease and increase vulnerability
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 • No active education or outreach programs • Lacks resources to accomplish projects independently

City of Oriska

Impact	4	<ul style="list-style-type: none"> • Loss of crop, livestock, economy, lost jobs, • Increased fire hazards • Higher cost to cool homes, increased utilities
Frequency	2	<ul style="list-style-type: none"> • 1988 • Some dry conditions each year, couple weeks in length • In 2013, dry conditions for July and August, little to no rain • In 2012, lawns were dry, little moisture in the soil
Likelihood	3	<ul style="list-style-type: none"> • Weather patterns are cyclical, weather patterns unpredictable • Not a lot of drain tile in the area thus far • Drain tile is coming, will
Vulnerability	2	<ul style="list-style-type: none"> • More vulnerable: High senior population • More vulnerable: Elementary school • More vulnerable: Abandoned buildings may result in fires • More vulnerable: Overgrown vegetation on yards • More vulnerable: Abandoned vehicles
Capability	2	<ul style="list-style-type: none"> • Underground 10,000 tank of backup water • Water from Barnes Rural Water District

City of Pillsbury

Impact	2	<ul style="list-style-type: none"> • Loss of crop, livestock, economy, lost jobs • Increased fire hazards-overland fire, risk to buildings • Higher cost to cool homes, increased utilities • Lower water supplies
Frequency	2	<ul style="list-style-type: none"> • 1988 • Some dry conditions each year, couple weeks in length • In 2013, dry conditions for June to October - little to no rain.
Likelihood	3	<ul style="list-style-type: none"> • Weather patterns are cyclical, weather patterns unpredictable. • Not a lot of drain tile in the area thus far – could lead to issues
Vulnerability	2	<ul style="list-style-type: none"> • More vulnerable: High senior population • More vulnerable: Abandoned buildings may result in fires • More vulnerable: Abandoned vehicles

		<ul style="list-style-type: none"> • More vulnerable: Sloughs by railroad tracks-never mowed and could become start and spread if the wind is right
Capability	2	<ul style="list-style-type: none"> • Water from Dakota Water Users-offices in Finley, wells in Hannaford. • No equipment to move water • Individual wells

City of Rogers

Impact	4	<ul style="list-style-type: none"> • Loss of crop, livestock, economy, lost jobs • Increased fire hazards-overland fire, risk to buildings • Higher cost to cool homes, increased utilities • Lower water supplies • All residents will be affected • Fire issues
Frequency	2	<ul style="list-style-type: none"> • 1988 • Some dry conditions each year, couple weeks in length • In 2013, dry conditions for June to October
Likelihood	2	<ul style="list-style-type: none"> • Weather patterns are cyclical, weather patterns unpredictable. • Not a lot of drain tile in the area thus far – could lead to issues, some has been done
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: High senior population, many children and families • More vulnerable: Abandoned buildings may result in fires • More vulnerable: Abandoned vehicles • Barnes Rural Water District • Less vulnerable: Fire Dept. has equipment to move water • Less vulnerable: Farmers have wells • Less vulnerable: Elevator has two large tanks for water storage-200,000 each
Capability	1	<ul style="list-style-type: none"> • Active city council • Limited tax base • Limited administrative and city staff • Lack of water conservation plan

City of Sanborn

Impact	4	<ul style="list-style-type: none"> • Loss of crop, livestock, economic activity and jobs • Casualties possible • Increased risk to buildings from fire hazards • Higher cost to cool homes resulting in increased utilities • Lower water supplies may lead to water shortages • Impacts locally-grown food supplies as water shortages may occur • Local economy heavily dependent on agriculture
Frequency	1	<ul style="list-style-type: none"> • Severe drought in 1988 • Some dry conditions each year lasting a couple weeks in length • In 2013 and 2014, dry conditions lasted for June to October

Chapter 5

Likelihood	2	<ul style="list-style-type: none"> • Weather patterns are cyclical and unpredictable • No drain tile in the area • Little irrigation in and around the area decreases likelihood of water resource depletion • City water is provided by Barnes Rural Water District and decreases likelihood of impacts • High water content in the soil and high water table decreases likelihood of severe drought
Vulnerability	2	<ul style="list-style-type: none"> • More vulnerable: City is completely dependent on the water district • More vulnerable: High elderly population • More vulnerable: Abandoned structures are vulnerable to fire potential from dry conditions • Less vulnerable: Fire department has 10,000-gallon fire truck and equipment for moving of water • Less vulnerable: City has water tower for backup water supply • Less vulnerable: Water is provided by Barnes Rural Water District • Lack of individual wells can decrease and increase vulnerability
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 • No active education or outreach programs • Lacks resources to accomplish projects independently

City of Sibley

Impact	2	<ul style="list-style-type: none"> • Loss of crop, livestock, economy, lost jobs, casualties (possible) • Increased fire hazards-overland fire, risk to buildings • Higher cost to cool homes, increased utilities • Lower water supplies/water shortages • Impacts local food supplies • Increase summer and recreational population • Increase tax revenue and economic activity
Frequency	2	<ul style="list-style-type: none"> • 1988 • Some dry conditions each year, couple weeks in length • In 2012, dry conditions for June to October - little to no rain • Dry conditions summer of 2014
Likelihood	2	<ul style="list-style-type: none"> • Weather patterns are cyclical, weather patterns unpredictable. • Not a lot of drain tile in the area – however farmers are started to install • Hilly terrain will prevent large installations of drain tile • Located on an aquifer with plenty of available water
Vulnerability	2	<ul style="list-style-type: none"> • Elderly population and retired individuals • Summer and recreational population • Fire Department has fire truck for moving of water
Capability	1	<ul style="list-style-type: none"> • Active city council • Limited tax base • Designated evacuation routes with the County

		<ul style="list-style-type: none"> • Limited administrative and city staff • Lack of water conservation plan • City has a drought management plan
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City of Valley City

Impact	1	<ul style="list-style-type: none"> • Loss of crop, livestock, economic activity and jobs • Casualties possible • Increased risk to buildings from fire hazards • Higher cost to cool homes resulting in increased utilities • Lower water supplies may lead to water shortages • Impacts locally-grown food supplies as water shortages may occur • Restrictions on water use by city residents • Reduction in availability of water for drinking purposes • Wells would need to be used and would run dry • Local economy dependent on agriculture
Frequency	2	<ul style="list-style-type: none"> • Severe drought in 1988 • Some dry conditions each year lasting a couple weeks in length • In 2013 and 2014, dry conditions lasted for June to October
Likelihood	2	<ul style="list-style-type: none"> • Weather patterns are cyclical and unpredictable • Drain tile starting to be installed in and around the city • Little irrigation in and around the area decreases likelihood of water resource depletion • City water is provided by city public works • High water content in the soil and high water table decreases likelihood of severe drought
Vulnerability	2	<ul style="list-style-type: none"> • More vulnerable: Lack of individual wells can decrease and increase vulnerability • More vulnerable: High elderly population • More vulnerable: Abandoned structures are vulnerable to fire potential from dry conditions • More vulnerable: City public works has capacity for water storage lasting the city up to 2 days without water restrictions and with restrictions up to 3 days • More vulnerable: City is vulnerable as it is dependent on surface water for potable water • More vulnerable: City schools, university, dependent populations, senior housing • Less vulnerable: Water is provided own city system
Capability	3	<ul style="list-style-type: none"> • Active city council • Water Conservation Plan and Drought Management Plan • Water restriction criteria in Drought Management Plan • Relies on county, regional, state and other agencies for assistance • Education and outreach through the Valley City Times-Record to education public on strategies to restrict water usage • Possesses resources to accomplish projects independently

		<ul style="list-style-type: none"> • City maintains wells as backup water supply that would last around a month • City installed Automatic Metering and Infrastructure with targets that can be put into place to limit water usage, warning, fine and then complete shut off
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City of Wimbledon

Impact	4	<ul style="list-style-type: none"> • Loss of crop, livestock, economy, lost jobs, casualties (possible) • Increased fire hazards-overland fire, risk to buildings • Higher cost to cool homes, increased utilities • Lower water supplies/water shortages • Impacts local food supplies. • Full blown drought would devastate age economy
Frequency	3	<ul style="list-style-type: none"> • 1988 • Some dry conditions each year, couple weeks in length. • In 2013, dry conditions for June to October - little to no rain
Likelihood	3	<ul style="list-style-type: none"> • Weather patterns are cyclical, weather patterns unpredictable. • Not a lot of drain tile in the area – however farmers are started to install • Not much irrigation • Some large bodies of water needing attention, water levels are dropping
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: All on Barnes Rural Water • More vulnerable: City well still provides water, but not treated • More vulnerable: Elderly population – high population • More vulnerable: 25 children • More vulnerable: Backup water cannot help with crops • Less vulnerable: Water tower backup supply of water • Less vulnerable: 10,000 gallon backup down at water plant • Less vulnerable: Water at elevator
Capability	2	<ul style="list-style-type: none"> • Water from Barnes Rural Water District • City installed storm sewer with grant from the state • Active city council • No plans in place

Vulnerabilities to County-Owned Buildings and Property

Drought does not have an impact on structures in the county. However, loss of water supply would have an effect on 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 vulnerable to drought include 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, Barnes County and jurisdictions would have less access to water for fighting fires. A summary of county and city owned property in Barnes County is provided in Chapter 4, Profile and Inventory.

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. They would be more susceptible to drought.

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

With the influx of energy development in the western portion of the State, large volumes of water are used in the hydraulic fracturing or “fracking” process for extraction of oil and natural gas. According to the 2014 NDMHMP, an average of three million gallons of water is required in the fracking process for each well drilled. With the announcement of test drilling in McIntosh and Emmons Counties, there is the potential for energy development to move to the eastern side of the State. Drought conditions could be exacerbated if energy development were to take hold in Barnes 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 to occur more frequently. 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 ends. 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
- Barnes County Emergency Operations Plan

5.4 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. This moisture can come from several different sources and circumstances. One source is heavy snowpack which is affected by rapid warming trend as well as spring rain falling directly on the snowpack. Another source of flooding occurs when heavy rain falls in such a short time that the soil cannot absorb it. Flooding is also caused when heavy rain falls over a prolonged period of time and the ground becomes saturated and cannot absorb the additional moisture.

Flooding can also result from ice jamming or blocking streams. Ice breaking up into pieces, called floes, move along with the flowing rivers or streams. The ice floes can jam at curves, narrow places in the channel, and at structures creating an effective dam that produces water backup and overflow. Finally, flooding can occur as a result of dam, dike, or levee failure, overtopping or breaching.

Floods are classified as gradual or flash floods. A gradual flood is a slow developing event with a natural, predictable source of water or moisture, such as snow melt, slow rain, or a controlled dam release. This type can often be forecast from the amount of moisture or water available. Its time of occurrence can be calculated to a reasonable degree. Protective measures can usually be implemented in a timely manner to mitigate the potential damage and loss. The other type of flood is a quick-occurring, flash flood. A flash flood can happen in any jurisdiction in the county and is caused by: thunderstorms, heavy rains on snowpack, dam, dike or levee failures. This type of flood happens with little warning and response organizations have little time to react.

Overland flooding occurs when waterway 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.

Floods can be classified in three categories:

- Category A – All major floods, exclusive of relatively localized floods, which extensive property damages occur or serious danger to life or flood protective work prevails.
- Category B – Floods, including so-called “flash floods”, as well as other relatively localized short duration floods, that produce high property damage or hazard to life in local areas without creating or contributing substantially to dangerous flooding along larger rivers downstream.
- Category C – Flows approaching flood stage in a relatively large drainage area without having directly caused loss of life or significant property damage, but creating a condition especially favorable to a major flood in the event of further heavy rainfall or snow melt or both.

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.

The impact of flooding may be felt by the individual and family; city, county, state government; and within regions, such as an entire drainage basin.

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 as a result 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.

According to the N.D. Department of Emergency Services, there are 18 repetitive loss properties from flooding in Barnes County, of which nine are located in Valley City.

Based on the data in Table 5.4.1, between 1948 and March 2014, Barnes County experienced 51 instances of significant flooding with three injuries and no fatalities. These events resulted in \$11,282,796 in property damage and \$1,865,000 in crop damage. Detailed accounts for newspapers regarding occurrences of flooding can be found in Appendix 8.4.

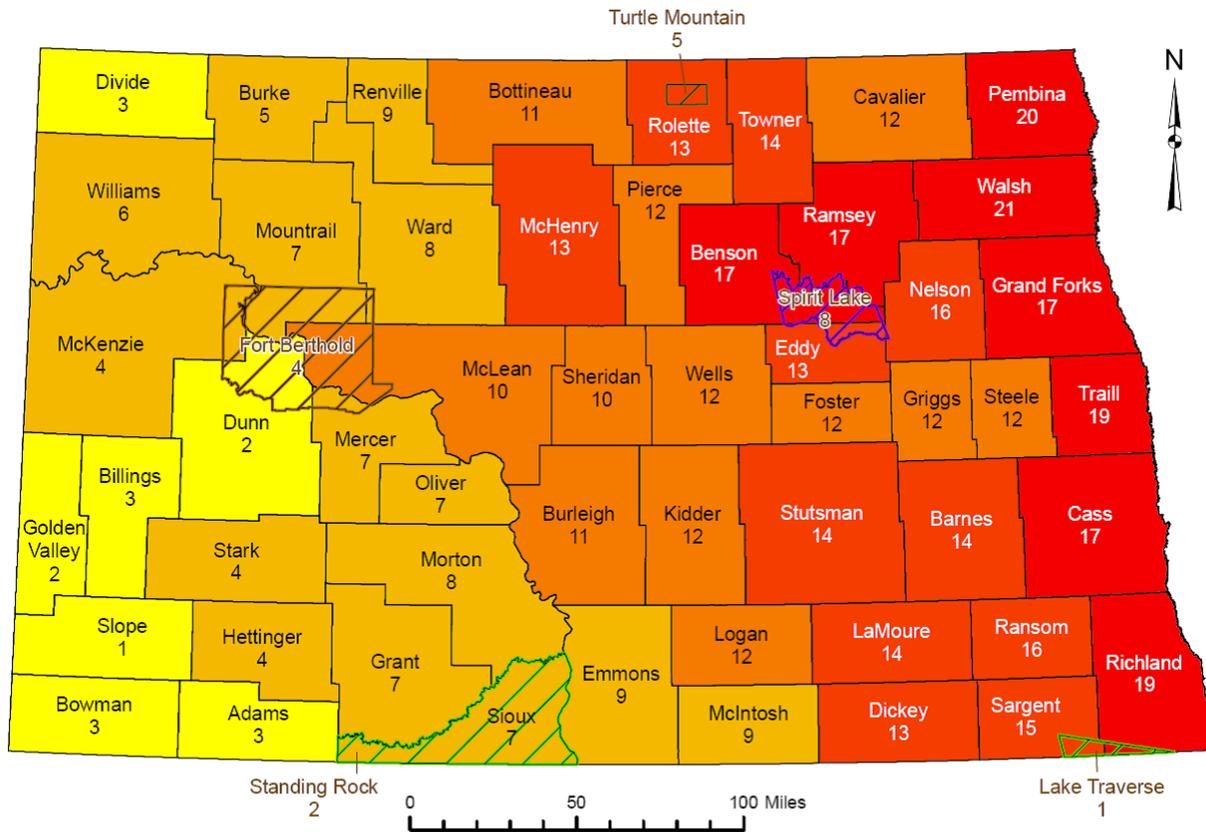
Table 5.4.1 – 1948 to March 2014 Barnes County Flood Event History Summary

Flood					
Number of Occurrences	Date Range	Injuries	Fatalities	Property Damage	Crop Damage
51	1948-March 2014	2	0	\$11,282,796	\$1,865,000

Sources: Spatial Hazard Events and Losses Database for the United States (SHELDUS)
 National Oceanic and Atmospheric Administration (NOAA)
 National Climatic Data Center (NCDC)
 Valley City Times-Record
 2010 Barnes County MHMP

Figure 5.4.1 shows the number of Presidential Disaster and Emergency Declarations that include flooding in Barnes County between 1989 and 2013. A total of 14 presidential disasters have been declared that impacted Barnes County.

Figure 5.4.1 – 1989 to 2013 – North Dakota Presidential Disaster and Emergency Declarations Including Flooding



Map compiled 6/2013
 Intended for planning purposes only.
 Data Source: FEMA

Number of Federal Flood Disasters

Counties	Tribal Lands
1 - 3	1 - 3
4 - 9	4 - 6
10 - 12	7 - 9
13 - 16	
17 - 21	

Source: North Dakota Department of Emergency Services

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. Indemnity is the amount paid to cover insurance claims from crop loss due to flooding. The loss liability of crops was \$263,960 in Barnes County between 1990 and 2013 on 7,854 acres. Indemnity paid was \$541,071 resulting in losses of 49 percent of total liability. Crop loss indemnity paid from

flooding over the 24-year period resulted in an annual average of approximately \$11,000. Detailed data is available per crop for each year and can be found in Appendix 8.4.

Probability and Magnitude

Based on hazard history information provided by NOAA, NCDC and SHELDUS, the probability of flooding events in Barnes County is 76 percent based on 51 events occurring between 1948 and March 2014. Crop losses data from flooding provided by the RMA over the 24-year period resulted in an annual average indemnity paid of \$11,000. The magnitude can be classified as substantial due to approximately \$11,000,000 in property damage. Damage from flooding commonly occurs to homes, roads, agricultural land and public infrastructure.

Risk Assessment

Table 5.4.2 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 5.4.2 – Risk Assessment Summary Flood Scored Chart

Flood	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Barnes County	4	3	3	4	2	12
Dazey	4	2	2	3	2	9
Fingal	3	3	3	4	1	12
Kathryn	3	2	3	3	2	9
Leal	4	2	3	3	2	10
Litchville	2	2	2	2	2	6
Nome	3	2	3	3	1	10
Oriska	3	3	4	4	2	12
Pillsbury	3	3	3	2	2	9
Rogers	3	3	4	3	1	12
Sanborn	4	3	3	2	1	11
Sibley	4	3	4	4	1	14
Valley City	4	4	4	4	1	15
Wimbledon	2	3	3	2	2	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 5.4.3 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 as a result of the 100-year flood.
- New development must not cause an increase in flood damages to other property.

Table 5.4.3 – Jurisdictions Participating in National Flood Insurance Program

Jurisdiction Name	CID #	Entry Date	Mapped
County of Barnes	380339	06/04/87	2/06/08
City of Kathryn	380001	11/22/74	2/06/08
City of Litchville	380187	01/17/75	2/06/08
City of Valley City	380002	02/08/74	2/06/08
City of Wimbledon	380212	2/14/75	NSFHA

Source: FEMA Community Status Book Report, North Dakota

Capabilities of and Vulnerabilities to Jurisdictions

Upon review of statistics and data regarding flooding, the frequency and likelihood was ranked mostly a “3” or “4” in the county. Flooding is a concern for residents in the county given past losses and frequency of the hazard. The ranking for impact, 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.

Barnes County

Impact	4	<ul style="list-style-type: none"> • Roads can become washed out and limit access for emergency services and economy activity • Loss of economy resulting from crop damage Increased mosquitos-many transmit disease due to lots of grass and debris laying around • Large property loss, vehicles, personal property • Can impact lift stations and cause sewer backups • Damage to critical facilities and infrastructure • Potential loss of life from fast moving water and drowning’s • Some homes with basements which can become flooded • NFIP total paid as of 1/13/2013: \$2,297,190
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		<ul style="list-style-type: none"> • Total crop loss of \$263,960 between 1990 and 2013 • Increased crime as emergency services are limited in mobility • Temporary relocation of medical services would decrease range of services offered • Temporary homeless population • Increase in communicable disease from overland flooding and standing water • Cause of secondary hazards such as shortage or outage of critical materials or infrastructure, or transportation accidents
Frequency	3	<ul style="list-style-type: none"> • Potential for overland flooding when experiencing heavy rain or a fast snow melt in the spring • Increase in strength of precipitation in recent years • Infrastructure improvements such as raising of roads still need to be completed • Per capita average annualized loss of \$400 • Annual indemnity of \$10,998 paid for crop loss
Likelihood	3	<ul style="list-style-type: none"> • Heavy spring melting and heavy rains occurring every 5 years • Due to lack of storm water system overland flooding is likely in the future • High water table • Installation of drain tile • More paved or impervious surface increases runoff and decreases water absorbed naturally into the ground and increases magnitude of overland flooding • Changing weather patterns with increased rain intensity
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: High water table • More vulnerable: Lack of storm water system in some jurisdictions • More vulnerable: High elderly population in certain areas • More vulnerable: Crops • More vulnerable: Aging population • More vulnerable: the size of the watershed and basin which drains water from Devils Lake area • Less vulnerable: County has been flood mapped • Less vulnerable: Road raises have been completed and properties have been removed from flood areas • Less vulnerable: Advanced warning systems such as reverse 911, cell phones, internet and TV • Less vulnerable: Local residents possess equipment for cleanup of debris
Capability	2	<ul style="list-style-type: none"> • FEMA Flood Mapped • Active County Commission • Contracts for engineering, planning and grant writing • GIS services are provided by the state and engineering firms • Relies on regional, state and other entities for assistance with major projects • Does not have financial resources to accomplish projects independently • Active emergency management department with education and outreach capabilities

City of Dazey

Impact	4	<ul style="list-style-type: none"> • Water accumulates in city park and throughout the city • Impacts the lift station, losses power, people experience sewer backups • Blocked roads in the city • Basement flooding occurs • No death or injuries • Long-term health risks due to mold and disease from standing water • Mosquito infestation, nuisance
Frequency	4	<ul style="list-style-type: none"> • Standing water each year in the city park • Basements have seepage yearly
Likelihood	4	<ul style="list-style-type: none"> • Heavy spring melting to heavy rains occurs yearly • Fill in the drainage ditch, water does not have anywhere to drain • City located in a closed basin • Drainage of farmland may increase likelihood
Vulnerability	4	<ul style="list-style-type: none"> • Abandoned buildings • No school • High elderly population • City park-low lying spot in the city • Daycare located near slough • Inadequate storm water system-old and cannot serve the community • Lift station is located adjacent to where water accumulates. • Pump house in the park, affect drinking water
Capability	2	<ul style="list-style-type: none"> • Lack of manpower by the city and general public • Fire department has equipment to pump water, somewhat effective. • City has floating pump. • Has borrowed pumping equipment from Hannaford and Barnes County Fire Dept. • Barnes Rural Water Board and Water District

City of Fingal

Impact	3	<ul style="list-style-type: none"> • Blocked roads in the city • Increased mosquitos-many transmit disease due to lots of grass and debris laying around • Basement have become flooded • Residents have sump pumps running 24/7 • Large property loss, vehicles, personal property • Some casualties
Frequency	3	<ul style="list-style-type: none"> • Only happens when a lot of precipitation or snow in the winter • Depends largely on the weather • Sump pumps are constantly running from high water table • Couple times per year
Likelihood	3	<ul style="list-style-type: none"> • Heavy spring melting to heavy rains occurs yearly • Runoff from farms from the west, coulees north of town • Due to lack of storm water system, is likely in the future • High water table

		<ul style="list-style-type: none"> • Planting method of beans, changing in farm practices causes water to run off, no longer ridged • Drainage ditches are dug to drain agriculture fields
Vulnerability	4	<ul style="list-style-type: none"> • High water table • Low elderly population • Location of lift station not elevated • Water from surrounding farms • Loss of power from flooding causes sanitary system to backup • Main Street and 4th avenue experience overland flooding • Lift station located in lowest part of the city
Capability	1	<ul style="list-style-type: none"> • Lack of manpower by the city and general public • No education programs or outreach • Limited financial capabilities • Active city council • Barnes Rural Water District • No plans

City of Kathryn

Impact	3	<ul style="list-style-type: none"> • Blocked roads in the city • Increased mosquitos-many transmit disease due to lots of grass and debris laying around • Basement have become flooded • Residents have sump pumps running 24/7 • Large property loss, vehicles, personal property • Some casualties
Frequency	2	<ul style="list-style-type: none"> • Only happens when a lot of precipitation or snow in the winter • Depends largely on the weather • Sump pumps are constantly running
Likelihood	3	<ul style="list-style-type: none"> • Heavy spring melting to heavy rains occurs yearly • Runoff from hills into the creek that runs through town • Due to lack of storm water system, is likely in the future • High water table • Drainage from drain tile into Clausen Springs and other sections
Vulnerability	3	<ul style="list-style-type: none"> • High water table • Large elderly population • Water caused backup into drinking water system • Water from creek backed up into lift station – vulnerable area
Capability	2	<ul style="list-style-type: none"> • Lack of manpower by the city and general public • National Guard for help • Fire department has equipment to pump water • Sump pumps • First responder & EMT • Two culverts-allows drainage into creek • No set plans in place, low tax base

City of Leal

Impact	4	<ul style="list-style-type: none"> Blocked roads in the city Long-term health risks due to mold and disease from standing water Increased mosquitos-many transmit disease Basement have become flooded Residents have sump pumps running 24/7 Overland flooding from 2009 flood-water came from 10 Mile Lake which is one mile away. Water came from Northeast. Most town residents were impacted. Had to cut a road to allow drainage of water. Culvert is now installed on Railway Avenue and Third Street.
Frequency	2	<ul style="list-style-type: none"> When raining heavy, roads become blocked and standing water Each year it occurs Sump pumps are constantly running each summer
Likelihood	3	<ul style="list-style-type: none"> Heavy spring melting to heavy rains occurs yearly Heavy rains each year Due to lack of storm water system, is likely in the future High water table Culvert installed on Railway Avenue decreases likelihood of standing water
Vulnerability	3	<ul style="list-style-type: none"> Overland flooding from 2009 flood-water came from 10-mile lake which is one miles away High elderly population Individual septic systems can be impacted, may cause sewer backups. High water table East end of town receives heavy flooding from spring melt, drainage of water, etc. Elderly person and two young children
Capability	2	<ul style="list-style-type: none"> Lack of manpower by the city and general public Fire department has equipment to pump water, somewhat effective Barnes County Water District Sump pumps No set maintenance programs of culvert, don't on an as-needed basis First responder

City of Litchville

Impact	2	<ul style="list-style-type: none"> Blocked roads in the city Long-term health risks due to mold and disease from standing water Increased mosquitos-many transmit disease Basement have become flooded-can at times from heavy rains
Frequency	2	<ul style="list-style-type: none"> When raining heavy, roads become blocked and is expected Each year it occurs Sump pumps are constantly running on a wet year
Likelihood	2	<ul style="list-style-type: none"> Heavy spring melting to heavy rains occurs yearly Heavy rains each year

		<ul style="list-style-type: none"> • Drainage of farmland may increase likelihood • Has storm water system • Drainage ditch on north end of town, drains storm water • High water table
Vulnerability	2	<ul style="list-style-type: none"> • Abandoned buildings • Abandoned cars • High elderly population • Storm water system • High water table • City park gets hit the worst-drains but is very slow • School sits high and is not impacted
Capability	2	<ul style="list-style-type: none"> • Lack of manpower by the city and general public • Fire department has equipment to pump water, somewhat effective. • Barnes County Water District • Sump pumps • Has drainage ditch

City of Nome

Impact	3	<ul style="list-style-type: none"> • Blocked roads • Increased mosquito and transmitting of diseases from standing water • Basements have become flooded • Residents have sump pumps running 24/7 • Large loss of property, vehicles, personal property • Some casualties are possible • Residents may miss work from flooding of basements or damage to personal property resulting in loss of economy
Frequency	2	<ul style="list-style-type: none"> • Only happens when a lot of rain falls or snow in the winter • Depends largely on weather patterns • Large snow melt in spring of 2010 resulted in overland flooding of 5th Avenue
Likelihood	3	<ul style="list-style-type: none"> • Heavy spring melting to heavy rains occurs yearly • Lack of storm water system in the city for drainage • High water table • No drain tile in the area may increase amount of standing water • Topography does not allow swift drainage of precipitation, snow melt, standing water, etc.
Vulnerability	3	<ul style="list-style-type: none"> • High water table • Low elderly population • Lack storm water system for drainage • Mitigation project of drainage on 5th Avenue decreases vulnerability • City lacks equipment and infrastructure to address flooding • Lack of manpower by the city and general public • National Guard for help • Fire department has equipment to pump water
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 • No active education or outreach programs • Lacks resources to accomplish projects independently
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City of Oriska

Impact	3	<ul style="list-style-type: none"> • Blocked roads in the city • Long-term health risks due to mold and disease from standing water • Lift station can become overloaded at times
Frequency	3	<ul style="list-style-type: none"> • In 1993 had some basement seepage • When raining heavy, roads become blocked and is expected
Likelihood	4	<ul style="list-style-type: none"> • Heavy spring melting to heavy rains occurs yearly • Drainage of farmland may increase likelihood • Due to lack of storm water system, is likely in the future
Vulnerability	4	<ul style="list-style-type: none"> • Abandoned buildings • Abandoned cars • School with about 60 kids • High elderly population – 30% • Lift station in a low-lying spot • Sewer system may need maintenance
Capability	2	<ul style="list-style-type: none"> • Lack of manpower by the city and general public • Fire department has equipment to pump water, somewhat effective • Barnes Rural Water Board and Water District • Individuals with equipment for drainage purposes • Sump pumps • City has a pump at water house

City of Pillsbury

Impact	3	<ul style="list-style-type: none"> • Blocked roads in the city • Long-term health risks due to mold and disease from standing water • Increased mosquitos-many transmit disease • Basement have become flooded-all basements in town are in bad shape
Frequency	3	<ul style="list-style-type: none"> • When raining heavy, roads become blocked and is expected • Each year it occurs • Sump pumps are constantly running
Likelihood	3	<ul style="list-style-type: none"> • Heavy spring melting to heavy rains occurs yearly • Heavy rains each year • Drainage of farmland may increase likelihood • Due to lack of storm water system, is likely in the future • Drainage ditch currently not in use • High water table
Vulnerability	2	<ul style="list-style-type: none"> • Abandoned buildings • Abandoned cars • High elderly population • Individual septic systems

		<ul style="list-style-type: none"> • High water table
Capability	2	<ul style="list-style-type: none"> • Lack of manpower by the city and general public • Fire department has equipment to pump water, somewhat effective • Barnes County Water District and Dakota Water Users • Sump pumps • Has drainage ditch, but is currently blocked

City of Rogers

Impact	3	<ul style="list-style-type: none"> • Blocked roads in the city • Long-term health risks due to mold and disease from standing water • Increased mosquitos-many transmit disease • Basement have become flooded-most have a lot of moisture, sump pumps
Frequency	3	<ul style="list-style-type: none"> • When raining heavy, roads become blocked and is expected • Each year it occurs sometimes multiple • Sump pumps are constantly running on a wet year • 3 to 4 times each year water is blocking roads • Can come down in 4 to 5 inches at once
Likelihood	4	<ul style="list-style-type: none"> • Heavy spring melting to heavy rains occurs yearly • No drainage ditches • High water table • Culvert has storm gate/grate/screen to catch debris, but is too high
Vulnerability	3	<ul style="list-style-type: none"> • Abandoned buildings • Near old gas pump water accumulates on 1st street • Abandoned cars • High elderly population, families with children • No storm system or drainage ditch • High water table.
Capability	1	<ul style="list-style-type: none"> • Lack of manpower by the city and general public • Fire department has equipment to pump water, somewhat effective • Barnes County Water District • Sump pumps • No drainage ditch

City of Sanborn

Impact	4	<ul style="list-style-type: none"> • Blocked roads • Increased mosquito and transmitting of diseases from standing water • Basements have become flooded • Residents have sump pumps running 24/7 • Large loss of property, vehicles, personal property • Some casualties are possible • Residents may miss work from flooding of basements or damage to personal property resulting in loss of economy
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		<ul style="list-style-type: none"> • Loss of phone and internet service due to flooding of ICTC operations building located near train tracks • Loss of freight railroad service due to filling up of Sanborn Lake, which may result in a state-wide loss of economy • Loss of access in and out of the city due to flooding of roadways
Frequency	3	<ul style="list-style-type: none"> • Only happens when a lot of rain falls or snow in the winter • Depends largely on weather patterns • Large snow melt in spring of 2009, 2010 and 2011 resulted in overland flooding of city streets
Likelihood	3	<ul style="list-style-type: none"> • Heavy spring melting to heavy rains occurs yearly • Lack of storm water system in the city for drainage • High water table • No drain tile in the area may increase amount of standing water • Topography does not allow swift drainage of precipitation, snow melt, standing water, etc.
Vulnerability	2	<ul style="list-style-type: none"> • High water table • High elderly population • Lack storm water system for drainage • Installation of new culverts decreases amount of standing water • City lacks equipment and infrastructure to address flooding • Extensive manpower provided by the fire department • Fire department has equipment to pump standing water
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 • No active education or outreach programs • Fire department has portable pumps and extensive manpower • Lacks resources to accomplish projects independently

City of Sibley

Impact	4	<ul style="list-style-type: none"> • Roads become blocked and washed out • City park experiences damage with equipment washing into the lake at times • Increased mosquitos-many transmit disease due to lots of grass and debris laying around • Large property loss, vehicles, personal property • Impacts lift station and causes sewer backups • Fire hall experiences seepage • Straw from feedlots and other debris is washed into town causing blockage of flood gates • Potential mold issues due to humidity and location right on Lake Ashtabula • Potential loss of life from flash flooding of water coming down from the hill to the west • Some homes with basements which can become flooded
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Frequency	3	<ul style="list-style-type: none"> • Potential for overland flooding when experiencing heavy rain or a fast snow melt in the spring • Depends largely on the weather • Sump pumps are constantly in homes with basements constantly • Severe overland flooding from heavy rains occurring once every 3 to 5 years • Experienced 7-inch downpour in 2004
Likelihood	4	<ul style="list-style-type: none"> • Heavy spring melting and heavy rains occurring every 5 years • Due to lack of storm water system overland flooding is likely in the future • High water table • Installation of drain tile at city park
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: High water table • More vulnerable: Lack of storm water system • More vulnerable: Lift station vulnerable due to location on the ground and is unprotected from flood waters • More vulnerable: High elderly population and retirees • More vulnerable: Campground grounds and trailer homes • More vulnerable: Local terrain with the city located at the bottom of the hill and on the water allows runoff to run right through the city • Installation of drain tile at city park • Home and properties having rail ties as foundations • Few homes have proper footings and foundations • Road impacted from snow melt depends on location of snow banks • Less vulnerable: Local residents possess equipment for cleanup of debris
Capability	1	<ul style="list-style-type: none"> • Active city council • Limited tax base • Designated evacuation routes with the County • Limited administrative and city staff

City of Valley City

Impact	4	<ul style="list-style-type: none"> • Blocked roads • Increased mosquito and transmitting of diseases from standing water • Basements have become flooded • Residents have sump pumps running 24/7 • Large loss of property, vehicles, personal property • Some casualties are possible • Residents may miss work from flooding of basements or damage to personal property resulting in loss of economy • Loss of access in and out of the city due to flooding of roadways • Mental health issues in general population from trauma experienced through property and personal loss due to flooding • Contamination of water wells serving as source of drinking water for individuals due to flooding may result in disease outbreaks • Spoiling of food due to loss of electricity may result in disease
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		<ul style="list-style-type: none"> • Sewer and water systems are out of commission from flooding and loss of power contributing to property damage and transmission of disease
Frequency	4	<ul style="list-style-type: none"> • Only happens when a lot of rain falls or snow in the winter • Depends largely on weather patterns • Large snow melt in spring of 2009, 2010 and 2011 resulted in riverine and overland flooding of city streets • In June 2013, approximately 30% of basements were flooded from heavy rainfall (around 4 inches in first hour) • In the past 10 years, a heavy rain episode has occurred each year resulting in flash flooding
Likelihood	4	<ul style="list-style-type: none"> • Heavy spring melting to heavy rains occurs yearly • Storm water system • High water table • No drain tile in the area may increase amount of standing water • Topography does not allow swift drainage of precipitation, snow melt, standing water, etc • Installation of new flood control measures reduces amount of standing water and flood damage to homes • Heavy rainfall in April would result in major overland flooding as city storm drains are closed as river is high from spring snow melt • City essentially becomes a closed basin • City maintains gravity feed storm water system • City-County Health worked with care centers to educate staff on property hand-washing and handling of residents when access to running water was temporarily unavailable
Vulnerability	4	<ul style="list-style-type: none"> • High water table • High elderly population • Lack storm water system for drainage • Installation of new culverts decreases amount of standing water • City lacks equipment and infrastructure to address flooding • Extensive manpower provided by the fire department • Fire department and public works has equipment to pump standing water out of low-lying areas • Installation of pump stations in the future • City has one master lift station and 10 satellite stations, which is located on the river nearing lowest spot • Major sanitary sewer line parallels the river for around 10 city blocks • Main sanitary sewer collection lines runs under main street adjacent to river for 12 blocks •
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 with flood protection • Flood fight is done by outside entities such as the Corps of Engineers • No active education or outreach programs • Fire department has portable pumps and extensive manpower • Lacks resources to accomplish projects independently

		<ul style="list-style-type: none"> • City-County Health operates a hotline • City has limited financial means to construct flood control measures and invest in new sanitary sewer and storm water infrastructure • Public works and city staff are trained and educated to mitigate staff
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City of Wimbledon

Impact	2	<ul style="list-style-type: none"> • Blocked roads in the city-temporarily • Increased mosquitos-many transmit disease due to lots of grass and debris laying around • Basement have become flooded • Residents have sump pumps running 24/7 • Large property loss, vehicles, personal property • Some casualties • Not much water and flood damage to buildings
Frequency	3	<ul style="list-style-type: none"> • Only happens when a lot of precipitation or snow in the winter • Depends largely on the weather • Sump pumps are constantly running • High water table • Heavy rain fall event once a year
Likelihood	3	<ul style="list-style-type: none"> • Heavy spring melting to heavy rains occurs yearly • Has storm water system, is not likely • High water table • Heavy rains annually • Lift stations pump out water, sometimes needs time to catch, capacity somewhat low
Vulnerability	2	<ul style="list-style-type: none"> • High water table • Large elderly population • Lower capacity of lift stations, can become overwhelmed • City park experiences flooding frequently-ankle high •
Capability	2	<ul style="list-style-type: none"> • Lack of manpower by the city and general public • National Guard for help • city has equipment to pump water • no city plans or ordinances in place • elevator has pump • has lift stations

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. As shown in Chapter 4, Profile and Inventory of the county-owned facilities, 19 county-are located in Valley City and are valued at \$19,461,931 consisting of approximately 97 percent of the total

valuation of county-owned buildings. Figure 8.4.1 in Appendix 8.4 shows the vulnerability of the city Valley City to flooding. A majority of county-owned buildings in Valley City are located in the flood vulnerability and are at risk to the hazard. The flood vulnerability of Barnes County is shown in Appendix 8.4, Figure 8.4.2.

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 infrastructure, and county and city owned property in Barnes County is provided in Chapter 4, Profile and Inventory.

Vulnerabilities to New and Future Development

New and future development in Barnes County and Valley City are at high risk to flooding if allowed in a floodplain. With projected population increases in Barnes County through 2030, more people will be vulnerable to flooding if development is not restricted from flood prone areas. FEMA flood maps were produced for the county and jurisdictions in 2008 and are shown in Appendix 5.4. Mapping helps determine which areas are flood prone and no suitable for development. New and future development in Barnes County is less vulnerable to flooding than other counties without flood maps as local government can plan future growth accordingly.

Data Limitations and Other Key Documents

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
- North Dakota NFIP Map Modernization Plan
- Barnes County Emergency Operations Plan

5.5 Geologic Hazard

Characteristics

A landslide is the movement of rock, soil, artificial fill, or a combination thereof on a slope in a downward or outward direction. The primary causes of landslides are slope saturation by water from intense rainfall, snowmelt, or changes in ground-water levels on primarily steep slopes, earthen dams, and the banks of lakes, reservoirs, canals, and rivers (US Geological Survey). Other causative factors include steepening of slopes by erosion or construction, alternate freezing or thawing, earthquake shaking, volcanic eruptions, and the loss of vegetation from construction or wildfires. The saturation or destabilization of a slope allows the material to succumb to the forces of gravity or ground movement.

Many different types of landslides exist: slides, falls, topples, flows, and lateral spreads. Slides involve the mass movement of material from a distinct zone of weakness separating the slide material from the more stable underlying material. The primary types of slides are rotational slides and translational slides. Falls occur when materials, mostly rocks and boulders, fall abruptly from a steep slope or cliff. Falls are strongly influenced by gravity, mechanical weathering, and the presence of interstitial water. Topples are similar to falls, yet they pivot around a connection point at the base of the material and are most often caused by gravity or fluids in the cracks of the rocks. Flows typically have a higher percentage of water material embedded in them and behave more like a liquid than other types of landslides. The five primary categories of flows are: debris flows, debris avalanches, earthflows, mudflows, and creeps. Lateral spreads usually occur on gentle slope or flat surfaces when liquefaction occurs and leads to fractures on the surface. Complex landslides involve any combination of these types (US Geological Survey).

Landslides are typically associated with mountainous regions, but they can also occur in areas of low relief. In these areas, the landslides are often the result of cut-and-fill failures (from roadway and building excavations), river bluff failures, lateral spreading, or mine collapse (US Geological Survey).

Landslides occur in natural and anthropogenic settings in North Dakota and are most commonly found within major river valleys and on engineered slopes along major transportation corridors. Landslides are dominantly found in two settings, controlled by the surface geology of the Great Plains in western and southwestern North Dakota and along major river valleys of the Missouri, Sheyenne, James, Souris, and Red Rivers (North Dakota Geological Survey).

History

Information provided by the 2010 Barnes County MHMP, 2012 Flood and Impact Grant Applications, Valley City Times-Record shows instances of landslide where 16 homes have been moved, damage to fiber optic cables have occurred, and roads have sunk. Table 5.3.1 summarizes the history of geologic hazard in Barnes County. The data is also shown in Appendix 8.3.

Table 5.3.1 – Barnes County Geologic Hazard History Summary

Geologic Hazard (Landslide)					
Number of Damaged Properties	Date Range	Injuries	Fatalities	Property Damage	Crop Damage
16	1993 to 2014	0	0	36,976	\$0

Sources: 2010 Barnes County MHMP, 2012 Flood and Impact Grant Applications, Valley City Times-Record

There have been no Presidential Disaster Declarations pertaining to landslide in Barnes County.

Probability and Magnitude

Geologic hazard in Barnes County has resulted in moving of 16 homes with more scheduled to be moved in the future as buyouts of homes in areas at risk continue. Fiber optic lines have also been damaged and may have resulted in disruptions to communications. Roads have sunk leading to some areas to experience isolation. Records show that approximately \$37,000 in property damage has occurred. Therefore, the probability of geologic hazard is 100 percent and magnitude depends on homes and infrastructure impacted. Figure 8.5.2 and 8.5.3 shows the areas subject to geologic hazard in Barnes County.

The magnitude of geologic hazard has so far been minimal in terms of actual damage to property and crops. Approximately 16 homes have been moved and infrastructure has been impacted. A fiber optic line near Kathryn was damaged due to shifting of roads from a landslide. It is unknown if a disruption in communications occurred due to the event. The Barnes County Rural Water District has replaced many water mains that have ruptured due to shifting soils. The magnitude of the hazard can be substantial as property damage occurs, and the potential for death, injury and disruptions to critical facilities and infrastructure is present.

Risk Assessment

Table 5.5.3 shows the risk assessment as determined by individual jurisdictions and the planning committee for geologic hazard. The risk assessment methodology can be found in the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment. The total in Table 5.5.3 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. Only the jurisdictions of Barnes County, Sibley and Valley City are subject to geologic hazard.

Table 5.5.3 – Risk Assessment Summary Geologic Hazard Scored Chart

Geologic Hazard (Landslide)	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Barnes County	2	3	2	3	2	8
Sibley	4	2	4	4	1	13
Valley City	3	2	3	3	1	10

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

Seasonal Pattern	Typically during the spring, summer, and fall during or after heavy rainfall or other weather events impacting stability of soil
Duration	Up to several minutes
Speed of Onset	Sudden to slow and steady

Capabilities of and Vulnerabilities to Jurisdictions

Upon review of the statistics from the 2010 Barnes County MHMP, 2012 Flood and Impact Grant Applications, Valley City Times-Record, the cities of Sibley and Valley City are the only jurisdictions subject to the hazard. However, all jurisdictions are vulnerable to the hazard in some respect as disruptions to critical facilities and infrastructure can occur.

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.

Barnes County

Impact	2	<ul style="list-style-type: none"> • Loss of life, property and economy • Reduction in tax base from loss of residential homes, cabins and recreational areas • Damage to streets, power lines, gas lines, electric lines • Disruption in transportation mobility • Disruption in communication • Potential for loss of drinking water • Potential loss of sewer service • Loss of power • Approximately 20 single-family homes have experienced sliding • Canadian Pacific railroad bed has been shifting in areas of the county
Frequency	3	<ul style="list-style-type: none"> • 14 incidents of landside have occurred between 1993 and 2010
Likelihood	2	<ul style="list-style-type: none"> • Unstable and rocky terrain in areas around Valley City, the Sheyenne River and Lake Ashtabula • Soil types and changing in climate patterns increase chances of the hazard
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: Bridges, roads, infrastructure • More vulnerable: Buried power lines and utility services

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		<ul style="list-style-type: none"> • More vulnerable: Single-family subdivisions in and around Valley City and Lake Ashtabula • Less vulnerable: Better awareness of soil types and better planning management for new development
Capability	2	<ul style="list-style-type: none"> • Active county commission • Administration and staff to assist in buyouts and moving of homes and infrastructure • Planning and regulatory limitations in place to limit development in areas at risk to the hazard • GIS and other mapping applications allowing appropriate studying of soils at risk to the hazard

City of Sibley

Impact	4	<ul style="list-style-type: none"> • Loss of life, property and economy • Reduction in tax base from loss of cabins • Damage to streets, power lines, gas lines, electric lines • Disruption in transportation mobility • Disruption in communication • Potential for loss of drinking water • Potential loss of sewer service • Loss of power
Frequency	2	<ul style="list-style-type: none"> • No incidents of the hazard have occurred
Likelihood	4	<ul style="list-style-type: none"> • Unstable and rocky terrain in the local area • Experience large amounts of erosion from hillside during heavy rains
Vulnerability	4	<ul style="list-style-type: none"> • Location of the town on the water at the bottom of the hill • Elderly population and retirees • Summer and recreation population • Lift station located adjacent to the Fire Hall • Pump house located north side of the city • The entire town is vulnerable due to small size and location • Location of city utility on the hillside and through the city
Capability	1	<ul style="list-style-type: none"> • Active city council • Limited tax base • Designated evacuation routes with the County • Limited administrative and city staff

City of Valley City

Impact	2	<ul style="list-style-type: none"> • Loss of life, property and economy • Reduction in tax base from loss of residential homes, cabins and recreational areas • Damage to streets, power lines, gas lines, electric lines • Disruption in transportation mobility • Disruption in communication
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		<ul style="list-style-type: none"> • Severed fiber optic lines cause business interruptions • Potential loss of sewer service • Loss of power • Approximately 20 single-family homes have experienced sliding
Frequency	2	<ul style="list-style-type: none"> • 16 homes have been moved between 1993 and 2014 with more scheduled in the future
Likelihood	3	<ul style="list-style-type: none"> • Unstable and rocky terrain in areas to the west, southeast and east of the city • Soil types and changing in climate patterns increase chances of the hazard
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: Bridges, roads, infrastructure • More vulnerable: Buried power lines and utility services • More vulnerable: Single-family subdivisions in and around Valley City • Less vulnerable: Better awareness of soil types and better planning management for new development • Less vulnerable: Homes and infrastructure in the area have been moved or improved to ensure resiliency
Capability	1	<ul style="list-style-type: none"> • Active city council • Administration and staff to complete buyouts and moving of homes and infrastructure • Planning and regulatory limitations in place to limit development in areas at risk to the hazard • Relies on outside agencies and organizations to assist in infrastructure projects to mitigate the hazard

Vulnerabilities to County-Owned Buildings and Property

County-owned buildings and property are generally not at risk from geologic hazard. Landslides are considered in development of county-owned buildings and property and, as of 2014, no buildings or properties are known to be in areas at risk. An inventory of county-owned buildings and property is shown in Chapter 4, Profile and Inventory.

Vulnerabilities of Critical Facilities and Infrastructure

Transportation and utility infrastructure are most vulnerable to landslides. A map of the transportation system in Barnes County is shown in chapter 9. Roads are vulnerable to the hazard as they can be closed due to shifting soils, limiting transportation and economic activity. Impacts to roads and infrastructure can isolate people living in remote locations and smaller jurisdictions. Utility infrastructure such as fiber optic lines and water mains are vulnerable as they can be taken out of service if landslides impact their functionality.

Vulnerabilities to New and Future Development

New and future development should be restricted from development on slopes with excessive grade and soil types identified as prone to landslide. The areas vulnerable to landslide are identified in and around

Valley City as shown in Figures 8.5.2 and 8.5.3 in Appendix 8.5. Building code regulations and enforcement should be directed to these areas to ensure no new or future development occurs.

Data Limitations and Other Key Documents

A data limitation for understanding impacts from geologic hazard is the difficulty in identifying the extent of other local factors such as drainage, which impacts the amount of water in the soil and overall soil stability. Therefore, a process to determine near accurate loss estimates for geologic hazard 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 Emergency Operations Plan
- Barnes County Emergency Operations Plan

5.6 Hazardous Material Release

Characteristics

Hazardous material are any substance in any quantity or form that may pose an unreasonable risk to the safety, health, environment, and property of citizens. 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 polychlorinated biphenyl (PCB’s) 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)
- Gases (Class 2)
- Flammable and combustible liquids (Class 3)
- Flammable solids, spontaneously combustible, and dangerous when wet (Class 4)
- Oxidizing substances and organic peroxides (Class 5)
- Toxic/poisonous substances poison inhalation (Class 6)
- Radioactive materials (Class 7)
- Corrosive substances (Class 8)
- Miscellaneous hazardous materials/products, substances, or organisms (Class 9)

Source: 2014 NDMHMP

Hazardous materials are defined and/or managed under a number of federal, state, and local laws, regulations, plans, and ordinances.

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.

Hazardous material incidents can be categorized into two distinct groups – incidents of a transportation nature and those that occur at a stationary or fixed facility.

The former is an occurrence resulting in the uncontrolled release of materials during transport that are capable of posing a risk to health, safety, and property as determined in the Department of Transportation (DOT) regulations. Generally, such materials are classed identically to those of a stationary incident. Over 18,000 materials are covered under the DOT regulations. The population most seriously affected by a hazardous material release would be within a five mile circle around the site of the release. The denser the population in the circle the greater the expected losses. Likely sites are around major transportation routes such as highways, rail lines, or pipelines along which hazardous materials move.

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. Source: North Dakota Enhanced Hazard Mitigation Plan 2011.

Hazardous materials are also often used during terrorist attacks. They can cause damages to the water supply and food supply.

In the past, states and local governments have concentrated emergency preparedness (operational planning, training, etc.) activities solely to the transportation of hazardous material.

Since the amendments of CERCLA (Title III) Emergency Planning and Community Right-To-Know law, we have improved our hazardous material planning base for fixed facility disaster or emergency situations.

It is common to view hazardous material releases in a worst case scenario. However, the majority of 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

Table 5.6.1 summarizes incidents of hazardous material release in Barnes County. There were a total of 28 occurrences between 2006 and 2014 with five injuries and three fatalities. Property and crop damage is unknown. Barnes County Emergency Management provided the data. The detailed history of events can be found in Appendix 8.6, Table 8.6.1.

There have been no declared disasters or emergencies pertaining to hazardous material release in Barnes County.

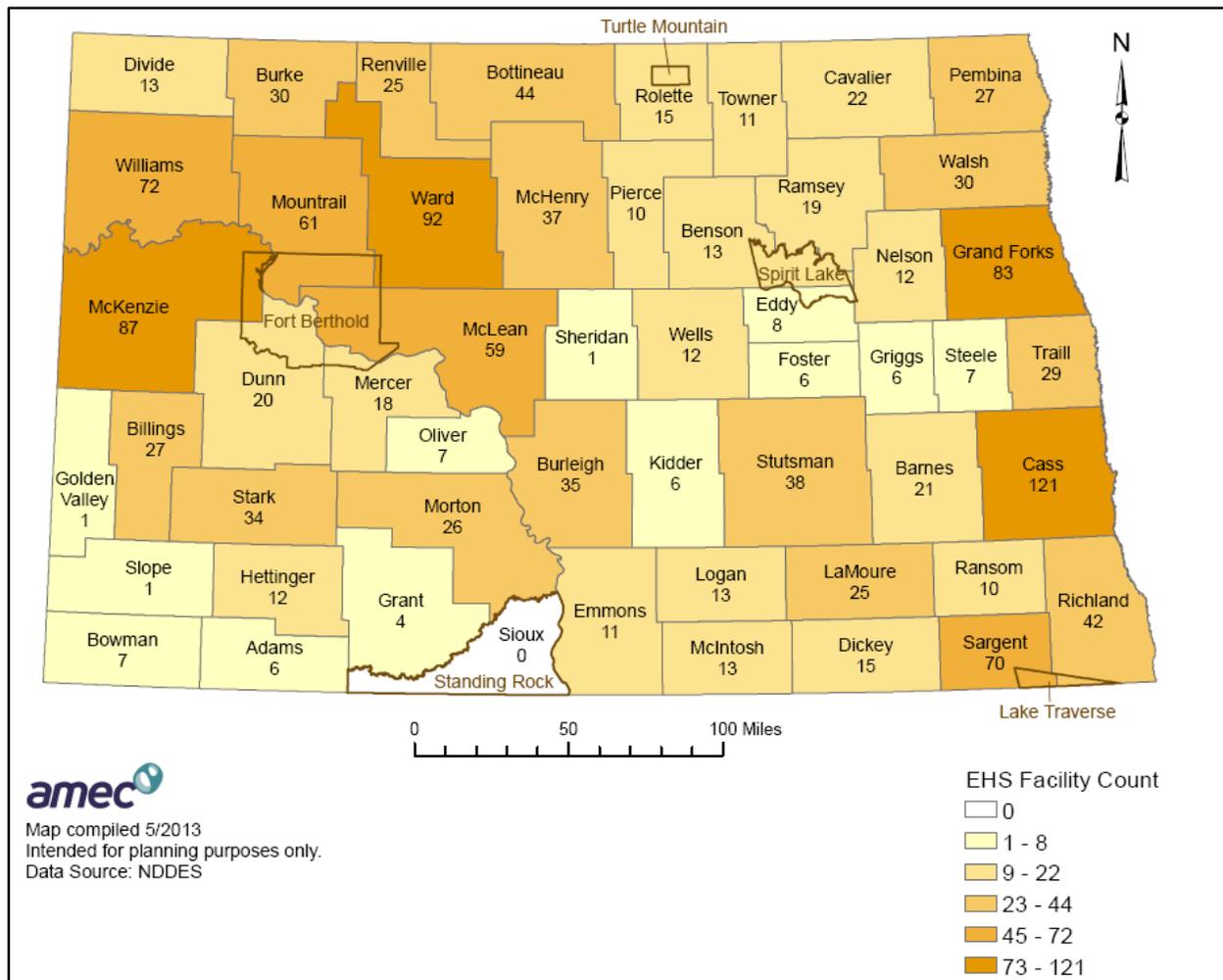
Table 5.6.1 – Barnes County Hazardous Material Release Summary

Hazardous Material Release					
Number of Occurrences	Date Range	Injuries	Fatalities	Property Damage	Crop Damage
28	2006 to 2014	5	3	Unknown	Unknown

Source: N.D. State Radio, Barnes County Emergency Management

Figure 5.6.1 shows the number of extremely hazardous substance facilities in Barnes County as of 2011. In 2011, approximately 21 extremely hazardous substances facilities are in Barnes 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. The facilities are most likely related to the agriculture industry and are located within city limits.

Figure 5.6.1 – 2011 Number of Extremely Hazardous Substance Facilities in North Dakota by County



Source: North Dakota Department of Emergency Services, 2014 NDMHMP

Probability and Magnitude

As shown on Table 5.6.1, in 2012 there were 28 occurrences of hazardous material release between 2006 and 2014, resulting in a probability of three to four hazardous material releases each year. Given that the local economy is heavily reliant on agriculture and the amount of extremely hazardous substance facilities in Barnes County, as shown in Figure 5.6.1, it is likely a hazardous material release will occur in Barnes County more frequently 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. Releases when high winds are present may carry chemicals and material great distances and impact many people.

Risk Assessment

Table 5.6.2 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 5.6.2 – Risk Assessment Summary Hazardous Material Release Scored Chart

Hazardous Material Release	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Barnes County	4	4	4	4	1	15
Dazey	4	2	3	3	1	11
Fingal	4	3	4	4	1	14
Kathryn	2	2	2	2	1	7
Leal	4	2	4	4	1	13
Litchville	3	2	1	2	3	5
Nome	4	1	2	3	1	9
Oriska	4	1	4	4	1	12
Pillsbury	4	2	4	3	1	12
Rogers	4	2	3	1	1	9
Sanborn	4	2	4	4	1	13
Sibley	4	2	1	2	1	8
Valley City	4	2	3	4	1	12
Wimbledon	4	2	4	4	2	12

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

Seasonal Pattern	Summer
Duration	Application of chemicals
Speed of Onset	Immediate

Capabilities of and Vulnerabilities to Jurisdictions

Upon review of statistics from the 2014 NDMHMP and information provided by Barnes County Emergency Management, the frequency, likelihood and vulnerabilities of hazardous material release varied based on the location of industry and infrastructure. Impact was scored “3” or “4” in Barnes

County and city jurisdictions, with the exception of Kathryn. 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. Capabilities were scored by the plan consultants based on the capability assessment worksheet found in the 2013 Mitigation Planning Handbook.

Barnes County

Impact	4	<ul style="list-style-type: none"> • Potential loss of life • Loss of economy from crops and livestock • Damage to environmentally-sensitive areas and habitats from saturation of chemicals into the soil • Loss of wildlife • Contamination of drinking water supplies for people and livestock • Potential for fire as a secondary impact • Blocked road and loss of transportation mobility • The hospital and medical facilities would be shut down due to increased change of contamination • Increase of crime from looting • Can result in uninhabitable areas from leaks, spills or contaminations
Frequency	4	<ul style="list-style-type: none"> • Never had any major occurrences resulting in mass casualties • No incidents of major leaks from storage tanks • 12 incidents between 2006 and 2013 resulting in three injuries and two fatalities
Likelihood	4	<ul style="list-style-type: none"> • Hazard is likely in the future due to the presence of chemicals in the agriculture sector being hauled in and around the county by truck • Increased industrialization and chemicals in agriculture will likely result in more hazardous material releases • Increase in transportation of oil and other chemicals from the oil patch • 92 Tier II reported hazardous chemical facilities in 2011 • Pipelines running through Barnes County carrying hazardous materials • Increase in transportation of chemicals; Interstate, railroad and other truck hauling • Potential for additional anhydrous plant on west boarder of county
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: Crops and livestock • More vulnerable: Increased truck traffic • More vulnerable: Increase in chemicals used in agriculture operations • More vulnerable: More chemicals being stored on farm sites • More vulnerable: Presence of large propane tanks for residential and commercial use

		<ul style="list-style-type: none"> • More vulnerable: Prolonged response times from emergency services for rural communities • More vulnerable: Lack of medical clinic, hospital or local ambulance in rural areas (including 12 smaller cities) • More vulnerable: Only awareness trained Fire Departments in Barnes County • More vulnerable: Lack for reporting of chemicals stored in various locations in the agriculture communities • Less vulnerable: Installation of new cell tower increased reception
Capability	1	<ul style="list-style-type: none"> • Active County Commission • Contracts for engineering, planning and grant writing • GIS services are provided by the state and engineering firms • Relies on regional, state and other entities for assistance with major projects • Does not have financial resources to accomplish projects independently • Active emergency management department with education and outreach capabilities • County has county-wide mutual aid agreement signed for emergency services

City of Dazey

Impact	4	<ul style="list-style-type: none"> • Loss of life, crops and livestock • Loss of economy • Potential for fire as a secondary impact • Blocked road, loss of transportation
Frequency	2	<ul style="list-style-type: none"> • Some tanks have overfilled and released from heat in the summer
Likelihood	3	<ul style="list-style-type: none"> • People have propane tanks in town on their properties for heating • More chemicals being stored in the area by farmers on their properties
Vulnerability	3	<ul style="list-style-type: none"> • No communication or way to spread the word if something happened. • People are not signed up for Code Red • Lack of street signs, road safety, no planned improvements • Truck traffic carrying chemicals on N.D. Highway 1 • Long response from Ambulance
Capability	1	<ul style="list-style-type: none"> • No stockpile of medical • Quick response unit • Covered by Barnes County Ambulance

City of Fingal

Impact	4	<ul style="list-style-type: none"> • Loss of life, crops and livestock • Loss of economy • Potential for fire as a secondary impact • Blocked road, loss of transportation mobility • Railroad out of service when elevator burned down, worried about heat from tracks
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Frequency	3	<ul style="list-style-type: none"> • Never had any major occurrences
Likelihood	4	<ul style="list-style-type: none"> • People have propane tanks in town on their properties for heating. • Trucks transporting larger tanks, carrying more chemicals • Truck route around the city – little use • No anhydrous tanks or chemicals – decreases likelihood, no chemicals at all • Increase in train traffic, carrying oil, chemicals
Vulnerability	4	<ul style="list-style-type: none"> • No communication other than cell phones – good service in the area • No chemicals stored in the city • Low elderly population • Small size-would impact all areas of the city • Lack grade-separated crossings with railroad • Increase in oil and chemical traffic on railroad • City located off Highway 32, trucks do not traverse through the city
Capability	1	<ul style="list-style-type: none"> • Lack of manpower by the city and general public • No education programs or outreach • Limited financial capabilities • Active city council • Barnes Rural Water District • No plans People are signed up for Code Red – whole town is signed up • Covered by Barnes County Ambulance. • First responder & EMT

City of Kathryn

Impact	2	<ul style="list-style-type: none"> • Loss of life, crops and livestock • Loss of economy • Potential for fire as a secondary impact • Blocked road, loss of transportation mobility
Frequency	2	<ul style="list-style-type: none"> • Never had any major occurrences
Likelihood	2	<ul style="list-style-type: none"> • People have propane tanks in town on their properties for heating • Trucks transporting larger tanks, carrying more chemicals • Signs prohibit trucks from entering city limits-decreases likelihood • No anhydrous tanks – decreases likelihood, no chemicals at all
Vulnerability	2	<ul style="list-style-type: none"> • No communication other than cell phones – good service in the area • No chemicals stored in the city • Elderly population • Small size-would impact all areas of the city
Capability	1	<ul style="list-style-type: none"> • No stockpile of medical supplies • People are signed up for Code Red – whole town is signed up • Covered by Barnes County Ambulance • First responder & EMT • No official truck route, but posted signed to prohibit truck traffic in town, posted through the county

City of Leal

Impact	4	<ul style="list-style-type: none"> • Loss of life, crops and livestock • Loss of economy • Potential for fire as a secondary impact • Blocked road, loss of transportation mobility
Frequency	2	<ul style="list-style-type: none"> • Never had any major occurrences
Likelihood	4	<ul style="list-style-type: none"> • People have propane tanks in town on their properties for heating • Trucks transporting equipment have larger tanks, carrying more chemicals • More oil trains coming through, railroad busy in general with material. Scored 4 because of the RR by itself. Average of 20-minute frequency, around 20+ trains per day. • Main line CP railway providing ammonia to the plant, sits on tracks at times, runs through the middle of town
Vulnerability	4	<ul style="list-style-type: none"> • No communication other than cell phones – good service in the area • People are signed up for Code Red • Railroad right through the city – bisects the city • Agrium Ammonia storage two miles east of town • Main line CP railway providing ammonia to the plant, sits on tracks at times, runs through the middle of town • Chemicals are storage in town-sprayers are filled in the city, north end of the city
Capability	1	<ul style="list-style-type: none"> • No stockpile of medical supplies • Covered by Barnes County Ambulance • First responder

City of Litchville

Impact	3	<ul style="list-style-type: none"> • Loss of life, crops and livestock • Loss of economy • Potential for fire as a secondary impact • Blocked road, loss of transportation mobility
Frequency	2	<ul style="list-style-type: none"> • Anhydrous tank let off some pressure and stabilized, early 2000s • Dakota Plains keeping closer eye on the tank-may move out of town
Likelihood	1	<ul style="list-style-type: none"> • People have propane tanks in town on their properties for heating • Trucks transporting equipment have larger tanks, carrying more chemicals • Anhydrous tank at Dakota Plains • No railroad-no trains • No located on major highways or truck routes
Vulnerability	2	<ul style="list-style-type: none"> • No communication other than cell phones – good service in the area, new tower north of the town, landlines, internet • People are not signed up for Code Red-most don't know • High senior population, school population as well • Dakota Plains anhydrous tank, chemicals and fertilizers
Capability	3	<ul style="list-style-type: none"> • No stockpile of medical supplies

		<ul style="list-style-type: none"> • Covered by Barnes County Ambulance. 8 first responders with medical devices and other AED • Dakota Plains does routine maintenance checks, has individual in charge of safety meetings
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City of Nome

Impact	4	<ul style="list-style-type: none"> • Loss of life, crops and livestock • Loss of economy • Potential for fire as a secondary impact • Blocked roads leading to loss of transportation mobility • Small size of city could lead to large losses of property and people
Frequency	1	<ul style="list-style-type: none"> • Never had any major occurrences or incidences
Likelihood	2	<ul style="list-style-type: none"> • Propane is used for heating alternative • Trucks transporting larger tanks and carrying more chemicals • No anhydrous stored in tanks in city limits – decreases likelihood • No railroad hauling chemicals through city limits – decreases likelihood
Vulnerability	3	<ul style="list-style-type: none"> • Cell phone service standard in the area • No chemicals stored in the city • Low elderly population • Small size of city would leave all residents impacted • Limited traffic control signage and enforcement on N.D. Highway 32 • No stockpile of medical supplies • Covered by Barnes County Ambulance, but may result in prolonged response times • Lacks hazardous material route
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 • No active education or outreach programs • Lacks resources to accomplish projects independently

City of Oriska

Impact	4	<ul style="list-style-type: none"> • Loss of life, crops and livestock • Loss of economy • Potential for fire as a secondary impact • Blocked road, loss of transportation mobility • Depending on material released, fires may result
Frequency	1	<ul style="list-style-type: none"> • Never has any occurrences.
Likelihood	4	<ul style="list-style-type: none"> • People do not have propane tanks in town on their properties for heating • More chemicals being stored in the area by farmers on their properties • Trucks transporting equipment have larger tanks, carrying more chemicals • More oil trains coming through

Vulnerability	4	<ul style="list-style-type: none"> • No communication or way to spread the word if something happened other than cell phones • Some speeding, but RR tracks slow people down • Truck traffic carrying chemicals on Interstate 94 • Railroad right through the city – bisects the city, Highway 32 as well
Capability	1	<ul style="list-style-type: none"> • No stockpile of medical supplies • Covered by Barnes County Ambulance

City of Pillsbury

Impact	4	<ul style="list-style-type: none"> • Loss of life, crops and livestock • Loss of economy • Potential for fire as a secondary impact • Blocked road, loss of transportation mobility
Frequency	2	<ul style="list-style-type: none"> • Never has any occurrences
Likelihood	4	<ul style="list-style-type: none"> • People have propane tanks in town on their properties for heating • Trucks transporting equipment have larger tanks, carrying more chemicals • More oil trains coming through, railroad busy in general with material. Scored 4 because of the RR by itself. Average of 20-minute frequency, around 50+ trains per day. • Anhydrous plant closed and no longer in town • Fertilizer plant being built by Arthur Companies right on north side of 26th, just south of town
Vulnerability	3	<ul style="list-style-type: none"> • No communication other than cell phones – good service in the area, new tower north of the town • Railroad right through the city – bisects the city, Highway 32 somewhat • High senior population
Capability	1	<ul style="list-style-type: none"> • No stockpile of medical supplies • Covered by Barnes County Ambulance • Covered by Hope Ambulance

City of Rogers

Impact	4	<ul style="list-style-type: none"> • Loss of life, crops and livestock • Loss of economy • Potential for fire as a secondary impact • Blocked road, loss of transportation mobility • Loss of railroad service • Small size of city-everyone would be impacted
Frequency	2	<ul style="list-style-type: none"> • No history of incidents.
Likelihood	3	<ul style="list-style-type: none"> • People have propane tanks in town on their properties for heating • Trucks transporting equipment have larger tanks, carrying more chemicals • Anhydrous and other chemicals at Benson-Quinn • Railroad transports chemicals

		<ul style="list-style-type: none"> • located on highways or truck routes
Vulnerability	1	<ul style="list-style-type: none"> • No communication other than cell phones – good service in the area, new tower north of the town, landlines, internet. • People are not signed up for Code Red-most don't know • High senior population, families with kids • Local population is highly mobile
Capability	1	<ul style="list-style-type: none"> • No stockpile of medical supplies • Fire department has first aid kit at the Fire Hall • No clinic or hospital • Covered by Barnes County Ambulance • Benson Quinn has two individuals in charge of safety meetings

City of Sanborn

Impact	4	<ul style="list-style-type: none"> • Loss of life, crops and livestock • Loss of economy • Potential for fire as a secondary impact • Blocked roads leading to loss of transportation mobility • Blocked roads could result in temporary isolation and shortage or outage of critical materials or infrastructure • Small size of city could lead to large losses of property and people • Could result in explosion and destruction of buildings from trains carrying hazardous chemicals and oil shipments
Frequency	2	<ul style="list-style-type: none"> • Never had any major occurrences or incidences • Anhydrous station south of city experienced valve deterioration on main supply tank
Likelihood	4	<ul style="list-style-type: none"> • Propane is used for heating alternative some a few residences • Anhydrous stored in tanks in city limits on south side of railroad tracks • Railroad hauling chemicals and oil through city limits has increased astronomically since 2010 • Presence of side track allows parking of freight trails increases amount of hazardous material temporarily stored in city limits • Natural gas availability as heating source decreases propane and alternative fuel sources • Construction of CHS nitrogen fertilizer plant will increase likelihood of a release
Vulnerability	4	<ul style="list-style-type: none"> • Cell phone service in the area is reliable • Anhydrous ammonia fill station located results in truck traffic hauling chemicals in and out of city limits • High elderly population • Small size of city would leave all residents impacted • Limited traffic control signage and enforcement on Barnes County Road 11 and 22 • Medical supplies in stock at fire hall and at homes of first responders • Covered by Barnes County Ambulance, but may result in prolonged response times • Lacks hazardous material route

		<ul style="list-style-type: none"> • Presence of side track allows parking of freight trails increases amount of hazardous material temporarily stored in city limits
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 • No active education or outreach programs • Lacks resources to accomplish projects independently

City of Sibley

Impact	4	<ul style="list-style-type: none"> • Loss of life, crops and livestock • Town would need to be evacuated if a release large in magnitude occurred • Loss of economy from summer time and recreational population • Potential for fire as a secondary impact • Blocked road and loss of transportation mobility • Loss of habitat for fish and other wildlife
Frequency	2	<ul style="list-style-type: none"> • Never had any major occurrences • Train hauling toilet paper, four wheelers, laundry detergent and other cargo derailed north of the city 5 miles on the Karnak High Bridge in 2006
Likelihood	1	<ul style="list-style-type: none"> • People have propane tanks in town on their properties for heating • Trucks transporting larger tanks and carrying more chemicals
Vulnerability	2	<ul style="list-style-type: none"> • No communication other than cell phones – good service in the area • Installation of new cell tower increased reception • No chemicals stored in the city • Elderly population and retirees • Due to the small size of the city, everyone would be impacted • City has fire truck to extinguish a fire from a release if it was a secondary impact • No stock of medical supplies • Lack of medical clinic, hospital or local ambulance
Capability		<ul style="list-style-type: none"> • Active city council • Limited tax base • Designated evacuation routes with the County • Limited administrative and city staff

City of Valley City

Impact	4	<ul style="list-style-type: none"> • Loss of life, crops and livestock • Loss of economy • Potential for fire as a secondary impact • Blocked roads leading to loss of transportation mobility • Blocked roads could result in temporary isolation and shortage or outage of critical materials or infrastructure • Small size of city could lead to large losses of property and people
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		<ul style="list-style-type: none"> • Could result in explosion and destruction of buildings from trains carrying hazardous chemicals and oil shipments • Mass casualties if a release were to occur on Interstate 94 or the hi-line bridge over the city • Potable water sources could be contaminated if a release were to impact the Sheyenne River
Frequency	2	<ul style="list-style-type: none"> • Never had any major occurrences or incidences • Chemicals and other materials are stored in city limits
Likelihood	3	<ul style="list-style-type: none"> • Propane is used for heating alternative some a few residences • Anhydrous stored in tanks in city limits on south side of railroad tracks • Railroad hauling chemicals and oil through city limits has increased astronomically since 2010 • Presence of side track allows parking of freight trails increases amount of hazardous material temporarily stored in city limits • Natural gas availability as heating source decreases propane and alternative fuel sources • City located on Interstate 94 which carries large amounts of truck traffic carrying chemicals and other hazardous materials • Construction of CHS nitrogen fertilizer plant will increase likelihood of a release • Trains have slowed down while traversing Hi-Line Bridge
Vulnerability	4	<ul style="list-style-type: none"> • Cell phone service in the area is reliable • Anhydrous ammonia fill station located results in truck traffic hauling chemicals in and out of city limits • High elderly population • Small size of city would leave all residents impacted • Limited traffic control signage and enforcement on Barnes County Road 11 and 22 • Medical supplies in stock at fire hall and at homes of first responders • Covered by Barnes County Ambulance, but may result in prolonged response times • Lacks hazardous material route • Presence of side track allows parking of freight trails increases amount of hazardous material temporarily stored in city limits • Egress from the city is limited to evacuate the population if an incident occurred
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 • No active education or outreach programs • Lacks resources to accomplish projects independently • City has Evacuation Plan • Public works and city departments went through training on incident command

City of Wimbledon

Impact	4	<ul style="list-style-type: none"> • Loss of life, crops and livestock • Loss of economy • Potential for fire as a secondary impact • Blocked road, loss of transportation mobility • Explosion causing mass property loss from oil trains
Frequency	2	<ul style="list-style-type: none"> • Never had any major occurrences
Likelihood	4	<ul style="list-style-type: none"> • People have propane tanks in town on their properties for heating • Trucks transporting larger tanks, carrying more chemicals • Truck route around the city, no one ever uses • Agroline anhydrous tanks and others • No real increase in truck traffic-decreases because Cenex moved seed plant out of town • Heavy traffic at harvest time • Signed contract with ethanol plant at Spiritwood will increase traffic • Increase in oil trains
Vulnerability	4	<ul style="list-style-type: none"> • No communication other than cell phones – good service in the area • chemicals stored in the city • Elderly population • Small size-would impact all areas of the city • Agroline anhydrous tanks right on highway 9-vulnerable to transportation accident • Oil trains traversing right through the city - CP rail line • Cenex located right in town for refueling-encouraged to come into town empty
Capability	2	<ul style="list-style-type: none"> • First responders have supplies, but no stock pile • People are not signed up for Code Red • Covered by Barnes County Ambulance • Hazardous/truck route – • No plans, financial • Agroline has safety education for employees and Cenex as well • Crossing arms at railroad

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 Barnes County. Figure 8.6.1 in Appendix 8.6 shows the locations of hazardous materials sites in Valley City.

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 threaten 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 in Barnes County. Figure 8.6.1 in Appendix 8.6 shows the locations of hazardous materials sites in Valley City.

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.

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
- Barnes County Emergency Operations Plan

5.7 Homeland Security Incident

Characteristics

A homeland security incident is any intentional 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. Forms of civil unrest can range from groups blocking sidewalks, roadways, and buildings to mobs rioting and looting. Civil unrest may be spontaneous, as when a mob erupts into violence, or it may be planned, as when a demonstration or protest intentionally interferes with another individual's or group's lawful business.

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.
- Bioterrorism – 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 US economy
- Civil Unrest and Violence – occurs on a smaller scale than terrorism with larger groups

Source: 2014 MHMP

History

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

There have been no declared disasters or emergencies pertaining to homeland security incident in Barnes County.

Probability and Magnitude

Determining the probability of the homeland security incident hazard on Barnes County is difficult at best as no data on any historical incidents is available. The only data available regarding the hazard was obtained from the North Dakota State Fire and Tornado Fund and is shown in Table 5.6.2, which shows roughly \$27,000 paid to facilities in Barnes County for claims on theft and vandalism. Aside from this dataset, the lack of alternative data results in the inability to calculate a probability for the hazard. 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 Barnes County, which has a population density of 7.4 people per square mile. Since the economy of Barnes County is largely based on agriculture and manufacturing, an incident involving agriculture or at a manufacturing facility has the potential to be disastrous and large in magnitude. Crops, agricultural and manufactured 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 5.6.1 shows the risk assessment as determined by individual jurisdictions and the committee. The risk assessment methodology can be found in 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 5.6.1 – Risk Assessment Summary Homeland Security Incident Scored Chart

Homeland Security Incident	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Barnes County	4	3	4	4	1	14
Dazey	4	2	3	3	1	11
Fingal	4	2	3	3	1	11
Kathryn	2	2	2	2	1	7
Leal	4	2	2	3	2	9
Litchville	1	1	1	1	2	2
Nome	4	1	1	2	1	7
Oriska	2	2	2	2	1	7
Pillsbury	2	2	2	2	1	7
Rogers	2	2	2	3	1	8
Sanborn	4	1	2	4	1	10
Sibley	4	2	1	3	1	9
Valley City	4	3	3	4	2	12
Wimbledon	4	2	2	4	1	11

(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 were unavailable primarily due to the lack of incident of the hazard occurring in the county.

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.

Barnes County

Impact	4	<ul style="list-style-type: none"> • Potential loss of economy, livestock and life • Disruption of services to maintain economic activity and daily life • Harm to reputation of the county as a safe place to reside causing damage to economic growth and decline in school enrollments • Potential exodus of people resulting in permanent population loss
Frequency	3	<ul style="list-style-type: none"> • Security threats have occurred in public schools in recent years
Likelihood	4	<ul style="list-style-type: none"> • Always a possibility of an event occurring in the future • No dense or large population in the area • Presence of Valley City State University and major employers may increase likelihood of an attack • Wintershow event in Valley City along with other large in events in the couth where large groups of people congregate • Railroad transportation carrying oil and other hazardous chemicals
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: Limited law enforcement staff and resources • More vulnerable: Denser population in and around Valley City • More vulnerable: Highline Bridge carrying hazardous materials high over Valley City and the Sheyenne River • Less vulnerable: Inadequate mental health services in the county and state • Less vulnerable: Sparse population and rural nature of the county • Less vulnerable: Better security has been implemented at schools
Capability	1	<ul style="list-style-type: none"> • Relies on regional, state and federal agencies for assistance • Does not have resources to accomplish projects independently • Active emergency management department with education and outreach available on the department’s website

City of Dazey

Impact	3	<ul style="list-style-type: none"> • Mass casualties, economic losses, widespread panic • Loss population
Frequency	1	<ul style="list-style-type: none"> • No incidents have occurred
Likelihood	2	<ul style="list-style-type: none"> • Local resident is mentally ill and chemically dependent
Vulnerability	3	<ul style="list-style-type: none"> • Small town, everyone is impacted, fearful, anxious • Day care is vulnerable • Local resident is unstable
Capability	1	<ul style="list-style-type: none"> • Sheriff’s department • Fire department

City of Fingal

Impact	4	<ul style="list-style-type: none"> • Mass casualties, economic losses, widespread panic • Loss population
Frequency	2	<ul style="list-style-type: none"> • No incidents have occurred
Likelihood	3	<ul style="list-style-type: none"> • No major employers • No school in the city • No dense or large population in the area • Increase in train traffic may increase likelihood
Vulnerability	3	<ul style="list-style-type: none"> • Small town, everyone is impacted, fearful, anxious • Right off a highway - evacuation route • Trains traversing through town
Capability	1	<ul style="list-style-type: none"> • Community hall and fire hall for gathering of residents • Sheriff's department – Barnes • First responder & EMT • No real plans in place or financial tax base • Lack of manpower by the city and general public • No education programs or outreach • Limited financial capabilities • Active city council • Barnes Rural Water District

City of Kathryn

Impact	2	<ul style="list-style-type: none"> • Mass casualties, economic losses, widespread panic • Loss population
Frequency	2	<ul style="list-style-type: none"> • No incidents have occurred
Likelihood	1	<ul style="list-style-type: none"> • No major employers • No school in the city • No dense or large population in the area
Vulnerability	1	<ul style="list-style-type: none"> • Small town, everyone is impacted, fearful, anxious • Right off a highway - evacuation route
Capability	2	<ul style="list-style-type: none"> • Community hall and fire hall for gathering of residents • Sheriff's department – Barnes • First responder & EMT • No real plans in place or financial tax base

City of Leal

Impact	4	<ul style="list-style-type: none"> • Mass casualties, economic losses, widespread panic • Loss of population
Frequency	2	<ul style="list-style-type: none"> • No incidents have occurred
Likelihood	2	<ul style="list-style-type: none"> • No major employers • Barnes County North located two miles away
Vulnerability	3	<ul style="list-style-type: none"> • Small town, everyone is impacted, fearful, anxious • Right off major rail line, off a highway evacuation

		<ul style="list-style-type: none"> • Elderly individual, two kids • Barnes County North located two miles away • No buildings for communal
Capability	2	<ul style="list-style-type: none"> • Sheriff’s department – Barnes • First responder

City of Litchville

Impact	1	<ul style="list-style-type: none"> • Mass casualties, economic losses, widespread panic • Loss of population
Frequency	1	<ul style="list-style-type: none"> • No incidents have occurred
Likelihood	1	<ul style="list-style-type: none"> • No major employers besides Dakota Plains • Has one bar
Vulnerability	1	<ul style="list-style-type: none"> • Small town, everyone is impacted, fearful, anxious • Right off major transportation rough-easy evacuation • High senior population, school children.
Capability	2	<ul style="list-style-type: none"> • Sheriff’s department - Barnes • Fire department – has some equipment that can be used • Community Center for gathering and sheltering-school

City of Nome

Impact	4	<ul style="list-style-type: none"> • Mass casualties, economic losses, and widespread panic • Potential for population loss if incident occurred
Frequency	1	<ul style="list-style-type: none"> • No incidents have occurred
Likelihood	1	<ul style="list-style-type: none"> • No major employers • No school in the city • No dense or large population in the area
Vulnerability	2	<ul style="list-style-type: none"> • Small town, everyone is impacted, fearful, anxious • Right off a highway – evacuation route • Low elderly population • Low population of school-aged children • Lack of railroad line through city limits • Community hall and fire hall for gathering of residents • First responders live nearby
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 • No active education or outreach programs • Lacks resources to accomplish projects independently

City of Oriska

Impact	4	<ul style="list-style-type: none"> • Loss of life, crops and livestock • Loss of economy • Potential for fire as a secondary impact • Blocked road, loss of transportation mobility • Depending on material released, fires may result
Frequency	1	<ul style="list-style-type: none"> • Never has any occurrences
Likelihood	4	<ul style="list-style-type: none"> • People do not have propane tanks in town on their properties for heating • More chemicals being stored in the area by farmers on their properties • Trucks transporting equipment have larger tanks, carrying more chemicals • More oil trains coming through
Vulnerability	4	<ul style="list-style-type: none"> • No communication or way to spread the word if something happened other than cell phones • People are signed up for Code Red not all • Some speeding, but RR tracks slow people down • Truck traffic carrying chemicals on Interstate 94 • Railroad right through the city – bisects the city, Highway 32 as well
Capability	1	<ul style="list-style-type: none"> • No stockpile of medical supplies • Covered by Barnes County Ambulance

City of Pillsbury

Impact	2	<ul style="list-style-type: none"> • Mass casualties, economic losses, widespread panic • Loss population
Frequency	2	<ul style="list-style-type: none"> • No incidents have occurred
Likelihood	2	<ul style="list-style-type: none"> • No major employers besides the grain elevator
Vulnerability	2	<ul style="list-style-type: none"> • Small town, everyone is impacted, fearful, anxious • Right off major transportation rough-easy evacuation • High senior population
Capability	1	<ul style="list-style-type: none"> • Sheriff's department - Barnes • Fire department – Hope • No buildings for communal gatherings

City of Rogers

Impact	2	<ul style="list-style-type: none"> • Mass casualties, economic losses, widespread panic • Loss of population
Frequency	2	<ul style="list-style-type: none"> • No incidents have occurred
Likelihood	2	<ul style="list-style-type: none"> • No major employers besides Benson Quinn
Vulnerability	3	<ul style="list-style-type: none"> • Small town, everyone is impacted, fearful, anxious • Right off major transportation rough-easy evacuation • High senior population, children and families
Capability	1	<ul style="list-style-type: none"> • Sheriff's department - Barnes • Fire department – has some equipment that can be used

City of Sanborn

Impact	4	<ul style="list-style-type: none"> • Mass casualties, economic losses, and widespread panic • Potential for population loss if incident occurred • Small size of city could lead to large losses of property and people
Frequency	1	<ul style="list-style-type: none"> • No incidents have occurred
Likelihood	2	<ul style="list-style-type: none"> • Presence of the anhydrous ammonia fill station • No school in the city • No dense or large population in the area
Vulnerability	4	<ul style="list-style-type: none"> • Small town, everyone is impacted, fearful, anxious • Right off Interstate 94 and county roads, which can be used as evacuation routes • High elderly population • High population of school-aged children • Railroad line and side track through city limits • Community hall and fire hall for gathering of residents • 18 first responders living in and around the city • Lack of law enforcement in the city results in prolonged response time from Barnes County Sheriff
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 • No active education or outreach programs • Lacks resources to accomplish projects independently

City of Sibley

Impact	4	<ul style="list-style-type: none"> • Mass casualties, economic losses, widespread panic • Loss of population • Loss of summer and recreation population
Frequency	2	<ul style="list-style-type: none"> • No incidents have occurred
Likelihood	1	<ul style="list-style-type: none"> • No major employers • No school in the city • No dense or large population in the area
Vulnerability	3	<ul style="list-style-type: none"> • Small town, everyone is impacted, fearful, anxious • Lack of emergency services except for fire • Right off a highway - evacuation route
Capability	1	<ul style="list-style-type: none"> • Active city council • Limited tax base • Designated evacuation routes with the County • Limited administrative and city staff

City of Valley City

Impact	4	<ul style="list-style-type: none"> • Mass casualties, economic losses, and widespread panic • Potential for population loss if incident occurred • Small size of city could lead to large losses of property and people • Potential loss of drinking water source if river were contaminated • Permanent abandonment of the city depending on the incident/chemical used and the magnitude of destruction
Frequency	3	<ul style="list-style-type: none"> • No incidents have occurred • Valley City Police Department stated no incidents of bomb threats at public schools and facilities, or calls at businesses in recent years • There is a high possibility for an incident at any location
Likelihood	3	<ul style="list-style-type: none"> • Presence of Valley City State University bringing in international faculty and populations • Presence of the Hi-Line Bridge carrying oil, chemicals, freight over high above the city
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: Small town, everyone is impacted, fearful, anxious • Less vulnerable: Located on Interstate 94 and county roads which can be used as evacuation routes • More vulnerable: High elderly population • More vulnerable: High population of school-aged children • More vulnerable: City located at intersection of railroad lines carrying oil, chemicals and other freight • More vulnerable: Lack of proper equipment and response technology by police department • Less vulnerable: City-County Health has capability to disperse medications on a large scale • More vulnerable: Lack of funding to train and educate employees as turn-over occurs at City-County Health, Mercy Hospital, healthcare system, in addition to emergency services such as police and fire departments • More vulnerable: Potential loss of potable and drinking water source if river were contaminated • More vulnerable: Lack of knowledge by general population of proper shelter-in-place techniques • More vulnerable: Lack of property emergency equipment for the police department • More vulnerable: Lack of air-purifying respirator (gas mask) and self-contained breathing apparatus to perform rescue operations • More vulnerable: Surrounding topography with the city being located in a river valley allows for chemicals to settle within city limits and have a staying permanence
Capability	2	<ul style="list-style-type: none"> • Lacks technical, administrative and financial resources for mitigation • Relies on county, regional, state and other agencies • Education or outreach programs performed on a routine basis at public schools, Valley City State University, and general public • Lacks resources to accomplish projects independently • City has an evacuation plan • No enough staff

City of Wimbledon

Impact	4	<ul style="list-style-type: none"> • Mass casualties, economic losses, widespread panic • Loss population
Frequency	2	<ul style="list-style-type: none"> • No incidents have occurred
Likelihood	2	<ul style="list-style-type: none"> • No major employers • Not a population center • No school in the city • No dense or large population in the area
Vulnerability	4	<ul style="list-style-type: none"> • Small town, everyone is impacted, fearful, anxious • Right off a highway - evacuation route • Unstable populations – some people have threatened – family • Train line right through town • Alliance pipeline right north of town-1.5 miles north, combination of chemicals
Capability	1	<ul style="list-style-type: none"> • Community hall and fire hall for gathering of residents • Sheriff’s department – Barnes • No evacuation plans

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 Barnes County Courthouse in Valley City would be the critical facility most at risk to a homeland security incident. 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. Table 5.6.2 illustrates vandalism and theft claims paid on critical facilities insured by the State of North Dakota from 1989 to 2013. In total, \$2,206 was paid to state agencies, \$3,474 to state universities, \$9,695 to the local government and \$11,859 to school districts. No claims were paid to adjutant general entities in Barnes County.

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
Barnes Co.	\$2,206	\$0	\$3,474	\$9,695	\$11,859	\$27,234

Source: North Dakota State Fire and Tornado Fund, 2010; N.D. Department of Emergency Services

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

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

According to the 2014 NDMHMP, there is one energy, two public health, two transportation, three emergency services, one communications and two water Critical Infrastructure and Key Resources facilities for a total of 11 Critical Infrastructure and Key Resources facilities in Barnes County. Chapter 4 provides an inventory of county and city owned property in Barnes 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 Barnes 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)
- Barnes County Emergency Operations Plan

5.8 Severe Summer Weather

Including Downburst/Strong Winds/Straight-Line Winds, Extreme Heat, Hail, Lightning, and Tornadoes

Characteristics

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 tornadoes. 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 tornadoes.

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.

Strong winds will occur outside of tornadoes and severe thunderstorms. The winds usually develop with strong pressure gradients and gusty frontal passages. Strong winds occur any time of year.

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. Exposure to extreme heat can cause physical problems and may cause heat disorders or illnesses. 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.

Studies indicate that, other things being equal, the severity of heat disorders tends to increase with age. Conditions that cause heat cramps in a 17-year-old may result in heat exhaustion in someone 40-years old, and in heat stroke in a person over 60. Sunburn, with its ultraviolet radiation burns, can significantly hamper the skin's ability to shed excess heat. Acclimatization has to do with adjusting sweat-salt concentrations, among other things. The idea is to lose enough water to regulate body temperature, with the least possible chemical disturbance—salt depletion.

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. Studies have shown that the temperature inside a parked vehicle can rapidly rise to a dangerous level for children, pets and even adults. Leaving the windows slightly open does not significantly decrease the heating rate. The effects can be more severe in children because their bodies warm at a faster rate than adults.

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 (at least 15 spf) if you must be outdoors
- 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 to do so by a 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 and who spend much of their time alone.
- 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. It is recommended not to handle animals in extreme heat unless absolutely necessary. Transportation of animals should be planned for early mornings.

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.

When the charge difference between the ground and the cloud becomes too large, a conductive channel of air develops between the cloud and the ground, and a small amount of charge (step leader) starts moving towards the ground. When it nears the ground, an upward leader of opposite charge connects with the step leader. At the instant this connection is made, a powerful discharge occurs between the cloud and the ground. We see this discharge as a bright visible flash of lightning.

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

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 5.7.1 – 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 5.7.1 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 tornados. 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.

Figures showing largest recorded hail size, highest rated tornado, and strongest non-tornadic wind gust by North Dakota county can be found in Appendix 8.

History

Barnes County has a documented hazard history that shows a 100 percent frequency and likelihood of the hazard occurring based on past occurrences. Approximately 223 occurrences of the hazards were recorded over a span of 54 years resulting in 6.50 injuries and one fatality. Property damage was approximately \$26.5 million and crop damage was \$39.1 million. Table 5.7.2 summarizes the history of severe summer weather occurrences in Barnes County. A detailed record of data history for severe summer weather be found in Appendix 8.8, in addition to figures showing largest hail size, strongest wind gust and largest tornado recorded.

Table 5.7.2 – Barnes County Severe Summer Weather Summary

Severe Summer Weather						
Number of Occurrences	Date Range	Probability	Injuries	Fatalities	Property Damage	Crop Damage
223	1960-2013	100%	6.50	1.00	\$26,513,677	\$39,102,775

Sources: Spatial Hazard Events and Losses Database of the United States (SHELDUS)
 National Oceanic and Atmospheric Administration (NOAA)
 Information Service/National Climatic Data Center (NCDC)
 2009 Barnes County MHMP

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. Indemnity is the amount paid to cover insurance claims from crop loss due to severe summer weather. The loss liability of crops totaled \$333,913,031 in Barnes County between 1990 and 2013 on 2,345,139 acres. Indemnity paid was \$202,148,886 resulting in losses of 61 percent of total liability. Crop loss indemnity paid from severe summer weather over the 24-year period resulted in an annual average of approximately \$8,422,870. Detailed data is available per crop for each year and can be found in Appendix 8.8, Table 8.8.8.

Probability and Magnitude

Hazard history was gathered from NOAA, NCDC, SHELDUS, newspaper accounts, and the previous FEMA-approved Barnes County Mitigation Plan. This data covers a 54-year period from 1960 through 2013, and documents 223 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. Crop loss from severe summer weather resulted in an average annual indemnity of \$8,422,870.

Risk Assessment

Table 5.8.5 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 5.8.5 – Risk Assessment Summary Severe Summer Weather Scored Chart

Severe Summer Weather	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Barnes County	3	4	4	3	2	12
Dazey	3	2	3	3	2	9
Fingal	4	3	3	3	1	12
Kathryn	3	2	2	2	2	7
Leal	4	3	3	3	2	11
Litchville	3	3	4	3	1	12
Nome	4	3	3	4	1	13
Oriska	3	3	4	3	2	11
Pillsbury	2	4	3	2	1	10
Rogers	4	3	3	3	2	11
Sanborn	4	3	4	3	1	13
Sibley	4	2	3	4	1	12
Valley City	3	4	4	2	3	10
Wimbledon	3	3	3	3	2	10

(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, Barnes County has a low-moderate vulnerability to tornados, hail, and thunderstorm winds, and moderate vulnerability to extreme heat and lightning. The county has an overall vulnerability ranking of low-moderate to severe summer weather.

Capabilities of and vulnerabilities to 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.

Barnes County

Impact	3	<ul style="list-style-type: none"> • Loss of economy, livestock and crops • Increased fire danger from dry conditions and high winds • Downed trees and power lines • Structural damage to homes farmsteads • Strain to emergency services and responders if damage is widespread • Unpaved streets in small jurisdictions can become damaged from rainfall and moisture • Lightning strike to power pole and trees causing power outages • Heavy rains cause overland flooding damaging buildings and structures • Heavy rain causes shifting of soil potentially downing power lines • Possible displacement of an estimated 639 people based on an average household size of 2.29 people in 279 mobile home structures • A total of \$202,148,886 in crop loss between 1990 and 2013 • Approximately seven injuries and one death between 1960 and 2012 • Temporary economic boost due to rebuilding/repairs of homes, businesses and other structures
Frequency	4	<ul style="list-style-type: none"> • Hazard occurs multiple times each year • Hail impacts areas of the county each year • Strong winds during summer months are commonplace • 156 occurrences between 1960 and 2012 resulting in 100 percent probability • Approximately \$8,422,870 in annual indemnity paid due to crop loss
Likelihood	4	<ul style="list-style-type: none"> • The hazard is part of the climate in the area • Strong storms and high wind are highly likely to occur in the future • Lack of storm water systems in some communities may contribute to overland flooding • 100 percent probability of hazards based on frequency of occurrences • Lightning strikes causing fires and other damages
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: 279 mobile homes structures consisting of five percent of the total housing stock • More vulnerable: 24 percent of population (2,632 people) is under the age of 20 and 20 percent consists of people over 65 (2,170 people) • More vulnerable: Location of small communities have experience prolonged response from emergency services

		<ul style="list-style-type: none"> • Less vulnerable: More advanced warning systems and reverse 911 • Less vulnerable: Increased communication, cell phones, internet and TV • Less vulnerable: Increase in technological capabilities of tractors and farm equipment warn farmers of severe storms • Less vulnerable: Emergency sirens are in place throughout the county • Less vulnerable: Education in schools has increased • Less vulnerable: Better predictions from the National Weather Service
Capability	2	<ul style="list-style-type: none"> • Active county commission • Contract for engineering, planning, and grant writing • GIS services provided by the state and county • Relies on county, state and other agencies for emergency assistance • Does not have financial resources to accomplish projects independently • County has county-wide mutual aid agreement for emergency services • Active emergency management department with education and outreach available on the department's website • Maintains capital improvements project list and project funding sources

City of Dazey

Impact	3	<ul style="list-style-type: none"> • Overland flooding in city park from heavy rains • Hail damage to homes, loss of power, fallen trees and debris • Lighting strike could cause a fire to buildings • Abandoned buildings could collapse, blown over • Loss of life and injury
Frequency	2	<ul style="list-style-type: none"> • Heavy rain from time to time • Little lightning or hail
Likelihood	3	<ul style="list-style-type: none"> • Lack of storm water drain • Heavier rains in recent years, more intense rain
Vulnerability	3	<ul style="list-style-type: none"> • Has storm siren, but not adequate. Manually started. Dispatch cannot set siren off. • Temporary worker population-Mayo construction • No official emergency shelter • Senior population, day care • Roads can become blocked-heavy rains • Limit access for emergency services
Capability	2	<ul style="list-style-type: none"> • Has inert landfill for debris • City has a tractor to move debris • Has community center for people to take cover • Fire department has equipment

City of Fingal

Impact	4	<ul style="list-style-type: none"> • Hail damage to homes, loss of power, fallen trees and debris • Property damage to community buildings • Lighting strike could cause a fire to buildings
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		<ul style="list-style-type: none"> • Loss of life, injury • Cars become stalled • Streets can become soggy from moisture • Straight-line winds can cause damage to buildings • Lightning strike to power pole and trees. Power outages can occur
Frequency	3	<ul style="list-style-type: none"> • Heavy rain from time to time during summer months • Couple high winds and strong storms per summer season • Climate trends
Likelihood	3	<ul style="list-style-type: none"> • Lack of storm water drain and storm water • Not a lot of heavy rains in recent years
Vulnerability	3	<ul style="list-style-type: none"> • Roads can become blocked-heavy rains, trees, blown debris. • Limit access for emergency services • Lack of paved streets • Lack of manpower • Vulnerable population • Three trailer homes • Roads in and out of town are well maintained – good access • Abandoned buildings, not well kept, could collapse from heavy rain or wind
Capability	1	<ul style="list-style-type: none"> • No inert landfill for debris • Fire department has equipment • Have adopted state building codes – lack enforcement • First responder & EMT • Fire hall, community hall • Small tax base • Active city council • No real plans in place or financial tax base • Lack of manpower by the city and general public • No education programs or outreach • Limited financial capabilities • Active city council • Barnes Rural Water District

City of Kathryn

Impact	3	<ul style="list-style-type: none"> • Hail damage to homes, loss of power, fallen trees and debris • Property damage to community buildings • Lightning strike could cause a fire to buildings • Loss of life, injury • Cars become stalled • Streets can become soggy from moisture • Straight-line winds can cause damage to buildings • Lightning strike to power pole and trees. Power outages can occur
Frequency	2	<ul style="list-style-type: none"> • Heavy rain from time to time during summer months • Couple high winds and strong storms per summer season
Likelihood	2	<ul style="list-style-type: none"> • Lack of storm water drain

		<ul style="list-style-type: none"> • Not a lot of heavy rains in recent years
Vulnerability	2	<ul style="list-style-type: none"> • Roads can become blocked-heavy rains, trees, blown debris. • Limit access for emergency services • Lack of paved streets • Lack of manpower • Elderly population • Two trailer homes • Roads in and out of town are well maintained, provide continued access for the city
Capability	2	<ul style="list-style-type: none"> • No inert landfill for debris • Fire department has equipment • Have adopted state building codes • First responder & EMT • Fire hall, community hall • Small tax base • Active city council

City of Leal

Impact	4	<ul style="list-style-type: none"> • Hail damage to homes, loss of power, fallen trees and debris • Lighting strike could cause a fire to buildings • Loss of life, injury • Cars become stalled • Streets can become soggy from moisture • Straight-line winds can cause damage to buildings • Lightning strike to power pole and trees. Power outages can occur.
Frequency	3	<ul style="list-style-type: none"> • Heavy rain from time to time during summer months • Hail 3 miles south in 2014 • Couple high winds and strong storms per summer season
Likelihood	3	<ul style="list-style-type: none"> • Lack of storm water drain • Heavier rains in recent years, more intense rain. More of a downpour than slow and steady
Vulnerability	3	<ul style="list-style-type: none"> • Elderly individual, two young • Roads can become blocked-heavy rains, trees, blown debris • Limit access for emergency services • Lack of paved streets • Lack of manpower • City park has many fallen branches • Lack grade separated access to town from railroad
Capability	2	<ul style="list-style-type: none"> • No inert landfill for debris • Fire department has equipment. • Has not adopted building codes • First responder

City of Litchville

Impact	3	<ul style="list-style-type: none"> • Hail damage to homes, loss of power, fallen trees and debris • Lighting strike could cause a fire to buildings • Abandoned buildings could collapse or blow over • Loss of life, injury • Overland flooding of streets from heavy rain near park • Cars become stalled • Streets can become soggy from moisture-not all streets are paved • Straight-line winds can cause damage to buildings • Chemicals tanks were blown over
Frequency	3	<ul style="list-style-type: none"> • Heavy rain from time to time • No much hail recently • Couple high winds and strong storms per summer season • Straight line winds about 6 to 7 years ago-lots of trees blew down
Likelihood	4	<ul style="list-style-type: none"> • Lack of storm water drain • Heavier rains in recent years, more intense rain. More of a downpour than slow and steady.
Vulnerability	3	<ul style="list-style-type: none"> • Senior population, children at school • City park-overland flooding from heavy rain • Limit access for emergency services • Lack of paved streets • Lack of manpower • No building codes
Capability	1	<ul style="list-style-type: none"> • No inert landfill for debris – contract through Sanitary Specialists • Fire department has equipment. • Has not adopted building codes • Small community-independent in nature, people help out • As needed maintenance by city

City of Nome

Impact	4	<ul style="list-style-type: none"> • Damage to homes and community buildings from hail, broken windows, loss of shingles, fallen tree debris • Power outages • Lighting strike could cause a fire to buildings • Potential injury and loss of life • Cars become stalled due to high water • Streets can become soggy from moisture • Straight-line winds can cause damage to buildings • Small size of city limits impacted areas and populations • Severe storms can potentially destroy majority of structures in the city
Frequency	3	<ul style="list-style-type: none"> • Heavy rain from time to time during summer months • Around two-to-three high winds and strong storms per summer season • Each year structures experience damage to shingles • Each year tree branches fall and damage structures

Likelihood	3	<ul style="list-style-type: none"> • Lacks storm water drainage systems • Heavy rains in recent years • Climatic patterns of the area will result in several storms per year
Vulnerability	4	<ul style="list-style-type: none"> • Lack of paved streets • Lack of storm drainage system • Lack of storm shelter • Prolonged response times and limited access for emergency services • Lack of manpower • Low elderly population • Roads in and out of town are well maintained • City lacks early warning system and only has a manually activated emergency siren • Most city residents are not signed up for Code Red • City has inert landfill • City has adopted build codes but lacks of enforcement • Fire department has equipment
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 • No active education or outreach programs • Lacks resources to accomplish projects independently • Has adopted state building codes

City of Oriska

Impact	3	<ul style="list-style-type: none"> • Hail damage to homes, loss of power, fallen trees and debris • Lighting strike could cause a fire to buildings • Abandoned buildings could collapse, blown over • Loss of life, injury • Overland flooding of streets from heavy rain on southeast side near park • Cars become stalled • Streets can become soggy from moisture
Frequency	3	<ul style="list-style-type: none"> • Heavy rain from time to time • No much hail recently • Couple high winds and strong storms per summer season
Likelihood	4	<ul style="list-style-type: none"> • Lack of storm water drain • Heavier rains in recent years, more intense rain. More of a downpour than slow and steady
Vulnerability	3	<ul style="list-style-type: none"> • Two emergency shelters • Senior population. – 30% • Roads can become blocked-heavy rains • Limit access for emergency services • Lack of paved streets • Lift station in low-lying area
Capability	2	<ul style="list-style-type: none"> • Has inert landfill for debris. • Has two shelters for people to take cover

		<ul style="list-style-type: none"> • Fire department has equipment • Adopted state building codes
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City of Pillsbury

Impact	2	<ul style="list-style-type: none"> • Hail damage to homes, loss of power, fallen trees and debris • Lighting strike could cause a fire to buildings • Abandoned buildings could collapse, blown over • Loss of life, injury • Overland flooding of streets from heavy rain on southeast side near park • Cars become stalled • Streets can become soggy from moisture • Straight-line winds can cause damage to buildings
Frequency	4	<ul style="list-style-type: none"> • Heavy rain from time to time • No much hail recently • Hail four miles south in 2014 • Couple high winds and strong storms per summer season
Likelihood	3	<ul style="list-style-type: none"> • Lack of storm water drain • Heavier rains in recent years, more intense rain. More of a downpour than slow and steady
Vulnerability	2	<ul style="list-style-type: none"> • Senior population • Roads can become blocked-heavy rains • Limit access for emergency services • Lack of paved streets • Lack of manpower
Capability	1	<ul style="list-style-type: none"> • No inert landfill for debris – contract through Brager in Sibley • Fire department has equipment • Has not adopted building codes

City of Rogers

Impact	4	<ul style="list-style-type: none"> • Hail damage to homes, loss of power, fallen trees and debris. • Lighting strike could cause a fire to buildings. • Abandoned buildings could collapse, blown over. • Loss of life, injury. • Overland flooding of streets from heavy rain • Cars become stalled. • Streets can become soggy from moisture-not all streets are paved • Straight-line winds can cause damage to buildings. • Chemicals tanks were blown over.
Frequency	3	<ul style="list-style-type: none"> • Heavy rain from time to time each summer. • No much hail recently. • Couple high winds and strong storms per summer season. • Straight line winds about 6 to 7 years ago-lots of trees blew down.
Likelihood	3	<ul style="list-style-type: none"> • Lack of storm water drain or system

		<ul style="list-style-type: none"> • Heavier rains in recent years, more intense rain. More of a downpour than slow and steady.
Vulnerability	3	<ul style="list-style-type: none"> • Senior population, children and families • City park-overland flooding from heavy rain • Corner of 1st by the old gas pump. • Limit access for emergency services • Lack of paved streets • Lack of manpower • No building codes • No public shelter. • Three trailer homes in town.
Capability	2	<ul style="list-style-type: none"> • No inert landfill for debris – contract through Dakota Sanitation • Fire department has equipment. • Has not adopted building codes • Small community-independent in nature, people help out. • As needed maintenance by city. • Mayor takes debris to old baseball diamond.

City of Sanborn

Impact	4	<ul style="list-style-type: none"> • Damage to homes and community buildings from hail, broken windows, loss of shingles, fallen tree debris • Power outages • Lighting strike could cause a fire to buildings • Potential injury and loss of life • Potential loss of livestock and economy • Cars become stalled due to high water • Streets can become soggy from moisture • Straight-line winds can cause damage to buildings • Small size of city limits impacted areas and populations • Severe storms can potentially destroy majority of structures in the city • Large financial impact to local economy as it is heavily reliant on agriculture • Drivers become stuck in potholes and mud on city streets
Frequency	3	<ul style="list-style-type: none"> • Heavy rain from time to time during summer months • Around two-to-three high winds and strong storms per summer season • Each year structures experience damage to shingles • Each year tree branches fall and damage structures
Likelihood	4	<ul style="list-style-type: none"> • Lacks storm water drainage system • Heavy rains in recent years • Climatic patterns of the area will result in several storms per year
Vulnerability	3	<ul style="list-style-type: none"> • Lack of paved streets • Lack of storm drainage system • Less vulnerable: Presence of three storm shelters • Prolonged response times and limited access for emergency services • Large amount of manpower and volunteers on fire department

		<ul style="list-style-type: none"> • Less vulnerable: City residents have equipment and volunteer time and resources for clean up • High elderly population • High school-age population • Roads in and out of town are maintain and sufficient • Less vulnerable: City streets are in the process of being re-graveled • City has emergency siren activated by county dispatch • Most city residents are not signed up for Code Red • City has inert landfill • City has adopted build codes but lacks of enforcement • Fire department has equipment for moving of water and debris
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 • No active education or outreach programs • Lacks resources to accomplish projects independently • Has adopted state building codes but lacks enforcement

City of Sibley

Impact	4	<ul style="list-style-type: none"> • Hail damage to homes, loss of power, fallen trees and debris • Property damage to community buildings • Lighting strike could cause a fire to buildings • Loss of life and injury • Streets can become soggy from moisture • Straight-line winds can cause damage to buildings • Lightning strike to power pole and trees causing power outages • Heavy rains cause overland flooding damaging buildings and structures • Heavy rain causes shifting of soil potentially downing power lines
Frequency	2	<ul style="list-style-type: none"> • Heavy rain from time to time during summer months • Couple high winds and strong storms per summer season
Likelihood	3	<ul style="list-style-type: none"> • Lack of storm water drain may contribute to overland flooding • Not a lot of heavy rains in recent years • Strong winds in the last few years
Vulnerability	4	<ul style="list-style-type: none"> • Roads can become blocked-heavy rains, trees, blown debris. • Limit access for emergency services • Lack of paved streets • Lack of manpower • Elderly population and retirees • Trailer homes and cabins from summer and recreation population lack structural integrity in the foundations • Less vulnerable: City maintains an inert landfill
Capability	1	<ul style="list-style-type: none"> • Active city council • Limited tax base • Designated evacuation routes with the County • Limited administrative and city staff

City of Valley City

Impact	3	<ul style="list-style-type: none"> • Damage to homes and community buildings from hail, broken windows, loss of shingles, fallen tree debris • Power outages • Lighting strike could cause a fire to buildings • Potential injury and loss of life • Potential loss of livestock and economy • Cars become stalled due to high water • Streets can become soggy from moisture could wash out • Straight-line winds can cause damage to buildings • Small size of city limits impacted areas and populations • Severe storms can potentially destroy majority of structures in the city • Large financial impact to local economy as it is heavily reliant on agriculture
Frequency	4	<ul style="list-style-type: none"> • Heavy rain from time to time during summer months • Around two-to-three high winds and strong storms per summer season • Each year structures experience damage to shingles • Each year tree branches fall and damage structures • Large hail storm in 2013 resulting in large amount of homes needing to be re-shingled • Heavy rain events every other year results overland flooding as city is located in a closed basin topography
Likelihood	4	<ul style="list-style-type: none"> • Lacks storm water drainage system • Heavy rain events every year • Climatic patterns of the area will result in several storms per year
Vulnerability	2	<ul style="list-style-type: none"> • Located of master lift station • Lack of storm drainage system • Less vulnerable: Presence of three storm shelters • Prolonged response times and limited access for emergency services • Large amount of manpower and volunteers on fire department • Less vulnerable: City residents have equipment and volunteer time and resources for clean up • High elderly population • High school-age population • Roads in and out of town are maintain and sufficient • Less vulnerable: City streets are in the process of being re-graveled • City has emergency siren activated by county dispatch • Most city residents are not signed up for Code Red • City has inert landfill • Contract with city of Fargo for waste services • City has adopted build codes and has enforcement to ensure integrity of structures • Fire department has equipment for moving of water and debris
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

		<ul style="list-style-type: none"> • No active education or outreach programs • Public work is well funded • Lacks resources to accomplish projects independently • Has adopted state building codes and has enforcement
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City of Wimbledon

Impact	3	<ul style="list-style-type: none"> • Hail damage to homes, loss of power, fallen trees and debris • Property damage to community buildings • Lighting strike could cause a fire to buildings • Loss of life, injury • Cars become stalled • Streets can become soggy from moisture • Straight-line winds can cause damage to buildings • Lightning strike to power pole and trees. Power outages can occur • Tree/branches landing on buildings causing damage
Frequency	3	<ul style="list-style-type: none"> • Heavy rain and storms from time to time during summer months • Couple high winds and strong storms per summer season
Likelihood	3	<ul style="list-style-type: none"> • Heavier rains – 3 to 4 inches now instead of 1 or 2 • Removal of shelter belts allowing more direct wind
Vulnerability	3	<ul style="list-style-type: none"> • Roads can become blocked-heavy rains, trees, blown debris. • Limit access for emergency services • Lack of paved streets • Lack of manpower • Elderly population • Trailer homes • Abandoned buildings – former hotel • Emergency siren – can be set off manually, has yet to be tested
Capability	2	<ul style="list-style-type: none"> • inert landfill/field for debris • Fire department has equipment • No building codes • First responder & EMT • Fire hall, community hall • Emergency siren – can be set off manually, has yet to be tested • No evacuation plan, financial, etc.

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 Barnes County Courthouse in Barnes 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

Critical facilities such as schools, college, water towers, roadways, county-owned buildings and other specialty facilities such as 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.

Vulnerabilities of Critical Facilities and Infrastructure

Critical facilities such as schools, water towers, roadways, county-owned buildings and other specialty facilities such as 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. This could 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.

Vulnerabilities to New and Future Development

Building codes ensure buildings and structures are built adequately to withstand most severe weather. The cities of Fingal, Kathryn, Leal, Nome, Oriska, Sanborn and Valley City have building codes and ordinances regulating building and development. The smaller cities of Dazey, Litchville, Pillsbury, Rogers, Sibley and Wimbledon lack building codes and do not have standards for new and future development. This lack puts these cities at more risk of damage and impacts from severe summer weather and windstorms. However, the city of Wimbledon has ordinances in place for trailer parks.

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

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.

- North Dakota Emergency Operations Plan, Severe Storms Annex
- Barnes County Emergency Operations Plan
- Fingal Ordinances
- Kathryn Ordinances
- Leal Ordinances
- Nome Ordinances

- Sanborn Ordinances
- Valley City Ordinances
- Wimbledon Ordinances (trailer parks)
- North Dakota State Building Code
- North Dakota League of Cities: Planning and Zoning Handbook

5.9 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, 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 the most dramatic and dangerous winter storms. A blizzard has winds of 35 mph or more with snow and blowing snow reducing visibility to less than $\frac{1}{4}$ mile for at least 3 hours. Blizzards are usually characterized by low temperatures and by strong winds bearing large amounts of snow. Snowfall is usually present during the early stages of the blizzard. However, most of the snow in a blizzard is in the form of fine, powdery particles of snow which are whipped up from the surface in such great density that at times the visibility is only a few yards, creating a blinding condition.

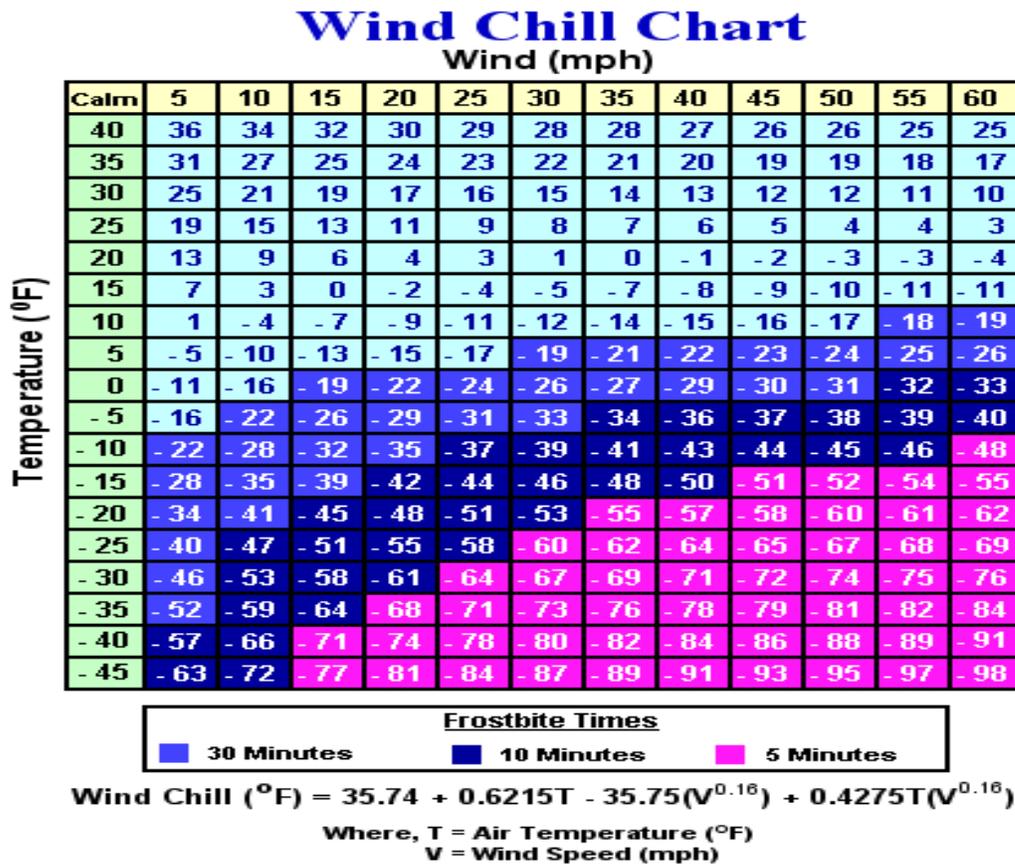
Heavy Snow storm is probably the most significant winter weather phenomenon. Snow can be continuous, intermittent, flurries or if showery in nature, snow squalls. Snow squalls are brief, intense falls of snow for short durations and are comparable to summer rain showers. Blowing and drifting snow often happen together, due to strong winds and falling snow or loose snow on the ground.

Recycled Snow is the ongoing blowing and drifting of already accumulated snow from one or more snow events that continues to blow and drift for days and weeks. The blowing snow is raised above the surface and blows in quantities that reduce visibility, continuously form new drifts, and fills in plowed roads three or four times per day. It is the most significant winter weather phenomenon in the county.

Ice Storms Freezing rain or freezing drizzle is rain or drizzle occurring when surface temperatures are below freezing. The moisture falls in liquid form but freezes upon impact, resulting in a coating of ice or glaze on all exposed surfaces. This is often called an ice storm. Sleet is sometimes incorrectly referred to as an ice storm. Sleet is frozen rain drop, ice pellets, which bounce when hitting the ground. Sleet does not stick to trees, but a sufficient depth can cause hazardous driving conditions. Heavy accumulations of ice can bring down trees and topple utility poles and communication towers. Ice can disrupt communications and power for days while utility companies repair extensive damage. Even small accumulations of ice can be extremely dangerous to motorists and pedestrians. Bridges and overpasses are particularly dangerous because they freeze before other surfaces.

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 describes how cold it feels and is based on heat loss on exposed skin from wind and cold. The wind chill makes it feel much colder than the actual temperature.

Figure 5.8.1 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.

By nature, different types of winter weather occur within a winter storm, and varying intensities. Strong winds, extreme cold, accumulations of ice and heavy snow, and dangerous wind chills are typically what most affect our region. Winter storms may be deceptive because many deaths and injuries are directly related to the storm. 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 been known to 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 and can cause extensive damage to public and private property. Each year a number of people, stranded in a blizzard attempt to walk to safety and become lost. They often suffer from hunger, thirst, severe frostbite, and hypothermia. Frostbite can lead to loss of fingers and toes or cause permanent kidney, pancreas and liver injury and even death. Hypothermia has often been called “The killer of the unprepared”. It is also the number one killer of many outdoor sports enthusiasts.

Hypothermia is a condition where the body temperature, or core temperature, is lowered. The blood is cooled, reducing oxygen carried to the brain and dulling 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 end result is arrest of the circulation and respiratory systems and death.

Wind chill is not the actual temperature but rather how wind and cold feel on exposed skin. As the wind increases, heat is carried away from the body at an accelerated rate, driving down the body temperature. Animals are also affected by wind chill; however, cars, plants, and other objects are not.

The livestock industry can be severely impacted during winter storm situations. The snow can prevent cattlemen from getting feed and water to their livestock. Heavy snow can cause shelter roofs to cave in, crushing or suffocating livestock.

History

Barnes County has a documented hazard history that shows 141 occurrences of the hazard between 1960 and 2013, resulting in a 100 percent frequency and likelihood of the hazard occurring in the future. Table 5.9.1 shows a summary of the severe winter weather history in Barnes County. It documents severe winter weather impacts which includes nearly 1.76 injuries, 4.650 fatalities reported and approximately \$13, 073,933 million in property damage and crop losses of \$33,635. Fatalities from storms are reported for the storm in its entirety and apportioned across all counties impacted. Detailed history can be found in Appendix 8.9.

Table 5.9.1 – 1960 to 2014 Barnes County Severe Winter Weather History Summary

Severe Winter Weather					
Number of Occurrences	Date Range	Injuries	Fatalities	Property Damage	Crop Damage
141	1960-April 2014	1.76	4.65	\$13,073,933	\$33,635

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)
 2010 Barnes County MHMP

Probability and Magnitude

Hazard history was gathered from NOAA, NCDC, SHELDUS, newspaper accounts, and the previous FEMA-approved Barnes County Mitigation Plan. This data covers a 54-year period from 1960 through 2015, and documents 141 notable severe winter weather occurrences, which equates to a probability of 100 percent.

Risk Assessment

Table 5.9.2 shows the risk assessment as determined by individual jurisdictions and the committee. The risk assessment methodology can be found in 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 5.8.4 – Risk Assessment Summary Severe Winter Weather Scored Chart

Severe Winter Weather	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Barnes County	4	4	4	3	2	13
Dazey	4	4	4	4	2	14
Fingal	4	4	4	4	1	15
Kathryn	3	3	3	2	2	9
Leal	3	3	4	4	2	12
Litchville	2	3	1	2	3	5
Nome	3	3	3	3	1	11
Oriska	3	4	4	3	3	11
Pillsbury	3	4	4	3	1	13
Rogers	3	3	4	4	2	12
Sanborn	4	3	4	3	1	13
Sibley	4	4	4	3	1	14
Valley City	3	4	4	2	3	10
Wimbledon	4	4	4	3	2	13

(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 Barnes 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 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.

Barnes County

Impact	4	<ul style="list-style-type: none"> • Restricted access for emergency services from snow blocking roads • Loss of economy and livestock and potential loss of life • Power outages • Loss of infrastructure from roads being closed • Increased isolation of rural residents and small communities • Isolation of the communities • Severe low temperatures may increase utility costs • Low temperatures may affect alternative fuel sources • Increased cost for fuel for snow removal if we have heavy snow • Highways can become icy reducing mobility speeds • Heavy snow causing heavy spring melting and potential flooding in the spring • Possible displacement of an estimated 639 people based on an average household size of 2.29 people in 279 mobile home structures • Approximately two injuries and nearly five deaths between 1960 and 2013 • Additional calls for emergency services may strain resources • Difficulty sheltering stranded people due to lack of temporary housing structures
Frequency	4	<ul style="list-style-type: none"> • Hazard occurs multiple times each year • Blizzard conditions, heavy snow, extreme wind chill occur each year • Strong winds are commonplace • 94 occurrences between 1960 and 2013 resulting in a probability of 100 percent
Likelihood	4	<ul style="list-style-type: none"> • The hazard is part of the climate in the area • Blizzards, heavy snow, high winds and extremely cold temperature are expected • Increased removal of shelterbelts allows more ground blizzards
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: Townships do not have equipment to clear roads and rely on farmers • More vulnerable: Roads shut down from accumulation of snow • More vulnerable: 279 mobile homes structures consisting of five percent of the total housing stock • More vulnerable: 24 percent of population (2,632 people) is under the age of 20 and 20 percent consists of people over 65 (2,170 people) • More vulnerable: Longer response times from emergency services

		<ul style="list-style-type: none"> • More vulnerable: Lack of road signage limits navigation for emergency services and first responders in rural areas • Less vulnerable: County has adequate equipment for clearing roads • Less vulnerable: Better weather alerts and education of residents through internet, TV and cable • Less vulnerable: Increased awareness through CodeRed
Capability	2	<ul style="list-style-type: none"> • Active county commission • Contract for engineering, planning, and grant writing • GIS services provided by the state • Relies on regional, state and other agencies for emergency assistance • County has county-wide mutual aid agreement • Active emergency management department with education and outreach available on the department's website • Stable tax base to maintain funding for the county road department to continue operations and maintain department staff • Administrative support from other county departments

City of Dazey

Impact	4	<ul style="list-style-type: none"> • Heavy snow, blocked roads, power outages • Isolation of the community • Loss of life, injury, loss of economy • Low temperatures may affect alternative fuel sources
Frequency	4	<ul style="list-style-type: none"> • Happens yearly, weather and climate in the area
Likelihood	4	<ul style="list-style-type: none"> • Will happen in the future • Removal of shelter belts and vegetation leads to more ground blizzard conditions
Vulnerability	4	<ul style="list-style-type: none"> • Senior population, day care, no school • Some trailer homes, abandoned buildings • One major highway for transportation, three access points into the city • Use of propane-low temperature will affect it
Capability	2	<ul style="list-style-type: none"> • City has tractor with snow scoop • City has a snow blower • Alternative heating sources-propane

City of Fingal

Impact	4	<ul style="list-style-type: none"> • Heavy snow, blocked roads, power outages • Isolation of the community • Severe low temperatures-increase utility costs • Loss of life, injury, loss of economy • Low temperatures may affect alternative fuel sources • Increased cost for snow removal if we have heavy snow • Highways can become icy reducing mobility speeds • Heavy rain results in melting and potential flooding in the spring
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		<ul style="list-style-type: none"> • Barnes County experiences delays in opening roads due to staff reductions
Frequency	4	<ul style="list-style-type: none"> • Happens yearly, weather and climate in the area • High winds and ground blizzard conditions
Likelihood	4	<ul style="list-style-type: none"> • Will happen in the future due to our climate • Removal of shelter belts and vegetation leads to more ground blizzard conditions
Vulnerability	4	<ul style="list-style-type: none"> • Trailer homes • Lack of paved streets • Can block the access to town, block roads • Good roads leading in and out of town • Vulnerable populations • Good city shop located in the city with snow blower, other equipment • North entrance from Highway 32 is blocked more frequently than others
Capability	1	<ul style="list-style-type: none"> • Have adopted state building codes – lack enforcement • First responder & EMT • Fire hall, community hall • Small tax base • Active city council • No real plans in place or financial tax base • Lack of manpower by the city and general public • No education programs or outreach • Limited financial capabilities • Active city council • Barnes Rural Water District

City of Kathryn

Impact	3	<ul style="list-style-type: none"> • Heavy snow, blocked roads, power outages • Isolation of the community • Severe low temperatures-increase utility costs • Loss of life, injury, loss of economy • Low temperatures may affect alternative fuel sources • Increased cost for snow removal if we have heavy snow • Highways can become icy reducing mobility speeds • Heavy rain results in melting and potential flooding in the spring
Frequency	3	<ul style="list-style-type: none"> • Happens yearly, weather and climate in the area • High winds and ground blizzard conditions
Likelihood	3	<ul style="list-style-type: none"> • Will happen in the future due to our climate. • Removal of shelter belts and vegetation leads to more ground blizzard conditions
Vulnerability	2	<ul style="list-style-type: none"> • Trailer homes • Lack of paved streets • Can block the access to town, block roads • Good roads leading in and out of town • Elderly population • Good county shop located in the city

Capability	2	<ul style="list-style-type: none"> • Local residents do snow removal-county is effective as well • Some residents have alternative sources of heat • Fire hall as shelter due to in-floor heat • Adopted state building codes • Independent, small town good neighbors-help each other out • First responder & EMT
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City of Leal

Impact	3	<ul style="list-style-type: none"> • Heavy snow, blocked roads, power outages. • Isolation of the community. • Loss of life, injury, loss of economy. • Low temperatures may affect alternative fuel sources. • Increased cost for snow removal if we have heavy snow. • Highways can become icy reducing mobility speeds.
Frequency	3	<ul style="list-style-type: none"> • Happens yearly, weather and climate in the area. • High winds and ground blizzard conditions-always blocks roads to Highway 9. • 4 to 5 times a winter with strong storms.
Likelihood	4	<ul style="list-style-type: none"> • Will happen in the future due to our climate. • Removal of shelter belts and vegetation leads to more ground blizzard conditions. • Nothing to the west of town to block snow.
Vulnerability	4	<ul style="list-style-type: none"> • Elderly individual, two young • No trailer homes • Lack of paved streets. • Can block the access to town, stop to switch cars, block roads. • Nothing to the west of town to block snow. • Lack grade separated access to town from railroad.
Capability	2	<ul style="list-style-type: none"> • Local residents do snow removal. • Some residents have alternative sources of heat. • No shelter. • No building codes. • Independent, small town good neighbors-help each other out. • First responder.

City of Litchville

Impact	2	<ul style="list-style-type: none"> • Heavy snow, blocked roads, power outages • Isolation of the community • Loss of life, injury, loss of economy • Low temperatures may affect alternative fuel sources • Increased cost for snow removal
Frequency	3	<ul style="list-style-type: none"> • Happens yearly, weather and climate in the area. • High winds and ground blizzard conditions-always blocks roads to N.D. Highways 1 and 46

		<ul style="list-style-type: none"> • 4 to 5 times a winter with strong storms
Likelihood	1	<ul style="list-style-type: none"> • Will happen in the future • Removal of shelter belts and vegetation leads to more ground blizzard conditions-happening outside of town but nowhere near city limits
Vulnerability	2	<ul style="list-style-type: none"> • Senior population, school population • Some trailer homes, abandoned buildings, abandoned vehicles • Lack of paved streets • People view this as normal, are used to it, part of everyday life
Capability	3	<ul style="list-style-type: none"> • Local residents do snow removal, County does city streets • Some residents have alternative sources of heat • Community center and school as shelters • No building codes • Water tower has recirculating pump to keep water from freezing

City of Nome

Impact	3	<ul style="list-style-type: none"> • Blocked roads and power outages from heavy snow • Isolation of the community • Severe low temperatures can increase utility costs • Potential loss of life and injury • Loss of economy • Low temperatures may affect alternative fuel sources • Increased cost for snow removal • Highways can become icy reducing mobility speeds • Heavy snow results in potential flooding in the spring • City streets build up with compacted snow which limits mobility and causes damage to streets • Drivers become stuck in potholes and mud on city streets
Frequency	3	<ul style="list-style-type: none"> • Happens yearly due to weather and climate in the area • High winds and ground blizzard conditions occurs each year • Ice storm occurred in 1997 resulting in temporary isolation of the community
Likelihood	3	<ul style="list-style-type: none"> • Will happen in the future due to the climate • Removal of shelter belts and vegetation around the city leads to more ground blizzard conditions in the local area
Vulnerability	3	<ul style="list-style-type: none"> • Two trailer homes • Lack of paved streets • Low elderly population • Lack of equipment leaves city reliant on others for snow removal • City has contracted help to remove snow in the city • Portion of N.D. Highway 32 through the city is last priority by the State for clearing of snow • Adopted state building codes • Independent, small town and good neighbors willing to help out • High winds does not allow accumulation of snow on top of structures resulting in lower snow loads on roofs
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 • No active education or outreach programs • Lacks resources to accomplish projects independently • Has adopted state building codes
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City of Oriska

Impact	3	<ul style="list-style-type: none"> • Heavy snow, blocked roads, power outages • Isolation of the community • Loss of life, injury, loss of economy • Low temperatures may affect alternative fuel sources • Increased cost for snow removal
Frequency	4	<ul style="list-style-type: none"> • Happens yearly, weather and climate in the area
Likelihood	4	<ul style="list-style-type: none"> • Will happen in the future • Removal of shelter belts and vegetation leads to more ground blizzard conditions
Vulnerability	3	<ul style="list-style-type: none"> • Senior population and school • Some trailer homes, abandoned buildings, abandoned vehicles • Located right on Interstate 94 • Fragmentation of school district may lead to stranded kids
Capability	3	<ul style="list-style-type: none"> • City has contract for snow removal • Some residents have wood burners • Two shelters • Lift station – Sanitary sewer • Building codes

City of Pillsbury

Impact	3	<ul style="list-style-type: none"> • Heavy snow, blocked roads, power outages • Isolation of the community • Loss of life, injury, loss of economy • Low temperatures may affect alternative fuel sources • Increased cost for snow removal
Frequency	4	<ul style="list-style-type: none"> • Happens yearly, weather and climate in the area • High winds and ground blizzard conditions-always blocks roads to Highway 32 • 4 to 5 times a winter with strong storms
Likelihood	4	<ul style="list-style-type: none"> • Will happen in the future • Removal of shelter belts and vegetation leads to more ground blizzard conditions
Vulnerability	3	<ul style="list-style-type: none"> • Senior population • Some trailer homes, abandoned buildings, abandoned vehicles • Lack of paved streets • 3rd avenue becomes blocked each storm • Trains stop to let others pass, can block the access to town

Capability	1	<ul style="list-style-type: none"> • Local residents do snow removal • Some residents have alternative sources of heat • No shelter • No building codes
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City of Rogers

Impact	3	<ul style="list-style-type: none"> • Heavy snow, blocked roads, power outages • Isolation of the community • Loss of life, injury, loss of economy • Low temperatures may affect alternative fuel sources • Increased cost for snow removal • Icy roads – accidents can occur
Frequency	3	<ul style="list-style-type: none"> • Happens yearly, weather and climate in the area • High winds and ground blizzard conditions-always blocks roads to Highway 1 • 4 to 5 times a winter with strong storms
Likelihood	4	<ul style="list-style-type: none"> • Will happen in the future • Removal of shelter belts and vegetation leads to more ground blizzard conditions-happening outside of town but nowhere near city limits
Vulnerability	4	<ul style="list-style-type: none"> • Senior population, children and families • three trailer homes, abandoned buildings, abandoned vehicles • Lack of paved streets • People view this as normal, are used to it, part of everyday life • No grocery store or gas station, or clinic
Capability	2	<ul style="list-style-type: none"> • Local residents do snow removal, County Road 10 does the highway, ND Highway 1 north and south • Some residents have alternative sources of heat • shelters (unofficial) • No building codes

City of Sanborn

Impact	4	<ul style="list-style-type: none"> • Blocked roads and power outages from heavy snow • Isolation of the community from blocked roads • Severe low temperatures can increase utility costs • Potential loss of life and injury • Loss of economy • Low temperatures may affect alternative fuel sources • Increased cost for snow removal • Highways can become icy reducing mobility speeds • Heavy snow results in potential flooding in the spring • City streets build up with compacted snow which limits mobility and causes damage to streets • Blocked roads increases difficulty for elderly residents to travel and access necessary medical services
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Frequency	4	<ul style="list-style-type: none"> • Happens yearly due to weather and climate in the area • High winds and ground blizzard conditions occurs each year • Ice storm occurred in 1997 resulting in temporary isolation of the community
Likelihood	4	<ul style="list-style-type: none"> • Will happen in the future due to the climate • Removal of shelter belts and vegetation around the city leads to more ground blizzard conditions in the local area
Vulnerability	3	<ul style="list-style-type: none"> • Six trailer homes • Lack of paved streets • High elderly population • High school-age population • Less vulnerable: City residents have equipment and volunteer time and resources for clean up • County clears city streets • More/less vulnerable: Adopted state building codes but lacks enforcement • Independent, small town and good neighbors willing to help out • High winds does not allow accumulation of snow on top of structures resulting in lower snow loads on roofs
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 • No active education or outreach programs • Lacks resources to accomplish projects independently • Has adopted state building codes but lacks enforcement

City of Sibley

Impact	4	<ul style="list-style-type: none"> • Heavy snow, blocked roads, power outages • Isolation of the community • Severe low temperatures-increase utility costs • Loss of life, injury, loss of economy • Low temperatures may affect alternative fuel sources • Increased cost for fuel for snow removal if we have heavy snow. • Highways can become icy reducing mobility speeds • Heavy snow causing melting and potential flooding in the spring
Frequency	4	<ul style="list-style-type: none"> • Happens yearly, weather and climate in the area. • High winds and ground blizzard conditions • Heavy snow each year • Geography of the city allows for snow to fill city streets with snow
Likelihood	4	<ul style="list-style-type: none"> • Will happen in the future due to our climate • Geography of the city allows for snow to fill city streets with snow • Location at the bottom of the hill allows for strong winds into the valley
Vulnerability	3	<ul style="list-style-type: none"> • Trailer homes and cabins for summer and recreation populations • Lack of paved streets (except for Main Street/Lake Avenue) • Good roads leading in and out of town • Elderly population and retirees

		<ul style="list-style-type: none"> • Limited access with only one way in and out of the city • Bridge over Lake Ashtabula can become blocked from heavy snow blowing of the lake • City owns snow plow and removal equipment • No stockpile of medical supplies • No medical clinic, hospital or local ambulance
Capability	1	<ul style="list-style-type: none"> • Active city council • Limited tax base • Some financial capabilities for maintaining snow removal equipment • Designated evacuation routes with the County • Limited administrative and city staff • Lack of education or outreach programs

City of Valley City

Impact	3	<ul style="list-style-type: none"> • Blocked roads and power outages from heavy snow • Isolation of the community from blocked roads • Severe low temperatures can increase utility costs • Potential loss of life and injury • Loss of economy • Low temperatures may affect alternative fuel sources • Increased cost for snow removal • Highways can become icy reducing mobility speeds • Heavy snow results in potential flooding in the spring • Frozen water services limits available of • Blocked roads increases difficulty for elderly residents to travel and access necessary medical services
Frequency	4	<ul style="list-style-type: none"> • Happens yearly due to weather and climate in the area • High winds and ground blizzard conditions occurs each year • Ice storm occurred in 1997 resulting in temporary isolation of the community
Likelihood	4	<ul style="list-style-type: none"> • Will happen in the future due to the climate • Removal of shelter belts and vegetation around the city leads to more ground blizzard conditions in the local area • Topography of the city being located in a closed basin contributes to impacts of the hazards
Vulnerability	2	<ul style="list-style-type: none"> • Six trailer homes • Lack of paved streets • High elderly population • High school-age population • Less vulnerable: City residents have equipment and volunteer time and resources for clean up • County clears city streets • More/less vulnerable: Adopted state building codes but lacks enforcement • Downtown buildings with flat roofs are vulnerable to heavy snow loads on roofs

		<ul style="list-style-type: none"> • Neighborhoods will help each other out • High winds does not allow accumulation of snow on top of structures resulting in lower snow loads on roofs
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 • No active education or outreach programs • Lacks resources to accomplish projects independently • Has adopted state building codes but lacks enforcement

City of Wimbledon

Impact	4	<ul style="list-style-type: none"> • Heavy snow, blocked roads, power outages • Isolation of the community • Severe low temperatures-increase utility costs • Loss of life, injury, loss of economy • Low temperatures may affect alternative fuel sources • Increased cost for snow removal if we have heavy snow. • Highways can become icy reducing mobility speeds, transportation accident • Heavy precipitation results in melting and potential flooding in the spring • Snow and ice build ups on power lines, causing outages
Frequency	4	<ul style="list-style-type: none"> • Happens yearly, weather and climate in the area • High winds and ground blizzard conditions
Likelihood	4	<ul style="list-style-type: none"> • Will happen in the future due to our climate. • Removal of shelter belts and vegetation leads to more ground blizzard conditions • Fire chief cannot condemn buildings, state fire marshal has to do it
Vulnerability	3	<ul style="list-style-type: none"> • Trailer homes • Lack of paved streets • Can block the access to town, block roads • Good roads leading in and out of town • Elderly population • Good city shop located in the city • Gas station and grocery store • Fire chief cannot condemn buildings, state fire marshal has to do it, the ability of fire chief was taken away • Some residents have alternative sources of heat
Capability	2	<ul style="list-style-type: none"> • Local residents do snow removal-county is effective as well • Some residents have alternative sources of heat • Fire hall and community center • no state building codes • no evacuation plan • no plans in place, or financial

Vulnerabilities to County-Owned Buildings and Property

Most structures remain unaffected by impacts from severe winter weather with the exception of 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 Barnes 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 cities of Berlin and Dickey do not have backup generators for any facilities. The cities of Kathryn, Leal, Nome, Oriska, Pillsbury, Rogers, and Sibley do not have generators.

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. Suspended power lines are highly susceptible to fallen tree branches, other debris or accumulation of ice, leading to power outages. Restoration of power can take up to several days or even week. All jurisdictions in the county have experienced power outages during severe winter weather to varying degrees of extent. Delivery of water to jurisdictions can be interrupted by water main breakage resulting from freeze and thaw cycles. Barnes Rural Water District, which provides drinking water to jurisdictions in the county, has not experienced interruptions in service.

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. Jurisdictions without building codes should have improved construction to better withstand severe winter weather.

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 raises 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. Conversely, increases in populations in existing jurisdictions may lessen the risk to impacts from severe winter weather as it leads to less isolated populations and

increases the number of people reachable by emergency services during an emergency. As shown in Chapter 4, Profile and Inventory on Table 4.2, between 2010 and 2030, Barnes County and the cities of Litchville, Sanborn, Valley City and Wimbledon are projected to increase in population. Projections were not available for the remaining jurisdictions.

Data Limitations and Other Key Documents

Severe winter weather is frequent in Barnes County. 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 documents.

- North Dakota Emergency Operations Plan
- Barnes County Emergency Operations Plan

5.10 Shortage or Outage of Critical Materials or Infrastructure

Characteristics

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

Disrupting critical materials supply system could severely diminish supplies, hurting the health and safety of the residents in Barnes County. Critical materials or infrastructure shortages and outages are often related to other hazards.

Shortages of critical energy supplies can cause:

- 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. This could cause severe economic impact on the general public, because they would be forced to seek alternate, possibly more costly, energy sources. Such energy shortages will also impact emergency public health and safety services.
- 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 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. An unplanned outage is described as an outage occurring without warning from outside causes, such as severe weather. Sustained power outages are outages lasting longer than five minutes. Momentary outages are shorter than five minutes. The FEMA Standard Values for Loss of Services for Utilities and Roads/Bridges states that the economic impact of complete loss of electrical services is \$126 per person per day.

Homes and businesses are heated with fuels such as 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 the heating systems. Telephone, cellular telephone, and internet services are provided by several local and national companies. Privately-owned gas stations are located throughout the county.

History

Electrical power in the county is provided by Ottertail Power Company in Barnes County outside the city of Valley City. Valley City maintains its own municipal electric service. According to data of power outages provided by Otter Tail Power Company between January 2010 and May/June 2014, the jurisdictions in Barnes County shown in Table 5.10.1 experienced total power outages of four hours, 13 minutes and nine seconds. Table 5.10.1 summarizes the history of outages in Barnes County. A written description of each outage is provided in Appendix 8.10 in Tables 8.10.2 and 8.10.3. This data does not include all power outages in the county.

Table 5.10.1 –January 2010 to May/June 2014 Barnes County Momentary and Sustained Power Outages

Jurisdiction	Momentary Power Outage		Sustained Power Outage		Total Outage Time
	Number of Outages	Length of Time (Hr., Min. Sec.)	Number of Outages	Length of Time (Hr., Min. Sec.)	
Dazey	84	0:46:34	10	25:38:02	26:06:06
Fingal	90	0:13:42	25	30:10:46	30:24:28
Kathryn	NA	NA	NA	NA	NA
Leal	38	0:17:16	14	23:59:18	24:16:34
Litchville	94	0:13:16	13	12:26:39	12:39:55
Nome	NA	NA	NA	NA	NA
Oriska	39	0:17:02	18	41:25:46	41:42:48
Pillsbury	15	0:05:10	NA	NA	0:05:10
Rogers	33	0:12:17	31	13:51:24	14:03:41
Sanborn	12	0:02:46	4	8:34:22	8:37:08
Sibley	32	0:11:14	NA	NA	0:11:14
Valley City	NA	NA	NA	NA	NA
Wimbledon	17	0:08:54	15	21:51:35	22:00:29
Total	474	2:36:10	115	1:37:19	4:13:29

Source: Otter Tail Power Company

Quantitative data regarding other types of shortage or outage of critical materials or infrastructure, or shortage of food and medical supplies, is not included. Barnes Rural Water District Dakota Rural Water

District provide water to the county and its jurisdictions, have backup generators to maintain water service during times of power outage.

Probability and Magnitude

The probability of the shortage or outage of critical materials or infrastructure hazard in Barnes County is hard to determine as the cause can either be natural or manmade. Aside from the power outage frequency shown, the lack of data results in an inability to calculate a probability for the hazard. However, during jurisdictional meetings, city council members and meeting participants said there is always a chance any jurisdiction can experience power outages and blocked roads from snow, flooding and windstorms that could cause a shortage of critical materials. 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 or food supplies, 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 5.10.2 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.

Table 5.10.2 – Risk Assessment Summary Shortage or Outage of Critical Materials or Infrastructure Scored Chart

Shortage or Outage of Critical Materials or Infrastructure	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Barnes County	3	4	4	3	2	12
Dazey	3	2	4	3	2	10
Fingal	3	2	3	3	1	10
Kathryn	3	2	2	2	2	7
Leal	3	3	4	4	2	12
Litchville	2	1	2	2	2	5
Nome	3	4	3	3	1	12
Oriska	2	2	2	2	1	7
Pillsbury	2	2	2	2	2	6
Rogers	3	3	3	3	2	10
Sanborn	4	4	4	3	1	14
Sibley	4	2	3	4	1	12
Valley City	3	2	3	4	2	10
Wimbledon	4	3	3	4	2	12

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

Seasonal Pattern	Spring, Fall, Winter
Duration	6 months
Speed of Onset	Slow

Capabilities of and Vulnerabilities to Jurisdictions

According to the 2014 NDMHMP, the risk to jurisdictions in Barnes County from shortage or outage of critical materials or infrastructure was ranked moderate based on the number of people affected. In the state plan, the rating of “moderate” is for populations of 9,001 to 16,000, based on the 2010 U.S. Census information. The 2010 U.S. Census population for Barnes County was 11,066.

Capabilities and vulnerabilities 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

Barnes County

Impact	3	<ul style="list-style-type: none"> • Long periods of time without power or water could lead to loss of life • Power outages cause complete shutting down of the city • Vulnerable individuals impacted from loss of electric and medical supplies • Reduced mobility • Economic impact if outage of utilities occurred and summer/recreation population left • Roads can become blocked, but not long enough to result in outages of infrastructure for emergency services or economy activity • Increased crime from looting
Frequency	4	<ul style="list-style-type: none"> • Momentary and Sustained outages occur multiple times each year • Approximately 115 sustained and 474 momentary outages between 2010 and May 2014 • Around 15 to 20 leaks occur each year to pipes but no total outages to jurisdictions has occurred
Likelihood	4	<ul style="list-style-type: none"> • County clears highways • State maintains I-94 • Generators installed for critical facilities and infrastructure for some areas • Cannot bury power lines due to terrain and unstable soil in certain areas • Geographical location in the county may impact the length of outage for each jurisdiction
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: Lack of grocery store and/or gas stations in many smaller jurisdictions • More vulnerable: One hospital in the county • More vulnerable: Vulnerable population relying on electricity to power oxygen tanks and other health needs • More vulnerable: Lack of buried power lines and plans to improve existing electric infrastructure • More vulnerable: Elderly population in remote areas due to lack of alternative housing options • More vulnerable: Long response times from emergency services • Less vulnerable: Locally grown food by residents • Less vulnerable: Barnes County Water Resource District • Less vulnerable: Lack of citizens on individual wells and presence of regional water systems
Capability	2	<ul style="list-style-type: none"> • Lacks technical, administrative and financial resources • Relies on regional, state, and other agencies for assistance • Does not have resources to accomplish projects independently • Active emergency management department with education and outreach available on the departments website

City of Dazey

Impact	3	<ul style="list-style-type: none"> • Long periods of time could lead to loss of life • Power outages-lasts very short • Senior population impacted from loss of electric and medical supplies • Reduced mobility • Limited drinking water, limited sanitary sewer • Costly to the city to take care of the issue
Frequency	2	<ul style="list-style-type: none"> • In 1997, lost power for 3 days • Intermittent, 2 to 3 times per month during the summer. One a month or so in the winter • Some blocked roads during winter months up to a day, couple times during the season
Likelihood	4	<ul style="list-style-type: none"> • Water service set up, when power goes out, turn off valves and allow rural water system to deliver water. Reduced pressure instead • Roads become blocked and are difficult to maintain. Local resident has tractor to clear roads. • Relies on highway department for N.D. Highway 1, city streets are on the last part of the list. • No backup power for lift station
Vulnerability	3	<ul style="list-style-type: none"> • One power connection from Otter Tail • No grocery • Some people grow local food supply • Long response time for ambulance, police. Fire department could have some mobility issues • No gas station
Capability	2	<ul style="list-style-type: none"> • Some equipment of local residents to remove snow, water, etc. • Resident has portable generator • Fire department has 4 portable generators • Small size of community: people willing to help out, come together

City of Fingal

Impact	3	<ul style="list-style-type: none"> • Long periods of time without power or water could lead to loss of life • Power outages loss of economy • Elderly individual impacted from loss of electric and medical supplies • Reduced mobility • Limited drinking water, limited-sanitary sewer • Costly to the city to take care of the issue, financial burden
Frequency	2	<ul style="list-style-type: none"> • Power outages-not long lasting, mostly momentary, up to 2 or 3 hours • More during the summer from thunderstorms and falling tree branches • Never an issue with water • Never any issues with food, people stock up
Likelihood	3	<ul style="list-style-type: none"> • County clears roads-does real well • Some residents has their own generator • City has portable generator • City has snow blower to clear roads

		<ul style="list-style-type: none"> • Clearing of street is done by local residents to a point • Burying of lines by Otter Tail, or stronger posts have reduced power outages • Loss of area needing electrical service increases reliability
Vulnerability	3	<ul style="list-style-type: none"> • No grocery • No gas station • Some people grow local food supply – few • Long response time for ambulance, police. Fire department could have some mobility issues • Elderly or young population and getting medication (vulnerable) • Some residents lack backup power supplies for heating purposes
Capability	1	<ul style="list-style-type: none"> • No real plans in place or financial tax base • Lack of manpower by the city and general public • No education programs or outreach • Limited financial capabilities • Active city council • Barnes Rural Water District

City of Kathryn

Impact	3	<ul style="list-style-type: none"> • Long periods of time without power or water could lead to loss of life • Power outages • Elderly individual impacted from loss of electric and medical supplies • Reduced mobility • Limited drinking water, limited septic system functionality-sanitary sewer • Costly to the city to take care of the issue
Frequency	2	<ul style="list-style-type: none"> • Power outages-not long lasting, mostly momentary, up to 2 or 3 hours • Never an issue with water • Never any issues with food, people stock up
Likelihood	2	<ul style="list-style-type: none"> • County clears roads-does real well • Some residents has their own generator • Clearing of street is done by local residents, county comes with plow if really needed • No improvements to power infrastructure planned, no burying of lines
Vulnerability	2	<ul style="list-style-type: none"> • No grocery • No gas station • Some people grow local food supply – few • Long response time for ambulance, police. Fire department could have some mobility issues • Elderly population and getting medication • Individual wells, not hooked up to Barnes Rural Water yet
Capability	2	<ul style="list-style-type: none"> • Some equipment of local residents to remove snow, water, etc. • County is good at clearing roads • Fire department has equipment • Small size of community: people willing to help out, come together

City of Leal

Impact	3	<ul style="list-style-type: none"> • Long periods of time without power or water could lead to loss of life • Power outages • Elderly individual impacted from loss of electric and medical supplies. • Reduced mobility • Limited drinking water, limited septic system functionality-sanitary sewer • Costly to the city to take care of the issue. • Lightning strike causes power outage
Frequency	3	<ul style="list-style-type: none"> • Some blocked roads during winter months up to a day, couple times during the season • Power outages-somewhat • Blocked access to town from trains on tracks-daily
Likelihood	4	<ul style="list-style-type: none"> • Roads become blocked to town from trains on tracks-daily • Snow drifts block roads in winter months • Some residents has their own generator • Clearing of street is hired out to a local resident
Vulnerability	4	<ul style="list-style-type: none"> • No grocery • No gas station • Some people grow local food supply – few • Long response time for ambulance, police. Fire department could have some mobility issues • Lack grade separated access to town from railroad
Capability	2	<ul style="list-style-type: none"> • Some equipment of local residents to remove snow, water, etc. • Fire department has equipment • Small size of community: people willing to help out, come together • First responder

City of Litchville

Impact	2	<ul style="list-style-type: none"> • Long periods of time could lead to loss of life • Power outages • Downed power lines • Senior population impacted from loss of electric and medical supplies • Reduced mobility • Limited drinking water, limited sanitary sewer
Frequency	1	<ul style="list-style-type: none"> • Some blocked roads during winter months up to a day, couple times during the season • Out of power for 22 hours in April 1997
Likelihood	2	<ul style="list-style-type: none"> • Roads become blocked -residents have equipment for clearance • Clearing of street is done by County • City has trash pump for backup if generators fail for sanitary sewer • City has two interconnections for power
Vulnerability	2	<ul style="list-style-type: none"> • No full-service grocery • Less vulnerable: Cenex Gas Station. Also sells basic groceries. • Some people grow local food supply – few

		<ul style="list-style-type: none"> • High senior population, school children • Long response time for ambulance, police. Fire department could have some mobility issues. • Local bar has pizza • City has two interconnections for power
Capability	2	<ul style="list-style-type: none"> • Some equipment of local residents to remove snow, water, etc. • Fire department has equipment for pumping water • Small size of community: people willing to help out, come together

City of Nome

Impact	3	<ul style="list-style-type: none"> • Long periods of time without power or water could lead to loss of life • Power outages • Elderly individuals impacted from loss of electric and medical supplies • Reduced mobility • Limited drinking water and functionality of sanitary sewer if power outages occurred
Frequency	4	<ul style="list-style-type: none"> • Power outages occur nearly every week • Outages last longer during winter months • Never an issue with water now that city is connected to Barnes Rural Water District • Ice storm in 1997 resulted in isolation of the community with the National Guard needing to be called in
Likelihood	3	<ul style="list-style-type: none"> • County clears roads and N.D. State Highway 32 • Some residents has their own generator • Clearing of streets is done by an area farmer who is hired by the city • No improvements to power infrastructure planned such as burying power lines • Power poles and wires of the power grid are outdated
Vulnerability	3	<ul style="list-style-type: none"> • No grocery • No gas station • Some residents grow local food supply • Long response time for ambulance, police • Fire department could have mobility issues from blocked roads • Low elderly population • Fire department has equipment • No longer individual wells • Water provided by Barnes Rural Water District • Area residents and city have equipment to clear roads and maintain infrastructure
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 • No active education or outreach programs • Lacks resources to accomplish projects independently

City of Oriska

Impact	2	<ul style="list-style-type: none"> • Long periods of time could lead to loss of life • Power outages-use to be frequent, not so much anymore • Senior population impacted from loss of electric and medical supplies • Reduced mobility • Limited drinking water, limited sanitary sewer • Costly to the city to take care of the issue
Frequency	2	<ul style="list-style-type: none"> • Some blocked roads during winter months up to a day, couple times during the season • In 1997, no power for 6 days to a week after snow/ice storm
Likelihood	2	<ul style="list-style-type: none"> • Roads become blocked and are difficult to maintain • Power outages-use to be frequent, not so much anymore • New power line, better connection
Vulnerability	2	<ul style="list-style-type: none"> • Better connection to Otter Tail • No grocery • No gas station • Some people grow local food supply - few • Long response time for ambulance, police. Fire department could have some mobility issues • No gas station
Capability	3	<ul style="list-style-type: none"> • Some equipment of local residents to remove snow, water, etc. • Fire department has equipment • Small size of community: people willing to help out, come together

City of Pillsbury

Impact	2	<ul style="list-style-type: none"> • Long periods of time could lead to loss of life • Power outages • Senior population impacted from loss of electric and medical supplies • Reduced mobility • Limited drinking water, limited sanitary sewer • Costly to the city to take care of the issue
Frequency	2	<ul style="list-style-type: none"> • Some blocked roads during winter months up to a day, couple times during the season • Power outages-somewhat
Likelihood	2	<ul style="list-style-type: none"> • Roads become blocked and are difficult to maintain-residents have equipment • Each resident has their own generator • Clearing of street is hired out to a local resident
Vulnerability	2	<ul style="list-style-type: none"> • No grocery • No gas station • Some people grow local food supply – few • High senior population • Long response time for ambulance, police. Fire department could have some mobility issues • Local bar has a restaurant and some food

Capability	2	<ul style="list-style-type: none"> • Some equipment of local residents to remove snow, water, etc. • Fire department has equipment • Small size of community: people willing to help out, come together
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City of Rogers

Impact	3	<ul style="list-style-type: none"> • Long periods of time could lead to loss of life • Power outages • Downed power lines • Senior population impacted from loss of electric and medical supplies • Reduced mobility • Limited drinking water • Loss of sanitary sewer from septic tanks from loss of power
Frequency	3	<ul style="list-style-type: none"> • Some blocked roads during winter months up to a day, couple times during the season • March of 1997-whole county was out for 3 days up to a week-out for 2 weeks in Rogers
Likelihood	3	<ul style="list-style-type: none"> • Roads become blocked -residents have equipment for clearance • Clearing of street is done by local resident
Vulnerability	3	<ul style="list-style-type: none"> • No full-service grocery or gas station • Some people grow local food supply – few • High senior population, children with families • Long response time for ambulance, police. Fire department could have some mobility issues
Capability	2	<ul style="list-style-type: none"> • Some equipment of local residents to remove snow, water, etc. • Fire department has equipment for pumping water • Small size of community: people willing to help out, come together

City of Sanborn

Impact	4	<ul style="list-style-type: none"> • Long periods of time without power or water could lead to loss of life • Power outages • Elderly individuals impacted from loss of electric and medical supplies • Reduced mobility • Limited drinking water and functionality of sanitary sewer if power outages occurred • Parking of trains on side track results in temporary isolation of the city
Frequency	2	<ul style="list-style-type: none"> • Power outages occur sparingly • Never an issue with water now that city is connected to Barnes Rural Water District • Ice storm in 1997 resulted in isolation of the community and loss of power for one week
Likelihood	4	<ul style="list-style-type: none"> • County clears county road and state clears Interstate 94 • City resident clear roads during winter months • No improvements to power infrastructure planned such as burying power lines

		<ul style="list-style-type: none"> • Increase in train traffic, which can block roadways, may increase isolation of community • Installation of new power poles through Sanborn lake
Vulnerability	3	<ul style="list-style-type: none"> • No grocery • Gas station • Some residents grow local food supply • Long response time for ambulance and police • Fire department could have mobility issues from blocked roads • High elderly population • High school-age population • Fire department has equipment for moving water • Residents no longer maintain individual wells for potable sources • Water provided by Barnes Rural Water District • Area residents and city lack equipment to clear roads and maintain infrastructure
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 • No active education or outreach programs • Lacks resources to accomplish projects independently

City of Sibley

Impact	4	<ul style="list-style-type: none"> • Long periods of time without power or water could lead to loss of life • Power outages cause complete shutting down of the city • Elderly individual impacted from loss of electric and medical supplies • Reduced mobility • Economic impact if outage of utilities occurred and summer/recreation population left
Frequency	2	<ul style="list-style-type: none"> • Power outages-not long lasting, mostly momentary, up to an hour • Power outages occurs 3 to 4 times per year • Never an issue with water
Likelihood	3	<ul style="list-style-type: none"> • County clears N.D. Highway 26 • Some residents has their own generator • Clearing of street is done by local residents and with city snow plow • No improvements to power infrastructure planned • Cannot bury power lines due to terrain and unstable soil
Vulnerability	4	<ul style="list-style-type: none"> • No grocery • No gas station • Some people grow local food supply – few • Long response time for local ambulance, police • Fire department could have some mobility issues • Elderly population and getting medication • Cannot bury power lines due to terrain and unstable soil • Summer and recreation population would overwhelm the city if sustain power outages or loss of water occurred
Capability	1	<ul style="list-style-type: none"> • Active city council

		<ul style="list-style-type: none"> • Limited tax base • Some financial capabilities for maintaining snow removal equipment • Designated evacuation routes with the County • Limited administrative and city staff • Lack of education or outreach programs
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City of Valley City

Impact	3	<ul style="list-style-type: none"> • Long periods of time without power or water could lead to loss of life • Power outages • Elderly individuals impacted from loss of electric and medical supplies • Reduced mobility from blocked • Limited drinking water and functionality of sanitary sewer if power outages occurred • Property damage from sewer backups due to loss of sanitary sewer • Loss of economy and economic activity
Frequency	2	<ul style="list-style-type: none"> • Major power outages occurs every couple of years but length is never longstanding • Water restrictions have been put into place in 2008 • Ice storm in 1997 resulted in little damage to the city
Likelihood	3	<ul style="list-style-type: none"> • County clears county road and state clears Interstate 94 • City resident clear roads during winter months • Municipal power system has limited resources as compared to a larger company and may increase length of outage • Increase in train traffic, which can block roadways, may increase isolation of community • Largely dependent on intensity of weather event in terms of blocked roads, outages of infrastructure and services • City does not have joint municipal agreements which increases independent nature of the system
Vulnerability	4	<ul style="list-style-type: none"> • Two grocery stores • Gas stations • Some residents grow local food supply • Long response time for ambulance and police • Emergency services can experience temporary mobility issues from blocked roads • High elderly population • High school-age population • Fire department has equipment for moving water • Senior housing and VCSU • Residents no longer maintain individual wells for potable sources • Area residents and city lack equipment to clear roads and maintain infrastructure • 12th Street and old Highway 10 experience issues with snow and blocked roads • City public works maintains street clearing staff and equipment • Topography of area allows for heavy accumulation of snow

		<ul style="list-style-type: none"> • City has a lot of vulnerable populations • Mercy hospital is located adjacent to the city with mechanical systems located in the basement • City buildings and infrastructure are all located in flood plain except the water treatment plant
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 • No active education or outreach programs • Lacks resources to accomplish projects independently • Public works moves critical equipment out of flood plain

City of Wimbledon

Impact	4	<ul style="list-style-type: none"> • Long periods of time without power or water could lead to loss of life • Power outages-biggest concern, lift stations could be incapacitated, water backup into homes, property damage, potential loss of life, sanitary sewer could back up into homes • Elderly individual impacted from loss of electric and medical supplies • Reduced mobility • Limited drinking water • Costly to the city to take care of the issue
Frequency	3	<ul style="list-style-type: none"> • Power outages-not long lasting, mostly momentary, up to 2 or 3 hours, 3 to 4 times a year • Never an issue with water • Never any issues with food, people stock up
Likelihood	3	<ul style="list-style-type: none"> • County clears roads-does real well • Some residents has their own generator • City has portable generator • Clearing of street is done by local residents as well • City has own maintainer • No improvements to power infrastructure planned, no burying of lines • Has gas station, has grocery
Vulnerability	4	<ul style="list-style-type: none"> • Some people grow local food supply – few • Long response time for ambulance, police, fire • Elderly population and getting medication • Trains blocking streets in town limiting mobility – lack of grade separated crossings • Water tower, back up tank of 10,000 gallons
Capability	2	<ul style="list-style-type: none"> • Some equipment of local residents to remove snow, water, etc. • County is good at clearing Highway 9 • Fire department has equipment • No evacuation plan, no financial

Vulnerabilities to County-Owned Buildings and Property

County-owned buildings and property are vulnerable to shortage or outage of critical materials and infrastructure as a result 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. Some buildings can become uninhabitable if an incident were to occur during winter months with extreme cold or summer months with windstorm. Structures are not vulnerable directly, but damage can result from occurrences of other hazards. Chapter 4 provides a summary of county and city owned property in Barnes 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. As populations increase, utility providers may have to add capacity at strategic points to provide service to a growing number of customers and upgrade other related infrastructure, such as power lines. The city of Barnes is the only jurisdiction in Barnes County with projected population increases through 2030. With an addition of roughly 31 residents by 2030, projected population growth should be manageable to avoid an overload of the electrical system and mitigate power outages.

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 Barnes County.

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

- Barnes County Emergency Operations Plan
- North Dakota Emergency Operations Plan, Shortage of Critical Materials Annex
- North Dakota Energy Emergency Response Plan Update, N.D. State Energy Office, 2013

5.11 Transportation Accident

Including Vehicle, Railway, Bus, 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 a large number of deaths and/or injuries that reach a magnitude that overtaxes the response abilities of local resources. In most disasters death and injury represent one of the hazard impacts, 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 Barnes County, even an incident involving a small number of deaths and/or injuries could overwhelm local resources.

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

Railroad: Passenger trains or cargo trains such as BNSF or CPR.

Bus: School bus transportation would be the most likely event. Tourist buses travel through Barnes County. No commercial service.

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

Transportation incidents occur with little or no warning. They involve a large number of 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 general public and hinder economic activity.

History on transportation accidents was provided by the N.D. Department of Transportation. A total of 1,581 accidents were recorded between 2009 and 2013 in Barnes County. Of the 1,581 crashes, 1,298 involved property damage only, 273 crashes involved injuries, and 10 involved fatalities. Damage to property and crops was not available in the data provided. The data did not include reports of transportation accidents involving aircraft, trains or other modes of transportation aside from automobiles. Details regarding recent transportation accidents are shown in Appendix 8.11.

According to the 2014 NDMHMP, in 2011, there were approximately 309 crashes in Barnes County resulting in 71 injuries, one fatality and approximately \$6,039,436 in injury costs.

Probability and Magnitude

According to the data provided by the N.D. Department of Transportation, 1,581 incidents of transportation accidents have occurred in Barnes County between 2009 and 2013, resulting in an average of 395 accidents per year, or a 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 Barnes County was low, 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 Barnes County. In Barnes County, the magnitude of transportation accidents can be classified as low frequency, high impact.

Risk Assessment

Table 5.11.1 shows the risk assessment as determined by individual jurisdictions and the planning committee. The risk assessment methodology can be found in 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 5.11.1 – Risk Assessment Summary Transportation Accident Scored Chart

Transportation Accident	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Barnes County	4	3	4	3	2	12
Dazey	3	2	3	2	2	8
Fingal	4	3	4	4	1	14
Kathryn	1	2	2	2	1	6
Leal	4	2	3	4	2	11
Litchville	1	1	1	2	3	2
Nome	2	2	3	3	2	8
Oriska	4	2	3	3	2	10
Pillsbury	4	2	3	3	1	11
Rogers	3	2	4	4	1	12
Sanborn	4	2	4	4	1	13
Sibley	3	2	2	3	1	9
Valley City	4	4	4	4	1	13
Wimbledon	4	3	4	4	2	13

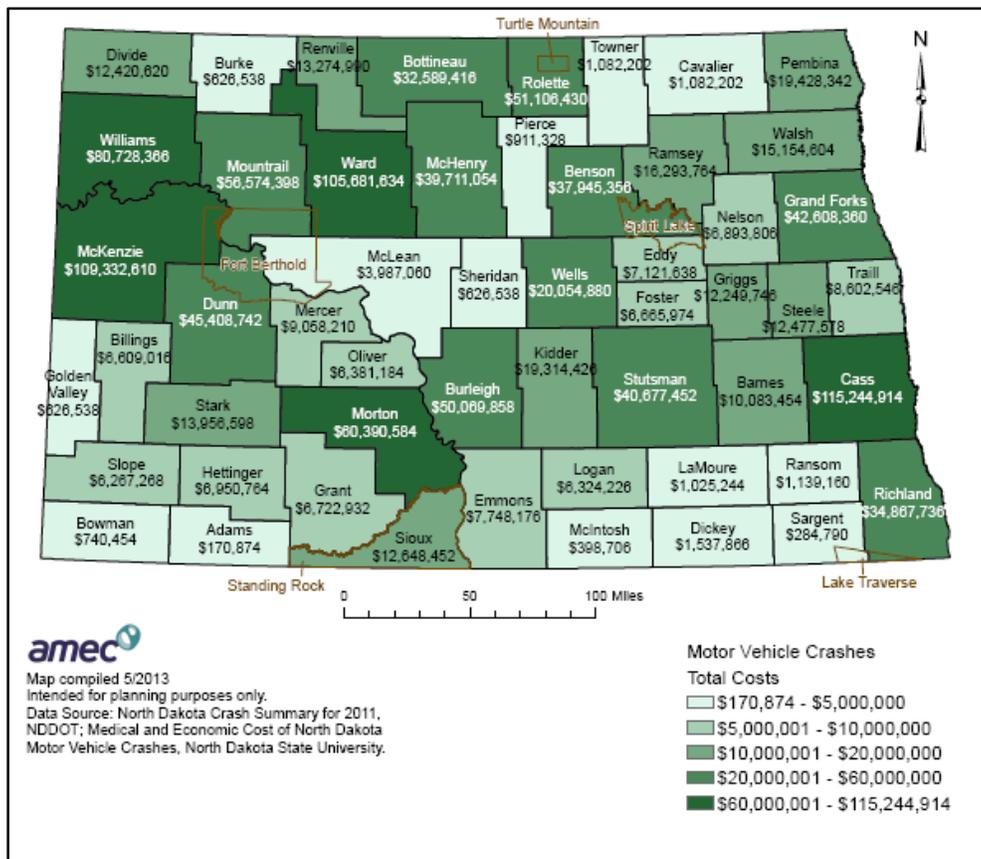
(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Seasonal Pattern	None
Duration	Hours to 2 weeks
Speed of Onset	No warning

Mapping

Figure 5.11.1 illustrates the 2011 motor vehicle crashes by county in North Dakota. Barnes County reported approximately \$10,083,454 in costs associated with vehicle crashes.

Figure 5.11.1 – 2011 Motor Vehicle Crashes Costs per North Dakota County



Source: North Dakota Department of Emergency Services

Capabilities of and Vulnerabilities to Jurisdictions

Most jurisdictions in the east and north portions of the county scored transportation accident above 10 which is reflective of the increase in truck and train traffic due to economic activity. Capabilities and vulnerabilities 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.

Barnes County

Impact	2	<ul style="list-style-type: none"> • Potential for loss of life and economic activity • Strain on local resources due to the limited number of ambulances and first responders • Release of hazardous material can occur if an accident involves a truck, plane, train or farm equipment
Frequency	4	<ul style="list-style-type: none"> • Frequency of transportation accidents is high due to the presence of Interstate highway and numerous state highways • Plane crashes are occasional occurrences due to farmers using planes for crop dusting
Likelihood	4	<ul style="list-style-type: none"> • Transportation accidents are highly likely in the future due to an increase in chemicals being used in the agriculture sector and increased traffic on county highways • More economic activity from rapid growth throughout the state and spillover from oil activity in the west
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: Response times for emergency services are prolonged due to rural nature of the county • More vulnerable: Lack of road signage for navigation of roads by emergency services
Capability	2	<ul style="list-style-type: none"> • Active county commission • Contract for engineering, planning, and grant writing. • GIS services provided by the state • Relies on regional, state and other agencies for emergency assistance • County-wide mutual aid agreement • Active emergency management department with education and outreach available on the department’s website • Maintains capital improvements project list and project funding sources

City of Dazey

Impact	3	<ul style="list-style-type: none"> • Loss of life, injury, loss of economy • Highway 1 can become blocked limiting access • Loss of property such as cars, trucks, etc. • Result in HAZMAT
Frequency	2	<ul style="list-style-type: none"> • Nothing major in the area in recent years • ATV accidents in the country side, fire dept. responded
Likelihood	3	<ul style="list-style-type: none"> • Increase in truck traffic on Highway 1 • Recreational vehicles are used
Vulnerability	2	<ul style="list-style-type: none"> • No railroad, no airport • Farmer has private landing strip • No local ambulance, response times from Barnes County prolonged.

		<ul style="list-style-type: none"> • No local police • Hospitals and medical clinics are far away • Senior population doesn't drive too much. Some still do. • Highway does not enter city limits
Capability	2	<ul style="list-style-type: none"> • No clinic • Quick response unit, fire department has equipment • People have large trucks, tractors, equipment-farmers mostly

City of Fingal

Impact	4	<ul style="list-style-type: none"> • Loss of life, injury, loss of economy • Loss of property such as cars, trucks, etc. • Result in HAZMAT • Result in fires of buildings and equipment and vehicles • Explosions from oil trains
Frequency	3	<ul style="list-style-type: none"> • Nothing major in the area in recent years • 10 years ago, heavy fog caused a motorist to hit a train on Highway 32
Likelihood	4	<ul style="list-style-type: none"> • Frequently patrolled by county sheriff - decreases speeding & likelihood • Truck route • Heavy smoke from controlled burning reduces visibility • Increase in oil train traffic • Increase in truck traffic on Highway 32 • Layout of entrances into town with bad visibility and signage
Vulnerability	4	<ul style="list-style-type: none"> • No airport • No local ambulance, response times from Barnes County prolonged • No local police • Sheriff is good at patrolling county 32 • Hospitals and medical clinics are far away • Lack of paved streets-soggy roads, pot holes • Vulnerable populations • Increase in truck and train traffic on rail line and highway 32 • Layout of streets off main street and railroad confusing and may cause a few accidents
Capability	1	<ul style="list-style-type: none"> • First responder & EMT • Fire hall, community hall • Small tax base • Active city council • No real plans in place or financial tax base • Lack of manpower by the city and general public • No education programs or outreach • Limited financial capabilities • Active city council • Barnes Rural Water District

City of Kathryn

Impact	1	<ul style="list-style-type: none"> • Loss of life, injury, loss of economy • Loss of property such as cars, trucks, etc. • Result in HAZMAT • Result in fires of buildings and equipment and vehicles
Frequency	2	<ul style="list-style-type: none"> • Nothing major in the area in recent years • Motorcycles accident on the highway on the 4th of July on gravel road south of town-2014
Likelihood	2	<ul style="list-style-type: none"> • Frequently patrolled by county sheriff - decreases speeding & likelihood • Signs prohibiting truck from traveling on city streets other than county road
Vulnerability	2	<ul style="list-style-type: none"> • No airport • No local ambulance, response times from Barnes County prolonged • No local police • Sheriff is good at patrolling county 21 • Hospitals and medical clinics are far away • Lack of paved streets-soggy roads, pot holes • Elderly population • Lack of street signage, cross walks, sidewalks
Capability	1	<ul style="list-style-type: none"> • No clinic or local ambulance • No medical supplies in stock • People have large trucks, tractors, equipment-farmers mostly • Cell phones for immediate calls for help • First responder & EMT • Fire hall has truck for fire suppression and assistance in accidents

City of Leal

Impact	4	<ul style="list-style-type: none"> • Loss of life, injury, loss of economy • Loss of property such as cars, trucks, etc. • Result in HAZMAT • Result in fires of buildings and equipment and vehicles • Explosions from oil cars – mass casualties • Loss of wildlife habitat
Frequency	2	<ul style="list-style-type: none"> • Nothing major in the area in recent years • Derailments of train east of town-resulted in a fatality. In 1990s
Likelihood	3	<ul style="list-style-type: none"> • Increased oil train traffic • Stalling of trains on tracks • Trains are stopped on a daily basis • Arms installed in 1980s • Lack of stop lights, stop signs. Yield signs out on Highway 9.
Vulnerability	4	<ul style="list-style-type: none"> • No airport • No local ambulance, response times from Barnes County prolonged • No local police • Hospitals and medical clinics are far away • Lack of paved streets-soggy roads, pot holes

		<ul style="list-style-type: none"> • Barnes County North-students can be reckless, careless. School lets out at 3:30 pm. • Lack of grade separated crossing with railroad and highway
Capability	2	<ul style="list-style-type: none"> • No clinic or local ambulance • No medical supplies in stock • People have large trucks, tractors, equipment-farmers mostly • Cell phones for immediate calls for help • First responder

City of Litchville

Impact	1	<ul style="list-style-type: none"> • Loss of life, injury, loss of economy • Loss of property such as cars, trucks, etc. • Result in HAZMAT • Result in fires of buildings and equipment and vehicles • Blocked roads
Frequency	1	<ul style="list-style-type: none"> • Nothing major in the area in recent years
Likelihood	1	<ul style="list-style-type: none"> • City not located on major highway • Not many drivers, old population and young • Little traffic-small town
Vulnerability	2	<ul style="list-style-type: none"> • No airport • No local ambulance, response times from Barnes County prolonged • No local police • First responders (8) • Hospitals and medical clinics are far away • Senior population does not drive much • Lack of paved streets-soggy roads, pot holes • Not located on railroad
Capability	3	<ul style="list-style-type: none"> • No clinic or local ambulance • Medical supplies and AED, limited with first responders • People have large trucks, tractors, equipment-farmers mostly • Cell phones for immediate calls for help

City of Nome

Impact	2	<ul style="list-style-type: none"> • Loss of life and injury • Loss of economy • Loss of property such as cars and trucks • Can result in HAZMAT • Can result in fires of buildings, equipment and vehicles
Frequency	2	<ul style="list-style-type: none"> • No major accidents in the area in recent years • One accident occurred in 2008 where a driver fell asleep and rolled his vehicle
Likelihood	3	<ul style="list-style-type: none"> • Speeding traffic through the city • High truck and auto traffic through the city on N.D. Highway 32 • Lack of enforcement by County Sheriff on N.D. Highway 32

Vulnerability	3	<ul style="list-style-type: none"> • No airport • No local ambulance with response times from Barnes County prolonged • No local police • Lack of enforcement by County Sheriff for speeding traffic • Hospitals and medical clinics are far away • Lack of paved streets results in soggy roads and potential accidents • Low elderly population • Lack of street signage, crosswalks, sidewalks • No medical supplies in stock • Fire hall has truck for fire suppression and assistance in accidents
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 • No active education or outreach programs • Lacks resources to accomplish projects independently • Has adopted state building codes

City of Oriska

Impact	4	<ul style="list-style-type: none"> • Loss of life, injury, loss of economy • Loss of property such as cars, trucks, etc. • Result in HAZMAT • Result in fires of buildings and equipment and vehicles
Frequency	2	<ul style="list-style-type: none"> • Nothing major in the area in recent years
Likelihood	3	<ul style="list-style-type: none"> • Increase in truck traffic on 94 • Increased oil train traffic
Vulnerability	3	<ul style="list-style-type: none"> • No airport • Farmer 8 miles north of town has private landing strip • No local ambulance, response times from Barnes County prolonged • No local police • Hospitals and medical clinics are far away • Senior population does drive well • Lack of grade separated crossings from Railroad • Lack of paved streets-soggy roads, pot holes
Capability	2	<ul style="list-style-type: none"> • No clinic or local ambulance • People have large trucks, tractors, equipment-farmers mostly • Cell phones for immediate calls for help •

City of Pillsbury

Impact	4	<ul style="list-style-type: none"> • Loss of life, injury, loss of economy • Loss of property such as cars, trucks, etc. • Result in HAZMAT • Result in fires of buildings and equipment and vehicles • Explosions from oil cars – mass casualties
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Frequency	2	<ul style="list-style-type: none"> • Nothing major in the area in recent years • People were hit in the past, but arms installed in 1980s • Derailments with trains-smaller with a few RR cars
Likelihood	3	<ul style="list-style-type: none"> • Increased oil train traffic • Trains are stopped for days at a time to allow passing • Possible closing of second cross may limit access
Vulnerability	3	<ul style="list-style-type: none"> • No airport. • No local ambulance, response times from Barnes County prolonged • No local police • Hospitals and medical clinics are far away • Senior population does drive well • Lack of paved streets-soggy roads, pot holes
Capability	1	<ul style="list-style-type: none"> • No clinic or local ambulance • Medical supplies in stock • People have large trucks, tractors, equipment-farmers mostly • Cell phones for immediate calls for help

City of Rogers

Impact	3	<ul style="list-style-type: none"> • Loss of life, injury, loss of economy • Loss of property such as cars, trucks, etc. • Result in HAZMAT • Result in fires of buildings and equipment and vehicles • Blocked roads • Benson and Quinn could lose functionality for a period of time • Explosions from oil trains
Frequency	2	<ul style="list-style-type: none"> • Nothing major in the area in recent years
Likelihood	4	<ul style="list-style-type: none"> • City not located on major highway, but located on State Highway • Lots of truck traffic, lots of anhydrous being transported • Lots of potatoes being hauled to Cavendish, lots of traffic • Little traffic-small town • Oil trains going through the area. Also propane and other chemicals. • Lack of armed crossings
Vulnerability	4	<ul style="list-style-type: none"> • No airport • No local ambulance, response times from Barnes County prolonged • No local police • Hospitals and medical clinics are far away • Senior population does drive • Lack of paved streets-soggy roads, pot holes • Railroad without armed crossings
Capability	1	<ul style="list-style-type: none"> • No clinic or local ambulance • No Medical supplies and AED, No first responders • People have large trucks, tractors, equipment-farmers mostly • Cell phones for immediate calls for help

City of Sanborn

Impact	4	<ul style="list-style-type: none"> • Loss of life and injury • Loss of economy • Loss of property such as cars and trucks • Can result in HAZMAT • Can result in fires of buildings, equipment and vehicles • Results in temporary isolation of the community from blocked roads • Increases response times for emergency services from blocked roads and may result in death of area resident
Frequency	2	<ul style="list-style-type: none"> • No major accidents in the area in recent years • Small-to-moderate traffic accident occurring roughly once per year at intersection of county roads 11 and 22
Likelihood	4	<ul style="list-style-type: none"> • Speeding traffic through the city on county roads • Closing of elevator drastically reduced truck traffic through city limits • Adequate enforcement by County Sheriff on county roads • Closing of elevator resulted in side track now being used by trains carrying oil and chemicals, which can be parked illegally for several hours at a time
Vulnerability	4	<ul style="list-style-type: none"> • No airport • No local ambulance with response times from Barnes County prolonged • No local police • Adequate enforcement by County Sheriff on county roads • Hospitals and medical clinics are far away • Lack of paved streets results in soggy roads and potential accidents • High elderly population • High school-age population results in high risk for pedestrian accident • Lack of ordinances restricting use of recreational vehicles in city limits • Lack of crosswalks and sidewalks • Adequate street signage recently improved resulting in better awareness of traffic in city limits • Medical supplies in stock at fire hall and at homes of first responders • Fire hall has truck for fire suppression and assistance in accidents • Closing of elevator resulted in side track now being used by trains carrying oil and chemicals, which can be parked illegally for several hours at a time
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 • No active education or outreach programs • Lacks resources to accomplish projects independently • Has adopted state building codes but lacks enforcement

City of Sibley

Impact	3	<ul style="list-style-type: none"> • Loss of life, injury, loss of economy • Loss of property such as cars, trucks, etc. • Result in HAZMAT • Result in fires of buildings and equipment and vehicles • Potential boating accidents on Lake Ashtabula
Frequency	2	<ul style="list-style-type: none"> • No major car, truck or train accidents • No boating, jet skis or watercraft accidents
Likelihood	2	<ul style="list-style-type: none"> • Frequently patrolled by county sheriff - decreases speeding & likelihood • Signs prohibiting trucks from traveling on city streets • Local signs by residents for reduced speeds to avoid pedestrian accidents • Construction of new highway bridge carrying N.D. Highway 26 over Lake Ashtabula is higher and wider and therefore reduces the potential for boating accidents
Vulnerability	3	<ul style="list-style-type: none"> • No airport • No local ambulance, response times from Barnes County prolonged • No local police • Sheriff is good at patrolling N.D. Highway 26 • Hospitals and medical clinics are far away • Lack of paved streets-soggy roads, pot holes • Elderly population and retirees • Lack of street signage, cross walks, sidewalks • Higher than average amount of boats and watercraft are vulnerable to accidents on Lake Ashtabula • High concentration of people during the summer hauling cargo, boats
Capability		<ul style="list-style-type: none"> • Active city council • Limited tax base • Some financial capabilities for maintaining snow removal equipment • Designated evacuation routes with the County • Limited administrative and city staff • Lack of education or outreach programs

City of Valley City

Impact	4	<ul style="list-style-type: none"> • Loss of life and injury • Loss of economy • Loss of property such as cars and trucks • Can result in HAZMAT • Can result in fires of buildings, equipment and vehicles • Results in temporary isolation of the community from blocked roads • Increases response times for emergency services from blocked roads and may result in death of area resident • Business interruptions
Frequency	4	<ul style="list-style-type: none"> • No major accidents involving trains or trucks in the area in recent years • Small-to-moderate traffic accident occurring roughly • Casualty as air show in 2012

		<ul style="list-style-type: none"> • Pedestrian death in 2014 • Collision of semi-trucks on Interstate 94 in 2014
Likelihood	4	<ul style="list-style-type: none"> • Adequate enforcement by city police department • Increased in train traffic carrying oil and other shipments • Increase in traffic on Interstate 94 • City located at the junction of two railroad lines increases likelihood
Vulnerability	4	<p>Airport</p> <ul style="list-style-type: none"> • No local ambulance with response times from Barnes County prolonged • No local police • Adequate enforcement by County Sheriff on county roads • Hospitals and medical clinics are far away • Lack of paved streets results in soggy roads and potential accidents • High elderly population • High school-age population results in high risk for pedestrian accident • Lack of ordinances restricting use of recreational vehicles in city limits • Adequate crosswalks, sidewalks and stop lights regulate traffic movements and speeds • Adequate street signage recently improved resulting in better awareness of traffic in city limits • Medical supplies in stock at fire hall and at homes of first responders • Fire hall has truck for fire suppression and assistance in accidents • National Guard is headquartered in the city • Increased in train traffic carrying oil and other shipments • Increase in traffic on Interstate 94 • City located at the junction of two railroad lines increases likelihood • Landing path for planes at the airport is located directly over 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 • No active education or outreach programs • Lacks resources to accomplish projects independently

City of Wimbledon

Impact	4	<ul style="list-style-type: none"> • Loss of life, injury, loss of economy • Loss of property such as cars, trucks, etc. • Result in HAZMAT • Result in fires of buildings and equipment and vehicles • Could have explosion from oil train, derailments, etc. • People could be killed with collisions
Frequency	3	<ul style="list-style-type: none"> • Nothing major in the area in recent years • Last summer, 3 motorcycles and a pickup crashed • Lost lift last year-alcohol related
Likelihood	4	<ul style="list-style-type: none"> • Frequently patrolled by county sheriff - decreases speeding & likelihood, depends on election year or not • Gravel roads, unpaved streets, heavy traffic • Dust from truck traffic lingers, reduces visibility

		<ul style="list-style-type: none"> • Train line through the city • Oil trains
Vulnerability	4	<ul style="list-style-type: none"> • No airport • No local ambulance, response times from Barnes County prolonged • No local police • Sheriff is good at patrolling county 9 • Hospitals and medical clinics are far away • Lack of paved streets-soggy roads, pot holes • Elderly population • Lack of street signage, cross walks, sidewalks • Speeding on highway 9 through town, curve reduces visibility
Capability	2	<ul style="list-style-type: none"> • No clinic or local ambulance • First responders have supplies, but no stockpile • People have large trucks, tractors, equipment-farmers mostly • Cell phones for immediate calls for help-better communication • No evacuation plans, financial backup • Fire department is certified extraction

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 Barnes 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.

- Barnes County Emergency Operations Plan
- North Dakota Emergency Operations Plan, Transportation Annex
- TransAction II, North Dakota's Statewide Strategic Transportation Plan
- North Dakota Highway Safety Plan

5.12 Urban Fire/Structure Collapse

Including 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 Barnes 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 fire/structure collapse can happen independently from other types of incidents.

History

History on urban fire/structure collapse incidents was provided by the Valley City Fire Department, Valley City Rural Fire Department, and the National Fire Incident Reporting System (NFIRS) and the previously FEMA-approved Barnes County Mitigation Plan. Approximately 249 urban fire/structure collapse occurrences were recorded between January 1, 2010 and August 2014 in the city of Valley City. On average, seven minor injuries occur each year. In rural areas surrounding Valley City 89 calls for service for the Valley City Rural Fire Department were reported. Table 5.12.1 summarizes urban fire/structure collapse data provided by the city and rural fire departments in Valley City. See Appendix 8.12 for an expanded version of the data along with information from the previously-approved FEMA MHMP for Barnes County.

Table 5.12.1 – January 1, 2010 to August 2014 Valley City Urban Fire/Structure Collapse Summary

Urban Fire/Structure Collapse					
Number of Calls	Date Range	Injuries	Fatalities	Property Damage	Crop Damage
249	January 1, 2010 to May 2014	NA	NA	NA	NA
Rural Fire Incidents					
Number of Calls	Date Range	Injuries	Fatalities	Property Damage	Crop Damage
89	January 1, 2010 to May 2014	NA	NA	NA	NA

Source: Valley City Fire Department, Valley City Rural Fire Department

Detailed information on history of fire calls and incidents from the fire districts/departments in Barnes County outside Valley City was not available. 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, 2002, through December 31, 2013. This information is used to help better understand the risk of urban fire/structure collapse in Barnes County outside Valley City. The N.D. State Fire Marshal's office started reporting with the NFIRS system in the end of 2001. It was not implemented until January of 2002. Fire departments and districts based in Barnes County reported a total of 147 structure fires, 104 vehicle fires and 188 "other" or unclassified fires. The Valley City Fire Department recorded the most structure fires with 93, followed by the Fingal Fire Protection District with 12. The Valley City Rural Fire Department recorded the most vehicle fires with 35, followed by the Valley City Fire Department with 33, and the Sanborn Fire Protection District with eight. The Valley City Rural Fire Department recorded the most "other" or unclassified fires with 113, followed by the Fingal Fire Protection District with 22, the Valley City Fire Department with 18, and the Wimbledon Fire Protection District with 14. NFIRS reports by fire department responding, not by location of the incident. Fire departments from neighboring counties have coverage over parts of Barnes County. Total number of fires reported may be more than what actually occurred in the county. As such, data from NFIRS was excluded from Table 5.12.1 to avoid skewing of data history and is shown for supportive purposes of the continued need for investment of funding into fire departments and districts in the county.

Table 5.12.2 – 2002 to 2013 Barnes County Fire Summary by Fire Department/District

Fire Protection Agency	Frequency 2002-2013			
	Structure Fire	Vehicle Fires	Other Fires	Totals
Dazey Fire Protection District	0	6	11	17
Edna Rural Fire Department	0	0	0	0
Fingal Fire Protection District	12	2	22	35
Hastings Rural Fire Department	1	0	0	1
Kathryn Fire Protection District	0	0	0	0
Litchville Fire Department	0	0	0	0
Litchville Rural Fire Department	1	2	1	2
Nome Fire Protection District	1	1	0	2
Oriska Fire Department	0	0	0	0
Rogers Fire Department	1	2	0	3
Sanborn Fire Department	1	1	2	4
Sanborn Fire Protection District	4	8	6	18
Sibley Fire Department	0	1	1	2
Valley City Fire Department	93	33	18	144
Valley City Rural Fire Department	29	45	113	187
Wimbledon Fire Protection District	4	3	14	21
Totals	147	104	188	436

Source: National Fire Incident Reporting System Summary By Incident Type. 01/01/2002 to 12/31/2013

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

Probability and Magnitude

Data provided by the Valley City Fire Department and Valley City Rural Fire Department documents 289 calls for urban fire/structure collapses and 89 calls for rural fires occurring between January 1, 2010 and August 2014. According to data provided by NFIRS, a total of 147 structure fires, 104 vehicle fires and 188 other fires occurred between 2002 and 2013, resulting in a probability of 100 percent.

In terms of magnitude, smaller and less severe fires are typical. The Valley City Fire and Rural Fire Departments did not report any fatalities, but did state that on average approximately seven minor injuries occur each year. The probability of fires fluctuates by season, local weather patterns, and traffic conditions among other variables. The chances of structure fire increases during winter months as people use electric heaters and other alternative sources for heating homes. Fires from vehicles and transportation accidents can occur at any point in time during the year.

According to the 2014 NDMHMP, Barnes County had a moderate urban fire or structure collapse vulnerability rating based on housing density per square mile, which was 3.82. The only cities that have adopted the building codes are Fingal, Kathryn, Leak, Nome, Oriska, Sanborn and Valley City.

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 in 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 5.12.3 – Risk Assessment Summary Urban fire/structure collapse Scored Chart

Urban Fire/Structure Collapse	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Barnes County	2	3	3	3	2	11
Dazey	3	2	2	3	2	8
Fingal	3	3	3	4	1	12
Kathryn	2	2	3	3	2	8
Leal	2	2	2	3	1	8
Litchville	1	1	2	3	2	5
Nome	3	2	3	3	2	9
Oriska	2	3	3	3	1	10
Pillsbury	2	2	2	2	1	7
Rogers	3	2	2	3	1	9
Sanborn	2	2	3	4	3	8
Sibley	3	2	4	3	1	11
Valley City	4	3	3	3	2	11
Wimbledon	4	2	3	3	3	9

(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 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.

Barnes County

Impact	2	<ul style="list-style-type: none"> • Loss of property, vehicles, personal possessions • Loss of economy • Loss of critical facilities and infrastructure • Loss of equipment and structures • Potential loss of life
Frequency	3	<ul style="list-style-type: none"> • Approximately 680 reports between 2004 and 2009 resulting in 97 annual incidents
Likelihood	3	<ul style="list-style-type: none"> • Vegetation can become dry from drought and cause a building fire • Always a possibility • Higher probability due to increase of electronic devices and alternative heat sources • Approximately 100 percent probability based on previous occurrences • Numerous older residences in jurisdictions • Human error in manufacturing and engineering of materials used in building and construction
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: Diversion of fire suppression resources for other hazards • More vulnerable: Lack of building codes in small jurisdictions • Less vulnerable: Collapsed structure team based in Fargo can respond to events in the county • Lack of water tower or holding tank in some of the smaller communities • Distance from neighboring fire departments can lead to more issues, bigger impact, etc. • Less vulnerable: Educated fire departments
Capability	2	<ul style="list-style-type: none"> • Active county commission • Fire department and districts with equipment and personnel • Relies on county, regional, state and other agencies for assistance as fire department only has one full-time staff member • Fire departments conduct education and outreach to school and the general public • Some jurisdictions have adopted state building codes, but lack enforcement except for Valley City • Natural Guard is located in the county

City of Dazey

Impact	3	<ul style="list-style-type: none"> • Loss of life, property, vehicles, personal possessions • Loss of economy • Lose community asset/buildings
Frequency	2	<ul style="list-style-type: none"> • No real incident in recent years • House on fire early 1990s • Responded to tractor fire in Sibley, week of June 2, 2014
Likelihood	2	<ul style="list-style-type: none"> • Presence of abandoned buildings and absentee owners, deteriorating, more susceptible to fire
Vulnerability	3	<ul style="list-style-type: none"> • Senior population, day care.

		<ul style="list-style-type: none"> Abandoned properties are vulnerable areas. Around 7 properties/buildings. Chemically dependent/mentally unstable individual Lack of alternative housing
Capability	2	<ul style="list-style-type: none"> Fire department, fire hall, 4 fire trucks in town Underground storage tank for backup water for fire suppression Lack of building codes and enforcement 6 dedicated personnel for fire department

City of Fingal

Impact	3	<ul style="list-style-type: none"> Loss of life, property, vehicles, personal possessions Loss of economy Lose community asset/buildings
Frequency	3	<ul style="list-style-type: none"> No real incidents Dome/Trailer house burned down spring 2014 Single-family home abandoned experienced fire damage in 2007
Likelihood	3	<ul style="list-style-type: none"> Abandoned buildings, not well kept Vegetation can become dry from drought and cause a building to fire, mostly down on large lot with debris Existing hydrants, but are not maintained by Barnes Rural Water Outdated electrical in homes Wood burners used in some residences
Vulnerability	4	<ul style="list-style-type: none"> Lack of alternative housing-residents will take them in however. No more CRP near the city except for SW part of the city Connected to Rural Water Distance from neighboring fire departments can lead to more issues, bigger impact, etc. Small size of town and spacing of residential structures reduces risk, however buildings on main street are close together and hazardous Abandoned buildings, not well kept Bradley house on northwest corner of town is vulnerable from being abandoned Existence of hydrants does not lower vulnerable due to poor water pressure
Capability	1	<ul style="list-style-type: none"> Fire department with truck and equipment Adopted state building codes First responder & EMT Mutual aid with county Small tax base Active city council No real plans in place or financial tax base Lack of manpower by the city and general public No education programs or outreach Limited financial capabilities Active city council

City of Kathryn

Impact	2	<ul style="list-style-type: none"> • Loss of life, property, vehicles, personal possessions • Loss of economy • Lose community asset/buildings
Frequency	2	<ul style="list-style-type: none"> • No real incidents • Chimney fire on a house in 2012
Likelihood	3	<ul style="list-style-type: none"> • Abandoned buildings, not well kept • Vegetation can become dry from drought and cause a building to fire, mostly down on large lot with debris • Installation of hydrants lowers vulnerability
Vulnerability	3	<ul style="list-style-type: none"> • Lack of alternative housing-residents will take them in however. • No more CRP near the city • Several water supplies for backup until Rural Water comes in • Distance from neighboring fire departments can lead to more issues, bigger impact, etc. • Small size of town and spacing of residential structures reduces risk, however buildings on main street are close together and hazardous • Abandoned buildings, not well kept
Capability	2	<ul style="list-style-type: none"> • Fire department with truck and equipment • Adopted state building codes • First responder & EMT • Mutual aid with Nome and Litchville, Fingal, Fort Ransom

City of Leal

Impact	2	<ul style="list-style-type: none"> • Loss of life, property, vehicles, personal possessions • Loss of economy • Lose community asset/buildings
Frequency	2	<ul style="list-style-type: none"> • No recent fires in memory • Intentional removal of abandoned buildings by use of fire by residents
Likelihood	2	<ul style="list-style-type: none"> • Intentional removal of abandoned buildings by use of fire by residents • Mowing of lawns keeps vegetation calm
Vulnerability	3	<ul style="list-style-type: none"> • Elderly individual, two kids • Lack of alternative housing-residents will take them in however • No more CRP near the city • No back up water supply • Distance from neighboring fire departments can lead to more issues, bigger impact, etc. • Small size of town and spacing of structures reduces risk • Mowing of lawns keeps vegetation calm • Intentional removal of abandoned buildings by use of fire by residents • Removal of abandoned vehicles
Capability	1	<ul style="list-style-type: none"> • Fire department with truck and equipment • No building codes • First responder

City of Litchville

Impact	1	<ul style="list-style-type: none"> • Loss of life, property, vehicles, personal possessions • Loss of economy • Lose community asset/buildings
Frequency	1	<ul style="list-style-type: none"> • No recent fires in memory
Likelihood	2	<ul style="list-style-type: none"> • Presence of abandoned buildings and absentee owners, deteriorating, more susceptible to fire • Old electrical wiring of homes-people shouldn't be living there
Vulnerability	3	<ul style="list-style-type: none"> • Senior population, children at school • Abandoned properties are vulnerable areas, vehicles • Lack of alternative housing-residents will take them in however • Good communication with fire department for alerting of an incident • Back up water supply of 50,000 gallons
Capability	2	<ul style="list-style-type: none"> • Fire department with truck and equipment • No building codes

City of Nome

Impact	3	<ul style="list-style-type: none"> • Loss of life, property, vehicles, personal possessions • Loss of economy • Loss of community asset/buildings • Loss of multiple structures
Frequency	2	<ul style="list-style-type: none"> • No real incidents or large structure fires • Smaller fires in recent years resulting in loss of garages and sheds
Likelihood	3	<ul style="list-style-type: none"> • Abandoned buildings are not well kept • Vegetation can become dry from drought and cause a building fire • City mows and maintains vegetation on city lots • Lack of ability to pump water from city hydrants • Lack of water tower and storage to feed pressure to pump water • High water table and moisture in the soil • Approximation of houses to each other could lead to loss of multiple structures • Age of structures and wiring is out of date and may increase likelihood of an incident
Vulnerability	3	<ul style="list-style-type: none"> • Lack of alternative housing for displaced residents • No more CRP near the city • Tall grass around city limits could ignite a structure • Distance from neighboring fire departments can lead to more issues and prolonged response times • Small size of town and spacing of residential structures reduces risk, however buildings on main street are close together and hazardous • Abandoned buildings are not well kept • Lack of water storage or pressure vessel to increase pressure for fire suppression • Fire department has trucks and equipment • First responder located south of town

		<ul style="list-style-type: none"> • Fire hall has truck for fire suppression and assistance in incidences • Adopted state building codes
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 • No active education or outreach programs • Lacks resources to accomplish projects independently • Has adopted state building codes • First responder located south of town

City of Oriska

Impact	2	<ul style="list-style-type: none"> • Loss of life, property, vehicles, personal possessions • Loss of economy • Lose community asset/buildings
Frequency	3	<ul style="list-style-type: none"> • Lost a shop in late February/early March 2014 from a fire • 2011 the Zion church burned down from electrical problem
Likelihood	3	<ul style="list-style-type: none"> • Presence of abandoned buildings and absentee owners, deteriorating, more susceptible to fire • Overgrown grass could ignite structures • Old electrical wiring, no inspector
Vulnerability	3	<ul style="list-style-type: none"> • Senior population, school children • Abandoned properties are vulnerable areas, vehicles • Lack of alternative housing • Lots of older homes-older wiring, dated building materials and structure • Limited communication with fire department for alerting of an incident
Capability	1	<ul style="list-style-type: none"> • Fire department, fire hall and truck • Have building codes but no enforcement

City of Pillsbury

Impact	2	<ul style="list-style-type: none"> • Loss of life, property, vehicles, personal possessions • Loss of economy • Lose community asset/buildings
Frequency	2	<ul style="list-style-type: none"> • No recent fires in memory
Likelihood	2	<ul style="list-style-type: none"> • Presence of abandoned buildings and absentee owners, deteriorating, more susceptible to fire • Old electrical wiring of homes are not in service, some aren't wired
Vulnerability	2	<ul style="list-style-type: none"> • Senior population • Abandoned properties are vulnerable areas, vehicles • Lack of alternative housing-residents will take them in however • Limited communication with fire department for alerting of an incident • CRP at the church near the railroad - big slough and drainage ditch • No back up water supply
Capability	1	<ul style="list-style-type: none"> • Fire department with truck and equipment • No building codes

City of Rogers

Impact	3	<ul style="list-style-type: none"> • Loss of life, property, vehicles, personal possessions • Loss of economy • Lose community asset/buildings • Loss of jobs at the elevator
Frequency	2	<ul style="list-style-type: none"> • No recent fires in memory • Elevator fire in 2013, two fires, nothing serious, grain dryer fire, grain leg burned as well
Likelihood	2	<ul style="list-style-type: none"> • Presence of abandoned buildings and absentee owners, deteriorating, more susceptible to fire • Old electrical wiring of homes-people shouldn't be living there
Vulnerability	3	<ul style="list-style-type: none"> • Senior population, children and families • Abandoned properties are vulnerable areas, vehicles • Lack of alternative housing-residents will take them in however • Good communication with fire department for alerting of an incident • Back up water supply of at the elevator if needed, 400,000 gallons total at times
Capability	1	<ul style="list-style-type: none"> • Fire department with truck and equipment • No building codes

City of Sanborn

Impact	2	<ul style="list-style-type: none"> • Loss of life, property, vehicles, personal possessions • Loss of economy • Loss of community asset/buildings • Spacing of structures and residential homes limits potential spread of fire
Frequency	2	<ul style="list-style-type: none"> • No real incidents or large structure fires • Smaller fires in recent years resulting in loss of garages and sheds • Bar and motel burned down in 2002 • Bar/business in town collapsed due to explosion of substance in neighboring building in late 1990s
Likelihood	3	<ul style="list-style-type: none"> • Abandoned buildings are not well kept • Vegetation can become dry from drought and cause a building fire • City mows and maintains vegetation on city lots • Less vulnerable: City has ability to pump water from city hydrants • Less vulnerable: City maintains water tower for backup water supplies for suppression • Less vulnerable: High water table and moisture in the soil • Spacing of structures and residential homes limits potential spread of fire • Age of structures and wiring is out of date and may increase likelihood of an incident
Vulnerability	4	<ul style="list-style-type: none"> • More vulnerable: Lack of alternative housing for displaced residents • Less vulnerable: Loss of CRP near city limits • Less vulnerable: Distance from neighboring fire departments can lessen issues

		<ul style="list-style-type: none"> • Small size of town and spacing of residential structures reduces risk, however buildings on main street are close together and hazardous • Abandoned buildings are not well kept • Fire department has trucks and equipment to move water • 18 first responders living in and around the city • Fire hall has truck for fire suppression and assistance in incidences • More/less vulnerable: Adopted state building codes but lacks enforcement • Less vulnerable: City has ability to pump water from city hydrants • Less vulnerable: City maintains water tower for backup water supplies for suppression • Less vulnerable: High water table and moisture in the soil • More vulnerable: Age of fire department volunteers
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 • No active education or outreach programs • Fire department possess equipment, fire trucks, 10,000-gallon fire semi-tanker and highly education/well trained volunteer staff • Lacks resources to accomplish projects independently • Has adopted state building codes but lacks enforcement • 18 first responders located in and around the city

City of Sibley

Impact	3	<ul style="list-style-type: none"> • Loss of life, property, vehicles, personal possessions • Loss of economy • Lose community asset/buildings such as the Fire Hall • Fire could spread and destroy multiple properties from clustering of cabins and trailer, in addition to high wind
Frequency	2	<ul style="list-style-type: none"> • No incidents of building fires or structures
Likelihood	4	<ul style="list-style-type: none"> • Vegetation can become dry from drought and cause a building to fire, mostly down on large lot with debris • Large amount of cabins and trailer homes that are not up to code • Wiring in homes is outdated
Vulnerability	3	<ul style="list-style-type: none"> • Lack of alternative housing-residents will take them in however. • Lack of water tower or holding tank • Presence of lake, in addition to a fire truck with pumping capabilities, allowing for endless supply of water for fire suppression • Distance from neighboring fire departments can lead to more issues, bigger impact, etc. • Small size of town and spacing of residential structures increases risk • Lack of building codes
Capability	1	<ul style="list-style-type: none"> • Active city council • Limited tax base • Some financial capabilities for maintaining snow removal equipment • Designated evacuation routes with the County

		<ul style="list-style-type: none"> • Limited administrative and city staff • Lack of education or outreach programs • Lack of building codes
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City of Valley City

Impact	4	<ul style="list-style-type: none"> • Loss of life, property, vehicles, and personal possessions • Loss of economy from business interruptions, lost jobs and lost homes • Loss of community assets/buildings/infrastructure • Loss of multiple properties as some neighborhoods are dense as spacing of structures close together • Mental health issues in city residents from financial loss, loss personal possession and temporary displacement • Catastrophic loss to individual as losses to the community are absorbed • Collapse of downtown buildings with flat roofs from heavy snow • Losses due to fire is greater in rural setting due to low supply of water for fire suppression • Could result in HAZMAT as chemicals are stored in city limits • Health hazard due to poor air quality from burning of furniture and other materials inside structures that can release chemicals
Frequency	3	<ul style="list-style-type: none"> • Approximately 50 percent are insignificant calls and are minor in nature • A major house fire occurred in January 2014 resulting in total loss • Lost two houses and three cars in a fire that spread in 2011
Likelihood	3	<ul style="list-style-type: none"> • Some abandoned buildings are not well kept • Vegetation can become dry from drought and cause a building fire • City mows and maintains vegetation in public parks and city lots • Less vulnerable: City fire department and public works has ability to pump water from city hydrants and with equipment from river • Less vulnerable: City maintains five water towers and tanks for backup water supplies for suppression • Less vulnerable: High water table and moisture in the soil • Loss of multiple properties as some neighborhoods are dense as spacing of structures close together • Age of structures and wiring is out of date in some structure and may increase likelihood of an incident • City adopted building codes and has enforcement to assure property building construction • Fire department and fire chief have ability to inspect remodel projects on residential homes • Urban fire is more likely to occur in Valley City than surrounding rural areas due to high concentration of population
Vulnerability	3	<ul style="list-style-type: none"> • More vulnerable: Lack of alternative housing for displaced residents • Less vulnerable: Loss of CRP near city limits • Less vulnerable: Distance from neighboring fire departments can lessen issues • Small size of town and spacing of residential structures reduces risk, however buildings on main street are close together and hazardous

		<ul style="list-style-type: none"> • Abandoned buildings are not well kept • Fire department has trucks and equipment to move water • Fire department is well trained and educated on property fire suppression techniques • More/less vulnerable: Adopted state building codes and has enforcement • Less vulnerable: City has ability to pump water from city hydrants • Less vulnerable: City maintains water tower for backup water supplies for suppression • Less vulnerable: High water table and moisture in the soil • High senior population • High school-age population • Valley City State University with dormitories housing students in close quarters • Senior housing facilities • Presence of mentally challenged individuals living in housing facilities and single-family homes throughout the city • Mercy Hospital and medical clinics serving the city's population • Barnes County EMT/Ambulance is headquarters in the city • Rural areas more vulnerable to structure fires due to low supply of water for fire suppression • Older downtown structures lack modern sprinkler systems • Lack of plowed roads in winter months decreases mobility of fire trucks and limited accessibility
Capability	2	<ul style="list-style-type: none"> • Active city council • Fire department has stable funding from the city • Fire department conducts pre-planning for best use of resources to address each fires specific needs • Fire department chief and staff has ability to write grants • Relies on county, regional, state and other agencies for assistance as fire department only has one full-time staff member • Fire department has one truck with GPS navigation • Fire department conducts fire prevention week and fire drills at public schools and Valley City State University • Has adopted state building codes and has enforcement • Natural Guard is located in the city

City of Wimbledon

Impact	4	<ul style="list-style-type: none"> • Loss of life, property, vehicles, personal possessions • Loss of economy • Lose community asset/buildings • Abandoned buildings, could lead to other buildings on fire, could spread
Frequency	2	<ul style="list-style-type: none"> • No real incidents • Structural fire, lost single-family home last fall 2013 • Garage fire
Likelihood	3	<ul style="list-style-type: none"> • Abandoned buildings, not well kept

		<ul style="list-style-type: none"> • Vegetation can become dry from drought and cause a building to fire, mostly down on large lot with debris • Installation of hydrants lowers vulnerability • Fire department with equipment • Old buildings and electrical outdated, old wiring
Vulnerability	3	<ul style="list-style-type: none"> • Lack of alternative housing-residents will take them in however. • No more CRP near the city • water supplies for backup until Rural Water comes in • Distance from neighboring fire departments can lead to more issues, bigger impact, etc. • Small size of town and spacing of residential structures reduces risk, however buildings on main street are close together and hazardous • Abandoned buildings, not well kept • Fire department with equipment • Residents yards are well kept • Helping hand of farmers-have backup water, transport water around quickly
Capability	3	<ul style="list-style-type: none"> • Fire department with truck and equipment • no building codes • first responders • water tower for backup • 10,000 tank • Hook to city well for backup water • Active city council • Fire department of 10 • Mutual aid from county • District has levy taxes • County mutual aid

Vulnerabilities to County-Owned Buildings and Property

Any and 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 Barnes 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. Barnes 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

A data limitation is a lack of specific details on property damage, location, and other descriptions. The NFIRS data does not distinguish between an urban fire and structure collapse. As a result, there is difficulty in determining the true probability and overall impact of structure collapse. Fire department and district boundaries cross county lines. Smaller and rural fire departments/districts do not tabulate history.

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

- Barnes County Emergency Operations Plan
- North Dakota Emergency Operations Plan, Fire Annex

5.13 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 occur in this third peak, accounting for 50 percent of the annual burned acreage. This third fire season typically extends until a season-ending snowfall. Fire along railroad right-of-ways is a common occurrence during extremely dry conditions.

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 Barnes 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.

History

History of wildland fire and rural fire was provided by the N.D. Forest Service. Approximately 36 wildland fire occurrences were recorded 2005 and 2008. The largest wildland fire reported was reported one mile west of Urbana in Barnes County near the Stutsman County Line - sections 18, 19, and 20. Proposed industrial development in Spiritwood Township in neighboring Stutsman County may increase risk to the hazard over the next five years. The average size of all other incidents when the largest fire is excluded is approximately 13 acres.

The 2014 NDMHMP states the wildland fire risk to jurisdictions in Barnes County is low and also shows a map of the location of wildland fires burning 1,000 acres or more. Only one fire of 1,000 acres or more was reported in Barnes County.

Table 5.13.1 summarizes wildland fire in Barnes County. See Appendix 8.13 for details of wildland fire occurrences.

Table 5.13.1 – April 2012 to April 2014 Barnes County Wildland Fire Summary

Wildland Fire					
Number of Occurrences	Date Range	Largest Fire	Average Fire Size (Acres)	Property Damage	Crop Damage
36	2005 to 2008	1,000	13	0	0

Source: N.D. Forest Service

There have been no declared disasters or emergencies pertaining to wildland fire in Barnes 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, 2002, to December 31, 2013. Table 5.13.2 shows fires in Barnes County. Other fires can include wildland fire, but the exact number is unknown. Approximately 188 other fires occurred from fire districts and departments providing coverage in Barnes County.

Table 5.13.2 – 2002 to 2013 Barnes County Fire Summary by Fire Department/District

Fire Protection Agency	Frequency 2002-2013			
	Structure Fire	Vehicle Fires	Other Fires	Totals
Dazey Fire Protection District	0	6	11	17
Edna Rural Fire Department	0	0	0	0
Fingal Fire Protection District	12	2	22	35
Hastings Rural Fire Department	1	0	0	1
Kathryn Fire Protection District	0	0	0	0
Litchville Fire Department	0	0	0	0
Litchville Rural Fire Department	1	2	1	2
Nome Fire Protection District	1	1	0	2
Oriska Fire Department	0	0	0	0
Rogers Fire Department	1	2	0	3
Sanborn Fire Department	1	1	2	4
Sanborn Fire Protection District	4	8	6	18
Sibley Fire Department	0	1	1	2
Valley City Fire Department	93	33	18	144
Valley City Rural Fire Department	29	45	113	187
Wimbledon Fire Protection District	4	3	14	21
Totals	147	104	188	436

Source: National Fire Incident Reporting System Summary By Incident Type. 01/01/2002 to 12/31/2013

Probability and Magnitude

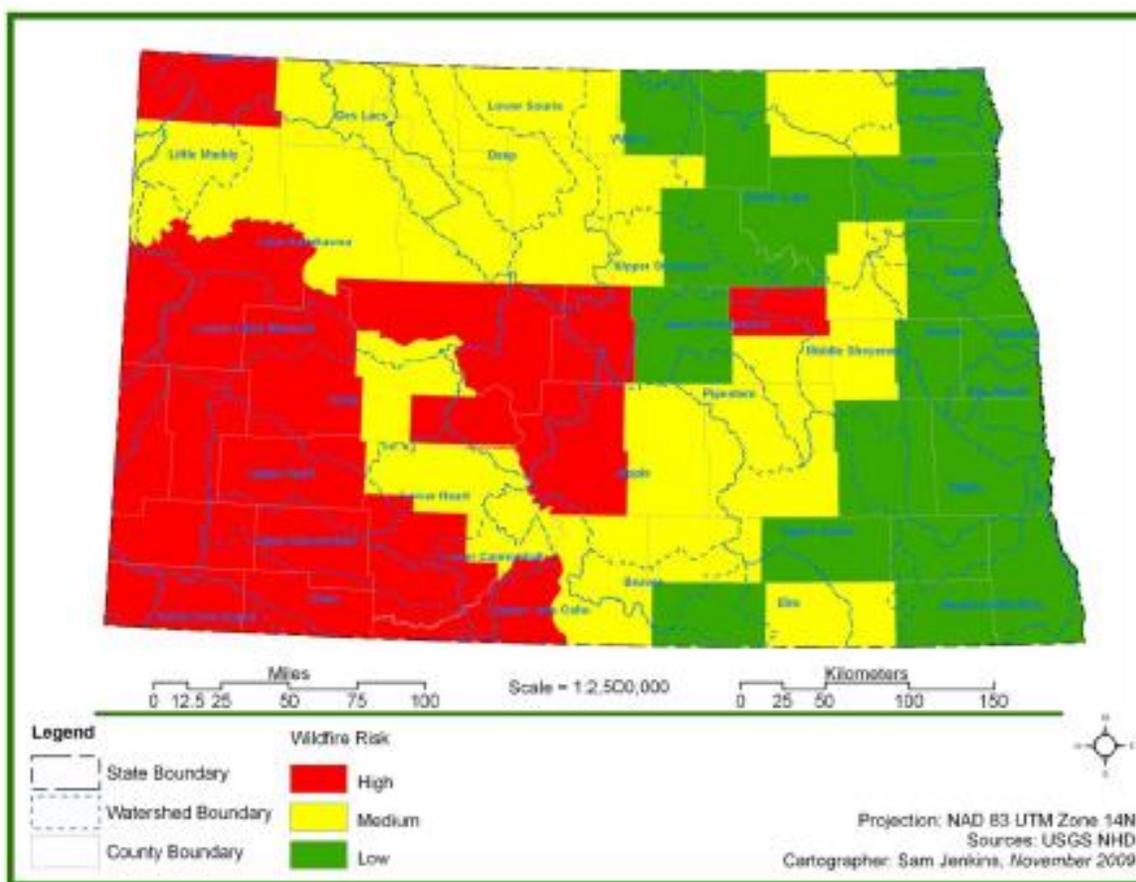
Approximately 36 occurrences of wildland fire occurred in Barnes County between 2005 and 2008. Figure 8.13.2 in Appendix 8.13 shows the total amount of acres burned by wildfire in North Dakota by county. The largest wildfire in Barnes County occurred in 2008 and burned 1,000 acres. The fire is excluded from the figure. Data provided by the Valley City Fire Department and Valley City Rural Fire Department documents 289 calls for urban fire/structure collapses and 89 calls for rural fires occurring between January 1, 2010 and August 2014. According to data provided by NFIRS, a total of 147 structure fires, 104 vehicle fires and 188 other fires occurred between 2002 and 2013. Other fires can include wildland fire, but the exact number is unknown. Based on statistics from both sources, the resulting probability of wildland fire is 100 percent.

In terms of magnitude, smaller and less severe fires are typically occur 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 reported wildland fires remain less than 1,000 acres in the county, with the exception of one fire in 2008 that the Sanborn Fire Department responded to.

Mapping. The risk of wildland fire in Barnes County is ranked low per the 2014 NDMHMP (Figure 5.13.1).

Figure 5.13.1 – Wildfire Risk by North Dakota County



Source: North Dakota Department of Emergency Services

Risk Assessment

Table 5.13.3 shows the risk assessment as determined by individual jurisdictions and the planning committee. The risk assessment methodology can be found in 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 5.13.3 – Risk Assessment Summary Wildland Fire Scored Chart

Wildland Fire	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Barnes County	2	3	3	3	1	10
Dazey	4	3	3	4	2	12
Fingal	3	3	3	3	1	11
Kathryn	2	2	2	3	2	7
Leal	4	2	2	3	1	10
Litchville	2	2	2	2	3	5
Nome	3	2	2	2	2	7
Oriska	4	2	2	2	2	8
Pillsbury	2	2	2	4	2	8
Rogers	3	3	4	2	2	10
Sanborn	3	2	3	3	3	8
Sibley	4	2	3	4	1	12
Valley City	4	4	4	3	2	13
Wimbledon	4	3	2	2	3	8

(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 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.

City of Dazey

Impact	4	<ul style="list-style-type: none"> • Loss of life, injury, loss of economy • Loss of farm equipment, structures • Could result in HAZMAT • Property loss • Health hazard due to poor air quality
Frequency	3	<ul style="list-style-type: none"> • Farmers do controlled burns, 50% become out of control
Likelihood	3	<ul style="list-style-type: none"> • Continue to have controlled burns • Lack of fire break around the city

		<ul style="list-style-type: none"> • Dry conditions each year for a couple weeks. Strong winds.
Vulnerability	4	<ul style="list-style-type: none"> • Lack of crop break around the city • Lack of manpower • Windy conditions each year
Capability	2	<ul style="list-style-type: none"> • Fire department, fire hall, 4 fire trucks in town • Underground storage tank for backup water for fire suppression • Lack of building codes and enforcement • 6 dedicated personnel for fire department • Mutual aid agreements with Wimbledon, Sanborn, Hannaford, Rogers

City of Fingal

Impact	3	<ul style="list-style-type: none"> • Loss of life, injury, loss of economy • Loss of farm equipment, structures • Could result in HAZMAT • Property loss from fires • Health hazard due to poor air quality • Loss of wildlife habitat
Frequency	3	<ul style="list-style-type: none"> • Farmers do controlled burning, can become out of control at times • No reports of lightning impacting •
Likelihood	3	<ul style="list-style-type: none"> • Lack of fire break around the city • Hot bearings from trains causing vegetation to ignite • Dry conditions each year for a couple weeks, strong winds • No more CRP, except for southwest side of city • Grassland surrounds the city • Existence of hydrants does not lower vulnerable due to poor water pressure
Vulnerability	3	<ul style="list-style-type: none"> • Lack of manpower. Prolonged response from surrounding fire districts • Windy conditions each year • Trailer homes • Lack of fire break • No CRP except for southwest side of city • Residents do not maintain individual wells and sources of water • Existence of hydrants does not lower vulnerable due to poor water pressure • Lots of grass and vegetation in the area all sides of city • Overgrown lots in city limits
Capability	1	<ul style="list-style-type: none"> • Adopted state building codes • Mutual aid with Nome and Litchville, Fingal, Fort Ransom • Small man power • Fire department with equipment-four trucks, Fire Hall • First responder & EMT

City of Kathryn

Impact	2	<ul style="list-style-type: none"> • Loss of life, injury, loss of economy • Loss of farm equipment, structures • Could result in HAZMAT • Property loss from fires • Health hazard due to poor air quality • Loss of wildlife habitat
Frequency	2	<ul style="list-style-type: none"> • Farmers don't do much control burning, very slim • No reports of lightning impacting • 4th of July 2014-grass fire at Clausen Springs
Likelihood	2	<ul style="list-style-type: none"> • Lack of fire break around the city • Dry conditions each year for a couple weeks, strong winds • No more CRP • Grassland surrounds the city • Installation of hydrants lowers vulnerability
Vulnerability	3	<ul style="list-style-type: none"> • Lack of manpower. Prolonged response from surrounding fire districts • Windy conditions each year • Trailer homes • Lack of fire break • No CRP • Residents maintain individual wells and sources of water • Installation of hydrants lowers vulnerability • Lots of grass and vegetation in the area to the north mostly but on all sides of city
Capability	2	<ul style="list-style-type: none"> • Adopted state building codes • Mutual aid with Nome and Litchville, Fingal, Fort Ransom • Small man power • Fire department with equipment-four trucks, Fire Hall • First responder & EMT

City of Leal

Impact	4	<ul style="list-style-type: none"> • Loss of life, injury, loss of economy • Loss of farm equipment, structures • Could result in HAZMAT • Property loss from fires • Health hazard due to poor air quality • Loss of wildlife habitat
Frequency	2	<ul style="list-style-type: none"> • Farmers don't do much control burning • No reports of lightning impacting
Likelihood	2	<ul style="list-style-type: none"> • Lack of fire break around the city • Dry conditions each year for a couple weeks. Strong winds. • No more CRP • Railroad through town ROW
Vulnerability	3	<ul style="list-style-type: none"> • Lack of manpower. Prolonged response from surrounding fire districts. • Windy conditions each year

		<ul style="list-style-type: none"> • No trailer homes • Lack of fire break • No CRP • Railroad ROW through town • Backup water supply for the city. However, residents maintain individual wells and sources of water.
Capability	1	<ul style="list-style-type: none"> • No building codes • Mutual aid agreements are not signed. Do have one through the County. • No man power • Fire department with equipment-one truck • First responder

City of Litchville

Impact	2	<ul style="list-style-type: none"> • Loss of life, injury, loss of economy • Loss of farm equipment, structures • Could result in HAZMAT • Property loss from fires • Health hazard due to poor air quality • Loss of wildlife habitat
Frequency	2	<ul style="list-style-type: none"> • Farmers do controlled burns, none become out of control
Likelihood	2	<ul style="list-style-type: none"> • Continue to have controlled burns • Lack of fire break around the city but does have rows of trees • Dry conditions each year for a couple weeks. Strong winds. • Fire department is present when controlled burns are started, notified and on alert
Vulnerability	2	<ul style="list-style-type: none"> • Windy conditions each year • Fire department is present when controlled burns are started, notified and on alert • Elderly population need help with evacuation • Trailer homes • Lack of fire break but has trees around the city • Less CRP in the area • No vulnerable areas in city limits
Capability	3	<ul style="list-style-type: none"> • No building codes • Mutual aid agreements are not signed • Little man power on city level • Fire department with equipment • Dakota Plains has water hauling equipment • Has mutual aid with LaMoure, Sanborn, Kathryn and Marion

City of Nome

Impact	3	<ul style="list-style-type: none"> • Loss of life, injury, and economy • Loss of farm equipment • Could result in HAZMAT • Property loss from fires • Health hazard due to poor air quality • Loss of wildlife habitat
Frequency	2	<ul style="list-style-type: none"> • Farmers don't do much control burning • No reports of lightning starting fires
Likelihood	2	<ul style="list-style-type: none"> • Lack of fire break around the city • Dry conditions each year for a couple weeks with strong winds • No more CRP • Grassland surrounds the city • Age of buildings and structures may result in a structure fire causing a secondary wildland fire • Abandoned buildings may cause a structure fire and can potentially result in a wildland fire
Vulnerability	2	<ul style="list-style-type: none"> • Prolonged response from surrounding fire departments • Windy conditions each year • Lack of fire break • No CRP • Lots of grass and vegetation in the area surrounding the city • Fire hall has truck for fire suppression and assistance in incidences • Adopted state building codes
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 • No active education or outreach programs • Lacks resources to accomplish projects independently • First responder located south of town

City of Oriska

Impact	4	<ul style="list-style-type: none"> • Loss of life, injury, loss of economy • Loss of farm equipment, structures • Could result in HAZMAT • Property loss from fires • Health hazard due to poor air quality • Loss of wildlife habitat
Frequency	2	<ul style="list-style-type: none"> • Farmers do controlled burns, 20% become out of control
Likelihood	2	<ul style="list-style-type: none"> • Continue to have controlled burns • Lack of fire break around the city • Dry conditions each year for a couple weeks. Strong winds. • CRP is gone-decreases chances of fire
Vulnerability	2	<ul style="list-style-type: none"> • Lack of manpower • Windy conditions each year

		<ul style="list-style-type: none"> • Elderly population and school-need help with evacuation • Trailer homes • Lack of fire break
Capability	2	<ul style="list-style-type: none"> • Building codes but no enforcement • Mutual aid agreements are not signed • Fire department with equipment • Fire Hall

City of Pillsbury

Impact	2	<ul style="list-style-type: none"> • Loss of life, injury, loss of economy • Loss of farm equipment, structures • Could result in HAZMAT • Property loss from fires • Health hazard due to poor air quality • Loss of wildlife habitat
Frequency	2	<ul style="list-style-type: none"> • Farmers do controlled burns with 10% becoming out of control • 2 or 3 out of control
Likelihood	2	<ul style="list-style-type: none"> • Continue to have controlled burns • Lack of fire break around the city • Dry conditions each year for a couple weeks. Strong winds. • CRP by the railroad, still near the church-one field
Vulnerability	4	<ul style="list-style-type: none"> • Lack of manpower • Windy conditions each year • Elderly population need help with evacuation • Trailer homes • Lack of fire break • CRP near railroad and church, near highway as well, circles the city • Indoor smoking ban may lead to more fires if people kick butts
Capability	2	<ul style="list-style-type: none"> • No building codes • Mutual aid agreements are not signed • No man power • Fire department with equipment • Carol power

City of Rogers

Impact	3	<ul style="list-style-type: none"> • Loss of life, injury, loss of economy • Loss of farm equipment, structures • Could result in HAZMAT • Property loss from fires • Health hazard due to poor air quality • Loss of wildlife habitat
Frequency	3	<ul style="list-style-type: none"> • Farmers do controlled burns, 40%become out of control
Likelihood	4	<ul style="list-style-type: none"> • Continue to have controlled burns • Lack of fire break around the city but does have rows of trees

		<ul style="list-style-type: none"> • Dry conditions each year for a couple weeks. Strong winds.
Vulnerability	2	<ul style="list-style-type: none"> • Windy conditions each year • Fire department has equipment and personnel • Elderly population need help with evacuation • Trailer homes • Lack of fire break but has trees around the city • Less CRP in the area • No vulnerable areas in city limits • No official shelter • Lack of alternative housing options
Capability	2	<ul style="list-style-type: none"> • No building codes • Mutual aid agreements are signed • Little man power on city level • Fire department with equipment • Benson Quinn has water hauling equipment

City of Sanborn

Impact	3	<ul style="list-style-type: none"> • Loss of life, injury, and economy • Loss of farm equipment • Could result in HAZMAT • Property loss from fires • Health hazard due to poor air quality • Loss of wildlife habitat
Frequency	2	<ul style="list-style-type: none"> • Farmers conduct large amount of controlled burning • No reports of lightning starting fires
Likelihood	3	<ul style="list-style-type: none"> • Lack of fire break around the city • Dry conditions each year for a couple weeks with strong winds • Reduction of CRP • Grassland does not surround the city • Abandoned buildings may cause a structure fire and can potentially result in a wildland fire
Vulnerability	3	<ul style="list-style-type: none"> • Less vulnerable: Short response from surrounding fire departments • Windy conditions each year • Lack of fire break around the city • Reduction of CRP • Fire hall has truck for fire suppression and assistance in incidences • Adopted state building codes but lacks enforcement • Presence of sloughs reduces mobility of fire department vehicles and limits accessibility
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 • No active education or outreach programs • Fire department possess equipment, fire trucks, 10,000-gallon fire semi-tanker and highly education/well trained volunteer staff • Lacks resources to accomplish projects independently

		<ul style="list-style-type: none"> • Has adopted state building codes but lacks enforcement • 18 first responders located in and around the city
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City of Sibley

Impact	4	<ul style="list-style-type: none"> • Loss of life, injury, loss of economy • Loss of farm equipment, structures • Could result in HAZMAT • Property loss from fires • Health hazard due to poor air quality • Loss of wildlife habitat
Frequency	2	<ul style="list-style-type: none"> • Farmers don't do much control burning • No reports of lightning impacting vegetation and causing a fire
Likelihood	3	<ul style="list-style-type: none"> • Lack of fire break around the city • Dry conditions each year for a couple weeks, strong winds • Summer and recreation population lighting off fireworks and setting up campfires along the water
Vulnerability	4	<ul style="list-style-type: none"> • Lack of manpower • Prolonged response from surrounding fire districts • Windy conditions each year • Trailer homes and cabins for summer and recreation population • Lack of fire break • More vulnerable: orientation of town on a narrow north-south strip increase vulnerability if the fire came from the north • Presence of lake, in addition to a fire truck with pumping capabilities, allowing for endless supply of water for fire suppression
Capability	1	<ul style="list-style-type: none"> • Active city council • Limited tax base • Some financial capabilities for maintaining snow removal equipment • Designated evacuation routes with the County • Limited administrative and city staff • Lack of education or outreach programs • Lack of building codes

City of Valley City

Impact	4	<ul style="list-style-type: none"> • Loss of life and injury • Property such and structures and farm equipment from fires • Loss of wildlife habitat • Could result in loss of crops and livestock and economy activity • Loss can potentially be catastrophic to individual farmers or landowner as the loss is highly localized
Frequency	4	<ul style="list-style-type: none"> • Farmers conduct large amount of controlled burning • Approximately 5 percent of controlled burns become uncontrolled • Approximately 30 wildland fires occur in the spring and fall each year • No reports of lightning starting fires

Likelihood	4	<ul style="list-style-type: none"> • Dry conditions each year for a couple weeks with strong winds • Reduction of CRP in and around the city in recent years • Increase in railroad traffic contributes to likelihood of wildland fire from hot sparks emitted from friction on hot breaks • Grassland is present near city limits • Increased traffic on Interstate 94 can increase likelihood due to litter and cigarette butts thrown from passing motorists • Abandoned buildings may cause a structure fire and can potentially result in a wildland fire
Vulnerability	3	<ul style="list-style-type: none"> • Less vulnerable: Short response from surrounding fire departments • Windy conditions each year • Reduction of CRP • Fire hall has truck for fire suppression and assistance in incidences • Presence of sloughs reduces mobility of fire department vehicles and limits accessibility • More vulnerable: Large elderly population living in surrounding rural areas • Less vulnerable: High water table and moisture in the soil • More vulnerable: Potentially prolonged response time from fire department due to size of coverage area • Less vulnerable: County-wide mutual aid agreement for emergency services • Less vulnerable: N.D. Game and Fish Department maintains a four-wheel drive ranger vehicle with fire suppression equipment that is available to fire district if needed
Capability	2	<ul style="list-style-type: none"> • Active township board for rural fire district • Fire district does not stable funding from the townships • Fire district conducts pre-planning for best use of resources to address each fires specific needs • Fire district chief and staff has ability to write grants • Fire district chief and staff are well-trained and educated on proper wildland fire suppression techniques • Fire district relies on county, regional, state and other agencies for assistance as district lacks full-time staff • Fire district has one truck with GPS navigation • Fire district conducts fire prevention week and fire drills at public schools and Valley City State University • Natural Guard is located in the city

City of Wimbledon

Impact	4	<ul style="list-style-type: none"> • Loss of life, injury, loss of economy • Loss of farm equipment, structures • Could result in HAZMAT • Property loss from fires • Health hazard due to poor air quality • Loss of wildlife habitat • Small size of town-everyone could be impacted
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Frequency	3	<ul style="list-style-type: none"> • Farmers do much control burning, very slim chance of becoming uncontrollable • No reports of lightning impacting • Railroad and hot bearings have started
Likelihood	2	<ul style="list-style-type: none"> • Lack of fire break around the city • Dry conditions each year for a couple weeks, strong winds • No more CRP • Grassland surrounds the city • Farmers respond and do fire breaks if needed with equipment • Controlled burns each year, can become out of control
Vulnerability	2	<ul style="list-style-type: none"> • Lack of manpower. Prolonged response from surrounding fire districts • Windy conditions each year • Trailer homes • Lack of fire break • No CRP • City well for backup • Water tower • County mutual aid
Capability	3	<ul style="list-style-type: none"> • Fire department with truck and equipment • no building codes • first responders • water tower for backup • 10,000 tank • Hook to city well for backup water • Active city council • Fire department of 10 • Mutual aid from county • District has levy taxes • County mutual aid

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 are able to reach the property in a timely manner. An inventory of county-owned buildings and property is shown in Chapter 4.

Lack of firebreaks around jurisdictions in Barnes 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 Barnes 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. Barnes County has planning regulations limiting providing regulation 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

Limited data was available from fire departments and districts in the county. Valley City Fire Department and Valley City Rural Fire Department was the only entity tabulating fire data history. However, many smaller jurisdictions did not have any incidents to report. From the data that was available, a data limitation is the lack of the location and details of wildland fires. Fire department and district boundaries cross county lines, therefore, coverage in some areas of the county is provided by departments and districts based in neighboring counties. Similarly, Barnes County departments also provide coverage to neighboring counties.

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

- Barnes 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

5.14 Windstorm

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

Characteristics

Strong winds can occur year-round in Barnes 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. A comparison of Figures 5.14.1 and 5.14.2 shows that Lamoure County falls into Zone III. Winds speeds reach up to 200 miles per hour in Zone III. No special wind regions are identified in Barnes County.

Figure 5.14.1 Wind Zones in the Unites States



Source: FEMA

Figure 5.14.2 Map of Barnes County in North Dakota



History

According to NOAA, NCDC and SHELDUS, and the previously FEMA-approved Barnes County Mitigation Plan, Barnes County has 73 reported high wind events between 1965 and 2013 resulting in no injuries, 0.06 deaths, \$1,234,518 in property damage and \$12,759,887 in crop damage. Table 5.14.1 summarizes the history of windstorm occurrences in Barnes County. A detailed record of data history for windstorms can be found in Appendix 8.15, in addition to a map showing high wind events in North Dakota by county between 2000 and 2013.

According to the 2014 NDMHMP, between 2000 and 2013 Barnes County experienced \$300,000 in property damages or \$21,429 annually, and \$281,082 in total insurance payments to cover crop losses or \$20,077 annually due to windstorms. Crop loss data from the RMA is similar to what is reported in the state plan. However, the amount of property and crop damage shown in Table 5.14.1 is far greater than what is shown in the state plan and from data provided by the RMA.

Table 5.14.1 – Barnes County Windstorm Summary

Windstorm						
Number of Occurrences	Date Range	Probability	Injuries	Fatalities	Property Damage	Crop Damage
73	1965-2013	100%	0	0.06	\$1,234,518	\$12,759,887

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)
2009 Barnes County Mitigation Plan

There have been no declared disasters or emergencies pertaining to windstorm in Barnes County.

Crop loss from windstorm 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 windstorm. The loss liability of crops from windstorm was \$527,922 in Barnes County between 1990 and 2013 on 5,569 acres. Indemnity paid was \$259,681 resulting in losses of 49 percent of total liability. Crop loss indemnity paid over the 24-year period resulted in an annual average of \$10,820. Detailed data is available per crop for each year and can be found in Appendix 8.14.

Probability and Magnitude

Hazard history was gathered from NOAA, NCDC, SHELDUS, and the previously FEMA-approved Barnes County Mitigation plan. The data covers a 49-year period from 1965 through 2013, and documents 73 notable windstorm occurrences, which equates to a probability of 100 percent. Data from the 2014 NDMHMP shows 15 windstorm events between 2000 and 2013 resulting in a probability of 100 percent. Indemnity was paid for crop loss from windstorm on 11 occurrences between 1990 and 2013 resulting in a probability of 46 percent. Crop loss data from the RMA reveals that indemnity will be paid roughly once every two years. 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 5.14.2 shows the risk assessment as determined by individual jurisdictions and the planning committee. The risk assessment methodology can be found in 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 5.14.2 – Risk Assessment Summary Windstorm Scored Chart

Windstorm	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Barnes County	4	3	3	2	1	11
Dazey	3	3	3	2	2	9
Fingal	4	3	3	4	1	13
Kathryn	3	3	3	2	2	9
Leal	4	3	3	3	2	11
Litchville	2	2	2	2	3	5
Nome	4	3	3	3	1	12
Oriska	3	2	2	3	4	6
Pillsbury	2	3	3	3	1	13
Rogers	4	2	3	3	2	10
Sanborn	4	3	3	3	2	11
Sibley	4	4	2	4	1	13
Valley City	3	4	4	2	3	10
Wimbledon	4	4	4	3	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, Barnes County has an overall vulnerability ranking of low-moderate to windstorms.

Capabilities and vulnerabilities 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.

Barnes County

Impact	4	<ul style="list-style-type: none"> • Downed power lines and trees • Can contribute to the spread of wildland fires • Loss of economy and crops • Damage to structures and grain bins collapsing from straight line winds • Decreased visibility from wind-blown debris, dirt, and vegetation • Possible displacement of an estimated 639 people based on an average household size of 2.29 people in 279 mobile home structures • Property damage, broken windows, flying shingles • Toppled trees, uprooted • Potential for injuries and loss of life • Loss of crop and livestock • Could start a fire of buildings and structures • High winds can spread fires causing damage to buildings and structures • Approximately \$259,681 in crop damage • Increase of crime from broken windows and potential looting
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 commonplace in the county throughout the year • Approximately 26 incidents of windstorm between 1965 and 2013
Likelihood	3	<ul style="list-style-type: none"> • Cyclical weather patterns could increase or decrease • The hazard is part of the climate in the area • Strong winds and storms are highly likely to occur in the future • Removal of trees and vegetation increases the likelihood of wind impacting structures 50 percent probability based on past occurrences
Vulnerability	2	<ul style="list-style-type: none"> • More vulnerable: Loss of CRP and shelter belts to hold snow back, leads to more ground blizzard conditions • More vulnerable: Five percent of total housing, consists of 119 mobile homes structures • More vulnerable: 24 percent of population (2,632 people) is under the age of 20 and 20 percent consists of people over 65 (2,170 people) • More vulnerable: Lack of building codes in some jurisdictions • More vulnerable: Older structures and housing stock • Less vulnerable: More advanced warning systems and reverse 911 provide people and farmers more time to prepare and take shelter • Less vulnerable: Advanced communication, cell phones, internet and TV • Less vulnerable: Official shelters located throughout the county

City of Dazey

Impact	3	<ul style="list-style-type: none"> • Property damage, broken windows, flying shingles • Trees toppled and uprooted. • Abandoned buildings could topple. Grain bin collapsed. • Loss of life, injury • Storm sewer could lose power from flying debris-loss of sewer system • Power outage
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Frequency	3	<ul style="list-style-type: none"> Occurs throughout the year in all weather conditions
Likelihood	3	<ul style="list-style-type: none"> Removal of tree rows allows for wind to impact city more directly
Vulnerability	2	<ul style="list-style-type: none"> Senior population, day care Abandoned structures Power lines Lift station vulnerable to power outages
Capability	2	<ul style="list-style-type: none"> Lack of building codes Fire department with equipment City has a tractor Inert landfill Residents that have equipment for cleanup

City of Fingal

Impact	4	<ul style="list-style-type: none"> Property damage, broken windows, flying shingles Toppled trees, uprooted Loss of life, injury Loss of crop and livestock Loss of power Could start a fire of buildings and structures, could allow grass fire to spread
Frequency	3	<ul style="list-style-type: none"> Occurs throughout the year in all weather conditions Straight line winds mostly in summer months, tree debris In 2003/2004, lots of damage from wind to homes and trees, airborne debris, branches
Likelihood	3	<ul style="list-style-type: none"> Removal of tree rows allows for wind to impact city more directly Cyclical weather patterns could increase or decrease Lack of buildings on west side of city-wind has direct access into town Location in lower part of the surrounding area Removal of shelter belts
Vulnerability	4	<ul style="list-style-type: none"> Power lines in town not buried Community center/catholic church for a shelter Lack of Redundancy in power grid Removal of shelter belts
Capability	1	<ul style="list-style-type: none"> Fire department with truck and equipment Adopted state building codes First responder & EMT Mutual aid with county Small tax base Active city council No real plans in place or financial tax base Lack of manpower by the city and general public No education programs or outreach Limited financial capabilities Active city council

City of Kathryn

Impact	3	<ul style="list-style-type: none"> • Property damage, broken windows, flying shingles • Toppled trees, uprooted • Loss of life, injury • Loss of crop and livestock • Loss of power • Could start a fire of buildings and structures, could allow grass fire to spread
Frequency	3	<ul style="list-style-type: none"> • Occurs throughout the year in all weather conditions • Straight line winds mostly in summer months, tree debris • Damaged former hardware store building on main street, going to tear building down, beyond repair
Likelihood	3	<ul style="list-style-type: none"> • Removal of tree rows allows for wind to impact city more directly • Cyclical weather patterns could increase or decrease • Lack of buildings on west side of city-wind has direct access into town • Location in lower part of the surrounding area
Vulnerability	2	<ul style="list-style-type: none"> • Power lines in town not buried • Fire hall for shelter • Redundancy in power grid
Capability	2	<ul style="list-style-type: none"> • Adopted state building codes • No inert landfill • Residents that have equipment for cleanup • Fire department has equipment • Lack of manpower in general due to small size • Independent, small town good neighbors-help each other out. • First responder & EMT

City of Leal

Impact	4	<ul style="list-style-type: none"> • Property damage, broken windows, flying shingles • Loss of life, injury • Loss of crop and livestock • Loss of power • Could start a fire • Can moved train cars off the tracks-result in a HAZMAT or fire
Frequency	3	<ul style="list-style-type: none"> • Occurs throughout the year in all weather conditions
Likelihood	3	<ul style="list-style-type: none"> • Removal of tree rows allows for wind to impact city more directly • Cyclical weather patterns could increase or decrease • Lack of buildings on west side of city-wind has direct access into town
Vulnerability	3	<ul style="list-style-type: none"> • Intentional removal of abandoned buildings by use of fire by residents • Removal of abandoned vehicles • Power lines in town not buried • No shelters • Lack of intermittency in power grid with one feeder
Capability	2	<ul style="list-style-type: none"> • No building codes • No inert landfill

		<ul style="list-style-type: none"> • Residents that have equipment for cleanup. • Fire department has equipment • Lack of manpower • Independent, small town good neighbors-help each other out. • First responder
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City of Litchville

Impact	2	<ul style="list-style-type: none"> • Property damage, broken windows, flying shingles • Abandoned buildings could topple • Loss of life, injury. • Loss of crop and livestock • Loss of power • Could start a fire
Frequency	2	<ul style="list-style-type: none"> • Occurs throughout the year in all weather conditions • Usually a summer thing
Likelihood	2	<ul style="list-style-type: none"> • Heavy trees around city limits – south side lacks trees • Cyclical weather patterns could increase or decrease
Vulnerability	2	<ul style="list-style-type: none"> • Senior population, school children • Abandoned structures and vehicles • Power lines in town not buried • Two power interconnections • No official shelters, but has community center and school • Older homes • Trailer homes.
Capability	3	<ul style="list-style-type: none"> • No building codes • No inert landfill • Residents that have equipment for cleanup • Fire department has equipment • Lack of manpower at the city level • Farmers help out, move debris, etc. • Maintenance done on an as needed basis by the city

City of Nome

Impact	4	<ul style="list-style-type: none"> • Damage to homes and community buildings such as broken windows, loss of shingles • Toppled trees can become uprooted and damage buildings • Loss of life and possible injury • Loss of crop and livestock • Loss of power • Could start a structure fire • Contribute to spread of wildland fire • Wind can cause accumulation of snow on city street and block roadways which results in temporary isolation
Frequency	3	<ul style="list-style-type: none"> • Occurs throughout the year in all weather conditions

		<ul style="list-style-type: none"> • Straight line winds mostly in summer months • Blizzards occur frequently in winter months
Likelihood	3	<ul style="list-style-type: none"> • Removal of tree rows allows for wind to impact city more directly • Cyclical weather patterns could increase or decrease • Topography of area with flat land and lack of trees increases likelihood
Vulnerability	3	<ul style="list-style-type: none"> • Power lines providing power to the city are not buried • Fire hall is a small steel building and is not adequate for use as a shelter • City lacks equipment to clear debris and branches or move snow • Age of structures and housing stock increases vulnerability • Distance to hospital and medical clinic is extensive • City has an inert landfill for debris and branches • Fire hall has truck for fire suppression and assistance in incidences • Adopted state building codes
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 • No active education or outreach programs • Lacks resources to accomplish projects independently • First responder located south of town • Fire hall has truck for fire suppression and assistance in incidences • Adopted state building codes

City of Oriska

Impact	3	<ul style="list-style-type: none"> • Property damage, broken windows, flying shingles. • Toppled trees. Uprooted. • Abandoned buildings could topple • Loss of life and injury • Loss of crop and livestock • Loss of power • Could start a fire
Frequency	2	<ul style="list-style-type: none"> • Occurs throughout the year in all weather conditions
Likelihood	2	<ul style="list-style-type: none"> • Removal of tree rows allows for wind to impact city more directly • Cyclical weather patterns could increase or decrease
Vulnerability	3	<ul style="list-style-type: none"> • Senior population and school • Abandoned structures and vehicles • Power lines in town not buried but main feed to town IS buried • Two shelters • Older homes
Capability	4	<ul style="list-style-type: none"> • Building codes but lack enforcement • Inert landfill • Residents that have equipment for cleanup • Fire hall for fire trucks

City of Pillsbury

Impact	2	<ul style="list-style-type: none"> • Property damage, broken windows, flying shingles • Topped trees become uprooted. • Abandoned buildings could topple • Loss of life, injury • Loss of crop and livestock • Loss of power • Could start a fire • Has moved train cars off the tracks
Frequency	3	<ul style="list-style-type: none"> • Occurs throughout the year in all weather conditions
Likelihood	3	<ul style="list-style-type: none"> • Removal of tree rows allows for wind to impact city more directly • Cyclical weather patterns could increase or decrease
Vulnerability	3	<ul style="list-style-type: none"> • Senior population • Abandoned structures and vehicles • Power lines in town not buried • No shelters • Older homes • Trailer home
Capability	1	<ul style="list-style-type: none"> • No building codes • No inert landfill • Residents that have equipment for cleanup • Fire department has equipment • Lack of manpower

City of Rogers

Impact	4	<ul style="list-style-type: none"> • Property damage, broken windows, flying shingles • Abandoned buildings could topple • Loss of life, injury. • Loss of crop and livestock • Loss of power • Could start a fire
Frequency	2	<ul style="list-style-type: none"> • Occurs throughout the year in all weather conditions • Usually a summer thing
Likelihood	3	<ul style="list-style-type: none"> • Heavy trees around city limits. • Cyclical weather patterns could increase or decrease • Removal of shelter belt.
Vulnerability	3	<ul style="list-style-type: none"> • Senior population, families with children • Abandoned structures and vehicles • Power lines in town not buried • No official shelters, fire hall • Older homes • Trailer homes
Capability	2	<ul style="list-style-type: none"> • No building codes • No inert landfill • Residents that have equipment for cleanup

		<ul style="list-style-type: none"> • Fire department has equipment • Lack of manpower at the city level • Farmers help out, move debris, etc. • Maintenance done on an as needed basis by the city
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City of Sanborn

Impact	3	<ul style="list-style-type: none"> • Loss of life, injury, and economy • Loss of farm equipment • Could result in HAZMAT • Property loss from fires • Health hazard due to poor air quality • Loss of wildlife habitat
Frequency	2	<ul style="list-style-type: none"> • Farmers conduct large amount of controlled burning • No reports of lightning starting fires
Likelihood	3	<ul style="list-style-type: none"> • Lack of fire break around the city • Dry conditions each year for a couple weeks with strong winds • Reduction of CRP • Grassland does not surround the city • Abandoned buildings may cause a structure fire and can potentially result in a wildland fire
Vulnerability	3	<ul style="list-style-type: none"> • Less vulnerable: Short response from surrounding fire departments • Windy conditions each year • Lack of fire break around the city • Reduction of CRP • Fire hall has truck for fire suppression and assistance in incidences • Adopted state building codes but lacks enforcement • Presence of sloughs reduces mobility of fire department vehicles and limits accessibility
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 • No active education or outreach programs • Fire department possess equipment, fire trucks, 10,000-gallon fire semi-tanker and highly education/well trained volunteer staff • Lacks resources to accomplish projects independently • Has adopted state building codes but lacks enforcement • 18 first responders located in and around the city

City of Sibley

Impact	4	<ul style="list-style-type: none"> • Property damage, broken windows, flying shingles • Toppled trees, uprooted • Loss of life, injury • Loss of crop and livestock • Loss of power
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		<ul style="list-style-type: none"> • Could start a fire of buildings and structures • High winds can spread fires causing damage to buildings and structures • Loss of calf barn • Derailment of train near Carmack • Damage to boats and pontoons on Lake Ashtabula as some can flip over
Frequency	4	<ul style="list-style-type: none"> • Occurs throughout the year in all weather conditions • Straight line winds mostly in summer months, tree debris • Docks and boats damaged or tripped over each summer
Likelihood	2	<ul style="list-style-type: none"> • Cyclical weather patterns could increase or decrease • Location on the water at the bottom of the valley allows for more direct wind • Tornadoes do not touch town and travel over the city • More vulnerable: Local terrain with the city located at the bottom of the hill allows wind to gain strength
Vulnerability	4	<ul style="list-style-type: none"> • Power lines in town not buried • Fire hall for shelter • Geographic location at the bottom of the hill • Cannot bury power lines due to terrain and unstable soil • Lack of building codes • Lack of basements • Majority of structures in the city are trailer homes, campers or cabins
Capability	1	<ul style="list-style-type: none"> • Active city council • Limited tax base • Some financial capabilities for maintaining snow removal equipment • Designated evacuation routes with the County • Limited administrative and city staff • Lack of education or outreach programs • Lack of building codes

City of Valley City

Impact	3	<ul style="list-style-type: none"> • Damage to homes and community buildings such as broken windows, loss of shingles • Toppled trees can become uprooted and damage buildings • Loss of life and possible injury • Loss of crop and livestock • Loss of power • Could start a structure fire • Can contribute to spread of wildland fires • Wind can cause accumulation of snow on city street and block roadways which results in temporary isolation • Fallen power lines
Frequency	4	<ul style="list-style-type: none"> • Occurs throughout the year in all weather conditions • Straight line winds mostly in summer months • Blizzards occur frequently in winter months
Likelihood	4	<ul style="list-style-type: none"> • Cyclical weather patterns could increase or decrease • Topography of area with flat land allow wind to travel uninterrupted

		<ul style="list-style-type: none"> • River valley acts as a funnel and channels wind into the city
Vulnerability	2	<ul style="list-style-type: none"> • More vulnerable: Power lines providing power to the city are not buried • More vulnerable: High elderly population • More vulnerable: High school-age population • Less vulnerable: Power lines traversing Sanborn Lake were recently replaced • Less vulnerable: City has three official storm shelters • Less vulnerable: Fire department and city residents have equipment to clear debris and branches or move snow • More vulnerable: Age of structures and housing stock increases vulnerability • Less vulnerable: City has an inert landfill for debris and branches • Less vulnerable: Adopted state building codes and has enforcement
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 • No active education or outreach programs • Lacks resources to accomplish projects independently • 18 first responders with medical supplies living in and around the city • Fire hall has truck for fire suppression and assistance in incidences • Adopted state building codes but lacks enforcement

City of Wimbledon

Impact	4	<ul style="list-style-type: none"> • Property damage, broken windows, flying shingles • Toppled trees, uprooted • Loss of life, injury • Loss of crop and livestock • Loss of power • Could start a fire of buildings and structures, could allow grass fire to spread
Frequency	4	<ul style="list-style-type: none"> • Occurs throughout the year in all weather conditions • Straight line winds mostly in summer months, tree debris • Spring is when wind is strongest
Likelihood	4	<ul style="list-style-type: none"> • Removal of tree rows allows for wind to impact city more directly • Cyclical weather patterns could increase or decrease • Lack of buildings on west side of city-wind has direct access into town
Vulnerability	3	<ul style="list-style-type: none"> • Power lines in town not buried-power outages • Fire hall for shelter • No redundancy in power grid • Larger old trees, cottonwoods are older and more susceptible
Capability	1	<ul style="list-style-type: none"> • no state building codes • inert landfill/field • Residents that have equipment for cleanup • Fire department has equipment • Lack of manpower in general due to small size • No evacuation plan

	<ul style="list-style-type: none"> • Independent nature of residents • No infrastructure programs
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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 Barnes County Courthouse in Barnes 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 cities of Fingal, Kathryn, Leal, Nome, Oriska, Sanborn, and Valley City have adopted building codes while the cities of Dazey, Litchville, Pillsbury, Rogers, Sibley and Wimbledon have not. This lack puts these cities are more at risk to damage and impacts from windstorms as a result. 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. However, the city of Valley City is the only jurisdiction with a building inspector for enforcement.

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

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:

- Barnes County Emergency Operations Plan
- North Dakota Emergency Operations Plan, Severe Storms Annex

6. Mitigation Strategy

Mitigation Purpose, Goals, and Projects

This update of the Barnes County Multi-Jurisdictional Multi-Hazard Plan includes a mitigation strategy consisting of six goals and specific mitigation projects for each incorporation jurisdiction based on the risk assessment developed at Planning Committee and jurisdictional meetings. A total of 86 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. Problem statements, which assisted in formulating specific mitigation actions to reduce the impacts of hazards, are shown for each incorporated jurisdiction before the mitigation actions.

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

Goal 1: Improve public awareness of hazards.

Goal 2: Implement education programs for people to protect themselves.

Goal 3: Improve planning and regulation in jurisdictions to mitigate hazards.

Goal 4: Reduce impact of hazards.

Goal 5: Improve resiliency of critical facilities and infrastructure.

Goal 6: Provide places of refuge and early warnings for public and vulnerable populations 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
- Hazard(s) addressed
- Project status
- Priority
- Responsible agency
- Partners
- Timeframe for completion
- Cost and
- Funding sources

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 one to five (1 to 5) scoring. A score of one (1) indicated a project is ineffective, not feasible and/or too costly, and a five (5) indicated the project was highly effective, feasible and/or a higher benefit compared to cost. A score of three (3) was neutral.

Each mitigation project included in the plan is valuable as it addresses needs specific to Barnes County and its jurisdictions. Due to a varied 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 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 in based on the capabilities of all jurisdictions. Table 6.1 on the following page summarizes the projects by priority by Jurisdiction.

Table 6.1 – Prioritization of Mitigation Projects by Jurisdiction

Jurisdiction	Project Number by Prioritization		
	Low	Medium	High
Barnes County	2, 7	9, 13, 22	1, 4, 5, 6, 8, 10, 11, 12, 14, 15, 16, 17, 18, 19, 20, 21, 23, 24, 25, 26, 27, 28
Dazey	1, 2, 3	--	--
Fingal	1, 3	2	--
Kathryn	1	--	2, 3, 4
Leal	--	--	1, 2
Litchville	1	2	--
Nome	4	--	1, 2, 3
Oriska	--	4	1, 2, 3
Pillsbury	--	--	1, 2, 3
Rogers	--	--	1, 2, 3
Sanborn	--	2	1, 3, 4, 5
Sibley	--	1	2, 3, 4, 5
Valley City	14	5, 11, 13, 15, 16	1, 2, 3, 4, 6, 7, 8, 9, 10, 12, 14
Wimbledon	--	--	1, 2, 3

Acronyms

The acronyms used in the mitigation projects profiles are described as follows:

Acronym	Entity
BRWD	Barnes Rural Water District
County Road Dept.	Barnes County Road Department
DWU	Dakota Water Users
Dept. of Commerce	N.D. Department of Commerce
EM	Barnes County Emergency Manager
Extension Service	NDSU/Barnes County Extension Service
FEMA	Federal Emergency Management Agency
FSA	USDA Farm Service Agency
KLJ	Kadrmass, Lee & Jackson
NDDDES	N.D. Department of Emergency Services
NDDOT	N.D. Department of Transportation
NDTOA	N.D. Townships Officers Association
NRCS	USDA Natural Resources Conservation Service
NWS	National Weather Service
Public Utilities	Bek Communications, Dakota Central, Dickey Rural Networks, Inter-Community Telephone Company, Mid-Continent, Montana-Dakota Utilities, Qwest, Otter Tail Power Company
Public Works	Valley City Public Works
Red Cross	American Red Cross
Regional Council	South Central Dakota Regional Council
RD	USDA Rural Development
Social Services	Barnes County Social Services
State Water Commission	N.D. State Water Commission
USACE	United States Army Corps. of Engineers
WRD	Barnes County Water Resource District

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.

Barnes County

Barnes County is impacted by communicable disease, dam failure, drought, flood, geologic hazards, hazardous material release, homeland security incident, severe summer weather, severe winter weather, shortage or outage of critical materials or infrastructure, transportation accidents, urban fire/structure collapse, wildland fire and windstorm. Flooding is a major issue in many communities due to the presence of a high water table, closed basins, and the Sheyenne River traversing through the county. Many communities experience isolation from impacts of hazards due to the rural nature of the county. 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 construction of permanent flood control measures and other large-scale mitigation projects. Permanent flood protection, flood control measures, education and outreach, drainage, upgrading of critical facilities and infrastructure, upgrading of emergency sirens and construction of additional storms shelters are a priority for the county.

Barnes County Project 1: Use Barnes County Emergency Management website and local media outlets to improve household disaster preparedness.

Description/Benefit	To keep households ready in case of a disaster.
Hazards Addressed	All hazards
Affected Jurisdictions	Barnes County, Dazey, Fingal, Kathryn, Leal, Litchville, Nome, Oriska, Pillsbury, Rogers, Sanborn, Sibley, Valley City, Wimbledon
Project Status	New
Priority	High
Responsible Agency	Emergency Manager: Kim Franklin Radio Stations: KSJB, KQDJ, KDDR Newspapers: Valley City Times-Record and Litchville Bulletin Digital Media: Bek Communications, CSI, Daktel, DRN, ICTC, Mid-Continent, Qwest, Satellite/DirecTV
Partners	NDDES, Red Cross, FEMA, NWS, city & county governments, health districts, social services
Timeframe for Completion	Ongoing
Cost	\$0 to \$1,000 annually
Funding Source	County, state, federal, city, private

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34

Barnes County Project 2: Increase awareness of drought tolerant practices in farming and municipalities.

Description/Benefit	Make public aware of farming, crop programs and use of green (recycled) water. Educating the public on rationing/restrictions on water usage.
Hazards Addressed	Drought, Fire
Affected Jurisdictions	Barnes County, Dazey, Fingal, Kathryn, Leal, Litchville, Nome, Oriska, Pillsbury, Rogers, Sanborn, Sibley, Valley City, Wimbledon
Project Status	Continue
Priority	Low
Responsible Agency	Barnes County Water Resource District Manager Bruce Anderson Extension service, Farm Services Agency, Agroline, ADM-Benson Quinn
Partners	Fire departments/districts, soil conservation, elevators, city/county government, EM, State Water Commission, USACE
Timeframe for Completion	1 year or less
Cost	\$1,500 per year
Funding Source	Grants (state, federal, utilities), local budgets

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	4	5	5	3	4	5	31

Barnes County Project 3: 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. Educate residents on the importance of shelter-in-place.
Hazards Addressed	Shortage or Outage of Critical Materials or Infrastructure
Affected Jurisdictions	Barnes County, Dazey, Fingal, Kathryn, Leal, Litchville, Nome, Oriska, Pillsbury, Rogers, Sanborn, Sibley, Valley City, Wimbledon
Project Status	Ongoing and continue
Priority	High
Responsible Agency	Barnes County Emergency Manager Kim Franklin Barnes County Sheriff Randy McClafin Valley City Police Department Chief of Police Fred Thompson
Partners	Social services, EM, fire departments and districts, health districts, public utilities, county/city government, fuel suppliers
Timeframe for Completion	6 months or less
Cost	\$1,500 to \$2,000
Funding Source	Grants (state, federal, utilities)

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	4	5	5	4	4	5	32

Barnes County Project 4: Increase awareness of methods for prevention of communicable diseases.

Description/Benefit	Make public aware of risk of communicable diseases and methods for prevention in people; animals and crops for economic impact.
Hazards Addressed	Communicable Disease
Affected Jurisdictions	Barnes County, Dazey, Fingal, Kathryn, Leal, Litchville, Nome, Oriska, Pillsbury, Rogers, Sanborn, Sibley, Valley City, Wimbledon
Project Status	Ongoing and Continue
Priority	High
Responsible Agency	City-County Health Director Theresa Will
Partners	Central Valley Health District, social services, EM, fire departments and districts, county/city government
Timeframe for Completion	Ongoing
Cost	\$300 for a PSA, \$1,000 to \$3,000/week for substantial outreach
Funding Source	Grants (state, federal, utilities), county budget

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35

Barnes County Project 5: Increase awareness of hazardous materials.

Description/Benefit	Make the public aware of risk from hazardous materials and keep informed on current railroad shipping methods, storage sites and weather events.
Hazards Addressed	Hazardous Material Release (All)
Affected Jurisdictions	Barnes County, Dazey, Fingal, Kathryn, Leal, Litchville, Nome, Oriska, Pillsbury, Rogers, Sanborn, Sibley, Valley City, Wimbledon
Project Status	Ongoing and Continue
Priority	High
Responsible Agency	Barnes County Emergency Manager Kim Franklin BNSF and CPR Agriculture companies
Partners	City, state, federal, local government
Timeframe for Completion	Ongoing
Cost	Free – through media
Funding Source	Local, state, federal, private

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35

Barnes County Project 6: Assure continuous and effective operation of Code Red/emergency telephone notification system and promote residents to sign up.

Description/Benefit	Keep public informed on current weather events and maintain communication in cell phone outage areas.
Hazards Addressed	All
Affected Jurisdictions	Barnes County, Dazey, Fingal, Kathryn, Leal, Litchville, Nome, Oriska, Pillsbury, Rogers, Sanborn, Sibley, Valley City, Wimbledon
Project Status	Ongoing and continue
Priority	High
Responsible Agency	Barnes County Emergency Manager Kim Franklin
Partners	Digital Media: Bek Communications, CSI, Daktel, DRN, ICTC, Mid-Continent, Qwest, Satellite/DirecTV Barnes County Commission
Timeframe for Completion	Ongoing
Cost	\$3,00 to \$5,000 per year
Funding Source	Local, state, federal

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35

Barnes County Project 7: Encourage farmers and general public to have insurance to protect from property losses from hazards.

Description/Benefit	Benefit to crop insurance, residential conservation practices, and property insurance.
Hazards Addressed	Drought, Flood, Severe Summer Weather
Affected Jurisdictions	Barnes County, Dazey, Fingal, Kathryn, Leal, Litchville, Nome, Oriska, Pillsbury, Rogers, Sanborn, Sibley, Valley City, Wimbledon
Project Status	New
Priority	Low
Responsible Agency	Farm Services Agency, private insurance companies
Partners	EM, county extension, agricultural producers
Timeframe for Completion	Ongoing
Cost	\$0
Funding Source	Local, state, federal

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
3	3	3	3	3	3	3	21

Barnes County Project 8: Increase education and awareness of fire safety and prevention.

Description/Benefit	Make the public aware of methods to remain safe from risk of fire and potential prevention methods. Keep areas around buildings and structures clear grass, overgrown vegetation and debris.
Hazards Addressed	Urban Fire/Structure Collapse, Wildland Fire
Affected Jurisdictions	Barnes County, Dazey, Fingal, Kathryn, Leal, Litchville, Nome, Oriska, Pillsbury, Rogers, Sanborn, Sibley, Valley City, Wimbledon
Project Status	Ongoing and continue
Priority	High
Responsible Agency	Dazey Fire District/Department Fire Chief Daryl Kunze Fingal Fire Department Fire Chief Mike Koller Kathryn Fire District/Department Fire Chief Rick Velvre Leal Fire Department Fire Chief Eugene Jewett Litchville Fire Department Fire Chief Darren Miedema Nome Fire Department Fire Chief Randy Langland Oriska Fire Department Fire Chief Buck Trader Hope Fire Department Fire Chief Jeff Juliuson Rogers Fire Department Fire Chief Fred Wanzek Sanborn Fire Department Fire Chief Valley City Fire District/Department Fire Chief Gary Retterath Valley City Fire District/Department Captain Ron Burchill Wimbledon Fire Department Fire Chief Kurt Wagner
Partners	City, state, federal, local government, EM, ambulance and police, City-County Health, Central Valley Health District
Timeframe for Completion	6 months – ongoing
Cost	\$10,000 to \$15,000
Funding Source	Local, state, federal, private

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35

Barnes County Project 9: Encourage jurisdictions to review and implement ordinances.

Description/Benefit	Build the planning and regulatory capability of incorporated jurisdictions through plans, policies, and ordinances.
Hazards Addressed	All
Affected Jurisdictions	Barnes County, Dazey, Fingal, Kathryn, Leal, Litchville, Nome, Oriska, Pillsbury, Rogers, Sanborn, Sibley, Valley City, Wimbledon
Project Status	New
Priority	Medium
Responsible Agency	Barnes County Planning Commission Dazey City Council: Contact – City Auditor Darlene Hare Fingal City Council: Contact – City Auditor Corrine Ertelt Kathryn City Council: Contract – City Auditor Shirley Sivertson Leal City Council: Contact – City Auditor Mary Udem Litchville City Council: Contact – City Auditor Connie Smith Nome City Council: Contact – City Auditor Alice Capman Oriska City Council: Contact – City Auditor Katie Pommerer Pillsbury City Council: Contact – City Auditor Dennis McGuire Rogers City Council: Contact – City Auditor Tina Vincent Sanborn City Council: Contact – City Auditor Julie Franklin Sibley City Council: Contact – City Auditor Typhanny Schuler Valley City City Commission: Contact – City Auditor Avis Richter Wimbledon City Council: Contact – City Auditor Leon Doyle
Partners	City, state, federal, local government
Timeframe for Completion	Yearly
Cost	\$0 to \$500
Funding Source	Local, state, federal, private

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
4	4	4	4	4	4	4	28

Barnes County Project 10: Encourage jurisdictions to create and implement capital improvement plans that address infrastructure vulnerable to hazards.

Description/Benefit	To ensure maintenance and improvement of capital investments and incorporate mitigation actions to reduce future losses.
Hazards Addressed	All
Affected Jurisdictions	Dazey, Leal, Litchville, Oriska, Pillsbury, Rogers, Sanborn, Sibley, Wimbledon
Project Status	New
Priority	High
Responsible Agency	Dazey City Council: Contact – City Auditor Darlene Hare Leal City Council: Contact – City Auditor Mary Udem Litchville City Council: Contact – City Auditor Connie Smith Oriska City Council: Contact – City Auditor Katie Pommerer Pillsbury City Council: Contact – City Auditor Dennis McGuire Rogers City Council: Contact – City Auditor Tina Vincent Sanborn City Council: Contact – City Auditor Julie Franklin Sibley City Council: Contact – City Auditor Typhanny Schuler Wimbledon City Council: Contact – City Auditor Leon Doyle
Partners	Engineers, regional council, Dept. of Commerce, N.D. League of Cities, N.D. Association of Counties, NDTOA
Timeframe for Completion	Yearly
Cost	\$1,000 to \$1,200
Funding Source	Local budgets, grants, USDA RD

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35

Barnes County Project 11: Encourage jurisdictions to adopt State Building Codes.

Description/Benefit	To ensure new and existing structures adhere to building standard to withstand impacts from hazards.
Hazards Addressed	All
Affected Jurisdictions	Dazey, Litchville, Pillsbury, Rogers, Sibley, Wimbledon
Project Status	New
Priority	High
Responsible Agency	Dazey City Council: Contact – City Auditor Darlene Hare Litchville City Council: Contact – City Auditor Connie Smith Pillsbury City Council: Contact – City Auditor Dennis McGuire Rogers City Council: Contact – City Auditor Tina Vincent Sibley City Council: Contact – City Auditor Typhanny Schuler Wimbledon City Council: Contact – City Auditor Leon Doyle
Partners	Dept. of Commerce, N.D. League of Cities, N.D. Association of Counties, NDTOA
Timeframe for Completion	Yearly
Cost	\$1,500 to \$2,000
Funding Source	Local, state, federal budgets

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35

Barnes County Project 12: Assure Barnes County has FEMA-Approved Mitigation Plan.

Description/Benefit	Continuous assessing of jurisdictional vulnerabilities and update of hazards and impacts.
Hazards Addressed	All
Affected Jurisdictions	Barnes County, Dazey, Fingal, Kathryn, Leal, Litchville, Nome, Oriska, Pillsbury, Rogers, Sanborn, Sibley, Valley City, Wimbledon, Barnes County Water Resource District
Project Status	Done. Ongoing and continue.
Priority	High
Responsible Agency	Barnes County Emergency Manager Kim Franklin
Partners	Barnes County Commission, city councils, NDDDES, regional council
Timeframe for Completion	4 to 5 years
Cost	\$30,000 to \$50,000
Funding Source	Local, state, federal

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35

Barnes County Project 13: Strengthen building codes and land use regulations.

Description/Benefit	To ensure new and existing structures adhere to building standard to withstand impacts from hazards and responsible management of land resources.
Hazards Addressed	All
Affected Jurisdictions	Barnes County, Dazey, Fingal, Kathryn, Leal, Litchville, Nome, Oriska, Pillsbury, Rogers, Sanborn, Sibley, Valley City, Wimbledon, Barnes County Water Resource District
Project Status	Continue
Priority	Medium-High
Responsible Agency	Barnes County Planning Commission Dazey City Council: Contact – City Auditor Darlene Hare Fingal City Council: Contact – City Auditor Corrine Ertelt Kathryn City Council: Contract – City Auditor Shirley Sivertson Leal City Council: Contact – City Auditor Mary Udem Litchville City Council: Contact – City Auditor Connie Smith Nome City Council: Contact – City Auditor Alice Capman Oriska City Council: Contact – City Auditor Katie Pommerer Pillsbury City Council: Contact – City Auditor Dennis McGuire Rogers City Council: Contact – City Auditor Tina Vincent Sanborn City Council: Contact – City Auditor Julie Franklin Sibley City Council: Contact – City Auditor Typhanny Schuler Valley City City Commission: Contact – City Auditor Avis Richter Wimbledon City Council: Contact – City Auditor Leon Doyle
Partners	Dept. of Commerce, N.D. League of Cities, N.D. Association of Counties, NDTOA
Timeframe for Completion	Ongoing
Cost	\$2,000 per review
Funding Source	Local, state, federal

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	4	5	33

Barnes County Project 14: Assure new development is built in areas with low risk to hazards.

Description/Benefit	Limit losses of life and property from hazards. To ensure new development can provide highest positive impact to communities.
Hazards Addressed	All
Affected Jurisdictions	Barnes County, Dazey, Fingal, Kathryn, Leal, Litchville, Nome, Oriska, Pillsbury, Rogers, Sanborn, Sibley, Valley City, Wimbledon, Barnes County Water Resource District
Project Status	New
Priority	High
Responsible Agency	Barnes County Planning Commission Dazey City Council: Contact – City Auditor Darlene Hare Fingal City Council: Contact – City Auditor Corrine Ertelt Kathryn City Council: Contract – City Auditor Shirley Sivertson Leal City Council: Contact – City Auditor Mary Udem Litchville City Council: Contact – City Auditor Connie Smith Nome City Council: Contact – City Auditor Alice Capman Oriska City Council: Contact – City Auditor Katie Pommerer Pillsbury City Council: Contact – City Auditor Dennis McGuire Rogers City Council: Contact – City Auditor Tina Vincent Sanborn City Council: Contact – City Auditor Julie Franklin Sibley City Council: Contact – City Auditor Typhanny Schuler Valley City City Commission: Contact – City Auditor Avis Richter Wimbledon City Council: Contact – City Auditor Leon Doyle
Partners	Dept. of commerce, N.D. League of Cities, N.D. Association of Counties, NDTOA
Timeframe for Completion	Ongoing
Cost	\$2,000 per year/review
Funding Source	Local, state, federal

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	4	5	33

Barnes County Project 15: Create post-disaster debris management plan.

Description/Benefit	Provide temporary staging site for disposal of waste for all communities in the county and improve quality of life.
Hazards Addressed	All
Affected Jurisdictions	Barnes County, Dazey, Fingal, Kathryn, Leal, Litchville, Nome, Oriska, Pillsbury, Rogers, Sanborn, Sibley, Valley City, Wimbledon, Barnes County Water Resource District
Project Status	New
Priority	High
Responsible Agency	Barnes County Emergency Manager Kim Franklin City-Count Health Director Theresa Will Townships
Partners	Emergency agencies (ambulance, fire, police), engineering firms, regional council, NDDH
Timeframe for Completion	1 to 3 years
Cost	Up to \$1,000
Funding Source	Local, State, Federal

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	3	1	5	5	29

Barnes County Project 16: Remove existing structures from flood prone areas.

Description/Benefit	Economic resiliency. Residents with property at risk would be protected. Convert former lots into greenway/recreation areas for improved quality of life.
Hazards Addressed	Flood (Overland, Riverine), Geologic Hazard (Landslide)
Affected Jurisdictions	Barnes County, Dazey, Fingal, Kathryn, Leal, Litchville, Nome, Oriska, Pillsbury, Rogers, Sanborn, Sibley, Valley City, Wimbledon, Barnes County Water Resource District
Project Status	Ongoing and continue
Priority	High
Responsible Agency	Barnes County Emergency Manager Kim Franklin Dazey City Council: Contact – City Auditor Darlene Hare Fingal City Council: Contact – City Auditor Corrine Ertelt Kathryn City Council: Contract – City Auditor Shirley Sivertson Leal City Council: Contact – Mary Udem Litchville City Council: Contact – Connie Smith Nome City Council: Contact – Alice Capman Oriska City Council: Contact – Katie Pommerer Pillsbury City Council: Contact – Dennis McGuire Rogers City Council: Contact – Tina Vincent Sanborn City Council: Contact – Julie Franklin Sibley City Council: Contact – Typhanny Schuler Valley City City Commission: Contact – Avis Richter Wimbledon City Council: Contact – Leon Doyle
Partners	Barnes County Commission, State Water Commission, FEMA, insurance agents, regional council
Timeframe for Completion	Ongoing
Cost	\$50,000 to \$300,000 depending on the property and structure
Funding Source	County and city, state, federal, grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
3	5	5	3	5	2	5	28

Barnes County Project 17: Remove existing structures from areas prone to geologic hazards (landslides).

Description/Benefit	Economic resiliency. Residents with property at risk would be protected. Convert former lots into open space or wildlife habitat.
Hazards Addressed	Flood (Overland, Riverine), Geologic Hazard (Landslides)
Affected Jurisdictions	Barnes County, Sibley, Valley City
Project Status	Ongoing and continue
Priority	High
Responsible Agency	Barnes County Emergency Manager Kim Franklin Barnes County Water Resource District Manager Bruce Anderson Barnes County Planning and Zoning Administration Betty Koslofsky Valley City City Administrator Dave Schelkoph Sibley City Council: Contact – Auditor Typhanny Schuler Valley City City Commission: Contact – Auditor Avis Richter
Partners	Barnes County Commission, FEMA, State Water Commission, engineering firms, regional council
Timeframe for Completion	Ongoing
Cost	\$50,000 to \$300,000 depending on the property and structure
Funding Source	County and city, state, federal, grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
4	5	5	3	5	2	5	29

Barnes County Project 18: Encourage participation in NFIP to mitigate impacts of flooding.

Description/Benefit	Economic resiliency. Residents with property at risk would be insured.
Hazards Addressed	Flood (Riverine)
Affected Jurisdictions	Barnes County, Kathryn, Litchville, Valley City
Project Status	Ongoing and continue.
Priority	High
Responsible Agency	Barnes County Emergency Manager Kim Franklin Barnes County Floodplain Administrator Kim Franklin Kathryn City Council: Contact – Auditor Typhanny Schuler Litchville City Council: Contact – Auditor Connie Smith Valley City City Commission: Contact – Auditor Avis Richter
Partners	Barnes County Commission, state, FEMA, insurance agents
Timeframe for Completion	Ongoing
Cost	\$500 to \$1,000 per year
Funding Source	County and city, state, federal, grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35

Barnes County Project 19: Review of ordinances to assure jurisdictions meet minimum federal and state requirements to comply with NFIP.

Description/Benefit	To ensure program benefits are available to residents and jurisdictions.
Hazards Addressed	Flood (Riverine)
Affected Jurisdictions	Barnes County, Kathryn, Litchville, Valley City
Project Status	Ongoing and continue.
Priority	High
Responsible Agency	Barnes County Emergency Manager Kim Franklin Barnes County Floodplain Administrator Kim Franklin Kathryn City Council: Contact – Auditor Typhanny Schuler Litchville City Council: Contact – Auditor Connie Smith Valley City City Commission: Contact – Auditor Avis Richter
Partners	Barnes County Commission, state, FEMA, insurance agents
Timeframe for Completion	Ongoing
Cost	\$500 to \$1,000 per year
Funding Source	County and city, state, federal, grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35

Barnes County Project 20: Create a plan identifying alternative water sources for fire suppression.

Description/Benefit	Assure water to fight fires. Creeks, rivers, lakes, sloughs, irrigation wells, rural water, and water tenders at major agriculture chemical companies.
Hazards Addressed	Drought, Hazard Material Release, Transportation Accident, Urban Fire/Structure Collapse, Wildland Fire
Affected Jurisdictions	Barnes County, Dazey, Fingal, Kathryn, Leal, Litchville, Nome, Oriska, Pillsbury, Rogers, Sanborn, Sibley, Valley City, Wimbledon, Barnes County Water Resource District
Project Status	New
Priority	High
Responsible Agency	Barnes County Emergency Manager Kim Franklin Dazey Fire District/Department Fire Chief Daryl Kunze Fingal Fire Department Fire Chief Mike Koller Kathryn Fire District/Department Fire Chief Rick Velvre Leal Fire Department Fire Chief Eugene Jewett Litchville Fire Department Fire Chief Darren Miedema Nome Fire Department Fire Chief Randy Langland Oriska Fire Department Fire Chief Buck Trader Hope Fire Department Fire Chief Jeff Juliuson Rogers Fire Department Fire Chief Fred Wanzek Sanborn Fire Department Fire Chief Sibley Fire Department Fire Chief Mike Schuler Valley City Fire District/Department Fire Chief Gary Retterath Valley City Fire District/Department Captain Ron Burchill Wimbledon Fire Department Fire Chief Kurt Wagner
Partners	State Water Commission, USACE, BRWD, DWU, agriculture companies, N.D. Game & Fish
Timeframe for Completion	1 year
Cost	\$2,000
Funding Source	Local, state and federal, grants, fundraisers, local fire budgets.

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
4	5	4	5	4	5	4	31

Barnes County Project 21: Relocate existing propane, anhydrous and fuel tanks, and fertilizer plants away from residential areas and community assets to areas with conducive uses.

Description/Benefit	Assure adequate equipment and training to address situation resulting from fires and other hazards from the scope of their abilities.
Hazards Addressed	Hazardous Material Release, Homeland Security Incident, Flood, Severe Summer Weather, Severe Winter Weather, Transportation Accident, Urban Fire/Structure Collapse, Wildland Fire, Windstorm
Affected Jurisdictions	Barnes County, Dazey, Fingal, Kathryn, Leal, Litchville, Nome, Oriska, Pillsbury, Rogers, Sanborn, Sibley, Valley City, Wimbledon, Barnes County Water Resource District
Project Status	New
Priority	High
Responsible Agency	Barnes County Emergency Manager Kim Franklin Dazey Fire District/Department Fire Chief Daryl Kunze Fingal Fire Department Fire Chief Mike Koller Kathryn Fire District/Department Fire Chief Rick Velvre Leal Fire Department Fire Chief Eugene Jewett Litchville Fire Department Fire Chief Darren Miedema Nome Fire Department Fire Chief Randy Langland Oriska Fire Department Fire Chief Buck Trader Hope Fire Department Fire Chief Jeff Juliuson Rogers Fire Department Fire Chief Fred Wanzek Sanborn Fire Department Fire Chief Sibley Fire Department Fire Chief Mike Schuler Valley City Fire District/Department Fire Chief Gary Retterath Valley City Fire District/Department Captain Ron Burchill Wimbledon Fire Department Fire Chief Kurt Wagner
Partners	Elevators, cities, county. Fuel, propane and chemical companies.
Timeframe for Completion	5 to 10 years
Cost	Project specific
Funding Source	Local, state and federal, grants, fundraisers, local fire budgets.

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	3	4	4	5	30

Barnes County Project 22: Install solar-powered electronic Fire Danger Index Signs along highways and county roads near jurisdictions.

Description/Benefit	Identifying proper locations to implement signage that is most effective. Reduce risk of fire hazard from outdoor burning by residents.
Hazards Addressed	Drought, Hazard Material Release, Wildland Fire
Affected Jurisdictions	Barnes County, Dazey, Fingal, Kathryn, Leal, Nome, Oriska, Pillsbury, Rogers, Wimbledon
Project Status	New
Priority	Medium
Responsible Agency	Barnes County Commission Barnes County Emergency Manager Kim Franklin Barnes County Highway Superintendent Kerry Johnson Dazey Fire District/Department Fire Chief Daryl Kunze Fingal Fire Department Fire Chief Mike Koller Kathryn Fire District/Department Fire Chief Rick Velvre Leal Fire Department Fire Chief Eugene Jewett Nome Fire Department Fire Chief Randy Langland Oriska Fire Department Fire Chief Buck Trader Hope Fire Department Fire Chief Jeff Juliuson Rogers Fire Department Fire Chief Fred Wanzek Wimbledon Fire Department Fire Chief Kurt Wagner
Partners	City councils, EM, N.D. Attorney General-Fire Marshal Division, highway depts.
Timeframe for Completion	3 to 5 years
Cost	Up to \$5,000
Funding Source	Local, state and federal, grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
4	2	1	2	4	2	2	17

Barnes County Project 23: Create plans for loss of services.

Description/Benefit	Sheltering-in-place, Evacuating, Water and Fuel Rationing, Triage Medicine.
Hazards Addressed	Flood, Shortage or Outage of Critical Materials or Infrastructure, Severe Summer Weather, Severe Winter Weather
Affected Jurisdictions	Barnes County, Dazey, Fingal, Kathryn, Leal, Litchville, Nome, Oriska, Pillsbury, Rogers, Sanborn, Sibley, Valley City, Wimbledon, Barnes County Water Resource District
Project Status	Ongoing and continue
Priority	High
Responsible Agency	Barnes County Emergency Manager Kim Franklin City-Couth Health Director Theresa Will Dazey City Council: Contact – City Auditor Darlene Hare Fingal City Council: Contact – City Auditor Corrine Ertelt Kathryn City Council: Contract – City Auditor Shirley Sivertson Leal City Council: Contact – Mary Udem Litchville City Council: Contact – Connie Smith Nome City Council: Contact – Alice Capman Oriska City Council: Contact – Katie Pommerer Pillsbury City Council: Contact – Dennis McGuire Rogers City Council: Contact – Tina Vincent Sanborn City Council: Contact – Julie Franklin Sibley City Council: Contact – Typhanny Schuler Valley City City Commission: Contact – Avis Richter Wimbledon City Council: Contact – Leon Doyle
Partners	Social services, fire departments and districts, public utilities, Central Valley Health District
Timeframe for Completion	1 year
Cost	Plan specific
Funding Source	Grants (state, federal, utilities)

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35

Barnes County Project 24: Install generator at City-County Health.

Description/Benefit	Establish permanent source of backup power to maintain continued operation of refrigeration units storing vaccinations.
Hazards Addressed	All
Affected Jurisdictions	Barnes County, Dazey, Fingal, Kathryn, Leal, Litchville, Nome, Oriska, Pillsbury, Rogers, Sanborn, Sibley, Valley City, Wimbledon, Barnes County Water Resource District
Project Status	New
Priority	High
Responsible Agency	City-County Health Director Theresa Will
Partners	Jurisdictional officials, emergency agencies (ambulance, fire, police), engineering firms, regional council, Central Valley City District
Timeframe for Completion	1 year
Cost	\$50,000 to \$100,000
Funding Source	City, county, state and federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35

Barnes County Project 25: Raise road grades to prevent blockage.

Description/Benefit	Raise road grades to prevent blockage.
Hazards Addressed	Flood, Severe Summer Weather, Severe Winter Weather
Affected Jurisdictions	Barnes County, Dazey, Fingal, Kathryn, Leal, Litchville, Nome, Oriska, Pillsbury, Rogers, Sanborn, Sibley, Valley City, Wimbledon, Barnes County Water Resource District
Project Status	Ongoing and continue.
Priority	High
Responsible Agency	Barnes County Highway Superintendent Kerry Johnson Township Boards
Partners	Emergency agencies (ambulance, fire, police), engineering firms, EM, NDDOT
Timeframe for Completion	Ongoing
Cost	Project Specific
Funding Source	County, state and federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
4	5	3	5	5	4	4	30

Barnes County Project 26: Engineer or retrofit roads and bridges to withstand hazards.

Description/Benefit	Increase resiliency of roads to provide transportation and maintain access for emergency services in the county.
Hazards Addressed	All
Affected Jurisdictions	Barnes County, Dazey, Fingal, Kathryn, Leal, Litchville, Nome, Oriska, Pillsbury, Rogers, Sanborn, Sibley, Valley City, Wimbledon, Barnes County Water Resource District
Project Status	Ongoing and continue
Priority	High
Responsible Agency	Barnes County Highway Superintendent Kerry Johnson Township Boards
Partners	Emergency agencies (ambulance, fire, police), engineering firms, EM, NDDOT
Timeframe for Completion	5 to 10 years
Cost	Project specific
Funding Source	County, state and federal grants, private (BMSF)

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	3	4	3	3	5	28

Barnes County Project 27: Assure continued monitoring and maintenance of all dams in Barnes County.

Description/Benefit	To protect human life and property from dam failures.
Hazards Addressed	Dam Failure
Affected Jurisdictions	Sibley, Valley City, Kathryn
Project Status	Ongoing and continue.
Priority	High
Responsible Agency	U.S. Army Corps of Engineers, N.D. Flood Control Project Section Supervisor Rick Schueneman
Partners	EM, state, FEMA, BWRD, N.D Game & Fish
Timeframe for Completion	Ongoing
Cost	TBD
Funding Source	County and city, state, federal, grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35

Barnes County Project 28: Maintain Sheyenne River channel maintenance.

Description/Benefit	Maintain flow of runoff to eliminate standing water and control growth of vegetation to minimize fire hazard and spread of disease.
Hazards Addressed	Flood, Severe Summer Weather, Severe Winter Weather, Windstorm
Affected Jurisdictions	Sibley, Kathryn, Valley City
Project Status	New
Priority	High
Responsible Agency	Barnes County Water Resource District Manager Bruce Anderson
Partners	Barnes County Commission, State Water Commission, EM
Timeframe for Completion	Ongoing
Cost	\$50,000 to \$100,000
Funding Source	City, County, State and Federal Grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	4	5	5	34

City of Dazey

Located in a closed basin, the city of Dazey experiences overland flooding causing damage to property, critical facilities, and infrastructure. The city lacks generators for backup power and the emergency siren is manually activated. With little to no capabilities, the city is dependent on outside sources for mitigation.

Improved drainage, installation of generators and an upgraded emergency siren are a priority for the city.

City of Dazey Project 1: Establish permanent drainage from the city park to the slough east of the city to eliminate occurrences of overland flooding.

Description/Benefit	Reduction of damage to critical facilities and infrastructure from annual flooding to assure access for emergency services and continued operation of public infrastructure.
Hazards Addressed	Communicable Disease, Drought, Flood (Overland), Severe Summer Weather, Severe Winter Weather, Transportation Accident, Fire, Windstorm
Affected Jurisdictions	City of Dazey
Project Status	Continue
Priority	High
Responsible Agency	Dazey City Council: Contact – City Auditor Darlene Hare Barnes County Emergency Manager Kim Franklin Barnes County Water Resource District Manager Bruce Anderson
Partners	State Water Commission, NDDOT, township board
Timeframe for Completion	Ongoing
Cost	TBD
Funding Source	Local, state and federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	3	3	5	1	27

City of Dazey Project 2: Install generators for the city lift station and pump house.

Description/Benefit	Establish permanent source of backup power to maintain continued operation of the sanitary sewer system and pump house for drinking water.
Hazards Addressed	All
Affected Jurisdictions	City of Dazey
Project Status	New
Priority	High
Responsible Agency	Dazey City Council: Contact – City Auditor Darlene Hare Barnes County Emergency Manager Kim Franklin
Partners	Jurisdictional officials, emergency agencies (ambulance, fire, police), engineering firms, regional council
Timeframe for Completion	3 years
Cost	Project specific
Funding Source	City, county, state and federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34

City of Dazey Project 3: Install upgraded warning system.

Description/Benefit	Install updated warning siren replacing manually-activated siren with county-dispatch-activated sirens. The siren provides warning for people to take shelter from approaching storms.
Hazards Addressed	Fire, Severe Summer Weather, Windstorm
Affected Jurisdictions	City of Dazey
Project Status	New
Priority	High
Responsible Agency	Dazey City Council: Contact – City Auditor Darlene Hare Barnes County Emergency Manager Kim Franklin
Partners	Barnes County Commission, fire departments and districts
Timeframe for Completion	1 to 3 years
Cost	\$7,500 per siren
Funding Source	Local, state and federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34

City of Fingal

The city of Fingal experiences overland flooding on Main Street/4th Avenue due to poor drainage. Changes in agriculture practices of surrounding farmland has increased runoff causing additional flooding issues in the city. Critical facilities and infrastructure are vulnerable to flooding. Transportation accidents are another issue as the city has seen an increase in truck and rail traffic. With little to no additional capabilities, the city is dependent on outside sources for mitigation.

Improved drainage, installation of backup power sources, and improvements to transportation systems are a priority for the city.

City of Fingal Project 1: Create and implement drainage ditch maintenance system for drain at County Road 34 and 1st Avenue near railroad crossing.

Description/Benefit	Maintain flow of runoff to eliminate standing water blocking roads to maintain access for city residents and emergency services and continued operation of public infrastructure. Control growth of vegetation to minimize fire hazard and spread of disease.
Hazards Addressed	Communicable Disease, Drought, Flood (Overland), Severe Summer Weather, Severe Winter Weather, Transportation Accident, Fire, Windstorm
Affected Jurisdictions	City of Fingal
Project Status	New
Priority	Medium
Responsible Agency	Fingal City Council: Contact – City Auditor Corrine Ertelt Barnes County Emergency Manager Kim Franklin Barnes County Water Resource District Manager Bruce Anderson
Partners	State Water Commission, NDDOT, township board
Timeframe for Completion	Ongoing
Cost	TBD
Funding Source	Local, state and federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	3	3	5	5	31

City of Fingal Project 2: Install permanent generators for lift station and community center.

Description/Benefit	Establish permanent source of backup power to maintain continued operation of the sanitary sewer system and assure resiliency of community center as a storm shelter. Replace portable generator for lift station.
Hazards Addressed	All
Affected Jurisdictions	City of Fingal
Project Status	Continue
Priority	High
Responsible Agency	Fingal City Council: Contact – City Auditor Corrine Ertelt Barnes County Emergency Manager Kim Franklin
Partners	Emergency agencies (ambulance, fire, police), engineering firms, regional council
Timeframe for Completion	3 years
Cost	Project specific
Funding Source	Local, state and federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34

City of Fingal Project 3: Grade separate roads and highways from railroad crossings and/or install crossing arms.

Description/Benefit	Maintain access for emergency services and assure county-wide communication of accessibility.
Hazards Addressed	All
Affected Jurisdictions	City of Fingal
Project Status	New
Priority	High
Responsible Agency	Barnes County Highway Department Superintendent Kerry Johnson Binghampton Township Board
Partners	County, emergency agencies (ambulance, fire, police) engineering firms, soil conservation,
Timeframe for Completion	10 to 20 years
Cost	Project specific
Funding Source	County, state and federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	4	2	3	3	3	5	25

City of Kathryn

Located in proximity to Clausen Springs Dam, which experienced major erosion in 2009, the city of Kathryn is vulnerable to a dam failure event. The Clausen Springs Dam and the Sheyenne River Valley National Scenic Byway attract recreation and temporary populations during summer months. The city is also located in a low point with respect to surrounding topography and is near the Sheyenne River, which contributes to overland flooding issues. The emergency siren on the fire hall is manually activated. The city receives tax revenue from rental income on a former school house occupied by Valley City State University for research purposes. With little to no additional capabilities, the city is dependent on outside sources for mitigation.

Education and outreach, flood control measures, installation of a generator for backup power and an upgraded emergency siren are a priority for the city.

City of Kathryn Project 1: Increase education and awareness of wildfire prevention for temporary and recreation populations.

Description/Benefit	Make the public aware of risk to structures from camp fires, outdoor cooking and general recreational activity.
Hazards Addressed	Urban Fire/Structure Collapse, Wildland Fire
Affected Jurisdictions	City of Kathryn
Project Status	New
Priority	Low
Responsible Agency	Kathryn City Council: Contact-Shirley Sivertson Kathryn Fire Department Rick Velvre
Partners	City, state, federal, local government, EM
Timeframe for Completion	Ongoing
Cost	\$5,000 per year
Funding Source	Local, state, federal, private

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35

City of Kathryn Project 2: Create and implement creek maintenance.

Description/Benefit	Maintain flow of runoff to eliminate standing water and flooding of people’s homes. To control growth of vegetation to minimize fire hazard and spread of disease.
Hazards Addressed	Communicable Disease, Fire, Flood, Severe Summer Weather, Severe Winter Weather, Windstorm
Affected Jurisdictions	Kathryn
Project Status	Continue
Priority	High
Responsible Agency	Kathryn City Council: Contact – City Auditor Shirley Sivertson Barnes County Water Resource District Manager: Bruce Anderson
Partners	State Water Commission, township board
Timeframe for Completion	1 to 2 years
Cost	\$500 to \$1,000
Funding Source	City, county, state and federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	4	5	5	34

City of Kathryn Project 3: Install generators for the city lift station and fire hall.

Description/Benefit	Establish permanent source of backup power to maintain continued operation of the sanitary sewer system to ensure resiliency. To maintain continued operation of the fire hall and emergency siren.
Hazards Addressed	All
Affected Jurisdictions	City of Kathryn
Project Status	Continue
Priority	High
Responsible Agency	Kathryn City Council: Contact – City Auditor Shirley Sivertson Barnes County Emergency Manager Kim Franklin
Partners	Emergency agencies (ambulance, fire, police), engineering firms, regional council
Timeframe for Completion	3 years
Cost	Project specific
Funding Source	Local, state, federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34

City of Kathryn Project 4: Install upgraded warning system.

Description/Benefit	Install updated warning siren replacing manually-activated siren with county-dispatch-activated siren. The siren provides warning for people to take shelter from approaching storms.
Hazards Addressed	Fire, Severe Summer Weather, Windstorm
Affected Jurisdictions	City of Kathryn
Project Status	New
Priority	High
Responsible Agency	Kathryn City Council: Contact – City Auditor Shirley Sivertson Barnes County Emergency Manager Kim Franklin
Partners	Barnes County Commission, fire departments and districts
Timeframe for Completion	1 to 3 years
Cost	\$7,500 per siren
Funding Source	City, county, state and federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34

City of Leal

The city of Leal experiences overland flooding from 10 Mile Lake due to surrounding topography and inadequate drainage, which impacts infrastructure. The culvert under the CPR railroad line is suspected to have collapsed, further exacerbating flooding issues. The city has a manually-activated emergency siren instead of a siren activated by county-dispatch. With little to no additional capabilities, the city is dependent on outside sources for mitigation.

Improved drainage/flood control measures and an upgraded emergency siren are a priority for the city.

City of Leal Project 1: Upgrade culvert under CPR railroad line to improve drainage.

Description/Benefit	Improve drainage and eliminate overland flooding issues that causes damage to infrastructure and people’s homes. Maintain flow of runoff to control growth of vegetation to minimize fire hazard and spread of disease.
Hazards Addressed	Communicable Disease, Fire, Flood (Overland), Severe Summer Weather, Severe Winter Weather, Windstorm
Affected Jurisdictions	City of Leal
Project Status	New
Priority	High
Responsible Agency	Leal City Council: Contact – City Auditor Mary Udem Barnes County Emergency Manager Kim Franklin Barnes County Water Resource District Manager Bruce Anderson
Partners	Barnes County Commission, fire departments and districts, CPR
Timeframe for Completion	3 to 5 years
Cost	Project specific
Funding Source	City, county, state and federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	2	5	5	31

City of Leal Project 2: Install upgraded warning system.

Description/Benefit	Install updated warning siren replacing manually-activated siren with county-dispatch-activated siren. The siren provides warning for people to take shelter from approaching storms.
Hazards Addressed	Fire, Severe Summer Weather, Windstorm
Affected Jurisdictions	City of Leal
Project Status	New
Priority	High
Responsible Agency	Leal City Council: Contact – City Auditor Mary Udem Barnes County Emergency Manager Kim Franklin
Partners	Barnes County Commission, fire departments and districts
Timeframe for Completion	1 to 3 years
Cost	\$7,500 per siren
Funding Source	City, county, state and federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34

City of Litchville

The city of Litchville is vulnerable to flooding and severe summer weather as heavy rain causes overland flooding and impacts critical facilities and infrastructure. Flooding occurs on city streets primarily near the city park. The city does has a storm water drainage system, but the system lacks the capacity to allow for property drainage. Windstorms and high wind during severe summer weather also causes damage to structures in the city. Debris can clog drainage and contribute to overland flooding. With little to no additional capabilities, the city is dependent on outside sources for mitigation.

Improved drainage and infrastructure maintenance are a priority for the city.

City of Litchville Project 1: Establish permanent drainage for the city park to eliminate occurrences of overland flooding.

Description/Benefit	Reduction of damage to critical facilities and infrastructure from annual flooding to assure access for emergency services and continued operation of public infrastructure. Reduce or eliminate damage to people’s homes.
Hazards Addressed	Communicable Disease, Drought, Flood (Overland), Severe Summer Weather, Severe Winter Weather, Transportation Accident, Fire, Windstorm
Affected Jurisdictions	City of Litchville
Project Status	New
Priority	High
Responsible Agency	Litchville City Council: Contact – City Auditor Connie Smith Barnes County Emergency Manager Kim Franklin Barnes County Water Resource District Manager Bruce Anderson
Partners	State Water Commission, NDDOT, township board
Timeframe for Completion	1 to 3 years
Cost	TBD
Funding Source	Local, state and federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	3	5	5	33

City of Litchville Project 2: Create and implement tree trimming maintenance system.

Description/Benefit	Eliminate debris from drainage ditches to maintain flow of runoff to eliminate standing water and flooding of people’s homes. To control growth of vegetation to minimize fire hazard and spread of disease.
Hazards Addressed	Communicable Disease, Fire, Flood, Severe Summer Weather, Severe Winter Weather, Windstorm
Affected Jurisdictions	City Litchville
Project Status	New
Priority	Medium
Responsible Agency	Litchville City Council: Contact – City Auditor Connie Smith Barnes County Water Resource District Manager Bruce Anderson
Partners	State Water Commission, township board
Timeframe for Completion	1 to 2 years
Cost	\$500 to \$1,000
Funding Source	City, county, state and federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34

City of Nome

Severe summer weather and severe winter weather produce heavy precipitation impacting the city of Nome. Windstorms are common in the area causing power outages. Windstorms also cause debris and snow drifts to block roads. Residents are vulnerable to severe weather as the city does not have an official storm shelter. The city has a manually-activated emergency siren instead of a siren activated by county-dispatch. With little to no additional capabilities, the city is dependent on outside sources for mitigation.

Burying of power lines, installation of backup generators and an upgraded emergency siren, and construction of a storm shelter are a priority for the city.

City of Nome Project 1: Install upgraded warning system.

Description/Benefit	Install updated warning siren replacing manually-activated siren with county-dispatch-activated siren. The siren provides warning for people to take shelter from approaching storms.
Hazards Addressed	Fire, Severe Summer Weather, Windstorm
Affected Jurisdictions	City of Nome
Project Status	New
Priority	High
Responsible Agency	Nome City Council: Contact – City Auditor Alice Capman Barnes County Emergency Manager Kim Franklin
Partners	Barnes County Commission, fire departments and districts
Timeframe for Completion	1 to 3 years
Cost	\$7,500 per siren
Funding Source	City, county, state and federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34

City of Nome Project 2: Install generators for the city lift station and fire hall.

Description/Benefit	Establish permanent source of backup power to maintain continued operation of the sanitary sewer system to ensure resiliency. To maintain continued operation of the fire hall and emergency siren.
Hazards Addressed	All
Affected Jurisdictions	City of Nome
Project Status	New
Priority	High
Responsible Agency	Nome City Council: Contact – City Auditor Alice Capman Barnes County Emergency Manager Kim Franklin
Partners	Emergency agencies (ambulance, fire, police), engineering firms, regional council
Timeframe for Completion	3 years
Cost	Project specific
Funding Source	Local, state, federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34

City of Nome Project 3: Construct storm shelter.

Description/Benefit	To reduce or eliminate injury and death from severe weather.
Hazards Addressed	Flood, Severe Summer Weather, Severe Winter Weather, Fire, Windstorm
Affected Jurisdictions	City of Nome
Project Status	New
Priority	High
Responsible Agency	Nome City Council: Contact – City Auditor Alice Capman Barnes County Emergency Manager Kim Franklin Barnes County Commission
Partners	Emergency agencies (ambulance, fire, police), engineering firms, regional council, NDDDES, Red Cross
Timeframe for Completion	3 to 5 years
Cost	Up to \$75,000
Funding Source	County, state and federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	4	4	5	5	5	5	33

City of Nome Project 4: Bury Power Lines

Description/Benefit	Maintain power for critical services.
Hazards Addressed	Severe Summer Weather, Severe Winter Weather, Windstorm
Affected Jurisdictions	City of Nome
Project Status	New
Priority	Low
Responsible Agency	Public Utilities: Ottertail Power Company Federal Government Midwest Independent System Operator (MISO)
Partners	Cities, count, state
Timeframe for Completion	Long term – 20+ years
Cost	Dependent on funding available from utility
Funding Source	County, state and federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	4	1	4	2	1	3	20

City of Oriska

The city of Oriska is vulnerable to floods and severe summer weather as heavy rain causes overland flooding and impacts critical facilities and infrastructure. Flooding occurs most frequently on city streets near the city park. The city does not have a storm water drainage system further contributing to flooding and drainage issues. Windstorms and high wind during severe summer weather also causes damage to structures in the city and produces shortage or outage of critical materials or infrastructure. With little to no additional capabilities, the city is dependent on outside sources for mitigation.

Improved drainage, and installation of backup generators and an upgraded emergency siren are a priority for the city.

City of Oriska Project 1: Establish permanent drainage for the city park and other low-lying areas in the city to eliminate occurrences of overland flooding.

Description/Benefit	Reduction of damage to critical facilities and infrastructure from annual flooding to assure access for emergency services and continued operation of public infrastructure. Reduce or eliminate damage to people’s homes.
Hazards Addressed	Communicable Disease, Drought, Flood (Overland), Severe Summer Weather, Severe Winter Weather, Transportation Accident, Fire, Windstorm
Affected Jurisdictions	City of Oriska
Project Status	New
Priority	High
Responsible Agency	Oriska City Council: Contact – City Auditor Katie Pommerer Barnes County Emergency Manager Kim Franklin Barnes County Water Resource District Manager Bruce Anderson
Partners	State Water Commission, NDDOT, township board
Timeframe for Completion	1 to 3 years
Cost	TBD
Funding Source	Local, state and federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	3	5	5	33

City of Oriska Project 2: Install generator for the city lift station and fire hall.

Description/Benefit	Establish permanent source of backup power to maintain continued operation of the sanitary sewer system to ensure resiliency. To maintain continued operation of the fire hall and emergency siren.
Hazards Addressed	All
Affected Jurisdictions	City of Oriska
Project Status	New
Priority	High
Responsible Agency	Oriska City Council: Contact – City Auditor Katie Pommerer Barnes County Emergency Manager Kim Franklin
Partners	Emergency agencies (ambulance, fire, police), engineering firms, regional council
Timeframe for Completion	3 years
Cost	Project specific
Funding Source	Local, state, federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34

City of Oriska Project 3: Install upgraded warning system.

Description/Benefit	Install updated warning siren replacing manually-activated siren with county-dispatch-activated siren. The siren provides warning for people to take shelter from approaching storms.
Hazards Addressed	Fire, Severe Summer Weather, Windstorm
Affected Jurisdictions	City of Oriska
Project Status	New
Priority	High
Responsible Agency	Oriska City Council: Contact – City Auditor Katie Pommerer Barnes County Emergency Manager Kim Franklin
Partners	Barnes County Commission, fire departments and districts
Timeframe for Completion	1 to 3 years
Cost	\$7,500 per siren
Funding Source	City, county, state and federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34

City of Oriska Project 4: Create and implement drainage ditch maintenance system for existing drainage ditches in the city.

Description/Benefit	Maintain flow of runoff to eliminate standing water blocking roads to maintain access for city residents and emergency services and continued operation of public infrastructure. Control growth of vegetation to minimize fire hazard and spread of disease.
Hazards Addressed	Communicable Disease, Drought, Flood (Overland), Severe Summer Weather, Severe Winter Weather, Transportation Accident, Fire, Windstorm
Affected Jurisdictions	City of Oriska
Project Status	Medium
Priority	High
Responsible Agency	Oriska City Council: Contact – City Auditor Katie Pommerer Barnes County Emergency Manager Kim Franklin Barnes County Water Resource District Manager Bruce Anderson
Partners	State Water Commission, NDDOT, township board
Timeframe for Completion	Ongoing
Cost	TBD
Funding Source	Local, state and federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	3	3	5	5	31

City of Pillsbury

Severe winter weather produces heavy snow that blocks roads and results in overland flooding and drainage issues in the spring in the city of Pillsbury. With a high number of abandoned structures and trailer homes, and a high elderly population, the city is vulnerable to windstorms. Windstorms are a common occurrence in the city. With little to no additional capabilities, the city is dependent on outside sources for mitigation.

Improved drainage, installation of an upgraded emergency siren and construction of a shelter are a priority for the city.

City of Pillsbury Project 1: Upgrade existing drainage ditches in the city to reduce/eliminate occurrences of overland flooding.

Description/Benefit	Reduction of damage to critical facilities and infrastructure from annual flooding to assure access for emergency services and continued operation of public infrastructure. Reduce or eliminate damage to people’s homes.
Hazards Addressed	Communicable Disease, Drought, Flood (Overland), Severe Summer Weather, Severe Winter Weather, Transportation Accident, Fire, Windstorm
Affected Jurisdictions	City of Pillsbury
Project Status	New
Priority	High
Responsible Agency	Pillsbury City Council: Contact – City Auditor Dennis McGuire Barnes County Emergency Manager Kim Franklin Barnes County Water Resource District Manager: Bruce Anderson
Partners	State Water Commission, NDDOT, township board
Timeframe for Completion	1 to 3 years
Cost	TBD
Funding Source	Local, state and federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	3	5	5	33

City of Pillsbury Project 2: Install warning system.

Description/Benefit	Install updated county-dispatch-activated siren. The siren provides warning for people to take shelter from approaching storms.
Hazards Addressed	Fire, Severe Summer Weather, Windstorm
Affected Jurisdictions	City of Pillsbury
Project Status	New
Priority	High
Responsible Agency	Pillsbury City Council: Contact – City Auditor Dennis McGuire Barnes County Emergency Manager Kim Franklin
Partners	Barnes County Commission, fire departments and districts
Timeframe for Completion	1 to 3 years
Cost	\$7,500 per siren
Funding Source	City, county, state and federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34

City of Pillsbury Project 3: Construct storm shelter.

Description/Benefit	To reduce or eliminate injury and death from severe weather.
Hazards Addressed	Flood, Severe Summer Weather, Severe Winter Weather, Fire, Windstorm
Affected Jurisdictions	City of Pillsbury
Project Status	New
Priority	High
Responsible Agency	Pillsbury City Council: Contact – City Auditor Dennis McGuire Barnes County Emergency Manager Kim Franklin Barnes County Commission
Partners	Emergency agencies (ambulance, fire, police), engineering firms, regional council, NDDDES, Red Cross
Timeframe for Completion	3 to 5 years
Cost	Up to \$75,000
Funding Source	County, state and federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	4	4	5	5	5	5	33

City of Rogers

The city of Rogers experiences overland flooding from severe summer and winter weather. The city also has poor drainage, lacks a storm water drainage system and has a high water table. Blocked roads from standing water are common. The lack of grade-separated railroad crossings is problematic with the increase in train traffic through the city due to energy development in the western part of the state. With little to no additional capabilities, the city is dependent on outside sources for mitigation.

Improved drainage, installation of backup power for critical facilities and infrastructure, and improvements to the transportation system are a priority for the city.

City of Rogers Project 1: Establish permanent drainage for the city park and other low-lying areas to reduce/eliminate occurrences of overland flooding.

Description/Benefit	Reduction of damage to critical facilities and infrastructure from annual flooding to assure access for emergency services and continued operation of public infrastructure.
Hazards Addressed	Communicable Disease, Drought, Flood (Overland), Severe Summer Weather, Severe Winter Weather, Transportation Accident, Fire, Windstorm
Affected Jurisdictions	City of Rogers
Project Status	New
Priority	High
Responsible Agency	Rogers City Council: Contact – City Auditor Tina Vincent Barnes County Emergency Manager Kim Franklin Barnes County Water Resource District Manager Bruce Anderson
Partners	State Water Commission, NDDOT, township board
Timeframe for Completion	Ongoing
Cost	TBD
Funding Source	Local, state and federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	3	3	5	1	27

City of Rogers Project 2: Install generators for the city lift station and fire hall.

Description/Benefit	Establish permanent source of backup power to maintain continued operation of the sanitary sewer system to ensure resiliency. To maintain continued operation of the fire hall and emergency siren.
Hazards Addressed	All
Affected Jurisdictions	City of Rogers
Project Status	New
Priority	High
Responsible Agency	Rogers City Council: Contact – City Auditor Tina Vincent Barnes County Emergency Manager Kim Franklin
Partners	Emergency agencies (ambulance, fire, police), engineering firms, regional council
Timeframe for Completion	3 years
Cost	Project specific
Funding Source	Local, state, federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34

City of Rogers Project 3: Grade separate roads and highways from railroad crossings and/or install crossing arms.

Description/Benefit	Maintain access for emergency services and assure county-wide communication of accessibility.
Hazards Addressed	All
Affected Jurisdictions	City of Rogers
Project Status	New
Priority	High
Responsible Agency	Barnes County Highway Department Superintendent Kerry Johnson Rogers Township Board
Partners	County, emergency agencies (ambulance, fire, police) engineering firms, soil conservation,
Timeframe for Completion	10 to 20 years
Cost	Project specific
Funding Source	County, state and federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	4	2	3	3	3	5	25

City of Sanborn

The city of Sanborn experiences overland flooding from severe summer weather and severe winter weather, impact critical facilities and infrastructure. The lack of drainage of Sanborn Lake impacts an adjacent freight railroad line and roads leading to the city. Blocked roads occur from severe winter weather and can result in isolation of the city. With a high number of abandoned structures and trailer homes, and a high elderly population, the city is vulnerable to windstorms. The city has little to no capabilities for mitigation and therefore is dependent on outside sources.

Improved drainage, installation of additional generators for backup power, burying of power lines, and construction of a storm shelter are a priority for the city.

City of Sanborn Project 1: Upgrade existing drainage to eliminate overland flooding.

Description/Benefit	Reduction of damage to critical facilities and infrastructure from annual flooding to assure access for emergency services and continued operation of public infrastructure.
Hazards Addressed	Communicable Disease, Drought, Flood (Overland), Severe Summer Weather, Severe Winter Weather, Transportation Accident, Fire, Windstorm
Affected Jurisdictions	City of Sanborn
Project Status	Continue
Priority	High
Responsible Agency	Sanborn City Council: Contact – City Auditor Julie Franklin Barnes County Emergency Manager Kim Franklin Barnes County Water Resource District Manager Bruce Anderson
Partners	State Water Commission, NDDOT, township board
Timeframe for Completion	Ongoing
Cost	TBD
Funding Source	Local, state and federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	3	3	5	1	27

City of Sanborn Project 2: Create and implement drainage ditch maintenance system for existing drainage ditches in the city.

Description/Benefit	Maintain flow of runoff to eliminate standing water blocking roads to maintain access for city residents and emergency services and continued operation of public infrastructure. Control growth of vegetation to minimize fire hazard and spread of disease.
Hazards Addressed	Communicable Disease, Drought, Flood (Overland), Severe Summer Weather, Severe Winter Weather, Transportation Accident, Fire, Windstorm
Affected Jurisdictions	City of Sanborn
Project Status	Continue
Priority	Medium
Responsible Agency	Sanborn City Council: Contact – City Auditor Julie Franklin Barnes County Emergency Manager Kim Franklin Barnes County Water Resource District Manager: Bruce Anderson
Partners	State Water Commission, NDDOT, township board
Timeframe for Completion	Ongoing
Cost	TBD
Funding Source	Local, state and federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	3	3	5	5	31

City of Sanborn Project 3: Install generators for the city lift station and fire hall.

Description/Benefit	Establish permanent source of backup power to maintain continued operation of the sanitary sewer system to ensure resiliency. To maintain continued operation of the fire hall and emergency siren.
Hazards Addressed	All
Affected Jurisdictions	City of Sanborn
Project Status	New
Priority	High
Responsible Agency	Sanborn City Council: Contact – City Auditor Julie Franklin Barnes County Emergency Manager Kim Franklin
Partners	Emergency agencies (ambulance, fire, police), engineering firms, regional council
Timeframe for Completion	3 years
Cost	Project specific
Funding Source	Local, state, federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34

City of Sanborn Project 4: Construct storm shelter.

Description/Benefit	To reduce or eliminate injury and death from severe weather.
Hazards Addressed	Flood, Severe Summer Weather, Severe Winter Weather, Fire, Windstorm
Affected Jurisdictions	City of Sanborn
Project Status	New
Priority	High
Responsible Agency	Sanborn City Council: Contact – City Auditor Julie Franklin Barnes County Emergency Manager Kim Franklin Barnes County Commission
Partners	Emergency agencies (ambulance, fire, police), engineering firms, regional council, NDDDES
Timeframe for Completion	3 to 5 years
Cost	Up to \$75,000
Funding Source	County, state and federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	4	4	5	5	5	5	33

City of Sanborn Project 5: Bury Power Lines

Description/Benefit	Maintain power for critical services.
Hazards Addressed	Severe Summer Weather, Severe Winter Weather, Windstorm
Affected Jurisdictions	City of Sanborn
Project Status	New
Priority	High
Responsible Agency	Public Utilities: Ottertail Power Company Federal Government Midwest Independent System Operator (MISO)
Partners	Cities, count, state
Timeframe for Completion	Long term – 20+ years
Cost	Dependent on funding available for utility
Funding Source	County, state and federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	4	1	4	2	1	3	20

City of Sibley

Due to its location on Lake Ashtabula, the city of Sibley has a permanent population of around 30 residents and a temporary population from May to September of 300 residents for recreation. The city also experiences overland flooding issues due to surrounding topography. With little to no capabilities other than a drought management plan, the city is dependent on outside sources for mitigation.

Education and outreach to temporary residents, construction of flood control measures and a storm shelter are a priority for the city.

City of Sibley Project 1: Increase education and awareness of wildfire prevention for temporary and recreation populations.

Description/Benefit	Make the public aware of risk to structures from camp fires, outdoor cooking and general recreational activity.
Hazards Addressed	Urban Fire/Structure Collapse, Wildland Fire
Affected Jurisdictions	City of Sibley
Project Status	Medium
Priority	High
Responsible Agency	Barnes County Emergency Manager Kim Franklin N.D. Forest Service Sibley City Council: Contact-Typhanny Schuler Sibley Fire Department Mike Schuler
Partners	City, state, federal, local government, EM
Timeframe for Completion	Ongoing
Cost	\$5,000 per year
Funding Source	Local, state, federal, private

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35

City of Sibley Project 2: Construct levee on west of the city that is five feet wide, two feet high and a ½ mile long to divert runoff from surrounding hillsides.

Description/Benefit	Diversion of runoff to eliminate overland flooding issues impacting permanent and temporary residences, the lift station and fire hall to ensure continued operation of the sanitary sewer system and emergency services.
Hazards Addressed	Flood (Riverine and Overland)
Affected Jurisdictions	City of Sibley
Project Status	Continue
Priority	High
Responsible Agency	U.S. Army Corps. of Engineers State Water Commission Barnes County Commission, city councils, township boards
Partners	City councils, township board
Timeframe for Completion	Ongoing
Cost	TBD
Funding Source	Local, State and Federal Grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	1	5	5	30

City of Sibley Project 3: Install generators for the city lift station and fire hall.

Description/Benefit	Establish permanent source of backup power to maintain continued operation of the sanitary sewer system to ensure resiliency. To maintain continued operation of the fire hall.
Hazards Addressed	All
Affected Jurisdictions	City of Sibley
Project Status	New
Priority	High
Responsible Agency	Sibley City Council: Contact – City Auditor Typhanny Schuler Barnes County Emergency Manager Kim Franklin
Partners	Emergency agencies (ambulance, fire, police), engineering firms, regional council
Timeframe for Completion	3 years
Cost	Project specific
Funding Source	Local, state, federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34

City of Sibley Project 4: Install upgraded warning system.

Description/Benefit	Install updated warning siren replacing manually-activated siren with county-dispatch-activated siren. The siren provide warning for people to take shelter from approaching storms.
Hazards Addressed	Fire, Severe Summer Weather, Windstorm
Affected Jurisdictions	City of Sibley
Project Status	New
Priority	High
Responsible Agency	Sibley City Council: Contact – City Auditor Typhanny Schuler Barnes County Emergency Manager Kim Franklin
Partners	Barnes County Commission, fire departments and districts
Timeframe for Completion	1 to 3 years
Cost	\$7,500 per siren
Funding Source	City, county, state and federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34

City of Sibley Project 5: Construct storm shelter.

Description/Benefit	To reduce or eliminate injury and death from severe weather.
Hazards Addressed	Flood, Severe Summer Weather, Severe Winter Weather, Fire, Windstorm
Affected Jurisdictions	City of Sibley
Project Status	New
Priority	High
Responsible Agency	Sibley City Council: Contact – City Auditor Typhanny Schuler Barnes County Emergency Manager Kim Franklin Barnes County Commission
Partners	Emergency agencies (ambulance, fire, police), engineering firms, regional council, NDDDES, Red Cross
Timeframe for Completion	3 to 5 years
Cost	Up to \$75,000
Funding Source	County, state and federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	4	4	5	5	5	5	33

City of Valley City

The city of Valley City is located on the Sheyenne River which experiences severe riverine flooding. Flooding has impacted the city for decades. The city contains numerous vulnerable populations such as the only assisted living and senior housing developments in Barnes County, dormitory populations at Valley City State University, trailer/mobile home courts, a substantial elderly population, two elementary schools and one of the largest junior high/high schools in the surrounding area. The city has planning and regulatory, administrative and technical, financial, and education and outreach capabilities to accomplish mitigation. However, the city relies on outside sources for construction of permanent flood control measures and upgrading of infrastructure as these projects require millions of dollars in investment.

Education and outreach, permanent flood protection, flood control measures, buyouts of structures in hazard prone areas, education and outreach, and upgrading of critical facilities and infrastructure are a priority for the city.

City of Valley City Project 1: Use Valley City website and local media outlets to improve household disaster preparedness.

Description/Benefit	To keep households ready in case of a disaster.
Hazards Addressed	All hazards
Affected Jurisdictions	City of Valley City
Project Status	New
Priority	High
Responsible Agency	Valley City City Commission: Contact – City Auditor Avis Richter Valley City City Administrator Dave Schelkoph Valley City Police Department Chief of Police Fred Thompson Valley City Fire Department Fire Chief Gary Retterath Radio Stations: KSJB, KQDJ, KDDR Newspapers: Valley City Times-Record and Litchville Bulletin Digital Media: Bek Communications, CSI, Daktel, DRN, ICTC, Mid-Continent, Qwest, Satellite/DirecTV
Partners	NDDES, Red Cross, FEMA, NWS, city & county governments, health districts, social services
Timeframe for Completion	Ongoing
Cost	\$0 to \$5,000 annually
Funding Source	County, state, federal, city, private

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35

City of Valley City Project 2: Increase education and awareness of fire safety and prevention.

Description/Benefit	Make the public aware of methods to remain safe from risk of fire and potential prevention methods. Keep areas around buildings and structures clear grass, overgrown vegetation and debris.
Hazards Addressed	Urban Fire/Structure Collapse, Wildland Fire
Affected Jurisdictions	City of Valley City
Project Status	Ongoing and continue
Priority	High
Responsible Agency	Valley City Fire District/Department Fire Chief Gary Retterath Valley City Fire District/Department Assistant Fire Chief Daryl Stensland Valley City Fire District/Department Captain Ron Burchill
Partners	City council, state, federal, local government, EM, ambulance and police,
Timeframe for Completion	6 months – ongoing
Cost	\$10,000 to \$15,000
Funding Source	Local, state, federal, private

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35

City of Valley City Project 3: Increase awareness of methods for prevention of communicable diseases.

Description/Benefit	Make public aware of risk of communicable diseases and methods for prevention in people; animals and crops for economic impact.
Hazards Addressed	Communicable Disease
Affected Jurisdictions	City of Valley City
Project Status	Ongoing and Continue
Priority	High
Responsible Agency	City-County Health Director Theresa Will
Partners	Central Valley Health District, social services, EM, fire departments and districts, county/city government
Timeframe for Completion	Ongoing
Cost	\$300 for a PSA, \$1,000 to \$3,000/week for substantial outreach/ Free through city website.
Funding Source	Grants (state, federal, utilities), County budget.

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35

City of Valley City Project 4: Increase awareness of hazardous materials.

Description/Benefit	Make the public aware of risk from hazardous materials and keep informed on current railroad shipping methods, storage sites and weather events.
Hazards Addressed	Hazardous Material Release (All)
Affected Jurisdictions	City of Valley City
Project Status	Ongoing and Continue
Priority	High
Responsible Agency	Valley City Public Works Operations Specialist Jeff Differding Valley City Public Works Water Treatment Plant Superintendent Wade Hesch Valley City City Administrator Dave Schelkoph Valley City City Commission: Contact – Auditor Avis Richter Valley City Fire District/Department Fire Chief Gary Retterath Valley City Fire District/Department Assistant Fire Chief Daryl Stensland Valley City Fire District/Department Captain Ron Burchill Valley City Police Department Chief of Police Fred Thompson
Partners	State and federal government, EM
Timeframe for Completion	Ongoing
Cost	Free – through media and city website
Funding Source	Local, state, federal, private

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35

City of Valley City Project 5: Strengthen building codes and land use regulations.

Description/Benefit	To ensure new and existing structures adhere to building standard to withstand impacts from hazards and to achieve responsible management of land resources.
Hazards Addressed	All
Affected Jurisdictions	City of Valley City
Project Status	New
Priority	Medium
Responsible Agency	Barnes County Planning Commission Valley City Building/Fire Inspector David Andersen Valley City City Commission: Contact – Auditor Avis Richter Valley City City Administrator Dave Schelkoph Valley City Police Department Chief of Police Fred Thompson Valley City Fire Department Fire Chief Gary Retterath
Partners	Dept. of Commerce, league of cities, N.D. Association of Counties, N.D. Township Organization, KLJ
Timeframe for Completion	Ongoing
Cost	\$2,000 per review
Funding Source	Local, state, federal

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	5	5	5	34

City of Valley City Project 6: Assure new development is built in areas with low risk to hazards.

Description/Benefit	Limit losses of life and property from hazards. To ensure new development can provide highest positive impact to communities.
Hazards Addressed	All
Affected Jurisdictions	City of Valley City
Project Status	Ongoing and continue
Priority	High
Responsible Agency	Valley City Planning Commission Valley City Building/Fire Inspector David Andersen Valley City City Commission: Contact – Auditor Avis Richter Valley City City Administrator Dave Schelkoph Valley City Police Department Chief of Police Fred Thompson Valley City Fire Department Fire Chief Gary Retterath
Partners	Dept. of Commerce, N.D. League of Cities, N.D. Association of Counties, NDTOA, KLJ
Timeframe for Completion	Ongoing
Cost	\$2,000 per year/review
Funding Source	Local, state, federal

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	4	5	33

City of Valley City Project 7: Remove existing structures from flood prone areas.

Description/Benefit	Economic resiliency. Residents with property at risk would be protected. Convert former lots into greenway for improved quality of life.
Hazards Addressed	Flood (Overland, Riverine), Geologic Hazard (Landslide)
Affected Jurisdictions	City of Valley City
Project Status	Ongoing and continue
Priority	High
Responsible Agency	Valley City City Commission: Contact – Auditor Avis Richter Valley City City Administrator Dave Schelkoph Valley City City Commission Kadmas, Lee & Jackson (KLJ)
Partners	State Water Commission, FEMA, EM, regional council, WRD
Timeframe for Completion	Ongoing
Cost	\$75 million
Funding Source	State, federal, grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
3	5	5	5	5	5	5	33

City of Valley City Project 8: Remove existing structures from areas prone to geologic hazards.

Description/Benefit	Economic resiliency. Residents with property at risk would be protected. Convert former lots into open space or wildlife habitat.
Hazards Addressed	Flood (Overland, Riverine), Geologic Hazard (Landslides)
Affected Jurisdictions	City of Valley City
Project Status	Ongoing and continue
Priority	High
Responsible Agency	Valley City City Commission: Contact – Auditor Avis Richter Valley City City Administrator Dave Schelkoph Valley City City Commission Kadmas, Lee & Jackson (KLJ)
Partners	Barnes County Commission, state, FEMA, State Water Commission, engineering firms, regional council, EM, WRD
Timeframe for Completion	Ongoing
Cost	\$50,000 to \$300,000 depending on the property and structure
Funding Source	County and city, state, federal, grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
3	5	5	5	5	5	5	33

City of Valley City Project 9: Encourage participation in NFIP to mitigate impacts of flooding.

Description/Benefit	Economic resiliency. Residents with property at risk would be insured.
Hazards Addressed	Flood (Riverine)
Affected Jurisdictions	City of Valley City
Project Status	Ongoing and continue
Priority	High
Responsible Agency	Barnes County Emergency Manager Kim Franklin
Partners	Barnes County Commission, city council, state, FEMA
Timeframe for Completion	Ongoing
Cost	\$500 to \$1,000 per year
Funding Source	County and city, state, federal, grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35

City of Valley City Project 10: Review of ordinances to assure jurisdictions meet minimum federal and state requirements to comply with NFIP.

Description/Benefit	To ensure program benefits are available to residents and jurisdictions.
Hazards Addressed	Flood (Riverine)
Affected Jurisdictions	City of Valley City
Project Status	Ongoing and continue
Priority	High
Responsible Agency	Barnes County Emergency Manager Kim Franklin Barnes County Floodplain Administrator Kim Franklin Valley City City Administrator Dave Schelkoph Valley City City Commission: Contact – Auditor Avis Richter
Partners	Barnes County Commission, state, FEMA, insurance agents
Timeframe for Completion	Ongoing
Cost	\$500 to \$1,000 per year
Funding Source	County and city, state, federal, grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35

City of Valley City Project 11: Construct storm sewer near 9th Avenue NW to calm/slow amount of water flowing into storm sewers to prevent overloading of the system.

Description/Benefit	Reduction of damage to roads from annual flooding to assure emergency access and economic activity year round.						
Hazards Addressed	Flood (Overland)						
Affected Jurisdictions	City of Valley City						
Project Status	Ongoing and continue						
Priority	Medium						
Responsible Agency	Barnes County Commission Barnes County Water Resource District Manager Bruce Anderson Valley City City Commission: Contact – Auditor Avis Richter						
Partners	State Water Commission, NDDOT, FEMA						
Timeframe for Completion	Ongoing						
Cost	TBD						
Funding Source	Local and state grants						
Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	3	2	3	5	3	5	26

City of Valley City Project 12: Construct permanent engineered flood control protection on Sheyenne River in Valley City.

Description/Benefit	To reduce and eliminate river flood damage to property. To reduce impact to telephone poles and power infrastructure/substations.						
Hazards Addressed	Flood (Riverine), Severe Summer Weather, Severe Winter Weather						
Affected Jurisdictions	City of Valley City						
Project Status	Ongoing and continue						
Priority	High						
Responsible Agency	Valley City City Commission						
Partners	State Water Commission, NDDOT, FEMA, KLJ						
Timeframe for Completion	6 to 10 years						
Cost	\$75 million						
Funding Source	State Water Commission						
Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35

City of Valley City Project 13: Install storm sewer at 6th Ave SE and Valley Ave SE.

Description/Benefit	To reduce storm water runoff and eliminate overland flooding to downstream properties.
Hazards Addressed	Flood (Overland), Severe Summer Weather, Severe Winter Weather
Affected Jurisdictions	City of Valley City
Project Status	Ongoing and continue
Priority	Medium
Responsible Agency	Valley City City Commission Valley City Public Works Operations Specialist Jeff Differding
Partners	State Water Commission, NDDOT, FEMA, KLJ
Timeframe for Completion	6 to 10 years
Cost	TBD
Funding Source	Local, state and federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35

City of Valley City Project 14: Upgrade 4” cast iron water mains to 8” inch water mains.

Description/Benefit	Improve availability of potable water and increase strength of water flow for fire suppression.
Hazards Addressed	Urban Fire/Structure Collapse, Wildland Fire
Affected Jurisdictions	City of Valley City
Project Status	Ongoing and continue
Priority	High
Responsible Agency	Valley City City Commission
Partners	State Water Commission
Timeframe for Completion	10 years
Cost	\$10 to \$15 million
Funding Source	City

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35

City of Valley City Project 15: Upgrade storm sewer mains from Sheyenne River to 10th Ave SW.

Description/Benefit	Reduction of street flooding from heavy rain fall and spring snow melt.
Hazards Addressed	Flood (Overland), Severe Summer Weather, Severe Winter Weather
Affected Jurisdictions	City of Valley City
Project Status	Ongoing and continue
Priority	Medium
Responsible Agency	Valley City City Commission
Partners	Valley City State University
Timeframe for Completion	Ongoing
Cost	TBD
Funding Source	Special assessment

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	5	5	5	34

City of Valley City Project 16: Remove old mill site.

Description/Benefit	To reduce or eliminate health hazards from communicable diseases spawned from buildings in the floodway.
Hazards Addressed	Communicable Disease
Affected Jurisdictions	City of Valley City
Project Status	Ongoing and continue
Priority	Medium/High
Responsible Agency	Valley City City Commission
Partners	North Dakota National Guard
Timeframe for Completion	2016
Cost	\$10,000 to \$15,000
Funding Source	North Dakota National Guard, City of Valley City

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35

City of Valley City Project 17: Expand inert landfill.

Description/Benefit	To prevent water runoff and infiltration of ground water.
Hazards Addressed	Flooding (Overland), Severe Summer Weather, Severe Summer Weather
Affected Jurisdictions	City of Valley City
Project Status	Ongoing and continue
Priority	Low
Responsible Agency	Valley City City Commission
Partners	KLJ, Valley City Public works
Timeframe for Completion	Ongoing
Cost	TBD
Funding Source	City

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35

City of Wimbledon

Severe summer weather and severe winter weather produce heavy precipitation in the city of Wimbledon. Due to spring melt of snow the lack of a drainage maintenance schedule for existing ditches, the city is vulnerable to flooding. Windstorms are frequent in the area, which block roads due to snow drifts and various debris, and cause power outages. The city adopted revised trailer park ordinances due to the large amount of trailer homes. With little to no additional capabilities, the city is dependent on outside sources for mitigation.

Improved drainage, installation of generators for backup power and a storm shelter are a priority for the city.

City of Wimbledon Project 1: Create and implement drainage ditch maintenance system for existing drainage ditches in the city.

Description/Benefit	Maintain flow of runoff to eliminate standing water blocking roads to maintain access for city residents and emergency services and continued operation of public infrastructure. Control growth of vegetation to minimize fire hazard and spread of disease.
Hazards Addressed	Communicable Disease, Drought, Flood (Overland), Severe Summer Weather, Severe Winter Weather, Transportation Accident, Fire, Windstorm
Affected Jurisdictions	City of Wimbledon
Project Status	New
Priority	High
Responsible Agency	Wimbledon City Council: Contact – Auditor Leon Doyle Barnes County Emergency Manager Kim Franklin Barnes County Water Resource District Manager Bruce Anderson
Partners	State Water Commission, NDDOT, township board
Timeframe for Completion	Ongoing
Cost	TBD
Funding Source	Local, state and federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	3	3	5	5	31

City of Wimbledon Project 2: Install permanent generators for the city lift station and community center.

Description/Benefit	Establish permanent source of backup power to maintain continued operation of the sanitary sewer system to ensure resiliency. To maintain continued operation of the community center as unofficial shelter.
Hazards Addressed	All
Affected Jurisdictions	City of Wimbledon
Project Status	New
Priority	High
Responsible Agency	Wimbledon City Council: Contact – Auditor Leon Doyle Barnes County Emergency Manager Kim Franklin
Partners	Emergency agencies (ambulance, fire, police), engineering firms, regional council
Timeframe for Completion	3 years
Cost	Project specific
Funding Source	Local, state, federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34

City of Wimbledon Project 3: Construct storm shelter.

Description/Benefit	To reduce or eliminate injury and death from severe weather.
Hazards Addressed	Flood, Severe Summer Weather, Severe Winter Weather, Fire, Windstorm
Affected Jurisdictions	City of Wimbledon
Project Status	New
Priority	High
Responsible Agency	Wimbledon City Council: Contact – Auditor Leon Doyle Barnes County Emergency Manager Kim Franklin Barnes County Commission
Partners	Emergency agencies (ambulance, fire, police), engineering firms, regional council, NDDDES, Red Cross
Timeframe for Completion	3 to 5 years
Cost	Up to \$75,000
Funding Source	County, state and federal grants

Values: 1 is low, indicated a negative impact and/or too costly. Value of 5 is high, indicated positive impact and or higher benefit compared to cost.

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	4	4	5	5	5	5	33

Table 6.2 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 6.2.

Table 6.2 – Mitigation Project Number and Hazard Addressed

Incorporated Jurisdiction and Mitigation Project Number	Communicable Disease	Dam Failure	Drought	Flood	Geologic Hazard (Landslide)	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
<u>Barnes County</u>														
Project 1*	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Project 2			X									X	X	
Project 3*										X				
Project 4	X													
Project 5*	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Project 6	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Project 7			X	X				X						
Project 8*												X	X	
Project 9*	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Project 10*	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Project 11*	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Project 12*	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Project 13*	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Project 14*	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Project 15*	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Project 16*				X	X									
Project 17*				X	X									
Project 18*				X										
Project 19*				X										
Project 20*			X			X					X	X	X	
Project 21*				X		X	X	X	X		X	X	X	X
Project 22			X			X							X	
Project 23				X				X	X	X				
Project 24*	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Project 25*				X				X	X					
Project 26*	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Project 27*			X											
Project 28*				X				X	X					X

Table 6.2 – Mitigation Project Number and Hazard Addressed - Continued

Incorporated Jurisdiction and Mitigation Project Number	Communicable Disease	Dam Failure	Drought	Flood	Geologic Hazard (Landslide)	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
City of Dazey														
Project 1*	X		X	X				X	X		X	X	X	X
Project 2*	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Project 3								X				X	X	X
City of Fingal														
Project 1*	X		X	X				X	X		X	X	X	X
Project 2*	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Project 3*	X	X	X	X	X	X	X	X	X	X	X	X	X	X
City of Kathryn														
Project 1*												X	X	
Project 2*	X			X				X	X			X	X	X
Project 3*	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Project 4								X				X	X	X
City of Leal														
Project 1*	X			X				X	X			X	X	X
Project 2								X				X	X	X
City of Litchville														
Project 1*	X		X	X				X	X		X	X	X	X
Project 2*	X			X				X	X			X	X	X
City of Nome														
Project 1								X				X	X	X
Project 2*	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Project 3				X				X	X			X	X	X
Project 4*								X	X					X
City of Oriska														
Project 1*	X		X	X				X	X		X	X	X	X
Project 2*	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Project 3								X				X	X	X
Project 4*	X		X	X				X	X		X	X	X	X

Table 6.2 – Mitigation Project Number and Hazard Addressed - Continued

Incorporated Jurisdiction and Mitigation Project Number	Communicable Disease	Dam Failure	Drought	Flood	Geologic Hazard (Landslide)	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
City of Pillsbury														
Project 1*	X		X	X				X	X		X	X	X	X
Project 2								X				X	X	X
Project 3				X				X	X			X	X	X
City of Rogers														
Project 1*	X		X	X				X	X		X	X	X	X
Project 2	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Project 3	X	X	X	X	X	X	X	X	X	X	X	X	X	X
City of Sanborn														
Project 1*	X		X	X				X	X		X	X	X	X
Project 2*	X		X	X				X	X		X	X	X	X
Project 3*	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Project 4				X				X	X			X	X	X
Project 5								X	X					X
City of Sibley														
Project 1*												X	X	
Project 2*				X										
Project 3*	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Project 4								X	X			X	X	X
Project 5				X				X	X			X	X	X
City of Valley City														
Project 1*	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Project 2*												X	X	X
Project 3	X													
Project 4*	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Project 5*	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Project 6*	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Project 7*				X	X									
Project 8*				X	X									
Project 9*				X										
Project 10*				X										
Project 11*				X										

Table 6.2 – Mitigation Project Number and Hazard Addressed - Continued

Incorporated Jurisdiction and Mitigation Project Number	Communicable Disease	Dam Failure	Drought	Flood	Geologic Hazard (Landslide)	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
City of Valley City														
Project 12*				X				X	X					
Project 13*				X				X	X					
Project 14*												X	X	
Project 15*				X				X	X					
Project 16	X													
Project 17				X				X	X					
City of Wimbledon														
Project 1*	X		X	X				X	X		X	X	X	X
Project 2*	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Project 3				X				X	X			X	X	X

7. County/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 shows planning and regulatory capabilities of each incorporated jurisdiction, including Barnes 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 Barnes County and incorporated jurisdictions. Information on the capabilities of each jurisdiction was gathered at jurisdictional meetings, committee meetings and interviews during the planning process.

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, 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 Barnes 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 Mitigation Capability	Barnes Co.	Dazy	Fingal	Kathryn	Leal	Litchville	Nome	Oriska	Pillsbury	Rogers	Sanborn	Sibley	Valley City	Wimbledon
Chief Building Official/Inspector													X	
City Council/Commission	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Civil Engineer			X										X	
Emergency Manager	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Emergency Services GIS Capable	X	X						X					X	X
Emergency Siren		X	X	X	X	X	X	X		X	X	X	X	X
Fire Index Sign						X					X	X	X	
Fire ISO Rating		9		8				9		10	6	9	4	8
Firewise Certification														
Floodplain Administrator/Mngr.	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Generator (portable or permanent)	X	X	X			X					X		X	X
Grant Writing Staff	X	X	X			X		X			X	X	X	X
Infrastructure Maintenance Prgms.	X		X		X		X		X			X	X	X
LEPC	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Mutual Aid Agreements	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Other Staff for Administration		X				X		X		X	X		X	
Planning Services	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Reporting of Data to Em. Mngr.	X	X	X	X	X	X	X	X		X	X	X	X	X
StormReady Certification														

*Denotes communities that are in progress of purchasing and installing permanent generators.

Barnes County: Barnes 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. The Barnes County Emergency Manager is full-time and is also the floodplain administrator/manager. The county can contract with the South Central Dakota Regional Council (SCDRC), the regional planning council, or a private firm for planning services. The county road department maintains and repairs roads using chip-seal, and repairs and mows ditches on county roads. The county also is responsible for maintenance of all bridges located in the county, including bridges inside jurisdictional boundaries, and the Barnes County Water Resource District is responsible for river channel maintenance and clearing of debris to eliminate snagging. The weed board conducts annual tree trimming and elimination of weeds. For grant writing and administration capabilities, the county has the emergency manager, city-county health director, social services, NDSU/Barnes County Extension Service and employees at the Barnes County Courthouse. The county can also contract with SCDRC for grant writing and administration. The county has a county-wide mutual aid agreement for all emergency services. The county also has regional and state aid for emergency services. The county maintains Code Red, which serves as an automated hazard notification system for phones. The county does not own fire index signs and does not have a fire ISO rating. The county does not have any emergency sirens. The county has two portable generators at the sheriff’s department, but does not own permanent generators. The sign truck for the county road department and the truck for the county weed board have GPS for all vehicles. The Barnes County Sheriff’s Department provides law enforcement services. Fire protection is provided by local fire districts/departments.

Ambulance service is provided by Barnes County Ambulance. Law enforcement, fire districts/departments and ambulance services report hazard data to the emergency manager. The county does not have Firewise Certification. The county is not StormReady Certified.

The city of Dazey: The city of Dazey 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. The county emergency manager is the floodplain administrator/manager. 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 has grant writing capability. The fire district/department staff have administration capabilities for mitigation. In addition to the county-wide mutual aid agreement, the city has mutual aid for emergency services with Rogers, Sanborn and Wimbledon, and Hannaford in neighboring Griggs County. The city has an emergency siren located on top of the community center, but it is not adequate as it is manually activated. The fire district/department has four portable generators for backup power, but does not have any permanent generators. The fire ISO rating is nine. The city does not have a fire index sign. The fire district/department does not have GIS capabilities, but staff have smart phones with location and mapping applications. The mayor and fire district/department chief reports hazard data to the emergency manager. The city does not have Firewise or StormReady Certification.

The city of Fingal: The city of Fingal 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 contracts with a private firm for infrastructure maintenance. The county emergency manager is the floodplain administrator/manager. 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 maintains a contract with a sewer superintendent from Fargo to maintain the lift station on an annual basis. The city owns a mower and mows city property and vacant lots. The city charges \$50 per lot per mowing instance with charges placed on the water/sewer bill. The city auditor has grant writing capability. The city can also rely on the county emergency manager or the SCDRC for grant writing and administration. Mutual aid for emergency services is provided through the county-wide agreement. The city has an emergency siren located on the roof of the fire hall. The city has a portable generator for the lift station behind the community center. The portable generator is stored in the bus barn. The city does not have any permanent generators for backup power. The ISO rating for the city is unknown. The city does not have a fire index sign. Emergency services are not GIS capable. The fire chief reports hazard data to the emergency manager. It is unknown if the city is Firewise or StormReady Certified.

The city of Kathryn: The city of Kathryn 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 can contract for engineering services when needed. The county emergency manager is the floodplain administrator/manager. Emergency management is available through the county. The city can contract with the SCDRC or another entity for planning, grant writing and grant administration services. The city does not have any infrastructure maintenance programs, but does conduct maintenance on an as-needed basis. Mutual aid agreements are signed with the cities of Fingal, Litchville and Nome, and Fort Ransom in neighboring Ransom County, and is also covered under the

county-wide mutual aid agreement. The city has an emergency siren located on top of the fire hall, but it is not adequate as it is manually activated. The city does not have a generator for backup power. The fire ISO rating for the city is eight. The city does not have a fire index sign. Emergency services are not GIS capable. However, the fire district/department does have radios connected to county dispatch for improved communication. The fire district/department chief reports hazard data to the emergency manager. The city does not have Firewise or StormReady Certification.

The city of Leal: The city of Leal 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 can contract for engineering services when needed. The county emergency manager is the floodplain administrator/manager. 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 as it does not have staff for those capabilities. The city conducts mowing on vacant lots and charges \$300 per year per lot. Other infrastructure maintenance is conducted on an as-needed basis. The city has a mutual aid agreement for emergency services through the county-wide agreement. The city has an emergency siren located on top of the fire hall, but it is not adequate as it is manually activated. The city does not have any generators. The fire ISO rating for the city is unknown. The city does not have a fire index sign. Emergency services are not GIS capable. The city council reports hazard data to the emergency manager. The city does not have Firewise or StormReady Certification.

The city of Litchville: The city of Litchville 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 can contract for engineering services when needed. The county emergency manager is the floodplain administrator/manager. The city auditor has grant writing and administrative capabilities. The city can also contract with the SCDRC or a private firm for planning, grant writing and grant administration services. The city does not have any infrastructure maintenance programs, but conducts maintenance on trees, vegetation and the sanitary sewer system on an as-needed basis. Mutual aid agreements are signed with the cities of Kathryn and Sanborn, and the cities of LaMoure and Marion in neighboring LaMoure County. The city is also part of the county-wide mutual aid agreement for emergency services. The city has an emergency siren located on top of the water tower. The city has two generators; one for the sanitary sewer lift station and the other for the water tower to keep water circulating to avoid freezing in winter months. The fire ISO rating for the city is unknown. The city has a fire index sign located at the corner of Main Street. Emergency services are not GIS capable. The city auditor reports hazard data to the emergency manager. The city is not Firewise or StormReady certified.

The city of Nome: The city of Nome 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 but can contract with a private firm for civil engineering services. The county emergency manager is the floodplain administrator/manager. Emergency management is available through the county. The city does not have staff for grant writing and administration purposes and relies on the emergency manager or the SCDRC for planning services, grant writing and grant administration. The city performs infrastructure maintenance on an as-needed basis, with the exception of mowing. The city owns mowing equipment and pays an hourly wage for mowing of city lots. The city also has a contract with the city of Enderlin in neighboring Ransom County for mosquito spraying through a grant. Mutual aid agreements are signed with the city of Enderlin for fire protection. The city is also part of the county-wide mutual aid

agreement for emergency services. The city has an emergency siren located on top of the fire hall, but it is not adequate as it is manually activated. The city does not have any generators. The fire ISO rating for the city is unknown. The city does not have a fire index sign. Emergency services are not GIS capable. The city council reports hazard data to the emergency manager. The city is not Firewise certified. The city does not have StormReady Certification.

The city of Oriska: The city of Oriska has an active city council. The city does not have a chief building official or inspector. The city participates in the County LEPC. The city does not have a civil engineer on staff, but can contract with a private firm for engineering services when needed. The county emergency manager is the floodplain administrator/manager. Emergency management is available through the county. The city can contract with the SCDRC or a private firm for planning services, grant writing and grant administration services. However, the city council and auditor have experience in grant writing and administration. The mayor can also assist in administration. The city does not have any infrastructure maintenance programs, but conducts maintenance on an as-needed basis. The city is part of the county-wide mutual aid agreement for emergency services. The city has an emergency siren located on top of the fire hall, but it is not adequate as it is manually activated. The city does not have any generators. The fire ISO rating for the city is nine. The city does not have a fire index sign. Emergency services are not GIS capable. However, city staff have smart phones and assist emergency services when needed. The city auditor reports hazard data to the emergency manager. The city does not have Firewise or StormReady Certification.

The city of Pillsbury: The city of Pillsbury 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, but contracts when services are needed. The county emergency manager is the floodplain administrator/manager. 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 graveling of city streets every two-to-three years and mows city and vacant lots. The city is part of the county-wide mutual aid agreement for emergency services. The city, however, is part of the Hope Fire Department, which is headquartered in neighboring Steele County. The city does not have an emergency siren or generators. The fire ISO rating for the city is unknown. The city does not have a fire index sign. It is unknown if emergency services are GIS capable or if hazard data is reported to the emergency manager. It is unknown if the city is Firewise or StormReady Certified.

The city of Rogers: The city of Rogers 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, but can contract with a private firm when services are needed. The county emergency manager is the floodplain administrator/manager. 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. However, the city council and auditor have administration capabilities. Infrastructure maintenance is conducted on an as-needed basis. The city is part of the county-wide mutual aid agreement for emergency services. The city also has signed mutual aid agreements specifically with Dazey, Sanborn, Valley City and Wimbledon for fire protection. The city has two emergency sirens with both located at the fire hall and one being manually activated and the other activated by county dispatch. The city does not have any generators. The fire ISO rating for the city is 10. The city does not have a fire index sign.

Emergency services are not GIS capable. The fire chief and assistant fire chief report hazard data to the emergency manager. The city is not Firewise or StormReady Certified.

The city of Sanborn: The city of Sanborn 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, but can contract with a private firm when services are needed. The county emergency manager is the floodplain administrator/manager. 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. However, the county's emergency manager is a member of the city council and can write and administer grants. The city council and auditor also have administration capabilities. Infrastructure maintenance is conducted on an as-needed basis. The city is part of the county-wide mutual aid agreement for emergency services. The city has an emergency siren located at the fire hall. The city has a generator at the water tower. The fire ISO rating for the city is six. The city has a fire index sign located at the fire hall. Emergency services are not GIS capable. The fire chief and assistant fire chief report hazard data to the emergency manager. The city is not Firewise or StormReady Certified.

The city of Sibley: The city of Sibley 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, but can contract with a private firm when services are needed. The county emergency manager is the floodplain administrator/manager. 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. However, the auditor, mayor and city council have grant writing capabilities as an arbor day grant was written by staff and awarded. The city conducts an annual clean up with additional infrastructure maintenance conducted on an as-needed basis. The city is part of the county-wide mutual aid agreement for emergency services. The city has an emergency siren located at the fire hall, but it is not adequate as it is manually activated. The city does not have any generators. The fire ISO rating for the city is nine. The city does not have a fire index sign. Emergency services are not GIS capable. The fire chief reports hazard data to the emergency manager. The city is not Firewise or StormReady Certified.

The city of Valley City: The city of Valley City has an active city council. The city has a full-time chief building official/inspector who also serves as the floodplain administrator/manager. The city is also FEMA flood mapped. The city has an LEPC through the county. The city has an ongoing contract with a local engineering firm for engineering and planning services. Emergency management is available through the county. The police chief, city administrator, independent city committees, city beautification committee and various city employees have grant writing and administration capabilities. The local economic development corporation has a full-time grant writer. The city can also contract with the SCDRC for planning, grant writing and grant administration services. For infrastructure maintenance, the city's public works and street departments routinely conduct the following activities: street sweeping, street repair, pot-hole repair, chip-seal and pavement marking maintenance. The public works department also is responsible for mowing of lots and ditches. The city's police department has been deputized by the Barnes County Sheriff's Department. The city contracts with the county emergency manager for services during flood emergencies and occurrences of hazards. The police chief is also certified in incident command system and can train other city staff on the system. The city is also part of the county-wide mutual aid agreement for emergency services. The city has six emergency sirens. The sirens are located at the following locations:

- 900 block of 5th Ave NW
- East of Jefferson Elementary on the 300 block of 12th St. NE near Charlie Brown Baseball Field
- West Main at LaFarge Dakota
- Valley City Public Works Shop
- West Main at the 1000 block
- Grainger Hill near the technology center on the 600 block of 6th St. SE

The city also possessed generators at the following locations:

- Eight permanent generators and six portable generators at the police station
- One permanent generator at the master lift station
- One permanent generator at the water treatment plant
- One permanent generator at the fire department

The fire ISO rating for the city is four. The city has two wildland fire index signs; one located on west main and the other on east main near the John Deere shop. The police department vehicles have laptops that are air-carded and have mapping capabilities, but do not have automatic vehicle locators installed. The fire department has vehicles and services that are GIS capable. The police chief, fire chief and city staff report hazard data to the emergency manager. The city is not Firewise or StormReady Certified.

The city of Wimbledon: The city of Wimbledon 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 county emergency manager is the floodplain administrator/manager. The city is not flood mapped and the county emergency manager is the floodplain administrator/manager. 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. However, the auditor and mayor have grant writing and administration capabilities. The city conducts mowing of city and vacant lots with the cost special assessed to the lot owner. All other infrastructure maintenance programs are done on an as-needed basis. The city is part of the county-wide mutual aid agreement for emergency services. The city has an emergency siren located at the community center. The city owns one portable generator, which is stored at Agroline. The fire ISO rating for the city is eight. The city does not have a fire index sign. The fire responder vehicle is GPS capable, but all other emergency service are not GIS capable. The first responders use smart phones and are working with neighboring Stutsman County to get usable maps on the phones. It is unknown if hazard data is reported to the emergency manager. The city is not Firewise or StormReady Certified.

Table 7.2 shows the education and outreach capabilities of Barnes 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

Education and Outreach Mitigation Capability	Barnes Co.	Dazey	Fingal	Kathryn	Leal	Litchville	Nome	Oriska	Pillsbury	Rogers	Sanborn	Sibley	Valley City	Wimbledon
County/City Events	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Entities Providing Public Education	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Non-Profit Organizations	X												X	
Other	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Public-Private Partnerships	X												X	
School Programs	X					X		X					X	
Website with Hazard Education	X												X	

Barnes County: The NDSU/Barnes County Extension Service, the Girl Scouts, the Boy Scouts, and the 4-H are organizations providing education and outreach on hazards. The county’s emergency management department maintains a website with hazard education information. The NDSU/Barnes County Extension Service, Central Valley Health District, and City-County Health provide public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. Eagle Creek Software Services and John Deere Seeding Group participate in the Community Emergency Response Teams (CERTS). The county’s emergency manager conducts education on shelter-in-place, response to sirens, 911 and general hazard education to students at public school and the general public, and provides brochures, pamphlets and other materials available at the Barnes County Courthouse.

The city of Dazey: The city does not have non-profit organizations providing education on hazards, but has access to the NDSU/Barnes County Extension Service. The city does not maintain a website with hazard education. A website with hazard education is available through the county. There is not a school located in the city and therefore no school programs targeting hazard education are available. The city does not have any entities providing public education on hazards, but has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city does not conduct events on hazard education. There are no public-private partnerships providing education and outreach on hazards. The county’s emergency manager conducts education and outreach on hazards in the city.

The city of Fingal: The city does not have non-profit organizations providing education on hazards, but has access to the NDSU/Barnes County Extension Service. The city does not maintain a website with hazard education. A website with hazard education is available through the county. There is not a school located in the city and therefore no school programs targeting hazard education are available. The city

does not have any entities providing public education on hazards, but has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city does not conduct events on hazard education. However, the all school reunion held in the city provides an opportunity for hazard education. There are no public-private partnerships providing education and outreach on hazards. The county's emergency manager conducts education and outreach on hazards in the city.

The city of Kathryn: The city does not have non-profit organizations providing education on hazards, but has access to the NDSU/Barnes County Extension Service. The city does not maintain a website with hazard education. A website with hazard education is available through the county. There is not a school located in the city and therefore no school programs targeting hazard education are available. The city does not have any entities providing public education on hazards, but has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city does not conduct events on hazard education. There are no public-private partnerships providing education and outreach on hazards. The county's emergency manager conducts education and outreach on hazards in the city.

The city of Leal: The city does not have non-profit organizations providing education on hazards, but has access to the NDSU/Barnes County Extension Service. The city does not maintain a website with hazard education. A website with hazard education is available through the county. There is not a school located in the city and therefore no school programs targeting hazard education are available. However, Barnes County North is located approximately three miles west of the city where education and outreach is provided to students. The city does not have any entities providing public education on hazard, but has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city does not conduct events on hazard education. There are no public-private partnerships providing education and outreach on hazards. The county's emergency manager conducts education and outreach on hazards in the city.

The city of Litchville: The city does not have non-profit organizations providing education on hazards, but has access to the NDSU/Barnes County Extension Service. The city does not maintain a website with hazard education. A website with hazard education is available through the county. Fire prevention week is conducted at the elementary school on an annual basis. The Litchville Fire District and Department conducts education aside from fire prevention week at the elementary school when necessary. The city also has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city does not conduct events on hazard education. There are no public-private partnerships providing education and outreach on hazards. The county's emergency manager conducts education and outreach on hazards in the city.

The city of Nome: The city does not have non-profit organizations providing education on hazards, but has access to the NDSU/Barnes County Extension Service. The city does not maintain a website with hazard education. A website with hazard education is available through the county. There is not a school located in the city and therefore no school programs targeting hazard education are available. The city does not have any entities providing public education on hazards, but has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city does not have existing events where hazard education is conducted. However, the annual 4th of July community picnic and fire display provides an opportunity for hazard education. There are no public-private partnerships providing education and outreach on hazards. The county's emergency manager conducts education and outreach on hazards in the city.

The city of Oriska: The city does not have non-profit organizations providing education on hazards, but has access to the NDSU/Barnes County Extension Service. The city does not maintain a website with hazard education. A website with hazard education is available through the county. Fire prevention week is conducted at the elementary school on an annual basis in October by the Oriska Fire Department. The city also has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city does not conduct events on hazard education. There are no public-private partnerships providing education and outreach on hazards. The county's emergency manager conducts education and outreach on hazards in the city.

The city of Pillsbury: The city does not have non-profit organizations providing education on hazards, but has access to the NDSU/Barnes County Extension Service. The city does not maintain a website with hazard education. A website with hazard education is available through the county. There is not a school located in the city and therefore no school programs targeting hazard education are available. The city does not have any entities providing public education on hazards, but has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city does not conduct events on hazard education. There are no public-private partnerships providing education and outreach on hazards. The county's emergency manager conducts education and outreach on hazards in the city.

The city of Rogers: The city does not have non-profit organizations providing education on hazards, but has access to the NDSU/Barnes County Extension Service. The city does not maintain a website with hazard education. A website with hazard education is available through the county. There is not a school located in the city and therefore no school programs targeting hazard education are available. Adam Benson-Quinn conducts hazard education, safety drills and precaution workshops for employees, but not the general public. The city also has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city does not

conduct events on hazard education. There are no public-private partnerships providing education and outreach on hazards. The county's emergency manager conducts education and outreach on hazards in the city.

The city of Sanborn: The city does not have non-profit organizations providing education on hazards, but has access to the NDSU/Barnes County Extension Service. The city does not maintain a website with hazard education. A website with hazard education is available through the county. There is not a school located in the city and therefore no school programs targeting hazard education are available. Didiers Ag Center conducts hazard education for employees, but not the general public. The city also has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city also has an annual "smoker" event where hazard education is provided. There are no public-private partnerships providing education and outreach on hazards. The county's emergency manager conducts education and outreach on hazards in the city.

The city of Sibley: The city does not have non-profit organizations providing education on hazards, but has access to the NDSU/Barnes County Extension Service. The city does not maintain a website with hazard education. A website with hazard education is available through the county. There is not a school located in the city and therefore no school programs targeting hazard education are available. The Sodbusters, a monthly social club, provides education and outreach on hazards. The city also has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city does not conduct events on hazard education. There are no public-private partnerships providing education and outreach on hazards. The county's emergency manager conducts education and outreach on hazards in the city.

The city of Valley City: The NDSU/Barnes County Extension Service and City-County Health are based in Valley City and provide education and outreach on hazards. The city maintains a website with hazard education. A website with hazard education is also available through the county. School programs on hazard education are conducted at the elementary schools, junior high/high school and Valley City State University by the county's emergency manager, police chief, fire chief and city officials. The Valley City Police Department Police Chief provides education on active shooter and shelter-in-place at Valley City State University on an annual basis. The Valley City Fire Department District Fire Chief conducts fire safety and prevention at schools on an annual basis. The city also has access to Central Valley Health District for public education on hazards. The annual winter show held in the city and the Barnes County Air Show held every two years at the Barnes County Municipal Airport located on the city's northwest side are events where outreach on hazard education is conducted. The city does not conduct any events specific to hazard education. There are no public-private partnerships providing education and outreach on hazards. However, the city has had discussions with John Deere Seeding Group, the largest employer in the city and Barnes County, to partner with the city to form a public-private partnership to conduct hazard education for employees and the general public. The county's emergency manager conducts education and outreach on hazards in the city at schools, businesses, and city meetings.

The city of Wimbledon: The city does not have non-profit organizations providing education on hazards, but has access to the NDSU/Barnes County Extension Service. The city does maintain a website with hazard education. A website with hazard education is also available through the county. There is not a school located in the city and therefore no school programs targeting hazard education are available. However, Barnes County North is located southeast of the city approximately eight miles where education and outreach is provided to students. Agroline and Cenex conducts hazard education for employees, but not the general public. The city also has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city does not conduct events on hazard education. There are no public-private partnerships providing education and outreach on hazards. The county’s emergency manager conducts education and outreach on hazards in the city.

Table 7.3 shows the financial capabilities of Barnes 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	Barnes Co.	Dazey	Fingal	Kathryn	Leal	Litchville	Nome	Oriska	Pillsbury	Rogers	Sanborn	Sibley	Valley City	Wimbledon
Building Permits	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Capital Improvements Fund	X		X	X			X						X	
Community Development Block Grant (CDBG)	X	X	X	X	X	X	X	X	X	X	X	X	X	X
General Obligation Bonds/Special Tax			X	X		X					X		X	
Other	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Private Entities				X						X				
Sanitary Sewer Fee		X	X	X		X	X				X	X	X	X
Special Assessments for New Development	X												X	
Storm water Utility Fee													X	

Barnes County: Barnes County sets aside tax revenue for capital improvements in a fund specifically for county roads and bridges and maintains a schedule of capital improvement projects. The county does not have storm water utility or sanitary sewer fees. The county does not levy special assessments for new development, but can do so if warranted. However, the Barnes County Water Resource District can levy special assessments for drainage improvements. The county may incur debt through general obligation bonds or special tax bonds but has not done so as of 2014. The county issues building permits. However, individual townships, if zoned, may require separate building permits. The county has access to Community Development Block Grants (CDBG) through the SCDRC. Between 1983 and 2012, CDBG funding was provided for 30 infrastructure projects in the county and 10 city jurisdictions. The Barnes County Rural Water District, Barnes County Water Resource District, townships, and county school districts are other sources of funding for mitigation. The townships may assess a fee or special

assessment for infrastructure maintenance such as mowing roadside ditches or maintaining roads. State and federal sources can and have provided funding for mitigation.

The city of Dazey: The city does not set aside tax revenue for capital improvements, but does maintain a savings account. The city does not have storm water utility fee as it lacks a storm water system. The city does special assess \$10 per month for maintenance of the sanitary sewer system. The city does not levy special assessments for new development, but has the ability to do so if warranted. The city has not incurred any debt through general obligation bonds or special tax bonds, but also has the ability to do so if warranted. The city issues building permits through the county. The city has access to CDBG funds through the SCDRC. The city does not have any private entities providing funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation.

The city of Fingal: The city maintains a general fund and sets aside additional revenue in a separate account specifically for sewer projects. The city does not have storm water utility fee as it lacks a storm water system. The city does special assess \$7.75 per month on the garage and sewer bill for maintenance of the sanitary sewer system. The city does not levy special assessments for new development, but has the ability to do so if warranted. The city incurred debt through a bond from the state for a recent sewer project. The city can incur debt through general obligation bonds or special tax bonds in the future if needed. The city issues building permits. The city has access to CDBG funds through the SCDRC. The city does not have any private entities providing funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation.

The city of Kathryn: The city maintains a capital improvements fund through a special assessment of \$10 on the water bill every month. The city does not have storm water utility fee as it lacks a storm water system. The city does special assess \$21.50 per month on the garage and sewer bill for maintenance of the sanitary sewer system. The city took out a bond from the Bank of North Dakota for a sewer project. The city issues building permits. The city has access to CDBG funds through the SCDRC. The city does not levy special assessments for new development, but has the ability to do so if warranted. The city does not have any private entities providing funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation. The city also rents out a former school house located south of the city to Valley City State University for \$250 per month for the Prairie Waters Research Program. This revenue can also be used for mitigation if needed.

The city of Leal: The city maintains a general fund and not a separate account for capital improvements. The city does not have storm water utility fee as it lacks a storm water system. The city does not assess any sanitary sewer fees despite having a sanitary sewer system. The city does not levy special assessments for new development, but has the ability to do so if warranted. The city has not incurred any debt through general obligation bonds or special tax bonds, but also has the ability to do so if warranted. The city issues building permits through the county. The city has access to CDBG funds through the SCDRC. The city does not have any private entities provide funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation.

The city of Litchville: The city maintains a general fund and not a separate account for capital improvements. The city does not assess a storm water utility fee despite having a storm water system. The city uses revenue from the general fund for storm water improvements. The city does special assess \$17 per month on the property tax bill for maintenance of the sanitary sewer system. The city took out a

loan for a new lagoon. The city does not levy special assessments for new development, but has the ability to do so if warranted. The city issues building permits. The city has access to CDBG funds through the SCDRC. The city does not have any private entities providing funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation.

The city of Nome: The city has a city improvement account and pays for infrastructure projects from the account. The account is refunded through general revenue. The city does not assess a storm water utility fee as it does not have a storm water system. The city charges a sanitary sewer fee of \$8, plus a \$4 special fee for updating the sanitary sewer system, which is placed on the water/sewer/garbage bill. The city does not levy special assessments for new development, but has the ability to do so if warranted. The city has not incurred any debt through general obligation bonds or special tax bonds, but also has the ability to do so if warranted. The city issues building permits for free. The city has access to CDBG funds through the SCDRC. The city does not have any private entities providing funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation.

The city of Oriska: The city has a general fund and savings account that can help pay for infrastructure projects, but does not maintain an account specifically for infrastructure projects. The city does not assess a storm water utility fee as it lacks a storm water system. The city does not charge a sanitary sewer fee despite having a sanitary sewer system. The city does not levy special assessments for new development, but has the ability to do so if warranted. The city has not incurred any debt through general obligation bonds or special tax bonds, but also has the ability to do so if warranted. The city issues building permits for \$5. The city has access to CDBG funds through the SCDRC. The city does not have any private entities providing funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation.

The city of Pillsbury: The city does not set aside tax revenue for capital improvements, but does maintain a savings account, which can be used if necessary. The city does not have storm water utility fee as it lacks a storm water system. The city special assesses \$10 per month for maintenance of the sanitary sewer system. The city does not levy special assessments for new development, but has the ability to do so if warranted. The city has not incurred any debt through general obligation bonds or special tax bonds, but also has the ability to do so if warranted. The city issues building permits through the county. The city has access to CDBG funds through the SCDRC. The city does not have any private entities providing funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation.

The city of Rogers: The city does not set aside tax revenue for capital improvements and only has a general fund. The city does not have storm water utility fee as it lacks a storm water system. The city does not charge a sanitary sewer fee despite having a sanitary sewer system. The city does not levy special assessments for new development, but has the ability to do so if warranted. The city has not incurred any debt through general obligation bonds or special tax bonds, but also has the ability to do so if warranted. The city issues building permits. The city has access to CDBG funds through the SCDRC. The Adam Benson-Quinn elevator provides funding to the city when needed, which can potentially be used for mitigation purposes. The surrounding township and county school districts are other sources of funding for mitigation.

The city of Sanborn: The city does not set aside tax revenue for capital improvements and only has a general fund. The city does not have storm water utility fee as it lacks a storm water system. The city does charge a monthly sanitary sewer fee which is placed on the water/sewer/garbage bill. The city does not levy special assessments for new development, but has the ability to do so if warranted. The city issued a bond to pay for a new pump house in recent years and has the ability to incur debt through general obligation bonds or special tax bonds in the future if needed. The city issues building permits. The city has access to CDBG funds through the SCDRC. The city does not have any private entities providing funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation.

The city of Sibley: The city does not set aside tax revenue for capital improvements and only has a general fund. The city does not have storm water utility fee as it lacks a storm water system. The city charges a monthly sanitary sewer fee of \$50, which is placed on the water/sewer/garbage bill. The city does not levy special assessments for new development, but has the ability to do so if warranted. The city has not incurred any debt through general obligation bonds or special tax bonds, but also has the ability to do so if warranted. The city issues building permits. The city has access to CDBG funds through the SCDRC. The city does not have any private entities providing funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation.

The city of Valley City: The city sets aside revenues for capital improvements and maintains a separate fund. Revenues from the police department through citations and court actions help fund capital improvements. The city has a storm water utility fee of \$1 per month that is placed on resident's utility bill. The city also maintains a separate line item on the budget for storm water funding. The city also maintains a \$5 contingency plan on sanitary sewer repair and replacement. The city does not levy special assessments for new development, but has the ability to do so if warranted. The city requires developers to fund and install infrastructure such as water/sewer, streets and sidewalks. The city incurs debt through general obligation bonds or special tax bonds for public works and roads. Roads are financed through a general obligation bond, which is paid back through property tax revenue from properties that are either adjacent to or have a direct benefit from the road project. The city issues building permits. The city has access to CDBG funds through the SCDRC. The city does not have any private entities providing funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation.

The city of Wimbledon: The city does not set aside tax revenue for capital improvements and only has a general fund. The city does not have storm water utility fee as it lacks a storm water system. The city charges a monthly sanitary sewer fee of \$8, plus \$1.15 per thousand gallons of water on the water/sewer garbage bill. The city does not levy special assessments for new development, but has the ability to do so if warranted. The city has not incurred any debt through general obligation bonds or special tax bonds, but also has the ability to do so if warranted. The city issues building permits. The city has access to CDBG funds through the SCDRC. The city does not have any private entities providing funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation.

In addition to the aforementioned financial capabilities of the county and city jurisdictions, the following local, regional, state and federal entities can be used as funding sources for mitigation.

- Barnes County Rural Water District
- Barnes County Water Resource District
- Bek Communications
- Cable Service, Inc. (CSI)
- Dakota Central Telecommunications (Daktel)
- Dakota Rural Water District
- Dickey Rural Networks (DRN)
- Federal Emergency Management Agency
- Inter-Community Telephone Company
- N.D. Department of Emergency Services
- Mid-Continent Communications
- Montana-Dakota Utilities
- Otter Tail Power Company
- Qwest

Table 7.4 shows the planning and regulatory capabilities of Barnes 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.

Table 7.4 – Planning and Regulatory Capabilities

Planning and Regulatory Mitigation Capability	Barnes Co.	Dazey	Fingal	Kathryn	Leal	Litchville	Nome	Oriska	Pillsbury	Rogers	Sanborn	Sibley	Valley City	Wimbledon
Building Codes			X	X	X		X	X			X		X	
Building Permits	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Capital Improvements	X												X	
Comprehensive													X	
Continuity of Operations	X													
Drought Management												X		
FEMA Flood Map	X			X		X							X	
Flood Damage Reduction Study				X										
Flood Insurance Study	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Flood Management	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Flood Ordinance	X							*					X	
Impact Fees													X	
Pandemic Influenza Response Plan	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Inspector													X	
Land Use	X												X	
Local Emergency Operations	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Planning Commission	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Strategic													X	
Storm water	X	*											X	
Subdivision Ordinance	X												X	X
Transportation	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Water Conservation													X	
Zoning	X			X	X							X	X	X

*Denotes communities that are in progress of implementing planning and regulatory mitigation capability.

Barnes County: Barnes County does not have a comprehensive, strategic, drought management or water conservation plan. The planning and zoning administration maintains a land use plan. The county road department has a capital improvements plan and maintains a schedule of projects. The county has a local emergency operations but does not have a continuity of operations plan. The transportation plan is included in road department capital improvements plan. The county has a flood management plan administered by the county emergency manager. The flood management plan is also in the county’s emergency operations plan. The county highway department, townships or individual cities are responsible for their own plans. The county has zoning that is current as of 2012. The planning and zoning administration acts as the planning commission. The county does not have building codes. The county does not have an inspector. The county is FEMA flood mapped as of 2007. The county does not have a flood damage reduction study, but does have a flood insurance study. The county has flood ordinances and subdivision ordinances which are administered through the planning and zoning administration. The county does not have impact fees. The county issues building permits for building

and development. The cost of building permits is set up on a graduated scale based on building valuation. Central Valley Health and City-County Health also have a Pandemic Influenza Response Plan identifying points of dispensing sites in the county.

The city of Dazey: The city does not have a comprehensive, strategic, capital improvements, land use, storm water, water conservation or drought management plan. However, the city is in progress of developing a storm water management plan. The city is included under the county's local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city does not have zoning, subdivision ordinances or impact fees. The city issues building permits through the county. The city council serves as the planning commission for the city. The city has not adopted building codes and does not have an inspector. The city is not FEMA flood mapped and does not have flood ordinances. The city does not have a flood damage reduction study, but does have a flood insurance study. The city is covered under the County's Pandemic Influenza Response Plan.

The city of Fingal: The city does not have a comprehensive, strategic, capital improvements, land use, storm water, water conservation or drought management plan. The city is included under the county's local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city does not have zoning in place, but considers development on a case-by-case basis. The city does not have subdivision ordinances or impact fees, but does issue building permits. The city council serves as the planning commission for the city. The city adopted state building codes, but does not have an inspector. The city is not FEMA flood mapped and does not have flood ordinances. The city does not have a flood damage reduction study, but does have a flood insurance study. The city is covered under the County's Pandemic Influenza Response Plan.

The city of Kathryn: The city does not have a comprehensive, strategic, capital improvements, land use, storm water, water conservation or drought management plan. The city is included under the county's local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city has zoning in place. The city does not have subdivision ordinances or impact fees, but does issue building permits. The city council serves as the planning commission for the city. The city adopted state building codes 15 years ago, but does not have an inspector. The city is FEMA flood mapped but does not have flood ordinances. However, the city does have a flood damage reduction study from 1987 that can be used for mitigation. The city also have a flood insurance study. The city is covered under the County's Pandemic Influenza Response Plan.

The city of Leal: The city does not have a comprehensive, strategic, capital improvements, land use, storm water, water conservation or drought management plan. The city is included under the county's local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city does not have zoning, but utilizes the county zoning for regulation of development. The city does not have subdivision ordinances or impact fees. The city issues building permits through the county. The city council serves as the planning commission for the city. The city adopted the county's building codes, but does not have an inspector. The city is not FEMA flood mapped and does not have flood ordinances. The city does not

have a flood damage reduction study, but does have a flood insurance study. The city is covered under the County's Pandemic Influenza Response Plan.

The city of Litchville: The city does not have a comprehensive, strategic, capital improvements, land use, storm water, water conservation or drought management plan. The city is included under the county's local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city does not have zoning, subdivision ordinances or impact fees. The city issues its own building permits. The city council serves as the planning commission for the city. The city has no adopted building codes and does not have an inspector. The city is FEMA flood mapped but does not have flood ordinances. The city does not have a flood damage reduction study, but does have a flood insurance study. The city is covered under the County's Pandemic Influenza Response Plan.

The city of Nome: The city does not have a comprehensive, strategic, capital improvements, land use, storm water, water conservation or drought management plan. The city is included under the county's local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city does not have zoning, subdivision ordinances or impact fees. The city issues its own building permits for free. The city council serves as the planning commission for the city. The city adopted the state building codes in 2005/2006, but does not have an inspector. The city is not FEMA flood mapped and does not have flood ordinances. The city does not have a flood damage reduction study, but does have a flood insurance study. The city is covered under the County's Pandemic Influenza Response Plan.

The city of Oriska: The city does not have a comprehensive, strategic, capital improvements, land use, storm water, water conservation or drought management plan. The city is included under the county's local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city does not have zoning, subdivision ordinances or impact fees. The city issues building permits. The city council serves as the planning commission for the city. The city adopted the state building codes, but does not have an inspector. The city is not FEMA flood mapped and does not have flood ordinances. The city does not have a flood damage reduction study, but does have a flood insurance study. However, the city is considering flood ordinances to address overland flooding issues. The city is covered under the County's Pandemic Influenza Response Plan.

The city of Pillsbury: The city does not have a comprehensive, strategic, capital improvements, land use, storm water, water conservation or drought management plan. The city is included under the county's local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city does not have zoning, subdivision ordinances or impact fees. The city issues building permits through the county. The city council serves as the planning commission for the city. The city does not have building codes and does not have an inspector. The city is not FEMA flood mapped and does not have flood ordinances. The city does not have a flood damage reduction study, but does have a flood insurance study. The city is covered under the County's Pandemic Influenza Response Plan.

The city of Rogers: The city does not have a comprehensive, strategic, capital improvements, land use, storm water, water conservation or drought management plan. The city is included under the county's

local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city does not have zoning, subdivision ordinances or impact fees. The city issues building permits for \$5. The city council serves as the planning commission for the city. The city does not have building codes and does not have an inspector. The city is not FEMA flood mapped and does not have flood ordinances. The city does not have a flood damage reduction study, but does have a flood insurance study. The city is covered under the County's Pandemic Influenza Response Plan.

The city of Sanborn: The city does not have a comprehensive, strategic, capital improvements, land use, storm water, water conservation or drought management plan. The city is included under the county's local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city recently updated its zoning, but does not have subdivision ordinances or impact fees. The city issues building permits for \$5. The city council serves as the planning commission for the city. The city adopted state building codes but does not have an inspector. The city is not FEMA flood mapped and does not have flood ordinances. The city does not have a flood damage reduction study, but does have a flood insurance study. The city is covered under the County's Pandemic Influenza Response Plan.

The city of Sibley: The city does not have a comprehensive, strategic, capital improvements, land use, water conservation or storm water plan. The city does have a drought management plan. The city is included under the county's local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city has zoning in place dating back to the 1960s. The city is considering updating its zoning in 2015. The city does not have subdivision ordinances or impact fees. The city issues building permits for development. The city council serves as the planning commission for the city. The city has not adopted state building codes and does not have an inspector. The city is not FEMA flood mapped and does not have flood ordinances. The city does not have a flood damage reduction study, but does have a flood insurance study. The city is covered under the County's Pandemic Influenza Response Plan.

The city of Valley City: The city has a land use and transportation plan, which includes its comprehensive and strategic plans. The city maintains a capital improvements construction and forecast plan that plans projects 10 years in advance. The city works with the N.D. Department of Transportation on urban roads in Valley City to plan repair and maintenance, and areas needing replacement. The city has a draft of a local emergency operations plan prepared by the police department, which is scheduled for finalizing in late 2014/early 2015. The city has a flood management plan highlighting hierarchies inside each city department and the chain of command internally for each department. The public works department for the city has a water conservation plan consisting of a one-notification system for alerting residents when water rationing is in place. The storm water management plan for the city is operated through public works. The current planning and zoning for existing and new structures requires all storm water to be retained on site and slowly released into the system. The city renews the storm water management plans and planning and zoning ordinances every time a road is either redone or built. The city does not have a continuity of operations or drought management plan. The city has zoning in place and has ordinances that specifically manage development of housing. The city has a planning and zoning commission, which is appointed by the city council, and reports directly to the city commission. The adopted state buildings codes 15 years ago and has a full-time building inspector. The city is FEMA

flood mapped and has flood ordinances. The city does not have a flood damage reduction study, but does have a flood insurance study. The emergency flood plan also includes flood ordinances and is updated on an annual basis. The city issues permits for building and development. In place of impact fees, the city requires new developments to collect storm water and retain it on site. The city is covered under the County's Pandemic Influenza Response Plan.

The city of Wimbledon: The city does not have a comprehensive, strategic, capital improvements, land use, storm water, water conservation or drought management plan. The city is included under the county's local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city has zoning in place as of 2009. The city does not have impact fees but does have trailer park subdivision ordinances in place. The city issues building permits for development. The city council serves as the planning commission for the city. The city has not adopted state building codes and does not have an inspector. The city is not FEMA flood mapped and does not have flood ordinances. The city does not have a flood damage reduction study, but does have a flood insurance study. The city is covered under the County's Pandemic Influenza Response Plan.

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. However, as of 2014, there are no townships in Barnes County with adopted strategic plans.

In addition to strategic plans, townships that have zoning in place, including a zoning commission and a zoning administrator, can use zoning for mitigation purposes. In Barnes County, all townships follow the county's zoning. As of 2014, there are no townships in Barnes County with zoning in addition to the county's zoning. However, Eckelson Township has been discussing implementing additional zoning to address industrial development in Spiritwood Township in neighboring Stutsman County to the west.

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 (FMA)	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 (WPDGs)	US Environmental Protection Agency

8. Plan Maintenance

The Barnes 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 Barnes 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 include in Chapter 10. 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 Barnes County Commission. The fire departments, law enforcement departments, county health department, and emergency medical services will be encouraged to constantly inform 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 jurisdiction meetings. The plan will be available to the public at the Barnes County Courthouse and at the city halls in each of the jurisdictions. During plan updates, the plan will also be on the county website. The public is encouraged to share input on the plan.

9. Maps

Maps provide visual illustrations of the geography of the Barnes 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.

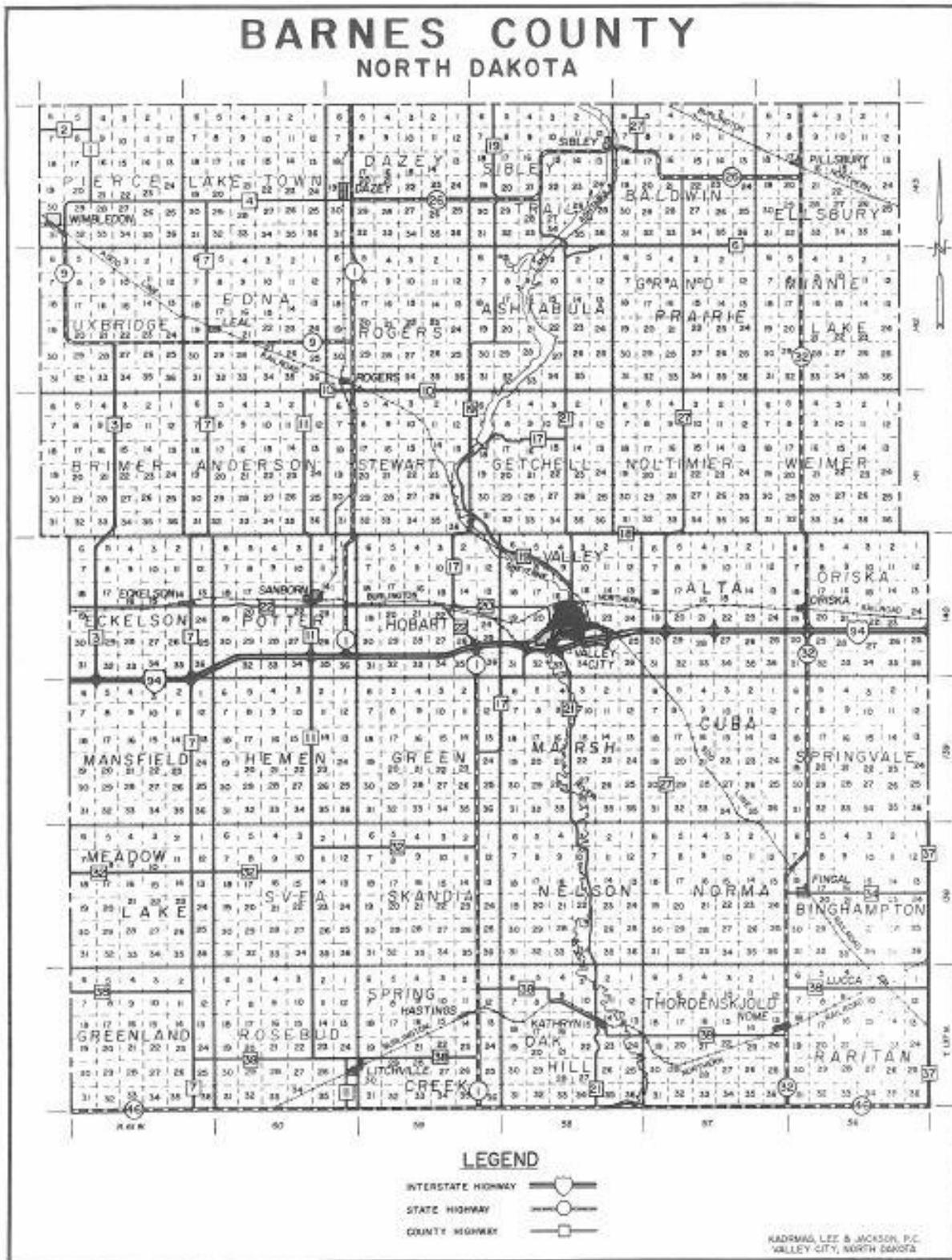
Figure 9.1 is of Barnes County and illustrates where each jurisdiction is located in reference to one another; national, state and county highways; railroads; and bodies of water and rivers. Information on the transportation system, including freight railroad, bridges and airports is important for understanding the transportation system and potential risk involved with transportation accidents, among other hazards.

Figure 9.1 – Barnes County, North Dakota



Source: North Dakota Geographic Information Systems

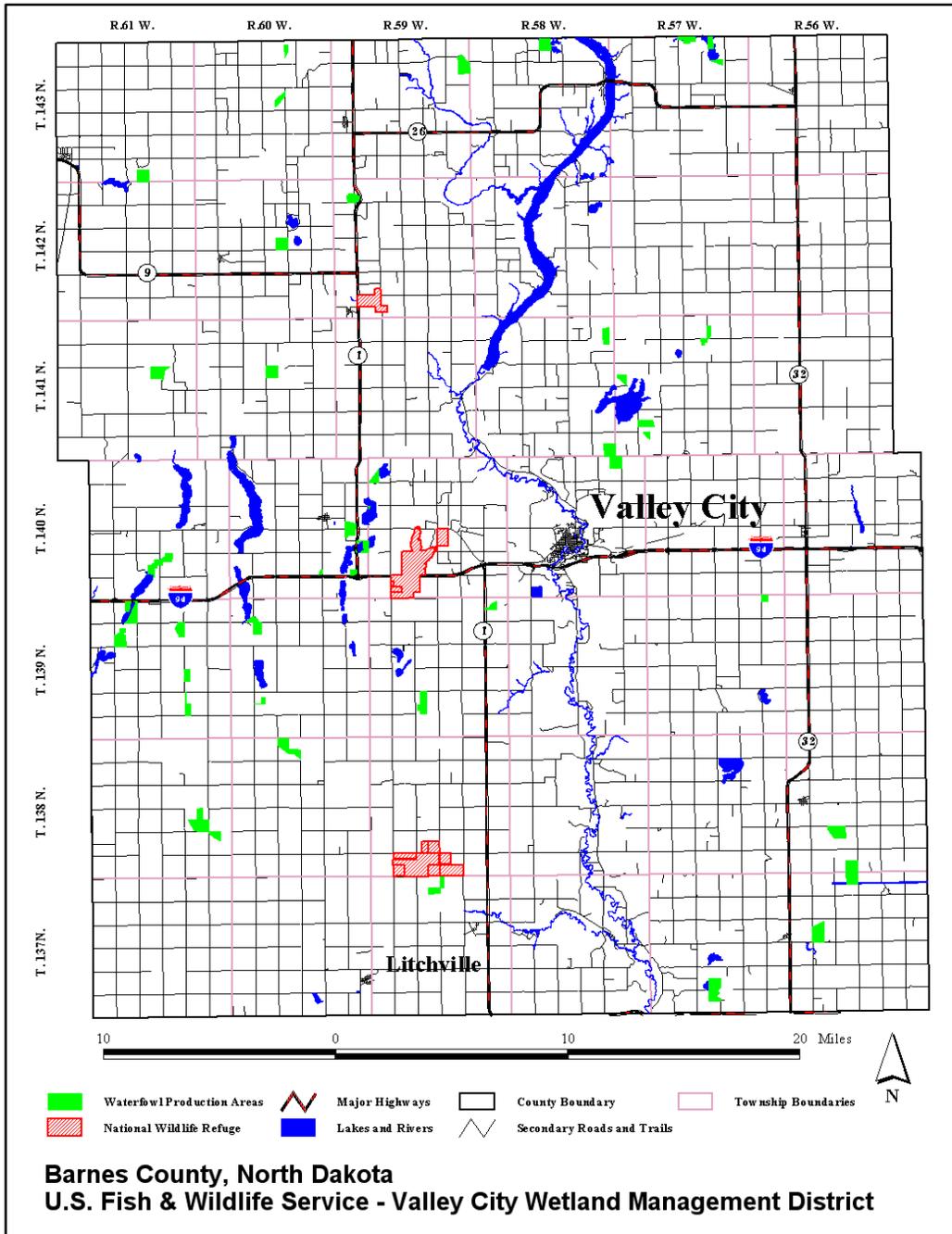
Figure 9.2 – Barnes County Townships



Source: Barnes County Auditor's Office

Figure 9.3 is a map of the waterfowl production areas (WPAs) in Barnes County under management of the Valley City 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.

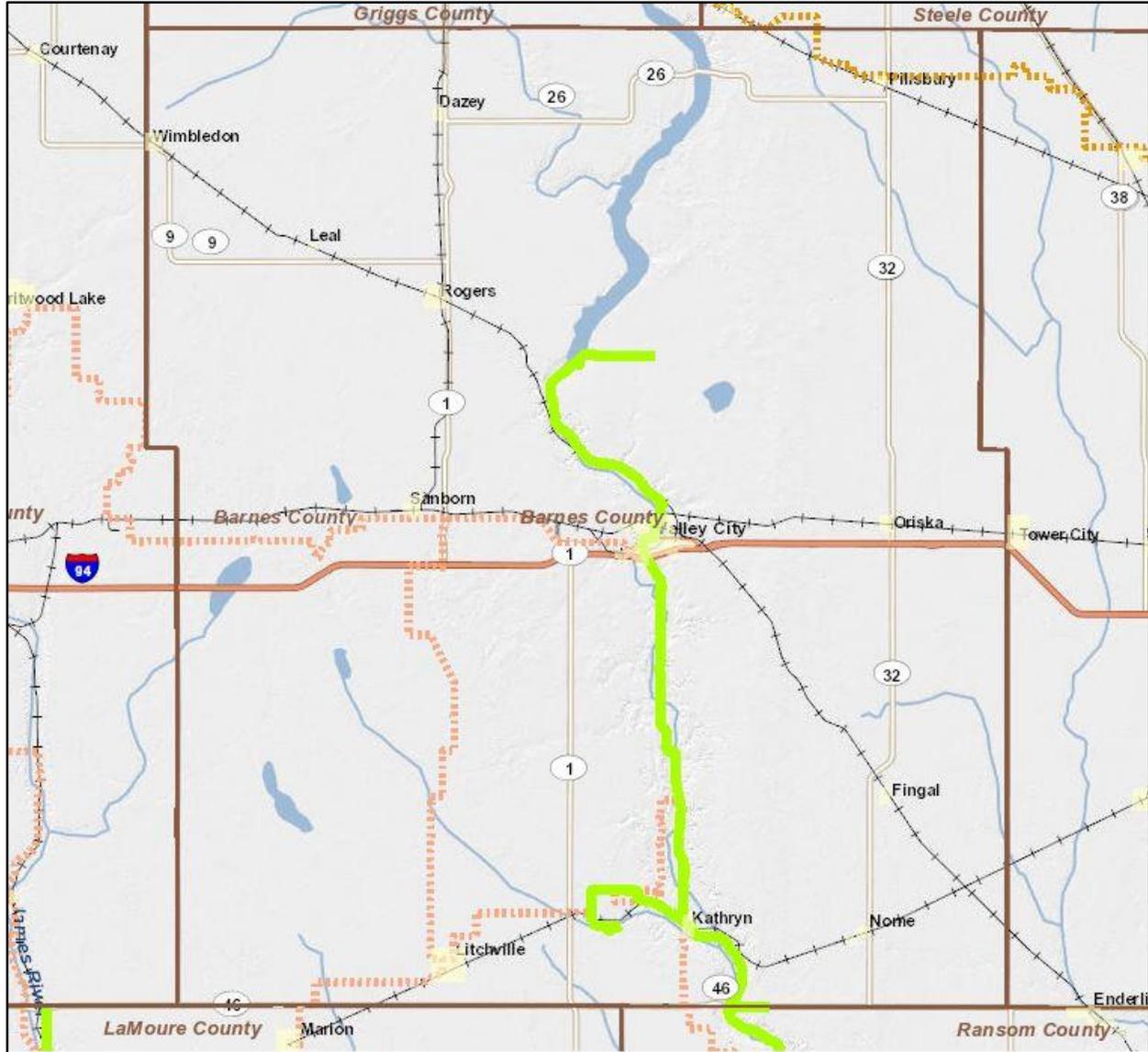
Figure 9.3 – Barnes County Waterfowl Production and National Wildlife Refuges



Sources: U.S. Fish & Wildlife Service, South Central Dakota Regional Council Comprehensive Economic Development Strategy

Figure 9.4 shows the location of the Sheyenne River Valley national Scenic Byway in Barnes County. The extent of the byway is highlighted in green. In addition, snowmobile routes are marked by the dashed orange and red lines.

Figure 9.4 – Sheyenne River Valley National Scenic Byway



Source: North Dakota Geographic Information Systems

Figures 9.5 and 9.6 show the location of official storm shelters in Barnes County and Valley City. Understanding the locations of official storm shelters in the county is important for mitigation to eliminate or reduce loss of life or injury.

Figure 9.5 – Barnes County Storm Shelter Locations

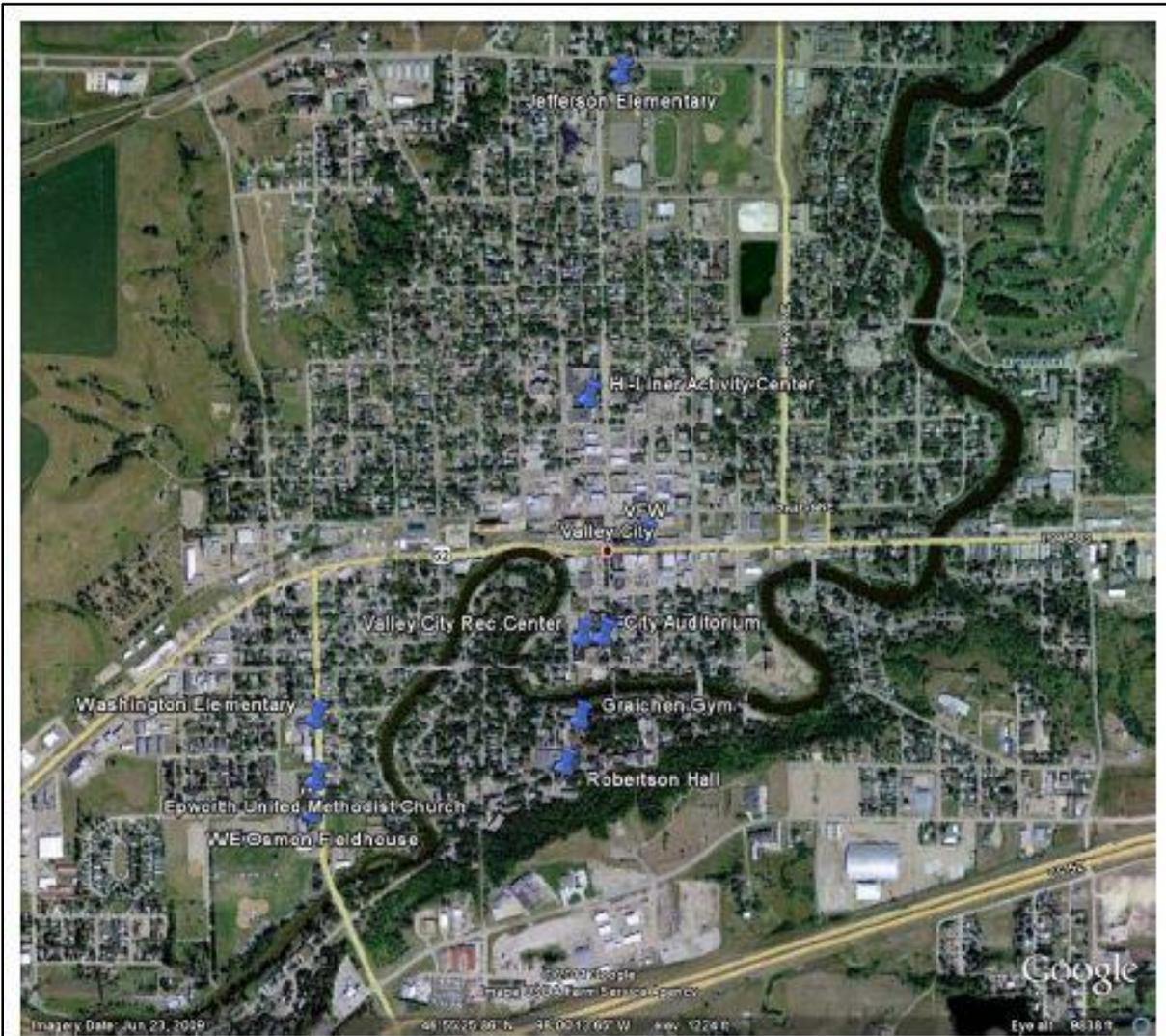


Rural Barnes County Shelters:

- Dazey City Hall, 1708 11 the Ave. SE, Dazey
- Barnes County North School, 10860 20 ½ St. SE, Rogers
- Sanborn Community Center, 603 5th Ave., Sanborn
- Oriska Elementary School, 502 2nd Ave., Oriska.....Capacity of 150
- Holy Trinity Church, 419 1st St., Fingal.....Capacity of 100
- Litchville Elementary, 304 6th Ave., Litchville.....Capacity of 250

Sources: Barnes County Emergency Operations Plan, Barnes County Emergency Management

Figure 9.6 – Valley City Storm Shelter Locations

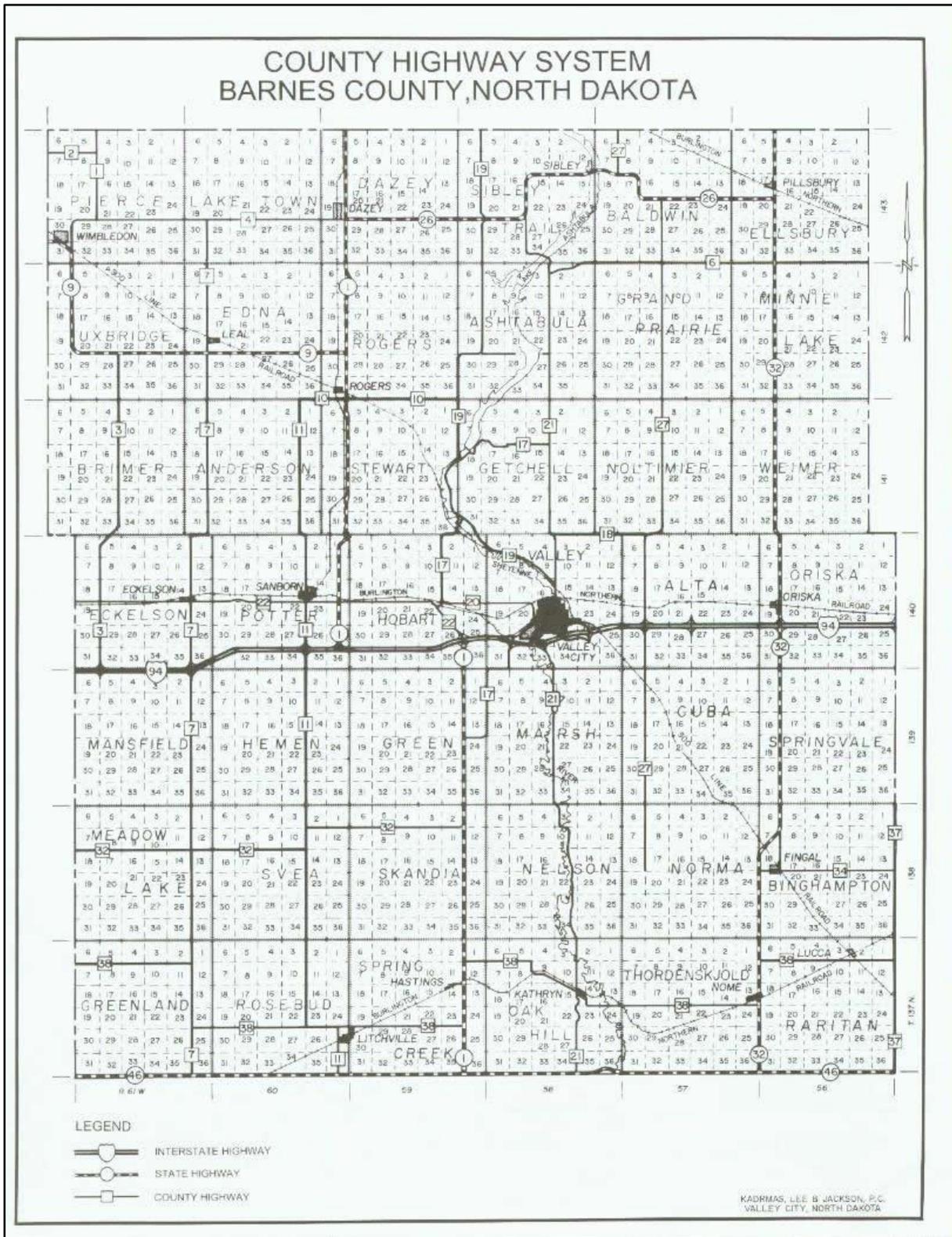


Valley City Shelters:

- Jefferson Elementary School, 1150 Central Ave. N
- Hi-Liner Activity Center, 460 Central Ave. N
- VFW, 138 East Main
- City Auditorium, 320 Central Ave. S.....Capacity of 500
- Valley City Rec. Center, 140 4th St. SW
- Graichen Gym, 155 College St. SW.....Capacity of 550
- Robertson Hall, 201 Viking Drive
- Washington Elementary School, 510 8th Ave. SW
- Epworth United Methodist Church, 680 8th Ave. SW.....Capacity of 150
- WE Osmon Fieldhouse, 730 8th Ave. SW.....Capacity of 2000

Sources: Barnes County Emergency Operations Plan, Barnes County Emergency Management

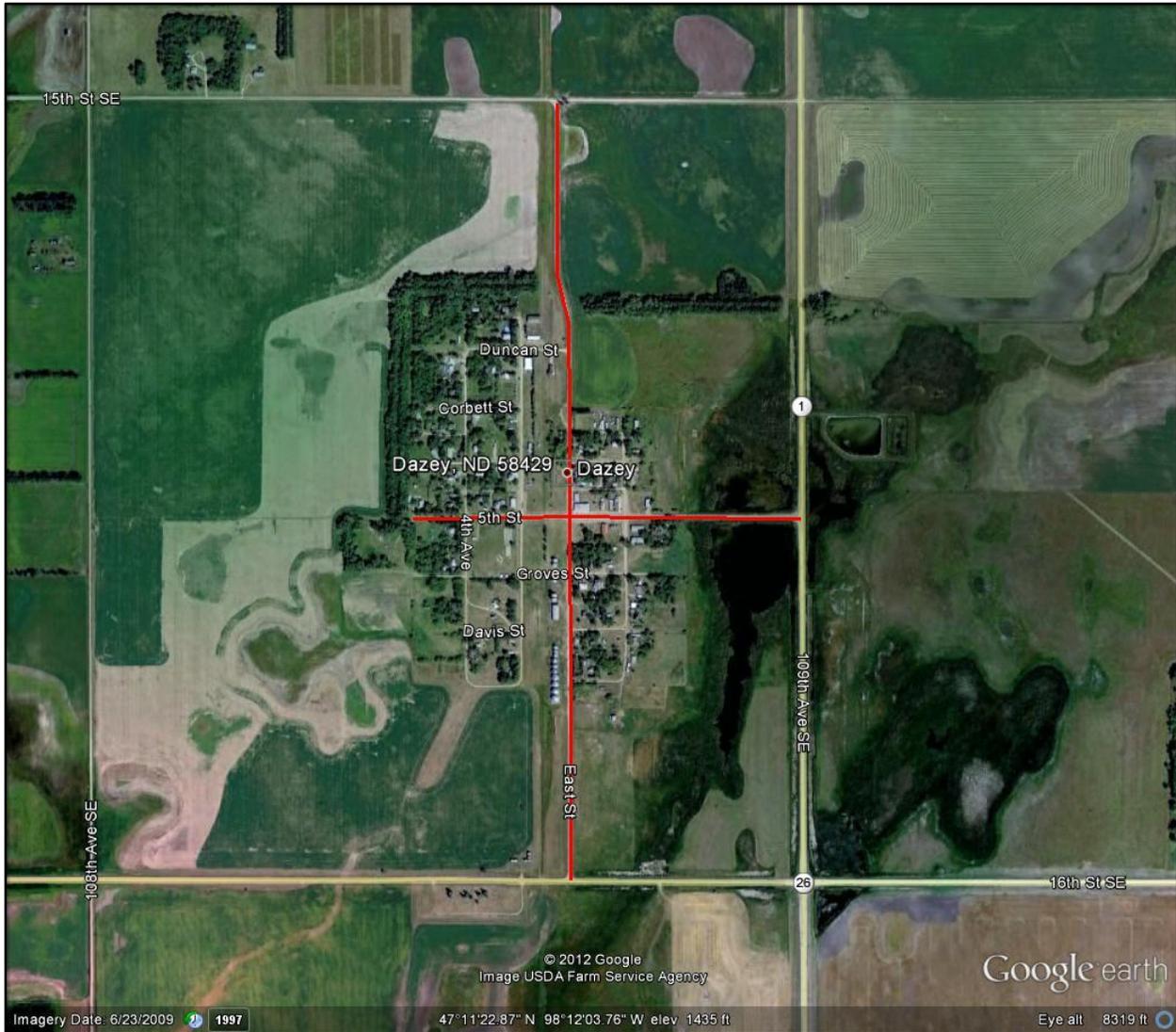
Figure 9.7 – Official Barnes County Highway System



Source: Barnes County Highway Department

Evacuation routes are necessary in mitigation to reduce or eliminate loss of life and injury during hazards. Figures 9.8 to 9.18 show the evacuation routes for incorporated jurisdictions in Barnes County. The extent of each evacuation route is shown in red.

Figure 9.8 – City of Dazey Evacuation Routes



Source: Barnes County Emergency Management

Figure 9.9 – City of Fingal Evacuation Routes



Source: Barnes County Emergency Management

Figure 9.10 – Leal Evacuation Routes



Source: Barnes County Emergency Management

Figure 9.11 – Litchville Evacuation Routes



Source: Barnes County Emergency Management

Figure 9.12 – Nome Evacuation Routes



Source: Barnes County Emergency Management

Figure 9.13 – Oriska Evacuation Routes



Source: Barnes County Emergency Management

Figure 9.14 – Pillsbury Evacuation Routes



Source: Barnes County Emergency Management

Figure 9.15 – Rogers Evacuation Routes



Source: Barnes County Emergency Management

Figure 9.16 – Sanborn Evacuation Routes



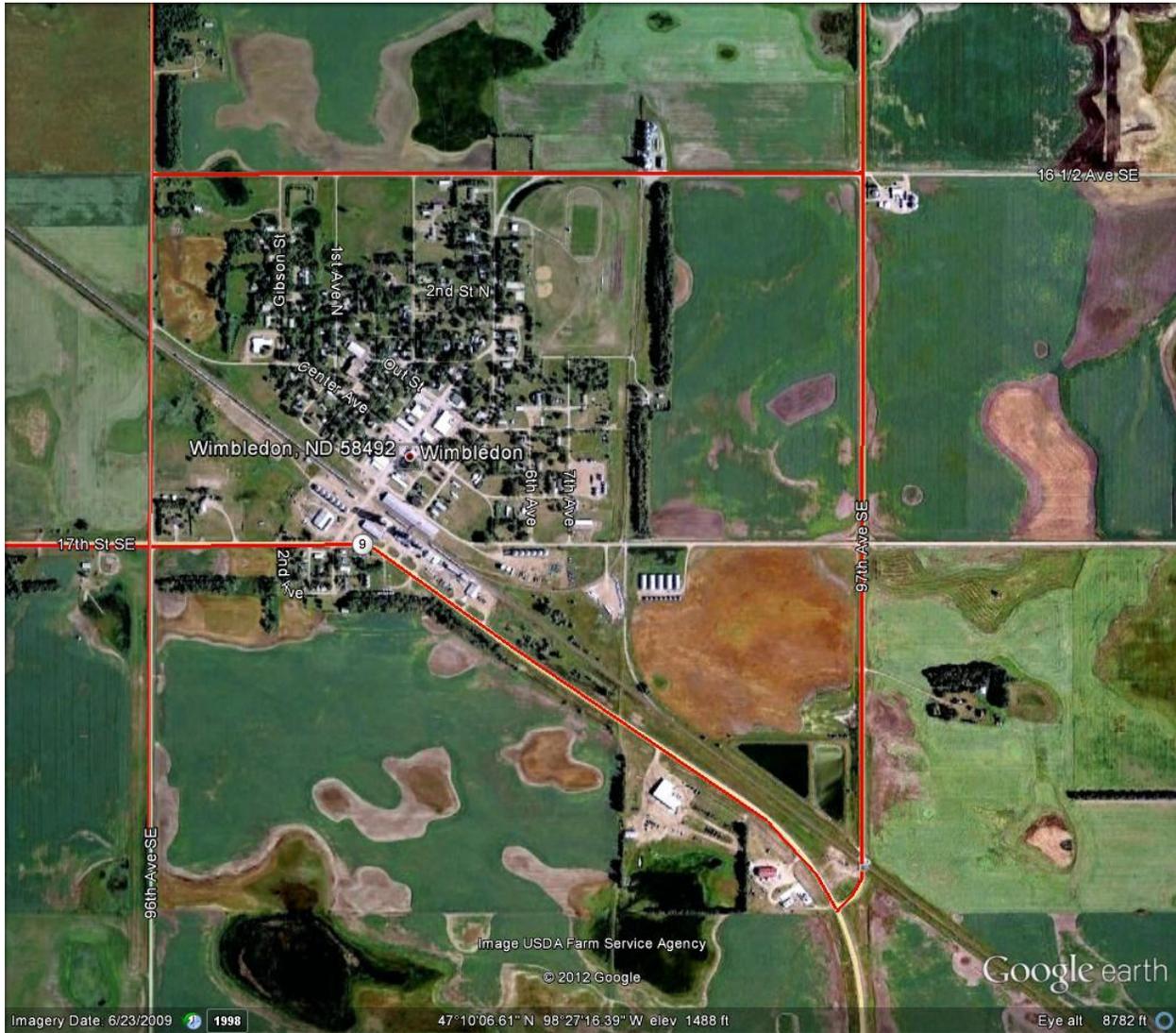
Source: Barnes County Emergency Management

Figure 9.17 – Sibley Evacuation Routes



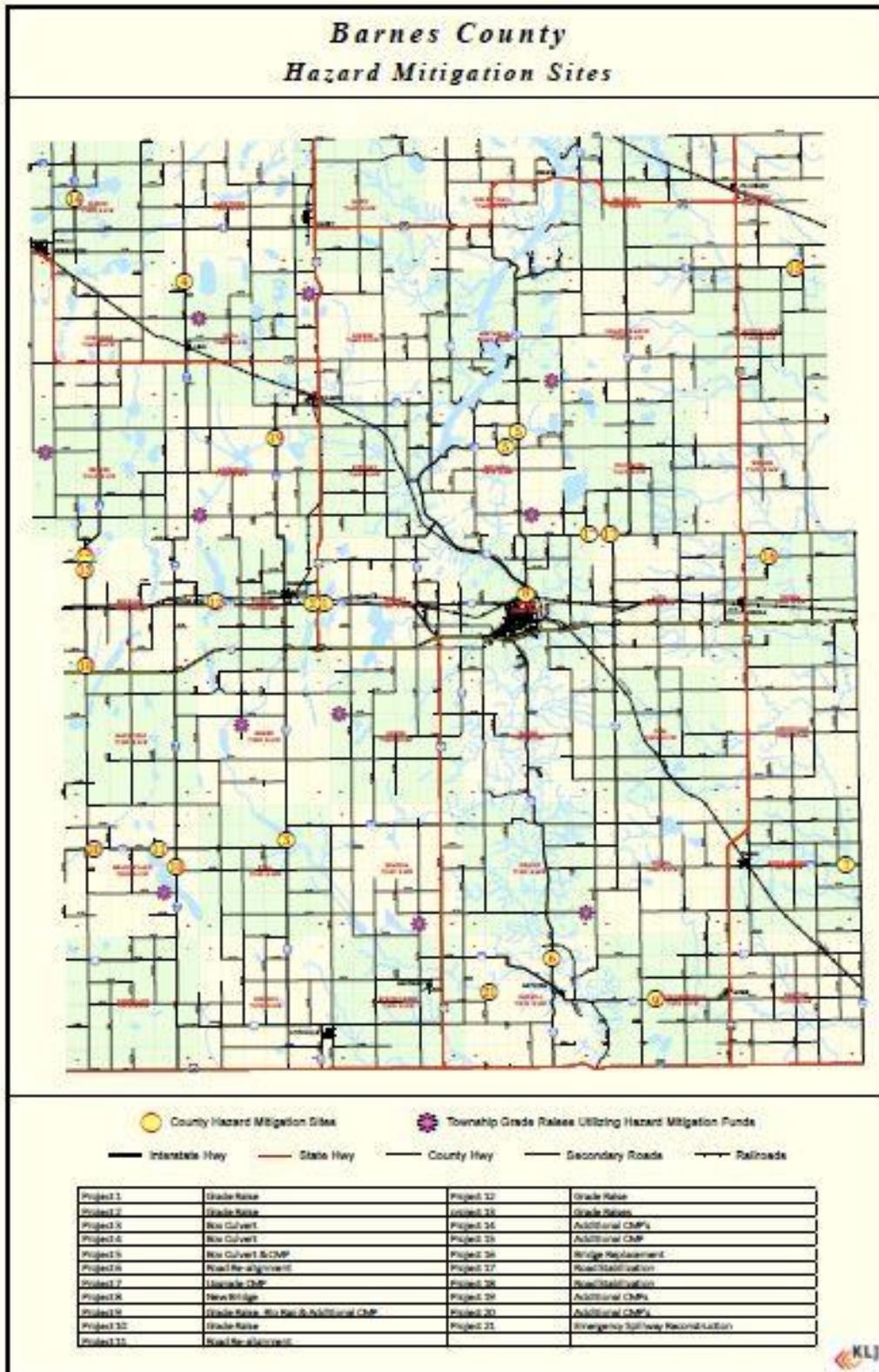
Source: Barnes County Emergency Management

Figure 9.18 – Wimbledon Evacuation Routes



Source: Barnes County Emergency Management

Figure 9.19 – Barnes County Road Hazard Mitigation Sites



Source: Barnes County Highway Department, Kadmas, Lee & Jackson (KLJ)

Figure 9.20 – Barnes County Load Restrictions Map



Source: Barnes County Highway Department, Kadrmas, Lee & Jackson (KLJ)

There is one municipal airport in Barnes County are located in Valley City. An aerial map of the airport is shown and was 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 9.21 – Barnes County Municipal Airport



Source: North Dakota Aeronautics Commission

Figure 9.22 shows the geographic extent of school districts covering Barnes 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 9.22 – Barnes County School Districts



Source: North Dakota Geographic Information Systems

Figure 9.23 – City of Dazey



Source: Barnes County Emergency Management

Figure 9.24 – City of Fingal



Source: Barnes County Emergency Management

Figure 9.25 – City of Kathryn



Source: Barnes County Emergency Management

Figure 9.26 – City of Leal



Source: Barnes County Emergency Management

Figure 9.27 – City of Litchville



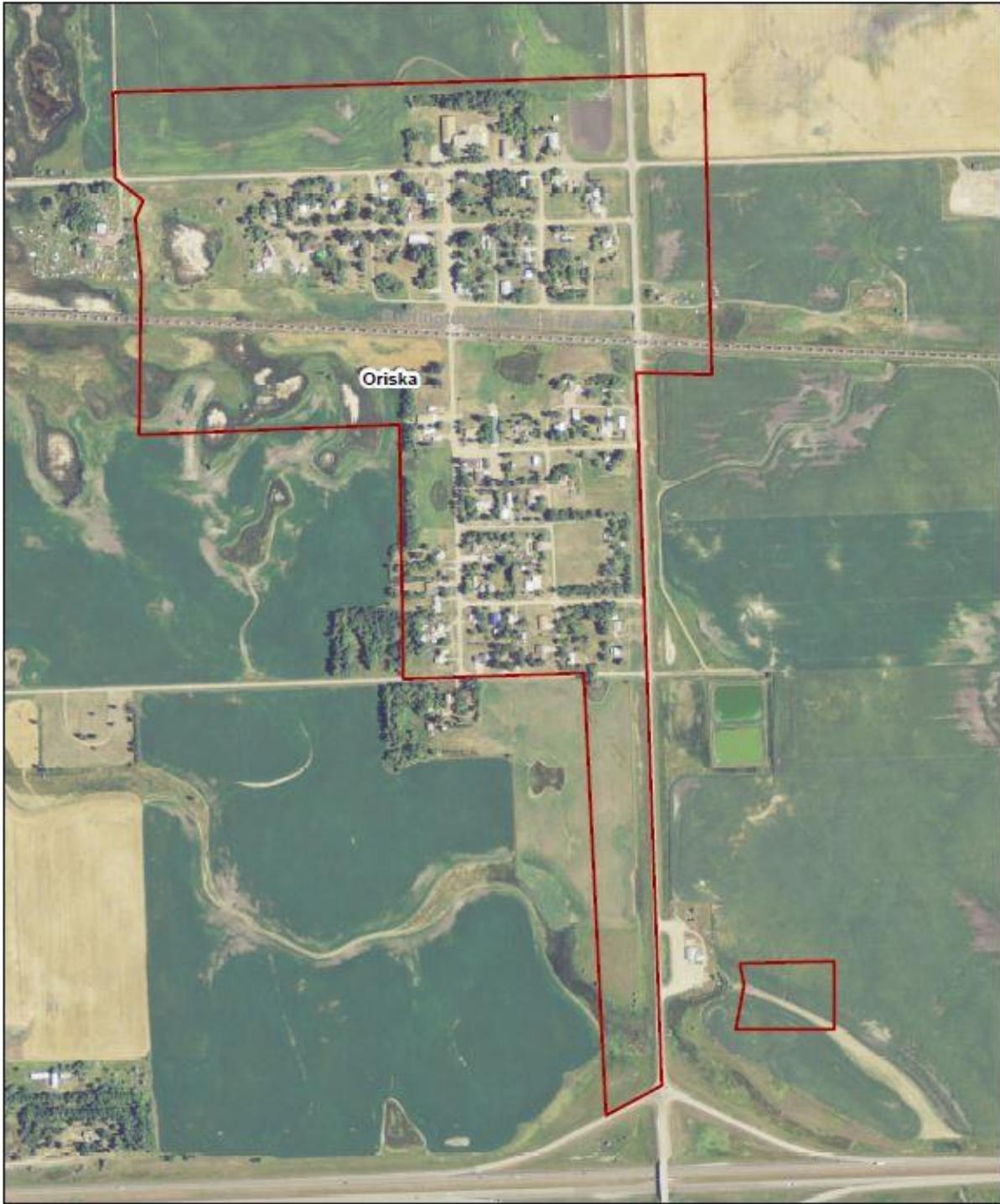
Source: Barnes County Emergency Management

Figure 9.28 – City of Nome



Source: Barnes County Emergency Management

Figure 9.29 – City of Oriska



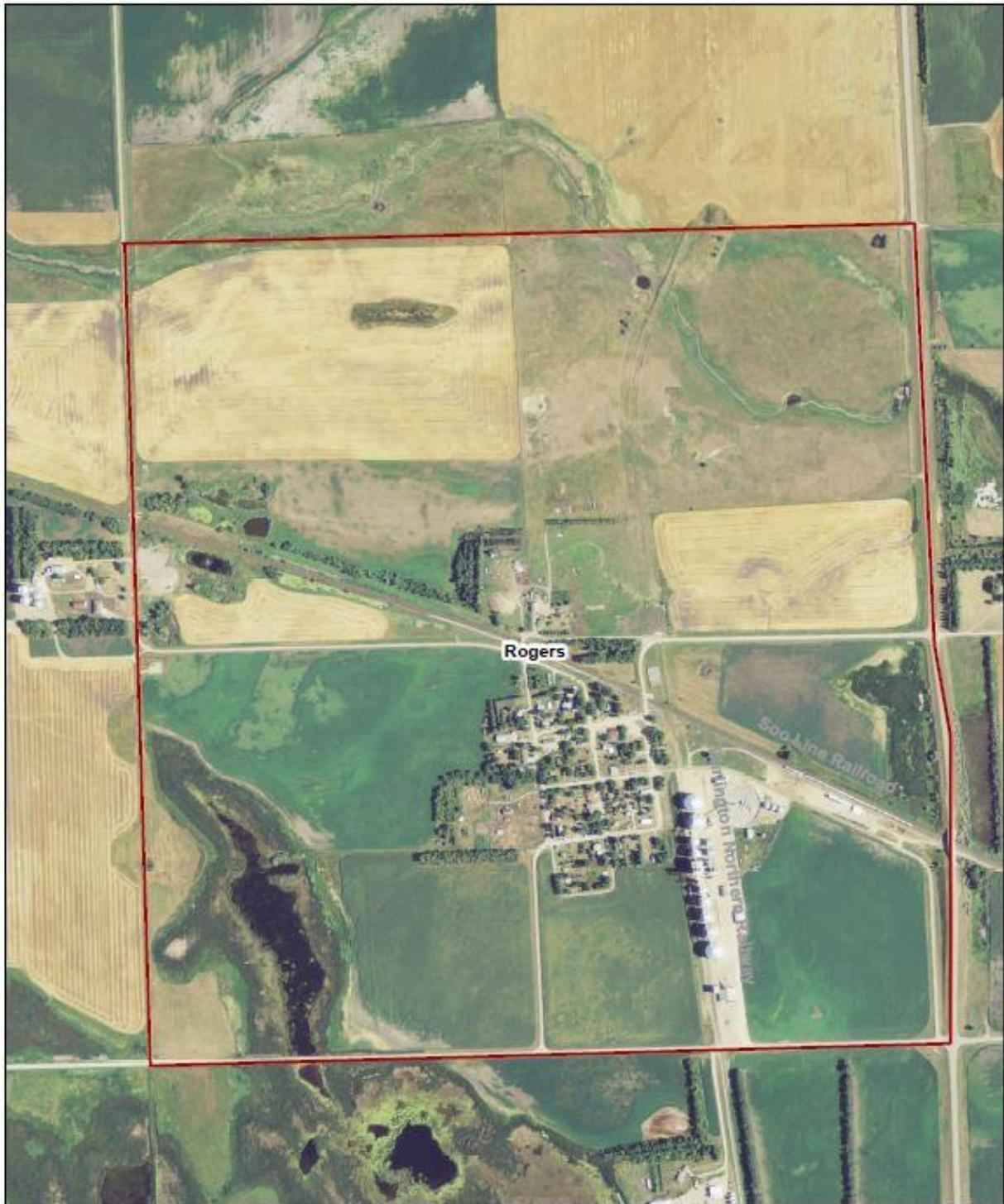
Source: Barnes County Emergency Management

Figure 9.30 – City of Pillsbury



Source: Barnes County Emergency Management

Figure 9.31 – City of Rogers



Source: Barnes County Emergency Management

Figure 9.32 – City of Sanborn



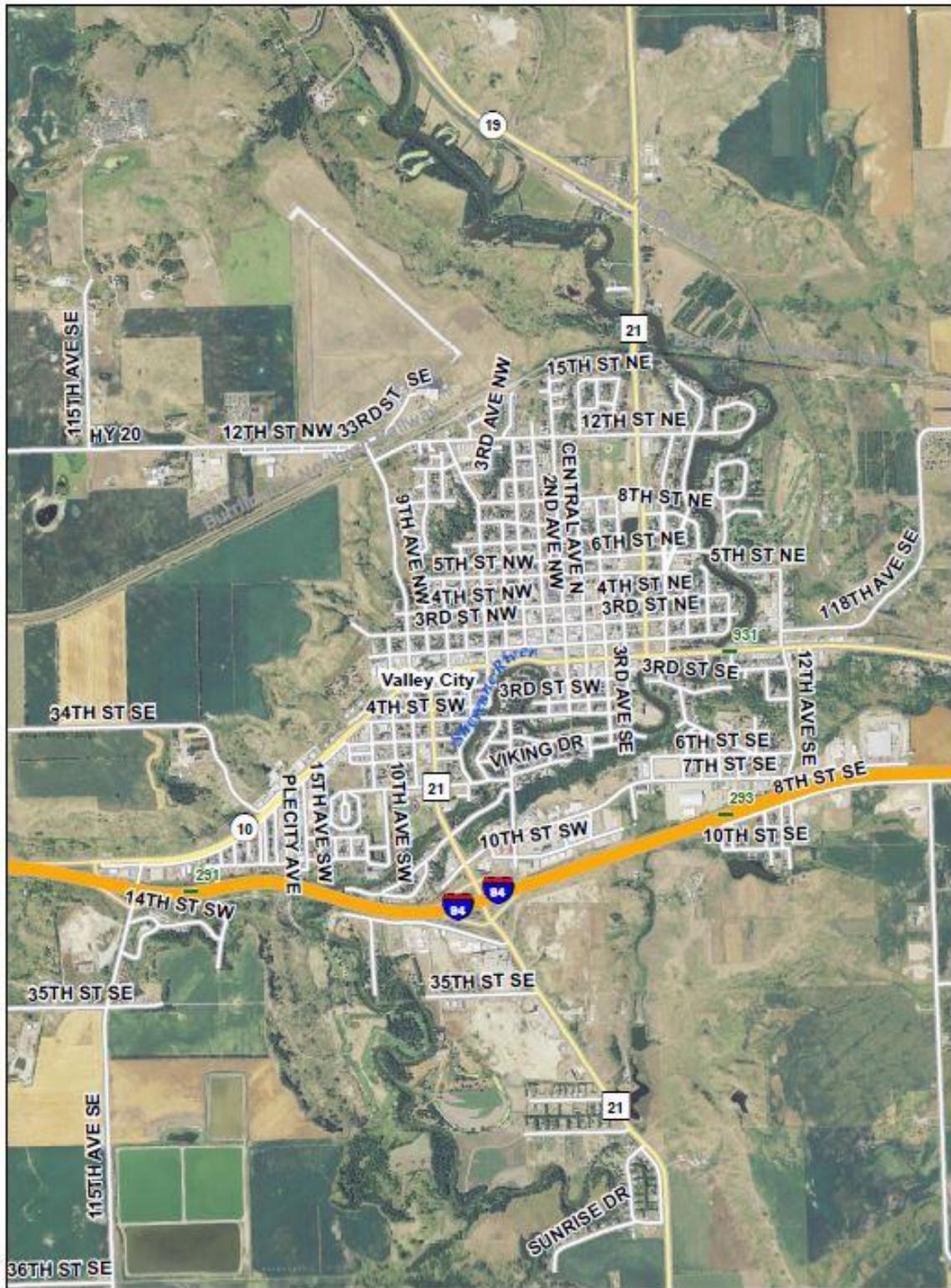
Source: Barnes County Emergency Management

Figure 9.33 – City of Sibley



Source: Barnes County Emergency Management

Figure 9.34 – City of Valley City



Source: Barnes County Emergency Management

Figure 9.35 – City of Wimbledon



Source: Barnes County Emergency Management

10. Annual Review of Hazard Impacts, Mitigation Projects and Report to Emergency Manager

Please complete as part of the February Jurisdictional Meeting:

Return to: Barnes County Emergency Manager
1525 12th St. NW
Valley City, ND 58072

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.