

# Burleigh County Multi-Hazard Mitigation Plan



**FEMA Approved: March 30, 2015 – March 29, 2020**

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### Executive Summary

The Burleigh County Multi-Jurisdictional Multi-Hazard Mitigation Plan (MHMP) was originally developed and approved by the Federal Emergency Management Agency (FEMA) in 2003 and subsequently approved in 2010 for an additional five years (March 8, 2015) to address the needs of the community of Burleigh County and the five incorporated cities: Bismarck, Lincoln, Regan, Wilton and Wing. The communities of Arena, Baldwin, Driscoll, McKenzie, Menoken, Moffit, and Sterling are unincorporated cities and fall under the jurisdiction of Burleigh County.

The purpose of the plan is an effort to reduce loss of life and property by lessening the impact of disasters. The planning process involves multiple elements with the two main elements being:

- Hazard Identification and Risk Assessment
- Mitigation Strategies

The 14 hazards were ranked by the planning team and communities utilizing the Risk Analysis Worksheet:

|   |                      |  |   |  |                     |
|---|----------------------|--|---|--|---------------------|
|  | <b>Highly Likely</b> | <b>C</b><br>• Drought<br>• Wildland Fire   | <b>B</b><br>• Communicable Disease<br>• Dam Failure<br>• Hazardous Materials Release<br>• Severe Summer Weather | <b>A</b><br>• Severe Winter Weather<br>• Windstorm                     | <b>A</b>            |
|   | <b>Likely</b>        | <b>C</b><br>Transportation Accident  | <b>C</b><br>Flood   | <b>B</b>   | <b>A</b>            |
|   | <b>Possible</b>      | <b>D</b><br>Urban Fire or Structure Collapse   | <b>C</b><br>Homeland Security Incident  | <b>B</b><br>Shortage or Outage of Critical Materials or Infrastructure | <b>B</b>            |
|   | <b>Unlikely</b>      | <b>D</b><br>Geologic Hazards   | <b>D</b>  | <b>C</b>   | <b>C</b>            |
|   |                      | <b>Negligible</b>  | <b>Limited</b>  | <b>Critical</b>  | <b>Catastrophic</b> |
|   |                      |  |   |  |                     |

Associated with each hazard are mitigation strategies that can be done at a local level.

Burleigh County completed step one of the Threat and Hazard Identification and Risk Assessment in 2013 with 29 responses. The survey responses closely correlated with the Risk Analysis.

The Burleigh County Multi-Hazard Mitigation Plan meets the requirements and procedures for a local mitigation plan as found in the Code of Federal Regulations (CFR), Title 44, Chapter 1, Part 201 ([44 CFR Part 201](#)).

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### **Adoption**

The jurisdictions in the Burleigh County Multi-Hazard Mitigation Plan (MHMP): Burleigh County and the incorporated cities of Lincoln, Regan, Sterling, Wilton, and Wing adopt the plan as submitted to the ND Department of Emergency Services and the Federal Emergency Management Agency (FEMA).

**Burleigh County**



*Burleigh County*

Emergency Management  
221 N 5<sup>th</sup> St  
Bismarck ND 58501  
(701) 222-6727

**Burleigh County Multi-Hazard Mitigation Plan**

**Whereas**, Burleigh County recognizes the threat that natural, man-made or technological hazards pose to people and property within our community; and

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

**Whereas**, an adopted Multi-Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple Federal Emergency Management Agency (FEMA) pre- and post-disaster mitigation grant programs; and

**Whereas**, Burleigh County participated in the preparation of this plan in accordance with the Disaster Mitigation Act of 2000; and

**Whereas**, adoption of the Burleigh County Multi-Hazard Mitigation Plan demonstrates the commitment to hazard mitigation; and

**Now, therefore, be it resolved**, that the Burleigh County Commission adopts the Burleigh County Multi-Hazard Mitigation Plan.

Signed this   18th   day of February, 2015.

Attested:   
Kevin J. Glatt  
Auditor/Treasurer

Signed:   
Douglas R. Schonert, Chairperson  
Burleigh County Commission

City of Lincoln



**Burleigh County Multi-Hazard Mitigation Plan**

**Whereas**, the City of Lincoln recognizes the threat that natural, man-made or technological hazards pose to people and property within our community; and

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

**Whereas**, an adopted Multi-Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple Federal Emergency Management Agency (FEMA) pre- and post-disaster mitigation grant programs; and

**Whereas**, the City of Lincoln participated in the preparation of this plan in accordance with the Disaster Mitigation Act of 2000; and

**Whereas**, adoption of the Burleigh County Multi-Hazard Mitigation Plan demonstrates the commitment to hazard mitigation; and

**Now, therefore, be it resolved**, that the Lincoln City Commission adopts the Burleigh County Multi-Hazard Mitigation Plan.

Signed this 4<sup>th</sup> day of February, 2015.

Attested: *Roberta Unterseher*  
Roberta Unterseher, Auditor

Signed: *Bob Johnston*  
Bob Johnston, Mayor  
Lincoln City Commission

**City of Regan**

**City of Regan  
16400 279<sup>th</sup> Ave NE  
Regan ND 58477  
701-286-6969**

**Burleigh County Multi-Hazard Mitigation Plan**

**Whereas**, the City of Regan recognizes the threat that natural, man-made or technological hazards pose to people and property within our community; and

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

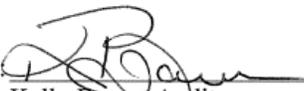
**Whereas**, an adopted Multi-Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple Federal Emergency Management Agency (FEMA) pre- and post-disaster mitigation grant programs; and

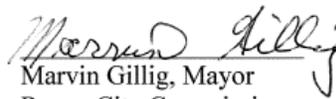
**Whereas**, the City of Regan participated in the preparation of this plan in accordance with the Disaster Mitigation Act of 2000; and

**Whereas**, adoption of the Burleigh County Multi-Hazard Mitigation Plan demonstrates the commitment to hazard mitigation; and

**Now, therefore, be it resolved**, that the Regan City Commission adopts the Burleigh County Multi-Hazard Mitigation Plan.

Signed this 24 day of March, 2015.

Attested:   
Kelly Bauer, Auditor

Signed:   
Marvin Gillig, Mayor  
Regan City Commission

City of Wilton

*CITY OF WILTON*

P.O. BOX 278 - 121 DAKOTA AVE.  
WILTON, ND 58579  
PHONE: 734-6707 - FAX: 734-6708  
WEB SITE: [www.wiltonnd.org](http://www.wiltonnd.org)  
e-mail: [wiltonnd@bektel.com](mailto:wiltonnd@bektel.com)

**Burleigh County Multi-Hazard Mitigation Plan**

**Whereas**, the City of Wilton recognizes the threat that natural, man-made or technological hazards pose to people and property within our community; and

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

**Whereas**, an adopted Multi-Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple Federal Emergency Management Agency (FEMA) pre- and post-disaster mitigation grant programs; and

**Whereas**, the City of Wilton participated in the preparation of this plan in accordance with the Disaster Mitigation Act of 2000; and

**Whereas**, adoption of the Burleigh County Multi-Hazard Mitigation Plan demonstrates the commitment to hazard mitigation; and

**Now, therefore, be it resolved**, that the Wilton City Commission adopts the Burleigh County Multi-Hazard Mitigation Plan.

Signed this 17 day of Feb., 2015.

Attested: Pattie Solberg Signed: LeeAnn Kellar  
Pattie Solberg, Auditor LeeAnn Kellar, Mayor  
Wilton City Commission

**City of Wing**

**Burleigh County Multi-Hazard Mitigation Plan**

**Whereas**, the City of Wing recognizes the threat that natural, man-made or technological hazards pose to people and property within our community; and

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

**Whereas**, an adopted Multi-Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple Federal Emergency Management Agency (FEMA) pre- and post-disaster mitigation grant programs; and

**Whereas**, the City of Wing participated in the preparation of this plan in accordance with the Disaster Mitigation Act of 2000; and

**Whereas**, adoption of the Burleigh County Multi-Hazard Mitigation Plan demonstrates the commitment to hazard mitigation; and

**Now, therefore, be it resolved**, that the Wing City Commission adopts the Burleigh County Multi-Hazard Mitigation Plan.

Signed this 12 day of March, 2015.

Attested: Mary D Fischer Signed:  
Mary Fischer, Auditor

Paul Sailing  
Paul Sailing, Mayor  
Wing City Commission

## **Introduction**

**Purpose:** Reduce the vulnerability of the life and health of people, property, environment, and economy of Burleigh County and its communities from the impacts of natural and technological hazards as well as adversarial threats.

**Scope:** The scope of the Burleigh County Multi-Hazard Mitigation Plan is countywide. Due to Burleigh County's limited resources, any incident or hazard that may occur or exist affects the entire jurisdiction. The Plan is not necessarily limited to Federal, State, or locally-declared disasters or emergencies. Any time situations or incidents occur that produce an opportunity for mitigation actions; they will be developed and incorporated into the Burleigh County Multi-Hazard Mitigation Plan.

**Authority:** The Burleigh County Multi-Hazard Mitigation Plan has been prepared pursuant to Section 322 of the [Disaster Mitigation Act of 2000](#) (Public Law 106-390) which requires local government to develop mitigation plans that shall:

- Describe actions to mitigate hazards, risks, and vulnerabilities identified under the plan; and
- Establish a strategy to implement those actions.

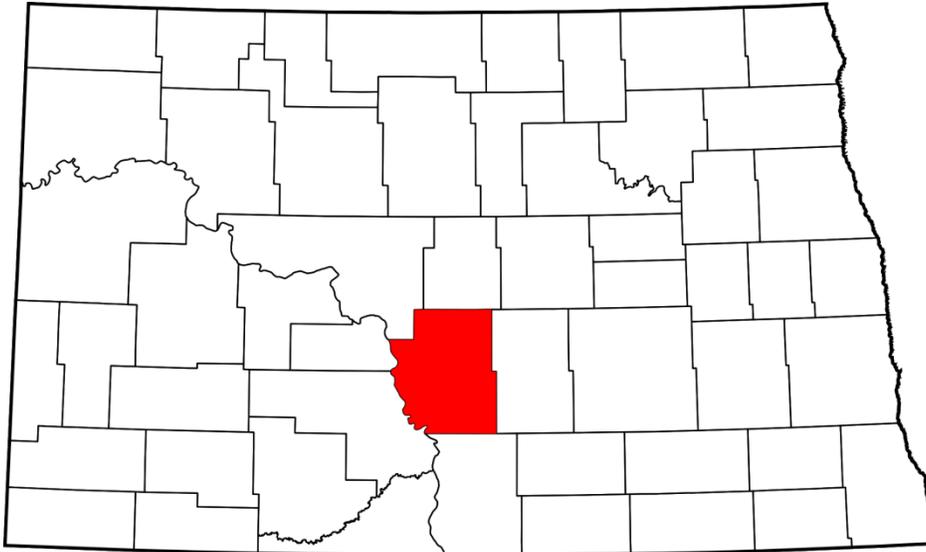
The Disaster Mitigation Act of 2000 became law on October 30, 2000 and amends the [Robert T. Stafford Disaster Relief and Emergency Assistance Act, as Amended \(The Stafford Act\)](#) (P.L. 93-288, as amended). Regulations for this activity can be found in [44 CFR, Part 201](#).

The [North Dakota Century Code 37-17.1-07](#) (Local or regional emergency management organizations.) states that "Each local or regional emergency management organization shall prepare and keep current a local disaster or emergency operational plan for its area." Burleigh County and incorporated cities consider the Mitigation Plan an integral part of the Burleigh County Emergency Management Program.

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 Burleigh County the executive body responsible for carrying out plans and policies is the Board of County Commissioners. Each jurisdiction develops an annual budget which may or may not include monies for mitigation projects; however, budgets do include monies for continued agency services.

## Community Profile

Burleigh County is located in south-central North Dakota with the Missouri River as the western boundary. The County seat is Bismarck which is also the State Capital of North Dakota.



It has the 13th largest area of the 53 counties in the State, and is 1,654 square miles (48 miles from north to south and 39 miles from east to west).

Picture Source: Wikipedia [website](#)

### Borders

|        |                                      |
|--------|--------------------------------------|
| North: | McLean and Sheridan Counties         |
| West:  | McLean, Morton , and Oliver Counties |
| South: | Emmons and Morton Counties           |
| East:  | Kidder County                        |

Residential and commercial development is concentrated in the incorporated areas of Burleigh County with the largest, single concentration occurring in and around the City of Bismarck. Over 95% of the land is farm property, approximately one half of which is cultivated. Lands not cultivated, primarily those with steeper slopes or shallower soils, provide native forage for livestock. Vegetation in upland areas consists of cultivated crops interspersed with native grasses and shrubs. Native trees and shrubs are common along the creek and river bottoms as well as some ravines. (Source: Flood Insurance Study, Burleigh County, North Dakota, and Incorporated Areas, Revised: August 4, 2014 available from the [FEMA Map Service Center](#), Product 38015CVOO0B)

### Rivers

Missouri River, Apple Creek, Burnt Creek, and Hay Creek

Principle drainage system: Missouri River. Burleigh County is on the western side of the continental divide and drains through the Missouri River drainage system. Most of the runoff in the eastern part of the county collects in depressions and does not reach the streams. Lakes, streams, coulees, dams and drainage ditches are abundant throughout the area. The county is a land of prairies, croplands, river valleys, and rolling hills.

## **Planning Process**

Multi-hazard mitigation planning is a continuous process whereby risk analyses, updating the situation assessment, research, coordinating, disaster response or other activities are occurring simultaneously.

The goal is to have the Burleigh County Hazard Mitigation Plan updated every five years. The original plan was developed in 2003 and subsequently updated in 2009. The current plan update process began in 2014 with the Emergency Manager collecting background information and soliciting technical advice and guidance from the ND Department of Emergency Services' Mitigation Division prior to the beginning of the official update plan process. In addition, throughout 2014, the Emergency Manager hosted and/or attended public meetings to revisit the current Multi-Hazard Mitigation Plan and incorporate information where applicable.

The plan update process officially began January 27, 2014 when the Emergency Manager hosted a Multi-Hazard Mitigation Plan Planning Team Meeting. (See Appendix A: Invited Stakeholders and Participation) Agenda items included:

- Confirm plan purpose
- Review current mitigation plan
- Refine plan scope and schedule
- Establish responsibilities
- Development an outreach strategy.

February 3, 2014, Burleigh County Emergency Management published an electronic survey utilizing "surveygizmo" to gather input from the public. The questions included in the survey were selected to make the experience brief while soliciting hazard vulnerability as well as public's view of the most likely community hazards. Open-ended responses were also included to collect anything responses the community felt relative to the survey and hazards. A total of 57 responses were received. The survey was emailed to area stakeholders, community responders, and contiguous counties. The survey results and the information captured were compared to the risks analysis and were closely aligned. Additionally, information received was factored into the mitigation projects. (See Appendix C: Burleigh County Public Survey) The survey was publicly advertised:

- Radio
- Television
- The Bismarck Tribune
- Burleigh County website
- Burleigh County social media

Bismarck and Burleigh County Emergency Managers hosted a “Community Mitigation Planning Public Input Meeting” on February 24, 2014. Public attendance was zero although the meeting was publicly advertised:

- Radio
- Television
- The Bismarck Tribune
- City of Bismarck website
- Burleigh County website
- Burleigh County social media

March 6, 2014, Bismarck Emergency Management published an online survey via the City of Bismarck website. The overall intent was “citizens have the opportunity to express their ideas and identify potential community-wide hazards, related vulnerabilities and mitigation approaches that would minimize risk and impact to the community.” The survey garnered four responses. (See Appendix D: City of Bismarck Public Survey)

Ensuring months involved a lot of research, data gathering and outreach to regulatory agencies and other governmental entities (US Army Corps of Engineers, ND State Water Commission, Burleigh County Water Resource Board, ND Forest Service, ND Fire Marshal’s Office, US National Weather Service). Additionally, a vast amount of phone calls and emails were utilized to elicit feedback from the participating jurisdictions.

The National Weather Service hosted a community open house on September 13, 2014 during National Preparedness Month. The event was advertised in The Bismarck Tribune, radio, television, websites, and social media. Emergency Management provided outreach and presented numerous materials on preparedness and mitigation, including but not limited to:

- Every Season to Prepare pamphlet
- Shelter In Place Brochure
- National Flood Insurance Program information
- Outdoor Warning System

On October 29, 2014, the Burleigh County Department Heads hosted their monthly meeting. The Emergency Manager discussed the plan update and process. The current plan update is available on the website. Mitigation projects were also solicited.

The Local Emergency Planning Committee met on November 12, 2014 and discussed the “Shelter In Place” brochure and the “Every Season to Prepare” pamphlet. Both items are included as ongoing mitigation projects to promote community preparedness and response to hazards in Burleigh County. An adequate supply of both items is maintained through Emergency Management and other stakeholders as well as being available throughout the community and the Burleigh County website.

On December 22, 2014, another Multi-Hazard Mitigation Plan, Planning Team Meeting was hosted. Members present reviewed the updated draft to include the layout and content, mitigation projects and priorities, mitigation capabilities, and the approval process. (See

Appendix A: Invited Stakeholders and Participation). Members were able to review the current draft via the website upon original meeting invite.

The Emergency Manager met with the Cities of Regan and Wilton on January 6, 2015 and the City of Lincoln on January 7, 2015 to review the current draft of the mitigation plan. Mitigation projects and priorities were discussed along with the opportunity to add projects at any time. Members were able to review the current draft via the website upon original meeting invite.

A regular meeting of the Burleigh County Water Resource District was previously publicized and met on January 13, 2015. The Emergency Manager discussed the Multi-Hazard Mitigation Plan process and solicited projects from the District. Prior to the meeting, discussions were held with the Chair, County Commission representative, and the District's contracted engineer regarding the plan and mitigation projects.

On January 21, 2015, the Emergency Manager met with the County Engineer to update the status of flood mitigation projects previously approved after the 2011 flood event. The Emergency Manager had a phone conference with the City of Wing Fire Chief to discuss the current plan and mitigation projects. The Fire Chief provided information on snow ridging and the City's water tower.

Information was obtained from regulatory agencies: ND Water Commission, US Army Corps of Engineers, and the local Water Resource Board was accomplished through meetings and/or emails.

Outreach to contiguous counties was accomplished through meeting invites and online survey participation. Emmons County and Morton County completed the online survey.

**Monitoring, Evaluating, and Updating the Plan:** The plan will be evaluated annually by the Burleigh County Emergency Manager with input from the planning committee members. As a means of monitoring the plan and progress made on the projects, the Burleigh County Emergency Manager will continually collaborate with planning committee members and representatives identified as “lead agencies” to discuss progress of the projects, existing and potential grant opportunities, and changes in regulations. It will be the responsibility of the Emergency Manager to update the hazard history sections on an annual basis as events occur.

All disaster or emergency incidents will be evaluated for general/specific mitigation recommendations to be added to the plan as they occur. A comprehensive plan review by the planning committee will occur every five years unless the need arises earlier through aforementioned reviews and actions.

The approved plan always remains available on the Burleigh County website for review by stakeholders and the general public.

**Plan Integration:** The Burleigh County Multi-Hazard Mitigation Plan will be considered as building codes are developed and/or updated. The awareness of the hazards and vulnerability may affect future development in hazard-prone areas.

The [Comprehensive Plan for Burleigh County](#) (page 8) ties all other plans to the Burleigh County Multi-Hazard Mitigation Plan:

“Objective 5: Ensure that the County is prepared to address Emergency Management incidents.

Policy: #1 Review and update contingency plans for all hazards identified in the Burleigh County Multi-Hazard Mitigation Plan.

#2 Review and address opportunities for mitigation of potential damage, such as, prohibiting developments in areas of high flood probability.

#3 Encourage County Departments and Boards to review and update emergency policies and procedures.

#4 Ensure that all developments are established with the safety of current and future users in mind.”

### Participating Jurisdictions in the Plan Review

| Jurisdictions Located within Burleigh County | Jurisdictions Asked to Participate in the Plan | Jurisdictions Represented in the Plan | Participation Status                         |
|--|--|---------------------------------------|--|
| Burleigh County                              | Burleigh County                                | Burleigh County                       | Continuing Participation (2003, 2008, 2014)  |
| City of Bismarck                             | City of Bismarck                               | City of Bismarck                      | *Continuing Participation (2003, 2008, 2014) |
| City of Lincoln                              | City of Lincoln                                | City of Lincoln                       | Continuing Participation (2003, 2008, 2014)  |
| City of Regan                                | City of Regan                                  | City of Regan                         | Continuing Participation (2003, 2008, 2014)  |
| City of Wilton                               | City of Wilton                                 | City of Wilton                        | Continuing Participation (2003, 2008, 2014)  |
| City of Wing                                 | City of Wing                                   | City of Wing                          | Continuing Participation (2003, 2008, 2014)  |

\*The City of Bismarck has chosen to develop an independent Mitigation Plan for their jurisdiction. A few agencies did participate in the Burleigh County update process due to their job functions which entail City of Bismarck and Burleigh County jurisdictions. A joint public meeting was hosted, and the Burleigh County Public Survey included the City of Bismarck.

All jurisdictions were invited to participate in the update process. If they were unable to attend, the Emergency Manager did outreach to obtain input on the overall plan and mitigation opportunities.

### Planning Team Members

| Jurisdiction                                | Contact   | Agency   | Contact Information  |
|---|---|--|--|
| Burleigh County                             | Mary Senger,<br>Emergency Manager                                   | Burleigh County<br>Emergency<br>Management       | 701-222-6727<br><a href="mailto:msenger@nd.gov">msenger@nd.gov</a>                                 |
| Burleigh County                             | Jim Peluso,<br>Commissioner   | Burleigh County<br>Commission                    | <a href="mailto:pelusohockey@yahoo.com">pelusohockey@yahoo.com</a>                                 |
| Burleigh County                             | Ray Ziegler, Building<br>Official/Director and<br>Floodplain Admin. | Burleigh County<br>Building,<br>Planning, Zoning | 701-221-3727<br><a href="mailto:rzeigler@nd.gov">rzeigler@nd.gov</a>                               |
| Burleigh County                             | Marcus Hall,<br>Engineer  | Burleigh County<br>Highway Dept                  | 701-204-7748<br><a href="mailto:mahall@nd.gov">mahall@nd.gov</a>                                   |
| Burleigh County                             | Greg Carlson, GIS<br>Coordinator                                    | Burleigh County<br>GIS                           | 701-204-7748<br><a href="mailto:grecarlson@nd.gov">grecarlson@nd.gov</a>                           |
| City of<br>Bismarck<br>& Burleigh<br>County | Rena Moch, Director   | Bismarck/Burleigh<br>Public Health               | 701-355-1541<br><a href="mailto:rmoch@bismarcknd.gov">rmoch@bismarcknd.gov</a>                     |
| City of<br>Bismarck<br>& Burleigh<br>County | Crystalynn Kuntz,<br>Emergency<br>Preparedness Coord                | Bismarck/Burleigh<br>Public Health               | 701-355-1546<br><a href="mailto:ckuntz@bismarcknd.gov">ckuntz@bismarcknd.gov</a>                   |
| City of<br>Lincoln                          | Bob Johnston, Mayor   | City of Lincoln                                  | 701-258-7969<br><a href="mailto:cityoflincoln@midconetwork.com">cityoflincoln@midconetwork.com</a> |
| City of<br>Lincoln                          | Roberta Unterseher,<br>Auditor                                      | City of Lincoln                                  | 701-258-7969<br><a href="mailto:cityoflincoln@midconetwork.com">cityoflincoln@midconetwork.com</a> |
| City of<br>Lincoln                          | Rob Dickson,<br>Supervisor  | City of Lincoln<br>Public Works                  | 701-258-5754<br><a href="mailto:lmd@midconetwork.com">lmd@midconetwork.com</a>                     |
| City of<br>Regan                            | Kelly Bauer, Auditor  | City of Regan                                    | 701-286-6969<br><a href="mailto:skyhigh@bektel.com">skyhigh@bektel.com</a>                         |
| City of<br>Wilton                           | LeeAnn Kellar,<br>Mayor   | City of Wilton                                   | 701-734-6247<br><a href="mailto:domonosk@bektel.com">domonosk@bektel.com</a>                       |
| City of<br>Wilton                           | JD Youngbird, Fire<br>Chief   | City of Wilton<br>Fire Dept.                     | 701-734-6936<br><a href="mailto:Wfd58579@bektel.com">Wfd58579@bektel.com</a>                       |
| City of<br>Wing                             | Mary Fischer, Auditor   | City of Wing                                     | 701-943-2434<br><a href="mailto:citywing@bektel.com">citywing@bektel.com</a>                       |
| City of<br>Wing                             | Dale Olson,<br>Public Works and Fire<br>Chief                       | City of Wing                                     | 701-943-2357<br><a href="mailto:dolson@bektel.com">dolson@bektel.com</a>                           |

**Review and Incorporation of Existing Plans, Studies, Reports, and Technical Information:**

The Burleigh County Multi-Hazard Mitigation Plan was developed in coordination with other local, state, and federal agencies, non-profit organizations, and local businesses and schools.

| Agency   | Plans and Programs   |
|--|--|
| American Red Cross (West Dakota)                   | <ul style="list-style-type: none"> <li>• Shelter</li> <li>• Mass Care</li> <li>• Windshield Damage Assessment</li> <li>• Disaster Recovery</li> </ul>  |
| Bismarck Community Development                     | <ul style="list-style-type: none"> <li>• Plat Reviews</li> </ul>   |
| Bismarck/Burleigh Combined Communications Center   | <ul style="list-style-type: none"> <li>• Alert and Warning</li> <li>• Communications</li> <li>• Emergency/Disaster Procedures</li> </ul>   |
| Bismarck/Burleigh Public Health                    | <ul style="list-style-type: none"> <li>• Shelters</li> <li>• Community Education</li> <li>• Vulnerable Populations</li> </ul>  |
| Burleigh County Auditor                            | <ul style="list-style-type: none"> <li>• Alternate Emergency Manager</li> <li>• Fiscal Management</li> </ul>   |
| Burleigh County Board of Health                    | <ul style="list-style-type: none"> <li>• Public Health Programs</li> </ul>   |
| Burleigh County Building/Planning/Zoning           | <ul style="list-style-type: none"> <li>• Development</li> <li>• Floodplain Administration</li> <li>• Inspections</li> <li>• Planning</li> </ul>  |
| Burleigh County Comprehensive Plan                 | <ul style="list-style-type: none"> <li>• Development</li> <li>• Planning</li> </ul>  |
| Burleigh County Commission                         | <ul style="list-style-type: none"> <li>• Disaster/Emergency Declarations</li> <li>• Budget Allocations</li> </ul>  |
| Burleigh County Community Wildfire Protection Plan | <ul style="list-style-type: none"> <li>• Fuel Loads</li> <li>• Mitigation Projects</li> </ul>  |
| Burleigh County Emergency Management               | <ul style="list-style-type: none"> <li>• Local Emergency Operations Plan</li> <li>• Multi-Hazard Mitigation Plan</li> <li>• Evacuation Annex</li> <li>• Shelter Annex</li> <li>• Mass Care Annex</li> <li>• Public Information Officer</li> <li>• Social Media Coordination</li> <li>• Disaster Recovery</li> <li>• Audit Lead</li> <li>• Local Emergency Planning Committee</li> <li>• Grants Coordination</li> <li>• Emergency Notification</li> </ul> |

|  |   |
|--|---|
| Burleigh County Extension Service                  | <ul style="list-style-type: none"> <li>• Animal Health</li> <li>• Plant Health</li> <li>• Community Education</li> </ul>  |
| Burleigh County GIS                                | <ul style="list-style-type: none"> <li>• Hazard Mapping</li> <li>• Tier II Project (underway)</li> </ul>  |
| Burleigh County Highway Department                 | <ul style="list-style-type: none"> <li>• Primary Routes</li> <li>• Bridges</li> <li>• Debris Removal</li> </ul>   |
| Burleigh County Local Emergency Planning Committee | <ul style="list-style-type: none"> <li>• Tier II Reporting</li> <li>• Community Education</li> <li>• Planning and Training</li> </ul>   |
| Burleigh County Schools                            | <ul style="list-style-type: none"> <li>• Curriculum Standards (safety drills)</li> </ul>  |
| Burleigh County School Superintendent              | <ul style="list-style-type: none"> <li>• Curriculum Standards (safety drills)</li> </ul>  |
| Burleigh County Sheriff's Department               | <ul style="list-style-type: none"> <li>• Traffic Control and Safety</li> <li>• Evacuation Routes</li> <li>• Emergency Notification</li> </ul>   |
| Burleigh County Snowmobile CERT                    | <ul style="list-style-type: none"> <li>• Alternate Transportation</li> <li>• Safety Checks</li> <li>• Planning and Training</li> </ul>  |
| Burleigh County State's Attorney                   | <ul style="list-style-type: none"> <li>• Legal Review</li> </ul>  |
| Burleigh County Water Resource Board               | <ul style="list-style-type: none"> <li>• Permitted Uses</li> <li>• Planning Commission</li> </ul>   |
| Burleigh County Zoning Ordinance                   | <ul style="list-style-type: none"> <li>• Floodplain Management</li> <li>• Voices for Lake Oahe/Beaver Bay Project</li> <li>• South Central Regional Water Project</li> <li>• Missouri River Joint Water Resource</li> <li>• ND Flood Risk Management Study</li> <li>• Beaver Creek Impediments</li> </ul> |
| Central Dakota Amateur Radio Club                  | <ul style="list-style-type: none"> <li>• Alternate Communications</li> <li>• Weather Spotters</li> </ul>  |
| Crisis Care Chaplaincy                             | <ul style="list-style-type: none"> <li>• Mental Health</li> <li>• Disaster Recovery</li> </ul>  |
| Lewis and Clark Regional Development Council       | <ul style="list-style-type: none"> <li>• Comprehensive Economic Development Strategy</li> </ul>   |
| Linton City Attorney                               | <ul style="list-style-type: none"> <li>• Legal Review</li> </ul>  |
| Lincoln City Commission                            | <ul style="list-style-type: none"> <li>• Disaster/Emergency Declarations</li> <li>• Budget Allocations</li> </ul>   |
| Metropolitan Planning Organization                 | <ul style="list-style-type: none"> <li>• Hazardous Materials Route Mapping (In Progress)</li> <li>• Transportation Routes</li> <li>• Planning</li> </ul>  |
| ND Pipeline Association                            | <ul style="list-style-type: none"> <li>• Maps</li> <li>• Education/Training</li> <li>• Planning and Zoning</li> </ul>   |

|  |  |
|--|--|
| Regan City Commission                    | <ul style="list-style-type: none"> <li>• Disaster/Emergency Declarations</li> <li>• Budget Allocations</li> </ul>  |
| Salvation Army                           | <ul style="list-style-type: none"> <li>• Shelter</li> <li>• Mass Care</li> <li>• Windshield Damage Assessment</li> <li>• Disaster Recovery</li> </ul>  |
| South Central Regional Water             | <ul style="list-style-type: none"> <li>• Rural Water</li> <li>• Planning</li> </ul>  |
| Southwest Central Emergency Preparedness | <ul style="list-style-type: none"> <li>• Points of Distribution</li> <li>• Mass Inoculation</li> <li>• SWC Regional Strategic National Stockpile</li> <li>• SWC Regional EOP Mental Health</li> <li>• SWC Regional EOP Pandemic Influenza</li> <li>• SWC Regional EOP Mass Fatality</li> </ul> |
| ND State Water Commission                | <ul style="list-style-type: none"> <li>• Strasburg Slough Preliminary Findings Report</li> </ul>   |
| US Army Corps of Engineers               | <ul style="list-style-type: none"> <li>• Planning Assistance (Section 22)</li> <li>• Beaver Creek Study (underway)</li> </ul>  |
| US Geological Survey                     | <ul style="list-style-type: none"> <li>• Creek/River Gages</li> </ul>  |
| US National Weather Service              | <ul style="list-style-type: none"> <li>• Weather Advisories</li> <li>• Hazard Advisories</li> </ul>  |
| Wilton City Commission                   | <ul style="list-style-type: none"> <li>• Disaster/Emergency Declarations</li> <li>• Budget Allocations</li> </ul>  |
| Wing City Commission                     | <ul style="list-style-type: none"> <li>• Disaster/Emergency Declarations</li> <li>• Budget Allocations</li> </ul>  |

The American Red Cross includes the shelter information provided by Burleigh County Emergency Management within their National Shelter System.

The Burleigh County Commission and Burleigh County Highway Department utilize the mitigation projects as appropriate when developing future budgets and road priorities.

Flood mitigation projects are closely tied to the Burleigh County Water Resource Board and their continuing discussions as well as the Burleigh County Flood Annex.

The Burleigh County Zoning Floodplain Ordinance is evaluated and based upon current NFIP guidelines.

Communicable Disease activities parallel with the Southwest Central Emergency Preparedness planning efforts.

The US National Weather Service (Bismarck Office) remains in close contact with Burleigh County Emergency Management and Skywarn Spotters to “truth” forecasts and/or impacts.

The [Comprehensive Plan for Burleigh County](#) (page 8) ties all other plans to the Burleigh County Multi-Hazard Mitigation Plan.

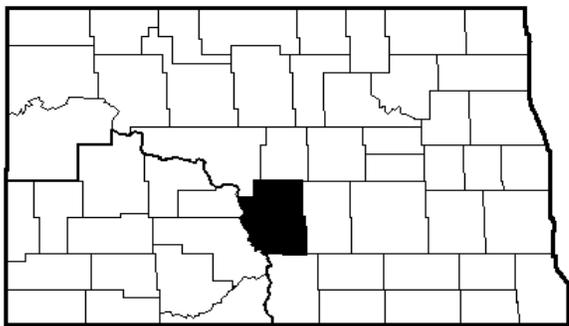
## Changes in Development

**General:** Burleigh County is located in the south central portion of North Dakota.

| <u>Borders</u> |                                     |
|----------------|-------------------------------------|
| North          | McLean and Sheridan Counties        |
| West           | Morton, Oliver, and McLean Counties |
| South          | Emmons and Morton Counties          |
| East           | Kidder County                       |

The Missouri River forms the western border between Burleigh, Morton, and Oliver Counties.

### *Burleigh County*



It has the 13<sup>th</sup> largest area of the 53 counties in the State, and is 1,654 square miles. It is 48 miles from north to south and 39 miles from east to west.

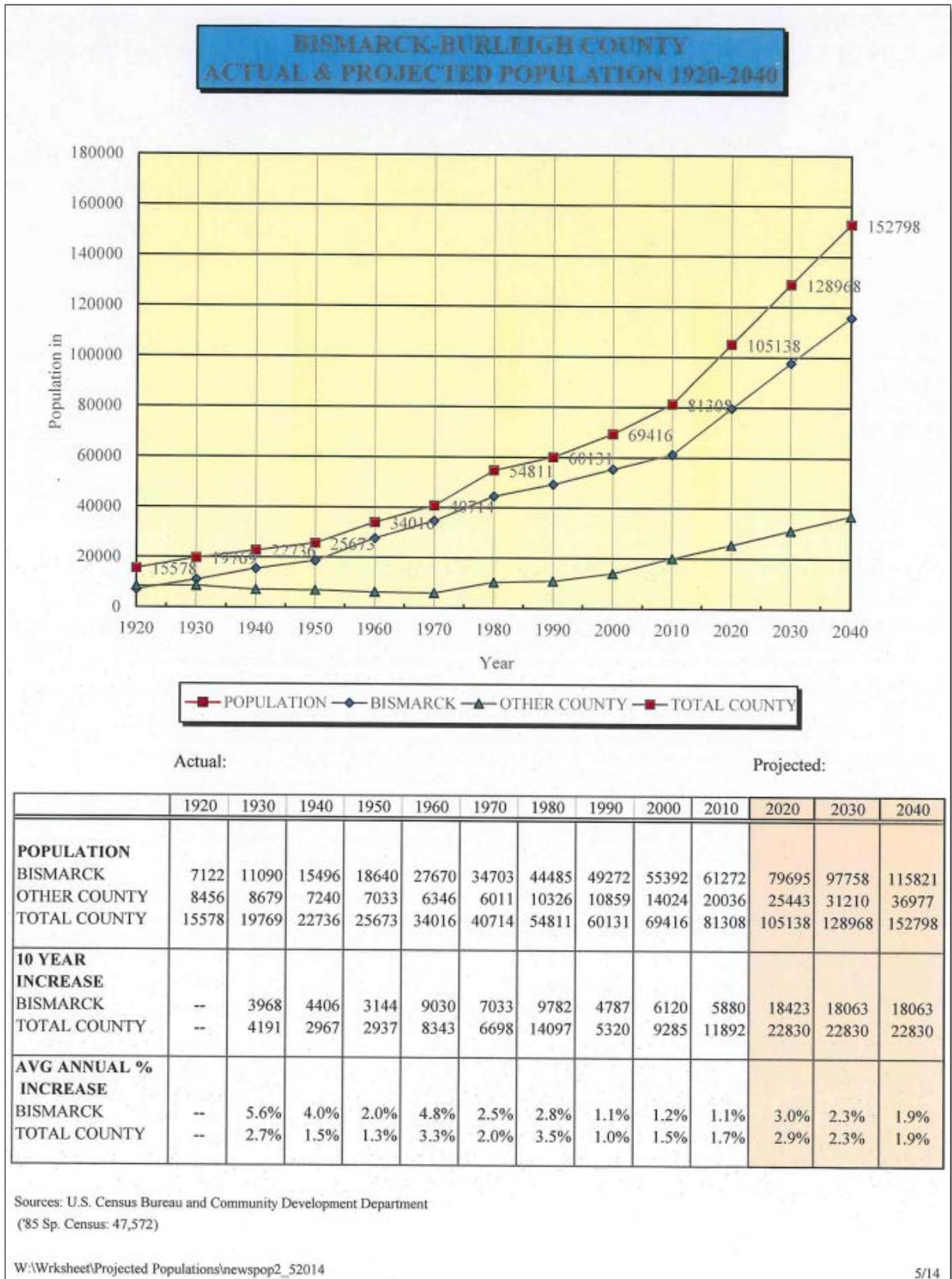
## Demographics

| <b>Burleigh County</b>       |        |
|------------------------------|--------|
| 2010 population estimate     | 81,308 |
| 2010 persons per square mile | 49.8   |

According to the [US Census Bureau](#), the 2013 population estimate is 88,457 (8.8% increase from 2010 and 27.43% increase since 2000). The County population continues to steadily increase:

|               |        |
|---------------|--------|
| 2013 estimate | 88,457 |
| 2010          | 81,308 |
| 2008          | 78,689 |
| 2000          | 69,416 |
| 1990          | 60,131 |

Projected populations show a continued, steady increase:



Source: Bismarck Community Development [website](#)

Burleigh County has five incorporated cities including the county seat, Bismarck.

| <b>City</b> | <b>Population</b> |
|-------------|-------------------|
| Bismarck    | 61,264            |
| Lincoln     | 2,406             |
| Regan       | 43                |
| Wilton      | 711               |
| Wing        | 152               |

Source: [US Census Bureau](#) 2010 Population Estimates

Bismarck is also the State Capitol of North Dakota:



Source: Photo taken by [Bobak Ha'Eri](#), on May 21, 2009

### Climate

The County’s geographic location results in a sub-humid continental climate characterized principally 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. Summers are usually hot and dry, with periods of prolonged high temperatures occurring from May through September. Winters are cold and dry, but the region is subject to severe blizzards. July is the warmest month, and January is the coldest month.

Normally the temperature is moderate until the beginning of July, after which short, hot periods are experienced until the end of August. The freeze-free period is the number of days between the average last occurrence of freezing temperatures in the spring and the average first occurrence of 32 degrees F or lower in the fall. The length of the freeze-free period approximates the length of the growing season which ranges from 110 days to over 130 days between May 12<sup>th</sup> and September 23<sup>rd</sup>. Topography and local weather conditions can produce subfreezing temperatures at the ground surface while the air temperature a few feet above the ground remains above 32 degrees F.

|                      |             |
|----------------------|-------------|
| Annual Precipitation | 17.85inches |
| Average Snowfall     | 51.2 inches |
| Warmest Month        | July        |
| Coldest Month        | January     |
| Temperature Extremes | -45 / +107  |

Source: US National Weather Service, Bismarck Office [website](#)

### Economy

According to the [US Census Bureau 2008-2012 American Community Survey](#), the largest percentage of the population (25.9%) is employed in the category of “Educations services, and health care and social assistance”, followed by 12.59% in the category of “Retail Trade”.

A total of 76.2% of the workers are “Private wage and salary workers”, 18.6% are “Government workers”, and 5.1% are “Self-employed in their own, not-incorporated businesses”. The median household income was \$61,811. The poverty status was 5.4% of the families below the poverty level, 8.2% of the individuals below the poverty level with the 7.3% of 65 and older individuals below the poverty level.



### Land Use Concerns

Agriculture remains the primary land use in Burleigh County. Census data shows indicated that Burleigh County has 1,014 farms in 2012 (down from 1,026 in 2007) that average 938 acres per farm for a total acreage of 951,021 acres. (Source: [USDA Census of Agriculture](#))

Soil erosion due to wind and water remains a problem. On steep gradients, rain washes out gullies in cultivated fields, and fields cultivated in the fall suffer extensive damage from wind. The county has 32,051 acres enrolled in the Conservation Reserve Program (CRP) which has helped mitigate the erosion problem; however, the acreage enrollment is steadily decreasing.

#### Conservation Reserve Program Cumulative Enrollment by Fiscal Years (Acres)

| Year | Acres   |
|------|---------|
| 2013 | 58,552  |
| 2012 | 70,421  |
| 2011 | 74,086  |
| 2010 | 75,219  |
| 2009 | 78,136  |
| 2008 | 101,963 |
| 2007 | 100,302 |

Source: [US Department of Agriculture, Farm Service Agency](#)

Burleigh County continues to study a variety of mitigation activities. Soil erosion, water supply, and water quality are major land use concerns of the county.

The Burleigh County floodplain ordinance was updated in 2011 and increased the base elevation from one to two feet for new developments to include the 500-year event versus the 100-year event. Additional amendments intended to minimize public and private losses from future flooding require new residential structures, attendant utilities, detached accessory buildings and substantial improvements to existing structures to be elevated on fill to at least two feet above the base flood elevation.

The City of Bismarck floodplain ordinance was also updated in 2011 and was similar to the Burleigh County floodplain ordinance with the exception of utilizing the 500-year event for the two-foot base elevation.

Additionally, the Burleigh County Water Resource District utilizes previous flood event data when considering flood control projects and includes non-structural project recommendations such as amending floodplain ordinances in direct correlation with National Flood Insurance Program recommendations and FEMA's flood insurance rate map data.

### Development

The Bismarck/Mandan Chamber of Commerce, Bismarck/Mandan Development Association, and local jurisdictions promote and encourage the opportunities for the area as a destination to live, work, and play.

Increasing populations have resulted in increasing development.

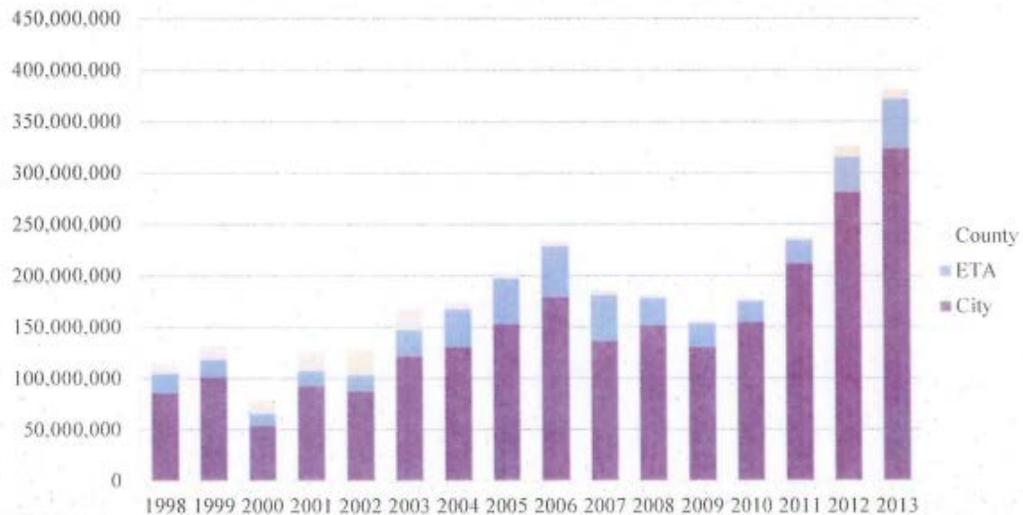
| <b>Building Permits (Reported Only)</b> |                     |                  |             |                          |
|---|---------------------|------------------|-------------|--------------------------|
| <b>Year</b>                             | <b>Type</b>         | <b>Buildings</b> | <b>Unit</b> | <b>Construction Cost</b> |
| 2013                                    | Single Family       | 852              | 852         | \$148,005,107            |
|   | Two Family          | 13               | 26          | \$2,800,997              |
|   | Three & Four Family | 5                | 18          | \$2,692,008              |
|   | Five or More Family | 15               | 488         | \$38,376,730             |
| 2012                                    | Single Family       | 803              | 803         | \$145,459,548            |
|   | Two Family          | 20               | 40          | \$4,672,034              |
|   | Three & Four Family | 19               | 60          | \$9,107,443              |
|   | Five or More Family | 16               | 486         | \$49,103,385             |
| 2011                                    | Single Family       | 394              | 394         | \$65,608,240             |
|   | Two Family          | 1                | 2           | \$238,476                |
|   | Three & Four Family | 5                | 20          | \$2,340,000              |
|   | Five or More Family | 1                | 10          | \$925,390                |
| 2010                                    | Single Family       | 469              | 469         | \$78,621,423             |
|   | Two Family          | 2                | 4           | \$830,660                |
|   | Three & Four Family | 2                | 8           | \$1,040,000              |
|   | Five or More Family | 2                | 49          | \$3,506,120              |
| 2009                                    | Single Family       | 356              | 356         | \$61,776,583             |
|   | Two Family          | 1                | 2           | \$288,007                |
|   | Three & Four Family | 3                | 11          | \$1,413,936              |
|   | Five or More Family | 2                | 71          | \$3,500,000              |

(Source: [US Census Bureau](#))

### CITY, ETA & COUNTY CONSTRUCTION VALUATION 1998-2013

| Year         | City                 |              | ETA                |              | County             |             | Total                |
|--------------|----------------------|--------------|--------------------|--------------|--------------------|-------------|----------------------|
|              | Valuation            | % of Total   | Valuation          | % of Total   | Valuation          | % of Total  | Valuation            |
| 1998         | 86,278,600           | 74.9%        | 18,600,454         | 16.1%        | 10,345,611         | 9.0%        | 115,224,665          |
| 1999         | 101,379,887          | 76.5%        | 16,913,759         | 12.8%        | 14,181,270         | 10.7%       | 132,474,916          |
| 2000         | 54,144,259           | 68.2%        | 11,074,490         | 13.9%        | 14,206,788         | 17.9%       | 79,425,537           |
| 2001         | 92,479,599           | 73.4%        | 14,489,687         | 11.5%        | 19,064,889         | 15.1%       | 126,034,175          |
| 2002         | 87,726,489           | 68.4%        | 15,444,654         | 12.0%        | 25,047,175         | 19.5%       | 128,218,318          |
| 2003         | 121,730,778          | 71.8%        | 25,491,456         | 15.0%        | 22,246,438         | 13.1%       | 169,468,672          |
| 2004         | 130,854,372          | 75.2%        | 36,626,150         | 21.1%        | 6,420,306          | 3.7%        | 173,900,828          |
| 2005         | 153,245,882          | 75.2%        | 44,405,745         | 21.8%        | 6,189,933          | 3.0%        | 203,841,560          |
| 2006         | 179,466,923          | 76.7%        | 49,856,234         | 21.3%        | 4,753,883          | 2.0%        | 234,077,040          |
| 2007         | 136,795,113          | 73.4%        | 44,968,721         | 24.1%        | 4,550,437          | 2.4%        | 186,314,271          |
| 2008         | 151,682,117          | 83.3%        | 26,811,363         | 14.7%        | 3,642,962          | 2.0%        | 182,136,442          |
| 2009         | 130,644,898          | 83.3%        | 23,402,586         | 14.9%        | 2,711,402          | 1.7%        | 156,758,886          |
| 2010         | 154,754,310          | 86.9%        | 20,675,133         | 11.6%        | 2,689,954          | 1.5%        | 178,119,397          |
| 2011         | 211,805,740          | 89.0%        | 23,181,537         | 9.7%         | 3,058,842          | 1.3%        | 238,046,119          |
| 2012         | 280,895,873          | 86.0%        | 35,156,895         | 10.8%        | 10,552,000         | 3.2%        | 326,604,768          |
| 2013         | 323,555,701          | 84.9%        | 48,839,981         | 12.8%        | 8,929,426          | 2.3%        | 381,325,108          |
| <b>TOTAL</b> | <b>2,397,440,541</b> | <b>79.6%</b> | <b>455,938,845</b> | <b>15.1%</b> | <b>158,591,316</b> | <b>5.3%</b> | <b>3,011,970,702</b> |

CONSTRUCTION VALUATION 1998-2013

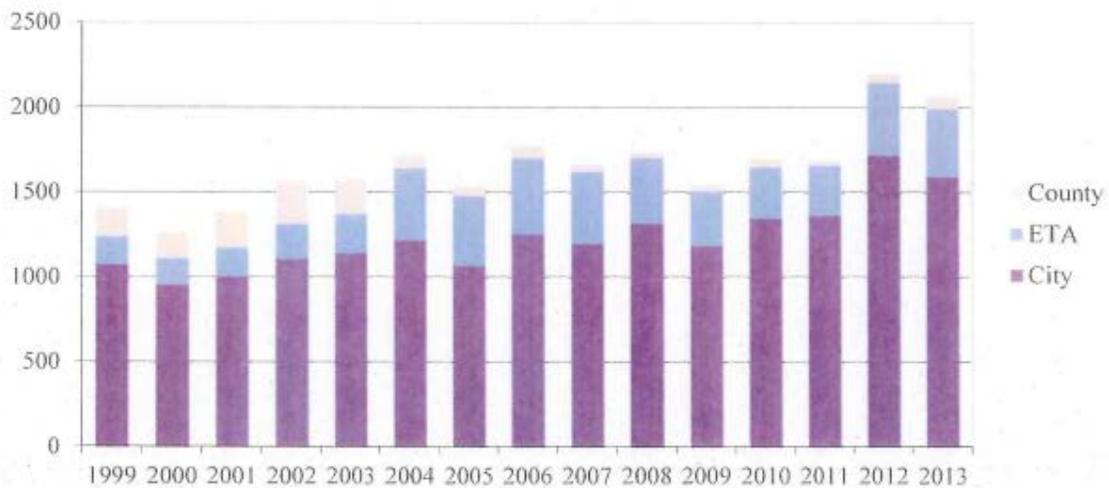


Source: [Bismarck 2013 Annual Report](#), Bismarck-Burleigh County Community Development Department, 2014.

## CITY, ETA & COUNTY BUILDING PERMITS ISSUED 1999-2013

| Year         | City          |              | ETA          |              | County       |             | Total<br>Number |
|--------------|---------------|--------------|--------------|--------------|--------------|-------------|-----------------|
|              | Number        | % of Total   | Number       | % of Total   | Number       | % of Total  |                 |
| 1999         | 1,077         | 76.3%        | 166          | 11.8%        | 168          | 11.9%       | 1,411           |
| 2000         | 956           | 75.2%        | 159          | 12.5%        | 156          | 12.3%       | 1,271           |
| 2001         | 1,006         | 72.6%        | 169          | 12.2%        | 211          | 15.2%       | 1,386           |
| 2002         | 1,109         | 70.6%        | 207          | 13.2%        | 255          | 16.2%       | 1,571           |
| 2003         | 1,144         | 72.1%        | 231          | 14.6%        | 212          | 13.4%       | 1,587           |
| 2004         | 1,220         | 70.9%        | 426          | 24.8%        | 75           | 4.4%        | 1,721           |
| 2005         | 1,070         | 69.5%        | 413          | 26.8%        | 56           | 3.6%        | 1,539           |
| 2006         | 1,256         | 70.8%        | 450          | 25.4%        | 68           | 3.8%        | 1,774           |
| 2007         | 1,199         | 71.7%        | 427          | 25.5%        | 46           | 2.8%        | 1,672           |
| 2008         | 1,319         | 75.8%        | 390          | 22.4%        | 31           | 1.8%        | 1,740           |
| 2009         | 1,190         | 77.1%        | 322          | 20.9%        | 32           | 2.1%        | 1,544           |
| 2010         | 1,349         | 79.4%        | 305          | 17.9%        | 46           | 2.7%        | 1,700           |
| 2011         | 1,366         | 80.7%        | 297          | 17.6%        | 29           | 1.7%        | 1,692           |
| 2012         | 1,718         | 78.0%        | 433          | 19.7%        | 51           | 2.3%        | 2,202           |
| 2013         | 1,593         | 77.1%        | 405          | 19.6%        | 69           | 3.3%        | 2,067           |
| <b>TOTAL</b> | <b>18,572</b> | <b>74.7%</b> | <b>4,800</b> | <b>19.3%</b> | <b>1,505</b> | <b>6.0%</b> | <b>24,877</b>   |

BUILDING PERMITS ISSUED 1999-2013



Source: [Bismarck 2013 Annual Report](#), Bismarck-Burleigh County Community Development Department, 2014.

### **Risk Assessment and Hazard Profile**

Burleigh County and the incorporated cities (Lincoln, Regan, Wilton, and Wing) contributed to the risk assessment for the Burleigh County Multi-Hazard Mitigation Plan.

The 14 hazards identified by the ND Department of Emergency Services were utilized for the risk assessment. (Source: State of North Dakota Multi-Hazard Mitigation Plan, February 2014)

| <b>Risk Assessment by Jurisdiction</b>                     |                 |          |         |       |        |      |
|--|-----------------|----------|---------|-------|--------|------|
|  | Burleigh County | Bismarck | Lincoln | Regan | Wilton | Wing |
| Communicable Disease                                       | X               | X        | X       | X     | X      | X    |
| Dam Failure  | X               | X        | X       |       |        |      |
| Drought  | X               | X        | X       | X     | X      | X    |
| Flood  | X               | X        | X       | X     | X      | X    |
| Geologic Hazards   | X               | X        |         |       |        |      |
| Hazardous Materials Incident                               | X               | X        | X       | X     | X      | X    |
| Homeland Security Incident                                 | X               | X        | X       | X     | X      | X    |
| Shortage or Outage of Critical Materials or Infrastructure | X               | X        | X       | X     | X      | X    |
| Summer Storm   | X               | X        | X       | X     | X      | X    |
| Transportation Accident                                    | X               | X        | X       |       | X      | X    |
| Urban Fire or Structure Collapse                           | X               | X        | X       | X     | X      | X    |
| Wildland Fire  | X               | X        | X       | X     | X      | X    |
| Windstorm  | X               | X        | X       | X     | X      | X    |
| Winter Storm   | X               | X        | X       | X     | X      | X    |

The majority of jurisdictions are affected by the hazards with slight variances in susceptibility as described below:

### **Communicable Disease**

Although each jurisdiction is susceptible to communicable disease, the more rural communities of Regan and Wing and unincorporated Burleigh County are particularly susceptible to those diseases that impact plants and animals. The cities, particularly the most populous city, Bismarck, are more susceptible to communicable disease.

The general age for disease susceptibility considers children under the age of 14 and adults over the age of 65 as most susceptible to disease (especially if exacerbated by underlying medical conditions). The table below depicts the susceptible ages for each jurisdiction.

| <b>Community</b> | <b>Population</b> | <b>0-14<br/>Years</b> | <b>15-64<br/>Years</b> | <b>65+<br/>Years</b> |
|------------------|-------------------|-----------------------|------------------------|----------------------|
| Burleigh         | 81,308            | 15,327                | 55,068                 | 10,913               |
| Bismarck         | 61,272            | 10,677                | 41,184                 | 9,411                |
| Lincoln          | 2,406             | 639                   | 1,679                  | 88                   |
| Regan            | 43                | 6                     | 25                     | 12                   |
| Wilton           | 711               | 113                   | 461                    | 137                  |
| Wing             | 152               | 48                    | 30                     | 29                   |

### **Dam Failure**

Two, high-hazard dams present significant risks to several sections of Burleigh County. Failure of the Garrison Dam in McLean County could affect the southwest section of Burleigh County (including the City of Bismarck and Lincoln) as discussed in the Dam Failure section. A failure of the Heart Butte Dam in Grant County could have an effect on portions of the far southwest portion of Burleigh County.

### **Drought, Urban Fire or Structure Collapse, and Wildland Fire**

The impacts of drought and wildland fire could impact city residents in a number of ways; however, rural Burleigh County is more susceptible to these hazards due to open prairie and agricultural activities. The five cities are more vulnerable to urban fire with losses greater in the more populated cities.

Although many rural residents have their own wells, rural Burleigh County would suffer great agricultural losses in drought with 1,014 farms in 2012 (down from 1,026 in 2007) that average 938 acres per farm for a total acreage of 951,021 acres. (Source: [USDA Census of Agriculture](#))

Grain elevators in Regan, Sterling, Wilton, and Wing as well as area agronomy centers may suffer losses due to drought and loss of crops.

The City of Lincoln has two, gravity-fed water towers with a 500,000-gallon capacity for each tower.

The City of Regan continues to have maintained wells and individual septic systems.

The City of Wing has one, gravity-fed water tower with a 50,000-gallon capacity.

Resources for potable water supplies are identified in the Burleigh County Emergency Operations Plan.

Fire Departments continue to lose staff and could run the risk disbanding. Additional and/or replacement equipment is always needed and sought through donations and grants.

### **Flood**

The following figure displays that no jurisdiction is immune to flood vulnerability and has either experienced the vulnerability or has the increasing susceptibility to experience the vulnerability.

| <b>Flood Vulnerabilities by Jurisdiction</b> |                 |          |         |       |        |      |
|--|-----------------|----------|---------|-------|--------|------|
|  | Burleigh County | Bismarck | Lincoln | Regan | Wilton | Wing |
| River Flooding                               | X               | X        | X       |       | X      | X    |
| Overland Flooding                            | X               | X        | X       | X     | X      | X    |
| Ice Jam Flooding                             | X               | X        | X       |       | X      |      |
| Lift Stations                                |                 | X        |         |       | X      |      |
| Lagoon Overruns                              | X               | X        | X       |       |        |      |
| Road Washouts                                | X               | X        | X       | X     | X      | X    |

Additionally, inundation maps can be found in the Attachments.

### **Geological Hazards**

No jurisdictions have significant history of this hazard.

An area of rural Burleigh County along the southern portion of Apple Creek has experienced some bank failures and slumping; no structures affected.

Areas along River Road in north Bismarck and rural Burleigh County also experience some sloughing from the grade of the eastern ridge with no structures affected.

### Hazardous Materials Release and Transportation Accident

Varied levels of susceptibility are apparent for all jurisdictions. Highway 83 runs through the western side of Burleigh County (including the Cities of Bismarck and Wilton). Additionally, Interstate 94 transects the middle of Burleigh County through the City of Bismarck and near the City of Lincoln. Railroad tracks run through Burleigh County, Bismarck, and Wilton. The City of Regan is located approximately ½ mile north of Highway 36, which is not a major transportation route. Throughout the year, farmers transport anhydrous ammonia in pup tanks.

The City of Bismarck is far more susceptible to the hazards due to being an urban center with the highest population density in Burleigh County. Other factors increasing susceptibility include:

- State Capitol
- Governmental Buildings (local, state, and federal)
- Higher Education Facilities
- Numerous Medical Facilities
- Tourism Destination
- Commercial and Agricultural Industries
- Increased Number of Impervious Surfaces
- Increased Transportation Flow

| <b>Hazardous Materials Release and Transportation Accident</b> |                 |          |         |       |        |      |
|--|-----------------|----------|---------|-------|--------|------|
|  | Burleigh County | Bismarck | Lincoln | Regan | Wilton | Wing |
| Anhydrous Ammonia  | X               | X        |         |       |        |      |
| Bulk Fuel  | X               | X        |         |       | X      |      |
| Bulk Fertilizer  | X               | X        |         |       |        |      |
| Farm Chemicals   |                 |          |         |       |        |      |
| Propane  | X               | X        |         |       | X      |      |
| Fuel and Gas   | X               | X        | X       | X     | X      | X    |
| Natural Gas  | X               | X        | X       |       | X      |      |
| Major Transportation Route                                     | X               | X        | X       |       | X      |      |
| Railroad   | X               | X        | X       |       | X      |      |

**Homeland Security Incident**

All jurisdictions could be impacted by a homeland security event; the greater vulnerability would be expected to be in the most populous city of Bismarck.

**Severe Summer Weather and Severe Winter Weather**

All jurisdictions are impacted. Severe summer weather incidents may cause major economic losses based on the level of impact. Severe winter weather often results in blocked roads and can affect each jurisdiction and may lead to economic loss dependent upon severity and length of time.

Rural Burleigh County residents have backup power sources (generators, coal or wood-burning stoves) and extra fuel sources (gas and propane).

The communities of Bismarck, Lincoln, Wilton, and Wing each maintain an outdoor warning siren system to alert a tornado. Lincoln, Wilton, and Wing also utilize their sirens to alert fire or ambulance crews.

**Disability Population\***

|                 | Population | Total with Disability | Under 18 Years | Total with Disability | 18-64 Years | Total with Disability | 65+ Years | Total with Disability |
|-----------------|------------|-----------------------|----------------|-----------------------|-------------|-----------------------|-----------|-----------------------|
| Burleigh County | 82,115     | 8,443                 | 18,892         | 599                   | 52,264      | 4,098                 | 10,959    | 3,746                 |

\*2009-2013 American Community Survey 5-Year Estimates

Burleigh County does not have the resources and shelter space to accommodate functional needs and general population for a large-event. (Source: Burleigh County Evacuation and Shelter Plan)

**Vulnerable Population\***

| <b>Category</b>   | <b>Facility</b>                     | <b>Address</b>        | <b>Jurisdiction</b> |
|-------------------|-------------------------------------|-----------------------|---------------------|
| Assisted Living   | Baptist Health Care Center          | 3400 Nebraska Dr      | Bismarck            |
| Assisted Living   | Good Samaritan Society              | 301 Lorrain Dr        | Bismarck            |
| Assisted Living   | Missouri Slope Lutheran Care Center | 2425 Hillview Av      | Bismarck            |
| Assisted Living   | Sanford Health St Vincent's         | 1021 N 26th St        | Bismarck            |
| Assisted Living   | St Gabriel's Community              | 4580 Coleman St       | Bismarck            |
| Assisted Living   | Redwood Village                     | 213 7th St N          | Wilton              |
| Hospital          | CHI St. Alexius Medical Center      | 900 E Broadway Av     | Bismarck            |
| Hospital          | Sanford Medical Center              | 300 N 7th St          | Bismarck            |
| Mobile Home Court | Airport Village                     | 1119 University Dr    | Bismarck            |
| Mobile Home Court | Centennial Park                     | 2500 Centennial Rd    | Bismarck            |
| Mobile Home Court | Century Park                        | E Century Av          | Bismarck            |
| Mobile Home Court | Chance Mobile Home Park             | 2406 E Thayer Av      | Bismarck            |
| Mobile Home Court | Colonial Estates                    | 1501 E Bismarck Expwy | Bismarck            |
| Mobile Home Court | Hay Creek Mobile Home Court         | 700 Haycreek Court    | Bismarck            |
| Mobile Home Court | Hi-Loh Mobile Home Park             | 507 S 8th St          | Bismarck            |
| Mobile Home Court | Holiday Mobile Home Park            | 700 S 12th St         | Bismarck            |
| Mobile Home Court | Holiday Mobile Home Park            | 600 S 9th St          | Bismarck            |
| Mobile Home Court | Parkview Mobile Home Estates        | 614 W Sweet Av        | Bismarck            |
| Mobile Home Court | Skyway Park Village                 | 1119 University Dr    | Bismarck            |
| Mobile Home Court | Stardust Terrace                    | 4005 N 19th St        | Bismarck            |
| Mobile Home Court | Tatley Meadows Mobile Home Park     | Tatley Park Rd        | Bismarck            |
| Mobile Home Court | Terrace Heights Mobile Home Park    | 2520 E Broadway Av    | Bismarck            |
| Mobile Home Court | Lincoln Meadows Mobile Home Park    | 116 Bluejay Av        | Burleigh County     |
| Mobile Home Court | Wilton Mobile Home Park             | Lukens Dr/Minnie Av   | Wilton              |

\*Hospitals and assisted living centers are required to have emergency plans. Mobile home dwellers are encouraged to find alternate locations for severe weather events during the "Watch" phase.

**Shortage or Outage of Critical Materials or Infrastructure**

All jurisdictions could be impacted. The larger populous (Bismarck, Lincoln, and Wilton) and communities with medical facilities (Bismarck) would experience greater impact without fuel, utilities, and/or medical supplies. Likewise, agriculture activities would be drastically impacted without utilities and fuel supplies.

**Windstorm**

Very similar to severe summer and winter storms, windstorms have the capacity to affect each jurisdiction. Downed power lines would have the greatest affect coupled with damages from flying debris and damage to facilities.

Mobile home dwellings are encouraged to have tie-downs.

**Hazards Excluded from this Plan**

| <b>Hazard</b>   | <b>Why Excluded/Where Addressed</b>  |
|-----------------|--|
| Avalanche       | Avalanches generally require long stretches of 25-55 degree slopes; Burleigh County has no areas that meet this criteria.<br>North Dakota is not covered by a National Avalanche Center.<br>North Dakota does not have a history of any declared state or federal avalanche disasters. |
| Coastal Erosion | Burleigh County does not have an ocean coastline.  |
| Coastal Storm   | Burleigh County does not have an ocean coastline.  |
| Hurricane       | Burleigh County does not have an ocean coastline, nor is it located in a potential hurricane impact area.  |
| Tsunami         | Burleigh County does not have an ocean coastline.  |
| Volcano         | Volcanic ashfall can occur over Burleigh County, but the frequency is relatively rare and the potential impacts are not expected to exceed local capabilities.<br>North Dakota does not have a history of any declared state or federal volcano disasters.                             |

**Risk Analysis Worksheet**

**Frequency:** How often is this hazard likely to develop in this area?

- Highly Likely Nearly 100% probability in the next year
- Likely 10–100% probability in the next year, or at least 1 chance in next 10 years
- Possible 1–10% probability in the next year, or at least 1 chance in next 100 years
- Unlikely Less than 1% probability in next 100 years

**Severity:** What is the expected extent of damage caused by this type of hazard?

- Catastrophic More than 50% of jurisdiction affected
- Critical 25–50% of jurisdiction affected
- Limited 10–25% of jurisdiction affected
- Negligible Less than 10% of jurisdiction affected

|                  |                      |                   |                |                 |                     |
|------------------|----------------------|-------------------|----------------|-----------------|---------------------|
| <b>Frequency</b> | <b>Highly Likely</b> | <b>C</b>          | <b>B</b>       | <b>A</b>        | <b>A</b>            |
|                  | <b>Likely</b>        | <b>C</b>          | <b>C</b>       | <b>B</b>        | <b>A</b>            |
|                  | <b>Possible</b>      | <b>D</b>          | <b>C</b>       | <b>B</b>        | <b>B</b>            |
|                  | <b>Unlikely</b>      | <b>D</b>          | <b>D</b>       | <b>C</b>        | <b>C</b>            |
|                  |                      | <b>Negligible</b> | <b>Limited</b> | <b>Critical</b> | <b>Catastrophic</b> |
|                  |                      | <b>Severity</b>   |                |                 |                     |

(Source: [FEMA Multi-Hazard Identification and Risk Assessment, January 1, 1997, Risk Assessment Approaches – Chapter/Section Number: Part 3](#))

**Risk Class:** Classification of the overall risk posed to the jurisdiction and immediacy of necessary action:

**Seasonal Pattern:** When is the type of hazard most likely to occur?

**Probable Duration:** How long will this event typically have an impact on the community?

**Speed of Onset:** How much advance warning does the community have for this type of event?

**Location/Jurisdiction:** Which areas are affected?

**Risks:** Types of situations that might result from the hazard.

|                                |
|--------------------------------|
| <b>Hazard</b>                  |
| <b>Frequency:</b> _____        |
| <b>Severity:</b> _____         |
| <b>Risk Class:</b> _____       |
| <b>Seasonal Pattern:</b> _____ |
| <b>Duration:</b> _____         |
| <b>Speed of Onset:</b> _____   |

DESCRIPTION:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

IDENTIFIED IMPACTS:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

HISTORY:

\_\_\_\_\_  
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## Burleigh County Hazard Risk Analysis Chart with Vulnerabilities for each Hazard

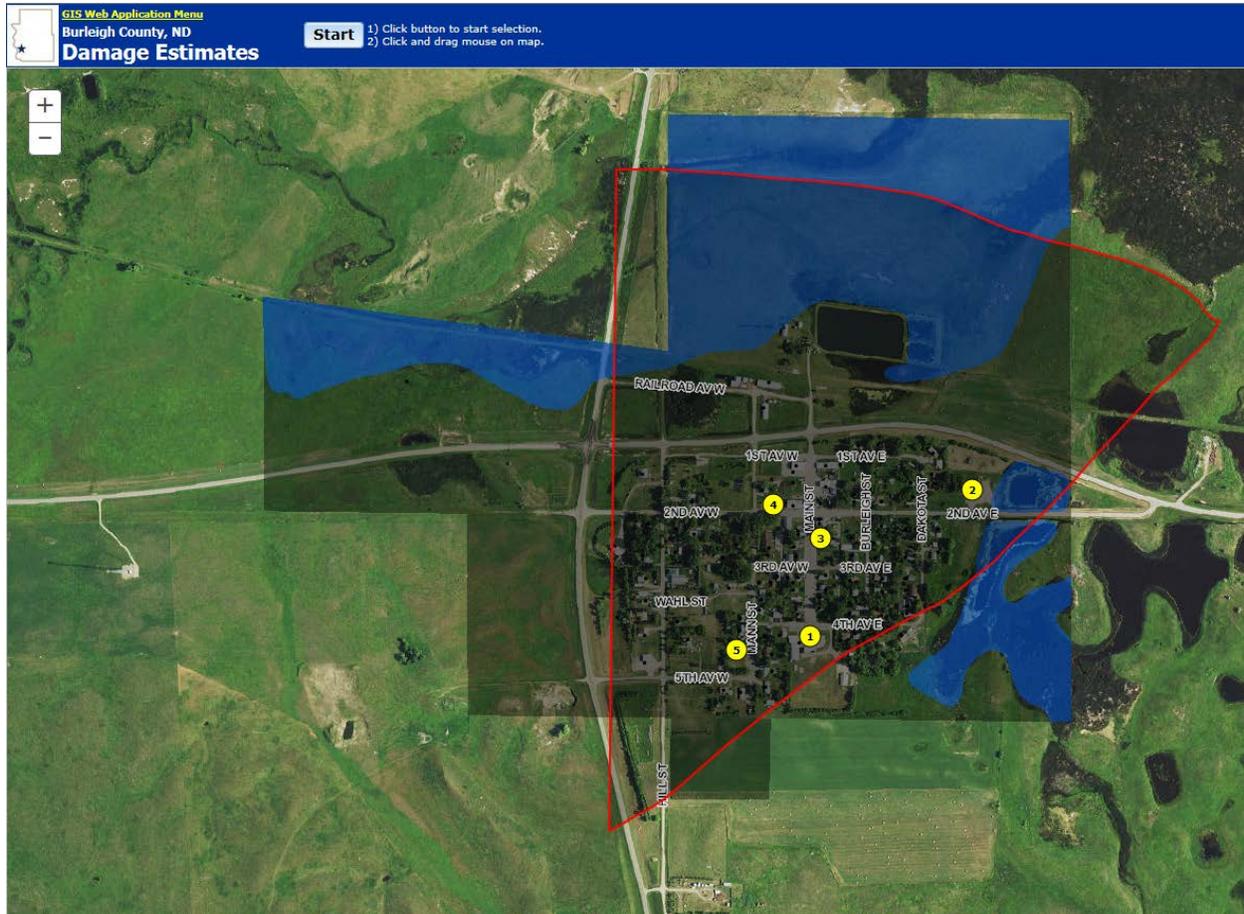
| <b>Risk Class:</b>                  | <b>B</b>             | <b>B</b>    | <b>C</b> | <b>C</b> | <b>D</b>         | <b>B</b>                    | <b>C</b>                   | <b>B</b>              | <b>A</b>              | <b>B</b>   | <b>C</b>                | <b>D</b>                         | <b>C</b>      | <b>A</b>  |
|-------------------------------------|----------------------|-------------|----------|----------|------------------|-----------------------------|----------------------------|-----------------------|-----------------------|--|-------------------------|----------------------------------|---------------|-----------|
| <b>HAZARD:</b>                      | Communicable Disease | Dam Failure | Drought  | Flood    | Geologic Hazards | Hazardous materials Release | Homeland Security Incident | Severe Summer Weather | Severe Winter Weather | Shortage or Outage of Critical Materials or Infrastructure | Transportation Accident | Urban Fire or Structure Collapse | Wildland Fire | Windstorm |
| Blocked Roads                       |                      | X           |          | X        | X                | X                           | X                          | X                     | X                     |  | X                       | X                                | X             | X         |
| Building Collapse                   |                      | X           |          | X        | X                | X                           | X                          | X                     | X                     |  |                         | X                                | X             |           |
| Business Interruptions              | X                    | X           | X        | X        | X                | X                           | X                          | X                     | X                     | X  | X                       | X                                | X             |           |
| Delayed Emergency Response          | X                    | X           |          | X        | X                | X                           | X                          | X                     | X                     | X  | X                       | X                                | X             |           |
| Downed Power Lines                  |                      | X           |          | X        | X                | X                           | X                          | X                     | X                     |  |                         | X                                | X             | X         |
| Downed Trees                        |                      | X           |          | X        | X                | X                           |                            | X                     | X                     |  |                         | X                                | X             | X         |
| Evacuation (Full)                   |                      | X           |          |          |                  | X                           |                            |                       |                       |  |                         |                                  |               |           |
| Evacuation (Localized)              |                      | X           |          | X        | X                | X                           | X                          | X                     | X                     |  | X                       | X                                | X             |           |
| Explosion                           |                      |             |          |          |                  | X                           | X                          | X                     |                       |  | X                       | X                                | X             |           |
| Flooding (Street)                   |                      | X           |          | X        |                  |                             |                            | X                     |                       |  |                         |                                  |               |           |
| Flooding (Structure)                |                      | X           |          | X        |                  |                             |                            | X                     |                       |  |                         |                                  |               |           |
| HAZMAT Release                      |                      | X           |          | X        |                  | X                           | X                          | X                     | X                     |  | X                       | X                                | X             |           |
| Increased Fire Potential            |                      |             | X        | X        |                  | X                           |                            | X                     | X                     |  |                         | X                                | X             |           |
| Increased Public Safety Runs        | X                    | X           |          | X        |                  | X                           | X                          | X                     | X                     | X  | X                       | X                                | X             |           |
| Livestock Injury/Death              | X                    | X           | X        | X        |                  | X                           | X                          | X                     | X                     |  |                         | X                                | X             |           |
| Loss of Economy                     | X                    | X           | X        | X        |                  | X                           | X                          | X                     | X                     | X  | X                       | X                                | X             |           |
| Loss/Overcrowded Medical Facilities | X                    | X           |          | X        |                  | X                           | X                          | X                     | X                     |  | X                       | X                                |               |           |
| Loss of Potable Water               | X                    | X           | X        | X        | X                | X                           | X                          | X                     | X                     | X  |                         |                                  |               |           |
| Loss of Power                       |                      | X           |          | X        | X                | X                           | X                          | X                     | X                     |  |                         | X                                | X             | X         |
| Mass Casualties                     | X                    | X           |          | X        |                  | X                           | X                          | X                     |                       |  | X                       | X                                |               |           |
| Property Damage                     |                      | X           | X        | X        | X                | X                           | X                          | X                     | X                     |  | X                       | X                                | X             | X         |
| School Closure                      | X                    | X           |          | X        |                  | X                           | X                          | X                     | X                     | X  |                         | X                                | X             |           |
| Sewer Backup                        |                      | X           |          | X        |                  |                             |                            | X                     |                       |  |                         |                                  |               |           |
| Wind Chill                          |                      |             |          |          |                  |                             |                            |                       | X                     |  |                         |                                  |               | X         |

### Overall Vulnerability Summary

| <b>HAZARD</b>  | <b>Description</b>  |
|--|---|
| Communicable Disease                                       | No change.  |
| Dam Failure  | No change.  |
| Drought  | Decreased from Risk Class “B” to “C”. Frequency is consistent; however, historical severity is limited and primarily agricultural.  |
| Flood  | No change.  |
| Geologic Hazards   | New hazard to match the State Plan. Hazard is likely; however, severity was deemed negligible-limited.  |
| Hazardous Materials Release                                | No change.  |
| Homeland Security Incident                                 | No change.  |
| Severe Summer Weather                                      | No change.  |
| Severe Winter Weather                                      | Increased from Risk Class “B” to “C”. Winter storms are broadly based and annually affect more than 50% of the County.  |
| Shortage or Outage of Critical Materials or Infrastructure | No change.  |
| Transportation Accident                                    | Increased from Risk Class “D” to “C”. The frequency of hazardous materials incidents occurring in relation to transportation has increased with historical severity being Negligible-Limited. . A recent hazardous materials flow study (2012) shows the number of hazardous materials being transported through Burleigh County has increased—especially in relation to rail cars. |
| Urban Fire or Structure Collapse                           | No change.  |
| Wildland Fire  | Decreased from Risk Class “B” to “C”. Fire Department respond to wildland fires every year; however, the historical severity has been negligible.   |
| Windstorm  | New hazard to match the State Plan. Windstorms are broadly based and annually affect more than 50% of the County.   |

## Damage Assessment

An in-house GIS application was created to assess damages from nearly any hazard. An example is shown below:



Source: Burleigh County GIS

The assessment includes:

- Any geometric shape
- Population within the shape
- Properties with assessed structures
- Assessed structure values
- Breakdown of the major structure types

|   |                    |
|---|--------------------|
| <b>Total Population (2010 Census):</b>      | <b>118</b>         |
| <b>Properties With Assessed Structures:</b> | <b>99</b>          |
| <b>Assessed Structure Value:</b>            | <b>\$2,199,400</b> |

|                                |
|--------------------------------|
| <b>All Major Structures: 5</b> |
| Churches: 1                    |
| Government Buildings: 3        |
| Hospitals/Clinics: 0           |
| Nursing Homes: 0               |
| Schools: 1                     |

| Legend  |  |
|---|--|
|    | <b>Major Structures</b>                    |
|    | <b>Properties With Assessed Structures</b> |
|    | <b>100 Year Floodplain</b>                 |
|    | <b>500 Year Floodplain</b>                 |
|    | <b>Municipal Area</b>                      |
|   | <b>Political Townships</b>                 |
|    | <b>Section Lines</b>                       |
| <p><i>* 'Total Population' is calculated from the 2010 US Census Blocks. The population of a census block is included only if the centroid of the census block is within the selection area.</i></p> <p><i>* The values for 'Properties With Assessed Structures' &amp; 'Assessed Structure Value' do not include tax exempt properties like government buildings and churches.</i></p> |  |

Source: Burleigh County GIS

**THIRA Survey Results  
As of 07-18-14**

| <b>2013 Burleigh County Hazard/Threat Identification Comparison*</b> |              |                                    |                |   |  |                   |
|--|--------------|------------------------------------|----------------|---|--|-------------------|
|  |              | <b>Very Likely</b>                 | <b>Likely</b>  | <b>Possible</b>   | <b>Unlikely</b>  | <b>Improbable</b> |
|  | <b>Score</b> | <b>5</b>                           | <b>4</b>       | <b>3</b>  | <b>2</b>   | <b>1</b>          |
| <b>Catastrophic</b>  | <b>5</b>     |                                    |                | • Dam Failure   | • Nuclear Terrorism Attack   |                   |
| <b>Significant</b>   | <b>4</b>     |                                    |                |   | • Biological Terrorism Attack<br>• Chemical Terrorism Attack<br>• RDD Terrorism Attack |                   |
| <b>Moderate</b>  | <b>3</b>     | • Summer Storms<br>• Winter Storms |                | • Aircraft as a Weapon<br>• Chemical Substance Spill or Release<br>• Explosives Terrorism Attack  | • Radiological Substance Release   |                   |
| <b>Minor</b>   | <b>2</b>     |                                    |                | • Armed Assault<br>• Biological Food Contamination<br>• Chemical/Biological Food Production Attack<br>• Human Pandemic Outbreak<br>• Supply Chain Disruption<br>• Transportation Incident |  |                   |
| <b>None/<br/>Negligible</b>  | <b>1</b>     |                                    | • Cyber Attack | • Animal Disease Outbreak<br>• Civil Disorder<br>• Flood<br>• Wildfire  |  |                   |

\*Based on 29 responses

### Burleigh County Disaster Declarations

| Number               | Declared  | State        | Description   |
|----------------------|-----------|--------------|---|
| <a href="#">1981</a> | 5/10/2011 | North Dakota | Flooding  |
| <a href="#">1901</a> | 4/21/2010 | North Dakota | Severe Winter Storm   |
| <a href="#">1829</a> | 3/24/2009 | North Dakota | Severe Storms and Flooding  |
| <a href="#">1376</a> | 5/28/2001 | North Dakota | Floods  |
| <a href="#">1334</a> | 6/27/2000 | North Dakota | Severe Storms And Flooding  |
| <a href="#">1279</a> | 6/8/1999  | North Dakota | Severe Storms, Tornadoes, Snow and Ice, Flooding, Ground Saturation, Landslides and Mudslides |
| <a href="#">1174</a> | 4/7/1997  | North Dakota | Severe Storms/Flooding  |
| <a href="#">1157</a> | 1/12/1997 | North Dakota | Severe Winter Storms/Blizzards  |
| <a href="#">1118</a> | 6/5/1996  | North Dakota | Flooding  |
| <a href="#">1050</a> | 5/16/1995 | North Dakota | Severe Storms, Flooding, Ground Saturation  |
| <a href="#">1001</a> | 7/26/1993 | North Dakota | Flooding, Severe Storms   |
| <a href="#">581</a>  | 4/26/1979 | North Dakota | Storms, Snowmelt, Flooding  |
| <a href="#">554</a>  | 4/17/1978 | North Dakota | Storms, Ice Jams, Snowmelt, Flooding  |
| <a href="#">287</a>  | 6/5/1970  | North Dakota | Severe Storms, Flooding   |
| <a href="#">256</a>  | 4/18/1969 | North Dakota | Flooding  |

Source: Source: <http://www.fema.gov/disasters>

### Burleigh County Emergency Declarations

| Number               | Declared  | State        | Description                  |
|----------------------|-----------|--------------|------------------------------|
| <a href="#">3318</a> | 4/7/2011  | North Dakota | Flooding                     |
| <a href="#">3309</a> | 3/14/2010 | North Dakota | Flooding                     |
| <a href="#">3247</a> | 9/13/2005 | North Dakota | Hurricane Katrina Evacuation |
| <a href="#">3016</a> | 7/21/1976 | North Dakota | Drought                      |
| <a href="#">3012</a> | 4/13/1976 | North Dakota | Severe Flooding              |

Source: Source: <http://www.fema.gov/disasters>

### Communicable Disease

|                         |  |
|-------------------------|--|
| <b>Frequency</b>        | Likely (10-100% probability in the next year, or at least 1 chance in next 10 years) |
| <b>Severity</b>         | Critical (25-50% of jurisdiction affected)   |
| <b>Risk Class</b>       | B  |
| <b>Seasonal Pattern</b> | None   |
| <b>Duration</b>         | Hours/Days   |
| <b>Speed of Onset</b>   | No warning   |
| <b>Location</b>         | Countywide   |

#### Description

Naturally occurring biological diseases in humans as well as those biological agents found in the environment, or diagnosed in animals, that have the potential for transmission to humans.

The probability of communicable disease in Burleigh County presents challenges due to a limited history of outbreaks. Medical advances over the past fifty years prevent many disease outbreaks, yet the potential still remains. Burleigh County is primarily a rural setting and somewhat isolated from the rapid spread of global diseases, however, international and domestic travel is so common that, like the Spanish Influenza Pandemic of 1918, North Dakotans would most likely be affected at some point. The urban areas could see rapid spread of such diseases through their populations.

#### Identified Impacts

- Business Interruptions
- Delayed Emergency Response
- Increased Public Safety Runs
- Livestock Injury/Death
- Loss of Economy
- Loss/Overcrowded Medical Facilities
- Loss of Potable Water
- Mass Casualties
- School Closure

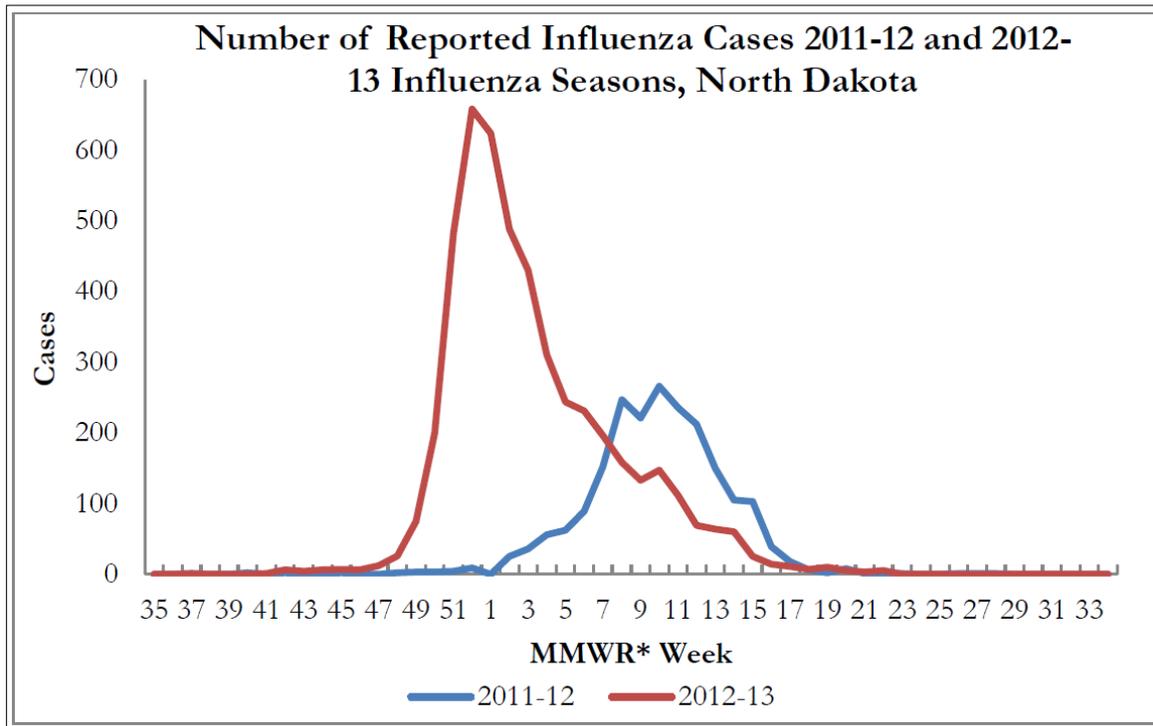
**History**

Although Burleigh County has not experienced a pandemic in recent years, seasonal influenza outbreaks occur annually.

**Burleigh County Influenza Season Summary**

| Season    | Cases Identified in Burleigh County | Cases Identified in North Dakota |
|-----------|-------------------------------------|----------------------------------|
| 2012-2013 | 1,142                               | 4,833                            |
| 2011-2012 | 367                                 | 1,487                            |
| 2010-2011 | 438                                 | 2,089                            |
| 2009-2010 | 618                                 | 3,259                            |

Source: [ND Department of Health](#)



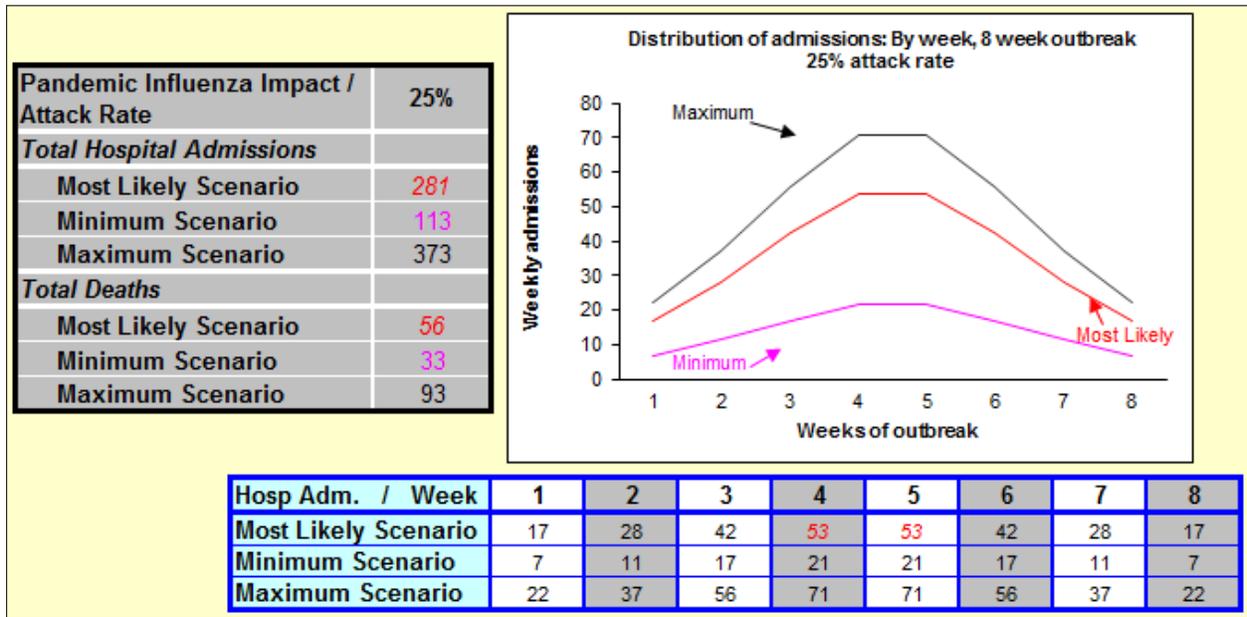
Source: [www.ndflu.com](http://www.ndflu.com)

North Dakota has had three influenza pandemics in the 20th century: 1918 caused 5,100 deaths in North Dakota, 500,000 deaths in the United States; 1957 resulted in 70,000 deaths in the United States; and 1968 resulted in 34,000 deaths in the United States.

Spanish Influenza Pandemic of 1918

The magnitude of a communicable disease outbreak varies from everyday disease occurrences to widespread infection. During the 1918 Influenza Pandemic, infection rates approached 28% in the United States. (Billings, 1997) Other pandemics produced infections rates as high as 35% of the total population. (World Health Organization, 2007) Such a pandemic affecting North Dakota represents a severe magnitude event. Almost any highly contagious, incapacitating disease that enters the North Dakota population would quickly overwhelm local and state health resources. Similarly, any rapidly spreading bioterrorism event for which little vaccination or containment capability exists is a high magnitude event.

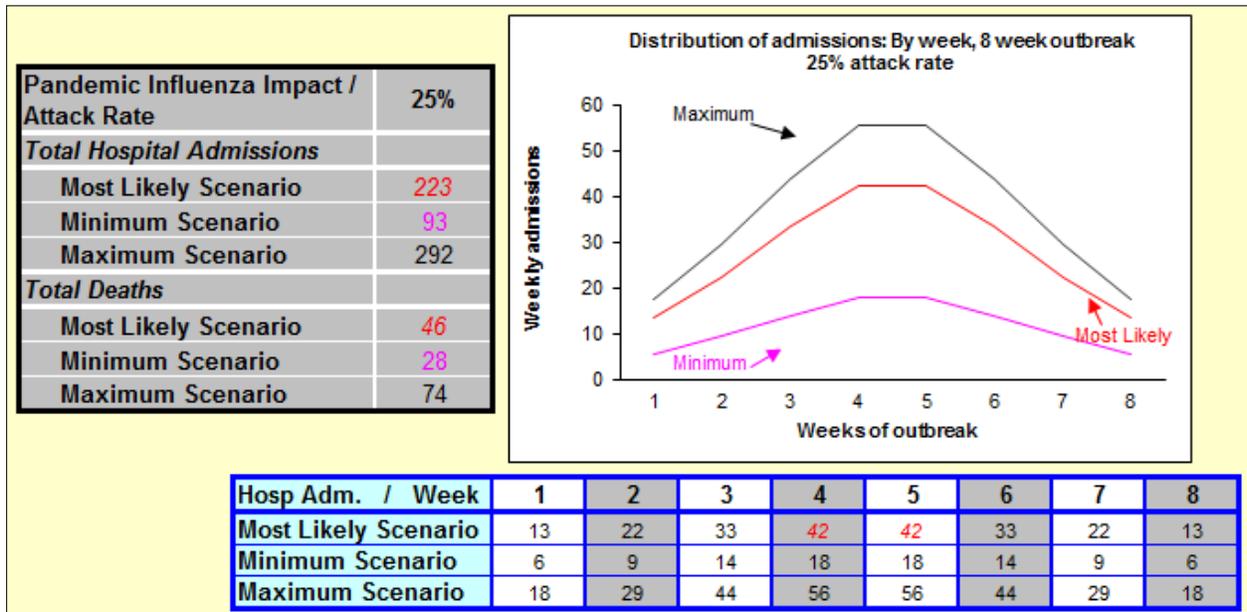
**1918 Pandemic and Impact Rate Based on 2010 Census Data\*  
Burleigh County**



\*According to Billings (1997) the 1918 attack rate was 28%, the figures above represented a 25% attach rate generated by [FluSurge](#).

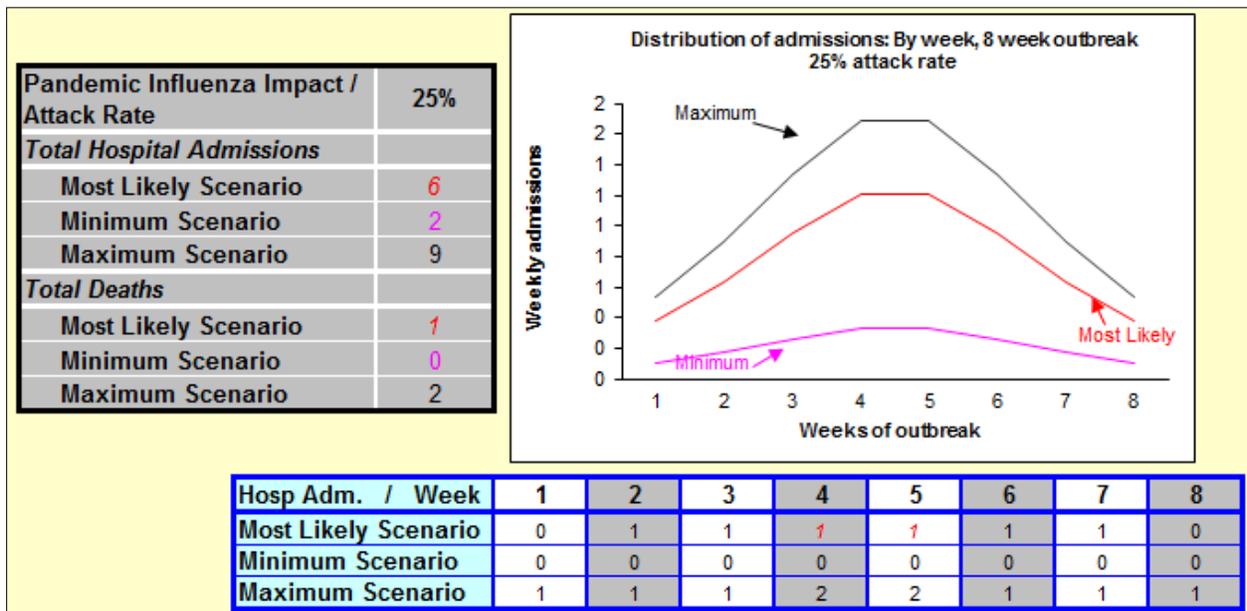
| Community | Population | 0-19 Years | 20-64 Years | 65+ Years |
|-----------|------------|------------|-------------|-----------|
| Burleigh  | 81,308     | 20,810     | 49,585      | 10,913    |
| Bismarck  | 61,272     | 14,442     | 37,419      | 9,411     |
| Lincoln   | 2,406      | 824        | 1,494       | 88        |
| Regan     | 43         | 7          | 24          | 12        |
| Wilton    | 711        | 156        | 418         | 137       |
| Wing      | 152        | 41         | 82          | 29        |

**1918 Pandemic and Impact Rate Based on 2010 Census Data\*  
City of Bismarck**



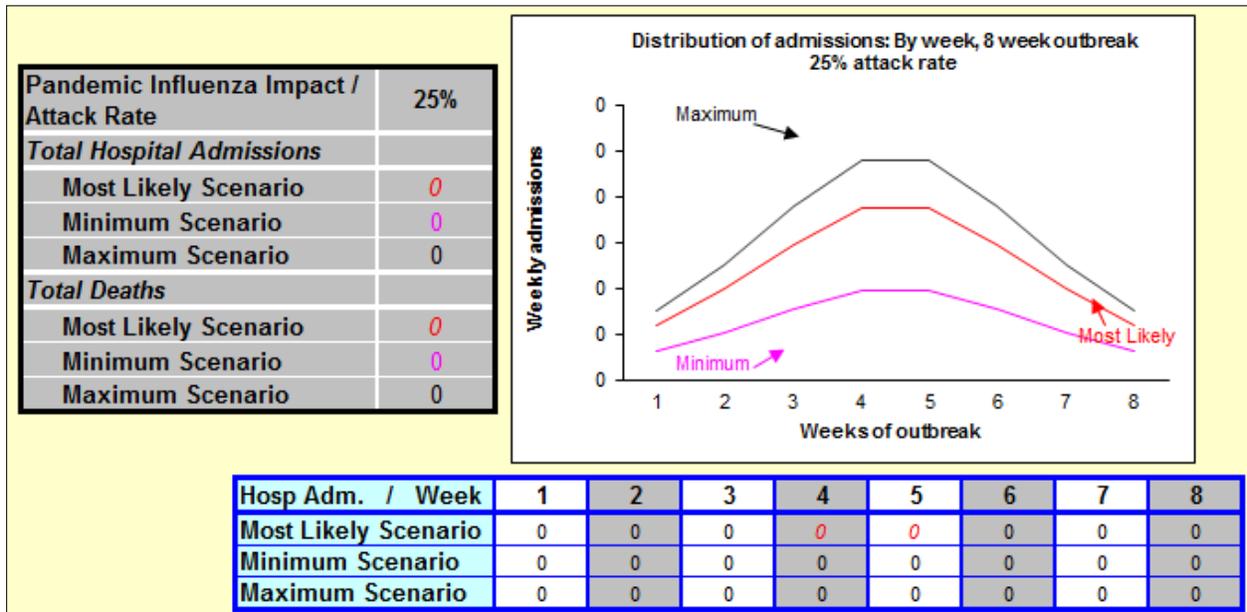
\*According to Billings (1997) the 1918 attack rate was 28%, the figures above represented a 25% attack rate generated by [FluSurge](#).

**1918 Pandemic and Impact Rate Based on 2010 Census Data\*  
City of Lincoln**



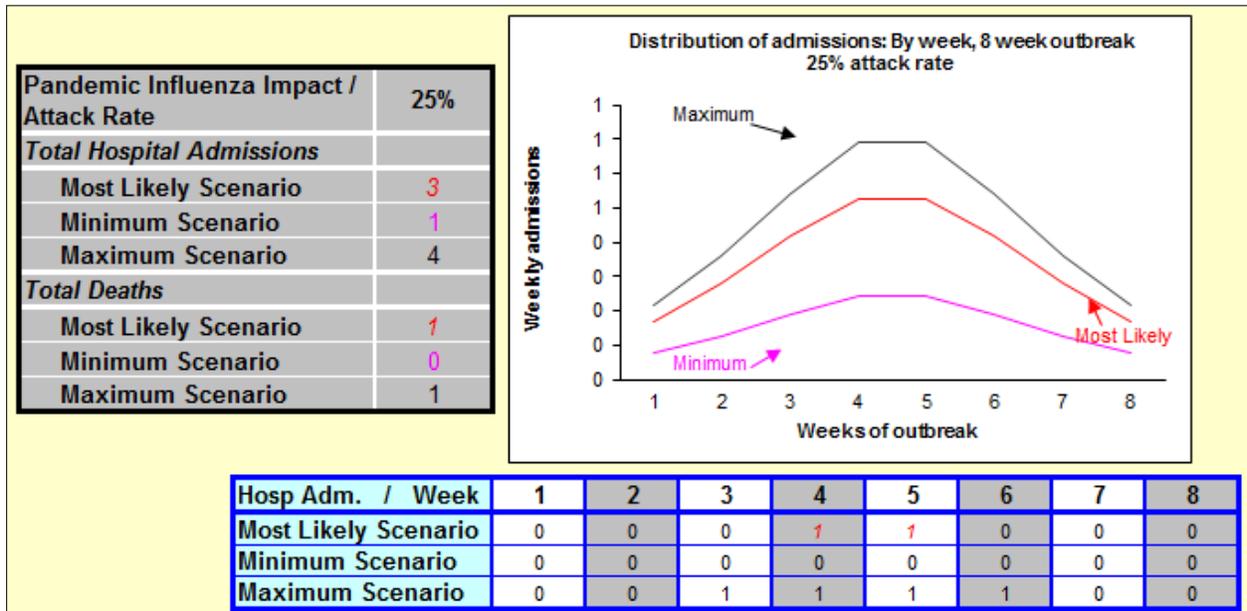
\*According to Billings (1997) the 1918 attack rate was 28%, the figures above represented a 25% attack rate generated by [FluSurge](#).

### 1918 Pandemic and Impact Rate Based on 2010 Census Data\* City of Regan



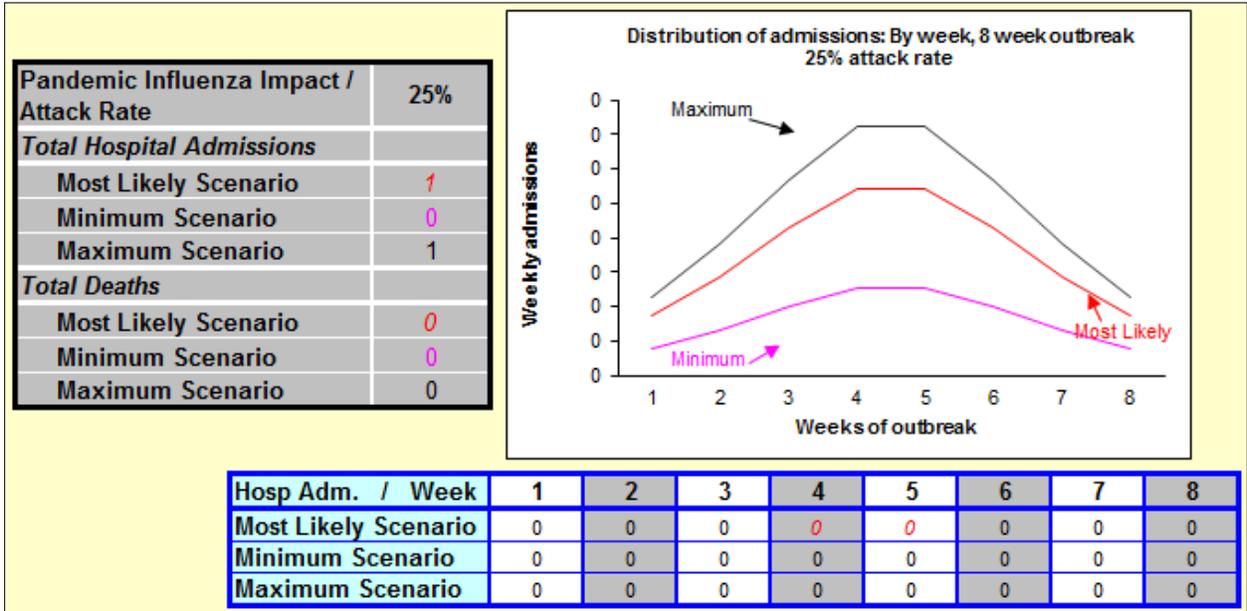
\*According to Billings (1997) the 1918 attack rate was 28%, the figures above represented a 25% attack rate generated by [FluSurge](#).

### 1918 Pandemic and Impact Rate Based on 2010 Census Data\* City of Wilton



\*According to Billings (1997) the 1918 attack rate was 28%, the figures above represented a 25% attack rate generated by [FluSurge](#).

**1918 Pandemic and Impact Rate Based on 2010 Census Data\*  
City of Wing**



\*According to Billings (1997) the 1918 attack rate was 28%, the figures above represented a 25% attach rate generated by [FluSurge](#).

### **Agricultural Diseases, Noxious Weeds, and Pests**

A comprehensive list of reportable conditions is maintained by the ND Department of Agriculture and available on their [website](#).

#### Anthrax

“Anthrax occurs worldwide and is associated with sudden death of cattle and sheep. Anthrax can infect all warm-blooded animals, including humans. The anthrax organism (*Bacillus anthracis*) has the ability to form spores and become resistant to adverse conditions. Pasteurization or ordinary disinfectants may destroy anthrax organisms in animals or their secretions. However, if the animal carcass is opened and the organisms are exposed to air, they will form spores. Sporulated anthrax organisms are highly resistant to heat, cold, chemical disinfectants and drying. The anthrax spore may live indefinitely in the soil of a contaminated pasture or yard.”  
(Source: ND Department of Agriculture [website](#))

Burleigh County has a low case history:

#### **Anthrax Cases in Burleigh County**

|      |   |
|------|---|
| 2014 | 0 |
| 2013 | 0 |
| 2010 | 0 |
| 2006 | 1 |
| 2005 | 0 |

## Dam Failure

|                         |   |
|-------------------------|---|
| <b>Frequency</b>        | Possible (1-10% probability in next year, or at least 1 chance in next 100 years) |
| <b>Severity</b>         | Critical (25-50% of jurisdiction affected)  |
| <b>Risk Class</b>       | B   |
| <b>Seasonal Pattern</b> | Spring/Summer   |
| <b>Duration</b>         | Days/Weeks  |
| <b>Speed of Onset</b>   | Little warning  |
| <b>Location</b>         | Countywide  |

### Description

A dam is any artificial barrier, including appurtenant works, which impounds or diverts water. Its purposes include the storage of water for irrigation, hydroelectric power generation, flood control, water supply, recreation, wildlife, etc. 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, the most common reasons are hydraulic inadequacy, seepage problems, and structural defects.

The “[FEMA Federal Guidelines for Dam Safety](#), Hazard Potential Classification System for Dams, April 2004” defines three classification levels:

- **Low Hazard Potential:** Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner’s property.
- **Significant Hazard Potential:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.
- **High Hazard Potential:** Dams assigned the high hazard potential classification are those where failure or mis-operation will probably cause loss of human life.

| <b>Hazard Potential Classification</b> | <b>Loss of Human Life</b>      | <b>Economic, Environmental, Lifeline Losses</b> |
|--|--------------------------------|---|
| Low                                    | None expected                  | Low and generally limited to owner              |
| Significant                            | None expected                  | Yes   |
| High                                   | Probable. One or more expected | Yes (but not necessary for this classification) |

### **Identified Impacts**

- Blocked Roads
- Building Collapse
- Business Interruptions
- Delayed Emergency Response
- Downed Power Lines
- Downed Trees
- Evacuation (Full)
- Evacuation (Localized)
- Flooding (Street)
- Flooding (Structure)
- HAZMAT Release
- Increased Public Safety Runs
- Livestock Injury/Death
- Loss of Economy
- Loss/Overcrowded Medical Facilities
- Loss of Potable Water
- Loss of Power
- Mass Casualties
- Property Damage
- School Closure
- Sewer Backup

The [ND State Water Commission](#) identifies 91 dams in Burleigh County. All of these dams have an element of hazard to cause loss of life and property damage should the dam fail. One dam is classified as “Significant” and one dam is classified as “High”.

| Location                     | Type | Structure Name            | County   | Purpose         | Federal Hazard Class |
|------------------------------|------|---------------------------|----------|-----------------|----------------------|
| <a href="#">13707508CCC</a>  | Dam  | LONG LAKE NWR 7           | Burleigh | Fish & Wildlife | Low                  |
| <a href="#">13707517BA</a>   | Dam  | LONG LAKE NWR - G12 MARSH | Burleigh | Livestock       | Low                  |
| <a href="#">13707530BA</a>   | Dam  | LONG LAKE NWR DAM #3      | Burleigh | Fish & Wildlife | Low                  |
| <a href="#">13707609CDCC</a> | Dam  | LONG LAKE NWR 6           | Burleigh | Fish & Wildlife | Low                  |
| <a href="#">13707614AD</a>   | Dam  | LANE DAM; MARY            | Burleigh | Fish & Wildlife | Low                  |
| <a href="#">13707615AC</a>   | Dam  | LONG LAKE NWR 5           | Burleigh | Fish & Wildlife | Low                  |
| <a href="#">13707624AA</a>   | Dam  | LONG LAKE NWR 4           | Burleigh | Fish & Wildlife | Low                  |
| <a href="#">13707828BCC</a>  | Dam  | SCHEELER DAM; DON         | Burleigh | Livestock       | Low                  |
| <a href="#">13707830DDB</a>  | Dam  | WEISBECK DAM; ROSE        | Burleigh | Fish & Wildlife | Low                  |
| <a href="#">13707919BC</a>   | Dam  | KIMBALL BOTTOMS SPILLWAY  | Burleigh | Fish & Wildlife | Low                  |
| <a href="#">13707923DC</a>   | Dam  | BURLEIGH CO GMA #1        | Burleigh | Fish & Wildlife | Low                  |
| <a href="#">13807602AB</a>   | Dam  | WETZEL DAM; EWALD 3       | Burleigh | Fish & Wildlife | Low                  |
| <a href="#">13807711CA</a>   | Dam  | MACDONALD DAM             | Burleigh | Livestock       | Low                  |
| <a href="#">13807711CA</a>   | Dam  | MACDONALD DAM             | Burleigh | Livestock       | None                 |
| <a href="#">13807904AA</a>   | Dam  | YEGEN DAM                 | Burleigh | Irrigation      | Low                  |
| <a href="#">13808018DD</a>   | Dam  | TURNBOW DEVELOPMENT CORP  | Burleigh | Fish & Wildlife | Low                  |
| <a href="#">13907605BA</a>   | Dam  | BROWN DAM; ROY N 1        | Burleigh | Livestock       | Low                  |
| <a href="#">13907605CB</a>   | Dam  | BROWN DAM; ROY N 2        | Burleigh | Livestock       | Low                  |
| <a href="#">13907610C</a>    | Dam  | Funston Dam; Merle        | Burleigh | Livestock       | Low                  |
| <a href="#">13907635CA</a>   | Dam  | WETZEL DAM; EWALD 1       | Burleigh | Fish & Wildlife | Low                  |
| <a href="#">13907635CD</a>   | Dam  | WETZEL DAM; EWALD 2       | Burleigh | Fish & Wildlife | Low                  |

|                             |     |                                     |          |                 |             |
|-----------------------------|-----|-------------------------------------|----------|-----------------|-------------|
| <a href="#">13907715BD</a>  | Dam | Estey Dam; Michael                  | Burleigh | Fish & Wildlife | Low         |
| <a href="#">13907903CD</a>  | Dam | Esposito Dam; Mike 2                | Burleigh | Livestock       | Low         |
| <a href="#">13907910AC</a>  | Dam | Esposito Dam; Mike                  | Burleigh | Livestock       | Low         |
| <a href="#">13907925CB</a>  | Dam | HENDERSON DAM                       | Burleigh | Fish & Wildlife | Low         |
| <a href="#">13907927DC</a>  | Dam | MCDOWELL DAM                        | Burleigh | Recreation      | Significant |
| <a href="#">13908017AAA</a> | Dam | CLAIRMONT FAMILY TRS DAM 1          | Burleigh | Fish & Wildlife | Low         |
| <a href="#">13908017AAB</a> | Dam | CLAIRMONT FAMILY TRS DAM 2          | Burleigh | Fish & Wildlife | Low         |
| <a href="#">13908019DA</a>  | Dam | C-Family Trust (William Clairmont ) | Burleigh | Livestock       | Low         |
| <a href="#">13908020BB</a>  | Dam | C-FAMILY TRUST                      | Burleigh | Livestock       | Low         |
| <a href="#">13908032ABB</a> | Dam | JACKMAN COULEE DAM 1                | Burleigh | Flood Control   | Low         |
| <a href="#">13908032ABC</a> | Dam | JACKMAN COULEE DAM 2                | Burleigh | Flood Control   | High        |
| <a href="#">14007511BC</a>  | Dam | Dronen Dam; Tim                     | Burleigh | Livestock       | Low         |
| <a href="#">14007534ABA</a> | Dam | HARPOLE DAM; RICHARD                | Burleigh | Fish & Wildlife | Low         |
| <a href="#">14007605BC</a>  | Dam | RICE LAKE DAM                       | Burleigh | Recreation      | Low         |
| <a href="#">14007728CD</a>  | Dam | NORTHERN IMPROVEMENT CO.            | Burleigh | Waste Lagoon    | None        |
| <a href="#">14007829DD</a>  | Dam | MCCORMICK RANCH INC. DAM            | Burleigh | Livestock       | Low         |
| <a href="#">14007904BD</a>  | Dam | BORNER DAM; AL                      | Burleigh | Fish & Wildlife | Low         |
| <a href="#">14007906CB</a>  | Dam | JACOBS DAM; JUSTIN 1                | Burleigh | Irrigation      | Low         |
| <a href="#">14007922CC</a>  | Dam | WARFORD DAM; DR JOHN 1              | Burleigh | Fish & Wildlife | Low         |
| <a href="#">14007927B</a>   | Dam | WARFORD DAM; DR JOHN 2              | Burleigh | Fish & Wildlife | Low         |
| <a href="#">14007929BB</a>  | Dam | WARFORD DAM; JOHN                   | Burleigh | Fish & Wildlife | Low         |
| <a href="#">14007932BAC</a> | Dam | CLOOTEN DAM; CRAIG                  | Burleigh | Fish & Wildlife | Low         |
| <a href="#">14008026DB</a>  | Dam | SOLBERG DAM; JOHN                   | Burleigh | Livestock       | Low         |
| <a href="#">14008034ACB</a> | Dam | WILLIAMS DAM; ROGER                 | Burleigh | Livestock       | Low         |
| <a href="#">14008103BDA</a> | Dam | DAKOTA ADVENTIST ACADEMY            | Burleigh | Irrigation      | Low         |
| <a href="#">14008109DDA</a> | Dam | ANDAHL DAM; RONALD & PAUL           | Burleigh | Mining          | Low         |

|                             |     |                              |          |                 |     |
|-----------------------------|-----|------------------------------|----------|-----------------|-----|
| <a href="#">14107510AD</a>  | Dam | DECKERT DAM; DENNIS 2        | Burleigh | Livestock       | Low |
| <a href="#">14107510DD</a>  | Dam | DECKERT DAM; DENNIS 1        | Burleigh | Livestock       | Low |
| <a href="#">14107526DDD</a> | Dam | HEIDT DAM; EARL              | Burleigh | Livestock       | Low |
| <a href="#">14107602CB</a>  | Dam | THOMPSON & STUART DAM 1      | Burleigh | Fish & Wildlife | Low |
| <a href="#">14107604CA</a>  | Dam | NEIDEFFER FLOOD CONTROL DAM  | Burleigh | Flood Control   | Low |
| <a href="#">14108014AC</a>  | Dam | McCLINTOCK DAM; ZOE          | Burleigh | Livestock       | Low |
| <a href="#">14108032BB</a>  | Dam | KARCH DAM; HAROLD            | Burleigh | Livestock       | Low |
| <a href="#">14108101DC</a>  | Dam | Bopp Dam; Timothy            | Burleigh | Livestock       | Low |
| <a href="#">14108125AAA</a> | Dam | JONES DAM; LLOYD 1           | Burleigh | Fish & Wildlife | Low |
| <a href="#">14108125ADB</a> | Dam | JONES DAM; LLOYD 2           | Burleigh | Fish & Wildlife | Low |
| <a href="#">14207532BD</a>  | Dam | KOSKI DAM; ELMER 1           | Burleigh | Fish & Wildlife | Low |
| <a href="#">14207532CC</a>  | Dam | KOSKI DAM; ELMER 2           | Burleigh | Fish & Wildlife | Low |
| <a href="#">14207607DA</a>  | Dam | FOX DAM; JAMES               | Burleigh | Fish & Wildlife | Low |
| <a href="#">14207611AB</a>  | Dam | ND NO NAME 122               | Burleigh | Recreation      | Low |
| <a href="#">14207629AB</a>  | Dam | CORNATZER DAM; DR. WILLIAM 3 | Burleigh | Fish & Wildlife | Low |
| <a href="#">14207629AC</a>  | Dam | CORNATZER DAM; DR. WILLIAM 4 | Burleigh | Fish & Wildlife | Low |
| <a href="#">14207629BA</a>  | Dam | CORNATZER DAM; DR. WILLIAM 1 | Burleigh | Fish & Wildlife | Low |
| <a href="#">14207629BDA</a> | Dam | CORNATZER DAM; DR. WILLIAM 2 | Burleigh | Fish & Wildlife | Low |
| <a href="#">14207629BDC</a> | Dam | CORNATZER DAM; DR. WILLIAM 5 | Burleigh | Fish & Wildlife | Low |
| <a href="#">14207806CA</a>  | Dam | STROM DAM; VICTOR            | Burleigh | Livestock       | Low |
| <a href="#">14208011DCA</a> | Dam | ADAMS DAM; WARREN            | Burleigh | Fish & Wildlife | Low |
| <a href="#">14307521DB</a>  | Dam | RATH WPA WETLAND             | Burleigh |                 | Low |
| <a href="#">14307604BB</a>  | Dam | SMITH DAM; FRED 2            | Burleigh | Fish & Wildlife | Low |
| <a href="#">14307604BC</a>  | Dam | SMITH DAM; FRED 1            | Burleigh | Fish & Wildlife | Low |
| <a href="#">14307634DA</a>  | Dam | NEMETZ DAM; JEAN L 3         | Burleigh | Fish & Wildlife | Low |

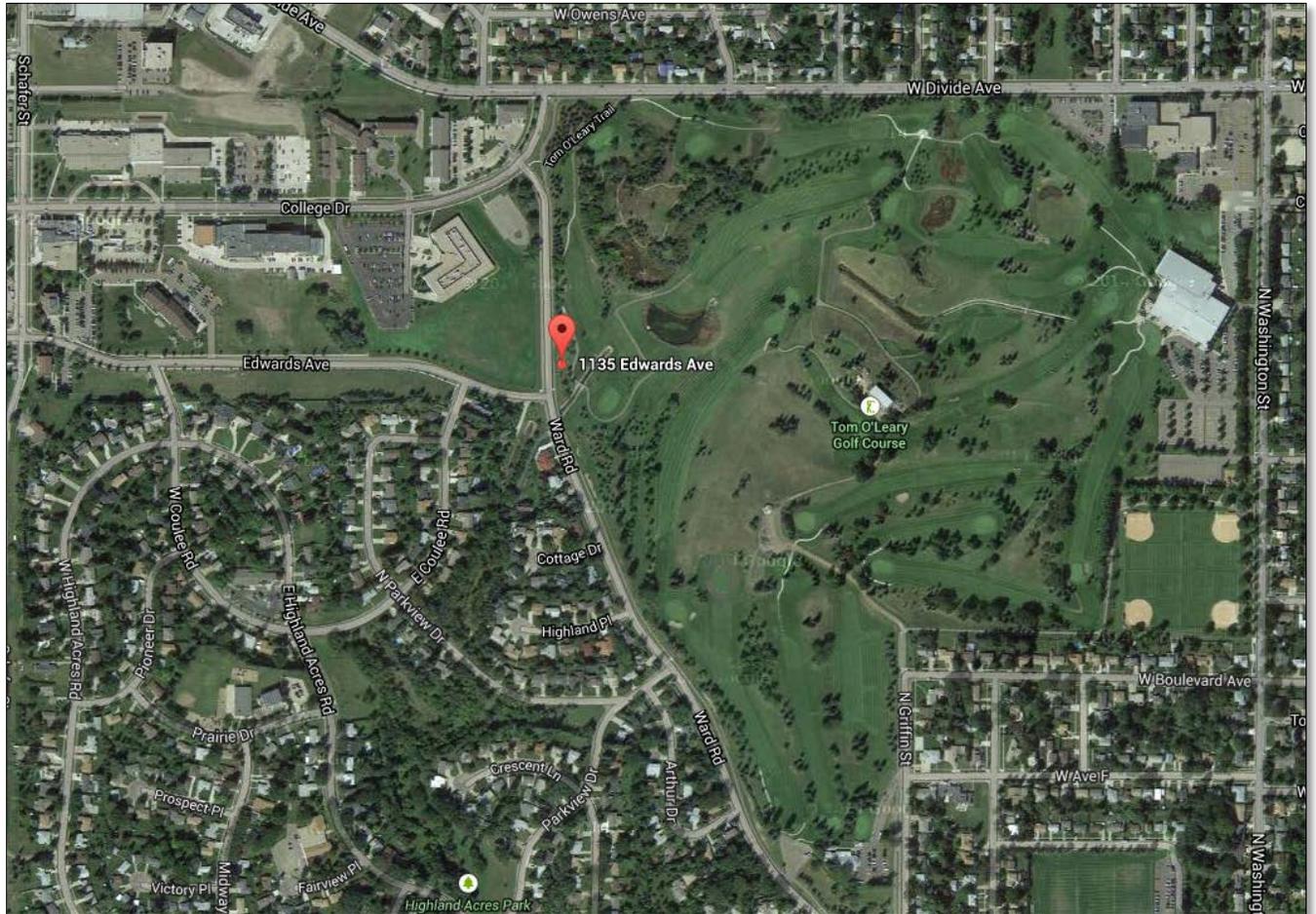
|                             |     |                      |          |                 |     |
|-----------------------------|-----|----------------------|----------|-----------------|-----|
| <a href="#">14307721BC</a>  | Dam | CANFIELD LAKE WPA    | Burleigh | Fish & Wildlife | Low |
| <a href="#">14307806CB</a>  | Dam | ERICKSON DAM; JOHN 2 | Burleigh | Livestock       | Low |
| <a href="#">14307902AB</a>  | Dam | Adamyk Dam; Ted      | Burleigh | Livestock       | Low |
| <a href="#">14307929AA</a>  | Dam | DESCIAK DAM; STEVE   | Burleigh | Fish & Wildlife | Low |
| <a href="#">14407625DB</a>  | Dam | SMITH DAM; FRED 4    | Burleigh |                 | Low |
| <a href="#">14407625DD</a>  | Dam | SMITH DAM; FRED 3    | Burleigh | Fish & Wildlife | Low |
| <a href="#">14407633AC</a>  | Dam | NEMETZ DAM; JEAN L 1 | Burleigh | Fish & Wildlife | Low |
| <a href="#">14407633DB</a>  | Dam | NEMETZ DAM; JEAN L 2 | Burleigh | Fish & Wildlife | Low |
| <a href="#">14407821DA</a>  | Dam | Fisher Dam; Wilbert  | Burleigh | Livestock       | Low |
| <a href="#">14407831DDA</a> | Dam | ERICKSON DAM; JOHN 1 | Burleigh | Fish & Wildlife | Low |
| <a href="#">14407836DD</a>  | Dam | LEMKE DAM; ROGER     | Burleigh | Fish & Wildlife | Low |
| <a href="#">14407919BC</a>  | Dam | BERG DAM; ELLA 2     | Burleigh | Fish & Wildlife | Low |
| <a href="#">14407919CDA</a> | Dam | BERG DAM; ELLA 1     | Burleigh | Fish & Wildlife | Low |
| <a href="#">14407923CD</a>  | Dam | LIFFRIG DAM; DUANE 2 | Burleigh | Livestock       | Low |
| <a href="#">14407934ADB</a> | Dam | DUMA DAM; DAVID      | Burleigh | Fish & Wildlife | Low |
| <a href="#">14407935AB</a>  | Dam | LIFFRIG DAM; DAVID 3 | Burleigh | Livestock       | Low |
| <a href="#">14407936AA</a>  | Dam | LIFFRIG DAM; DAVID 5 | Burleigh | Fish & Wildlife | Low |
| <a href="#">14407936AB</a>  | Dam | LIFFRIG DAM; DAVID 6 | Burleigh | Livestock       | Low |
| <a href="#">14407936AD</a>  | Dam | LIFFRIG DAM; DAVID 4 | Burleigh | Livestock       | Low |

McDowell Dam is recreation area located five miles east of Bismarck (1951 93<sup>rd</sup> Street NE). Available activities include swimming, boating, fishing and paddle boating. Failure of the rural dam classified as “significant” would most likely result in environmental and home loss (approximately 100) due to location.



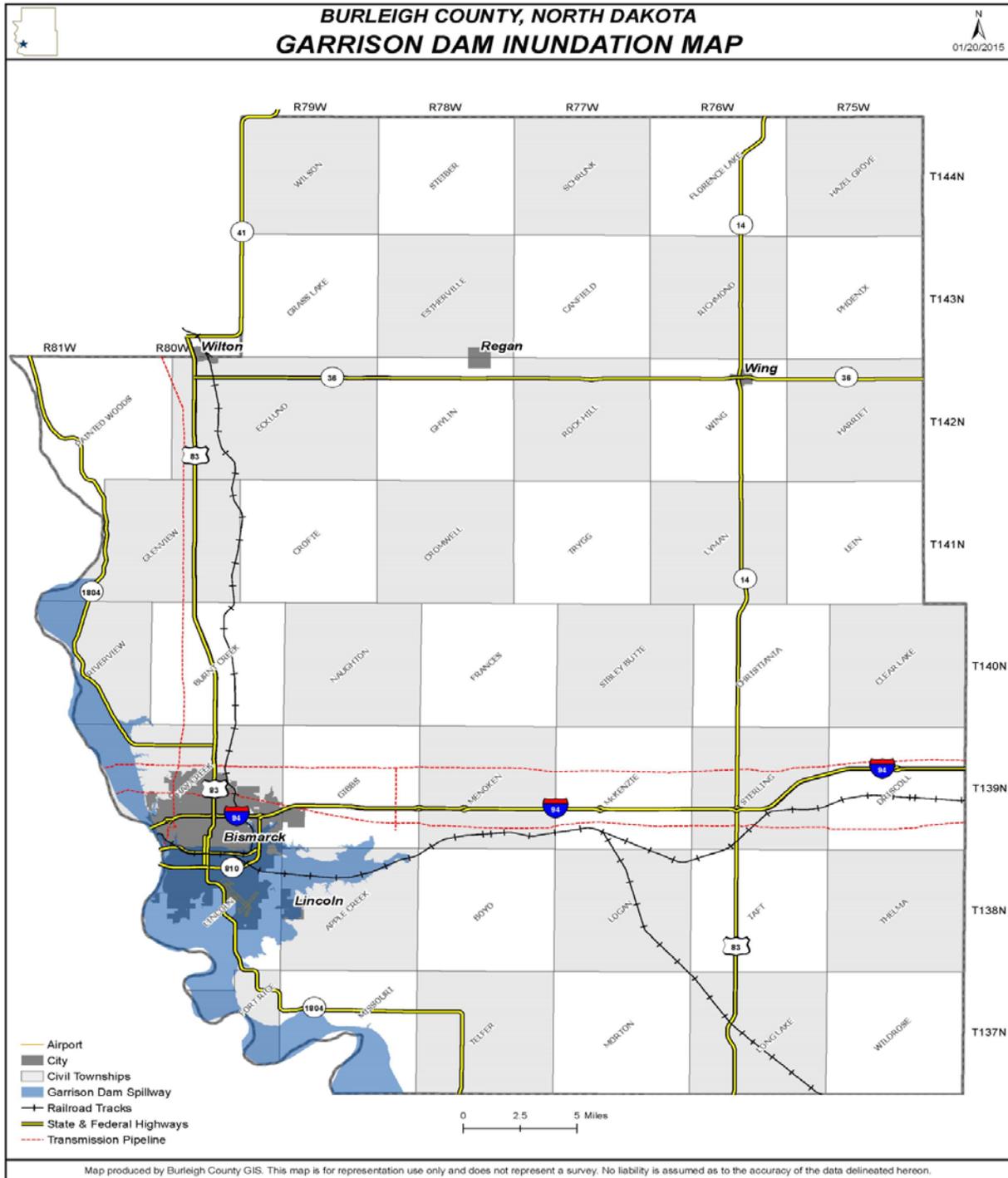
Source: ND Game and Fish [website](#)

The Jackman Coulee2 Dam is flood control structure located within the City of Bismarck (1135 Edwards Avenue). The structure is on the western edge of the “Tom O’Leary Golf Course”. Failure of the urban dam classified as “high” would most likely result in environmental and home damages (200+) and/or loss due to location.



Source: Google Maps [Website](#)

Lake Sakakawea was formed by the construction of the Garrison Dam in 1953. Lake Sakakawea covers 368,000 surface acres, can store a maximum of 24.5 million acre-feet, and has 1,600 miles of shoreline is six counties. Total failure of the dam could affect approximately 20,583 people and 6,318 properties with an assessed value of \$1,587,117,362 utilizing the Burleigh County Damage Estimator.



Source: Burleigh County GIS

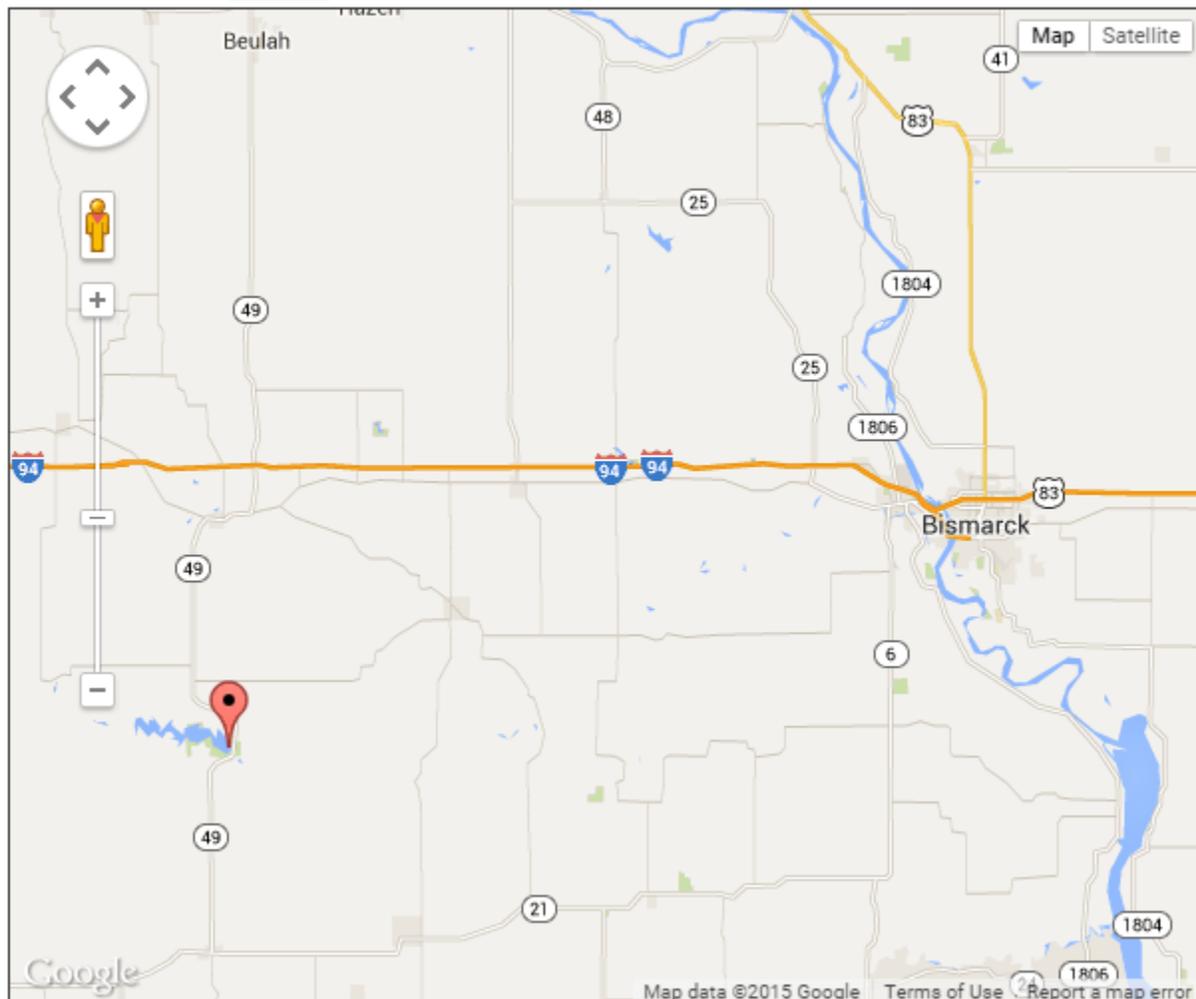
Heart Butte Dam and Reservoir, or Lake Tschida as it was renamed in 1958, is located in Grant County. The reservoir is approximately 70 miles southwest of Bismarck (Burleigh County).

(Source: [Heart Butte Reservoir Resource Management Plan, December 2006](#))

The dam is on the Heart River in Grant County. The spillway is a morning-glory type, leading to a 14-foot tube with a capacity of 5,700 cubic feet per second. The outlet works consist of a gated tube with a capacity of 700 cubic feet per second. The reservoir has a total capacity of 223,646 acre-feet, of which 147,861 acre-feet are for flood control storage and 206,365 acre-feet are for surcharge. The lake has a surface area of 3,397 acres. (Source: U.S. Department of Interior, Bureau of Reclamation [website](#))

A Heart Butte Dam hydrologically induced static failure scenario could affect approximately 19,022 people and 5,809 properties with assessed value of \$1,448,807,962 utilizing the Burleigh County Damage Estimator.

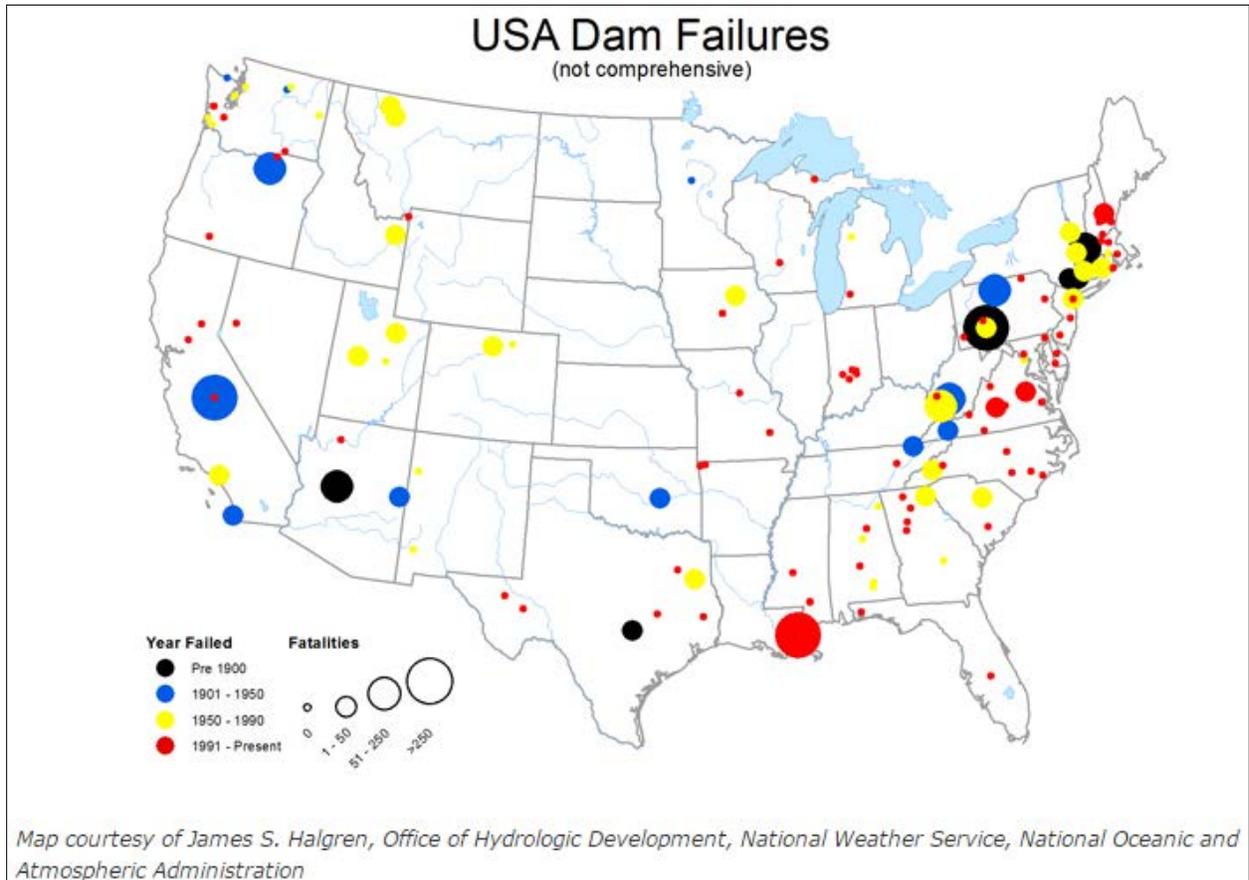
The red marker represents the selected facility. Click on the marker to get more details and options about that facility. You can also see this facility in [Google Maps](#), [Yahoo Maps](#) or [Terraserver](#) for driving directions, etc... You can also see an [EPA map](#) of this area.



Last updated: February 2, 2007

**History** – There has been no history of a dam failure within the County.

The Association of State Dam Safety Officials presents a map on their [website](#) compiled of a list of dam and levee failures.



## Drought

|                         |   |
|-------------------------|---|
| <b>Frequency</b>        | Likely (10-100% probability in the next year, or at least 1 chance in next 100 years) |
| <b>Severity</b>         | Limited (10-25% of jurisdiction affected)   |
| <b>Risk Class</b>       | C   |
| <b>Seasonal Pattern</b> | Summer  |
| <b>Duration</b>         | Weeks/Months  |
| <b>Speed of Onset</b>   | Slow onset  |

### Description

Drought is a condition of climatic dryness which is severe enough to reduce soil moisture and water below the minimum necessary for sustaining plant, animal, and human life systems. 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. Although agriculture production is the most obvious recipient of drought losses, this hazard will also attack urban areas by impacting on domestic and industrial water supplies.

**Identified Impacts**

It is a fact that precipitation deficits as little as four to six inches can cause severe drought conditions.

Drought severity regarding our agriculture procedures depends on 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.

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. Because of reduction in flow, the chemical quality of river and lake water will change, and the sediment transport regimes of streams will be altered.

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

There are a wide range of possible consequences that have and can occur again in regard to drought.

- Business Interruptions
- Increased Fire Potential
- Livestock Injury/Death
- Loss of Economy
- Loss of Potable Water
- Property Damage

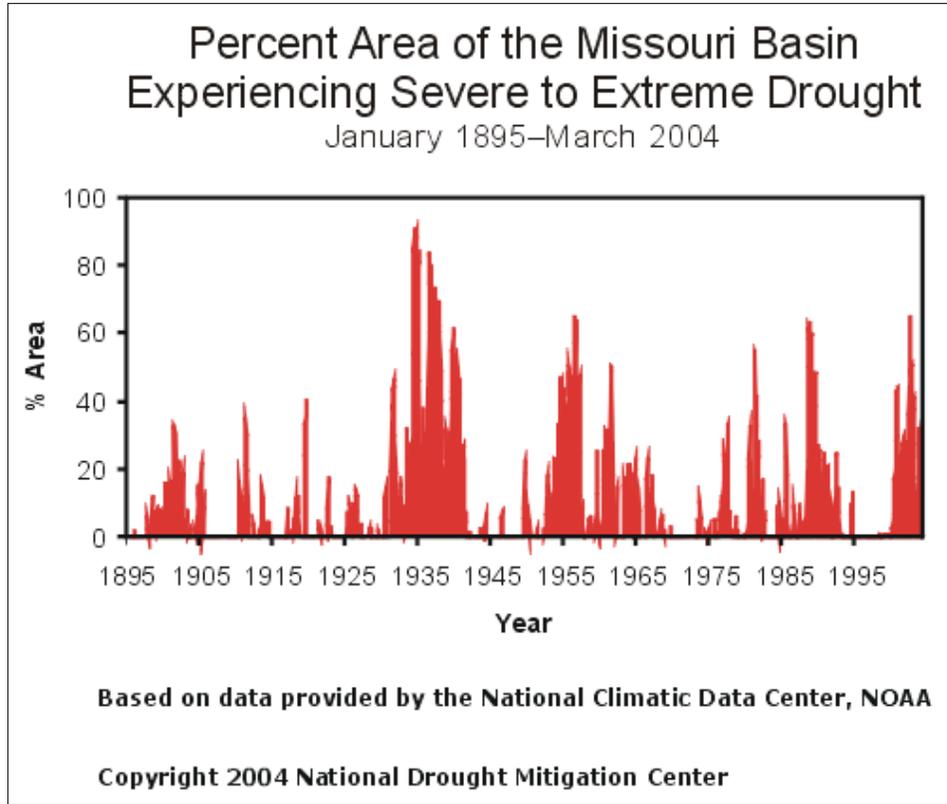
## History

June 1, 1988 – Excessive heat reported in Burleigh County with crop damages estimated over \$20 million.

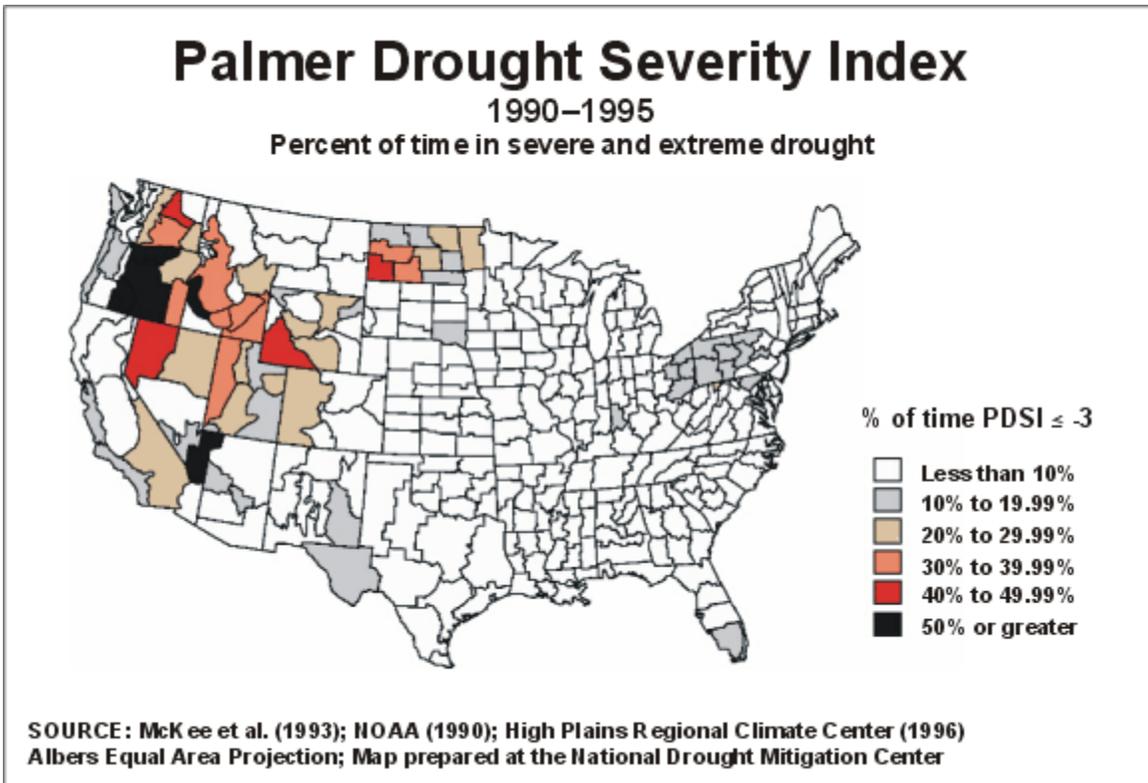
### Excessive Heat

| <u>Location</u>                 | <u>County/Zone</u> | <u>St.</u> | <u>Date</u> | <u>Time</u> | <u>T.Z.</u> | <u>Type</u>    | <u>Mag</u> | <u>Dth</u> | <u>Inj</u> | <u>PrD</u> | <u>CrD</u> |
|---------------------------------|--------------------|------------|-------------|-------------|-------------|----------------|------------|------------|------------|------------|------------|
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 07/16/2011  | 11:00       | CST-6       | Excessive Heat |            | 0          | 0          | 0.00K      | 0.00K      |
| <b>Totals:</b>                  |                    |            |             |             |             |                |            | 0          | 0          | 0.00K      | 0.00K      |

Source: National Oceanic and Atmospheric Administration National Climatic Data Center [Website](#) (01/1950 to 08/2014)



Source: National Drought Mitigation Center [website](#)



Source: National Drought Mitigation Center [website](#)

## Flood

|                         |  |
|-------------------------|--|
| <b>Frequency</b>        | Likely (10-100% probability in the next year, or at least 1 chance in next 10 years) |
| <b>Severity</b>         | Limited (10-25% of jurisdiction affected)  |
| <b>Risk Class</b>       | C  |
| <b>Seasonal Pattern</b> | Spring and Summer  |
| <b>Duration</b>         | 1 to 10 days   |
| <b>Speed of Onset</b>   | More than 24 hours warning   |
| <b>Location</b>         | Countywide   |

### Description

Flooding is defined as an overflow of water on land not normally covered by water.

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 a 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 blockage along 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.

The spring flood danger period generally 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 haw add to the seriousness of the spring flooding situation.

### Floodplain Management in North Dakota

Flood control development had its beginning with the Flood Control Act of 1936. This Act provided a basic plan and an authorized program for the control of water resources. In the early 1940's the North Dakota State 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 which may reduce susceptibility to flooding, 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: New 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 which directs the State Engineer to aid local governments to reduce flood damages through sound floodplain management. As a start, the state legislature provided the State Engineer with an appropriation to be used in assisting communities to obtain base flood (100-year) elevation data. With appropriate planning, we will see continued reduction in flood damage susceptibility across the state, but it will likely take many years to achieve the established goals.

### Missouri River Basin

The Missouri River Basin, comprised of seven major sub-basins, is the largest in the state, draining approximately 48 percent of the state's total area. The basin coincides roughly with the portion of the state having a semiarid climate. The tributaries on the south and west sides of the Missouri River typically occupy small but sharply defined valleys. This area is well drained with very few natural lakes. Numerous flat-topped, steep-sided buttes and hills characterize the topography. The most prominent are located in the Badlands along the Little Missouri River. Numerous small lakes and wetlands characterize the area east of the Missouri River. Annual mean precipitation in the basin ranges from 13 inches in the northwest to 17 inches in the east.

Lake Sakakawea was formed by the construction of the Garrison Dam in 1953. Lake Sakakawea covers 368,000 surface acres, can store a maximum of 24.5 million acre-feet, and has 1,600 miles of shoreline in six counties. Lake Oahe Dam in South Dakota covers 40,000 to 80,000 surface acres in North Dakota, with an average storage of 989,605 acre-feet and a maximum storage of 1,626,588 acre-feet, depending upon the management elevation of the lake. The two projects required a total of 550,000 acres of land in North Dakota, including shoreline acres needed for flood conditions.

### Hydrologic Analyses

Hydrologic analyses were completed on the following areas as part of the Flood Insurance Study, Burleigh County, North Dakota, and Incorporated Areas, Revised: August 4, 2014 (available from the [FEMA Map Service Center](#), Product 38015CV000B):

- Apple Creek
- Burnt Creek
- Grande Prairie Watersheds (Remmick, Grande Prairie Estates, Wachter)
- Hay Creek and North Valley Tributary
- Jackman Coulee
- Landfill Watershed
- Missouri River
- North 4th Street Watershed
- North Washington Street Watershed

**Identified Impacts**

Short-duration, high-intensity spring rainstorms, in combination with snowmelt and ice jams, are the principal cause of flooding on the Missouri River and Burnt and Apple Creeks in Burleigh County. High-intensity summer rainstorms also cause minor flooding on Burnt and Apple Creeks.

Floodplains consist primarily of cropland and open rangeland with some brushy and wooded areas along the Missouri River bottoms. Some roads and residential and commercial facilities are located in the Missouri River floodplains, particularly in the area south of the City of Bismarck.

(Source: Flood Insurance Study, Burleigh County, North Dakota, and Incorporated Areas, Revised: August 4, 2014 available from the [FEMA Map Service Center](#), Product 38015CV000B)

- Blocked Roads
- Building Collapse
- Business Interruptions
- Delayed Emergency Response
- Downed Power Lines
- Downed Trees
- Evacuation (Localized)
- Flooding (Street)
- Flooding (Structure)
- HAZMAT Release
- Increased Fire Potential
- Increased Public Safety Runs
- Livestock Injury/Death
- Loss of Economy
- Loss/Overcrowded Medical Facilities
- Loss of Potable Water
- Loss of Power
- Mass Casualties
- Property Damage
- School Closure
- Sewer Backup

## History

## Flash Flood

| <u>Location</u>                      | <u>County/Zone</u> | <u>St.</u> | <u>Date</u> | <u>Time</u> | <u>T.Z.</u> | <u>Type</u> | <u>Mag</u> | <u>Dth</u> | <u>Inj</u> | <u>PrD</u> | <u>CrD</u> |
|--------------------------------------|--------------------|------------|-------------|-------------|-------------|-------------|------------|------------|------------|------------|------------|
| <a href="#">BURLEIGH CO.</a>         | BURLEIGH CO.       | ND         | 08/16/2014  | 13:30       | CST-6       | Flash Flood |            | 0          | 0          | 20.00K     | 50.00K     |
| <a href="#">BURLEIGH CO.</a>         | BURLEIGH CO.       | ND         | 08/16/2014  | 10:40       | CST-6       | Flash Flood |            | 0          | 0          | 30.00K     | 25.00K     |
| <a href="#">BISMARCK</a>             | BURLEIGH CO.       | ND         | 06/22/2013  | 20:41       | CST-6       | Flash Flood |            | 0          | 0          | 90.00K     | 0.00K      |
| <a href="#">BALDWIN</a>              | BURLEIGH CO.       | ND         | 08/15/2011  | 20:20       | CST-6       | Flash Flood |            | 0          | 0          | 100.00K    | 0.00K      |
| <a href="#">BISMARCK</a>             | BURLEIGH CO.       | ND         | 08/01/2011  | 00:00       | CST-6       | Flash Flood |            | 0          | 0          | 5.00K      | 0.00K      |
| <a href="#">(BIS)BISMARCK MUNI A</a> | BURLEIGH CO.       | ND         | 07/31/2011  | 22:33       | CST-6       | Flash Flood |            | 0          | 0          | 5.00K      | 0.00K      |
| <a href="#">BISMARCK</a>             | BURLEIGH CO.       | ND         | 07/30/2011  | 02:45       | CST-6       | Flash Flood |            | 0          | 0          | 50.00K     | 0.00K      |
| <a href="#">(BIS)BISMARCK MUNI A</a> | BURLEIGH CO.       | ND         | 06/26/2009  | 20:00       | CST-6       | Flash Flood |            | 0          | 0          | 25.00K     | 0.00K      |
| <a href="#">WILTON</a>               | BURLEIGH CO.       | ND         | 06/15/2009  | 19:00       | CST-6       | Flash Flood |            | 0          | 0          | 1.000M     | 0.00K      |
| <a href="#">BISMARCK</a>             | BURLEIGH CO.       | ND         | 03/25/2009  | 08:20       | CST-6       | Flash Flood |            | 0          | 0          | 20.00K     | 0.00K      |
| <a href="#">DRISCOLL</a>             | BURLEIGH CO.       | ND         | 06/12/2007  | 16:40       | CST-6       | Flash Flood |            | 0          | 0          | 250.00K    | 50.00K     |
| <a href="#">MOFFIT</a>               | BURLEIGH CO.       | ND         | 08/24/2006  | 14:50       | CST         | Flash Flood |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BISMARCK</a>             | BURLEIGH CO.       | ND         | 08/23/2004  | 19:55       | CST         | Flash Flood |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BISMARCK</a>             | BURLEIGH CO.       | ND         | 06/09/2001  | 17:15       | CST         | Flash Flood |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BISMARCK ARPT</a>        | BURLEIGH CO.       | ND         | 08/21/1998  | 22:45       | CST         | Flash Flood |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BISMARCK</a>             | BURLEIGH CO.       | ND         | 08/21/1998  | 22:45       | CST         | Flash Flood |            | 0          | 0          | 0.00K      | 0.00K      |
| <b>Totals:</b>                       |                    |            |             |             |             |             |            | 0          | 0          | 1.595M     | 125.00K    |

Source: National Oceanic and Atmospheric Administration National Climatic Data Center [Website](#) (01/1950 to 08/2014)

### Flood

| <u>Location</u>                 | <u>County/Zone</u> | <u>St.</u> | <u>Date</u> | <u>Time</u> | <u>T.Z.</u> | <u>Type</u> | <u>Mag</u> | <u>Dth</u> | <u>Inj</u> | <u>PrD</u> | <u>CrD</u> |
|---------------------------------|--------------------|------------|-------------|-------------|-------------|-------------|------------|------------|------------|------------|------------|
| <a href="#">WILTON</a>          | BURLEIGH CO.       | ND         | 08/01/2011  | 00:00       | CST-6       | Flood       |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">WILTON</a>          | BURLEIGH CO.       | ND         | 07/01/2011  | 00:00       | CST-6       | Flood       |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">WILTON</a>          | BURLEIGH CO.       | ND         | 04/01/2009  | 00:00       | CST-6       | Flood       |            | 0          | 0          | 558.00K    | 0.00K      |
| <a href="#">WILTON</a>          | BURLEIGH CO.       | ND         | 03/06/2009  | 00:00       | CST-6       | Flood       |            | 0          | 0          | 530.00K    | 0.00K      |
| <a href="#">MENOKEN</a>         | BURLEIGH CO.       | ND         | 06/07/2007  | 00:00       | CST-6       | Flood       |            | 0          | 0          | 50.00K     | 100.00K    |
| <a href="#">BISMARCK</a>        | BURLEIGH CO.       | ND         | 08/31/2002  | 19:05       | CST         | Flood       |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BISMARCK</a>        | BURLEIGH CO.       | ND         | 07/27/2001  | 02:00       | CST         | Flood       |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BISMARCK</a>        | BURLEIGH CO.       | ND         | 07/26/2001  | 22:00       | CST         | Flood       |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 02/26/2000  | 11:58       | CST         | Flood       |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BISMARCK ARPT</a>   | BURLEIGH CO.       | ND         | 08/12/1999  | 00:00       | CST         | Flood       |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 03/20/1999  | 09:00       | CST         | Flood       |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 03/21/1997  | 08:00       | CST         | Flood       |            | 0          | 0          | 150.00K    | 0.00K      |
| <b>Totals:</b>                  |                    |            |             |             |             |             |            | 0          | 0          | 1.288M     | 100.00K    |

Source: National Oceanic and Atmospheric Administration National Climatic Data Center [Website](#) (01/1950 to 08/2014)

## Heavy Rain

| <u>Location</u>                     | <u>County/Zone</u> | <u>St.</u> | <u>Date</u> | <u>Time</u> | <u>T.Z.</u> | <u>Type</u> | <u>Mag</u> | <u>Dth</u> | <u>Inj</u> | <u>PrD</u> | <u>CrD</u> |
|-------------------------------------|--------------------|------------|-------------|-------------|-------------|-------------|------------|------------|------------|------------|------------|
| <a href="#">BISMARCK</a>            | BURLEIGH CO.       | ND         | 06/22/2013  | 20:37       | CST-6       | Heavy Rain  |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">(BIS)BISMARCK MUNIA</a> | BURLEIGH CO.       | ND         | 06/22/2013  | 20:15       | CST-6       | Heavy Rain  |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BISMARCK</a>            | BURLEIGH CO.       | ND         | 08/15/2011  | 19:45       | CST-6       | Heavy Rain  |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">DRISCOLL</a>            | BURLEIGH CO.       | ND         | 07/29/2011  | 22:00       | CST-6       | Heavy Rain  |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BISMARCK</a>            | BURLEIGH CO.       | ND         | 06/22/2010  | 01:35       | CST-6       | Heavy Rain  |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">(BIS)BISMARCK MUNIA</a> | BURLEIGH CO.       | ND         | 06/26/2009  | 21:22       | CST-6       | Heavy Rain  |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BISMARCK</a>            | BURLEIGH CO.       | ND         | 06/16/2009  | 02:30       | CST-6       | Heavy Rain  |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">FT LINCOLN</a>          | BURLEIGH CO.       | ND         | 06/15/2009  | 23:15       | CST-6       | Heavy Rain  |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BISMARCK</a>            | BURLEIGH CO.       | ND         | 06/15/2009  | 22:15       | CST-6       | Heavy Rain  |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">(BIS)BISMARCK MUNIA</a> | BURLEIGH CO.       | ND         | 06/15/2009  | 22:04       | CST-6       | Heavy Rain  |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BISMARCK</a>            | BURLEIGH CO.       | ND         | 06/15/2009  | 21:27       | CST-6       | Heavy Rain  |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BISMARCK</a>            | BURLEIGH CO.       | ND         | 07/17/1996  | 16:30       | CST         | Heavy Rain  | 100        | 1          | 0          | 0.00K      | 0.00K      |
| <b>Totals:</b>                      |                    |            |             |             |             |             |            | 1          | 0          | 0.00K      | 0.00K      |

Source: National Oceanic and Atmospheric Administration National Climatic Data Center [Website](#) (01/1950 to 08/2014)

Some of the more significant events include:

**2011** - Since the construction of Garrison Dam, the 2011 flood event is the flood of record with a peak mean daily discharge of 154,000. This event occurred as a result of high mountain snow pack and a very significant and widely distributed system that brought extensive rain throughout eastern Montana. Prior to the 2011 event, the maximum peak discharge that has occurred since 1953 on the Missouri River was 68,900 cubic feet per second (cfs). This occurred on July 13, 1975. Prior to the 2011 event, the highest record of flooding at the Bismarck stream gage since the completion of Garrison Dam was 16.11 feet (1634.39 NGVD 29), which occurred in March of 2009, because of ice conditions and ice jams.

**June 26, 2009** - One to three inches of rain fell over the Bismarck area in 45 minutes. The heaviest rainfall occurred across northern sections of the city. This resulted in widespread street flooding and overturned manhole covers. A few homes suffered water damage to basements. Property damage estimated at \$25K.

**February 25, 2009** - An ice jam on the Missouri River at Bismarck, and recent melting snow, caused a drainage canal to back up and overflow into south Bismarck. This occurred in the vicinity of University Drive and Wachter Avenue, and for several blocks around there. Damage was mostly confined to a mobile home park, which was lower in elevation than the surrounding terrain. The homes were elevated within the park and so damage was minimal. Bismarck city crews took action that resulted in the flood waters receding. Property damage estimated at \$20K.

**June 12, 2007** - Very heavy rain of 2.50 inches fell in 30 minutes time 7 miles south of Driscoll. A total of 4.50 inches of rain was measured 2 miles northeast of Driscoll. Water was reportedly standing everywhere and water covered roads including in the city of Driscoll. Several roads were washed out. Water was up to 4 inches deep in some homes basements in Driscoll. In the early afternoon of Tuesday June 12th, Tornado Watch 389 was issued in anticipation of severe thunderstorms developing during the afternoon hours. Several severe thunderstorm and tornado warnings were issued. One report of a severe thunderstorm wind gust and two confirmed tornado reports were received during the mid-afternoon hours. In addition, very heavy rain fell over large portions of central North Dakota, prompting several flash flood warnings during the late afternoon and early evening hours. Began 2 Miles North East of Driscoll and ended 7 Miles South West of Driscoll. Property damage estimated at \$250K, crop damage estimated at \$50K.

**June 7, 2007** - Several county roads were closed due to water over them. Low lying areas north of Menoken were flooded with water standing in fields. Thunderstorms followed by showers and then areas of steady rain on June 6 and 7 resulted in flooding in parts of southern North Dakota. Five to six (5 to 6) inches of rain was common over the two day period, 10 Miles North of Menoken. Property damage estimated at \$50K, crop damage estimated at \$100K.

**August 23, 2004** - Streets and underpasses flooded causing several major arteries to be closed. Water flowed across yards and into several basements of homes.

**July 27, 2001** - Rainfall of 3 to 4 inches over Bismarck caused flooding of streets and underpasses. Many back roads near the Missouri River were water covered at times and a few washed out. Two mudslides on River Road covered the northbound lanes.

**July 26, 2001** - Around 2 inches of rain fell in a very short time causing street flooding and pooling of water in Bismarck.

**June 9, 2001** - Widespread street flooding throughout the City of Bismarck with a foot or more of water covered the roads. Travel not advised. Up to 12 feet of water accumulated in the railroad underpasses in town.

**February 26, 2000** – Rapid snowmelt and heavy rain resulted in extensive runoff throughout Burleigh County. Unseasonably warm temperatures, as well as frozen grounds and ice and snow plugged culverts, also factored into the extensive runoff. Fifteen roadways were overtopped by runoff resulting in closure of these roads. Apple Creek near Menoken rose 10 feet from February 25<sup>th</sup> through the 27<sup>th</sup> weekend, cresting 16.6 feet. The flood stage is 15 feet. The flood warning remained in effect until March 1<sup>st</sup>, 2000 when levels fell below flood stage.

**August 12, 1999** – Periods of heavy rainfall ranging from 4 to 7 inches saturated much of Morton and Burleigh counties. Hardest impact was felt in the cities of Bismarck and Mandan. Two hundred twenty one (221) homes and businesses received water damage. Twelve (12) road sites were damaged and a significant mudslide closed portions of Highway 1804 in north Bismarck.

**March 20, 1999** – Flooding along Apple Creek near the city of Menoken in Burleigh County due to snowmelt and ice jams resulted in washed out roads and flooded fields. Many roads near the river were closed and barricaded. The flood stage on Apple Creek is 15 feet. The river crested at 16.2 feet on the evening of the 24<sup>th</sup>.

**Sources:**

- National Oceanic and Atmospheric Administration National Climatic Data Center [Website](#) (01/1950 to 08/2014)
- Flood Insurance Study, Burleigh County, North Dakota, and Incorporated Areas, Revised: August 4, 2014 available from the [FEMA Map Service Center](#), Product 38015CV000B

A number of Special Flood Hazard Areas (SFHA) are located within the County. Special Flood Hazard Areas (identified on our maps as 'A' or 'AE' zones) are defined as the area that will be inundated by the flood event having a 1% chance of being equaled or exceeded in any given year. Portions of unincorporated Burleigh County, City of Bismarck, City of Lincoln, and the City of Wing include SFHAs. The City of Wilton has no SFHAs.

As a means of providing protection from large monetary losses, the County encourages property owners to purchase flood insurance through the National Flood Insurance Program (NFIP). Properties that have sustained two or more losses of \$1000 or more in a 10-year period since 1978 are considered to be repetitive loss properties.

### Policy and Claims Report

| CID    | Community Name    | Total Premium | V-Zone | A-Zone | No. Policies | Total Coverage | Total Claims Since 1978 | Total Paid Since 1978 |
|--------|-------------------|---------------|--------|--------|--------------|----------------|-------------------------|-----------------------|
| 380149 | Bismarck, City of | \$499,515     | 0      | 273    | 741          | \$202,235,600  | 410                     | \$6,893,228           |
| 380017 | Burleigh County   | \$229,784     | 0      | 157    | 297          | \$79,866,600   | 265                     | \$8,289,985           |
|        | County Total:     | \$729,299     | 0      | 430    | 1,038        | \$286,102,200  | 675                     | \$15,183,213          |

Source: Jeff Klein, State NFIP Coordinator

## Community Repetitive Loss

COMMUNITY : BISMARCK, CITY OF

| Community   | State                | Regional       | National     |         |                |
|---|----------------------|----------------|--------------|---------|----------------|
|   | AE, A1-30, AO, AH, A |                | VE, V1-30, V | B, C, X | TOTAL          |
| RL Buildings (Total)  |                      | 26             | 0            | 0       | 26             |
| RL Buildings (Insured)  |                      | 25             | 0            | 0       | 25             |
| RL Losses (Total)   |                      | 53             | 0            | 0       | 53             |
| RL Losses (Insured)   |                      | 51             | 0            |         | 51             |
| RL Payments (Total)   |                      | \$2,348,596.70 | \$0.00       | \$0.00  | \$2,348,596.70 |
| Building  |                      | \$2,189,274.19 | \$0.00       | \$0.00  | \$2,189,274.19 |
| Contents  |                      | \$159,322.51   | \$0.00       | \$0.00  | \$159,322.51   |
| RL Payments (Insured)   |                      | \$2,299,312.61 | \$0.00       | \$0.00  | \$2,299,312.61 |
| Building  |                      | \$2,140,122.04 | \$0.00       | \$0.00  | \$2,140,122.04 |
| Contents  |                      | \$159,190.57   | \$0.00       | \$0.00  | \$159,190.57   |
| <b>Post - FIRM SFHA RL Buildings:</b>                         |                      |                | 13           |         |                |
| <b>Insured Buildings with 4 or More Losses:</b>               |                      |                | 0            |         |                |
| <b>Insured Buildings with 2-3 Losses &gt; Building Value:</b> |                      |                | 0            |         |                |
| <b>Total Target RL Buildings:</b>                             |                      |                | 0            |         |                |

Source: Jeff Klein, State NFIP Coordinator

| <b>Community Repetitive Loss</b>                              |       |                         |              |         |              |
|---|-------|-------------------------|--------------|---------|--------------|
| <b>COMMUNITY : BURLEIGH COUNTY *</b>                          |       |                         |              |         |              |
| Community   | State | Regional                | National     |         |              |
|   |       | AE, A1-30, AO,<br>AH, A | VE, V1-30, V | B, C, X | TOTAL        |
| RL Buildings (Total)  |       | 3                       | 0            | 0       | 5            |
| RL Buildings (Insured)  |       | 3                       | 0            | 0       | 4            |
| RL Losses (Total)   |       | 6                       | 0            | 0       | 10           |
| RL Losses (Insured)   |       | 6                       | 0            |         | 8            |
| RL Payments (Total)   |       | \$112,004.16            | \$0.00       | \$0.00  | \$130,468.46 |
| Building  |       | \$109,492.17            | \$0.00       | \$0.00  | \$122,171.29 |
| Contents  |       | \$2,511.99              | \$0.00       | \$0.00  | \$8,297.17   |
| RL Payments (Insured)   |       | \$112,004.16            | \$0.00       | \$0.00  | \$127,246.97 |
| Building  |       | \$109,492.17            | \$0.00       | \$0.00  | \$119,734.98 |
| Contents  |       | \$2,511.99              | \$0.00       | \$0.00  | \$7,511.99   |
| <b>Post - FIRM SFHA RL Buildings:</b>                         |       |                         | 2            |         |              |
| <b>Insured Buildings with 4 or More Losses:</b>               |       |                         | 0            |         |              |
| <b>Insured Buildings with 2-3 Losses &gt; Building Value:</b> |       |                         | 0            |         |              |
| <b>Total Target RL Buildings:</b>                             |       |                         | 0            |         |              |

Source: Jeff Klein, State NFIP Coordinator

After the 2011 flood event, Burleigh County pursued acquisitions through FEMA and did not meet the required Benefit Cost Analysis ns to proceed. Numerous residents did not want to participate which would have resulted in a “patchwork” process.

Additionally, vulnerability is further addressed utilizing the Burleigh County Damage Estimator (discussed previously on page 38) to determine estimate population, critical infrastructure, and structures impacted with assessed value for flood inundation.

This type of insurance is only available to property owners whose jurisdiction participates in the NFIP. The following jurisdictions participate in the National Flood Insurance Program (NFIP):

| CID    | Community         | Status        | Date of Entry | Date of Current Effective Map | Date of Init Map |
|--------|-------------------|---------------|---------------|-------------------------------|------------------|
| 380149 | Bismarck, City of | Participating | 09/18/85      | 07/19/05                      | 09/18/85         |
| 380017 | Burleigh County   | Participating | 09/18/85      | 07/19/05                      | 09/18/85         |
| 385396 | Lincoln, City of  | Participating | 05/12/08      | 07/19/05                      | 07/19/05         |
| 380065 | Wilton, City of   | Participating | 04/25/97      | (NSFHA)                       | 08/19/10         |
| 380213 | Wing, City of     | Participating | 08/19/80      | 07/19/05                      | 08/19/80         |

Source: Jeff Klein, State NFIP Coordinator

Burleigh County is trying to foster participation from the City of Regan. Additional NFIP strategies are listed in the Appendices.

#### **Flood Insurance Study (FIS)**

The last Flood Insurance Study (FIS), Revised 8-04-14, covered the jurisdiction of Burleigh County and incorporated areas and is available from the [FEMA Map Service Center](#), Product 38015CV000B. The Study reaffirms the history of the principal flood problems on pages 6-7:

## Geologic Hazards

|                         |   |
|-------------------------|---|
| <b>Frequency</b>        | Unlikely (Less than 1% probability in the next 100 years) |
| <b>Severity</b>         | Negligible (Less than 10% of jurisdiction affected)       |
| <b>Risk Class</b>       | D   |
| <b>Seasonal Pattern</b> | Spring and Summer   |
| <b>Duration</b>         | 1 to 10 days  |
| <b>Speed of Onset</b>   | Hours to days   |
| <b>Location</b>         | Countywide (areas along Missouri River and Creeks)        |

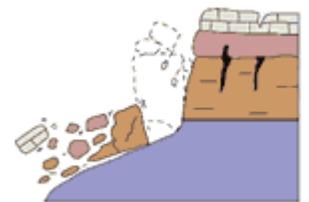
### Description

Geologic hazards in Burleigh County are not anticipated to cause severe damage; however, the potential exists for the occasional landslide or earthquake to cause some loss.

### Landslide

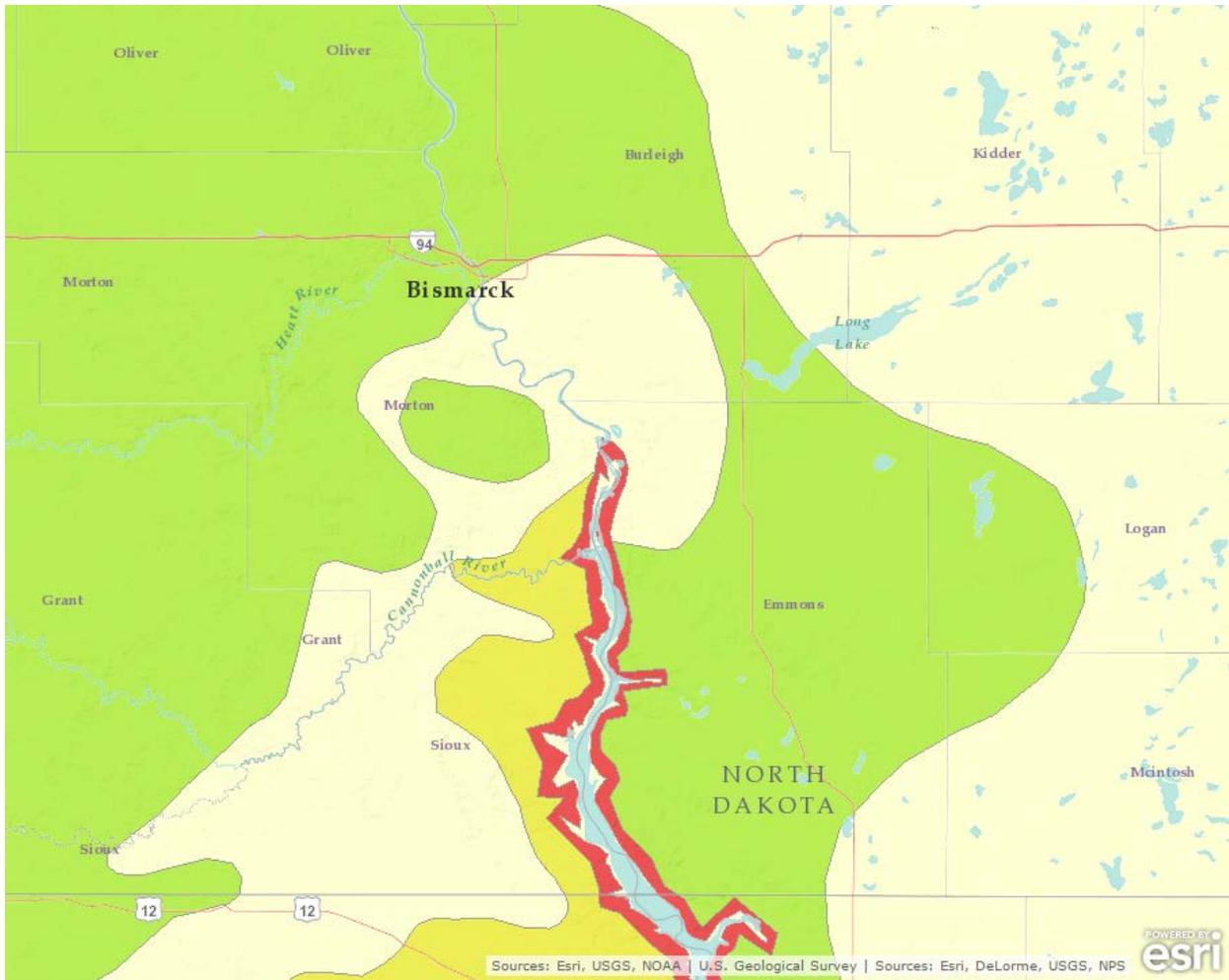
The term landslide includes a wide range of ground movement, such as rock falls, deep failure of slopes, and shallow debris flows. Although gravity acting on an over-steepened slope is the primary reason for a landslide, there are other contributing factors:

- erosion by rivers, glaciers, or ocean waves create oversteepened slopes
- rock and soil slopes are weakened through saturation by snowmelt or heavy rains
- earthquakes create stresses that make weak slopes fail
- earthquakes of magnitude 4.0 and greater have been known to trigger landslides
- volcanic eruptions produce loose ash deposits, heavy rain, and debris flows
- excess weight from accumulation of rain or snow, stockpiling of rock or ore, from waste piles, or from man-made structures may stress weak slopes to failure and other structures

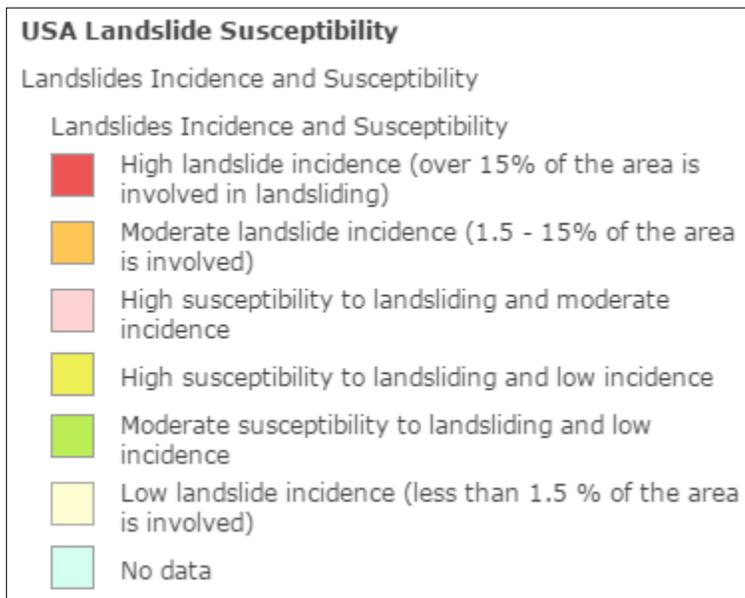


Slope material that becomes saturated with water may develop a debris flow or mud flow. The resulting slurry of rock and mud may pick up trees, houses, and cars, thus blocking bridges and tributaries causing flooding along its path.

(Source: US Geological Survey [website](#))



Source: ArcGIS USA Landslide Susceptibility [website](#)



**Identified Impacts**

- Blocked Roads
- Building Collapse
- Business Interruptions
- Delayed Emergency Response
- Downed Power Lines
- Downed Trees
- Evacuation (Localized)
- Loss of Potable Water
- Loss of Power
- Property Damage

**History**

There is no significant history of geologic hazards for Burleigh County; however, the landslide susceptibility has been identified for the western edge of Burleigh County which borders the Missouri River.

An area of rural Burleigh County along the southern portion of Apple Creek has some experienced some bank failures and slumping.

**July 27, 2001** - Rainfall of 3 to 4 inches over Bismarck caused flooding of streets and underpasses. Many back roads near the Missouri River were water covered at times and a few washed out. Two mudslides on River Road covered the northbound lanes.

**August 12, 1999** – Periods of heavy rainfall ranging from 4 to 7 inches saturated much of Morton and Burleigh counties. Hardest impact was felt in the cities of Bismarck and Mandan. Two hundred twenty one (221) homes and businesses received water damage. Twelve (12) road sites were damaged and a significant mudslide closed portions of Highway 1804 in north Bismarck.

### Hazardous Materials Release

|                         |  |
|-------------------------|--|
| <b>Frequency</b>        | Highly Likely (Nearly 100% probability in the next year) |
| <b>Severity</b>         | Limited (10-25% of jurisdiction affected)                |
| <b>Risk Class</b>       | B  |
| <b>Seasonal Pattern</b> | None   |
| <b>Duration</b>         | Hours/Days   |
| <b>Speed of Onset</b>   | No warning   |
| <b>Location</b>         | Countywide   |

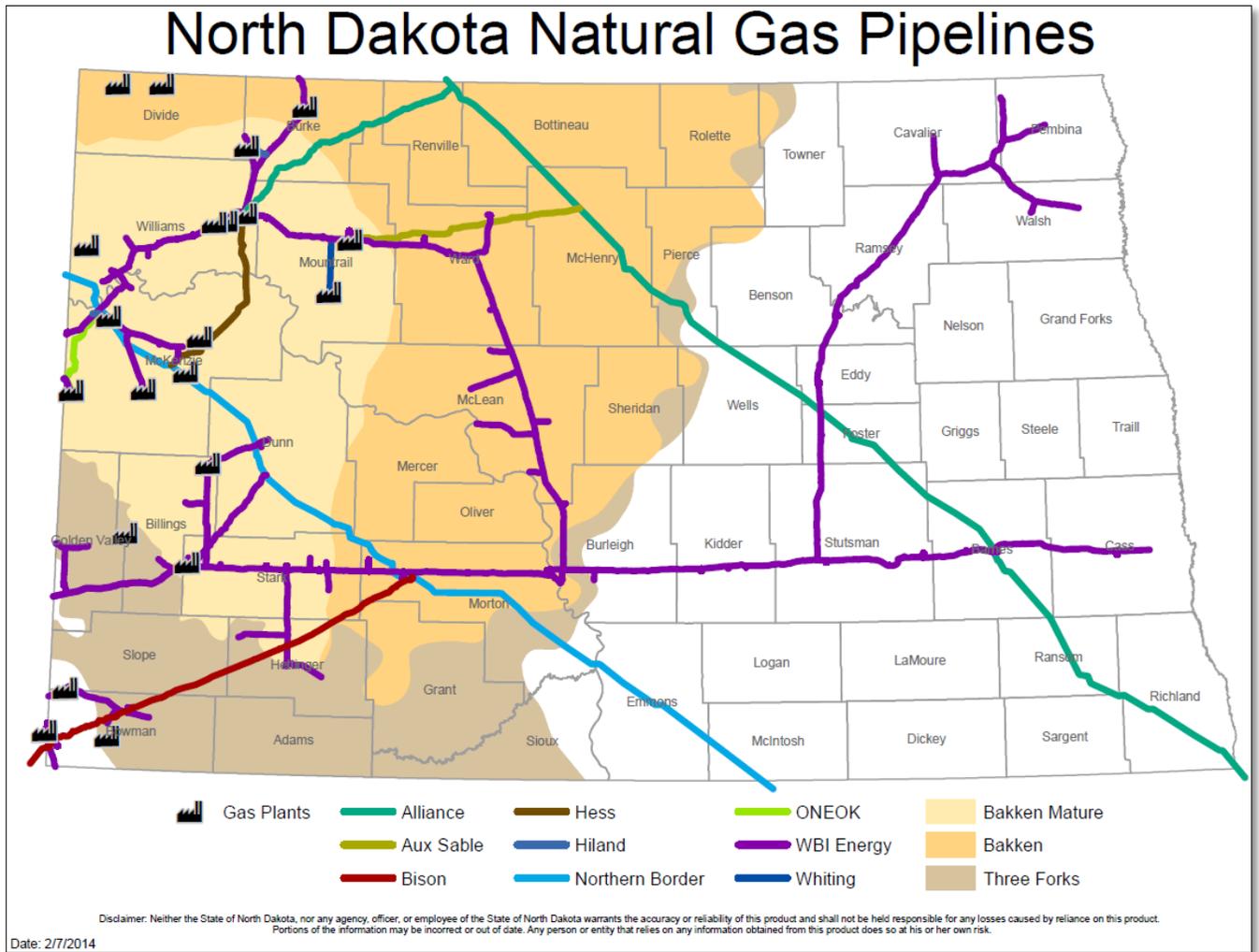
#### Description

Hazardous materials are any substances in any quantity or form which may pose an unreasonable risk to the safety, health, environment, and property of citizens. The term “hazardous materials” 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 materials such as anhydrous ammonia and phosgene gas. The potential severity of hazards of these materials is varied, but the primary reason for their designation is their risk to public safety. Tier II forms are on file with Burleigh County Emergency Management.

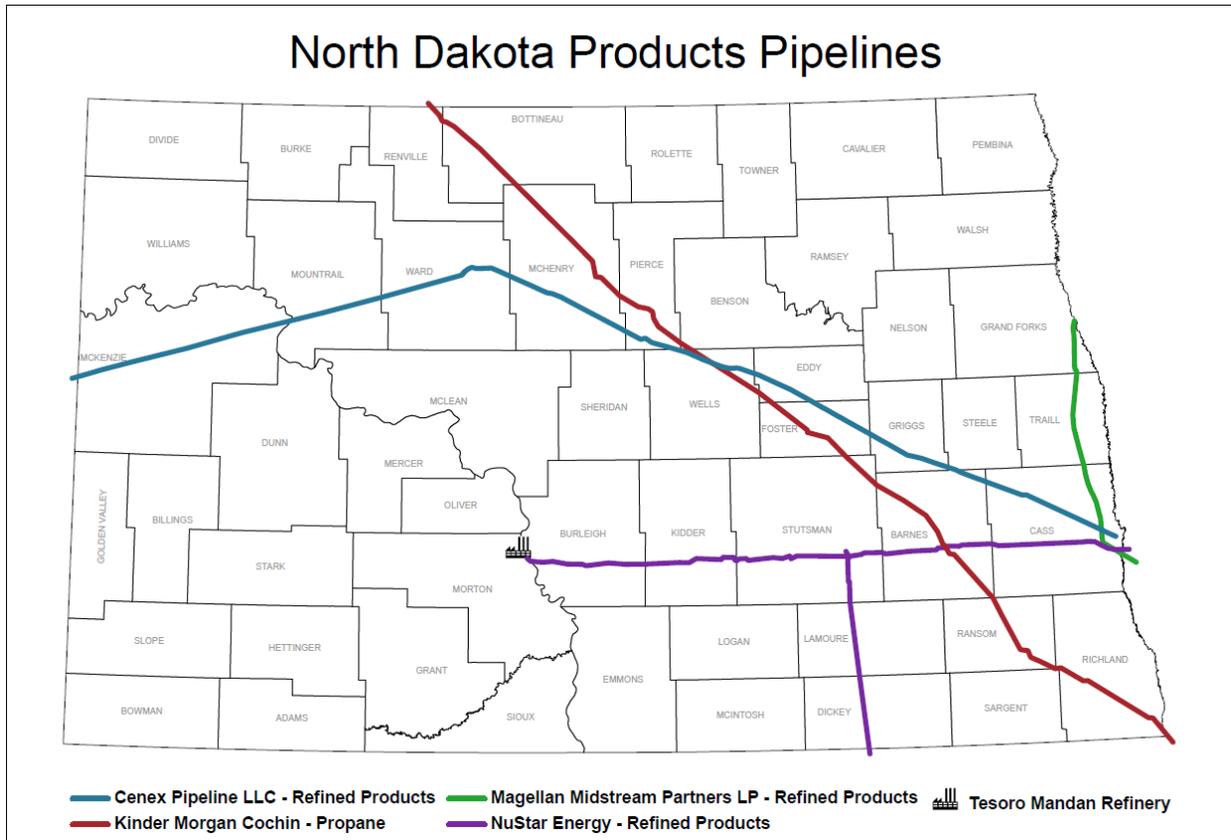
The County is exposed to and is at risk from accidents and/or incidents involving hazardous materials. The economy is based upon agriculture, manufacturing, and industry. All of these rely on the production, use, storage, transportation, etc. of hazardous materials. Explosives, flammable liquids, flammable solids, gases, poisons, pesticides, oxidizing substances, miscellaneous dangerous substances, and radioactive materials are either used in or transported through Burleigh County.

Hazardous materials are transported via three modes into and within Burleigh County:

- Highways: I-94 and ND 36 run east-west through the county. US-83, ND 1804, ND 41, and ND 14 run north-south through the county. (Attachment 3: Major Roadways in Burleigh County)
- Rail: BNSF owns/operates all railways in the county.
- Air: The Bismarck Airport is the only airport in the area with significant air hazardous material transportation activity.



Source: ND Pipeline Authority [website](#)



Source: ND Pipeline Authority [website](#)

**Identified Impacts**

- Blocked Roads
- Building Collapse
- Business Interruptions
- Delayed Emergency Response
- Downed Power Lines
- Downed Trees
- Evacuation (Full)
- Evacuation (Localized)
- Explosion
- HAZMAT Release
- Increased Fire Potential
- Increased Public Safety Runs
- Livestock Injury/Death
- Loss of Economy
- Loss/Overcrowded Medical Facilities
- Loss of Potable Water
- Loss of Power
- Mass Casualties
- Property Damage
- School Closure

## History

The ND Department of Health, Environment Health Section, records data whenever a General Environmental Incident report is filed. Burleigh County reportable data is identified below:

| Incident ID             | Date Reported | Incident Date | County   | Township Range Section | Latitude | Longitude | Contaminant   | Volume | Units   | Contained |
|-------------------------|---------------|---------------|----------|------------------------|----------|-----------|---|--------|---------|-----------|
| <a href="#">EIR3552</a> | 11/14/2014    | 11/13/2014    | Burleigh | 13908034               | 46.8148  | -100.7589 | The mercury found has not been released to the environment.                           |        |         | Yes       |
| <a href="#">EIR3430</a> | 8/20/2014     | 8/8/2014      | Burleigh | 13808007               | 46.78734 | -100.8163 | Gasoline  | 15     | gallons | No        |
| <a href="#">EIR3312</a> | 5/8/2014      | 4/30/2014     | Burleigh | 13907829               | 46.83621 | -100.5428 | Diesel fuel   | 60     | gallons | Yes       |
| <a href="#">EIR3303</a> | 5/1/2014      | 4/24/2014     | Burleigh | 14208003               | 47.11863 | -100.7924 | Diesel fuel   | 300    | gallons | No        |
| <a href="#">EIR3300</a> | 4/28/2014     | 4/21/2014     | Burleigh | 13808019               | 46.75302 | -100.823  | Gasoline  |        |         | Yes       |
| <a href="#">EIR3264</a> | 3/25/2014     | 3/24/2014     | Burleigh | 13907830               | 46.83724 | -100.5623 | Motor oil (hydraulic or lubricating oil)  | 1      | pounds  | No        |
| <a href="#">EIR2123</a> | 11/27/2013    | 7/9/2013      | Burleigh | 13907828               | 46.83033 | -100.5307 | CenexTMS 15w/40 motor oil   |        |         |           |
| <a href="#">EIR2037</a> | 9/5/2013      | 9/4/2013      | Burleigh | 13908033               | 46.81638 | -100.7836 | gasoline and waste oil - benzene, ethylbenzene  | 0      | gallons |           |
| <a href="#">EIR2000</a> | 7/26/2013     | 7/26/2013     | Burleigh | 13908031               | 46.8223  | -100.8165 | Ethylene Glycol   | 50     | gallons |           |
| <a href="#">EIR1983</a> | 7/15/2013     | 7/14/2013     | Burleigh | 13907926               | 46.83044 | -100.6148 | diesel fuel   | 5      | gallons |           |
| <a href="#">EIR1920</a> | 5/8/2013      | 5/1/2013      | Burleigh | 13907927               | 46.83055 | -100.6358 | 8-20-5-4 Liquid fertilizer  | 963    | gallons |           |
| <a href="#">EIR1868</a> | 2/5/2013      | 2/5/2013      | Burleigh | 13907628               | 46.82961 | -100.2782 | diesel fuel   | 85     | gallons |           |
| <a href="#">EIR1826</a> | 11/27/2012    | 11/24/2012    | Burleigh | 13808015               | 46.77291 | -100.763  | ethylene glycol   | 1600   | gallons |           |
| <a href="#">EIR1780</a> | 8/23/2012     | 8/23/2012     | Burleigh | 13908030               | 46.83073 | -100.8244 | Unknown   |        |         |           |
| <a href="#">EIR1778</a> | 8/6/2012      | 8/4/2012      | Burleigh | 13807917               | 46.77262 | -100.6788 | Produced Water  |        |         |           |
| <a href="#">EIR1779</a> | 8/2/2012      | 7/31/2012     | Burleigh | 13808007               | 46.78636 | -100.8269 | Diesel  |        |         |           |
| <a href="#">EIR1578</a> | 12/5/2011     | 12/4/2011     | Burleigh | 13908027               | 46.83086 | -100.7624 | Diesel Fuel   | 90     | gallons |           |
| <a href="#">EIR1376</a> | 3/18/2011     | 3/18/2011     | Burleigh | 13808000               | 46.76567 | -100.7737 | Jet Fuel  |        |         |           |
| <a href="#">EIR1355</a> | 2/12/2011     | 2/12/2011     | Burleigh | 13808008               | 46.78745 | -100.805  | 10% Alcohol and gasoline  | 50     | gallons |           |
| <a href="#">EIR1344</a> | 1/6/2011      | 1/1/2011      | Burleigh | 13908025               | 46.83073 | -100.7202 | diesel fuel   | 75     | gallons |           |
| <a href="#">EIR1343</a> | 1/3/2011      | 1/1/2011      | Burleigh | 13908025               | 46.83073 | -100.7202 | Diesel Fuel   | 75     | gallons |           |
| <a href="#">EIR1279</a> | 8/4/2010      | 8/2/2010      | Burleigh | 13908027               | 46.83086 | -100.7624 | Oil Based Traffic Paint   | 25     | gallons |           |
| <a href="#">EIR1267</a> | 7/9/2010      | 7/7/2010      | Burleigh | 14008000               | 46.9327  | -100.772  | Unknown   |        |         |           |
| <a href="#">EIR1263</a> | 6/28/2010     | 6/26/2010     | Burleigh | 13908032               | 46.81644 | -100.8047 | Non-PCB Mineral Oil   | 0      | gallons |           |
| <a href="#">EIR1236</a> | 4/13/2010     | 4/13/2010     | Burleigh | 13907930               | 46.83073 | -100.6991 | Potentially Toxic Air Contminants from the Burning of Municipal Solid Waste (garbage) |        |         |           |
| <a href="#">EIR1231</a> | 4/1/2010      | 3/31/2010     | Burleigh | 13808002               | 46.80186 | -100.7415 | Engine Oil/Water  | 25     | gallons |           |

|                         |            |            |          |          |          |           |  |       |         |  |
|-------------------------|------------|------------|----------|----------|----------|-----------|--|-------|---------|--|
| <a href="#">EIR1168</a> | 7/23/2009  | 7/23/2009  | Burleigh | 13908025 | 46.83073 | -100.7202 | Super Corr 3B, a solvent containing xylene and proprietary ingredients.                          | 30    | gallons |  |
| <a href="#">EIR1165</a> | 7/16/2009  | 7/16/2009  | Burleigh | 13907825 | 46.83001 | -100.4672 | Mineral oil, PCB concentration oil the oil is unknown at this time. Oil sent in for PCB testing. |       |         |  |
| <a href="#">EIR1114</a> | 3/17/2009  | 3/17/2009  | Burleigh | 13808003 | 46.80198 | -100.7626 | Mineral oil with <1 ppm PCBs   | 2     | gallons |  |
| <a href="#">EIR1084</a> | 12/3/2008  | 12/3/2008  | Burleigh | 14008124 | 46.93243 | -100.8423 | Treated sewage   | 1000  | gallons |  |
| <a href="#">EIR1008</a> | 5/20/2008  | 5/19/2008  | Burleigh | 13908025 | 46.83073 | -100.7202 | Shell 15W40 motor oil  | 50    | gallons |  |
| <a href="#">EIR998</a>  | 5/6/2008   | 5/6/2008   | Burleigh | 13808010 | 46.78743 | -100.7628 | Mineral oil ( 0 ppm PCBs)  | 25    | gallons |  |
| <a href="#">EIR951</a>  | 9/11/2007  | 9/11/2007  | Burleigh | 13808003 | 46.80198 | -100.7626 | Hydrocarbon/oil - possibly PCB contaminated  | 0     | gallons |  |
| <a href="#">EIR944</a>  | 8/21/2007  | 8/21/2007  | Burleigh | 13808003 | 46.80198 | -100.7626 | Bonderite 1070   | 250   | gallons |  |
| <a href="#">EIR933</a>  | 6/13/2007  | 6/13/2007  | Burleigh | 13808012 | 46.78733 | -100.7207 | 32-00 liquid fertilizer  | 25    | gallons |  |
| <a href="#">EIR810</a>  | 1/3/2006   | 1/1/2006   | Burleigh | 13808003 | 46.80198 | -100.7626 | Non-Hazardous E-Coat Paint Mixture (10 % product, 90% water)                                     | 28000 | gallons |  |
| <a href="#">EIR805</a>  | 12/1/2005  | 11/30/2005 | Burleigh | 13808011 | 46.78742 | -100.7418 | #6 Fuel Oil  | 1500  | gallons |  |
| <a href="#">EIR788</a>  | 8/9/2005   | 8/9/2005   | Burleigh | 13808004 | 46.80196 | -100.7838 | transformer mineral oil  | 25    | gallons |  |
| <a href="#">EIR619</a>  | 7/28/2003  | 7/26/2003  | Burleigh | 13908033 | 46.81638 | -100.7836 | Gasoline   | 95    | gallons |  |
| <a href="#">EIR609</a>  | 7/14/2003  | 7/14/2003  | Burleigh | 14107908 | 47.04811 | -100.7178 | unknown  |       |         |  |
| <a href="#">EIR82</a>   | 10/1/2001  | 10/1/2001  | Burleigh | 13808004 | 46.80196 | -100.7838 | Transformer Oil, less than 2 ppm PCBs  | 40    | gallons |  |
| <a href="#">EIR77</a>   | 9/5/2001   | 9/5/2001   | Burleigh | 13808000 | 46.76567 | -100.7737 | Jet "A"  | 60    | gallons |  |
| <a href="#">EIR43</a>   | 5/14/2001  | 5/14/2001  | Burleigh | 13808002 | 46.80186 | -100.7415 | Anhydrous Ammonia  | 120   | pounds  |  |
| <a href="#">EIR41</a>   | 4/27/2001  | 4/25/2001  | Burleigh | 13908031 | 46.81538 | -100.8269 | potable water (contained chlorine less than 2.5 ppm)   |       |         |  |
| <a href="#">EIR21</a>   | 3/5/2001   | 3/4/2001   | Burleigh | 13907629 | 46.82968 | -100.2992 | Unleaded gasoline  | 180   | gallons |  |
| <a href="#">EIR484</a>  | 2/24/2001  | 2/24/2001  | Burleigh | 13908024 | 46.8452  | -100.72   | Used Oil - 25-35 gallons   | 30    | gallons |  |
| <a href="#">EIR477</a>  | 1/4/2001   | 1/3/2001   | Burleigh | 13908032 | 46.81644 | -100.8047 | diesel fuel  | 50    | gallons |  |
| <a href="#">EIR471</a>  | 10/18/2000 | 10/18/2000 | Burleigh | 13907924 | 46.84497 | -100.5936 | Xylene.  | 0     | gallons |  |
| <a href="#">EIR451</a>  | 11/23/1999 | 11/23/1999 | Burleigh | 13808010 | 46.78743 | -100.7628 | smells like diesel fuel ?? not pooled on pavement, just a slick                                  |       |         |  |

|                        |            |            |          |          |          |           |                    |      |         |  |
|------------------------|------------|------------|----------|----------|----------|-----------|--------------------|------|---------|--|
| <a href="#">EIR264</a> | 9/3/1996   | 9/3/1996   | Burleigh | 13908032 | 46.81644 | -100.8047 | Transformer Oil    | 100  | gallons |  |
| <a href="#">EIR209</a> | 6/27/1994  | 6/27/1994  | Burleigh | 13908031 | 46.81538 | -100.8269 | Transformer Oil    | 180  | gallons |  |
| <a href="#">EIR203</a> | 3/10/1994  | 3/10/1994  | Burleigh | 13808015 | 46.77291 | -100.763  | Diesel fuel        | 30   | gallons |  |
| <a href="#">EIR192</a> | 12/6/1993  | 12/3/1993  | Burleigh | 13907623 | 46.84384 | -100.2358 | Transmission Fluid | 3    | gallons |  |
| <a href="#">EIR152</a> | 4/6/1992   | 4/2/1992   | Burleigh | 13908023 | 46.84524 | -100.7412 | Diesel Fuel        | 15   | gallons |  |
| <a href="#">EIR144</a> | 3/6/1992   | 3/6/1992   | Burleigh | 13908023 | 46.84524 | -100.7412 | Used Oil           | 1300 | gallons |  |
| <a href="#">EIR132</a> | 12/20/1991 | 12/20/1991 | Burleigh | 13907620 | 46.8442  | -100.299  | Diesel Fuel        | 200  | gallons |  |
| <a href="#">EIR136</a> | 11/19/1991 | 11/19/1991 | Burleigh | 13907628 | 46.82961 | -100.2782 | Diesel Fuel        | 150  | gallons |  |
| <a href="#">EIR137</a> | 10/15/1991 | 10/7/1991  | Burleigh | 13908025 | 46.83073 | -100.7202 | Hydraulic Fluid    | 50   | gallons |  |
| <a href="#">EIR123</a> | 7/10/1991  | 6/10/1991  | Burleigh | 13808034 | 46.72953 | -100.7636 | Tack Oil           |      |         |  |
| <a href="#">EIR94</a>  | 6/10/1989  | 6/10/1989  | Burleigh | 13808015 | 46.77291 | -100.763  | Jet A Fuel         | 100  | gallons |  |
| <a href="#">EIR311</a> | 4/11/1988  | 4/9/1988   | Burleigh | 13808015 | 46.77291 | -100.763  | Jet A Fuel         | 50   | gallons |  |
| <a href="#">EIR298</a> | 3/3/1988   | 3/2/1988   | Burleigh | 13808004 | 46.80196 | -100.7838 | gasoline           | 20   | gallons |  |
| <a href="#">EIR325</a> | 2/9/1982   | 2/8/1982   | Burleigh | 13808003 | 46.80198 | -100.7626 | Diesel fuel        | 100  | gallons |  |
| <a href="#">EIR392</a> | 6/21/1976  | 6/20/1976  | Burleigh | 14008116 | 46.94579 | -100.9091 | Diesel Fuel        | 4600 | gallons |  |
| <a href="#">EIR393</a> | 5/7/1976   | 4/30/1976  | Burleigh | 13908033 | 46.81638 | -100.7836 | Gasoline           | 916  | gallons |  |
| <a href="#">EIR396</a> | 2/12/1976  | 2/11/1976  | Burleigh | 13908033 | 46.821   | -100.783  | Gasoline           | 1200 | gallons |  |
| <a href="#">EIR397</a> | 1/27/1976  | 1/27/1976  | Burleigh | 13908033 | 46.821   | -100.783  | Fuel Oil           | 1000 | gallons |  |
| <a href="#">EIR402</a> | 10/29/1975 | 10/29/1975 | Burleigh | 14307932 | 47.16449 | -100.7178 | Anhydrous Ammonia  |      |         |  |

Source: ND Department of Health [website](#)

### Homeland Security Incident

|                         |   |
|-------------------------|---|
| <b>Frequency</b>        | Likely (10-100% probability in the next year, or at least 1 chance in next 100 years) |
| <b>Severity</b>         | Limited (10-25% of jurisdiction affected)   |
| <b>Risk Class</b>       | C   |
| <b>Seasonal Pattern</b> | None  |
| <b>Duration</b>         | Hours/Days  |
| <b>Speed of Onset</b>   | No warning  |

#### **Description**

A homeland security incident is any intentional adversarial human-caused incident, domestic or international, that causes mass casualties, large economic losses, or widespread panic in the country. Terrorism and civil unrest are examples of human-caused hazards that are intentional and often planned. Terrorism, both domestic and international, is a violent act done to try and influence government or the population of some political or social objective. Terrorist acts can come in many recognized forms or may be more subtle using untraditional methods. The primary recognized forms of terrorism are chemical, explosive, biological, radiological/nuclear, and cyber; however, terrorism's only limitation is the human imagination. (Source: State of North Dakota Multi-Hazard Mitigation Plan, February 2014)

**Identified Impacts**

- Blocked Roads
- Building Collapse
- Business Interruptions
- Delayed Emergency Response
- Downed Power Lines
- Evacuation (Localized)
- Explosion
- HAZMAT Release
- Increased Public Safety Runs
- Livestock Injury/Death
- Loss of Economy
- Loss/Overcrowded Medical Facilities
- Loss of Potable Water
- Loss of Power
- Mass Casualties
- Property Damage
- School Closure

**Key Facilities within Burleigh County**

Due to the critical nature and sensitivity, key facilities are on file at the Burleigh County Emergency Management Office.

We anticipate Burleigh County becoming more susceptible to this hazard as the County grows. As one of the largest urban centers and the State Capital, Bismarck is far more susceptible to this risk than other jurisdictions within the County.

**History**

Although there have been no National Security Emergencies specific to Burleigh County, any suspicious activity is reported to the ND State and Local Intelligence Center.

### **Key Facilities**

Key facilities are seen as having local impact within Burleigh County. A key facility would be one, which, if destroyed or incapable of functioning, would have a negative impact on the County's ability to respond or recover. Due to Burleigh County's limited resources, any incidents that occur within its jurisdiction may affect the entire county.

The Multi-Hazard Mitigation Plan for Burleigh County identifies key facilities located in the County and the hazards to which these facilities are susceptible. The hazards most likely to impact the key facilities are winter storms, hazardous materials, floods and summer storms.

- **Summer Storms:** Wind, hail, torrential rains, lightning, and tornadoes may cause damage to key facilities in Burleigh County.
- **Winter Storms:** Major arterials are vulnerable to becoming blocked with snow making them impassible. Many county and township roads become blocked during winter storms and cities are largely affected by winter storms.
- **Floods:** Flooding of the Missouri River and Apple Creek cause damage to homes in the western part Burleigh County and the City of Bismarck as well as farmlands and rural homes along the creek areas. During flooding events, roads may become inundated with water.
- **Hazardous Material:** Hazardous materials are transported via three modes into and within Burleigh County: Highways, Railroad, and Air.

#### **Major Facilities to consider:**

- Transportation (commercial airports, mainline railroads, rail yards, interstate highways, port/harbor facilities, major bridges/trestles)
- Industrial (food processors, health and medical supplies, major industries)
- Utilities (electric power generating plants/dams, electrical cross-country transmission lines, major electrical substations, municipal water systems, municipal sewage systems, telephone switching centers)
- Storage Sites (health and medical supplies, food, liquid fuels)
- Medical Capability (hospitals, nursing homes, clinics)
- Administrative (emergency operations centers, information/data/record centers, law enforcement/fire protection centers)

### Severe Summer Weather

|                         |  |
|-------------------------|--|
| <b>Frequency</b>        | Highly Likely (Nearly 100% probability in the next year) |
| <b>Severity</b>         | Limited (10-25% of jurisdiction affected)                |
| <b>Risk Class</b>       | B  |
| <b>Seasonal Pattern</b> | April to November  |
| <b>Duration</b>         | 2 to 5 hours   |
| <b>Speed of Onset</b>   | Little to no warning                                     |
| <b>Location</b>         | Countywide   |

#### Description

Severe summer storms are generated by temperature imbalances in the atmosphere, and as warm, moist air rises, the thunderstorm develops. These conditions will produce updrafts and downdrafts which 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 the thunderstorm continues to intensify, a tornado may develop.

#### Why Worry About Thunderstorms?

##### Lightning:

- Causes an average of 55-60 fatalities and 400 injuries each year
- Occurs with all thunderstorms
- Costs more than \$1 billion in insured losses each year

##### Tornadoes:

- Cause an average of 60-65 fatalities and 1,500 injuries each year
- Can produce wind speeds in excess of 200 mph
- Can be 1 mile wide and stay on the ground over 50 miles

##### Straight-line Winds:

- Can exceed 125 mph
- Can cause destruction equal to a tornado
- Are extremely dangerous to aviation

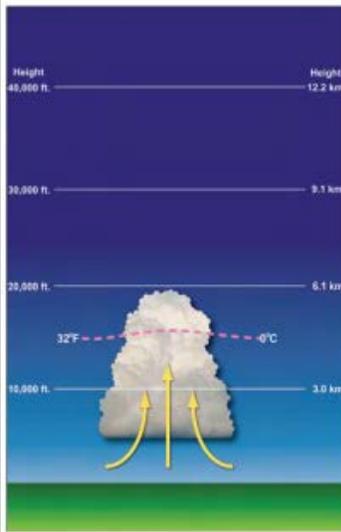
##### Hail:

- Can be larger than a softball (5 inches in diameter)
- Causes more than \$1 billion in crop and property damage each year

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! Every thunderstorm needs:

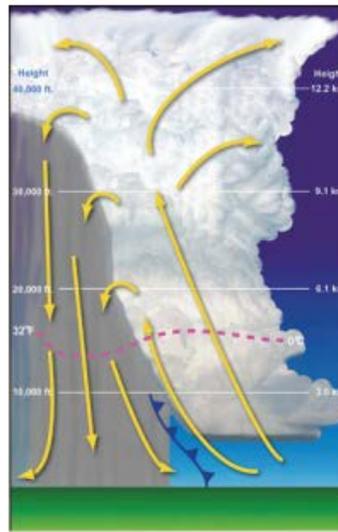
- Moisture—to form clouds and rain
- Unstable air—warm air that can rise rapidly
- Lift—caused by cold or warm fronts, sea breezes, mountains, or the sun's heat.

### The Thunderstorm Life Cycle



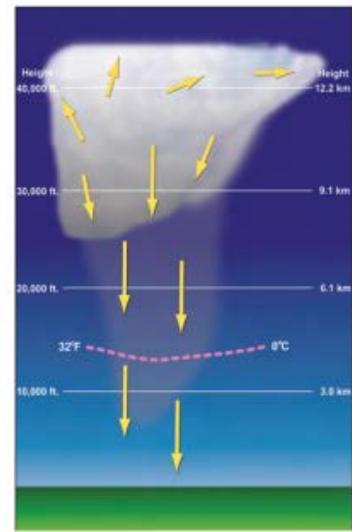
#### Developing Stage

- Towering cumulus cloud indicates rising air
- Usually little if any rain during this stage
- Lasts about 10 minutes
- Occasional lightning



#### Mature Stage

- Most likely time for hail, heavy rain, frequent lightning, strong winds, and tornadoes
- Storm occasionally has a black or dark green appearance
- Lasts an average of 10 to 20 minutes but some storms may last much longer



#### Dissipating Stage

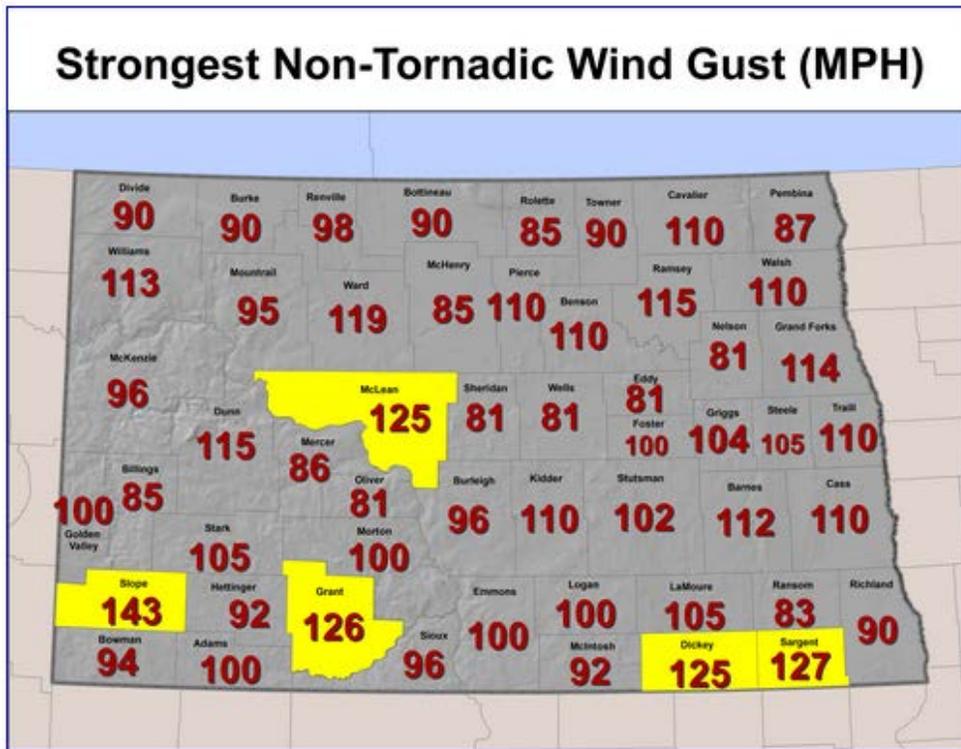
- Downdrafts, downward flowing air, dominate the storm
- Rainfall decreases in intensity
- Can still produce a burst of strong winds
- Lightning remains a danger

Source: [Thunderstorms, Tornadoes, Lightning...](#) A Preparedness Guide, US Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service

Downbursts/Straight-Line Winds

Straight-line winds are any winds not associated with the rotation of a tornado and are responsible for most thunderstorm damage. The winds can exceed 125 mph! A downburst is a small area of rapidly descending air beneath a thunderstorm and can cause damage equivalent to a strong tornado and can be extremely hazardous to aviation.

The number one cause of wind damage in North Dakota is from downburst winds, not tornadoes.

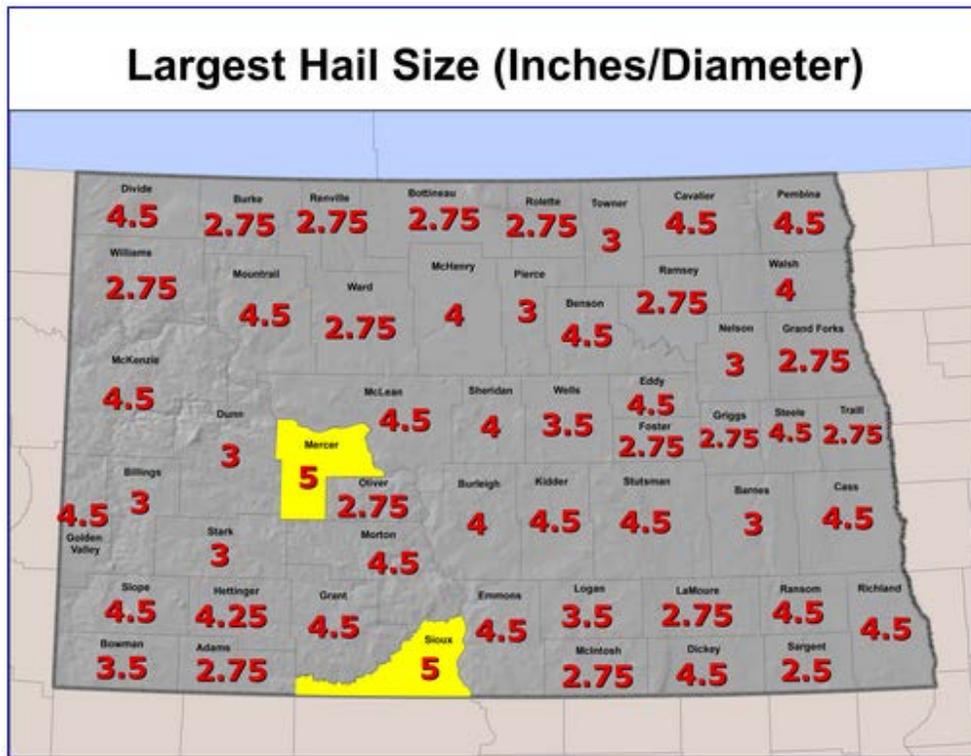


Source: National Weather Service Weather Forecast Office, Bismarck, ND [website](#)

Hail

Strong rising currents of air within a storm (updrafts) carry water droplets to a height where they freeze. Ice particles grown in size, becoming too heavy to be supported by the updraft, and fall to the ground. Hail is larger than sleet and forms only in thunderstorms. Hail stones can range from pea size to the size of a grapefruit. Hail has the potential to be life-threatening due to falling from great heights; large hailstones can fall at speeds faster than 100 mph!

The major hazard is to crops, aircraft, automobiles, roofs, and windows, etc. 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.



Source: National Weather Service Weather Forecast Office, Bismarck, ND [website](#)

### 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 snow and ice. The smaller ice crystals are carried upward toward 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. As a result, the top of the cloud becomes positively charged and the middle to lower part of the storm becomes 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 toward 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.



Source: [Thunderstorms, Tornadoes, Lightning](#)...A Preparedness Guide, US Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service

Severe Thunderstorms can occur any time of the day or night, but are most frequent during the late afternoon and evening hours. This is mostly due to the daytime heating which creates the extra heat energy to form these large thunderstorms. The criteria used by the National Weather Service for calling a thunderstorm severe is winds of 58 mph or more and/or hail three-quarters of an inch larger in diameter. There are other elements that make thunderstorms deadly, such as severe lightning, heavy rains, hail, straight-line winds, and tornadoes.

The general makeup of a severe thunderstorm is similar to that of a regular thunderstorm, except that each element is enhanced or more intense. This can be seen in the cloud formations and the weather that the storm produces.

## Tornado

Tornadoes are nature's most destructive weapons. They occur in many parts of the world—most frequently in the United States and can occur at any time of day.

- A tornado is a violently rotating column of air extending from a cumuliform cloud, such as a thunderstorm, to the ground.
- Tornadoes 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 **tornadoes can move in any direction** and can suddenly change their direction of motion.
- The average forward speed of a tornado is 30 mph but may vary from nearly stationary to 70 mph.
- The strongest tornadoes have rotating winds of more than 200 mph.
- Tornadoes can accompany tropical storms and hurricanes as they move onto land.
- Waterspouts are tornadoes that form over warm water. Water spouts can move onshore and cause damage to coastal areas.

### **Tornadoes are Nature's Most Violent Storms**

North Dakota has on average 23 *reported* tornadoes a year (1950 through 2012). The numbers range from only two in 1950, 1951 and 1961 to as many as 61 in 1999. Most tornadoes in the state occur from 3 PM to 11 PM local time in the months of June, July and August.



*Development Phase*



*Mature Stage*

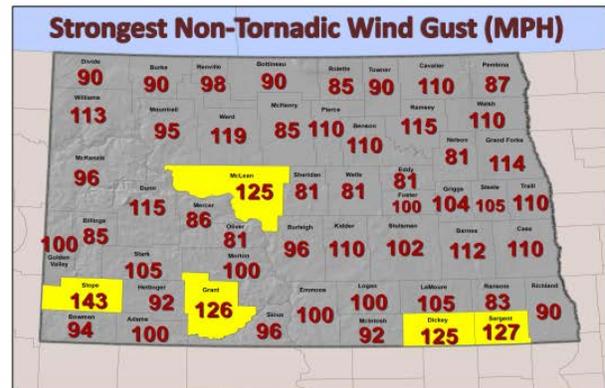
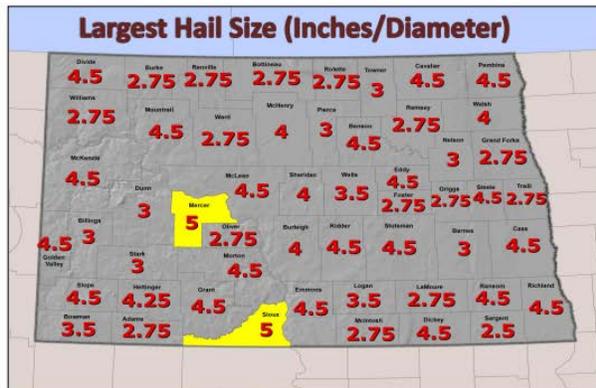
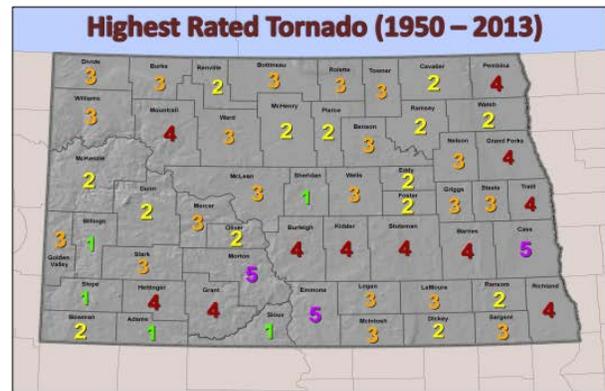
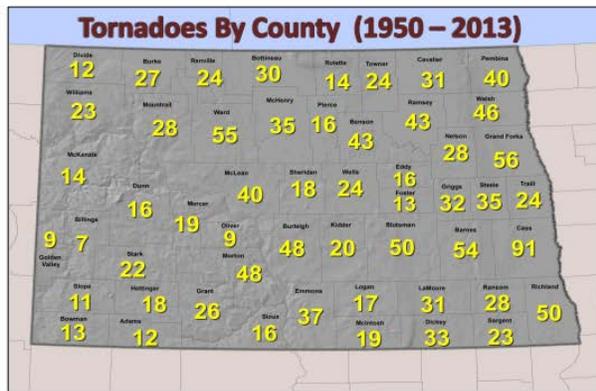


*Dissipation Stage*

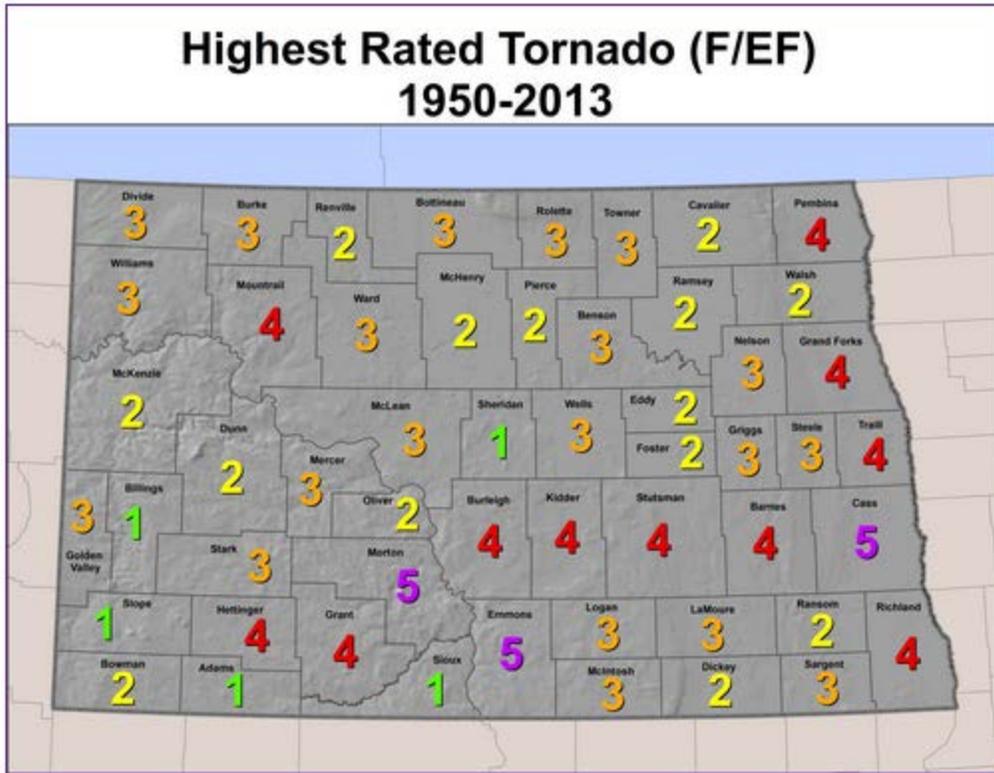
Source: Source: National Weather Service Weather Forecast Office, Bismarck, ND [website](#)

### Tornado Scales

| FUJITA SCALE |                        |                     | DERIVED EF SCALE |                     | OPERATIONAL EF SCALE |                     |
|--------------|------------------------|---------------------|------------------|---------------------|----------------------|---------------------|
| F Number     | Fastest 1/4 mile (mph) | 3 Second Gust (mph) | EF Number        | 3 Second Gust (mph) | EF Number            | 3 Second Gust (mph) |
| 0            | 40-72                  | 45-78               | 0                | 65-85               | 0                    | 65-85               |
| 1            | 73-112                 | 79-117              | 1                | 86-109              | 1                    | 86-110              |
| 2            | 113-157                | 118-161             | 2                | 110-137             | 2                    | 111-135             |
| 3            | 158-207                | 162-209             | 3                | 138-167             | 3                    | 136-165             |
| 4            | 208-260                | 210-261             | 4                | 168-199             | 4                    | 166-200             |
| 5            | 261-318                | 262-317             | 5                | 200-234             | 5                    | Over 200            |



Source: National Weather Service Weather Forecast Office, Bismarck, ND [website](#)



Source: National Weather Service Weather Forecast Office, Bismarck, ND [website](#)

**Identified Impacts**

- Blocked Roads
- Building Collapse
- Business Interruptions
- Delayed Emergency Response
- Downed Power Lines
- Downed Trees
- Evacuation (Localized)
- Explosion
- Flooding (Street)
- Flooding (Structure)
- HAZMAT Release
- Increased Fire Potential
- Increased Public Safety Runs
- Livestock Injury/Death
- Loss of Economy
- Loss/Overcrowded Medical Facilities
- Loss of Potable Water
- Loss of Power
- Mass Casualties
- Property Damage
- School Closure
- Sewer Backup

**History**

Source: National Oceanic and Atmospheric Administration National Climatic Data Center [Website](#) (01/1950 to 08/2014)

**Funnel Cloud**

| <u>Location</u>                     | <u>County/Zone</u> | <u>St.</u> | <u>Date</u> | <u>Time</u> | <u>T.Z.</u> | <u>Type</u>  | <u>Mag</u> | <u>Dt</u> | <u>In</u> | <u>PrD</u> | <u>CrD</u> |
|-------------------------------------|--------------------|------------|-------------|-------------|-------------|--------------|------------|-----------|-----------|------------|------------|
| <a href="#">BURLEIGH CO.</a>        | BURLEIGH CO.       | N D        | 08/09/2014  | 14:23       | CST -6      | Funnel Cloud |            | 0         | 0         | 0.00 K     | 0.00 K     |
| <a href="#">MENOKEN</a>             | BURLEIGH CO.       | N D        | 06/24/2010  | 18:55       | CST -6      | Funnel Cloud |            | 0         | 0         | 0.00 K     | 0.00 K     |
| <a href="#">BISMARCK</a>            | BURLEIGH CO.       | N D        | 07/04/2009  | 15:38       | CST -6      | Funnel Cloud |            | 0         | 0         | 0.00 K     | 0.00 K     |
| <a href="#">WING</a>                | BURLEIGH CO.       | N D        | 07/04/2009  | 15:23       | CST -6      | Funnel Cloud |            | 0         | 0         | 0.00 K     | 0.00 K     |
| <a href="#">WING</a>                | BURLEIGH CO.       | N D        | 07/04/2009  | 15:18       | CST -6      | Funnel Cloud |            | 0         | 0         | 0.00 K     | 0.00 K     |
| <a href="#">WING</a>                | BURLEIGH CO.       | N D        | 07/04/2009  | 15:15       | CST -6      | Funnel Cloud |            | 0         | 0         | 0.00 K     | 0.00 K     |
| <a href="#">FT LINCOLN</a>          | BURLEIGH CO.       | N D        | 08/11/2008  | 12:17       | CST -6      | Funnel Cloud |            | 0         | 0         | 0.00 K     | 0.00 K     |
| <a href="#">WILTON</a>              | BURLEIGH CO.       | N D        | 07/28/2008  | 19:58       | CST -6      | Funnel Cloud |            | 0         | 0         | 0.00 K     | 0.00 K     |
| <a href="#">BISMARCK</a>            | BURLEIGH CO.       | N D        | 08/24/2006  | 13:28       | CST         | Funnel Cloud |            | 0         | 0         | 0.00 K     | 0.00 K     |
| <a href="#">REGAN</a>               | BURLEIGH CO.       | N D        | 08/25/2004  | 19:00       | CST         | Funnel Cloud |            | 0         | 0         | 0.00 K     | 0.00 K     |
| <a href="#">(BIS)BISMARCK MUNIA</a> | BURLEIGH CO.       | N D        | 06/09/2001  | 19:36       | CST         | Funnel Cloud |            | 0         | 0         | 0.00 K     | 0.00 K     |
| <a href="#">BISMARCK</a>            | BURLEIGH CO.       | N D        | 06/09/2001  | 17:00       | CST         | Funnel Cloud |            | 0         | 0         | 0.00 K     | 0.00 K     |

|                          |              |        |            |       |     |                 |  |   |   |           |           |
|--------------------------|--------------|--------|------------|-------|-----|-----------------|--|---|---|-----------|-----------|
|                          |              |        |            |       |     | Cloud           |  |   |   |           |           |
| <a href="#">MENOKEN</a>  | BURLEIGH CO. | N<br>D | 11/01/2000 | 14:04 | CST | Funnel<br>Cloud |  | 0 | 0 | 0.00<br>K | 0.00<br>K |
| <a href="#">BISMARCK</a> | BURLEIGH CO. | N<br>D | 06/22/2000 | 15:35 | CST | Funnel<br>Cloud |  | 0 | 0 | 0.00<br>K | 0.00<br>K |
| <b>Totals:</b>           |              |        |            |       |     |                 |  | 0 | 0 | 0.00<br>K | 0.00<br>K |

## Hail

| <u>Location</u>                      | <u>County/Zone</u> | <u>St.</u> | <u>Date</u> | <u>Time</u> | <u>T.Z.</u> | <u>Type</u> | <u>Mag</u> | <u>Dt</u> | <u>In</u> | <u>PrD</u> | <u>CrD</u> |
|--------------------------------------|--------------------|------------|-------------|-------------|-------------|-------------|------------|-----------|-----------|------------|------------|
| <a href="#">BURLEIGH CO.</a>         | BURLEIGH CO.       | ND         | 08/20/2014  | 18:00       | CST-6       | Hail        | 1.25 in.   | 0         | 0         | 0.00K      | 0.00K      |
| <a href="#">MOFFIT</a>               | BURLEIGH CO.       | ND         | 07/05/2014  | 19:50       | CST-6       | Hail        | 1.00 in.   | 0         | 0         | 0.00K      | 0.00K      |
| <a href="#">(BIS)BISMARCK MUNI A</a> | BURLEIGH CO.       | ND         | 07/05/2014  | 19:30       | CST-6       | Hail        | 1.00 in.   | 0         | 0         | 0.00K      | 0.00K      |
| <a href="#">REGAN</a>                | BURLEIGH CO.       | ND         | 08/30/2013  | 23:15       | CST-6       | Hail        | 0.88 in.   | 0         | 0         | 0.00K      | 0.00K      |
| <a href="#">BISMARCK</a>             | BURLEIGH CO.       | ND         | 08/30/2013  | 20:35       | CST-6       | Hail        | 0.80 in.   | 0         | 0         | 0.00K      | 0.00K      |
| <a href="#">FT LINCOLN</a>           | BURLEIGH CO.       | ND         | 08/30/2013  | 20:27       | CST-6       | Hail        | 1.00 in.   | 0         | 0         | 0.00K      | 0.00K      |
| <a href="#">(BIS)BISMARCK MUNI A</a> | BURLEIGH CO.       | ND         | 08/30/2013  | 20:25       | CST-6       | Hail        | 1.00 in.   | 0         | 0         | 0.00K      | 0.00K      |
| <a href="#">BISMARCK</a>             | BURLEIGH CO.       | ND         | 08/30/2013  | 20:20       | CST-6       | Hail        | 1.00 in.   | 0         | 0         | 0.00K      | 0.00K      |
| <a href="#">BISMARCK</a>             | BURLEIGH CO.       | ND         | 08/30/2013  | 20:20       | CST-6       | Hail        | 0.75 in.   | 0         | 0         | 0.00K      | 0.00K      |
| <a href="#">BISMARCK</a>             | BURLEIGH CO.       | ND         | 08/30/2013  | 20:18       | CST-6       | Hail        | 1.00 in.   | 0         | 0         | 0.00K      | 0.00K      |
| <a href="#">BISMARCK</a>             | BURLEIGH CO.       | ND         | 08/30/2013  | 20:10       | CST-6       | Hail        | 1.00 in.   | 0         | 0         | 0.00K      | 0.00K      |
| <a href="#">MENOKEN</a>              | BURLEIGH CO.       | ND         | 07/31/2013  | 00:10       | CST-6       | Hail        | 0.75 in.   | 0         | 0         | 0.00K      | 0.00K      |
| <a href="#">BISMARCK</a>             | BURLEIGH CO.       | ND         | 07/30/2013  | 23:55       | CST-6       | Hail        | 0.75 in.   | 0         | 0         | 0.00K      | 0.00K      |

|                                      |              |        |            |       |           |      |          |   |   |       |       |
|--------------------------------------|--------------|--------|------------|-------|-----------|------|----------|---|---|-------|-------|
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N<br>D | 07/30/2013 | 23:55 | CST<br>-6 | Hail | 1.25 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N<br>D | 07/30/2013 | 23:50 | CST<br>-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N<br>D | 07/21/2013 | 18:25 | CST<br>-6 | Hail | 0.88 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N<br>D | 07/21/2013 | 18:15 | CST<br>-6 | Hail | 0.88 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N<br>D | 07/09/2013 | 15:26 | CST<br>-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">WING</a>                 | BURLEIGH CO. | N<br>D | 06/26/2013 | 14:25 | CST<br>-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">(BIS)BISMARCK MUNI A</a> | BURLEIGH CO. | N<br>D | 06/22/2013 | 20:24 | CST<br>-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">DRISCOLL</a>             | BURLEIGH CO. | N<br>D | 06/20/2013 | 16:45 | CST<br>-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">DRISCOLL</a>             | BURLEIGH CO. | N<br>D | 08/24/2012 | 19:15 | CST<br>-6 | Hail | 0.88 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">STERLING</a>             | BURLEIGH CO. | N<br>D | 08/24/2012 | 18:55 | CST<br>-6 | Hail | 1.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">WILTON</a>               | BURLEIGH CO. | N<br>D | 08/24/2012 | 17:28 | CST<br>-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">(BIS)BISMARCK MUNI A</a> | BURLEIGH CO. | N<br>D | 08/03/2012 | 13:22 | CST<br>-6 | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">DRISCOLL</a>             | BURLEIGH CO. | N<br>D | 06/30/2012 | 07:35 | CST<br>-6 | Hail | 1.50 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">MENOKEN</a>              | BURLEIGH CO. | N<br>D | 06/30/2012 | 06:55 | CST<br>-6 | Hail | 1.50 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N      | 06/30/2012 | 06:55 | CST       | Hail | 0.7      | 0 | 0 | 0.00K | 0.00K |

|   |                  |        |                |           |           |      |                 |   |   |         |       |
|---|------------------|--------|----------------|-----------|-----------|------|-----------------|---|---|---------|-------|
|   | H CO.            | D      | 2              | 2         | -6        |      | 5<br>in.        |   |   |         |       |
| <a href="#">BALDWIN</a>                 | BURLEIG<br>H CO. | N<br>D | 05/21/201<br>2 | 19:0<br>5 | CST<br>-6 | Hail | 0.7<br>5<br>in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">(BIS)BISMARCK<br/>MUNIA</a> | BURLEIG<br>H CO. | N<br>D | 08/22/201<br>1 | 19:2<br>3 | CST<br>-6 | Hail | 1.0<br>0<br>in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">(BIS)BISMARCK<br/>MUNIA</a> | BURLEIG<br>H CO. | N<br>D | 08/22/201<br>1 | 19:2<br>3 | CST<br>-6 | Hail | 0.7<br>5<br>in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">ARENA</a>                   | BURLEIG<br>H CO. | N<br>D | 08/22/201<br>1 | 19:2<br>0 | CST<br>-6 | Hail | 1.5<br>0<br>in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">ARENA</a>                   | BURLEIG<br>H CO. | N<br>D | 08/15/201<br>1 | 20:5<br>0 | CST<br>-6 | Hail | 1.0<br>0<br>in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BISMARCK</a>                | BURLEIG<br>H CO. | N<br>D | 08/15/201<br>1 | 20:1<br>5 | CST<br>-6 | Hail | 1.0<br>0<br>in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BISMARCK</a>                | BURLEIG<br>H CO. | N<br>D | 08/15/201<br>1 | 20:1<br>0 | CST<br>-6 | Hail | 0.7<br>5<br>in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BISMARCK</a>                | BURLEIG<br>H CO. | N<br>D | 07/29/201<br>1 | 22:1<br>6 | CST<br>-6 | Hail | 1.0<br>0<br>in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BISMARCK</a>                | BURLEIG<br>H CO. | N<br>D | 07/24/201<br>1 | 17:3<br>1 | CST<br>-6 | Hail | 0.7<br>5<br>in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">DRISCOLL</a>                | BURLEIG<br>H CO. | N<br>D | 07/24/201<br>1 | 15:0<br>5 | CST<br>-6 | Hail | 1.0<br>0<br>in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">WING</a>                    | BURLEIG<br>H CO. | N<br>D | 07/16/201<br>1 | 08:0<br>0 | CST<br>-6 | Hail | 0.8<br>8<br>in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">REGAN</a>                   | BURLEIG<br>H CO. | N<br>D | 07/16/201<br>1 | 07:4<br>0 | CST<br>-6 | Hail | 1.0<br>0<br>in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">(BIS)BISMARCK<br/>MUNIA</a> | BURLEIG<br>H CO. | N<br>D | 07/10/201<br>1 | 12:5<br>3 | CST<br>-6 | Hail | 1.0<br>0<br>in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">(BIS)BISMARCK<br/>MUNIA</a> | BURLEIG<br>H CO. | N<br>D | 07/10/201<br>1 | 12:5<br>0 | CST<br>-6 | Hail | 1.2<br>5<br>in. | 0 | 0 | 150.00K | 0.00K |

|                                      |              |        |            |       |           |      |          |   |   |       |       |
|--------------------------------------|--------------|--------|------------|-------|-----------|------|----------|---|---|-------|-------|
|                                      |              |        |            |       |           |      | in.      |   |   |       |       |
| <a href="#">(BIS)BISMARCK MUNI A</a> | BURLEIGH CO. | N<br>D | 07/10/2011 | 11:21 | CST<br>-6 | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">MOFFIT</a>               | BURLEIGH CO. | N<br>D | 06/07/2011 | 17:54 | CST<br>-6 | Hail | 2.00 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">WILTON</a>               | BURLEIGH CO. | N<br>D | 05/09/2011 | 11:50 | CST<br>-6 | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N<br>D | 08/02/2010 | 14:35 | CST<br>-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N<br>D | 07/20/2010 | 17:12 | CST<br>-6 | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N<br>D | 07/20/2010 | 17:10 | CST<br>-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">WILTON</a>               | BURLEIGH CO. | N<br>D | 07/10/2010 | 21:46 | CST<br>-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">(BIS)BISMARCK MUNI A</a> | BURLEIGH CO. | N<br>D | 06/25/2010 | 16:49 | CST<br>-6 | Hail | 0.88 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">FT LINCOLN</a>           | BURLEIGH CO. | N<br>D | 06/24/2010 | 18:16 | CST<br>-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">MENOKEN</a>              | BURLEIGH CO. | N<br>D | 06/24/2010 | 18:08 | CST<br>-6 | Hail | 0.88 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">FT LINCOLN</a>           | BURLEIGH CO. | N<br>D | 06/24/2010 | 18:08 | CST<br>-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">(BIS)BISMARCK MUNI A</a> | BURLEIGH CO. | N<br>D | 05/24/2010 | 19:24 | CST<br>-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">MENOKEN</a>              | BURLEIGH CO. | N<br>D | 06/15/2009 | 20:10 | CST<br>-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">STERLING</a>             | BURLEIGH CO. | N<br>D | 06/15/2009 | 17:51 | CST<br>-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |

|                                      |              |        |            |       |           |      |          |   |   |         |       |
|--------------------------------------|--------------|--------|------------|-------|-----------|------|----------|---|---|---------|-------|
| <a href="#">REGAN</a>                | BURLEIGH CO. | N<br>D | 07/23/2008 | 17:15 | CST<br>-6 | Hail | 1.75 in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">FT LINCOLN</a>           | BURLEIGH CO. | N<br>D | 07/19/2008 | 18:45 | CST<br>-6 | Hail | 2.75 in. | 0 | 0 | 10.00K  | 0.00K |
| <a href="#">(BIS)BISMARCK MUNI A</a> | BURLEIGH CO. | N<br>D | 07/19/2008 | 18:20 | CST<br>-6 | Hail | 2.75 in. | 0 | 0 | 800.00K | 0.00K |
| <a href="#">MENOKEN</a>              | BURLEIGH CO. | N<br>D | 07/16/2008 | 03:54 | CST<br>-6 | Hail | 0.75 in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">DRISCOLL</a>             | BURLEIGH CO. | N<br>D | 07/10/2008 | 18:15 | CST<br>-6 | Hail | 1.00 in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">(BIS)BISMARCK MUNI A</a> | BURLEIGH CO. | N<br>D | 07/10/2008 | 17:51 | CST<br>-6 | Hail | 0.88 in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BALDWIN</a>              | BURLEIGH CO. | N<br>D | 07/10/2008 | 17:29 | CST<br>-6 | Hail | 1.75 in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">DRISCOLL</a>             | BURLEIGH CO. | N<br>D | 07/10/2008 | 17:21 | CST<br>-6 | Hail | 1.00 in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">REGAN</a>                | BURLEIGH CO. | N<br>D | 07/10/2008 | 17:00 | CST<br>-6 | Hail | 2.25 in. | 0 | 0 | 10.00K  | 0.00K |
| <a href="#">BALDWIN</a>              | BURLEIGH CO. | N<br>D | 07/10/2008 | 16:44 | CST<br>-6 | Hail | 1.25 in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">STERLING</a>             | BURLEIGH CO. | N<br>D | 06/24/2008 | 18:55 | CST<br>-6 | Hail | 1.00 in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">WILTON</a>               | BURLEIGH CO. | N<br>D | 06/14/2008 | 16:04 | CST<br>-6 | Hail | 0.75 in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">MC KENZIE</a>            | BURLEIGH CO. | N<br>D | 06/11/2008 | 10:40 | CST<br>-6 | Hail | 0.75 in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BALDWIN</a>              | BURLEIGH CO. | N<br>D | 05/24/2008 | 20:43 | CST<br>-6 | Hail | 1.00 in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH     | N      | 05/24/2008 | 20:3  | CST       | Hail | 0.8      | 0 | 0 | 0.00K   | 0.00K |

|                                     |              |        |            |       |           |      |          |   |   |       |       |
|-------------------------------------|--------------|--------|------------|-------|-----------|------|----------|---|---|-------|-------|
|                                     | H CO.        | D      | 8          | 2     | -6        |      | 8 in.    |   |   |       |       |
| <a href="#">BISMARCK</a>            | BURLEIGH CO. | N<br>D | 08/11/2007 | 01:54 | CST<br>-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">(BIS)BISMARCK MUNIA</a> | BURLEIGH CO. | N<br>D | 08/11/2007 | 01:35 | CST<br>-6 | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a>            | BURLEIGH CO. | N<br>D | 08/11/2007 | 01:01 | CST<br>-6 | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">WING</a>                | BURLEIGH CO. | N<br>D | 06/17/2007 | 20:11 | CST<br>-6 | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a>            | BURLEIGH CO. | N<br>D | 06/16/2007 | 23:05 | CST<br>-6 | Hail | 0.88 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">STERLING</a>            | BURLEIGH CO. | N<br>D | 06/06/2007 | 22:05 | CST<br>-6 | Hail | 0.88 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">(BIS)BISMARCK MUNIA</a> | BURLEIGH CO. | N<br>D | 08/24/2006 | 11:50 | CST       | Hail | 1.25 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">STERLING</a>            | BURLEIGH CO. | N<br>D | 08/10/2006 | 04:45 | CST       | Hail | 0.88 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">WILTON</a>              | BURLEIGH CO. | N<br>D | 08/09/2006 | 07:00 | CST       | Hail | 0.88 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK ARPT</a>       | BURLEIGH CO. | N<br>D | 08/09/2006 | 06:56 | CST       | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a>            | BURLEIGH CO. | N<br>D | 07/24/2006 | 16:00 | CST       | Hail | 0.88 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a>            | BURLEIGH CO. | N<br>D | 06/14/2006 | 00:48 | CST       | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a>            | BURLEIGH CO. | N<br>D | 05/27/2006 | 21:33 | CST       | Hail | 1.50 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a>            | BURLEIGH CO. | N<br>D | 05/27/2006 | 20:55 | CST       | Hail | 2.50 in. | 0 | 0 | 0.00K | 0.00K |

|                          |              |        |            |       |     |      |          |   |   |         |       |
|--------------------------|--------------|--------|------------|-------|-----|------|----------|---|---|---------|-------|
|                          |              |        |            |       |     |      | in.      |   |   |         |       |
| <a href="#">WILTON</a>   | BURLEIGH CO. | N<br>D | 05/27/2006 | 20:00 | CST | Hail | 0.88 in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BISMARCK</a> | BURLEIGH CO. | N<br>D | 05/27/2006 | 18:42 | CST | Hail | 1.00 in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">WILTON</a>   | BURLEIGH CO. | N<br>D | 05/27/2006 | 15:21 | CST | Hail | 0.88 in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BISMARCK</a> | BURLEIGH CO. | N<br>D | 05/26/2006 | 09:05 | CST | Hail | 0.88 in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BISMARCK</a> | BURLEIGH CO. | N<br>D | 07/24/2005 | 20:10 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BISMARCK</a> | BURLEIGH CO. | N<br>D | 07/21/2005 | 18:25 | CST | Hail | 2.50 in. | 0 | 0 | 93.000M | 0.00K |
| <a href="#">WILTON</a>   | BURLEIGH CO. | N<br>D | 07/21/2005 | 17:45 | CST | Hail | 1.00 in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BISMARCK</a> | BURLEIGH CO. | N<br>D | 06/26/2005 | 20:11 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BISMARCK</a> | BURLEIGH CO. | N<br>D | 06/26/2005 | 20:10 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BISMARCK</a> | BURLEIGH CO. | N<br>D | 06/06/2005 | 23:05 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">WING</a>     | BURLEIGH CO. | N<br>D | 08/23/2004 | 19:50 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">REGAN</a>    | BURLEIGH CO. | N<br>D | 07/27/2004 | 18:40 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BISMARCK</a> | BURLEIGH CO. | N<br>D | 07/27/2004 | 18:00 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BISMARCK</a> | BURLEIGH CO. | N<br>D | 07/12/2004 | 00:02 | CST | Hail | 1.00 in. | 0 | 0 | 0.00K   | 0.00K |

|                                      |              |        |            |       |     |      |          |   |   |       |       |
|--------------------------------------|--------------|--------|------------|-------|-----|------|----------|---|---|-------|-------|
| <a href="#">REGAN</a>                | BURLEIGH CO. | N<br>D | 07/10/2004 | 16:50 | CST | Hail | 0.88 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">(BIS)BISMARCK MUNI A</a> | BURLEIGH CO. | N<br>D | 07/03/2003 | 19:16 | CST | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">REGAN</a>                | BURLEIGH CO. | N<br>D | 06/21/2003 | 16:20 | CST | Hail | 1.50 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BALDWIN</a>              | BURLEIGH CO. | N<br>D | 06/21/2003 | 15:32 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BALDWIN</a>              | BURLEIGH CO. | N<br>D | 06/21/2003 | 15:30 | CST | Hail | 2.00 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N<br>D | 05/07/2003 | 17:10 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N<br>D | 04/26/2003 | 21:45 | CST | Hail | 1.25 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">MENOKEN</a>              | BURLEIGH CO. | N<br>D | 08/31/2002 | 19:40 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N<br>D | 08/31/2002 | 19:30 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N<br>D | 08/31/2002 | 18:53 | CST | Hail | 2.50 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N<br>D | 08/31/2002 | 18:52 | CST | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N<br>D | 08/31/2002 | 17:49 | CST | Hail | 1.50 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N<br>D | 08/31/2002 | 17:42 | CST | Hail | 2.00 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">WILTON</a>               | BURLEIGH CO. | N<br>D | 08/30/2002 | 19:07 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N      | 08/30/2002 | 18:3  | CST | Hail | 2.5      | 0 | 0 | 0.00K | 0.00K |

|                                      |              |     |            |       |     |      |          |   |   |           |       |
|--------------------------------------|--------------|-----|------------|-------|-----|------|----------|---|---|-----------|-------|
|                                      | H CO.        | D   | 2          | 5     |     |      | 0 in.    |   |   |           |       |
| <a href="#">(BIS)BISMARCK MUNI A</a> | BURLEIGH CO. | N D | 08/30/2002 | 18:30 | CST | Hail | 1.75 in. | 0 | 0 | 0.00K     | 0.00K |
| <a href="#">(BIS)BISMARCK MUNI A</a> | BURLEIGH CO. | N D | 08/30/2002 | 18:11 | CST | Hail | 1.00 in. | 0 | 0 | 0.00K     | 0.00K |
| <a href="#">REGAN</a>                | BURLEIGH CO. | N D | 06/23/2002 | 19:53 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K     | 0.00K |
| <a href="#">WILTON</a>               | BURLEIGH CO. | N D | 06/23/2002 | 18:10 | CST | Hail | 2.50 in. | 0 | 0 | 0.00K     | 0.00K |
| <a href="#">WILTON</a>               | BURLEIGH CO. | N D | 06/23/2002 | 18:10 | CST | Hail | 2.75 in. | 0 | 0 | 0.00K     | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N D | 06/23/2002 | 17:07 | CST | Hail | 0.88 in. | 0 | 0 | 0.00K     | 0.00K |
| <a href="#">MENOKEN</a>              | BURLEIGH CO. | N D | 06/09/2001 | 18:15 | CST | Hail | 2.00 in. | 0 | 0 | 0.00K     | 0.00K |
| <a href="#">(BIS)BISMARCK MUNI A</a> | BURLEIGH CO. | N D | 06/09/2001 | 17:49 | CST | Hail | 1.00 in. | 0 | 0 | 0.00K     | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N D | 06/09/2001 | 17:36 | CST | Hail | 1.00 in. | 0 | 0 | 0.00K     | 0.00K |
| <a href="#">(BIS)BISMARCK MUNI A</a> | BURLEIGH CO. | N D | 06/09/2001 | 16:55 | CST | Hail | 1.75 in. | 0 | 0 | 113.000 M | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N D | 11/01/2000 | 14:40 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K     | 0.00K |
| <a href="#">WING</a>                 | BURLEIGH CO. | N D | 08/20/2000 | 21:45 | CST | Hail | 1.50 in. | 0 | 0 | 0.00K     | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N D | 08/20/2000 | 21:11 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K     | 0.00K |
| <a href="#">(BIS)BISMARCK MUNI A</a> | BURLEIGH CO. | N D | 08/20/2000 | 18:12 | CST | Hail | 1.50 in. | 0 | 0 | 0.00K     | 0.00K |

|                               |              |        |            |       |     |      |          |   |   |       |         |
|-------------------------------|--------------|--------|------------|-------|-----|------|----------|---|---|-------|---------|
|                               |              |        |            |       |     |      | in.      |   |   |       |         |
| <a href="#">BISMARCK</a>      | BURLEIGH CO. | N<br>D | 06/12/2000 | 23:10 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K   |
| <a href="#">WILTON</a>        | BURLEIGH CO. | N<br>D | 06/11/2000 | 18:30 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K   |
| <a href="#">BISMARCK ARPT</a> | BURLEIGH CO. | N<br>D | 08/15/1999 | 17:50 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K   |
| <a href="#">BISMARCK</a>      | BURLEIGH CO. | N<br>D | 08/15/1999 | 17:43 | CST | Hail | 0.88 in. | 0 | 0 | 0.00K | 0.00K   |
| <a href="#">MC KENZIE</a>     | BURLEIGH CO. | N<br>D | 06/25/1999 | 19:15 | CST | Hail | 0.88 in. | 0 | 0 | 0.00K | 0.00K   |
| <a href="#">MOFFIT</a>        | BURLEIGH CO. | N<br>D | 06/21/1999 | 02:25 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K   |
| <a href="#">DRISCOLL</a>      | BURLEIGH CO. | N<br>D | 06/03/1999 | 16:28 | CST | Hail | 2.00 in. | 0 | 0 | 0.00K | 0.00K   |
| <a href="#">BISMARCK ARPT</a> | BURLEIGH CO. | N<br>D | 08/18/1998 | 19:03 | CST | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K   |
| <a href="#">BISMARCK</a>      | BURLEIGH CO. | N<br>D | 07/06/1998 | 16:30 | CST | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K   |
| <a href="#">BISMARCK</a>      | BURLEIGH CO. | N<br>D | 07/06/1998 | 16:25 | CST | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K   |
| <a href="#">WING</a>          | BURLEIGH CO. | N<br>D | 05/27/1998 | 17:15 | CST | Hail | 1.25 in. | 0 | 0 | 0.00K | 100.00K |
| <a href="#">WILTON</a>        | BURLEIGH CO. | N<br>D | 05/27/1998 | 16:20 | CST | Hail | 1.00 in. | 0 | 0 | 5.00K | 0.00K   |
| <a href="#">WILTON</a>        | BURLEIGH CO. | N<br>D | 05/13/1998 | 20:00 | CST | Hail | 1.75 in. | 0 | 0 | 0.00K | 0.00K   |
| <a href="#">WILTON</a>        | BURLEIGH CO. | N<br>D | 09/16/1997 | 00:00 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K   |

|                          |              |        |            |       |     |      |          |   |   |       |       |
|--------------------------|--------------|--------|------------|-------|-----|------|----------|---|---|-------|-------|
| <a href="#">BISMARCK</a> | BURLEIGH CO. | N<br>D | 08/31/1997 | 19:46 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">DRISCOLL</a> | BURLEIGH CO. | N<br>D | 08/31/1997 | 18:40 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">DRISCOLL</a> | BURLEIGH CO. | N<br>D | 08/29/1997 | 12:45 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a> | BURLEIGH CO. | N<br>D | 07/01/1997 | 02:50 | CST | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">MENOKEN</a>  | BURLEIGH CO. | N<br>D | 07/28/1996 | 16:48 | CST | Hail | 1.50 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a> | BURLEIGH CO. | N<br>D | 07/28/1996 | 16:45 | CST | Hail | 1.25 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BALDWIN</a>  | BURLEIGH CO. | N<br>D | 07/28/1996 | 16:25 | CST | Hail | 1.50 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a> | BURLEIGH CO. | N<br>D | 07/28/1996 | 16:15 | CST | Hail | 2.00 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a> | BURLEIGH CO. | N<br>D | 07/10/1996 | 19:40 | CST | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a> | BURLEIGH CO. | N<br>D | 07/10/1996 | 19:35 | CST | Hail | 0.88 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a> | BURLEIGH CO. | N<br>D | 07/10/1996 | 19:30 | CST | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BALDWIN</a>  | BURLEIGH CO. | N<br>D | 07/10/1996 | 19:10 | CST | Hail | 1.50 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">WILTON</a>   | BURLEIGH CO. | N<br>D | 05/30/1996 | 18:55 | CST | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">Bismarck</a> | BURLEIGH CO. | N<br>D | 08/02/1995 | 18:08 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">Sterling</a> | BURLEIGH     | N      | 08/02/199  | 17:5  | CST | Hail | 0.8      | 0 | 0 | 0.00K | 0.00K |

|                                |              |        |            |       |     |      |          |   |   |       |        |
|--------------------------------|--------------|--------|------------|-------|-----|------|----------|---|---|-------|--------|
|                                | H CO.        | D      | 5          | 0     |     |      | 8 in.    |   |   |       |        |
| <a href="#">Bismarck</a>       | BURLEIGH CO. | N<br>D | 08/02/1995 | 17:13 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K  |
| <a href="#">Bismarck</a>       | BURLEIGH CO. | N<br>D | 07/20/1995 | 18:45 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K  |
| <a href="#">Bismarck (BIS)</a> | BURLEIGH CO. | N<br>D | 05/21/1995 | 17:21 | CST | Hail | 1.25 in. | 0 | 0 | 0.00K | 0.00K  |
| <a href="#">South Bismarck</a> | BURLEIGH CO. | N<br>D | 05/21/1995 | 17:18 | CST | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K  |
| <a href="#">Bismarck</a>       | BURLEIGH CO. | N<br>D | 05/21/1995 | 17:05 | CST | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K  |
| <a href="#">Baldwin</a>        | BURLEIGH CO. | N<br>D | 09/12/1994 | 06:40 | CST | Hail | 1.75 in. | 0 | 0 | 0.00K | 0.00K  |
| <a href="#">Near Bismarck</a>  | BURLEIGH CO. | N<br>D | 08/12/1994 | 23:12 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K  |
| <a href="#">Bismarck</a>       | BURLEIGH CO. | N<br>D | 08/12/1994 | 23:05 | CST | Hail | 1.50 in. | 0 | 0 | 0.00K | 0.00K  |
| <a href="#">NW Bismarck</a>    | BURLEIGH CO. | N<br>D | 07/12/1994 | 19:06 | CST | Hail | 0.75 in. | 0 | 0 | 5.00K | 0.00K  |
| <a href="#">Wilton</a>         | BURLEIGH CO. | N<br>D | 06/21/1994 | 19:30 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K | 50.00K |
| <a href="#">BURLEIGH CO.</a>   | BURLEIGH CO. | N<br>D | 06/18/1992 | 17:10 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K  |
| <a href="#">BURLEIGH CO.</a>   | BURLEIGH CO. | N<br>D | 06/03/1992 | 17:00 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K  |
| <a href="#">BURLEIGH CO.</a>   | BURLEIGH CO. | N<br>D | 07/06/1991 | 17:50 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K  |
| <a href="#">BURLEIGH CO.</a>   | BURLEIGH CO. | N<br>D | 07/06/1991 | 17:20 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K  |

|                              |              |        |            |       |     |      |          |   |   |       |       |
|------------------------------|--------------|--------|------------|-------|-----|------|----------|---|---|-------|-------|
|                              |              |        |            |       |     |      | in.      |   |   |       |       |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 06/25/1991 | 21:50 | CST | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 06/20/1991 | 05:00 | CST | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 05/12/1991 | 15:31 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 05/12/1991 | 15:15 | CST | Hail | 1.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 07/16/1990 | 21:00 | CST | Hail | 1.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 07/16/1990 | 20:30 | CST | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 08/21/1989 | 17:45 | CST | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 06/28/1989 | 18:54 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 06/28/1989 | 18:24 | CST | Hail | 1.50 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 05/29/1989 | 04:35 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 07/21/1987 | 13:20 | CST | Hail | 1.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 07/06/1987 | 16:25 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 08/19/1986 | 17:53 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 07/29/1986 | 20:10 | CST | Hail | 4.00 in. | 0 | 0 | 0.00K | 0.00K |

|                              |              |        |            |       |     |      |          |   |   |       |       |
|------------------------------|--------------|--------|------------|-------|-----|------|----------|---|---|-------|-------|
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 07/29/1986 | 19:38 | CST | Hail | 2.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 07/29/1986 | 19:11 | CST | Hail | 2.00 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 06/19/1986 | 23:04 | CST | Hail | 1.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 06/19/1986 | 22:48 | CST | Hail | 1.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 07/20/1985 | 19:10 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 05/10/1985 | 14:53 | CST | Hail | 1.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 07/20/1984 | 17:05 | CST | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 07/20/1984 | 16:30 | CST | Hail | 1.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 07/17/1983 | 21:00 | CST | Hail | 1.50 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 07/17/1983 | 20:05 | CST | Hail | 1.25 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 06/21/1983 | 16:35 | CST | Hail | 1.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 07/05/1982 | 03:55 | CST | Hail | 1.75 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 06/13/1982 | 20:00 | CST | Hail | 1.50 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 07/30/1981 | 18:00 | CST | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N      | 07/30/198  | 17:5  | CST | Hail | 2.5      | 0 | 0 | 0.00K | 0.00K |

|                              |                   |        |                |           |     |      |                 |   |   |       |       |
|------------------------------|-------------------|--------|----------------|-----------|-----|------|-----------------|---|---|-------|-------|
|                              | H CO.             | D      | 1              | 0         |     |      | 0<br>in.        |   |   |       |       |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH<br>H CO. | N<br>D | 07/21/198<br>1 | 19:0<br>0 | CST | Hail | 1.7<br>5<br>in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH<br>H CO. | N<br>D | 07/10/198<br>1 | 17:4<br>5 | CST | Hail | 1.7<br>5<br>in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH<br>H CO. | N<br>D | 07/10/198<br>1 | 17:2<br>6 | CST | Hail | 1.7<br>5<br>in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH<br>H CO. | N<br>D | 08/23/198<br>0 | 02:2<br>5 | CST | Hail | 1.0<br>0<br>in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH<br>H CO. | N<br>D | 08/23/198<br>0 | 01:3<br>7 | CST | Hail | 1.0<br>0<br>in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH<br>H CO. | N<br>D | 08/09/198<br>0 | 23:1<br>0 | CST | Hail | 1.0<br>0<br>in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH<br>H CO. | N<br>D | 08/03/198<br>0 | 17:1<br>5 | CST | Hail | 1.5<br>0<br>in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH<br>H CO. | N<br>D | 08/03/198<br>0 | 16:4<br>5 | CST | Hail | 1.5<br>0<br>in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH<br>H CO. | N<br>D | 07/13/198<br>0 | 18:2<br>5 | CST | Hail | 0.7<br>5<br>in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH<br>H CO. | N<br>D | 06/26/198<br>0 | 13:4<br>5 | CST | Hail | 1.5<br>0<br>in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH<br>H CO. | N<br>D | 08/28/197<br>9 | 16:3<br>0 | CST | Hail | 0.7<br>5<br>in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH<br>H CO. | N<br>D | 07/01/197<br>9 | 17:2<br>9 | CST | Hail | 1.7<br>5<br>in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH<br>H CO. | N<br>D | 05/25/197<br>8 | 17:5<br>2 | CST | Hail | 1.5<br>0<br>in. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH<br>H CO. | N<br>D | 05/25/197<br>8 | 16:4<br>0 | CST | Hail | 1.0<br>0<br>in. | 0 | 0 | 0.00K | 0.00K |

|                              |              |   |            |       |     |      |          |   |   |           |          |
|------------------------------|--------------|---|------------|-------|-----|------|----------|---|---|-----------|----------|
|                              |              |   |            |       |     |      | in.      |   |   |           |          |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N | 05/24/1978 | 18:50 | CST | Hail | 1.00 in. | 0 | 0 | 0.00K     | 0.00K    |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N | 06/26/1977 | 17:55 | CST | Hail | 2.00 in. | 0 | 0 | 0.00K     | 0.00K    |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N | 07/31/1975 | 16:20 | CST | Hail | 1.50 in. | 0 | 0 | 0.00K     | 0.00K    |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N | 08/19/1974 | 16:30 | CST | Hail | 1.75 in. | 0 | 0 | 0.00K     | 0.00K    |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N | 09/01/1973 | 16:15 | CST | Hail | 0.88 in. | 0 | 0 | 0.00K     | 0.00K    |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N | 08/14/1973 | 15:30 | CST | Hail | 1.75 in. | 0 | 0 | 0.00K     | 0.00K    |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N | 07/28/1970 | 19:45 | CST | Hail | 1.75 in. | 0 | 0 | 0.00K     | 0.00K    |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N | 07/26/1968 | 11:00 | CST | Hail | 1.50 in. | 0 | 0 | 0.00K     | 0.00K    |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N | 05/04/1965 | 20:03 | CST | Hail | 1.00 in. | 0 | 0 | 0.00K     | 0.00K    |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N | 07/21/1964 | 18:00 | CST | Hail | 1.25 in. | 0 | 0 | 0.00K     | 0.00K    |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N | 07/18/1963 | 20:00 | CST | Hail | 1.75 in. | 0 | 0 | 0.00K     | 0.00K    |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N | 07/05/1962 | 17:00 | CST | Hail | 1.75 in. | 0 | 0 | 0.00K     | 0.00K    |
| <b>Totals:</b>               |              |   |            |       |     |      |          | 0 | 0 | 206.980 M | 150.00 K |

## High Wind

| <u>Location</u>                 | <u>County/Zone</u> | <u>St.</u> | <u>Date</u> | <u>Time</u> | <u>T.Z.</u> | <u>Type</u> | <u>Mag</u> | <u>Dth</u> | <u>Inj</u> | <u>PrD</u> | <u>CrD</u> |
|---------------------------------|--------------------|------------|-------------|-------------|-------------|-------------|------------|------------|------------|------------|------------|
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 01/15/2014  | 20:00       | CST-6       | High Wind   | 59 kts. MG | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 05/14/2013  | 05:00       | CST-6       | High Wind   | 56 kts. MG | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 10/17/2012  | 21:00       | CST-6       | High Wind   | 52 kts. MG | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 10/07/2011  | 10:00       | CST-6       | High Wind   | 35 kts. MS | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 09/20/2011  | 03:00       | CST-6       | High Wind   | 35 kts. ES | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 05/31/2011  | 09:00       | CST-6       | High Wind   | 35 kts. ES | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 02/13/2011  | 09:00       | CST-6       | High Wind   | 38 kts. MS | 0          | 0          | 20.00K     | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 10/26/2010  | 11:00       | CST-6       | High Wind   | 53 kts. MG | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 08/13/2010  | 00:47       | CST-6       | High Wind   | 70 kts. MG | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 06/18/2010  | 10:00       | CST-6       | High Wind   | 36 kts. MS | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 05/25/2010  | 09:00       | CST-6       | High Wind   | 52 kts. EG | 0          | 0          | 30.00K     | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 01/31/2009  | 13:30       | CST-6       | High Wind   | 35 kts. ES | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 10/26/2008  | 12:47       | CST-6       | High Wind   | 51 kts. MG | 0          | 0          | 50.00K     | 0.00K      |

|                                 |                 |    |            |       |       |           |            |   |   |        |       |
|---------------------------------|-----------------|----|------------|-------|-------|-----------|------------|---|---|--------|-------|
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 07/12/2008 | 11:47 | CST-6 | High Wind | 37 kts. MS | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 05/19/2008 | 12:30 | CST-6 | High Wind | 35 kts. MS | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 05/01/2008 | 18:00 | CST-6 | High Wind | 52 kts. EG | 0 | 0 | 15.00K | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 03/24/2008 | 17:45 | CST-6 | High Wind | 35 kts. MS | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 01/08/2007 | 18:00 | CST-6 | High Wind | 59 kts. MG | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 03/09/2005 | 22:00 | CST   | High Wind | 46 kts. MS | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 12/20/2004 | 09:00 | CST   | High Wind | 47 kts. MS | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 12/11/2004 | 18:00 | CST   | High Wind | 42 kts. MS | 0 | 1 | 0.00K  | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 03/13/2004 | 12:58 | CST   | High Wind | 53 kts. MS | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 11/29/2002 | 08:00 | CST   | High Wind | 46 kts. M  | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 02/11/2002 | 13:31 | CST   | High Wind | 59 kts. M  | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 11/01/2001 | 10:00 | CST   | High Wind | 43 kts. M  | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 05/22/2001 | 11:42 | CST   | High Wind | 45 kts. M  | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 05/20/2001 | 15:38 | CST   | High Wind | 37 kts. M  | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 05/07/2001 | 13:02 | CST   | High      | 43         | 0 | 0 | 0.00K  | 0.00K |

| <a href="#">(ZONE)</a>          | (ZONE)          |    |            |       |     | Wind      | kts.<br>M    |   |    |         |       |
|---------------------------------|-----------------|----|------------|-------|-----|-----------|--------------|---|----|---------|-------|
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 04/05/2000 | 08:30 | CST | High Wind | 62 kts.<br>M | 0 | 10 | 0.00K   | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 11/01/1999 | 01:00 | CST | High Wind | 53 kts.      | 0 | 0  | 0.00K   | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 02/10/1996 | 10:00 | CST | High Wind | 54 kts.      | 0 | 0  | 0.00K   | 0.00K |
| <b>Totals:</b>                  |                 |    |            |       |     |           |              | 0 | 11 | 115.00K | 0.00K |

### Lightning

| <u>Location</u>               | <u>County/Zon</u><br><u>e</u> | <u>St.</u> | <u>Date</u>    | <u>Time</u> | <u>T.Z.</u> | <u>Type</u>   | <u>Ma</u><br><u>g</u> | <u>Dt</u><br><u>h</u> | <u>In</u><br><u>i</u> | <u>PrD</u>  | <u>CrD</u> |
|-------------------------------|-------------------------------|------------|----------------|-------------|-------------|---------------|-----------------------|-----------------------|-----------------------|-------------|------------|
| <a href="#">BISMARC<br/>K</a> | BURLEIGH<br>CO.               | N<br>D     | 07/30/201<br>1 | 02:0<br>0   | CST<br>-6   | Lightnin<br>g |                       | 0                     | 0                     | 190.00<br>K | 0.00<br>K  |
| <a href="#">WING</a>          | BURLEIGH<br>CO.               | N<br>D     | 07/27/201<br>0 | 02:2<br>5   | CST<br>-6   | Lightnin<br>g |                       | 0                     | 0                     | 8.00K       | 0.00<br>K  |
| <a href="#">BALDWIN</a>       | BURLEIGH<br>CO.               | N<br>D     | 06/26/201<br>0 | 07:2<br>8   | CST<br>-6   | Lightnin<br>g |                       | 0                     | 0                     | 1.00K       | 0.00<br>K  |
| <a href="#">MENOKEN</a>       | BURLEIGH<br>CO.               | N<br>D     | 07/16/200<br>8 | 04:0<br>0   | CST<br>-6   | Lightnin<br>g |                       | 0                     | 0                     | 5.00K       | 0.00<br>K  |
| <a href="#">BISMARC<br/>K</a> | BURLEIGH<br>CO.               | N<br>D     | 08/02/199<br>6 | 21:0<br>0   | CST         | Lightnin<br>g |                       | 0                     | 0                     | 2.00K       | 0.00<br>K  |
| <b>Totals:</b>                |                               |            |                |             |             |               |                       | 0                     | 0                     | 206.00<br>K | 0.00<br>K  |

## Thunderstorm Wind

| <u>Location</u>                      | <u>County/Zone</u> | <u>St.</u> | <u>Date</u> | <u>Time</u> | <u>T.Z.</u> | <u>Type</u>       | <u>Mag</u>    | <u>Dt</u> | <u>In</u> | <u>PrD</u> | <u>CrD</u> |
|--------------------------------------|--------------------|------------|-------------|-------------|-------------|-------------------|---------------|-----------|-----------|------------|------------|
| <a href="#">DRISCOLL</a>             | BURLEIGH CO.       | N<br>D     | 07/21/2014  | 17:05       | CST<br>-6   | Thunderstorm Wind | 52 kts.<br>EG | 0         | 0         | 0.00K      | 0.00K      |
| <a href="#">WILTON</a>               | BURLEIGH CO.       | N<br>D     | 07/21/2014  | 16:42       | CST<br>-6   | Thunderstorm Wind | 65 kts.<br>EG | 0         | 0         | 0.00K      | 0.00K      |
| <a href="#">(BIS)BISMARCK MUNI A</a> | BURLEIGH CO.       | N<br>D     | 07/21/2014  | 16:33       | CST<br>-6   | Thunderstorm Wind | 52 kts.<br>EG | 0         | 0         | 0.00K      | 0.00K      |
| <a href="#">FT LINCOLN</a>           | BURLEIGH CO.       | N<br>D     | 07/21/2014  | 16:25       | CST<br>-6   | Thunderstorm Wind | 52 kts.<br>EG | 0         | 0         | 0.00K      | 0.00K      |
| <a href="#">FT LINCOLN</a>           | BURLEIGH CO.       | N<br>D     | 07/21/2014  | 16:24       | CST<br>-6   | Thunderstorm Wind | 52 kts.<br>EG | 0         | 0         | 0.00K      | 0.00K      |
| <a href="#">MOFFIT</a>               | BURLEIGH CO.       | N<br>D     | 07/05/2014  | 19:50       | CST<br>-6   | Thunderstorm Wind | 61 kts.<br>EG | 0         | 0         | 10.00K     | 0.00K      |
| <a href="#">MOFFIT</a>               | BURLEIGH CO.       | N<br>D     | 07/05/2014  | 19:50       | CST<br>-6   | Thunderstorm Wind | 65 kts.<br>MG | 0         | 0         | 0.00K      | 0.00K      |
| <a href="#">(BIS)BISMARCK MUNI A</a> | BURLEIGH CO.       | N<br>D     | 07/05/2014  | 19:30       | CST<br>-6   | Thunderstorm Wind | 65 kts.<br>EG | 0         | 0         | 175.00K    | 0.00K      |
| <a href="#">BISMARCK</a>             | BURLEIGH CO.       | N<br>D     | 08/30/2013  | 20:10       | CST<br>-6   | Thunderstorm Wind | 52 kts.<br>EG | 0         | 0         | 0.00K      | 0.00K      |
| <a href="#">DRISCOLL</a>             | BURLEIGH CO.       | N<br>D     | 08/29/2013  | 03:27       | CST<br>-6   | Thunderstorm Wind | 52 kts.<br>EG | 0         | 0         | 0.00K      | 0.00K      |
| <a href="#">BISMARCK</a>             | BURLEIGH CO.       | N<br>D     | 08/29/2013  | 02:48       | CST<br>-6   | Thunderstorm Wind | 52 kts.<br>MG | 0         | 0         | 0.00K      | 0.00K      |
| <a href="#">BISMARCK</a>             | BURLEIGH CO.       | N<br>D     | 07/21/2013  | 18:21       | CST<br>-6   | Thunderstorm Wind | 52 kts.<br>EG | 0         | 0         | 0.00K      | 0.00K      |
| <a href="#">BISMARCK</a>             | BURLEIGH           | N          | 07/08/20    | 21:4        | CST         | Thunderstor       | 52            | 0         | 0         | 0.00K      | 0.00K      |

|                                      |              |        |                |           |           |                   |                      |   |   |        |       |
|--------------------------------------|--------------|--------|----------------|-----------|-----------|-------------------|----------------------|---|---|--------|-------|
|                                      | H CO.        | D      | 13             | 0         | -6        | m Wind            | kts.<br>EG           |   |   |        |       |
| <a href="#">REGAN</a>                | BURLEIGH CO. | N<br>D | 06/22/20<br>13 | 21:5<br>0 | CST<br>-6 | Thunderstorm Wind | 61<br>kts.<br>EG     | 0 | 0 | 35.00K | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N<br>D | 06/22/20<br>13 | 21:2<br>1 | CST<br>-6 | Thunderstorm Wind | 61<br>kts.<br>EG     | 0 | 0 | 30.00K | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N<br>D | 06/22/20<br>13 | 21:0<br>5 | CST<br>-6 | Thunderstorm Wind | 56<br>kts.<br>EG     | 0 | 0 | 20.00K | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N<br>D | 06/22/20<br>13 | 21:0<br>0 | CST<br>-6 | Thunderstorm Wind | 65<br>kts.<br>EG     | 0 | 0 | 40.00K | 0.00K |
| <a href="#">(BIS)BISMARCK MUNI A</a> | BURLEIGH CO. | N<br>D | 06/22/20<br>13 | 20:3<br>0 | CST<br>-6 | Thunderstorm Wind | 52<br>kts.<br>EG     | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N<br>D | 06/22/20<br>13 | 20:2<br>6 | CST<br>-6 | Thunderstorm Wind | 61<br>kts.<br>EG     | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">(BIS)BISMARCK MUNI A</a> | BURLEIGH CO. | N<br>D | 06/22/20<br>13 | 20:2<br>4 | CST<br>-6 | Thunderstorm Wind | 61<br>kts.<br>EG     | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">(BIS)BISMARCK MUNI A</a> | BURLEIGH CO. | N<br>D | 08/28/20<br>12 | 02:3<br>0 | CST<br>-6 | Thunderstorm Wind | 52<br>kts.<br>EG     | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">DRISCOLL</a>             | BURLEIGH CO. | N<br>D | 08/24/20<br>12 | 19:1<br>5 | CST<br>-6 | Thunderstorm Wind | 52<br>kts.<br>EG     | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">WING</a>                 | BURLEIGH CO. | N<br>D | 08/24/20<br>12 | 18:0<br>4 | CST<br>-6 | Thunderstorm Wind | 52<br>kts.<br>EG     | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">REGAN</a>                | BURLEIGH CO. | N<br>D | 08/24/20<br>12 | 17:3<br>0 | CST<br>-6 | Thunderstorm Wind | 52<br>kts.<br>EG     | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">DRISCOLL</a>             | BURLEIGH CO. | N<br>D | 07/12/20<br>12 | 22:1<br>0 | CST<br>-6 | Thunderstorm Wind | 59<br>kts.<br>M<br>G | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">FT LINCOLN</a>           | BURLEIGH CO. | N<br>D | 07/11/20<br>12 | 21:4<br>0 | CST<br>-6 | Thunderstorm Wind | 52<br>kts.<br>EG     | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N      | 07/11/20       | 21:4      | CST       | Thunderstorm      | 52                   | 0 | 0 | 0.00K  | 0.00K |

|   |                  |        |                |           |           |                       |                      |   |   |       |       |
|---|------------------|--------|----------------|-----------|-----------|-----------------------|----------------------|---|---|-------|-------|
|   | H CO.            | D      | 12             | 0         | -6        | m Wind                | kts.<br>M<br>G       |   |   |       |       |
| <a href="#">(BIS)BISMAR<br/>CK MUNI A</a> | BURLEIG<br>H CO. | N<br>D | 07/11/20<br>12 | 21:3<br>6 | CST<br>-6 | Thunderstor<br>m Wind | 61<br>kts.<br>EG     | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a>                  | BURLEIG<br>H CO. | N<br>D | 07/11/20<br>12 | 21:3<br>5 | CST<br>-6 | Thunderstor<br>m Wind | 52<br>kts.<br>M<br>G | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a>                  | BURLEIG<br>H CO. | N<br>D | 07/11/20<br>12 | 21:3<br>3 | CST<br>-6 | Thunderstor<br>m Wind | 52<br>kts.<br>EG     | 0 | 0 | 0.00K | 0.00K |
| <a href="#">(BIS)BISMAR<br/>CK MUNI A</a> | BURLEIG<br>H CO. | N<br>D | 06/15/20<br>12 | 21:1<br>7 | CST<br>-6 | Thunderstor<br>m Wind | 53<br>kts.<br>M<br>G | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a>                  | BURLEIG<br>H CO. | N<br>D | 06/13/20<br>12 | 22:3<br>2 | CST<br>-6 | Thunderstor<br>m Wind | 56<br>kts.<br>EG     | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a>                  | BURLEIG<br>H CO. | N<br>D | 06/13/20<br>12 | 22:2<br>1 | CST<br>-6 | Thunderstor<br>m Wind | 52<br>kts.<br>EG     | 0 | 0 | 0.00K | 0.00K |
| <a href="#">(BIS)BISMAR<br/>CK MUNI A</a> | BURLEIG<br>H CO. | N<br>D | 06/13/20<br>12 | 22:1<br>8 | CST<br>-6 | Thunderstor<br>m Wind | 52<br>kts.<br>M<br>G | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a>                  | BURLEIG<br>H CO. | N<br>D | 06/13/20<br>12 | 22:1<br>4 | CST<br>-6 | Thunderstor<br>m Wind | 56<br>kts.<br>EG     | 0 | 0 | 0.00K | 0.00K |
| <a href="#">FT LINCOLN</a>                | BURLEIG<br>H CO. | N<br>D | 08/15/20<br>11 | 20:3<br>0 | CST<br>-6 | Thunderstor<br>m Wind | 61<br>kts.<br>EG     | 0 | 0 | 0.00K | 0.00K |
| <a href="#">(BIS)BISMAR<br/>CK MUNI A</a> | BURLEIG<br>H CO. | N<br>D | 08/15/20<br>11 | 20:1<br>0 | CST<br>-6 | Thunderstor<br>m Wind | 62<br>kts.<br>M<br>G | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a>                  | BURLEIG<br>H CO. | N<br>D | 08/15/20<br>11 | 19:5<br>3 | CST<br>-6 | Thunderstor<br>m Wind | 52<br>kts.<br>M<br>G | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BISMARCK</a>                  | BURLEIG<br>H CO. | N<br>D | 08/05/20<br>11 | 18:3<br>2 | CST<br>-6 | Thunderstor<br>m Wind | 52<br>kts.<br>EG     | 0 | 0 | 0.00K | 0.00K |

|                                      |              |        |            |       |           |                   |               |   |   |         |       |
|--------------------------------------|--------------|--------|------------|-------|-----------|-------------------|---------------|---|---|---------|-------|
| <a href="#">STERLING</a>             | BURLEIGH CO. | N<br>D | 07/31/2011 | 22:35 | CST<br>-6 | Thunderstorm Wind | 70 kts.<br>EG | 0 | 0 | 40.00K  | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N<br>D | 07/31/2011 | 22:18 | CST<br>-6 | Thunderstorm Wind | 68 kts.<br>MG | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N<br>D | 07/31/2011 | 22:10 | CST<br>-6 | Thunderstorm Wind | 74 kts.<br>EG | 0 | 0 | 35.00K  | 0.00K |
| <a href="#">(BIS)BISMARCK MUNI A</a> | BURLEIGH CO. | N<br>D | 07/31/2011 | 21:56 | CST<br>-6 | Thunderstorm Wind | 59 kts.<br>MG | 0 | 0 | 0.20K   | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N<br>D | 07/31/2011 | 21:45 | CST<br>-6 | Thunderstorm Wind | 61 kts.<br>EG | 0 | 0 | 35.00K  | 0.00K |
| <a href="#">STERLING</a>             | BURLEIGH CO. | N<br>D | 07/30/2011 | 03:00 | CST<br>-6 | Thunderstorm Wind | 52 kts.<br>EG | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N<br>D | 07/22/2011 | 22:01 | CST<br>-6 | Thunderstorm Wind | 56 kts.<br>EG | 0 | 0 | 15.00K  | 0.00K |
| <a href="#">MOFFIT</a>               | BURLEIGH CO. | N<br>D | 07/10/2011 | 13:14 | CST<br>-6 | Thunderstorm Wind | 83 kts.<br>EG | 0 | 0 | 250.00K | 0.00K |
| <a href="#">(BIS)BISMARCK MUNI A</a> | BURLEIGH CO. | N<br>D | 07/10/2011 | 12:52 | CST<br>-6 | Thunderstorm Wind | 65 kts.<br>EG | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N<br>D | 06/12/2011 | 21:20 | CST<br>-6 | Thunderstorm Wind | 61 kts.<br>EG | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">MOFFIT</a>               | BURLEIGH CO. | N<br>D | 08/11/2010 | 23:47 | CST<br>-6 | Thunderstorm Wind | 59 kts.<br>MG | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N<br>D | 08/02/2010 | 14:40 | CST<br>-6 | Thunderstorm Wind | 56 kts.<br>EG | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N<br>D | 08/02/2010 | 14:25 | CST<br>-6 | Thunderstorm Wind | 61 kts.<br>MG | 0 | 0 | 0.00K   | 0.00K |

|                                      |              |        |            |       |           |                   |                      |   |   |         |       |
|--------------------------------------|--------------|--------|------------|-------|-----------|-------------------|----------------------|---|---|---------|-------|
| <a href="#">MOFFIT</a>               | BURLEIGH CO. | N<br>D | 06/22/2010 | 02:00 | CST<br>-6 | Thunderstorm Wind | 71<br>kts.<br>M<br>G | 0 | 0 | 30.00K  | 0.00K |
| <a href="#">MOFFIT</a>               | BURLEIGH CO. | N<br>D | 06/17/2010 | 13:47 | CST<br>-6 | Thunderstorm Wind | 53<br>kts.<br>M<br>G | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N<br>D | 06/17/2010 | 13:06 | CST<br>-6 | Thunderstorm Wind | 59<br>kts.<br>M<br>G | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">ARENA</a>                | BURLEIGH CO. | N<br>D | 06/17/2010 | 00:00 | CST<br>-6 | Thunderstorm Wind | 52<br>kts.<br>E<br>G | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N<br>D | 06/16/2010 | 23:20 | CST<br>-6 | Thunderstorm Wind | 56<br>kts.<br>E<br>G | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N<br>D | 06/16/2010 | 23:00 | CST<br>-6 | Thunderstorm Wind | 56<br>kts.<br>E<br>G | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N<br>D | 06/16/2010 | 22:52 | CST<br>-6 | Thunderstorm Wind | 68<br>kts.<br>M<br>G | 0 | 0 | 50.00K  | 0.00K |
| <a href="#">(BIS)BISMARCK MUNI A</a> | BURLEIGH CO. | N<br>D | 06/16/2010 | 22:52 | CST<br>-6 | Thunderstorm Wind | 61<br>kts.<br>E<br>G | 0 | 0 | 10.00K  | 0.00K |
| <a href="#">MOFFIT</a>               | BURLEIGH CO. | N<br>D | 06/16/2010 | 22:47 | CST<br>-6 | Thunderstorm Wind | 50<br>kts.<br>M<br>G | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">MOFFIT</a>               | BURLEIGH CO. | N<br>D | 05/24/2010 | 19:53 | CST<br>-6 | Thunderstorm Wind | 55<br>kts.<br>M<br>G | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">DRISCOLL</a>             | BURLEIGH CO. | N<br>D | 05/24/2010 | 19:53 | CST<br>-6 | Thunderstorm Wind | 56<br>kts.<br>M<br>G | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">ARENA</a>                | BURLEIGH CO. | N<br>D | 05/24/2010 | 19:47 | CST<br>-6 | Thunderstorm Wind | 78<br>kts.<br>E<br>G | 0 | 0 | 400.00K | 0.00K |
| <a href="#">WING</a>                 | BURLEIGH     | N      | 05/24/20   | 19:4  | CST       | Thunderstor       | 74                   | 0 | 0 | 50.00K  | 0.00K |

|                                      |              |        |                |           |           |                   |                      |   |   |             |       |  |
|--------------------------------------|--------------|--------|----------------|-----------|-----------|-------------------|----------------------|---|---|-------------|-------|--|
|                                      | H CO.        | D      | 10             | 4         | -6        | m Wind            | kts.<br>EG           |   |   |             |       |  |
| <a href="#">DRISCOLL</a>             | BURLEIGH CO. | N<br>D | 05/24/20<br>10 | 19:3<br>5 | CST<br>-6 | Thunderstorm Wind | 74<br>kts.<br>EG     | 0 | 0 | 200.00<br>K | 0.00K |  |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N<br>D | 07/09/20<br>09 | 00:0<br>0 | CST<br>-6 | Thunderstorm Wind | 52<br>kts.<br>EG     | 0 | 0 | 5.00K       | 0.00K |  |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N<br>D | 06/22/20<br>09 | 17:4<br>0 | CST<br>-6 | Thunderstorm Wind | 61<br>kts.<br>EG     | 0 | 0 | 17.00K      | 0.00K |  |
| <a href="#">(BIS)BISMARCK MUNI A</a> | BURLEIGH CO. | N<br>D | 05/12/20<br>09 | 18:5<br>0 | CST<br>-6 | Thunderstorm Wind | 52<br>kts.<br>EG     | 0 | 0 | 4.00K       | 0.00K |  |
| <a href="#">MOFFIT</a>               | BURLEIGH CO. | N<br>D | 03/22/20<br>09 | 10:3<br>5 | CST<br>-6 | Thunderstorm Wind | 58<br>kts.<br>M<br>G | 0 | 0 | 0.00K       | 0.00K |  |
| <a href="#">(BIS)BISMARCK MUNI A</a> | BURLEIGH CO. | N<br>D | 07/30/20<br>08 | 23:5<br>0 | CST<br>-6 | Thunderstorm Wind | 70<br>kts.<br>EG     | 0 | 0 | 40.00K      | 0.00K |  |
| <a href="#">BALDWIN</a>              | BURLEIGH CO. | N<br>D | 07/30/20<br>08 | 23:3<br>0 | CST<br>-6 | Thunderstorm Wind | 65<br>kts.<br>EG     | 0 | 0 | 10.00K      | 0.00K |  |
| <a href="#">(BIS)BISMARCK MUNI A</a> | BURLEIGH CO. | N<br>D | 06/26/20<br>08 | 18:2<br>0 | CST<br>-6 | Thunderstorm Wind | 60<br>kts.<br>EG     | 0 | 0 | 4.00K       | 0.00K |  |
| <a href="#">MENOKEN</a>              | BURLEIGH CO. | N<br>D | 07/01/20<br>07 | 19:1<br>5 | CST<br>-6 | Thunderstorm Wind | 65<br>kts.<br>EG     | 0 | 0 | 40.00K      | 0.00K |  |
| <a href="#">BISMARCK ARPT</a>        | BURLEIGH CO. | N<br>D | 05/14/20<br>07 | 01:1<br>8 | CST<br>-6 | Thunderstorm Wind | 55<br>kts.<br>M<br>G | 0 | 0 | 0.00K       | 0.00K |  |
| <a href="#">MOFFIT</a>               | BURLEIGH CO. | N<br>D | 08/24/20<br>06 | 15:0<br>0 | CST       | Thunderstorm Wind | 52<br>kts.<br>EG     | 0 | 0 | 0.00K       | 0.00K |  |
| <a href="#">REGAN</a>                | BURLEIGH CO. | N<br>D | 06/30/20<br>06 | 19:0<br>0 | CST       | Thunderstorm Wind | 57<br>kts.<br>EG     | 0 | 0 | 2.00K       | 0.00K |  |
| <a href="#">DRISCOLL</a>             | BURLEIGH CO. | N<br>D | 07/02/20<br>05 | 22:4<br>5 | CST       | Thunderstorm Wind | 52<br>kts.<br>EG     | 0 | 0 | 0.00K       | 0.00K |  |

|                                      |              |   |            |       |     |                   |            |   |   |        |       |
|--------------------------------------|--------------|---|------------|-------|-----|-------------------|------------|---|---|--------|-------|
| <a href="#">BISMARCK ARPT</a>        | BURLEIGH CO. | N | 06/06/2005 | 23:02 | CST | Thunderstorm Wind | 61 kts. EG | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">(BIS)BISMARCK MUNI A</a> | BURLEIGH CO. | N | 08/23/2004 | 19:27 | CST | Thunderstorm Wind | 50 kts. MG | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">(BIS)BISMARCK MUNI A</a> | BURLEIGH CO. | N | 08/08/2002 | 20:09 | CST | Thunderstorm Wind | 68 kts. M  | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">(BIS)BISMARCK MUNI A</a> | BURLEIGH CO. | N | 06/09/2002 | 00:06 | CST | Thunderstorm Wind | 54 kts. M  | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">DRISCOLL</a>             | BURLEIGH CO. | N | 07/22/2001 | 04:00 | CST | Thunderstorm Wind | 61 kts. E  | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">(BIS)BISMARCK MUNI A</a> | BURLEIGH CO. | N | 07/22/2001 | 03:32 | CST | Thunderstorm Wind | 61 kts. M  | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">WILTON</a>               | BURLEIGH CO. | N | 07/22/2001 | 03:27 | CST | Thunderstorm Wind | 61 kts. E  | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">WILTON</a>               | BURLEIGH CO. | N | 07/22/2001 | 03:00 | CST | Thunderstorm Wind | 57 kts. E  | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N | 07/21/2001 | 00:05 | CST | Thunderstorm Wind | 52 kts. E  | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">(BIS)BISMARCK MUNI A</a> | BURLEIGH CO. | N | 07/19/2001 | 23:00 | CST | Thunderstorm Wind | 52 kts. E  | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">(BIS)BISMARCK MUNI A</a> | BURLEIGH CO. | N | 07/19/2001 | 22:32 | CST | Thunderstorm Wind | 66 kts. M  | 0 | 0 | 50.00K | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N | 08/15/1999 | 17:44 | CST | Thunderstorm Wind | 52 kts.    | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">REGAN</a>                | BURLEIGH CO. | N | 07/25/1999 | 05:00 | CST | Thunderstorm Wind | 61 kts.    | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">MENOKEN</a>              | BURLEIGH CO. | N | 06/25/1999 | 20:50 | CST | Thunderstorm Wind | 70 kts.    | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">BISMARCK</a>             | BURLEIGH CO. | N | 06/25/1999 | 20:40 | CST | Thunderstorm Wind | 78 kts.    | 0 | 0 | 2.00M  | 0.00K |

|                                       |              |        |                |           |     |                   |            |   |   |             |        |
|---------------------------------------|--------------|--------|----------------|-----------|-----|-------------------|------------|---|---|-------------|--------|
| <a href="#">BISMARCK ARPT</a>         | BURLEIGH CO. | N<br>D | 06/25/19<br>99 | 20:3<br>1 | CST | Thunderstorm Wind | 70<br>kts. | 0 | 0 | 0.00K       | 0.00K  |
| <a href="#">REGAN</a>                 | BURLEIGH CO. | N<br>D | 05/27/19<br>98 | 16:4<br>9 | CST | Thunderstorm Wind | 52<br>kts. | 0 | 0 | 0.00K       | 0.00K  |
| <a href="#">BISMARCK ARPT</a>         | BURLEIGH CO. | N<br>D | 09/15/19<br>97 | 23:1<br>3 | CST | Thunderstorm Wind | 57<br>kts. | 0 | 0 | 0.00K       | 0.00K  |
| <a href="#">BISMARCK</a>              | BURLEIGH CO. | N<br>D | 07/18/19<br>97 | 04:0<br>0 | CST | Thunderstorm Wind | 65<br>kts. | 0 | 0 | 10.00K      | 0.00K  |
| <a href="#">BISMARCK</a>              | BURLEIGH CO. | N<br>D | 06/29/19<br>97 | 01:3<br>0 | CST | Thunderstorm Wind | 52<br>kts. | 0 | 0 | 0.00K       | 0.00K  |
| <a href="#">BISMARCK</a>              | BURLEIGH CO. | N<br>D | 05/07/19<br>97 | 16:1<br>0 | CST | Thunderstorm Wind | 61<br>kts. | 0 | 0 | 0.00K       | 0.00K  |
| <a href="#">BISMARCK</a>              | BURLEIGH CO. | N<br>D | 08/02/19<br>96 | 20:5<br>5 | CST | Thunderstorm Wind | 55<br>kts. | 0 | 0 | 0.00K       | 0.00K  |
| <a href="#">BISMARCK</a>              | BURLEIGH CO. | N<br>D | 07/28/19<br>96 | 16:4<br>2 | CST | Thunderstorm Wind | 55<br>kts. | 0 | 0 | 0.00K       | 0.00K  |
| <a href="#">BISMARCK</a>              | BURLEIGH CO. | N<br>D | 06/11/19<br>96 | 20:3<br>0 | CST | Thunderstorm Wind | 57<br>kts. | 0 | 0 | 0.00K       | 0.00K  |
| <a href="#">BISMARCK</a>              | BURLEIGH CO. | N<br>D | 05/16/19<br>96 | 23:1<br>2 | CST | Thunderstorm Wind | 69<br>kts. | 0 | 0 | 3.200<br>M  | 0.00K  |
| <a href="#">Lincoln</a>               | BURLEIGH CO. | N<br>D | 08/21/19<br>95 | 20:5<br>5 | CST | Thunderstorm Wind | 70<br>kts. | 0 | 0 | 0.00K       | 0.00K  |
| <a href="#">WSFO Bismarck</a>         | BURLEIGH CO. | N<br>D | 08/21/19<br>95 | 20:4<br>0 | CST | Thunderstorm Wind | 62<br>kts. | 0 | 0 | 0.00K       | 0.00K  |
| <a href="#">Bismarck</a>              | BURLEIGH CO. | N<br>D | 07/12/19<br>95 | 21:5<br>6 | CST | Thunderstorm Wind | 61<br>kts. | 0 | 0 | 0.00K       | 0.00K  |
| <a href="#">Bismarck</a>              | BURLEIGH CO. | N<br>D | 07/11/19<br>95 | 22:4<br>7 | CST | Thunderstorm Wind | 60<br>kts. | 0 | 0 | 0.00K       | 0.00K  |
| <a href="#">Bismarck</a>              | BURLEIGH CO. | N<br>D | 05/21/19<br>95 | 17:1<br>0 | CST | Thunderstorm Wind | 55<br>kts. | 0 | 0 | 0.00K       | 0.00K  |
| <a href="#">Menoken</a>               | BURLEIGH CO. | N<br>D | 08/22/19<br>94 | 21:0<br>0 | CST | Thunderstorm Wind | 52<br>kts. | 0 | 0 | 5.00K       | 0.00K  |
| <a href="#">Lincoln</a>               | BURLEIGH CO. | N<br>D | 08/22/19<br>94 | 19:3<br>0 | CST | Thunderstorm Wind | 0<br>kts.  | 0 | 0 | 10.00K      | 0.00K  |
| <a href="#">Bismarck</a>              | BURLEIGH CO. | N<br>D | 06/21/19<br>94 | 20:0<br>0 | CST | Thunderstorm Wind | 0<br>kts.  | 0 | 0 | 50.00K      | 0.00K  |
| <a href="#">Bismarck</a>              | BURLEIGH CO. | N<br>D | 06/21/19<br>94 | 19:3<br>0 | CST | Thunderstorm Wind | 0<br>kts.  | 0 | 0 | 5.00K       | 50.00K |
| <a href="#">Wilton and Baldwin ar</a> | BURLEIGH CO. | N<br>D | 06/21/19<br>94 | 19:1<br>5 | CST | Thunderstorm Wind | 0<br>kts.  | 0 | 0 | 500.00<br>K | 50.00K |

|                              |              |   |          |       |     |                   |         |   |   |       |       |
|------------------------------|--------------|---|----------|-------|-----|-------------------|---------|---|---|-------|-------|
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N | 06/14/19 | 18:00 | CST | Thunderstorm Wind | 56 kts. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N | 08/18/19 | 14:30 | CST | Thunderstorm Wind | 52 kts. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N | 07/28/19 | 16:30 | CST | Thunderstorm Wind | 0 kts.  | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N | 09/24/19 | 23:35 | CST | Thunderstorm Wind | 73 kts. | 0 | 1 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N | 08/21/19 | 21:26 | CST | Thunderstorm Wind | 50 kts. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N | 04/19/19 | 18:13 | CST | Thunderstorm Wind | 0 kts.  | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N | 08/13/19 | 17:10 | CST | Thunderstorm Wind | 53 kts. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N | 08/13/19 | 15:08 | CST | Thunderstorm Wind | 53 kts. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N | 07/05/19 | 03:26 | CST | Thunderstorm Wind | 64 kts. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N | 07/05/19 | 02:44 | CST | Thunderstorm Wind | 64 kts. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N | 08/05/19 | 01:19 | CST | Thunderstorm Wind | 0 kts.  | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N | 07/18/19 | 15:48 | CST | Thunderstorm Wind | 52 kts. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N | 08/29/19 | 02:55 | CST | Thunderstorm Wind | 60 kts. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N | 08/03/19 | 18:18 | CST | Thunderstorm Wind | 53 kts. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N | 07/03/19 | 18:18 | CST | Thunderstorm Wind | 50 kts. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N | 05/27/19 | 19:27 | CST | Thunderstorm Wind | 57 kts. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N | 05/27/19 | 19:00 | CST | Thunderstorm Wind | 52 kts. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N | 06/02/19 | 20:43 | CST | Thunderstorm Wind | 59 kts. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N | 05/19/19 | 12:53 | CST | Thunderstorm Wind | 53 kts. | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N | 09/11/19 | 17:05 | CST | Thunderstorm Wind | 50 kts. | 0 | 0 | 0.00K | 0.00K |

|                              |              |        |                |           |     |                   |            |   |   |            |             |
|------------------------------|--------------|--------|----------------|-----------|-----|-------------------|------------|---|---|------------|-------------|
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 07/11/19<br>78 | 23:4<br>8 | CST | Thunderstorm Wind | 61<br>kts. | 0 | 0 | 0.00K      | 0.00K       |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 07/04/19<br>78 | 22:1<br>4 | CST | Thunderstorm Wind | 52<br>kts. | 0 | 0 | 0.00K      | 0.00K       |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 06/15/19<br>78 | 01:4<br>8 | CST | Thunderstorm Wind | 70<br>kts. | 0 | 0 | 0.00K      | 0.00K       |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 07/10/19<br>77 | 19:2<br>6 | CST | Thunderstorm Wind | 65<br>kts. | 0 | 0 | 0.00K      | 0.00K       |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 05/15/19<br>77 | 16:2<br>5 | CST | Thunderstorm Wind | 0<br>kts.  | 0 | 0 | 0.00K      | 0.00K       |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 05/15/19<br>77 | 16:1<br>2 | CST | Thunderstorm Wind | 0<br>kts.  | 0 | 0 | 0.00K      | 0.00K       |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 06/11/19<br>76 | 21:1<br>5 | CST | Thunderstorm Wind | 50<br>kts. | 0 | 0 | 0.00K      | 0.00K       |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 06/11/19<br>76 | 15:3<br>0 | CST | Thunderstorm Wind | 0<br>kts.  | 0 | 0 | 0.00K      | 0.00K       |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | N<br>D | 05/01/19<br>65 | 19:3<br>0 | CST | Thunderstorm Wind | 52<br>kts. | 0 | 0 | 0.00K      | 0.00K       |
| <b>Totals:</b>               |              |        |                |           |     |                   |            | 0 | 1 | 7.377<br>M | 100.00<br>K |

## Tornado

| <u>Location</u>               | <u>County/Zone</u> | <u>St.</u> | <u>Date</u> | <u>Time</u> | <u>T.Z.</u> | <u>Type</u> | <u>Mag</u> | <u>Dth</u> | <u>Inj</u> | <u>PrD</u> | <u>CrD</u> |
|-------------------------------|--------------------|------------|-------------|-------------|-------------|-------------|------------|------------|------------|------------|------------|
| <a href="#">REGAN</a>         | BURLEIGH CO.       | ND         | 07/16/2011  | 16:35       | CST-6       | Tornado     | EF1        | 0          | 0          | 10.00K     | 0.00K      |
| <a href="#">MENOKEN</a>       | BURLEIGH CO.       | ND         | 08/11/2008  | 12:08       | CST-6       | Tornado     | EF0        | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BALDWIN</a>       | BURLEIGH CO.       | ND         | 07/28/2008  | 20:25       | CST-6       | Tornado     | EF0        | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BALDWIN</a>       | BURLEIGH CO.       | ND         | 07/10/2008  | 17:10       | CST-6       | Tornado     | EF0        | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">STERLING</a>      | BURLEIGH CO.       | ND         | 06/16/2007  | 23:57       | CST-6       | Tornado     | EF0        | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">MOFFIT</a>        | BURLEIGH CO.       | ND         | 06/16/2007  | 23:25       | CST-6       | Tornado     | EF0        | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BISMARCK ARPT</a> | BURLEIGH CO.       | ND         | 06/06/2005  | 23:02       | CST         | Tornado     | F1         | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BISMARCK</a>      | BURLEIGH CO.       | ND         | 06/23/2002  | 18:55       | CST         | Tornado     | F0         | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">DRISCOLL</a>      | BURLEIGH CO.       | ND         | 05/30/2001  | 13:50       | CST         | Tornado     | F0         | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">WILTON</a>        | BURLEIGH CO.       | ND         | 11/01/2000  | 15:05       | CST         | Tornado     | F0         | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BISMARCK</a>      | BURLEIGH CO.       | ND         | 11/01/2000  | 14:33       | CST         | Tornado     | F2         | 0          | 0          | 55.00K     | 0.00K      |
| <a href="#">BISMARCK</a>      | BURLEIGH CO.       | ND         | 11/01/2000  | 13:55       | CST         | Tornado     | F1         | 0          | 2          | 0.00K      | 0.00K      |
| <a href="#">ARENA</a>         | BURLEIGH CO.       | ND         | 06/25/1999  | 21:24       | CST         | Tornado     | F1         | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">WING</a>          | BURLEIGH CO.       | ND         | 06/06/1999  | 13:20       | CST         | Tornado     | F0         | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">REGAN</a>         | BURLEIGH CO.       | ND         | 06/06/1999  | 12:30       | CST         | Tornado     | F0         | 0          | 0          | 20.00K     | 0.00K      |
| <a href="#">DRISCOLL</a>      | BURLEIGH CO.       | ND         | 06/03/1999  | 16:50       | CST         | Tornado     | F1         | 0          | 0          | 75.00K     | 0.00K      |
| <a href="#">DRISCOLL</a>      | BURLEIGH CO.       | ND         | 06/03/1999  | 16:43       | CST         | Tornado     | F0         | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BISMARCK</a>      | BURLEIGH CO.       | ND         | 06/18/1998  | 14:10       | CST         | Tornado     | F0         | 0          | 0          | 0.00K      | 0.00K      |

|                              |              |    |            |       |     |         |    |   |   |         |       |
|------------------------------|--------------|----|------------|-------|-----|---------|----|---|---|---------|-------|
| <a href="#">WILTON</a>       | BURLEIGH CO. | ND | 05/13/1998 | 20:10 | CST | Tornado | F0 | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BISMARCK</a>     | BURLEIGH CO. | ND | 08/05/1997 | 17:10 | CST | Tornado | F0 | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | ND | 06/16/1992 | 17:20 | CST | Tornado | F0 | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | ND | 05/30/1985 | 14:24 | CST | Tornado | F0 | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | ND | 05/30/1985 | 13:55 | CST | Tornado | F2 | 0 | 0 | 25.00K  | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | ND | 05/10/1985 | 14:15 | CST | Tornado | F1 | 0 | 0 | 25.00K  | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | ND | 05/10/1985 | 14:12 | CST | Tornado | F1 | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | ND | 05/10/1985 | 14:10 | CST | Tornado | F0 | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | ND | 07/17/1983 | 20:50 | CST | Tornado | F0 | 0 | 0 | 0.03K   | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | ND | 07/30/1981 | 18:00 | CST | Tornado | F3 | 0 | 0 | 250.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | ND | 08/03/1980 | 17:00 | CST | Tornado | F1 | 0 | 0 | 2.50K   | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | ND | 08/21/1979 | 16:55 | CST | Tornado | F0 | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | ND | 06/15/1978 | 20:25 | CST | Tornado | F0 | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | ND | 06/11/1976 | 20:32 | CST | Tornado | F1 | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | ND | 06/11/1976 | 16:15 | CST | Tornado | F1 | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | ND | 06/17/1968 | 17:00 | CST | Tornado | F0 | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | ND | 06/19/1965 | 20:00 | CST | Tornado | F0 | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | ND | 07/04/1960 | 16:45 | CST | Tornado | F0 | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | ND | 07/02/1960 | 11:20 | CST | Tornado | F0 | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | ND | 07/16/1957 | 20:00 | CST | Tornado | F2 | 0 | 0 | 2.50K   | 0.00K |

|                              |              |    |            |       |     |         |    |   |    |         |       |
|------------------------------|--------------|----|------------|-------|-----|---------|----|---|----|---------|-------|
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | ND | 05/01/1957 | 17:45 | CST | Tornado | F0 | 0 | 0  | 0.00K   | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | ND | 06/17/1956 | 18:30 | CST | Tornado | F2 | 0 | 0  | 250.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | ND | 07/01/1952 | 18:36 | CST | Tornado | F4 | 0 | 1  | 250.00K | 0.00K |
| <a href="#">BURLEIGH CO.</a> | BURLEIGH CO. | ND | 07/01/1952 | 18:00 | CST | Tornado | F4 | 1 | 25 | 250.00K | 0.00K |
| <b>Totals:</b>               |              |    |            |       |     |         |    | 1 | 28 | 1.215M  | 0.00K |

Some of the more significant events include:

**July 21, 2005** - 2.50 inches of hail was reported in Bismarck. Nickel size to tennis ball size hail combined with 70 mph winds caused extensive and widespread damage in Bismarck. The larger hail fell on the north side of the city where most of the damage occurred. Numerous homes and vehicles damaged. There was damage to siding and roofs, and windows were broken. Property damage estimates were provided by the North Dakota Insurance Commissioner.

**June 9, 2001** – 1.00 inch hail reported at the Bismarck Airport. An approaching upper level system provided lift to produce severe thunderstorms over central North Dakota Saturday afternoon and evening. Abundant low-level moisture combined with relatively cool air aloft lead to the formation of an incredible amount of hail with many of these storms. The hail caused a tremendous amount of damage to homes and vehicles in the Bismarck and Mandan area's. An estimated damage from the hail in the two cities amounted around \$260 million. The wind speed associated with the storm ranged between 50 to 60 mph.

**November 1, 2000** – A F1 (73-112 mph) tornado touched down near Highway 83 in Bismarck and traveled in a west, northwest direction. Forty-two homes sustained minor to moderate damage and injuring two people. The tornado began 6 miles north of Bismarck and ended 10 miles north, northwest of Bismarck. Length was 3 miles and width 50 yards.

**November 1, 2000** – A F0 (40-72 mph) tornado touched down three miles west, northwest of Wilton. The tornado touched down in open country and moved in a west, northwest direction. The tornado remained in open country moving into McLean County. The tornado began 3 miles west, south west of Wilton and ended 2 miles west, northwest of Wilton. Length was 2 miles and width 40 yards.

**July 16, 1993** – Severe thunderstorm with heavy rain and \$227,273 in property damage and \$227,273 in crop damage.

**July 1, 1993** – Severe thunderstorm with heavy rain and \$943,396 in property damage and \$943,396 in crop damage.

**July 1, 1993** - Hail in Burleigh County with \$5,500,000 in property damage and \$1,000,000 in crop damage.

**July 31, 1966** – Burleigh County tornadoes, heavy hail, high winds, heavy rain with \$41,667 in property damage and \$41,667 in crop damage.

**July 1, 1952** – Tornado with 26 injuries, 1 fatality, and \$50,000 in property damage.

### Severe Winter Weather

|                         |  |
|-------------------------|--|
| <b>Frequency</b>        | Highly Likely (Nearly 100% probability in the next year) |
| <b>Severity</b>         | Critical (25-50% of jurisdiction affected)               |
| <b>Risk Class</b>       | A  |
| <b>Seasonal Pattern</b> | November to April  |
| <b>Duration</b>         | 2 to 5 days  |
| <b>Speed of Onset</b>   | 12 to 24 hours warning                                   |
| <b>Location</b>         | Countywide   |

#### Description

Winter storms occur in many forms and vary significantly in size, strength, intensity, duration, and impact. 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.

Heavy snow can paralyze a community by stranding travelers, stopping the flow commodities, and disrupting emergency services. The weight of snow can cause roofs to collapse and knock down trees and utility lines. Homes and farms may be isolated for days and unprotected livestock may die. The cost of snow removal, damage repair, and loss of business can have economic impacts on communities.

## HOW WINTER STORMS FORM

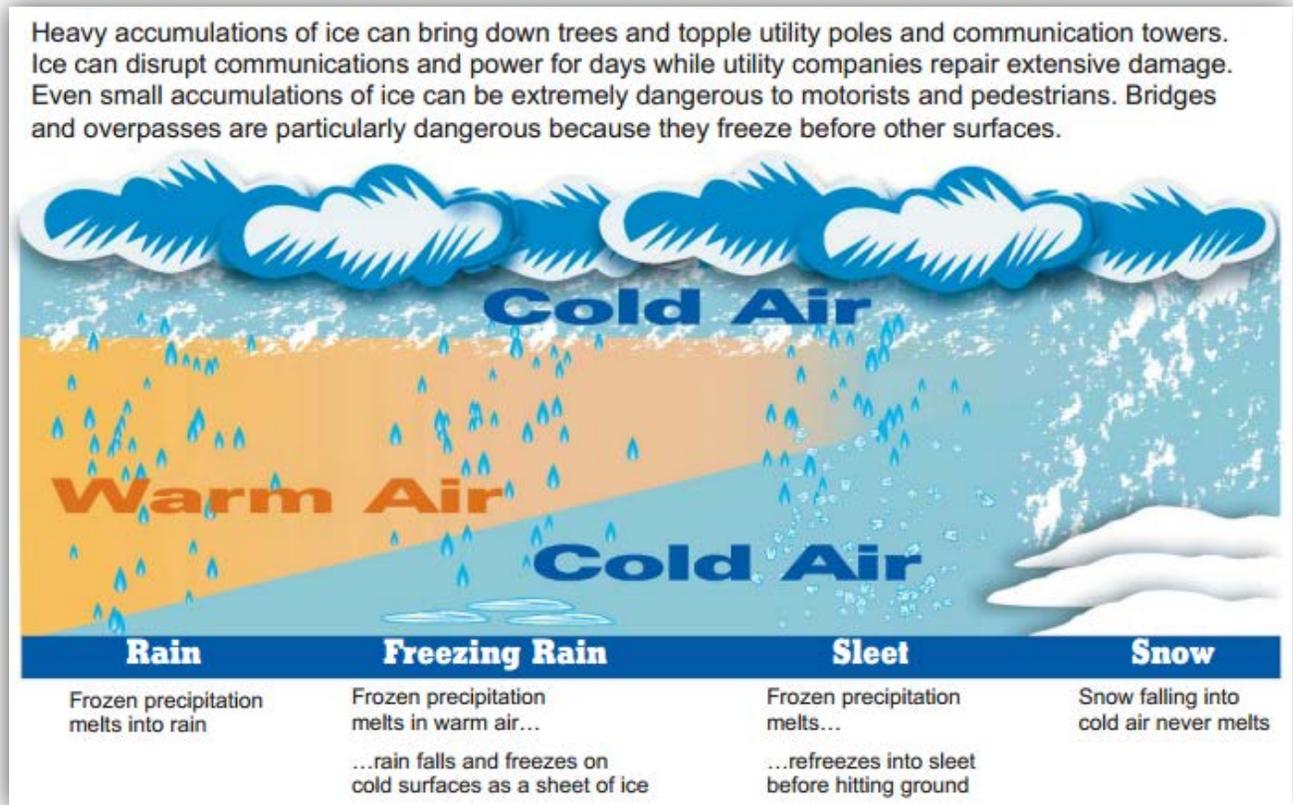
There are many ways for winter storms to form; however, all have three key components.

**COLD AIR:** For snow and ice to form, the temperature must be below freezing in the clouds and near the ground.

**MOISTURE:** Water evaporating from bodies of water, such as a large lake or the ocean, is an excellent source of moisture.

**LIFT:** Lift causes moisture to rise and form clouds and precipitation. An example of lift is warm air colliding with cold air and being forced to rise. Another example of lift is air flowing up a mountain side.

Source: [Winter Storms, The Deceptive Killers](#), A Preparedness Guide, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, June 2008



Source: [Winter Storms, The Deceptive Killers](#), A Preparedness Guide, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, June 2008

### Key Terms

**Blizzard:** Sustained winds or frequent gusts of 35 mph or more with snow and blowing snow frequently reducing visibility to less than a quarter mile for 3 hours or more.

**Blowing Snow:** Wind-driven snow that reduces visibility. Blowing snow may be falling snow and/or snow on the ground picked up by the wind.

**Freezing Rain:** Rain that freezes when it hits the ground; creating a coating of ice on roads, walkways, trees and power lines.

**Sleet:** Rain that turns to ice pellets before reaching the ground. Sleet also causes moisture on roads to freeze and become slippery.

**Snow Squalls:** Brief, intense snow showers accompanied by strong, gusty winds. Accumulation may be significant.

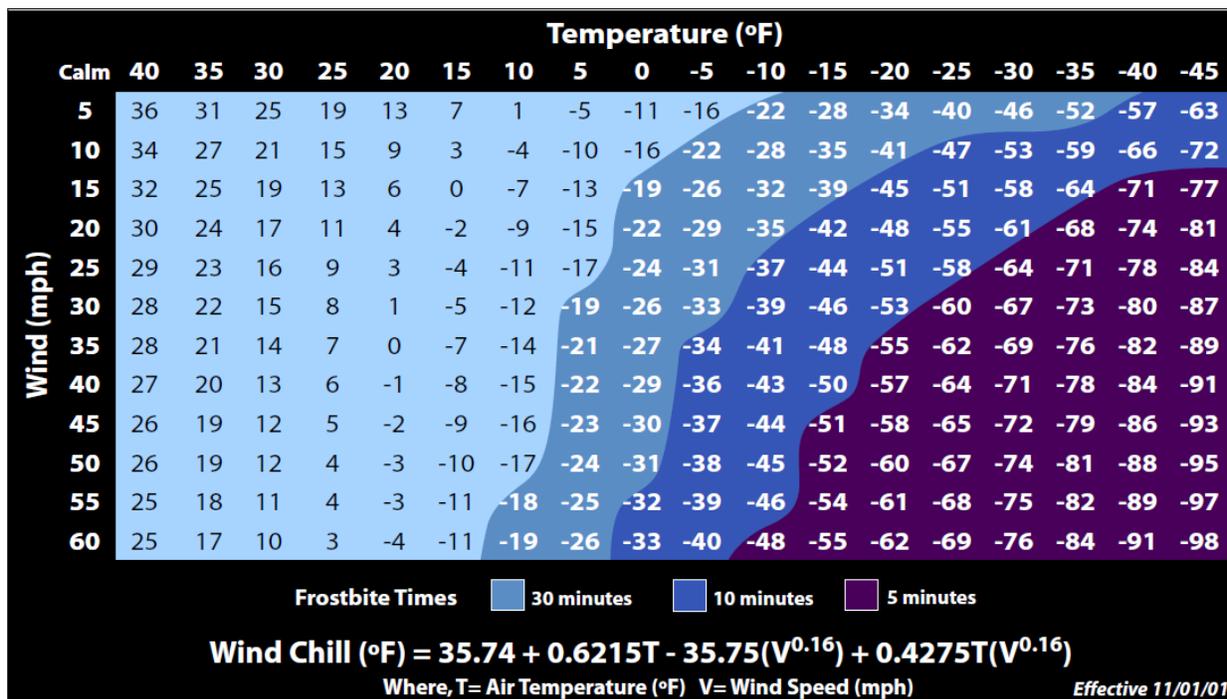
**Snow Showers:** Snow falling at varying intensities for brief periods of time. Some accumulation is possible.

**Snow Flurries:** Light snow falling for short durations with little or no accumulation.

**Wind Chill:** A measure of how cold people feel due to the combined effect of wind and cold temperatures; the [Wind Chill Index](#) is based on the rate of heat loss from exposed skin. Both cold temperatures and wind remove heat from the body; as the wind speed increases during cold conditions, a body loses heat more quickly. Eventually, the internal body temperature also falls and hypothermia can develop. Animals also feel the effects of wind chill; but inanimate objects, such as vehicles and buildings, do not. They will only cool to the actual air temperature, although much faster during windy conditions.



## Wind Chill Chart



Sources: [Winter Storms, The Deceptive Killers](#), A Preparedness Guide, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, June 2008

National Weather Service, National Oceanic and Atmospheric Administration, Winter Storm Safety, [website](#)

**Identified Impacts**

- Blocked Roads
- Building Collapse
- Business Interruptions
- Delayed Emergency Response
- Downed Power Lines
- Downed Trees
- Evacuation (Localized)
- HAZMAT Release
- Increased Fire Potential
- Increased Public Safety Runs
- Livestock Injury/Death
- Loss of Economy
- Loss/Overcrowded Medical Facilities
- Loss of Potable Water
- Loss of Power
- Property Damage
- School Closure
- Wind Chill

**History:**

Source: National Oceanic and Atmospheric Administration National Climatic Data Center [Website](#) (01/1950 to 08/2014)

**Blizzard**

| <u>Location</u>                 | <u>County/Zone</u> | <u>St.</u> | <u>Date</u> | <u>Time</u> | <u>T.Z.</u> | <u>Type</u> | <u>Mag</u> | <u>Dth</u> | <u>Inj</u> | <u>PrD</u> | <u>CrD</u> |
|---------------------------------|--------------------|------------|-------------|-------------|-------------|-------------|------------|------------|------------|------------|------------|
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 03/31/2014  | 05:00       | CST-6       | Blizzard    |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 01/26/2014  | 07:00       | CST-6       | Blizzard    |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 04/14/2013  | 09:00       | CST-6       | Blizzard    |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 04/30/2011  | 13:00       | CST-6       | Blizzard    |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 03/11/2011  | 13:00       | CST-6       | Blizzard    |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 10/26/2010  | 23:00       | CST-6       | Blizzard    |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 01/25/2010  | 09:00       | CST-6       | Blizzard    |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 12/25/2009  | 06:00       | CST-6       | Blizzard    |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 03/29/2009  | 18:00       | CST-6       | Blizzard    |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 03/23/2009  | 22:00       | CST-6       | Blizzard    |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 01/11/2009  | 21:00       | CST-6       | Blizzard    |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 12/13/2008  | 17:00       | CST-6       | Blizzard    |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 11/06/2008  | 18:00       | CST-6       | Blizzard    |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 03/02/2007  | 06:00       | CST-6       | Blizzard    |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 03/10/2004  | 14:30       | CST         | Blizzard    |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 02/10/2004  | 14:49       | CST         | Blizzard    |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 12/16/2000  | 04:00       | CST         | Blizzard    |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 04/01/1999  | 04:00       | CST         | Blizzard    |            | 0          | 0          | 0.00K      | 0.00K      |

|                                 |                 |    |            |       |     |          |  |   |   |         |       |
|---------------------------------|-----------------|----|------------|-------|-----|----------|--|---|---|---------|-------|
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 04/04/1997 | 18:00 | CST | Blizzard |  | 0 | 1 | 2.500M  | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 01/09/1997 | 04:00 | CST | Blizzard |  | 0 | 5 | 1.530M  | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 01/04/1997 | 06:00 | CST | Blizzard |  | 0 | 2 | 250.00K | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 01/04/1997 | 06:00 | CST | Blizzard |  | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 12/16/1996 | 04:00 | CST | Blizzard |  | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 02/26/1996 | 21:30 | CST | Blizzard |  | 0 | 0 | 0.00K   | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 01/17/1996 | 04:30 | CST | Blizzard |  | 0 | 0 | 0.00K   | 0.00K |
| <b>Totals:</b>                  |                 |    |            |       |     |          |  | 0 | 8 | 4.280M  | 0.00K |

## Cold/Wind Chill

| <u>Location</u>                 | <u>County/Zone</u> | <u>St.</u> | <u>Date</u> | <u>Time</u> | <u>T.Z.</u> | <u>Type</u>     | <u>Mag</u> | <u>Dth</u> | <u>Inj</u> | <u>PrD</u> | <u>CrD</u> |
|---------------------------------|--------------------|------------|-------------|-------------|-------------|-----------------|------------|------------|------------|------------|------------|
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 02/16/2006  | 18:00       | CST         | Cold/wind Chill |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 01/13/2005  | 14:58       | CST         | Cold/wind Chill |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 01/27/2004  | 20:00       | CST         | Cold/wind Chill |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 01/04/2004  | 18:00       | CST         | Cold/wind Chill |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 12/25/1996  | 06:00       | CST         | Cold/wind Chill |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 02/01/1996  | 00:00       | CST         | Cold/wind Chill |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 01/29/1996  | 12:00       | CST         | Cold/wind Chill |            | 1          | 0          | 0.00K      | 0.00K      |
| <b>Totals:</b>                  |                    |            |             |             |             |                 |            | 1          | 0          | 0.00K      | 0.00K      |

### Extreme Cold/Wind Chill

| <u>Location</u>                 | <u>County/Zone</u> | <u>St.</u> | <u>Date</u> | <u>Time</u> | <u>T.Z.</u> | <u>Type</u>             | <u>Mag</u> | <u>Dth</u> | <u>Inj</u> | <u>PrD</u> | <u>CrD</u> |
|---------------------------------|--------------------|------------|-------------|-------------|-------------|-------------------------|------------|------------|------------|------------|------------|
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 03/01/2014  | 00:00       | CST-6       | Extreme Cold/wind Chill |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 01/22/2014  | 21:00       | CST-6       | Extreme Cold/wind Chill |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 01/04/2014  | 04:00       | CST-6       | Extreme Cold/wind Chill |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 12/06/2013  | 21:00       | CST-6       | Extreme Cold/wind Chill |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 01/30/2013  | 20:00       | CST-6       | Extreme Cold/wind Chill |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 01/20/2013  | 20:00       | CST-6       | Extreme Cold/wind Chill |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 01/18/2012  | 06:00       | CST-6       | Extreme Cold/wind Chill |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 02/08/2011  | 00:00       | CST-6       | Extreme Cold/wind Chill |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 02/01/2011  | 18:00       | CST-6       | Extreme Cold/wind Chill |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 02/01/2011  | 00:00       | CST-6       | Extreme Cold/wind Chill |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 01/31/2011  | 16:00       | CST-6       | Extreme Cold/wind Chill |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 01/06/2010  | 21:00       | CST-6       | Extreme Cold/wind Chill |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 12/14/2009  | 16:00       | CST-6       | Extreme Cold/wind Chill |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 12/20/2008  | 06:00       | CST-6       | Extreme Cold/wind Chill |            | 0          | 0          | 0.00K      | 0.00K      |

|                                 |                 |    |            |       |       |                         |  |   |   |       |       |
|---------------------------------|-----------------|----|------------|-------|-------|-------------------------|--|---|---|-------|-------|
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 12/14/2008 | 23:59 | CST-6 | Extreme Cold/wind Chill |  | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 02/09/2008 | 23:00 | CST-6 | Extreme Cold/wind Chill |  | 0 | 0 | 0.00K | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 01/29/2008 | 04:00 | CST-6 | Extreme Cold/wind Chill |  | 0 | 0 | 0.00K | 0.00K |
| <b>Totals:</b>                  |                 |    |            |       |       |                         |  | 0 | 0 | 0.00K | 0.00K |

**Heavy Snow**

| <u>Location</u>                 | <u>County/Zone</u> | <u>St.</u> | <u>Date</u> | <u>Time</u> | <u>T.Z.</u> | <u>Type</u> | <u>Mag</u> | <u>Dth</u> | <u>Inj</u> | <u>PrD</u> | <u>CrD</u> |
|---------------------------------|--------------------|------------|-------------|-------------|-------------|-------------|------------|------------|------------|------------|------------|
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 12/03/2013  | 03:00       | CST-6       | Heavy Snow  |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 11/10/2012  | 10:00       | CST-6       | Heavy Snow  |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 02/28/2012  | 23:00       | CST-6       | Heavy Snow  |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 04/14/2011  | 19:00       | CST-6       | Heavy Snow  |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 03/30/2009  | 14:00       | CST-6       | Heavy Snow  |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 01/08/2009  | 15:00       | CST-6       | Heavy Snow  |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 12/29/2008  | 22:00       | CST-6       | Heavy Snow  |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 12/30/2006  | 04:00       | CST-6       | Heavy Snow  |            | 0          | 0          | 40.00K     | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 11/09/1998  | 00:00       | CST         | Heavy Snow  |            | 0          | 0          | 0.00K      | 0.00K      |
| <b>Totals:</b>                  |                    |            |             |             |             |             |            | 0          | 0          | 40.00K     | 0.00K      |

**Ice Storm**

| <u>Location</u>                 | <u>County/Zone</u> | <u>St.</u> | <u>Date</u> | <u>Time</u> | <u>T.Z.</u> | <u>Type</u> | <u>Mag</u> | <u>Dth</u> | <u>Inj</u> | <u>PrD</u> | <u>CrD</u> |
|---------------------------------|--------------------|------------|-------------|-------------|-------------|-------------|------------|------------|------------|------------|------------|
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 03/30/2007  | 05:00       | CST-6       | Ice Storm   |            | 0          | 0          | 25.00K     | 0.00K      |
| <b>Totals:</b>                  |                    |            |             |             |             |             |            | 0          | 0          | 25.00K     | 0.00K      |

### Winter Storm

| <u>Location</u>                 | <u>County/Zone</u> | <u>St.</u> | <u>Date</u> | <u>Time</u> | <u>T.Z.</u> | <u>Type</u>  | <u>Mag</u> | <u>Dth</u> | <u>Inj</u> | <u>PrD</u> | <u>CrD</u> |
|---------------------------------|--------------------|------------|-------------|-------------|-------------|--------------|------------|------------|------------|------------|------------|
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 04/14/2013  | 03:00       | CST-6       | Winter Storm |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 03/22/2011  | 10:00       | CST-6       | Winter Storm |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 04/02/2010  | 04:00       | CST-6       | Winter Storm |            | 0          | 0          | 2.00M      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 01/22/2010  | 12:00       | CST-6       | Winter Storm |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 01/05/2010  | 15:00       | CST-6       | Winter Storm |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 12/23/2009  | 16:00       | CST-6       | Winter Storm |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 02/28/2007  | 03:00       | CST-6       | Winter Storm |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 02/10/2004  | 11:00       | CST         | Winter Storm |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 01/24/2004  | 11:00       | CST         | Winter Storm |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 12/17/2002  | 14:52       | CST         | Winter Storm |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 05/07/2002  | 14:30       | CST         | Winter Storm |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 11/07/2000  | 06:00       | CST         | Winter Storm |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 03/08/2000  | 04:15       | CST         | Winter Storm |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 02/26/2000  | 00:00       | CST         | Winter Storm |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 02/25/2000  | 11:40       | CST         | Winter Storm |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 04/03/1999  | 03:45       | CST         | Winter Storm |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 01/26/1999  | 04:30       | CST         | Winter Storm |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 01/01/1999  | 03:00       | CST         | Winter Storm |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 11/18/1998  | 00:00       | CST         | Winter Storm |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH</a>        | BURLEIGH           | ND         | 03/12/1997  | 21:00       | CST         | Winter       |            | 0          | 0          | 0.00K      | 0.00K      |

|                                 |                 |    |            |       |     |              |  |   |   |        |       |
|---------------------------------|-----------------|----|------------|-------|-----|--------------|--|---|---|--------|-------|
| <a href="#">(ZONE)</a>          | (ZONE)          |    |            |       |     | Storm        |  |   |   |        |       |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 11/23/1996 | 06:00 | CST | Winter Storm |  | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 11/19/1996 | 04:00 | CST | Winter Storm |  | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 11/05/1996 | 04:00 | CST | Winter Storm |  | 0 | 0 | 0.00K  | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 03/23/1996 | 04:30 | CST | Winter Storm |  | 0 | 0 | 0.00K  | 0.00K |
| <b>Totals:</b>                  |                 |    |            |       |     |              |  | 0 | 0 | 2.000M | 0.00K |

### Winter Weather

| <u>Location</u>                 | <u>County/Zone</u> | <u>St.</u> | <u>Date</u> | <u>Time</u> | <u>T.Z.</u> | <u>Type</u>    | <u>Mag</u> | <u>Dth</u> | <u>Inj</u> | <u>PrD</u> | <u>CrD</u> |
|---------------------------------|--------------------|------------|-------------|-------------|-------------|----------------|------------|------------|------------|------------|------------|
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 05/06/2010  | 22:00       | CST-6       | Winter Weather |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 03/09/2010  | 12:00       | CST-6       | Winter Weather |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 01/21/2010  | 06:00       | CST-6       | Winter Weather |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 06/06/2009  | 06:00       | CST-6       | Winter Weather |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 01/16/2009  | 12:00       | CST-6       | Winter Weather |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 01/20/2006  | 07:00       | CST         | Winter Weather |            | 0          | 0          | 15.00K     | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 12/29/2005  | 11:45       | CST         | Winter Weather |            | 0          | 0          | 25.00K     | 0.00K      |
| <a href="#">MC KENZIE</a>       | BURLEIGH CO.       | ND         | 11/20/1997  | 18:00       | CST         | Winter Weather |            | 1          | 12         | 20.00K     | 0.00K      |
| <b>Totals:</b>                  |                    |            |             |             |             |                |            | 1          | 12         | 60.00K     | 0.00K      |

Some of the more significant events include:

**January 9, 1997** – Blizzard with one fatality and \$1,530,556 in property damage.

**April 4, 1997** – Blizzard with \$1,354,545 in property damage.

**March 23, 1996** – An early spring snowstorm moved up out of the 4-corners region of the country to bring another round of severe winter weather to the northern plains. Snowfall totals from the area include Minot AFB at 7 inches...Dickinson and Jamestown at 7.5 inches...Williston at 8 inches...Glen Ullin with 12 inches and Bismarck with 13 inches. I-94 in Morton County was reported to have 6-foot snowdrifts blocking lanes...and I-94 was closed from Saturday morning to Monday morning. Many travelers ended up being stranded for the weekend in North Dakota. Due to the warm weather received a few days before...roadways were warm. When the storm began...strong northeast to east winds blew the snow across the road...leaving the roadway wet. When the temperature began to fall, roadways became extremely icy. There were numerous reports of vehicles in the ditch, and a few rollovers were also reported. Many school across western and central North Dakota had Monday (25th) off due to the slow progress of the snow removal. Winds during the weekend averaged between 20 and 30 mph with higher gusts at times.

**January 29, 1996** – A 57 year old Bismarck man died from a heart attack while operating a snow blower. The day before the man died, the Bismarck area received 5 inches of snow. On the day he died, high temperatures were in the teens below zero with wind chills from 40 to 60 below.

**April 25, 1994** – A late season winter storm came a few days after temperatures of 80 degrees. Parts of southern North Dakota received almost a foot of heavy, wet snow. Some thunder occurred with the snowfall. Winds of 25 to 45 MPH caused blizzard conditions at times, and snow drifts three feet high. This late storm brought record seasonal snowfall to many parts of the state. Snowfall for the winter season topped 100 inches in some places. The storm closed schools and businesses, and shut down travel. Property damage from this storm is estimated at \$50,000.

**March 22, 1994** – Up to 14 inches of heavy, wet snow fell over much of southern North Dakota. The snow began in southwest and south central North Dakota the night of the 22<sup>nd</sup>, persisted throughout the day on the 23<sup>rd</sup> and lasted late into the night. The heaviest snowfall occurred in the southwest and south central sections, near the South Dakota border. Twelve inches of snow was reported in Bowman, in the southwest corner of the state. About eight inches of snow fell in the cities of Bismarck and Fargo.

**November 22, 1993** – A slow moving and enormous storm over North America brought record single-storm snowfall to a large part of North Dakota. Over two feet of snow fell over a large part of central and southeastern North Dakota and most of North Dakota had over a foot of snow from this storm. The greatest snowfall amount was reported at Oakes, in Dickey County in southeastern North Dakota, 31 inches. At the National Weather Service office in Bismarck, 28.3 inches of snow was measured during the 108-hour snow event. This amount set a new single storm record for snow in Bismarck. The snow began the evening of the 22<sup>nd</sup> and did not end until the morning of the 27<sup>th</sup>. Except for about six hours during the day on the 26<sup>th</sup> the snow was continuous through this period. The snowfall was intermittent over most of North Dakota during this lengthy evening. Fortunately, the wind was only 10 to 25 MPH during this storm, so it was well below blizzard conditions and blowing and drifting snow was not a problem. The storm occurred during the week of Thanksgiving, so many travelers were stranded. The prolonged snowfall kept snow removal crews working around the clock, and a few motorists crashed into the snowplows. Out in the rural areas, some farm buildings collapsed in the heavy snow. Property damage from this storm is estimated at \$500,000.

### Shortage or Outage of Critical Materials or Infrastructure

|                         |   |
|-------------------------|---|
| <b>Frequency</b>        | Possible (1-10% probability in next year, or at least 1 chance in next 100 years) |
| <b>Severity</b>         | Critical (25-50% of jurisdiction affected)  |
| <b>Risk Class</b>       | B   |
| <b>Seasonal Pattern</b> | None  |
| <b>Duration</b>         | Days/Weeks  |
| <b>Speed of Onset</b>   | Little to no warning  |
| <b>Location</b>         | Countywide  |

#### Description

A shortage or outage of critical materials or infrastructure occurs when demand for a product exceeds supply. A shortage of critical materials may include a wide variety of resources. The potential for a shortage of energy products requires preparing provisions for providing electric power and fuels to support emergency and disaster response operations and for the normal functioning of business and industry throughout the county. Supplying energy related resources during a shortage involves the production/generation, refinement, and transportation/transmitting of such resources. It also includes the conservation of these resources and the construction and maintenance of the energy system and its components.

The sudden and devastating occurrence of a severe natural disaster to include an extended period of severe cold weather; the disruption of a supply system; an embargo, which could result from international global conflict; or other significant event can disrupt the availability of fuels and other critical energy products. Such occurrences could impact future energy supplies and place extreme pressure on existing supplies, threatening the health, safety, and well-being of the citizens.

Shortages of critical energy supplies can cause:

- Widespread and prolonged electric 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; and,
- 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 impact on other emergency public health and safety services as well.

**Identified Impacts**

- Business Interruptions
- Delayed Emergency Response
- Increased Public Safety Runs
- Loss of Economy
- School Closure

**History**

There is no significant history of shortage or outage of critical materials or infrastructure within the County. Electrical outages in summer typically last from minutes to mere hours, while outages in the winter have lasted up to 2-3 days in rural areas. Some critical sites have backup generators. Water conservation during periods of drought or extreme temperature has always been voluntary as conditions have not warranted water bans.

### Transportation Accident

|                         |  |
|-------------------------|--|
| <b>Frequency</b>        | Likely (10-100% probability in the next year, or at least 1 chance in next 100 years.) |
| <b>Severity</b>         | Negligible (Less than 10% of jurisdiction affected)                                    |
| <b>Risk Class</b>       | C  |
| <b>Seasonal Pattern</b> | None   |
| <b>Duration</b>         | Hours  |
| <b>Speed of Onset</b>   | No warning   |
| <b>Location</b>         | Countywide   |

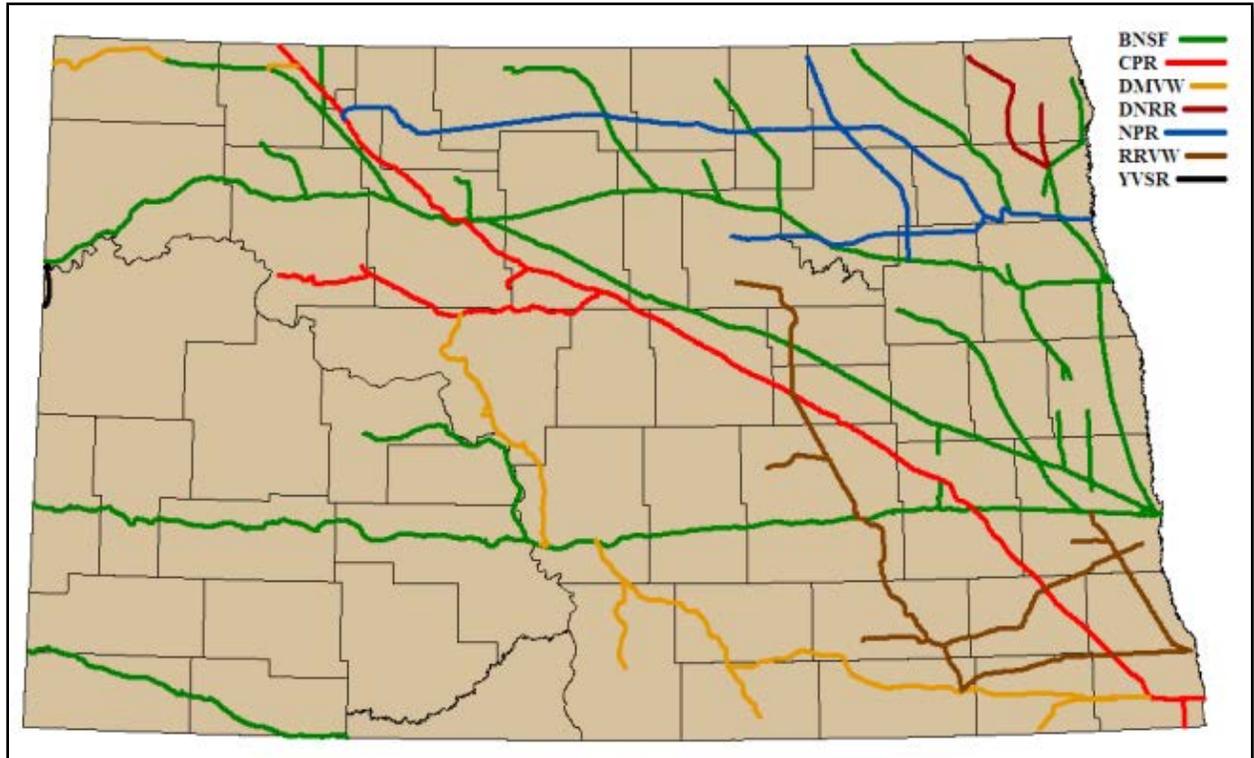
#### **Description**

A transportation accident is any large-scale aircraft, railroad, or vehicular accident involving mass casualties.

Burleigh County has one municipal airport, railroads, and several major highways.

### Railroad

Two railroads traverse the county: Burleigh Northern Santa Fe (BNSF) and the Dakota, Missouri Valley Western Railroad (DMVW).



Source: [ND State Rail Plan](#), December 2007

## Vehicle

Interstate 94 is a primary, east/west transportation route intersecting Burleigh County and the City of Bismarck and is north of the City of Lincoln. U.S. Highway 83 is the second most utilized route and runs north/south, intersecting Burleigh County and the Cities of Bismarck and Wilton. The most predominant products observed in the study were anhydrous ammonia and gasolines. (See Attachment 3, Major Roadways in Burleigh County)

### Highway Results



- **I-94 is primary highway route by which hazardous materials are transported in Burleigh County with 71% of hazmat vehicles**
- **US-83 is the second most utilized route (26%)**
- **ND 1804, ND 14, ND 36 and ND 41 saw a combined total of less than 4% of hazardous material vehicles transported in Burleigh County**
- **Anhydrous ammonia** accounts for 23% of observed hazardous material vehicles
- **Gasolines** account for another 21% of vehicles carrying hazardous materials.

**Note:**  
The non-random scheduled sampling technique employed for the study has a 2.1% margin of error.



Source: HazMat Traffic Flow Study, Burleigh County, September 2012

### Identified Impacts

- Blocked Roads
- Business Interruptions
- Delayed Emergency Response
- Evacuation (Localized)
- Explosion
- HAZMAT Release
- Increased Public Safety Runs
- Loss of Economy
- Loss/Overcrowded Medical Facilities
- Mass Casualties
- Property Damage

**History**

There is no history of mass casualty within Burleigh County.

**Aviation**

| Current Synopsis               | PDF Report(s) (Published)                           | Event Date | Location     | Make/Model                     | Regist. Number | NTSB No.   | Event Severity  |
|--------------------------------|---|------------|--------------|--------------------------------|----------------|------------|-----------------|
| <a href="#">Probable Cause</a> | Factual (05/25/2010)<br>Probable Cause (08/12/2010) | 4/4/2010   | Bismarck, ND | MAULE M-5-210C                 | N62040         | CEN10CA191 | Nonfatal        |
| <a href="#">Probable Cause</a> | Factual (08/28/2009)<br>Probable Cause (10/20/2009) | 7/23/2009  | Bismarck, ND | RAYTHEON AIRCRAFT COMPANY C90A | N405DD         | CEN09CA470 | Nonfatal        |
| <a href="#">Probable Cause</a> | Factual (03/16/2011)<br>Probable Cause (03/16/2011) | 6/4/2007   | Bismarck, ND | LEARJET 36                     | N136DH         | ENG07IA030 | Incident        |
| <a href="#">Probable Cause</a> | Factual (07/10/2005)<br>Probable Cause (09/13/2005) | 5/3/2005   | Bismarck, ND | Piper PA-31T                   | N2338V         | CHI05LA109 | Nonfatal        |
| <a href="#">Probable Cause</a> | Factual (04/27/2001)<br>Probable Cause (05/18/2001) | 8/6/2000   | BISMARCK, ND | Summers RV4                    | N131DS         | CHI00LA246 | Nonfatal        |
| <a href="#">Probable Cause</a> | Factual (01/15/1999)<br>Probable Cause (02/15/2001) | 7/20/1998  | BISMARCK, ND | Cessna R182                    | N9142C         | CHI98LA266 | Nonfatal        |
| <a href="#">Probable Cause</a> | Factual (01/15/1999)<br>Probable Cause (02/15/2001) | 7/11/1998  | LINCOLN, ND  | VOLLMERS SONERAI II L          | N317WM         | CHI98LA271 | <u>Nonfatal</u> |

|                                |   |            |                 |                     |        |            |                 |
|--------------------------------|---|------------|-----------------|---------------------|--------|------------|-----------------|
| <a href="#">Probable Cause</a> | Factual<br>(11/17/1999)<br><br>Probable Cause<br>(04/20/2000) | 4/7/1998   | BISMARCK,<br>ND | Cessna 208B         | N868FE | CHI98FA119 | Fatal(1)        |
| <a href="#">Probable Cause</a> | Factual<br>(05/02/1997)<br><br>Probable Cause<br>(08/25/1997) | 12/3/1996  | REGAN, ND       | Cessna 177          | N30255 | CHI97LA036 | <u>Nonfatal</u> |
| <a href="#">Probable Cause</a> | Factual<br><br>Probable Cause<br>(11/03/1993)                 | 6/20/1993  | WILTON,<br>ND   | CESSNA 150J         | N60454 | CHI93LA215 | <u>Nonfatal</u> |
| <a href="#">Probable Cause</a> |   | 5/27/1973  | STERLING,<br>ND | CESSNA 177A         | N30541 | MKC73FTG15 | <u>Nonfatal</u> |
| <a href="#">Probable Cause</a> | Factual<br><br>Probable Cause<br>(11/03/1993)                 | 3/10/1993  | BISMARCK,<br>ND | BELLANCA<br>7GCBC   | N88384 | CHI93LA128 | Nonfatal        |
| <a href="#">Probable Cause</a> | Factual<br><br>Probable Cause<br>(03/09/1993)                 | 6/1/1991   | BISMARCK,<br>ND | CESSNA 172P         | N5478K | CHI91DTG01 | Fatal(1)        |
| <a href="#">Probable Cause</a> | Factual<br><br>Probable Cause<br>(10/07/1988)                 | 12/19/1987 | BISMARCK,<br>ND | CESSNA<br>T210R     | N7381U | DEN88LA038 | Nonfatal        |
| <a href="#">Probable Cause</a> | Factual<br><br>Probable Cause<br>(05/02/1988)                 | 3/6/1987   | BISMARCK,<br>ND | BEECH 58            | N9025V | DEN87LA062 | Nonfatal        |
| <a href="#">Probable Cause</a> | Factual<br>(02/06/1995)<br><br>Probable Cause<br>(02/06/1995) | 2/6/1986   | BISMARCK,<br>ND | PIPER PA-34-<br>200 | N55654 | DEN86FA075 | Fatal(1)        |
| <a href="#">Probable Cause</a> | Factual<br>(02/06/1995)<br><br>Probable Cause<br>(02/06/1995) | 11/1/1985  | BISMARCK,<br>ND | BEECH A36TC         | N3663K | DEN86LA017 | Nonfatal        |

|                                |   |            |                 |                |        |            |          |
|--------------------------------|---|------------|-----------------|----------------|--------|------------|----------|
| <a href="#">Probable Cause</a> | Factual<br>(02/06/1995)<br><br>Probable Cause<br>(02/06/1995) | 9/30/1984  | BISMARCK,<br>ND | BEECH C24R     | N6703W | DEN84LA304 | Nonfatal |
| <a href="#">Probable Cause</a> | Factual<br>(02/06/1995)<br><br>Probable Cause<br>(02/06/1995) | 12/14/1983 | BISMARCK,<br>ND | MOONEY<br>M20J | N1151N | DEN84FA042 | Nonfatal |
| <a href="#">Probable Cause</a> | Factual<br><br>Probable Cause<br>(08/22/1983)                 | 8/22/1982  | BISMARCK,<br>ND | CESSNA 190     | N3004B | DEN82DA171 | Nonfatal |
| <a href="#">Probable Cause</a> | Factual<br><br>Probable Cause<br>(05/06/1983)                 | 5/6/1982   | BISMARCK,<br>ND | CESSNA 402A    | N4504Q | DEN82DA079 | Nonfatal |
| <a href="#">Probable Cause</a> |   | 8/4/1981   | BISMARCK,<br>ND | CESSNA 152     | N5324H | DEN81FTG17 | Nonfatal |
| <a href="#">Probable Cause</a> |   | 6/6/1981   | STERLING,<br>ND | PIPER PA-18A   | N9252D | DEN81FTG11 | Fatal(1) |
| <a href="#">Probable Cause</a> |   | 8/3/1979   | BISMARCK,<br>ND | BEECH V35      | N911V  | MKC79FTG13 | Nonfatal |
| <a href="#">Probable Cause</a> |   | 4/27/1977  | BISMARCK,<br>ND | CESSNA 185     | N102WC | MKC77FTG04 | Nonfatal |
| <a href="#">Probable Cause</a> |   | 7/5/1975   | BISMARCK,<br>ND | BEECH 35       | N3310V | MKC76AK004 | Fatal(4) |
| <a href="#">Probable Cause</a> |   | 5/29/1973  | BISMARCK,<br>ND | PIPER PA-32    | N3340W | MKC73FTG16 | Nonfatal |
| <a href="#">Probable Cause</a> |   | 3/2/1972   | BISMARCK,<br>ND | BEECH D18S     | N375C  | MKC72AK053 | Nonfatal |
| <a href="#">Probable Cause</a> |   | 2/2/1972   | BISMARCK,<br>ND | BEECH D18S     | N57CC  | MKC72AK047 | Nonfatal |
| <a href="#">Probable Cause</a> |   | 11/30/1970 | BISMARCK,<br>ND | PIPER PA-24    | N8908P | MKC71AK030 | Nonfatal |
| <a href="#">Probable Cause</a> |   | 10/15/1970 | BISMARCK,<br>ND | PIPER PA-24    | N8551P | MKC71FDD14 | Nonfatal |
| <a href="#">Probable Cause</a> |   | 6/14/1968  | BISMARCK,<br>ND | PIPER PA-25    | N7208Z | MKC69D0003 | Nonfatal |
| <a href="#">Probable Cause</a> |   | 11/11/1967 | BISMARCK,<br>ND | PIPER PA-22    | N3223Z | MKC68D0354 | Nonfatal |
| <a href="#">Probable Cause</a> | Factual<br>(09/13/2007)<br><br>Probable Cause                 | 8/1/2007   | Bismark, ND     | Beech B60      | N529R  | CHI07CA248 | Nonfatal |

|                                |   |           |                |                    |        |            |                 |
|--------------------------------|---|-----------|----------------|--------------------|--------|------------|-----------------|
|                                | (10/31/2007)                              |           |                |                    |        |            |                 |
| <a href="#">Probable Cause</a> | Factual<br>Probable Cause<br>(08/26/1992) | 3/20/1989 | BISMARK,<br>ND | GULFSTREAM<br>690A | N690MF | MKC89IA082 | Incident        |
| <a href="#">Probable Cause</a> |   | 3/5/1966  | BISMARK,<br>ND | BRANTLY B-2        | N5932X | MKC66A0051 | Nonfatal        |
| <a href="#">Probable Cause</a> |   | 7/27/1964 | BISMARK,<br>ND | BEECH K35          | N6099E | Unknown    | <u>Nonfatal</u> |

Source: National Transportation Safety Board Aviation [website](#)

### Railroad

| Date      | Railroad | Location     | Physical Act                           | Event                         | Injury                       |
|-----------|----------|--------------|--|-------------------------------|------------------------------|
| 3/30/2014 | BNS F    | Main/ Branch | Laying                                 | Struck by on-track equipment  | Fatality                     |
| 3/10/2012 | BNS F    | Main/ Branch | Laying                                 | Struck by on-track equipment  | Fatality                     |
| 8/30/2008 | BNS F    | Main/ Branch | Lying Down                             | Struck by on-track equipment  | Fatality                     |
| 6/2/2006  | BNS F    | Main/ Branch | Running                                | Struck by on-track equipment  | Fatality                     |
| 1/30/2004 | BNS F    | Main/ Branch | Driving (motor vehicle, forklift, etc) | Struck by on-track equipment  | Unspecified injury, multiple |
| 9/18/1999 | BNS F    | Main/ Branch | Sitting                                | Struck by on-track equipment  | Fatality                     |
| 8/1/1999  | BNS F    | Main/ Branch | Laying                                 | Struck by on-track equipment  | Amputation, upper leg        |
| 5/13/1999 | BNS F    | Main/ Branch | Laying                                 | Struck by on-track equipment  | Fatality                     |
| 5/13/1998 | BNS F    | Main/ Branch | Driving (motor vehicle, forklift, etc) | Highway-rail collision/impact | Fracture, lower leg          |
| 6/23/1997 | BNS F    | Main/ Branch | Driving (motor vehicle, forklift, etc) | Highway-rail collision/impact | Puncture wound               |
| 9/24/1988 | BNS F    | Main/ Branch | Walking                                | Highway-rail collision/impact | Concussion                   |

Source: Federal Railroad Administration Office of Safety Analysis [website](#)

**March 18, 2011** – An eight-car Burlington Northern Santa Fe train derailment at the 100 block of south Airport Road spilled tons of coal and damaged 13 railcars.

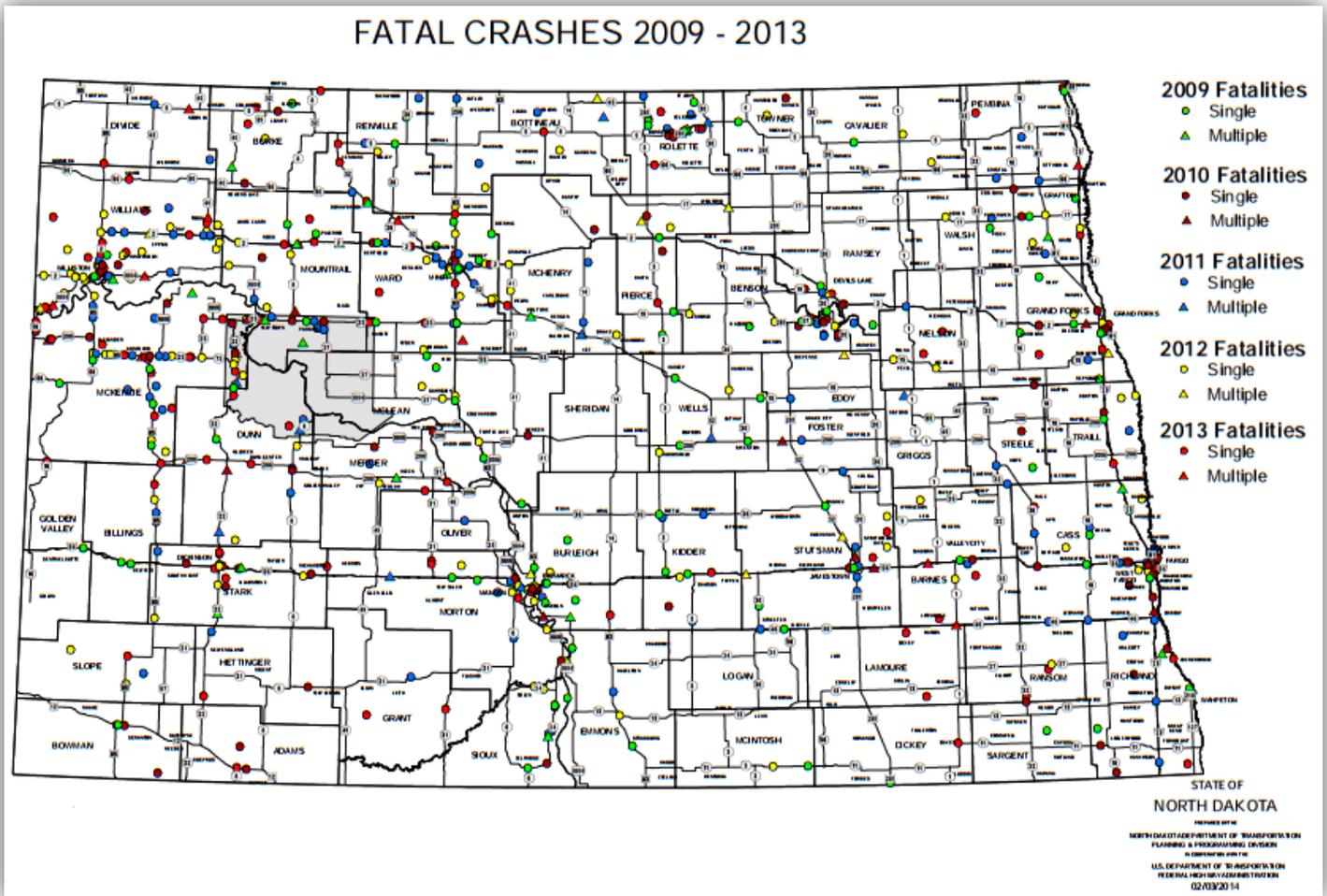
**July 10, 2010** - A 31-car Burlington Northern Santa Fe train derailment east of Bismarck (near Apple Creek between 66<sup>th</sup> St and 93<sup>rd</sup> St) spilled tons of coal and no injuries were reported.

**July 17-2006** – A 20-car Burlington Northern Santa Fe train derailment near McKenzie spilled soybeans..

**July 5, 2003** – A Burlington Northern Santa Fe train derailment south of the ND State Penitentiary spilled 36 cars of coal from a 123-car train. Each car was estimated to contain 100 tons of coal. No injuries reported.

**September 5, 2002** – A seven-car Dakota Missouri Valley and Western Railroad train derailment at the intersection of Rosser Avenue and 35<sup>th</sup> Street N, Bismarck resulted in a spill of fly ash.

### Vehicle



Source: [2013 North Dakota Crash Summary](#), North Dakota Department of Transportation

### Urban Fire or Structure Collapse

|                         |  |
|-------------------------|--|
| <b>Frequency</b>        | Highly Likely (Nearly 100% probability in the next year) |
| <b>Severity</b>         | Negligible (Less than 10% of jurisdiction affected)      |
| <b>Risk Class</b>       | D (Low risk condition, to be considered in planning)     |
| <b>Seasonal Pattern</b> | None   |
| <b>Duration</b>         | Hours  |
| <b>Speed of Onset</b>   | No warning   |
| <b>Location</b>         | Countywide   |

#### **Description**

The urban fire department is one of the oldest continuing institutions in America. Their profession and skill is to arrive at the fire as soon as possible, get all human life to safety, and to suppress the fire as quickly as possible. Primary factors that influence the potential for urban fire or structure collapse include: Electrical; incendiary-arson; smoking materials; heating devices; fuel systems; sparks; spills; spontaneous combustion and the levels of human activity in urban areas. Primary factors may also be secondary factors to another hazard such as tornado, wildfire, and severe winter storms.

The increasing cost of natural gas and fuel oil has caused families to rediscover alternate heating methods to heat their homes. As a result, the use of space heaters, fireplaces, and wood burning stoves can increase the fire hazard.

Many portable propane gas or kerosene heaters have self-continued fuel supplies and can be hazardous; even when used according to the manufacturer's instructions. The open flame provides a potential fire hazard, fuel leakage from the container could cause an explosion, and the fuel vapor is a source of indoor pollution.

Most people have limited experience with wood burners. As a result, a number of fires are caused by faulty installation of stoves and chimneys—wood heat has a poor safety record.

**Identified Impacts**

- Blocked Roads
- Building Collapse
- Business Interruptions
- Delayed Emergency Response
- Downed Power Lines
- Downed Trees
- Evacuation (Localized)
- Explosion
- HAZMAT Release
- Increased Fire Potential
- Increased Public Safety Runs
- Livestock Injury/Death
- Loss of Economy
- Loss/Overcrowded Medical Facilities
- Loss of Power
- Mass Casualties
- Property Damage
- School Closure

**History**

In the past there have been a number of urban structures that burned in Burleigh County.

| <b>Date</b> | <b>Address</b>                       | <b>Fire Dept</b> | <b>Result</b>   |
|-------------|--------------------------------------|------------------|---|
| 07-20-14    | 9730 Island Road                     | Bismarck Rural   | Home Loss   |
| 07-13-14    | 1998 66 <sup>th</sup> Street SE      | Bismarck Rural   | Mobile Home Loss  |
| 04-12-14    | 112 Libby Road                       | Bismarck Rural   | Garage Loss   |
| 01-12-14    | 15905 Sheyenne Circle                | Bismarck Rural   | Roof and wall damage  |
| 09-08-13    | Hwy 83                               | Bismarck Rural   | Fireworks Trailer Damage  |
| 03-02-13    | Hwy 36, Wing                         | Wing Rural       | Barn Loss   |
| 01-22-12    | 6850 48 <sup>th</sup> Ave S, Lincoln | Bismarck Rural   | Garage  |
| 01-19-12    | 210 Dove St                          | Bismarck Rural   | Mobile Home heavy smoke damage and fire damage to laundry room and bathroom |

The ND Forest Service was unable to provide complete historical data due to a recent upgrade and issues with retrieving public data. Data retrieved from 2010-2013 indicated no structural fires.

| Fire Data 2010-2013 |                      |          |             |              |            |           |             |
|---------------------|----------------------|----------|-------------|--------------|------------|-----------|-------------|
| Date                | Fire Name            | County   | Latitude    | Longitude    | Cause Code | Ownership | Final Acres |
| 03/03/12            | PALAMINO DR          | BURLEIGH |             |              | 4          | P         | 1           |
| 03/03/12            | PALAMINO DR          | BURLEIGH | 47.0448552  | -100.5049676 | 4          | P         | 1           |
| 03/11/12            | ENGLAND ST           | BURLEIGH | 46.755278   | -100.819722  | 5          | P         | 0           |
| 03/11/12            | ENGLAND ST           | BURLEIGH | 46.75548056 | -100.8198556 | 5          | P         | 0           |
| 03/12/12            | 110 TH AVE           | BURLEIGH | 46.931944   | -100.753333  | 9          | P         | 6           |
| 03/12/12            | 110 TH AVE           | BURLEIGH | 46.93205    | -100.7534778 | 9          | P         | 6           |
| 03/12/12            | RIFLE RANGE          | BURLEIGH | 46.675556   | -100.615     | 9          | S         | 1,000       |
| 03/12/12            | RIFLE RANGE          | BURLEIGH | 46.67571667 | -100.615225  | 9          | S         | 81          |
| 03/17/12            | TJ LANE              | BURLEIGH | 46.875556   | -100.685     | 4          | P         | 1           |
| 03/17/12            | TJ LANE              | BURLEIGH | 46.87566389 | -100.685075  | 4          | P         | 1           |
| 03/17/12            | 93RD ST NE           | BURLEIGH | 46.926111   | -100.641389  | 4          | P         | 45          |
| 03/17/12            | 93RD ST NE           | BURLEIGH | 46.92632222 | -100.6415028 | 4          | P         | 4,045       |
| 03/18/12            | I-94                 | BURLEIGH | 46.836667   | -100.525833  | 9          | S         | 5           |
| 03/18/12            | I-94                 | BURLEIGH | 46.83679167 | -100.5258556 | 9          | S         | 5           |
| 04/29/11            | -                    | Burleigh | 47.0448552  | -100.5049676 | 11         | P         | 0           |
| 04/29/11            |                      | Burleigh |             |              | 11         | P         | 1           |
| 04/14/11            | Interstate mm 181    | Burleigh | 47.0448552  | -100.5049676 | 9          | F         | 0           |
| 07/03/12            | Johns Lake East Fire | Burleigh | 47.317475   | -100.5206194 | 9          | P         | 0           |
| 07/03/12            | Johns Lake East Fire | Burleigh | 47.317475   | -100.5206194 | 9          | P         | 0           |
| 08/13/13            | arena fire           | burleigh | 47.0751     | -100.1551    | 2          | P         | 1           |
| 08/25/13            | Harriet #2           | burleigh | 0.          | 0.           | 2          | P         | 38          |
| 04/20/10            | na                   | Burleigh | 47.0448552  | -100.5049676 | 5          | P         | 1           |
| 04/21/10            | na                   | Burleigh | 47.0448552  | -100.5049676 | 5          | P         | 2           |
| 04/08/10            | na                   | Burleigh | 47.0448552  | -100.5049676 | 5          | P         | 30          |
| 04/08/10            | na                   | Burleigh | 47.0448552  | -100.5049676 | 5          | P         | 2           |
| 04/06/10            | na                   | Burleigh | 47.0448552  | -100.5049676 | 5          | P         | 1           |
| 04/07/10            | na                   | Burleigh | 47.0448552  | -100.5049676 | 5          | P         | 8           |
| 04/06/10            | na                   | Burleigh | 47.0448552  | -100.5049676 | 8          | P         | 15          |
| 04/06/10            | na                   | Burleigh | 47.0448552  | -100.5049676 | 8          | P         | 1           |
| 10/02/10            | gellof fire          | Burleigh | 47.0448552  | -100.5049676 | 2          | P         | 1           |
| 08/08/10            | harriot#1            | Burleigh | 47.0448552  | -100.5049676 | 9          | P         | 1           |
| 09/15/12            | wing 1               | Burleigh | 47.0448552  | -100.5049676 | 9          | P         | 5           |
| 09/18/12            | Schrunk 1            | Burleigh | 47.0448552  | -100.5049676 | 9          | P         | 1           |
| 08/17/13            | harriet fire         | Burleigh | 47.0625     | -100.145     | 2          | P         | 1           |
| 08/17/13            | harriet fire         | Burleigh | 47.0523     | -100.2028    | 2          | P         | 1           |

Total  
Acres 5,303

**Cause Codes:**

- 1= Lightning
- 2= Equipment Use
- 3= Smoking
- 4= Campfire
- 5= Debris Burning
- 6= Railroad
- 7= Arson
- 8= Children
- 9= Miscellaneous
- 10= Fireworks
- 11= Power Line
- 12= Structure

**Ownership**

- P= Private
- F= Federal
- S= State

| <b>Summary By Incident Type</b>                     |               |                        |                 |                              |                     |                 |                  |                  |                 |  |
|---|---------------|------------------------|-----------------|------------------------------|---------------------|-----------------|------------------|------------------|-----------------|--|
| <i>Report Period: From 01/01/2009 to 12/01/2014</i> |               |                        |                 |                              |                     |                 |                  |                  |                 |  |
| <b>All Selected Fire Departments</b>                |               |                        |                 |                              |                     |                 |                  |                  |                 |  |
| <b>Calls By Incident Type</b>                       |               |                        |                 |                              |                     |                 |                  |                  |                 |  |
|   | Frequency     | Percent Of Total Calls | Mutual Aid None | Mutual Aid Given             | Mutual Aid Received | Other Aid Given | Invalid Aid Flag | Exposures        | Total Incidents |  |
| <b>FIRES</b>  |               |                        |                 |                              |                     |                 |                  |                  |                 |  |
| Structure Fires (110-118, 120-123) .....            | 439           | 2.41 %                 | 431             | 10                           | 8                   | 0               | 0                | 2                | 451             |  |
| Vehicle Fires (130-138) .....                       | 261           | 1.43 %                 | 258             | 1                            | 3                   | 0               | 0                | 3                | 265             |  |
| Other Fires (100, 140-173) .....                    | 544           | 2.98 %                 | 524             | 28                           | 19                  | 1               | 0                | 1                | 573             |  |
| <b>Total Fires</b> .....                            | <b>1,244</b>  | <b>6.82 %</b>          | <b>1,213</b>    | <b>39</b>                    | <b>30</b>           | <b>1</b>        | <b>0</b>         | <b>6</b>         | <b>1,289</b>    |  |
| Pressure Ruptures, Explosion, Overheat (200-251)    | 19            | 0.10 %                 | 19              | 1                            | 0                   | 0               | 0                | 0                | 20              |  |
| <b>RESCUE CALLS</b>                                 |               |                        |                 |                              |                     |                 |                  |                  |                 |  |
| Emergency Medical Treatment (300-323)               | 10,880        | 59.66 %                | 10,796          | 7                            | 83                  | 1               | 0                | 0                | 10,887          |  |
| All Others (331-381) .....                          | 291           | 1.60 %                 | 280             | 30                           | 11                  | 0               | 0                | 0                | 321             |  |
| <b>Total Rescue Calls</b> .....                     | <b>11,171</b> | <b>61.26 %</b>         | <b>11,076</b>   | <b>37</b>                    | <b>94</b>           | <b>1</b>        | <b>0</b>         | <b>0</b>         | <b>11,208</b>   |  |
| Hazardous Condition Calls (400-482) .....           | 869           | 4.77 %                 | 846             | 5                            | 23                  | 0               | 0                | 0                | 874             |  |
| Service Calls (500-571) .....                       | 520           | 2.85 %                 | 515             | 1                            | 5                   | 0               | 0                | 0                | 521             |  |
| Good Intent Calls (600-671) .....                   | 1,238         | 6.79 %                 | 1,234           | 6                            | 3                   | 1               | 0                | 0                | 1,244           |  |
| Severe Weather or Natural Disaster Calls (800-815)  | 5             | 0.03 %                 | 5               | 0                            | 0                   | 0               | 0                | 0                | 5               |  |
| Special Incident Calls (900-911) .....              | 9             | 0.05 %                 | 9               | 1                            | 0                   | 0               | 0                | 0                | 10              |  |
| Unknown Incident Type (UUU) .....                   | 0             | 0.00 %                 | 0               | 0                            | 0                   | 0               | 0                | 0                | 0               |  |
| <b>FALSE CALLS</b>                                  |               |                        |                 |                              |                     |                 |                  |                  |                 |  |
| Malicious Calls (710-715, 751)                      | 233           | 1.28 %                 | 232             | 0                            | 1                   | 0               | 0                | 0                | 233             |  |
| Other False Calls (700, 721-746)                    | 2,928         | 16.06 %                | 2,917           | 0                            | 11                  | 0               | 0                | 0                | 2,928           |  |
| <b>Total False Calls</b> .....                      | <b>3,161</b>  | <b>17.33 %</b>         | <b>3,149</b>    | <b>0</b>                     | <b>12</b>           | <b>0</b>        | <b>0</b>         | <b>0</b>         | <b>3,161</b>    |  |
| <b>TOTAL CALLS</b> .....                            | <b>18,236</b> | <b>100.00 %</b>        | <b>18,066</b>   | <b>90</b>                    | <b>167</b>          | <b>3</b>        | <b>0</b>         | <b>6</b>         | <b>18,332</b>   |  |
| <b>Summary Totals</b>                               |               |                        |                 |                              |                     |                 |                  |                  |                 |  |
| Total Incidents With Exposure Fires .....           |               |                        | 2               | Total Fire Dollar Loss ..... |                     |                 |                  | \$ 9,789,205.00  |                 |  |
| Total Exposure Fires .....                          |               |                        | 6               | Total Dollar Loss .....      |                     |                 |                  | \$ 12,002,315.00 |                 |  |
| <b>Casualty Summary</b>                             |               |                        |                 |                              |                     |                 |                  |                  |                 |  |
|   |               |                        | <b>Civilian</b> | <b>Fire Service</b>          |                     |                 |                  |                  |                 |  |
| Fire Related Injuries                               |               |                        | 9               | 7                            |                     |                 |                  |                  |                 |  |
| Non-Fire Injuries                                   |               |                        | 4               | 10                           |                     |                 |                  |                  |                 |  |
| Fire Related Deaths                                 |               |                        | 5               | 0                            |                     |                 |                  |                  |                 |  |
| Non-Fire Deaths                                     |               |                        | 2               | 0                            |                     |                 |                  |                  |                 |  |

Source: ND Fire Marshal's Office, NFIRS 5.0 National Reporting System

## Wildland Fire

|                         |  |
|-------------------------|--|
| <b>Frequency</b>        | Highly Likely (Nearly 100% probability in the next year) |
| <b>Severity</b>         | Negligible (Less than 10 of jurisdiction affected)       |
| <b>Risk Class</b>       | C  |
| <b>Seasonal Pattern</b> | None   |
| <b>Duration</b>         | Hours/Days   |
| <b>Speed of Onset</b>   | No warning   |
| <b>Location</b>         | Countywide   |

### Description

Burleigh County experiences wildland fires every year. Factors that influence the potential for wildland fires include: type, amounts and conditions of fuel supply (vegetation); temperatures; wind conditions; precipitation patterns; humidity levels; topography and the levels of human activity on the land. Fires in areas of heavy vegetation, if not quickly detected and suppressed can quickly flare out of control and cause major damage to habitat, crops, livestock, wildlife, people, and structural property.

Wildland fires can occur at any time of the year, although they seldom occur during winter months (cold and snow are excellent mitigating factors).

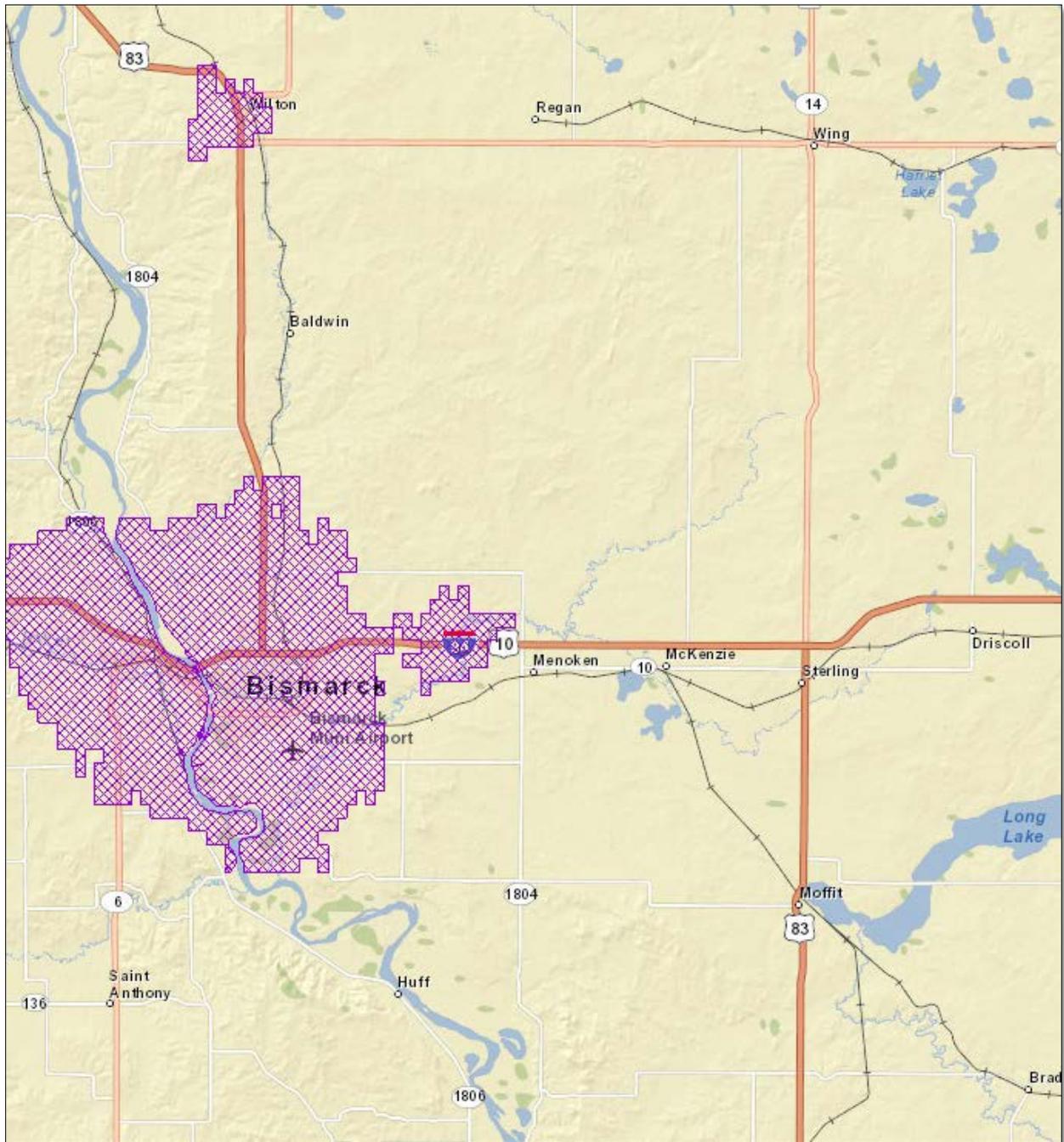
The main fire season normally begins about July 15th, when summer weather warms significantly and precipitation is usually limited to that resulting from thunderstorm activity. This longer and more dangerous season extends until about October 30th or until the first significant snow cover.

Most wildland fires result from acts of human carelessness during activities such as: controlled burns of sloughs, ditches, and fields by landowners; recreational activity such as camping, hunting, and other off-road vehicle travel; and use of fireworks preceding and immediately following the 4th of July.

Numerous fires are reported annually as a direct result from the use of farm machinery in fields and pastures. Fires along railroad right-of-ways are common occurrences during extremely dry conditions. Finally, some fires are caused annually by Mother Nature during lightning or thunderstorms.

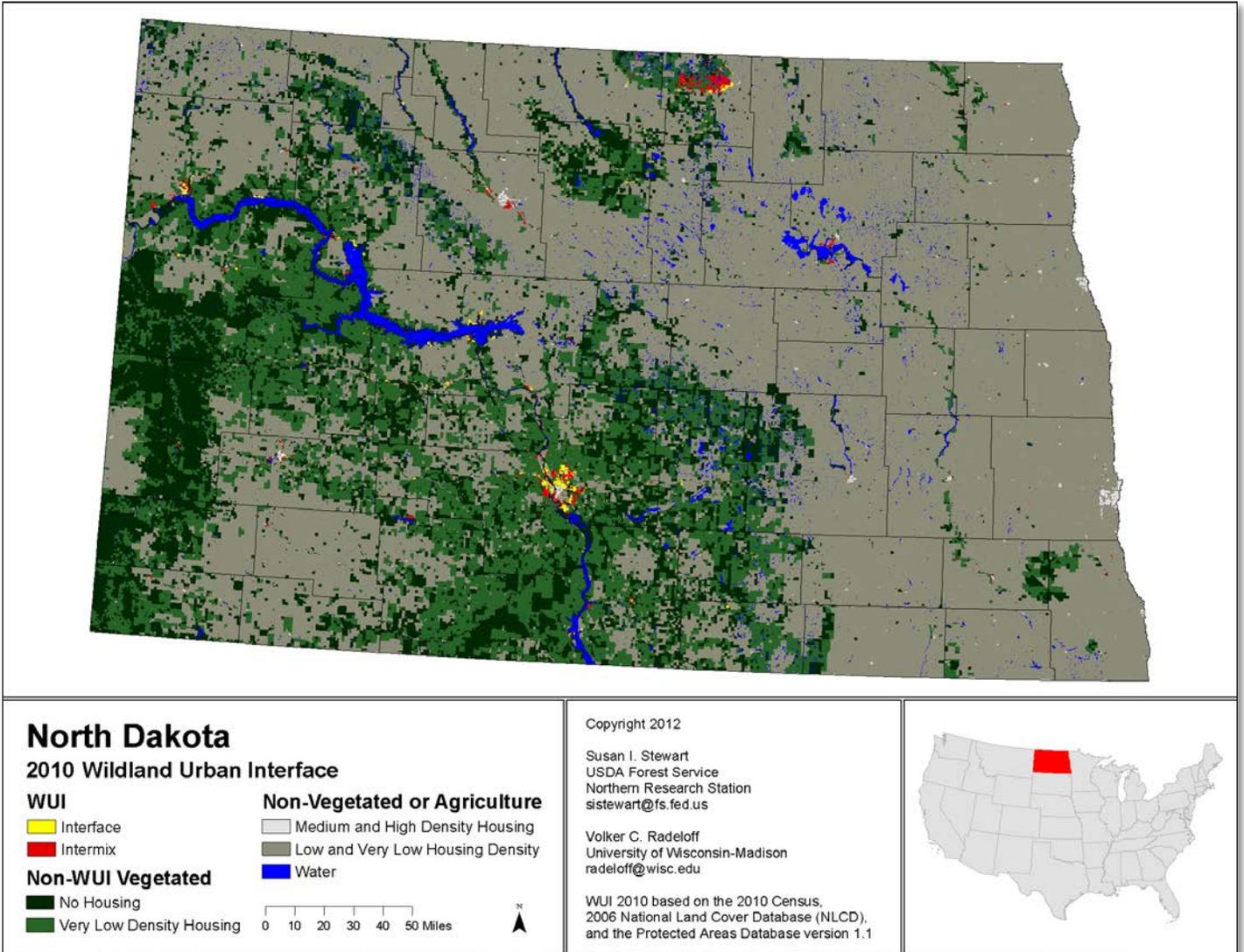
The vulnerability risk for Burleigh County, based on the following maps, is low due to the very low density housing.

### Burleigh County Wildland Urban Interface



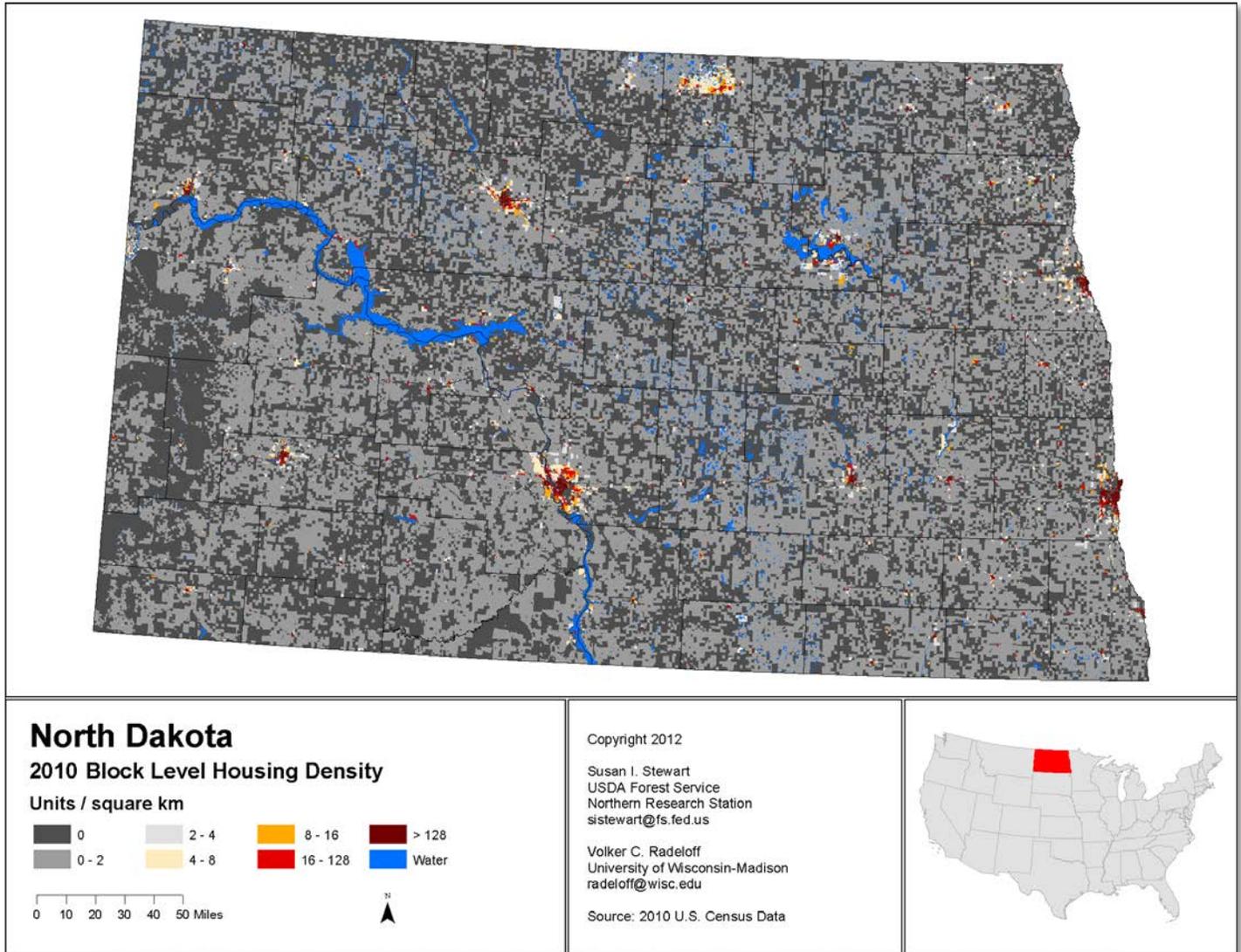
Source: Federal Fire Occurrence [Website](#)

### ND 2010 Wildland Urban Interface



Source: SILVIS Lab, Spatial Analysis for Conservation and Sustainability [website](#)

### North Dakota 2010 Block Level Housing Density



Source: SILVIS Lab, Spatial Analysis for Conservation and Sustainability [website](#)

**Population and Housing Units in SILVIS High and Moderate Risk Threat Zones**

| <b>County</b> | <b>Pop in High Risk</b> | <b>Housing Units in High Risk</b> | <b>Pop in Moderate Risk</b> | <b>Housing Units in Moderate Risk</b> | <b>Total Population in High and Moderate Risk</b> | <b>Total Housing Units in High and Moderate Risk</b> |
|---------------|-------------------------|-----------------------------------|-----------------------------|---------------------------------------|---|--|
| Burleigh      | 27,687                  | 13,216                            | 21,416                      | 8,147                                 | 49,104  | 21,363   |

**Housing Unit Values in High and Moderate Wildfire Risk Areas**

| <b>County</b> | <b>Total Housing Units in High and Moderate Risk Categories</b> | <b>Media Housing Value</b> | <b>Housing Unit Values in High and Moderate Wildfire Risk Areas</b> |
|---------------|---|----------------------------|---|
| Burleigh      | 21,363  | \$159,000                  | \$3,396,717,000   |

**Identified Impacts**

- Blocked Roads
- Building Collapse
- Business Interruptions
- Delayed Emergency Response
- Downed Power Lines
- Downed Trees
- Evacuation (Localized)
- Explosion
- HAZMAT Release
- Increased Fire Potential
- Increased Public Safety Runs
- Livestock Injury/Death
- Loss of Economy
- Loss of Power
- Property Damage
- School Closure

## History

| <u>Location</u>                 | <u>County/Zone</u> | <u>St.</u> | <u>Date</u> | <u>Time</u> | <u>T.Z.</u> | <u>Type</u> | <u>Mag</u> | <u>Dth</u> | <u>Inj</u> | <u>PrD</u> | <u>CrD</u> |
|---------------------------------|--------------------|------------|-------------|-------------|-------------|-------------|------------|------------|------------|------------|------------|
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 07/18/2006  | 14:00       | CST         | Wildfire    |            | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 04/08/2005  | 14:00       | CST         | Wildfire    |            | 0          | 3          | 0.00K      | 0.00K      |
| <a href="#">BISMARCK</a>        | BURLEIGH CO.       | ND         | 04/09/2003  | 14:14       | CST         | Wildfire    |            | 0          | 1          | 0.00K      | 0.00K      |
| <a href="#">MC KENZIE</a>       | BURLEIGH CO.       | ND         | 03/24/2003  | 13:35       | CST         | Wildfire    |            | 0          | 0          | 0.00K      | 0.00K      |
| <b>Totals:</b>                  |                    |            |             |             |             |             |            | 0          | 4          | 0.00K      | 0.00K      |

Source: National Oceanic and Atmospheric Administration National Climatic Data Center [Website](#) (01/1950 to 08/2014)

Several wildland fires occur annually; some of the more significant incidents are listed below:

**May 24, 2008** – A prescribed burn at the Long Lake Wildlife Refuge escaped containment, burning over 650 acres of private and refuge land.

**July 18, 2006** - A fire, 15 miles north of Bismarck, quickly consumed 500 acres of vegetation after igniting in tall grass near a farmstead. The fire spread to the structures on the farm. Two barns, a granary, and corrals were lost to the fire before it was brought under control.

**April 8, 2005** - Strong southerly winds gusting to 45 mph combine with low relative humidities and dry pastures, created red flag conditions in North Dakota. A large grass fire developed east of Wilton. The fire became very large in size, creating its own weather conditions. Winds shifted entrapping 3 rural firefighters. One firefighter suffered a broken leg while two others suffered second and third degree burns.

**April 9, 2003** – McLean Bottoms fire disaster (Burleigh and Emmons County). Wildland fire occurred on US Army Corps of Engineer land in Emmons County along the Missouri River. The fire continued to spread into Burleigh County on Corps land leased by North Dakota Game and Fish. Estimated 6,500 acres lost.

**March 24, 2003** - Grass fire one mile north and one mile east of McKenzie (5700 NE 249<sup>th</sup> St).

**Windstorm**

|                         |  |
|-------------------------|--|
| <b>Frequency</b>        | Highly Likely (Nearly 100% probability in the next year) |
| <b>Severity</b>         | Critical (25-50% of jurisdiction affected)               |
| <b>Risk Class</b>       | A  |
| <b>Seasonal Pattern</b> | None   |
| <b>Duration</b>         | Hours/Days   |
| <b>Speed of Onset</b>   | No warning   |
| <b>Location</b>         | Countywide   |

**Description**

The National Weather Service defines wind as:

“The horizontal motion of the air past a given point. Winds begin with differences in air pressures. Pressure that's higher at one place than another sets up a force pushing from the high toward the low pressure. The greater the difference in pressures, the stronger the force. The distance between the area of high pressure and the area of low pressure also determines how fast the moving air is accelerated. Meteorologists refer to the force that starts the wind flowing as the "pressure gradient force." High and low pressure are relative. There's no set number that divides high and low pressure. Wind is used to describe the prevailing direction from which the wind is blowing with the speed given usually in miles per hour or knots.” (Source: National Weather Service Glossary [website](#))

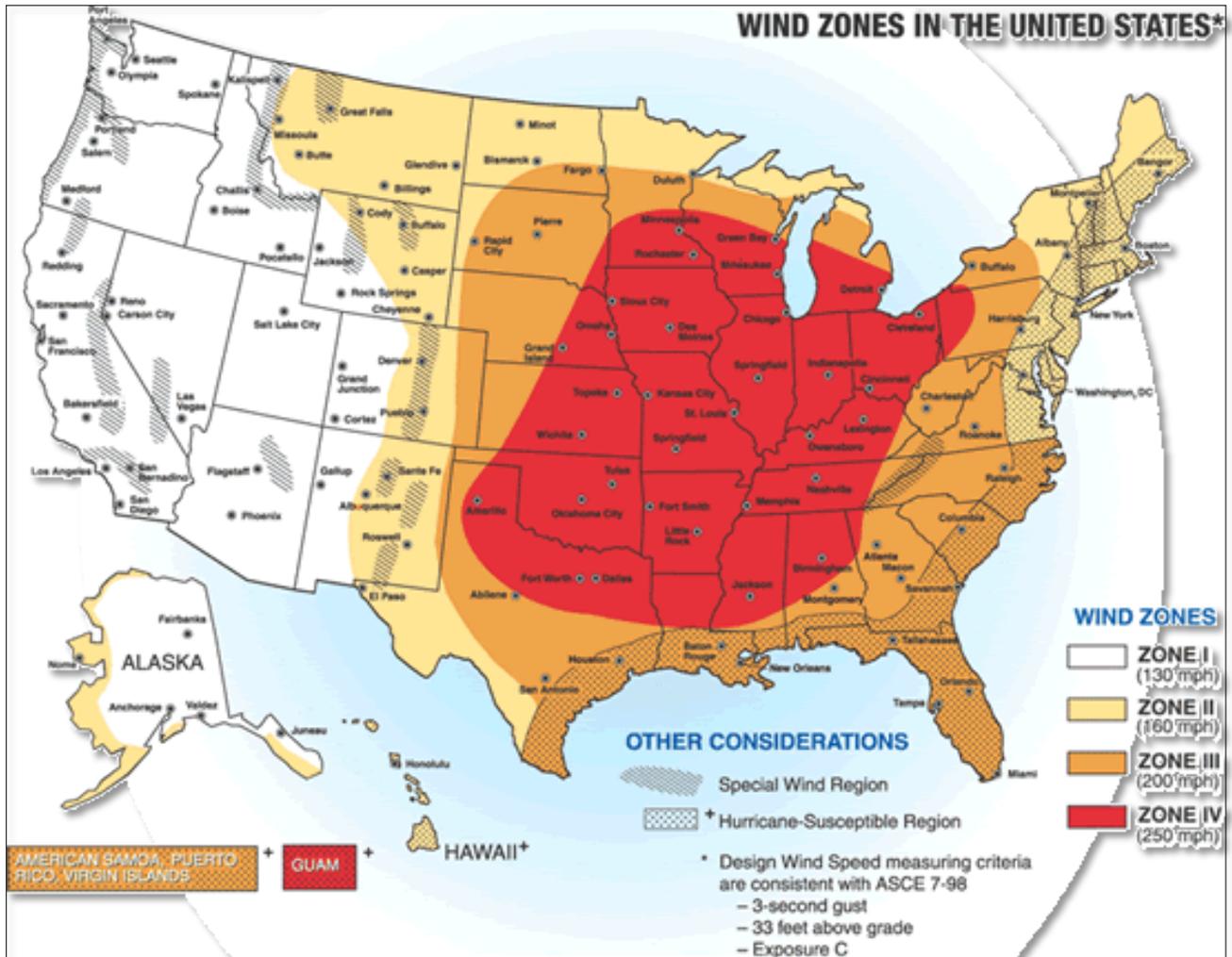
The Federal Emergency Management Agency recognizes Wind Zones in the United States. North Dakota is primarily in Zone II (160 mph) with a southeast portion in Zone III (200 mph). Burleigh County is within the Zone II designation.

**Windstorm Vulnerability**

| County   | Social Vuln. Rating | # of Events (2000-2003) | Property Damage | Annual Property Damages | Total Building Exposure (\$000) | Pop. Density | Livestock Exposure | Crop Exposure | Crop Insurance Payments (2003-2012) | Crop Losses (2003-2012) | Annual Crop Losses | Vuln. Score | Overall Vulnerability Ranking |
|----------|---------------------|-------------------------|-----------------|-------------------------|---------------------------------|--------------|--------------------|---------------|-------------------------------------|-------------------------|--------------------|-------------|-------------------------------|
| Burleigh | 2                   | 27                      | \$115,000       | \$8,846                 | \$8,282,489                     | 49.8         | \$31,554,000       | \$50,682,000  | \$1,028,647                         | \$1,155,783             | \$115,578          | 26          | Low-Moderate                  |

Source: State of North Dakota Multi-Hazard Mitigation Plan, February 2014

### United States Wind Zones



Source: Federal Emergency Management Agency, Wind Zones [website](#)

| Wind Zones                   | Areas Affected   |
|------------------------------|--|
| Zone I<br>(130 mph)          | All of Washington, Oregon, California, Idaho, Utah, and Arizona. Western parts of Montana, Wyoming, Colorado and New Mexico. Most of Alaska except the east and south coastlines.  |
| Zone II<br>(160 mph)         | Eastern parts of Montana, Wyoming, Colorado, New Mexico. Most of North Dakota. Northern parts of Minnesota, Wisconsin and Michigan. Western parts of South Dakota, Nebraska and Texas. All New England States. Eastern parts of New York, Pennsylvania, Maryland, and Virginia. Washington, DC.  |
| Zone III<br>(200 mph)        | Areas of Minnesota, South Dakota, Nebraska, Colorado, Kansas, Oklahoma, Texas, Louisiana, Mississippi, Alabama, Georgia, Tennessee, Kentucky, Pennsylvania, New York, Michigan, and Wisconsin. Most or all of Florida, Georgia, South Carolina, North Carolina, Virginia, West Virginia. All of American Samoa, Puerto Rico, and Virgin Islands. |
| Zone IV<br>(250 mph)         | Mid US including all of Iowa, Missouri, Arkansas, Illinois, Indiana, and Ohio and parts of adjoining states of Minnesota, South Dakota, Nebraska, Kansas, Oklahoma, Texas, Louisiana, Mississippi, Alabama, Georgia, Tennessee, Kentucky, Pennsylvania, Michigan, and Wisconsin. Guam.   |
| Special Wind Region          | Isolated areas in the following states: Washington, Oregon, California, Idaho, Utah, Arizona, Montana, Wyoming, Colorado, New Mexico. The borders between Vermont and New Hampshire; between New York, Massachusetts and Connecticut; between Tennessee and North Carolina.  |
| Hurricane Susceptible Region | Southern US coastline from Gulf Coast of Texas eastward to include entire state of Florida. East Coastline from Maine to Florida, including all of Massachusetts, Connecticut, Rhode Island, Delaware, and Washington DC. All of Hawaii, Guam, American Samoa, Puerto Rico and Virgin Islands.   |

**Identified Impacts**

- Blocked Roads
- Downed Power Lines
- Downed Trees
- Loss of Power
- Property Damage

## History

| <u>Location</u>                 | <u>County/Zone</u> | <u>St.</u> | <u>Date</u> | <u>Time</u> | <u>T.Z.</u> | <u>Type</u> | <u>Mag</u> | <u>Dth</u> | <u>Inj</u> | <u>PrD</u> | <u>CrD</u> |
|---------------------------------|--------------------|------------|-------------|-------------|-------------|-------------|------------|------------|------------|------------|------------|
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 01/15/2014  | 20:00       | CST-6       | High Wind   | 59 kts. MG | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 05/14/2013  | 05:00       | CST-6       | High Wind   | 56 kts. MG | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 10/17/2012  | 21:00       | CST-6       | High Wind   | 52 kts. MG | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 10/07/2011  | 10:00       | CST-6       | High Wind   | 35 kts. MS | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 09/20/2011  | 03:00       | CST-6       | High Wind   | 35 kts. ES | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 05/31/2011  | 09:00       | CST-6       | High Wind   | 35 kts. ES | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 02/13/2011  | 09:00       | CST-6       | High Wind   | 38 kts. MS | 0          | 0          | 20.00K     | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 10/26/2010  | 11:00       | CST-6       | High Wind   | 53 kts. MG | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 08/13/2010  | 00:47       | CST-6       | High Wind   | 70 kts. MG | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 06/18/2010  | 10:00       | CST-6       | High Wind   | 36 kts. MS | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 05/25/2010  | 09:00       | CST-6       | High Wind   | 52 kts. EG | 0          | 0          | 30.00K     | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 01/31/2009  | 13:30       | CST-6       | High Wind   | 35 kts. ES | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 10/26/2008  | 12:47       | CST-6       | High Wind   | 51 kts. MG | 0          | 0          | 50.00K     | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 07/12/2008  | 11:47       | CST-6       | High Wind   | 37 kts. MS | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 05/19/2008  | 12:30       | CST-6       | High Wind   | 35 kts. MS | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 05/01/2008  | 18:00       | CST-6       | High Wind   | 52 kts. EG | 0          | 0          | 15.00K     | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 03/24/2008  | 17:45       | CST-6       | High Wind   | 35 kts. MS | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 01/08/2007  | 18:00       | CST-6       | High Wind   | 59 kts. MG | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE)    | ND         | 03/09/2005  | 22:00       | CST         | High Wind   | 46 kts. MS | 0          | 0          | 0.00K      | 0.00K      |
| <a href="#">BURLEIGH</a>        | BURLEIGH           | ND         | 12/20/2004  | 09:00       | CST         | High        | 47 kts.    | 0          | 0          | 0.00K      | 0.00K      |

|                                 |                 |    |            |       |     |           |            |   |    |         |       |
|---------------------------------|-----------------|----|------------|-------|-----|-----------|------------|---|----|---------|-------|
| <a href="#">(ZONE)</a>          | (ZONE)          |    |            |       |     | Wind      | MS         |   |    |         |       |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 12/11/2004 | 18:00 | CST | High Wind | 42 kts. MS | 0 | 1  | 0.00K   | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 03/13/2004 | 12:58 | CST | High Wind | 53 kts. MS | 0 | 0  | 0.00K   | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 11/29/2002 | 08:00 | CST | High Wind | 46 kts. M  | 0 | 0  | 0.00K   | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 02/11/2002 | 13:31 | CST | High Wind | 59 kts. M  | 0 | 0  | 0.00K   | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 11/01/2001 | 10:00 | CST | High Wind | 43 kts. M  | 0 | 0  | 0.00K   | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 05/22/2001 | 11:42 | CST | High Wind | 45 kts. M  | 0 | 0  | 0.00K   | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 05/20/2001 | 15:38 | CST | High Wind | 37 kts. M  | 0 | 0  | 0.00K   | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 05/07/2001 | 13:02 | CST | High Wind | 43 kts. M  | 0 | 0  | 0.00K   | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 04/05/2000 | 08:30 | CST | High Wind | 62 kts. M  | 0 | 10 | 0.00K   | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 11/01/1999 | 01:00 | CST | High Wind | 53 kts.    | 0 | 0  | 0.00K   | 0.00K |
| <a href="#">BURLEIGH (ZONE)</a> | BURLEIGH (ZONE) | ND | 02/10/1996 | 10:00 | CST | High Wind | 54 kts.    | 0 | 0  | 0.00K   | 0.00K |
| <b>Totals:</b>                  |                 |    |            |       |     |           |            | 0 | 11 | 115.00K | 0.00K |

Source: National Oceanic and Atmospheric Administration National Climatic Data Center [Website](#) (01/1950 to 08/2014)

Some of the more significant events include:

**June 21, 1994** – Nine 80 foot power line towers were blown over from Wilton and southeast of Wilton. Trees were uprooted and building destroyed at a farm near Baldwin. Property damage from this storm is estimated at \$500,000. Crop damage from this storm is estimated at \$50,000.

**May 16, 1996** – As the storm moved into the Bismarck area, the National Weather Service at the airport received a gust to 79 mph. A small plane was tipped over at the airport, with part of the airport terminal roof blown off. There was at least 1 mobile home that was destroyed. Significant damage was done to trees, buildings and road signs. An estimated 3,000 people in Bismarck lost power. The Melroe Company had its roof lifted off. Property damage from this storm is estimated at \$3.2 million.

**Attachments**

Separate document.

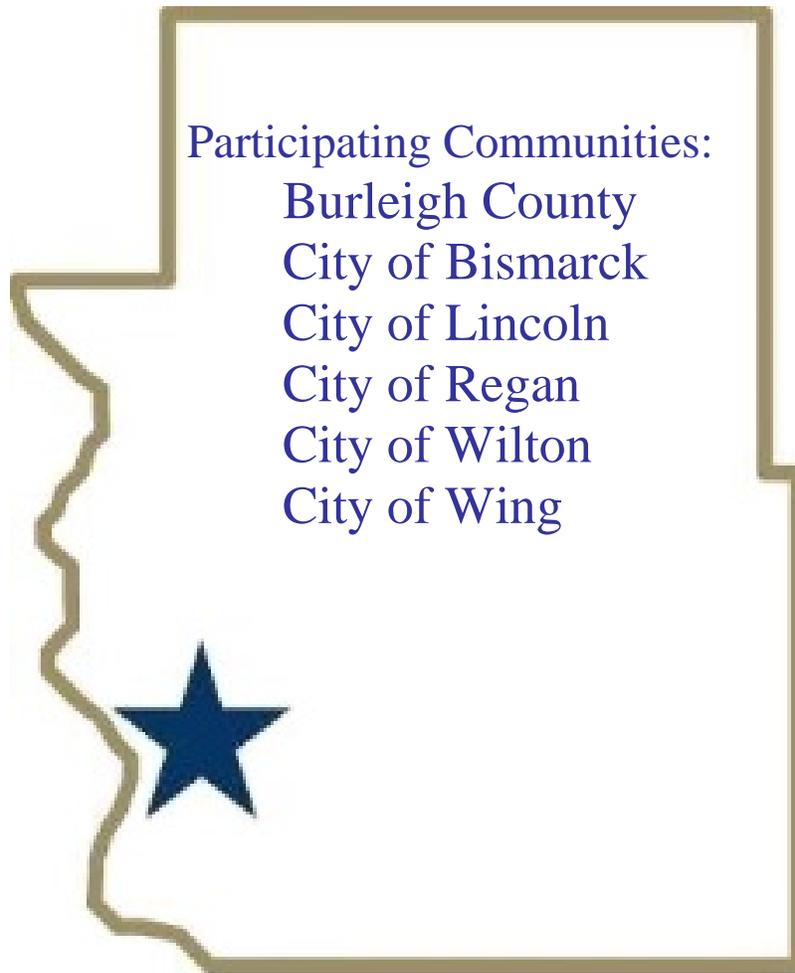
**Appendices**

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# Burleigh County Multi-Hazard Mitigation Plan

## Attachments



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**ATTACHMENT 1: MITIGATION PROJECTS**

Mitigation opportunities will be submitted on an equal basis except where urgent/special circumstances warrant high priority. The emphasis may be the cost benefit review of the proposed mitigation. Implementation and administration of the projects will be through the Burleigh County Emergency Manager unless dictated by the unique specialty or level of expertise needed for the project.

Three goals were identified to provide the general guidance for mitigation activities:

- Protect public health and safety.
- Minimize damage to existing and future property.
- Minimize economic losses and disruption of essential community services.

Projects were prioritized (low, medium, high) during groups meetings, individual input, and group e-mails. Processes included looking at previous history as well as current and projected conditions. The two highest hazards deemed “Highly Likely” (Severe Summer Weather and Severe Summer Weather) through the online survey and stakeholder input were thoroughly reviewed and resulted in some new mitigation projects.

Flood events of 2009 and 2011 promulgated additional mitigation project proposals and are included within the mitigation projects in this plan. Further, the projects are also included in the Burleigh County Flood Annex and utilized in the Burleigh County Highway Department’s Road Priority Listing approved by the Burleigh County Commission.

| Project  | Hazard               |             |         |       |                  |                             |                            |                       |                       |                                |                         |                                  |               |           | Jurisdiction    |          |         |       |        | Priority |     |        |      |
|--|----------------------|-------------|---------|-------|------------------|-----------------------------|----------------------------|-----------------------|-----------------------|--------------------------------|-------------------------|----------------------------------|---------------|-----------|-----------------|----------|---------|-------|--------|----------|-----|--------|------|
|  | Communicable Disease | Dam Failure | Drought | Flood | Geologic Hazards | Hazardous Materials Release | Homeland Security Incident | Severe Summer Weather | Severe Winter Weather | Shortage or Outage of Critical | Transportation Accident | Urban Fire or Structure Collapse | Wildland Fire | Windstorm | Burleigh County | Bismarck | Lincoln | Regan | Wilton | Wing     | Low | Medium | High |
| Community Outreach and Education                         | X                    | X           | X       | X     | X                | X                           | X                          | X                     | X                     | X                              | X                       | X                                | X             | X         | X               | X        | X       | X     | X      | X        |     | X      |      |
| Re-evaluate County Website                               | X                    | X           | X       | X     | X                | X                           | X                          | X                     | X                     | X                              | X                       | X                                | X             | X         | X               | X        | X       | X     | X      | X        | X   | X      |      |
| All Hazards Radio  | X                    | X           | X       | X     | X                | X                           | X                          | X                     | X                     | X                              | X                       | X                                | X             | X         | X               | X        | X       | X     | X      | X        |     | X      |      |
| ANS Opt-In Promotion                                     | X                    | X           | X       | X     | X                | X                           | X                          | X                     | X                     | X                              | X                       | X                                | X             | X         | X               | X        | X       | X     | X      | X        |     |        | X    |
| Evaluate ANS Replacement                                 | X                    | X           | X       | X     | X                | X                           | X                          | X                     | X                     | X                              | X                       | X                                | X             | X         | X               | X        | X       | X     | X      | X        |     | X      |      |
| Emergency Planning                                       | X                    | X           | X       | X     | X                | X                           | X                          | X                     | X                     | X                              | X                       | X                                | X             | X         | X               | X        | X       | X     | X      | X        |     | X      |      |
| Evaluate GIS Map   | X                    | X           | X       | X     | X                | X                           | X                          | X                     | X                     | X                              | X                       | X                                | X             | X         | X               | X        | X       | X     | X      | X        |     | X      |      |
| Evaluate MHMP  | X                    | X           | X       | X     | X                | X                           | X                          | X                     | X                     | X                              | X                       | X                                | X             | X         | X               | X        | X       | X     | X      | X        |     | X      |      |
| Vulnerable Population Registry                           | X                    | X           | X       | X     | X                | X                           | X                          | X                     | X                     | X                              | X                       | X                                | X             | X         | X               | X        | X       | X     | X      | X        |     | X      |      |
| Shelter Planning   | X                    | X           | X       | X     | X                | X                           | X                          | X                     | X                     | X                              | X                       | X                                | X             | X         | X               | X        | X       | X     | X      | X        |     | X      |      |
| Backup Generator for Wilton                              | X                    | X           | X       | X     | X                | X                           | X                          | X                     | X                     | X                              | X                       | X                                | X             |           |                 |          | X       | X     | X      |          |     | X      |      |
| Communicable Disease Outreach                            | X                    |             |         |       |                  |                             |                            |                       |                       |                                |                         |                                  |               | X         | X               | X        | X       | X     | X      |          |     | X      |      |
| Evaluate Inoculation and Isolation Plans                 | X                    |             |         |       |                  |                             |                            |                       |                       |                                |                         |                                  |               | X         | X               | X        | X       | X     | X      |          |     | X      |      |
| Mass Dispensing  | X                    |             |         |       |                  |                             |                            |                       |                       |                                |                         |                                  |               | X         | X               | X        | X       | X     | X      |          |     | X      |      |
| Immunizations/Vaccinations                               | X                    |             |         |       |                  |                             |                            |                       |                       |                                |                         |                                  |               | X         | X               | X        | X       | X     | X      |          |     | X      |      |
| Surveillance   | X                    |             |         |       |                  |                             |                            |                       |                       |                                |                         |                                  |               | X         | X               | X        | X       | X     | X      |          |     | X      |      |
| Monitoring   | X                    |             |         |       |                  |                             |                            |                       |                       |                                |                         |                                  |               | X         | X               | X        | X       | X     | X      |          |     | X      |      |
| National Flood Insurance Program Public Participation    |                      | X           |         | X     |                  |                             |                            |                       |                       |                                |                         |                                  |               | X         | X               | X        | X       | X     | X      |          |     | X      |      |
| Missouri River Flood Map                                 |                      | X           |         | X     |                  |                             |                            |                       |                       |                                |                         |                                  |               | X         | X               | X        |         |       |        |          |     | X      |      |
| Apple Creek Ind Park Levee                               |                      | X           |         | X     |                  |                             |                            |                       |                       |                                |                         |                                  |               | X         |                 |          |         |       |        |          |     | X      |      |
| MRCC Flood Control                                       |                      | X           |         | X     |                  |                             |                            |                       |                       |                                |                         |                                  |               | X         |                 |          |         |       |        |          | X   |        |      |
| Sibley Island Flood Control                              |                      | X           |         | X     |                  |                             |                            |                       |                       |                                |                         |                                  |               | X         |                 |          |         |       |        |          | X   |        |      |
| National Flood Insurance Program Jurisdiction Compliance |                      | X           |         | X     |                  |                             |                            |                       |                       |                                |                         |                                  |               | X         | X               |          |         | X     | X      |          |     | X      |      |
| National Flood Insurance Program Jurisdiction Compliance |                      | X           |         | X     |                  |                             |                            |                       |                       |                                |                         |                                  |               |           |                 | X        |         |       |        |          |     | X      |      |
| National Flood Insurance Program Participation           |                      | X           |         | X     |                  |                             |                            |                       |                       |                                |                         |                                  |               |           |                 | X        |         |       |        | X        |     | X      |      |
| Drought Awareness  |                      |             | X       |       |                  |                             |                            |                       |                       |                                |                         |                                  |               | X         | X               | X        | X       | X     | X      |          |     | X      |      |

| Project                         | Hazard               |             |         |       |                  |                             |                            |                       |                       |                                |                         |                                  |               | Jurisdiction |                 |          |         |       | Priority |      |     |        |      |
|---------------------------------|----------------------|-------------|---------|-------|------------------|-----------------------------|----------------------------|-----------------------|-----------------------|--------------------------------|-------------------------|----------------------------------|---------------|--------------|-----------------|----------|---------|-------|----------|------|-----|--------|------|
|                                 | Communicable Disease | Dam Failure | Drought | Flood | Geologic Hazards | Hazardous Materials Release | Homeland Security Incident | Severe Summer Weather | Severe Winter Weather | Shortage or Outage of Critical | Transportation Accident | Urban Fire or Structure Collapse | Wildland Fire | Windstorm    | Burleigh County | Bismarck | Lincoln | Regan | Wilton   | Wing | Low | Medium | High |
| Drought Awareness               |                      |             | X       |       |                  |                             |                            |                       |                       |                                |                         |                                  |               | X            | X               | X        | X       | X     | X        |      |     | X      |      |
| Water and Soil Conservation     |                      |             | X       |       |                  |                             |                            |                       |                       |                                |                         |                                  |               | X            | X               | X        | X       | X     | X        |      |     | X      |      |
| Fire Index/Drought Conditions   |                      |             | X       |       |                  |                             |                            |                       |                       |                                | X                       | X                                |               | X            | X               | X        | X       | X     | X        |      |     | X      |      |
| Flood Recovery Education        |                      |             |         | X     |                  |                             |                            |                       |                       |                                |                         |                                  |               | X            | X               | X        | X       | X     | X        | X    | X   |        |      |
| Apple Creek Road Grade Raise    |                      |             |         | X     |                  |                             |                            |                       |                       |                                |                         |                                  |               | X            |                 |          |         |       |          |      |     |        | X    |
| Culvert Cleaning                |                      |             |         | X     |                  |                             |                            |                       |                       |                                |                         |                                  |               |              |                 | X        |         |       |          |      |     |        | X    |
| Evacuation Routes               |                      |             | X       |       | X                |                             |                            |                       |                       |                                |                         |                                  |               | X            | X               | X        | X       | X     | X        |      |     |        | X    |
| Landslide Activity              |                      |             |         |       | X                |                             |                            |                       |                       |                                |                         |                                  |               | X            |                 |          |         | X     |          | X    |     |        |      |
| Hazmat Awareness                |                      |             |         |       | X                |                             |                            |                       |                       |                                |                         |                                  |               | X            | X               | X        | X       | X     | X        |      |     |        | X    |
| Hazmat Routes                   |                      |             |         |       | X                |                             |                            |                       |                       |                                |                         |                                  |               | X            | X               | X        | X       | X     | X        | X    | X   |        |      |
| Report Suspicious Activity      |                      |             |         |       |                  | X                           |                            |                       |                       |                                |                         |                                  |               | X            | X               | X        | X       | X     | X        |      |     |        | X    |
| WMD Training                    |                      |             |         |       | X                | X                           |                            |                       |                       |                                |                         |                                  |               | X            | X               | X        | X       | X     | X        |      |     |        | X    |
| Severe Summer Weather Awareness |                      |             |         |       |                  |                             | X                          |                       |                       |                                |                         |                                  |               | X            | X               | X        | X       | X     | X        |      |     |        | X    |
| Living Snow Fences              |                      |             |         |       |                  |                             | X                          | X                     |                       |                                |                         |                                  | X             | X            | X               | X        | X       | X     | X        |      |     |        | X    |
| Cut Trees/Limbs                 |                      |             |         |       |                  |                             | X                          | X                     |                       |                                |                         |                                  | X             | X            | X               | X        | X       | X     | X        | X    | X   |        |      |
| Severe Winter Weather Awareness |                      |             |         |       |                  |                             |                            | X                     |                       |                                |                         |                                  |               | X            | X               | X        | X       | X     | X        |      |     |        | X    |
| Clear Roadside Trees            |                      |             |         |       |                  |                             |                            | X                     |                       |                                |                         |                                  |               | X            |                 | X        | X       | X     | X        | X    | X   |        |      |
| Snow Fencing                    |                      |             |         |       |                  |                             |                            | X                     |                       |                                |                         |                                  |               | X            |                 | X        | X       | X     | X        | X    | X   |        |      |
| Snow Fencing                    |                      |             |         |       |                  |                             |                            | X                     |                       |                                |                         |                                  |               |              |                 |          |         | X     | X        | X    | X   |        |      |
| Three-Day Supplies              |                      |             |         |       |                  |                             |                            |                       | X                     |                                |                         |                                  |               | X            | X               | X        | X       | X     | X        | X    | X   |        | X    |
| Mass Casualty Planning          |                      |             |         |       |                  |                             |                            |                       |                       | X                              |                         |                                  |               | X            | X               | X        | X       | X     | X        | X    | X   |        | X    |
| Defensible Space                |                      |             |         |       |                  |                             |                            |                       |                       |                                | X                       | X                                |               | X            | X               | X        | X       | X     | X        | X    | X   |        |      |
| Defensible Space – Regan        |                      |             |         |       |                  |                             |                            |                       |                       |                                | X                       | X                                |               |              |                 |          | X       |       |          |      |     | X      |      |
| Defensible Space – Wilton       |                      |             |         |       |                  |                             |                            |                       |                       |                                | X                       | X                                |               |              |                 |          |         | X     |          |      |     | X      |      |
| Fuel Reduction                  |                      |             |         |       |                  |                             |                            |                       |                       |                                | X                       | X                                |               | X            | X               | X        | X       | X     | X        | X    | X   |        |      |
| CWPP                            |                      |             |         |       |                  |                             |                            |                       |                       |                                | X                       | X                                |               | X            | X               | X        | X       | X     | X        | X    | X   |        |      |
| Fire Lines                      |                      |             |         |       |                  |                             |                            |                       |                       |                                |                         | X                                |               | X            |                 | X        | X       | X     | X        | X    | X   |        |      |
| Missouri River Bottoms Access   |                      |             |         |       |                  |                             |                            |                       |                       |                                |                         | X                                |               | X            |                 |          |         |       |          |      |     | X      |      |
|                                 |                      |             |         |       |                  |                             |                            |                       |                       |                                |                         |                                  |               |              |                 |          |         |       |          |      |     |        |      |
|                                 |                      |             |         |       |                  |                             |                            |                       |                       |                                |                         |                                  |               |              |                 |          |         |       |          |      |     |        |      |

| Mitigation Projects         |        |   |  |  |                   |                                   |           |                  |          |
|-----------------------------|--------|---|--|--|-------------------|-----------------------------------|-----------|------------------|----------|
| Jurisdiction                | Hazard | Description   | Range of Actions (preferred action shown first if more than one listed)  | Lead Agency(s)   | Cost              | Funding Source                    | Timeframe | Progress         | Priority |
| Burleigh County, All Cities | All    | Community Outreach and Education: Timely, informational campaigns to inform and educate the public on hazards emergency preparedness.         | Maintain public education through workshops, training, and/or newspaper, website, and social media.                  | Emergency Management Fire Districts Public Health Sheriff's Department | \$5,000           | General Fund Budget and/or Grants | Annually  | 2003 and Ongoing | Medium   |
| Burleigh County, All Cities | All    | Re-evaluate County Website: Develop website further to serve as central repository for information gathering and dissemination during events. | Sole source contract through current website host.<br><br>Develop in-house.  | County Commission Emergency Management Department Heads                | \$15,000          | General Fund                      | 1-3 Years | 2003 and Ongoing | Low      |
| Burleigh County, All Cities | All    | All Hazards Radio: Promote the purchase and use of an all-hazards radio   | Coordinate with ongoing campaigns for Severe Summer Weather, Severe Winter Weather, and National Preparedness Month. | Emergency Management   | \$500             | General Fund                      | Annually  | 2003 and Ongoing | Medium   |
| Burleigh County, All Cities | All    | Automatic Notification System: Continue to promote "opt-in" of community.   | Campaign to promote system via website, social media, and print media.   | Bismarck/Burleigh Combined Communications                              | Staff Time        | General Fund                      | Annually  | 2014 and Ongoing | High     |
| Burleigh County, All Cities | All    | Evaluate Automatic Notification System Replacement  | Current system is becoming outdated.   | Bismarck/Burleigh Combined Communications                              | \$20,000-\$30,000 | General Fund                      | 1-3 Years | 2014 and Ongoing | Medium   |
| Burleigh County, All Cities | All    | Emergency Planning: Continue to evaluate and update current plans.  | Planning and training sessions to maintain awareness, roles, and responsibilities of current plans                   | Emergency Management   | \$5,000           | General Fund Budget and/or Grants | Annually  | 2003 and Ongoing | Medium   |
| Burleigh County, All Cities | All    | Evaluate GIS Maps: Addressing, City Maps, Floodplains, Key Facilities, aerial photos.   | Continue to staff a GIS person within Burleigh County  | Burleigh County Highway Dept   | \$100,000         | General Fund                      | 1-3 Years | 2010 and Ongoing | Medium   |
| Burleigh County, All Cities | All    | Evaluate MHMP: Evaluate information in the plan and update every five years.  | Maintain plan with in-house employees.<br><br>Contract the 5-year update   | Emergency Management   | \$1,000           | General Fund                      | 3-5 Years | 2003 and Ongoing | Medium   |
| Burleigh County, All Cities | All    | Vulnerable Population Registry: Identification of vulnerable populations for utilization in emergency/disaster situations.                    | Participate in the ND Department of Health Program.<br><br>Create stand-alone program.                               | Emergency Management Public Health Sheriff's Department                | \$100             | General Fund                      | Annually  | 2014 and Ongoing | Medium   |

| Mitigation Projects         |                      |   |  |   |            |   |           |                  |          |
|-----------------------------|----------------------|---|--|---|------------|---|-----------|------------------|----------|
| Jurisdiction                | Hazard               | Description   | Range of Actions (preferred action shown first if more than one listed)  | Lead Agency(s)  | Cost       | Funding Source                          | Timeframe | Progress         | Priority |
| Burleigh County, All Cities | All                  | Shelter Planning: Planning and training regarding shelter set-up.   | Planning meetings and exercises.   | Bismarck/Burleigh Public Health<br>Emergency Management | \$1,000    | General Fund                            | 1-3 Years | 2003 and Ongoing | Medium   |
| Regan, Wilton, Wing         | All                  | Backup Generator for Wilton Memorial Hall   | This facility serves as the backup location for Wilton City Hall and is used for larger Commission Meetings. It would also serve as the primary shelter for Regan, Wilton, and Wing. | City Mayors<br>Emergency Management                     | \$50,000   | General Fund<br>Budget and/or<br>Grants | 1-3 Years | 2015 and Ongoing | Medium   |
| Burleigh County, All Cities | Communicable Disease | Communicable Disease Outreach: Make public aware of the dangers of communicable disease to people, crops, and livestock | Advertising campaign to include current diseases in the area (if applicable) and promote inoculations  | Public Health<br>Extension Service                      | \$1,000    | General Fund<br>Budget and/or<br>Grants | Annually  | 2003 and Ongoing | Medium   |
| Burleigh County, All Cities | Communicable Disease | Evaluate Quarantine and Isolation Plans   | Continue to coordinate planning with Southwest Central Emergency Preparedness Coordinator  | Public Health   | \$1,000    | General Fund<br>and/or Grants           | Annually  | 2010 and Ongoing | Medium   |
| Burleigh County, All Cities | Communicable Disease | Mass Dispensing: Planning, training, and exercises.   | Continue planning efforts and exercise as appropriate.   | Public Health   | \$5,000    | General Fund<br>and/or Grants           | Ongoing   | 2010 and Ongoing | Medium   |
| Burleigh County, All Cities | Communicable Disease | Immunization/Vaccinations   | Immunization clinics.  | Public Health   | Staff Time | General Fund<br>and/or Grants           | Annually  | 2014 and Ongoing | Medium   |
| Burleigh County, All Cities | Communicable Disease | Surveillance: Monitoring trends in clinics, hospitals, and emergency rooms.   | Continue surveillance program.   | ND Department of Health<br>Public Health                | Staff Time | General Fund<br>and/or Grants           | Annually  | 2014 and Ongoing | Medium   |
| Burleigh County, All Cities | Communicable Disease | Monitoring: Case management of communicable diseases.   | Continue monitoring program.   | ND Department of Health<br>Public Health                | Staff Time | General Fund<br>and/or Grants           | Annually  | 2014 and Ongoing | Medium   |

| Mitigation Projects                |                   |  |   |   |           |   |  |   |          |
|------------------------------------|-------------------|--|---|---|-----------|---|--|---|----------|
| Jurisdiction                       | Hazard            | Description  | Range of Actions (preferred action shown first if more than one listed)   | Lead Agency(s)  | Cost      | Funding Source                                  | Timeframe  | Progress  | Priority |
| Burleigh County, All Cities        | Dam Failure Flood | National Flood Insurance Program (public): Promote public participation in the program.  | Continue to inform public regarding flood insurance.  | City Mayors<br>County Commission Chair<br>Emergency Management<br>Burleigh County Water Resource District | \$500     | General Fund                                    | Ongoing  | 2003 and Ongoing  | Medium   |
| Burleigh County, Bismarck, Lincoln | Dam Failure Flood | Missouri River Flood Inundation Mapping Program  | Online mapping program for community to see flooding impacts  | County Commission Chair<br>Emergency Management<br>Burleigh County Water Resource District                | \$50,000  | General Fund                                    | Ongoing  | 2009 and Ongoing  | Medium   |
| Burleigh County                    | Dam Failure Flood | Apple Creek Industrial Park Levee Assessment: The existing Apple Creek Industrial Park Levee has been de-accredited by FEMA resulting in a significant hindrance to development within this subdivision. | Complete assessment of current levee condition and identify actions required to certify the levee under the NFIP.<br><br>A scope of work and budget have been prepared. Local landowners have met to discuss the need to provide a bond for the local share of this assessment. The ND State Water Commission has provided a cost share agreement to the WRD, and they have signed the agreement. | Burleigh County Water Resource District   | \$150,000 | ND State Water Commission and Local Assessments | WRD is waiting for landowners to provide petition and a bond for completing this assessment. | 2013 and Ongoing<br><br>Anticipated completion in 2015-2016 | Medium   |

| Mitigation Projects |                   |  |  |   |             |   |  |                  |          |
|---------------------|-------------------|--|--|---|-------------|---|--|------------------|----------|
| Jurisdiction        | Hazard            | Description  | Range of Actions (preferred action shown first if more than one listed)  | Lead Agency(s)                          | Cost        | Funding Source  | Timeframe  | Progress         | Priority |
| Burleigh County     | Dam Failure Flood | Fox Island Flood Control: Fox Island properties remain vulnerable to flooding from the Missouri River. | <p>Construct a levee (combined with roadway grade raises) to provide flood control protection to the interior of Fox Island.</p> <p>The project has undergone various reconfigurations in response to evolving concerns and desires of local residents. Current preferred alternative will involve both the construction of a levee to be coordinated with roadway grade raises. A Preliminary Engineering Report has been prepared and the project can be taken to the voters for consideration once Lincoln Township has accrued sufficient funding.</p> | Burleigh County Water Resource District | \$3,145,000 | ND State Water Commission, Lincoln Township & Local Assessments | TBD. Dependent on availability of road funds for cost share from Lincoln Township. | 2011 and Ongoing | Low      |

| Mitigation Projects |                   |   |  |   |             |  |  |                  |          |
|---------------------|-------------------|---|--|---|-------------|--|--|------------------|----------|
| Jurisdiction        | Hazard            | Description   | Range of Actions (preferred action shown first if more than one listed)  | Lead Agency(s)                          | Cost        | Funding Source   | Timeframe  | Progress         | Priority |
| Burleigh County     | Dam Failure Flood | McDowell Dam Downstream Re-Zoning: McDowell Dam was designed and constructed as a medium hazard dam. Downstream development could raise the hazard classification to 'high' which could necessitate extensive modifications and public expense in order to comply with heightened dam design standards. | One alternative would be to create a special zoning district downstream of the dam within the breach zone to prevent additional development within this zone and reduce the likelihood of the dam being reclassified as high hazard.   | Burleigh County Water Resource District | TBD         | Burleigh County Water Resource District                                  | TBD. The State Water Commission is completing an updated assessment of the facility and downstream reach which may dictate a time frame and an approach. | 2015 and Ongoing | Low      |
| Burleigh County     | Dam Failure Flood | Missouri River Correctional Center Flood Control (MRCC): MRCC and adjacent residential properties remain vulnerable to flooding from the Missouri River.  | Construct a levee that would tie into 48th Avenue to the south and Tavis Road to the north to provide flood control to the MRCC and residential properties to the east.<br><br>Project failed initial assessment vote. Residents re-petitioned project. A revised Preliminary Engineering Report has been prepared. Legislation regarding the future of the MRCC property may influence project development, so efforts are on hold pending legislative outcome. | Burleigh County Water Resource District | \$1,636,000 | ND State Water Commission, Department of Corrections & Local Assessments | 2015-2016  | 2011 and Ongoing | Low      |

| Mitigation Projects                     |                   |  |  |   |             |   |           |                  |          |
|---|-------------------|--|--|---|-------------|---|-----------|------------------|----------|
| Jurisdiction                            | Hazard            | Description  | Range of Actions (preferred action shown first if more than one listed)  | Lead Agency(s)  | Cost        | Funding Source                                | Timeframe | Progress         | Priority |
| Burleigh County                         | Dam Failure Flood | Sibley Island Flood Control: Sibley Island properties remain vulnerable to flooding from the Missouri River. | Construct a levee which, combined with roadway grade raises, will provide flood control protection to the Sibley Island area south of 48th Avenue and east of Washington Street.<br><br>An initial feasibility assessment was completed and a public informational meeting was held in 2013. | Burleigh County Water Resource District   | \$1,850,000 | ND State Water Commission & Local Assessments | TBD       | 2011 and Ongoing | Low      |
| Burleigh County, Bismarck, Wilton, Wing | Dam Failure Flood | National Flood Insurance Program (jurisdictions): Continue compliance in the program.                        | Review floodplain ordinances   | City Mayors<br>County Commission Chair<br>Emergency Management<br>Burleigh County Water Resource District | \$1,000     | General Fund                                  | Ongoing   | 2003 and Ongoing | Medium   |
| Lincoln                                 | Dam Failure Flood | National Flood Insurance Program: Continue compliance in the program.  | Update floodplain ordinances   | City Mayor<br>Emergency Management<br>Burleigh County Water Resource District                             | \$500       | General Fund                                  | Ongoing   | 2003 and Ongoing | Medium   |
| Regan                                   | Dam Failure Flood | National Flood Insurance Program: Promote participation in the program.                                      | Continue to foster with Regan.   | City Mayor<br>Emergency Management<br>Floodplain Administrator  | \$500       | General Fund                                  | Ongoing   | 2003 and Ongoing | Low      |
| Burleigh County, All Cities             | Drought           | Drought Awareness: Inform public of critical water supplies and water bans during drought.                   | Publish information via flyers, newspaper, website, and social media.<br><br>Encourage installation of water-saving devices.   | City Mayors<br>County Commission Chair<br>Emergency Management  | \$100       | General Fund                                  | As Needed | 2003 and Ongoing | Medium   |

| Mitigation Projects         |                                  |  |   |  |                     |                            |           |                  |          |
|-----------------------------|----------------------------------|--|---|--|---------------------|----------------------------|-----------|------------------|----------|
| Jurisdiction                | Hazard                           | Description  | Range of Actions (preferred action shown first if more than one listed)   | Lead Agency(s)   | Cost                | Funding Source             | Timeframe | Progress         | Priority |
| Burleigh County, All Cities | Drought                          | Water and Soil Conservation: Encourage the agricultural community to implement water and soil conservation practices       | Continue to inform agricultural participants on the value of crops and livestock preservation during drought.   | Extension Service  | \$,1000             | General Fund and/or Grants | Ongoing   | 2003 and Ongoing | Medium   |
| Burleigh County, All Cities | Drought Urban Fire Wildland Fire | Fire Index/Drought Conditions: Inform community of fire danger index, burning regulations, and burn bans (when instituted) | Continue to provide information via newspaper, website, and social media  | Emergency Management Fire Districts Sheriff's Department     | \$100               | General Fund               | As Needed | 2003 and Ongoing | Medium   |
| Burleigh County, All Cities | Flood                            | Flood Recovery Education: Educate community on flood recovery procedures and assistance.                                   | Utilize FEMA products and include in a campaign.  | Emergency Management   | \$5,000             | General Fund and Grants    | As Needed | 2003 and Ongoing | Low      |
| Burleigh County             | Flood                            | Apple Creek Road: Grade raise to minimize yearly flooding.   | Walls Residence (west is low spot where channels are). Install box culvert – need to address downstream flow. Technical assistance from Water Management District concerning overall hydraulic benefit. | Highway Department Burleigh County Water Resource District   | \$350,000-\$400,000 | General Fund and Grants    | Ongoing   | 2003 and Ongoing | Medium   |
| Lincoln                     | Flood                            | Culvert Cleaning   | Ensure culverts are free of debris.   | Lincoln Public Works   | \$1,200             | General Fund               | Annually  | 2015 and Ongoing | Medium   |
| Burleigh County, All Cities | Flood Hazardous Materials        | Evacuation Routes: Study and develop evacuation routes.  | Develop locally with in-house expertise.  | Emergency Management Highway Department Sheriff's Department | Staff Time          | Staff Time                 | 3-5 Years | 2010 and Ongoing | Medium   |
| Burleigh County             | Geologic Hazards                 | Landslide Activity: Monitor embankments along Missouri River and Apple Creek for potential landslide activity.             | Establish and maintain a monitoring practice.   | Burleigh County Water Resource District                      | \$500               | General Fund and/or Grants | Annually  | 2015 and Ongoing | Low      |
| Burleigh County, All Cities | Hazardous Materials              | Hazmat Awareness: Community should understand the hazards and protective measures.   | Maintain and update the Shelter-in-Place brochure as necessary  | Emergency Management Fire Districts Sheriff's Department     | \$500               | LEPC                       | Annually  | 2003 and Ongoing | Medium   |

| Mitigation Projects         |  |  |   |   |            |                                   |           |                  |          |
|-----------------------------|--|--|---|---|------------|-----------------------------------|-----------|------------------|----------|
| Jurisdiction                | Hazard   | Description  | Range of Actions (preferred action shown first if more than one listed)                       | Lead Agency(s)                          | Cost       | Funding Source                    | Timeframe | Progress         | Priority |
| Burleigh County, All Cities | Hazardous Materials  | Hazardous Materials Routes: Develop and distribute map.  | Continue working with the Metropolitan Planning Organization to develop and distribute a map. | Emergency Management Highway Department |            | MPO                               | Ongoing   | 2010 and Ongoing | Low      |
| Burleigh County, All Cities | Homeland Security Incident                                   | Report Suspicious Activity: Urge residents to report suspicious activity of any kind to law enforcement.   | Continue to work with the ND State and Local Intelligence Center                              | Sheriff's Department                    | Free       | Free                              | Annually  | 2010 and Ongoing | Medium   |
| Burleigh County, All Cities | Homeland Security Incident                                   | WMD Training: Stakeholders need continued training.  | Continue to forward training to appropriate stakeholders as it becomes available.             | Emergency Management                    | Staff Time | Staff Time                        | Annually  | 2003 and Ongoing | Medium   |
| Burleigh County, All Cities | Severe Summer Weather  | Severe Summer Weather Awareness: Skywarn Training for awareness and potential storm spotters   | Maintain annual training as part of the Severe Summer Weather Awareness Campaign              | Emergency Management                    | \$500      | General Fund Budget and/or Grants | Annually  | 2003 and Ongoing | Medium   |
| Burleigh County, All Cities | Severe Summer Weather<br>Severe Winter Weather<br>Windstorms | Living Snow Fences: Continue to promote living snow fences and shelterbelts to prevent snow drifting and protection from severe summer weather and windstorms. | Continue to work with agricultural community to promote this protective practice.             | Extension Service                       | \$500      | General Fund and/or Grants        | Annually  | 2015 and Ongoing | Medium   |
| Burleigh County, All Cities | Severe Summer Weather<br>Severe Winter Weather<br>Windstorms | Cut Trees/Limbs: Evaluate trees and foliage around structures and utilities to reduce and potentially eliminate damages from weather events.                   | Continue to work with community to promote this protective practice.                          | Extension Service                       | \$500      | General Fund and/or Grants        | Annually  | 2015 and Ongoing | Low      |
| Burleigh County, All Cities | Severe Winter Weather  | Severe Winter Weather Awareness: Prepare community for the hazards of severe winter weather (blizzards, ice storm, windchill, etc)                             | Maintain annual campaign via newspaper, website, and social media.                            | Emergency Management                    | \$100      | General Fund Budget and/or Grants | Annually  | 2003 and Ongoing | Medium   |

| Mitigation Projects         |  |  |  |   |            |                            |                       |                  |          |
|-----------------------------|--|--|--|---|------------|----------------------------|-----------------------|------------------|----------|
| Jurisdiction                | Hazard                                   | Description  | Range of Actions (preferred action shown first if more than one listed)  | Lead Agency(s)  | Cost       | Funding Source             | Timeframe             | Progress         | Priority |
| Burleigh County, All Cities | Severe Winter Weather                    | Clear Roadside Trees: Effect snow removal clearing area.   | Identify areas and removal process with concentration on major arterials and collector streets.  | Highway Department  | \$100,000  | General Fund               | Annually              | 2012 and Ongoing | Low      |
| Burleigh County             | Severe Winter Weather                    | Snow Fencing (Ridging): Protection of areas where snow historically "drifts".  | Locations: Burleigh County Snow Ridge Locations Map (Attachment 3: Maps)   | Highway Department  | Staff Time | General Fund               | Annually or as Needed | 2015 and Ongoing | Low      |
| Wing                        | Severe Winter Weather                    | Snow Fencing (Ridging): Protection of areas where snow historically "drifts".  | Location: Open area near the basketball court off of Mann St, between 1st Av W and 2nd Ave W.  | Public Works  | Staff Time | General Fund               | Annually or as Needed | 2015 and Ongoing | Low      |
| Burleigh County, All Cities | Shortage or Outage of Critical Materials | Three-Day Supplies: Help the community prepare for an event whereby assistance may not be readily attainable.        | Campaign to promote 3-day supply for each person   | Emergency Management  | \$100      | General Fund               | Annually              | 2014 and Ongoing | Medium   |
| Burleigh County, All Cities | Transportation Accident                  | Mass Casualty Planning: Update plan on a regular basis.  | Continue to work with local stakeholders on plan maintenance.  | Emergency Management<br>Public Health<br>Sheriff's Department | \$200      | General Fund and/or Grants | Annually              | 2003 and Ongoing | Medium   |
| Burleigh County, All Cities | Urban Fire Wildland Fire                 | Defensible Space: Promote the use of defensible space to help protect structures.                                    | Promote firewise safety practices.   | Fire Districts  | \$1,000    | General Fund and/or Grants | Annually              | 2010 and Ongoing | Low      |
| Regan                       | Urban Fire Wildland Fire                 | Defensible Space: Evaluate and/or create defensible space around structures to include removing debris accumulation. | Promote firewise safety practices.<br><br>Evaluate and/or create defensible space around structures to include removing debris accumulation. | Wilton Fire District<br>Wing Fire District                    | Volunteer  | General Fund and/or Grants | Annually              | 2015 and Ongoing | Low      |
| Wilton                      | Urban Fire Wildland Fire                 | Defensible Space: Evaluate and/or create defensible space around structures to include removing debris accumulation. | Promote firewise safety practices.<br><br>Evaluate and/or create defensible space around structures to include removing debris accumulation. | Wilton Fire District<br>Wing Fire District                    | Volunteer  | General Fund and/or Grants | Annually              | 2015 and Ongoing | Low      |

| <b>Mitigation Projects</b>  |                             |  |  |   |                      |                               |                  |                     |                 |
|-----------------------------|-----------------------------|--|--|---|----------------------|-------------------------------|------------------|---------------------|-----------------|
| <b>Jurisdiction</b>         | <b>Hazard</b>               | <b>Description</b>   | <b>Range of Actions (preferred action shown first if more than one listed)</b> | <b>Lead Agency(s)</b>   | <b>Cost</b>          | <b>Funding Source</b>         | <b>Timeframe</b> | <b>Progress</b>     | <b>Priority</b> |
| Burleigh County, All Cities | Urban Fire<br>Wildland Fire | Fuel Reduction: Continue fuel reduction on the USFWS District, particularly the WUI; the USFWS performs prescription burning on approximately 1000 acres per year. | Prescription burns and education on haying and grazing to reduce fuels.        | Fire Departments ND<br>Forest Service ND<br>Game and Fish US<br>Fish and Wildlife | \$5,000-<br>\$10,000 | General Fund<br>and/or Grants | Annually         | 2010 and<br>Ongoing | Low             |
| Burleigh County, All Cities | Urban Fire<br>Wildland Fire | Community Wildfire Protection Plan: Review and Update.   | Continue to review and update the current CWPP.                                | Emergency Management<br>Fire Districts  | Staff Time           | Staff Time                    | Annually         | 2003 and<br>Ongoing | Low             |
| Burleigh County, All Cities | Wildland Fire               | Fire Lines: Promote the utilization of fire lines into heavily wooded areas and or inaccessible areas.   | Promote firewise safety practices.   | Fire Departments  | \$5,000              | General Fund<br>and/or Grants | Annually         | 2015 and<br>Ongoing | Low             |
| Burleigh County             | Wildland Fire               | Accessibility to Missouri River Bottoms south of Bismarck.   | Fuel reduction and fire breaks in strategic areas, access roads.               | Fire Departments<br>ND Forest Service<br>ND Game and Fish                         | Staff Time           | Staff Time                    | Annually         | 2010 and<br>Ongoing | Low             |

## ATTACHMENT 2: MITIGATION PROJECTS COMPLETED

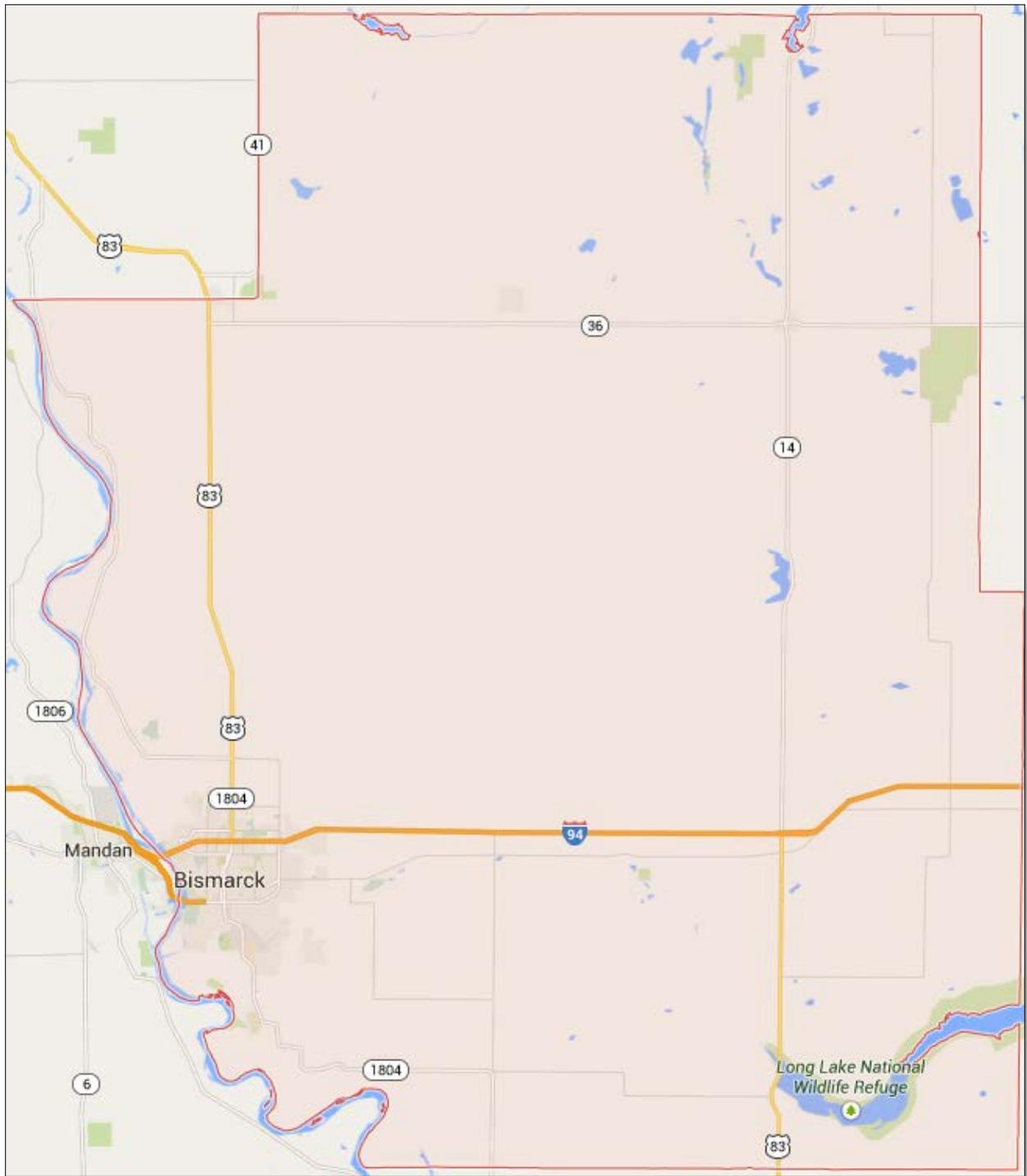
| Mitigation Projects Completed |        |   |   |   |           |                         |           |                                  |
|-------------------------------|--------|---|---|---|-----------|-------------------------|-----------|----------------------------------|
| Jurisdiction                  | Hazard | Description   | Range of Actions (preferred action shown first if more than one listed)                       | Lead Agency(s)  | Cost      | Funding Source          | Timeframe | Progress                         |
| Burleigh County, All Cities   | All    | Enhance Emergency Management Website: Develop website further to serve as central repository for information gathering and dissemination during events. Incorporate maps. | Sole source contract through current website host.<br><br>Develop in-house.                   | County Commission<br>Emergency Management<br>Department Heads                           | \$15,000  | General Fund            | 1-3 Years | Completed<br>2008, 2010          |
| Burleigh County, All Cities   | All    | GIS Map Updates/Maintenance: Addressing, center lines, parcels, aerial photos.  | Fully staff a GIS person within Burleigh County   | Burleigh County Highway Dept<br>Burleigh County Highway Dept<br>Combined Communications | \$400,000 | General Fund            | 1-3 Years | Completed                        |
| Burleigh County, All Cities   | All    | Shelter Planning: Planning and training regarding shelter set-up.   | Planning meetings and then exercise.  | Bismarck/Burleigh Public Health<br>Emergency Management                                 | \$1,000   | General Fund            | 1-3 Years | Completed<br>2007, 2008,<br>2014 |
| Burleigh County, All Cities   | All    | Public Health Records Backup: Electronic records backup system to maintain records.   | Purchase a software program.  | Public Health   | \$90,000  | General Fund and Grants | Completed | Completed<br>2011                |
| Burleigh County, All Cities   | All    | Transition to digital radios.   | Continue transition through Homeland Security funding.  | All Response Agencies   | \$500,000 | General Fund and Grants | Completed | Completed<br>2009-2014           |
| Burleigh County, All Cities   | All    | Emergency Preparedness Booklet  | Develop and distribute booklet through the Burleigh County Local Emergency Planning Committee | Emergency Management  | \$5,000   | General Fund and Grants | Completed | Completed<br>2008                |
| Burleigh County, All Cities   | All    | Improve warning in rural schools.   | Purchase NOAA Weather Radios for schools within Burleigh County.                              | Emergency Management  | \$500     | General Fund and Grants | Completed | Completed<br>2006, 2008,<br>2014 |

| Mitigation Projects Completed |  |   |   |  |             |                         |           |                      |
|-------------------------------|--|---|---|--|-------------|-------------------------|-----------|----------------------|
| Jurisdiction                  | Hazard   | Description   | Range of Actions (preferred action shown first if more than one listed)   | Lead Agency(s)   | Cost        | Funding Source          | Timeframe | Progress             |
| Burleigh County, All Cities   | All  | Bismarck/Burleigh Public Health generator.  | Unable to set up department operations center without backup power.   | Bismarck/Burleigh Public Health  | \$50,000    | General Fund and Grants | Completed | Completed 2008       |
| Burleigh County               | Flood  | Floodplain Ordinance: Update the ordinance.   | Update City of Bismarck and Burleigh County ordinances.<br>Continue to inform public regarding flood insurance. | City Mayors<br>County Commission Chair<br>Emergency Management<br>Water Resource Board | Staff Time  | General Fund            | 1-3 Years | Completed 2014       |
| Lincoln                       | Flood  | Floodplain Ordinance: Update the ordinance.   | Update City of Lincoln ordinance.<br>Continue to inform public regarding flood insurance.                       | City Mayor<br>Emergency Management<br>Water Resource Board                             | Staff Time  | General Fund            | 1-3 Years | Completed 2014       |
| Lincoln                       | Flood  | NFIP Participation: Foster participation from the City of Lincoln.                        | Meetings to promote awareness.  | Lincoln City Commission<br>Emergency Management<br>Floodplain Administrator            | Staff Time  | General Fund            | 3-5 Years | Completed 2008       |
| Bismarck                      | Flood  | Jackman Coulee Project: Repetitive flooding.  | Detention, Channel Restoration, Diversion, Storm Sewer  | City of Bismarck<br>Emergency Management<br>Floodplain Administrator                   | \$1,287,900 | General Fund and Grants | 3-5 Years | Completed 2004       |
| Burleigh County, All Cities   | Severe Summer Weather<br>Severe Winter Weather<br>Windstorms | StormReady Certification: Achieve National Weather Service StormReady for City and County | Work with the National Weather Service to achieve certification.  | Emergency Management<br>National Weather Service                                       | Staff Time  | General                 | 2-3 Years | Completed 2003, 2004 |
| Burleigh County, All Cities   | Severe Winter Weather  | Clear Roadside Trees: Effect snow removal clearing area.                                  | Identify areas and removal process  | Highway Department   | \$100,000   | General Fund            | 2-3 Years | Completed 2014       |
| Burleigh County, All Cities   | Shortage or Outage of Critical Materials                     | Establish Points of Distribution Sites  | Work with Bismarck/Burleigh Public Health to develop plan and sites.  | Bismarck/Burleigh Public Health<br>Emergency Management                                | Staff Time  | General Fund            | 2-3 Years | Completed 2006       |

| Mitigation Projects Completed |                             |  |   |  |          |                          |           |                |
|-------------------------------|-----------------------------|--|---|--|----------|--------------------------|-----------|----------------|
| Jurisdiction                  | Hazard                      | Description  | Range of Actions (preferred action shown first if more than one listed)   | Lead Agency(s)   | Cost     | Funding Source           | Timeframe | Progress       |
| Burleigh County, All Cities   | Urban Fire<br>Wildland Fire | Community Wildfire Protection Plan   | Develop plan with appropriate stakeholders.   | Emergency Management Fire Departments                    | \$3,000  | General Fund and Grants  | 2005-2006 | Completed 2007 |
| Burleigh County, Bismarck     | Urban Fire<br>Wildland Fire | Fuel Reduction by Wastewater Treatment Plant: Area between developed properties and undeveloped woodlands is building up fuel materials. | Reduction of fuel load in forest adjacent to trailer park and single family residence and Wastewater Treatment Plant (644 homes, 1,600 people affected). The measurable outcome would be a 90% reduction in fuel wood in the areas adjacent to trailers and homes, a fire break road constructed in the woods from which to fight fires and the protection of 644 residences from wildfire or threats | Bismarck Fire Department<br>Bismarck Forestry Department | \$14,413 | Grants and In-Kind Match | 2-3 Years | Completed 2004 |

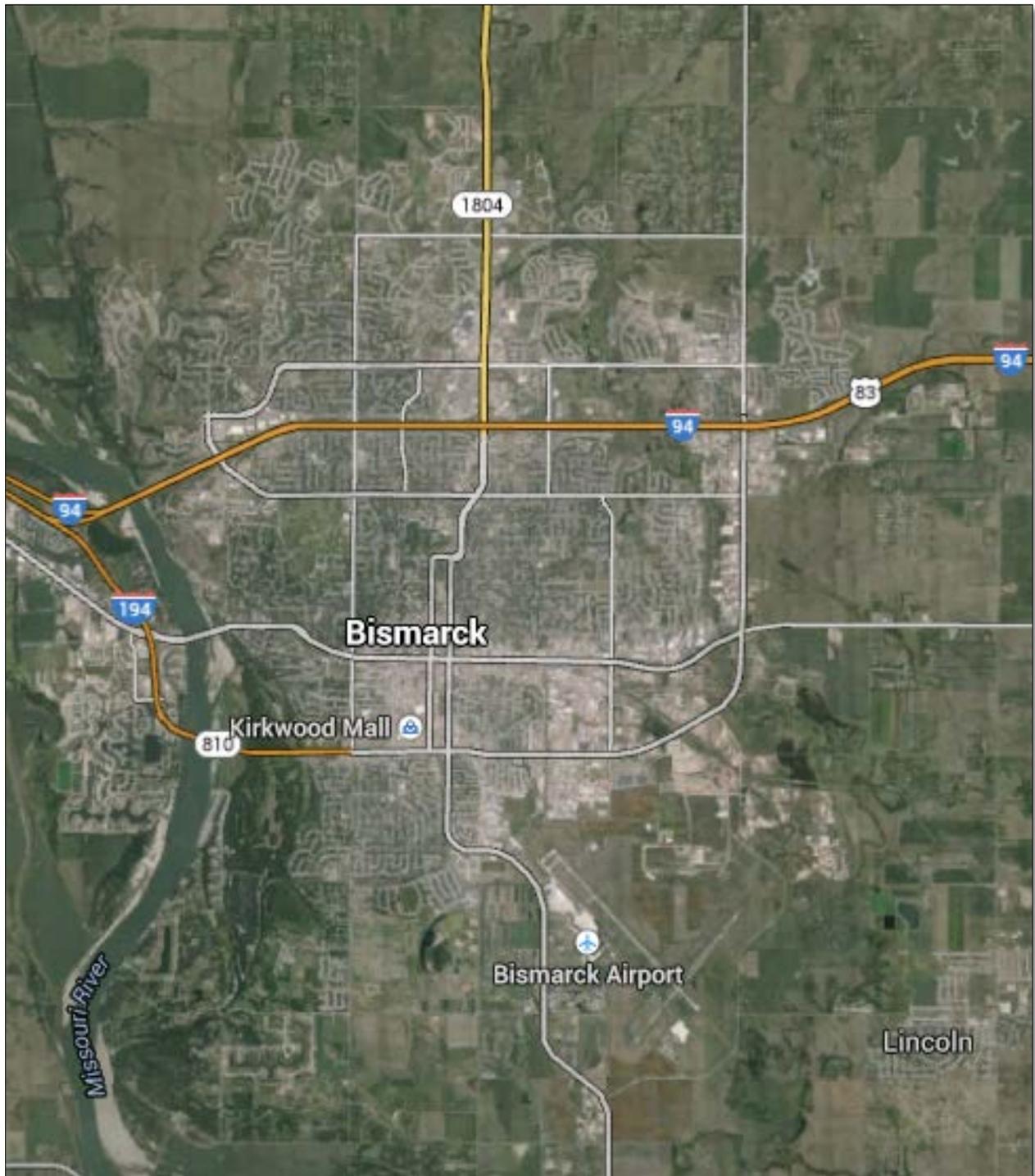
**ATTACHMENT 3: MAPS**

**Burleigh County**

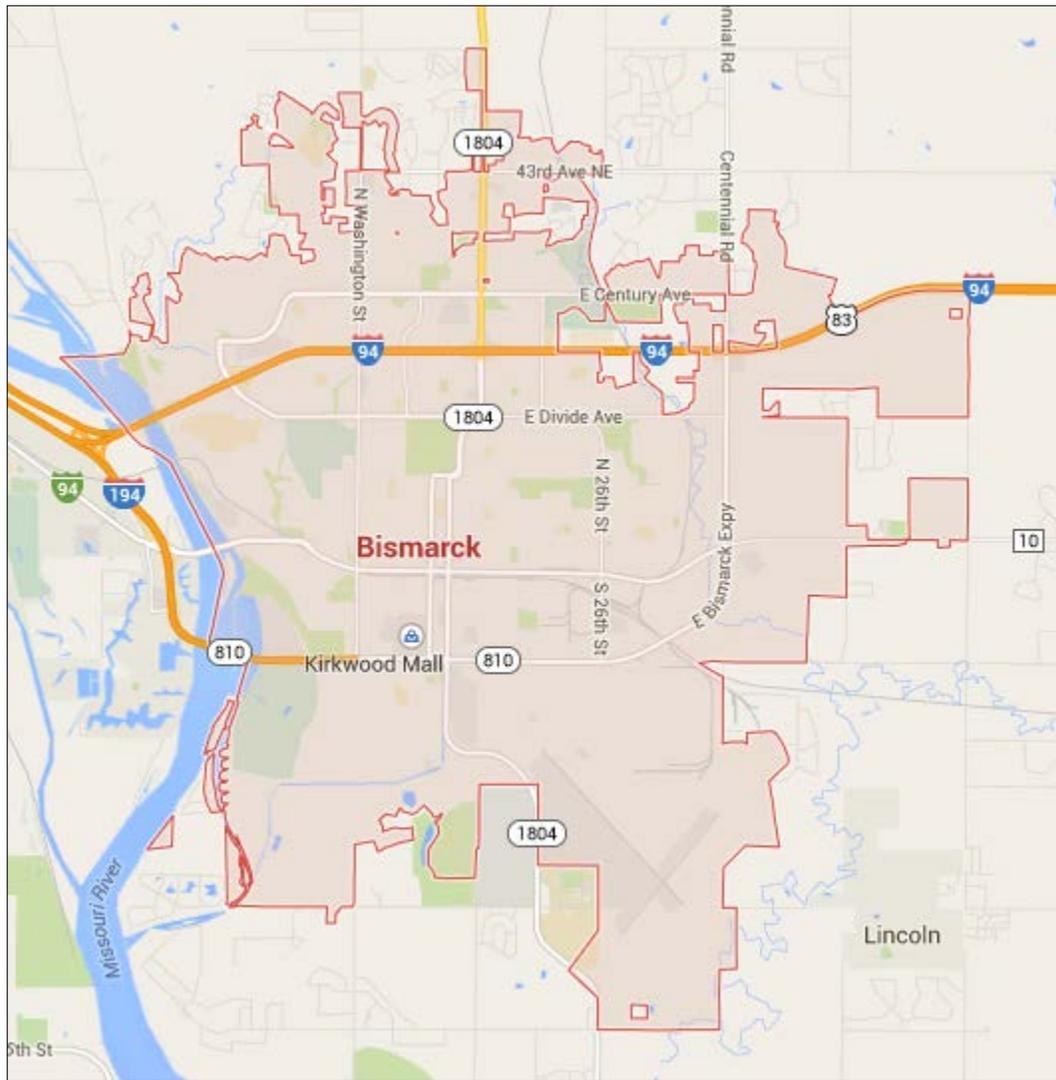


Source: Google Maps [website](#)

**City of Bismarck**



Source: Google Maps [website](#)

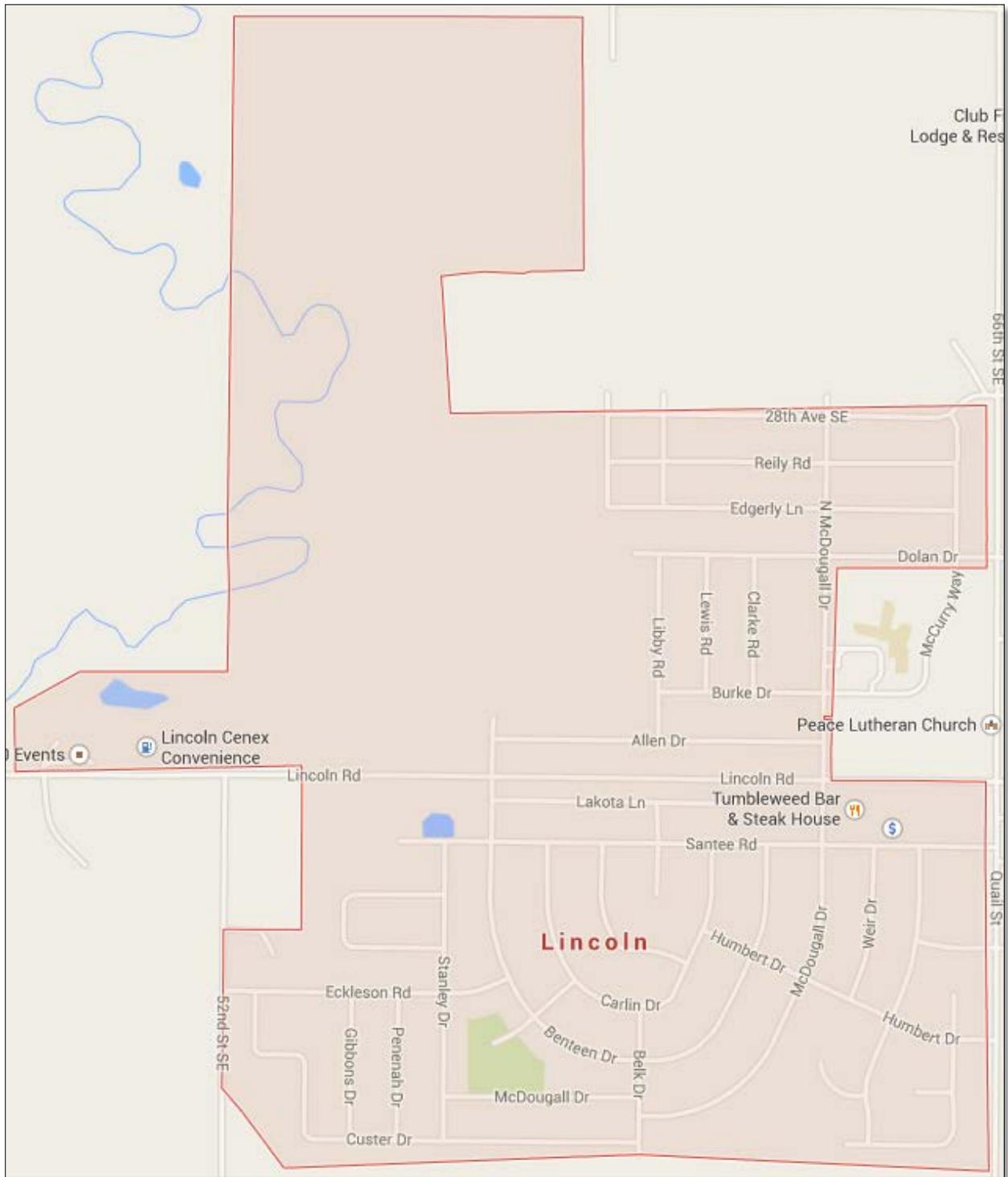


Source: Google Maps [website](#)

**City of Lincoln**

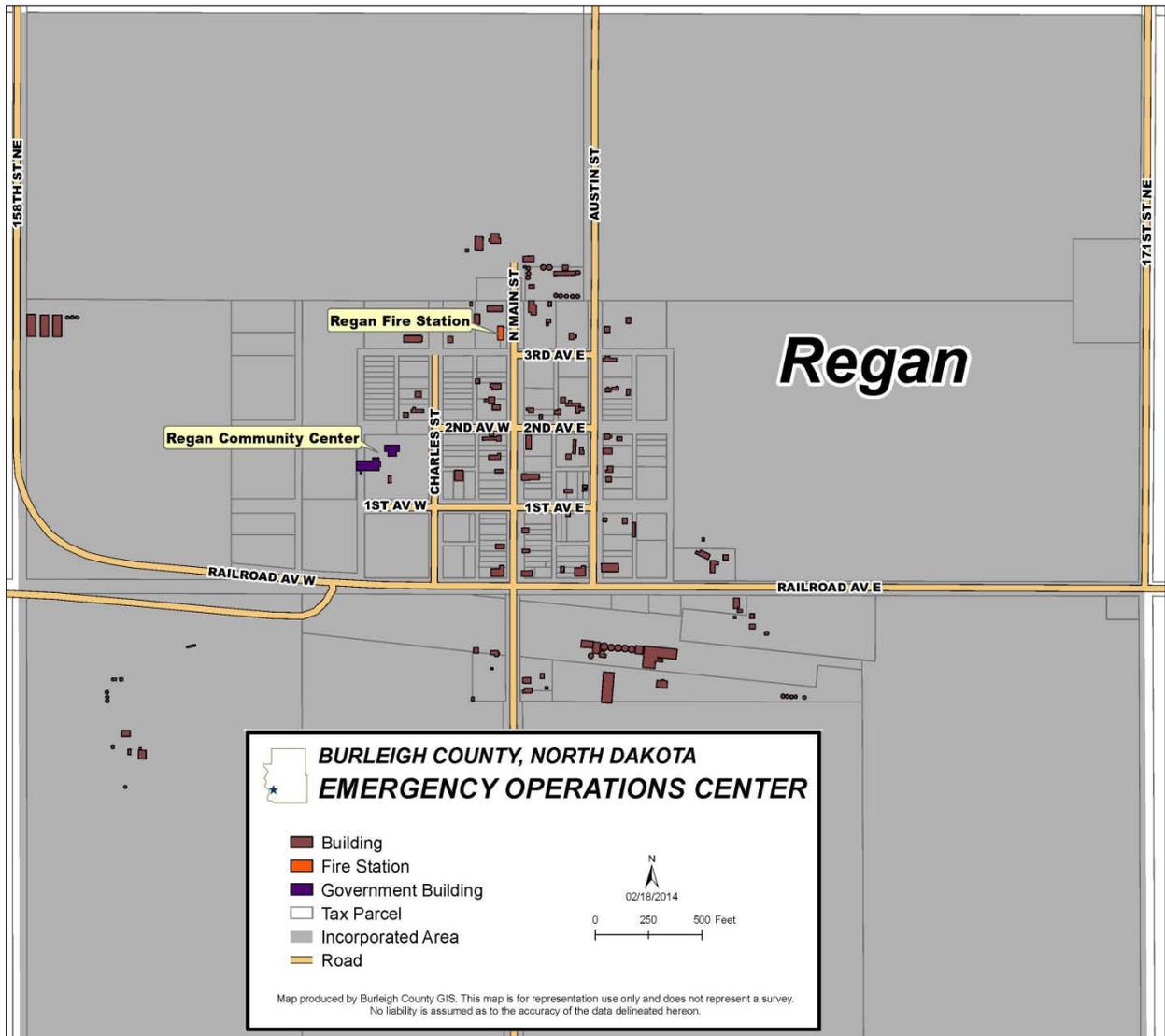


Source: Google Maps [website](#)



Source: Google Maps [website](#)

### City of Regan

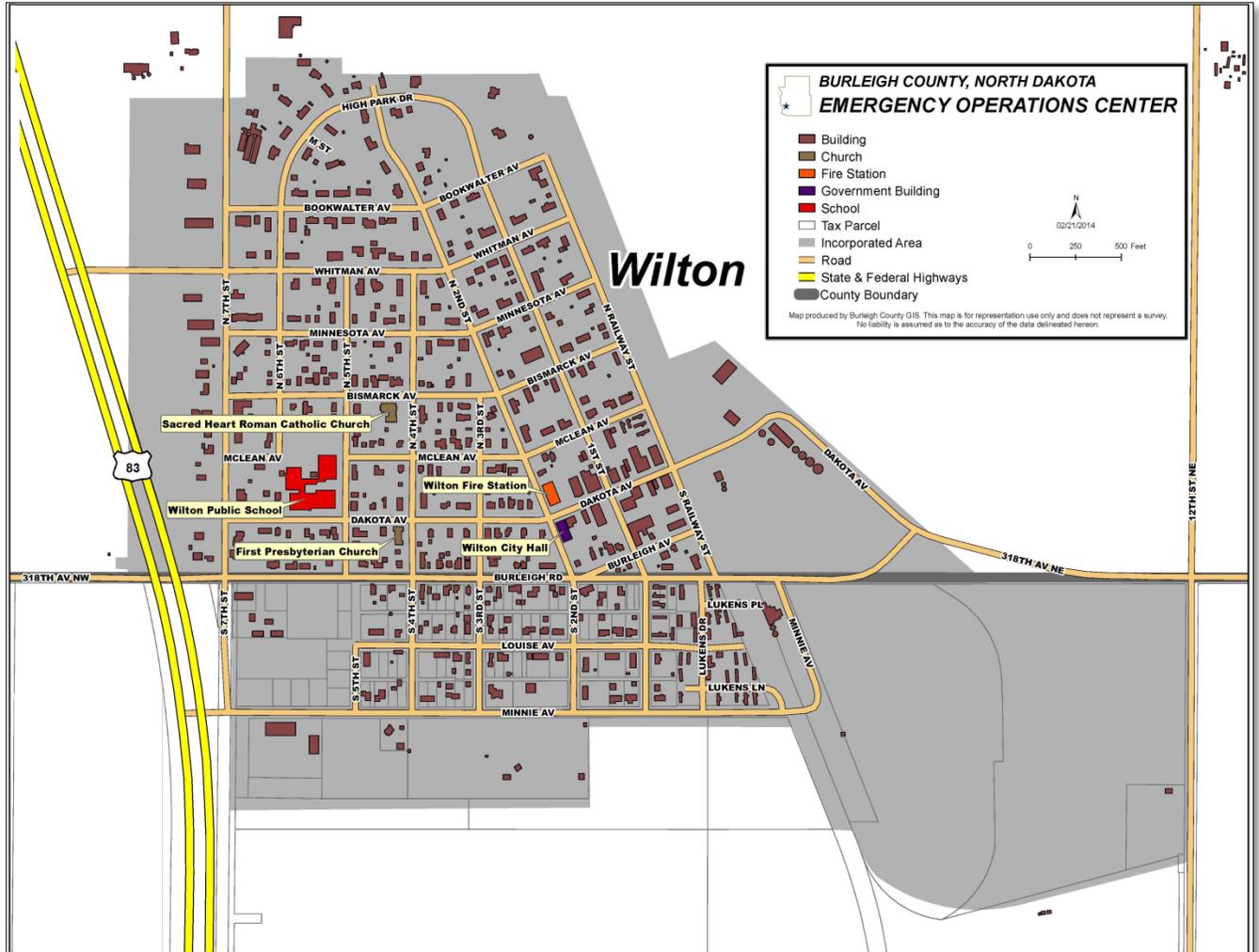


Source: Burleigh County GIS

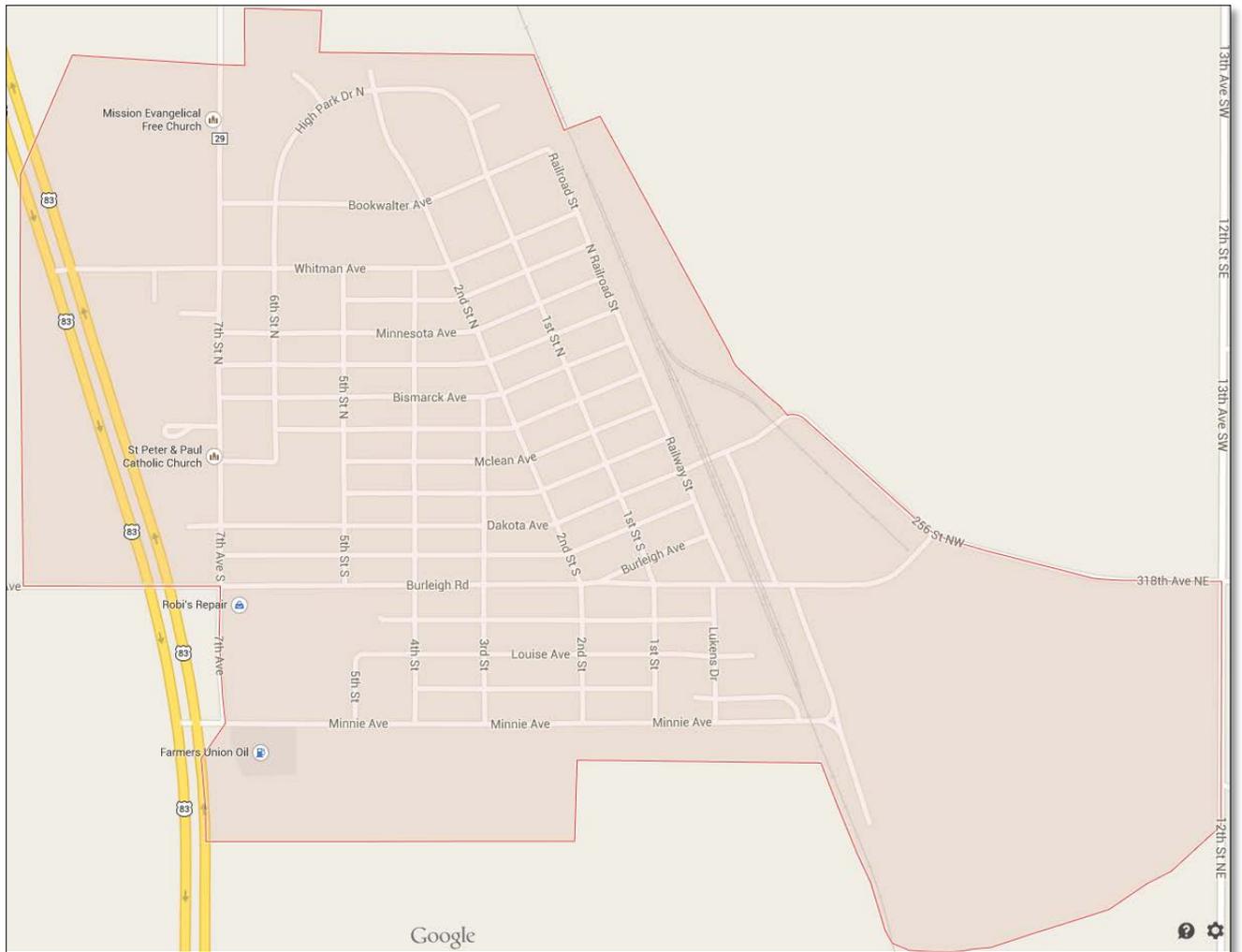


Source: Google Maps [website](#)

### City of Wilton

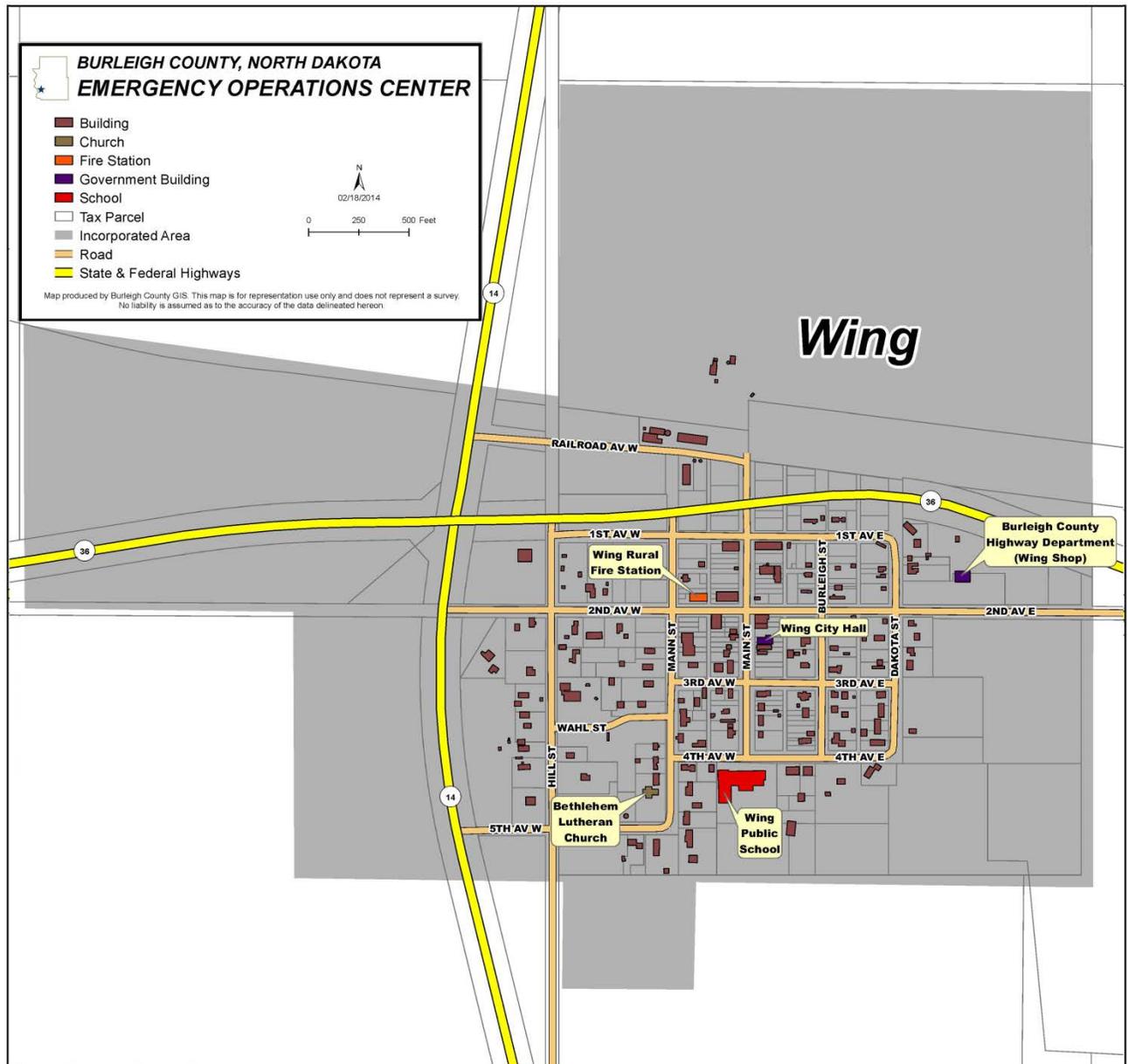


Source: Burleigh County GIS

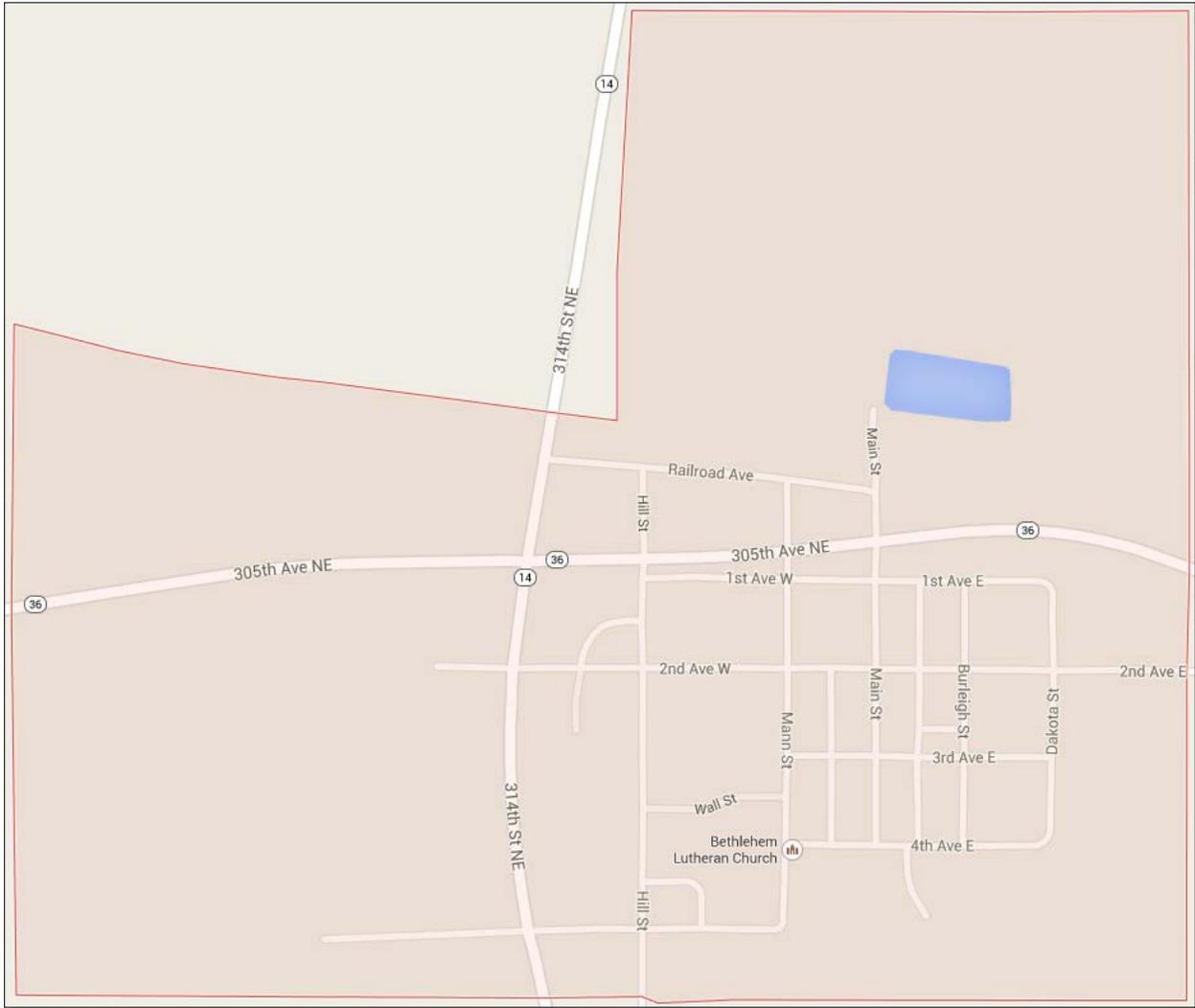


Source: Google Maps [website](#)

### City of Wing

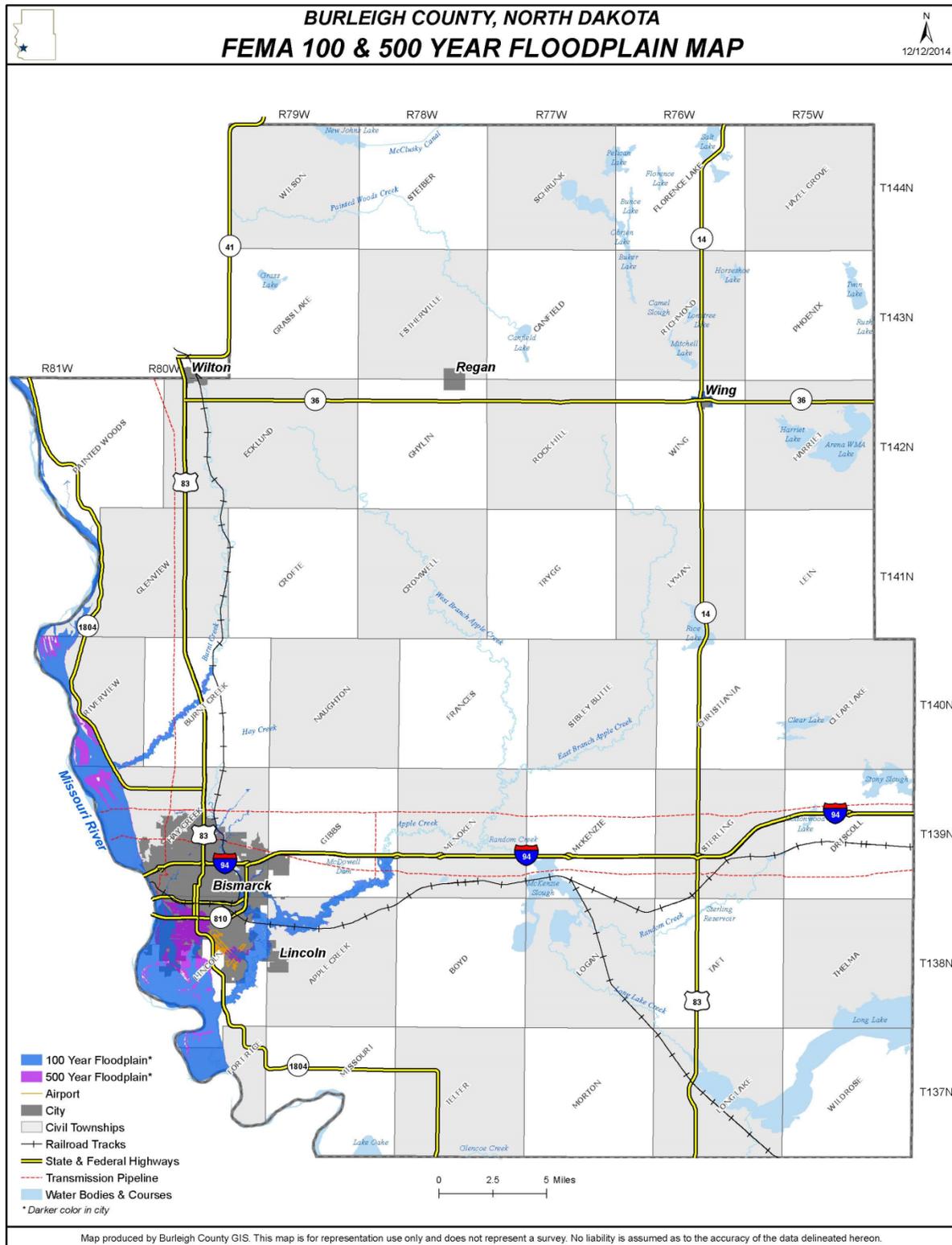


Source: Burleigh County GIS



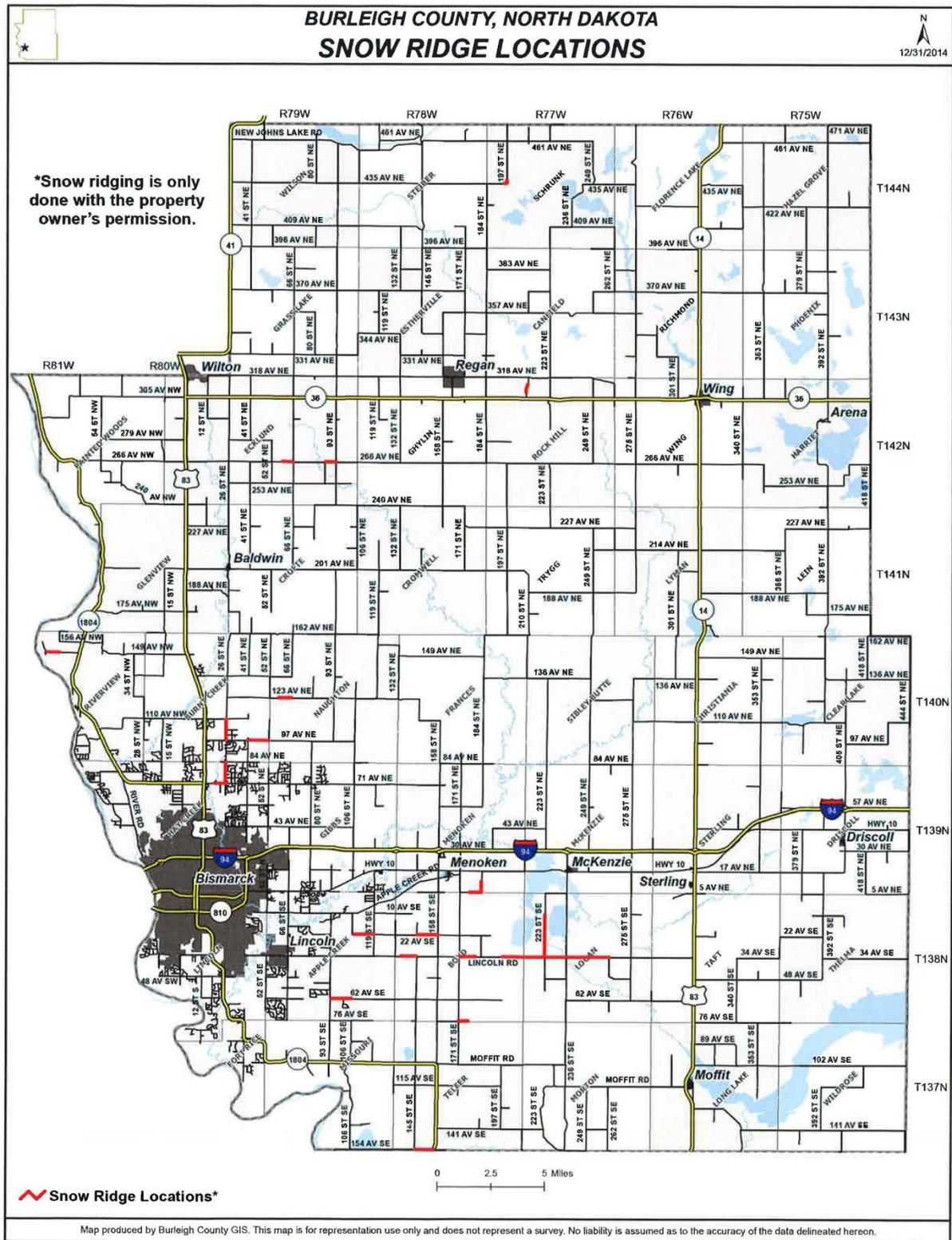
Source: Google Maps [website](#)

### 100- and 500-Year Floodplain Map



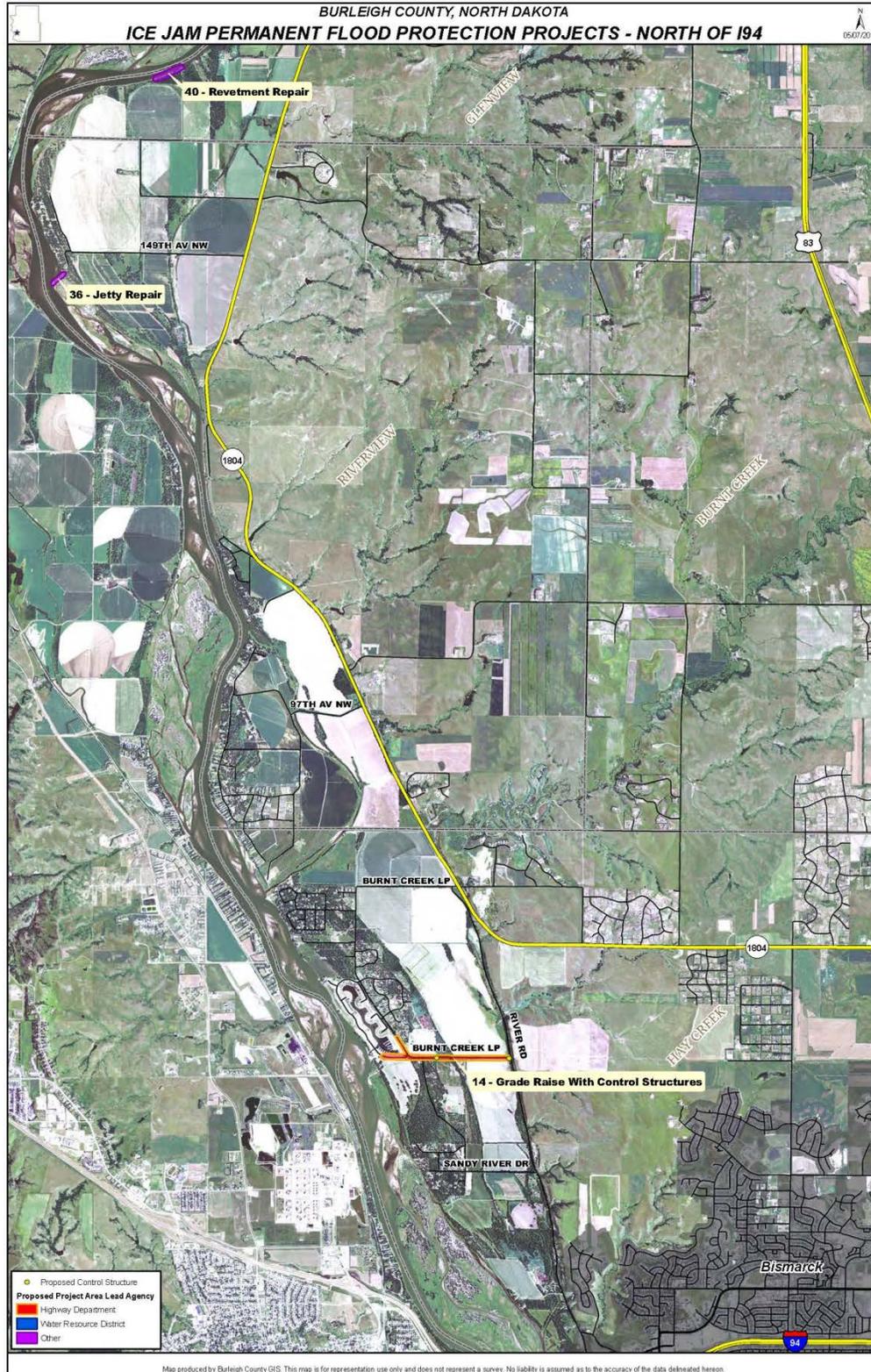
Source: Burleigh County GIS

### Burleigh County Snow Ridge Locations



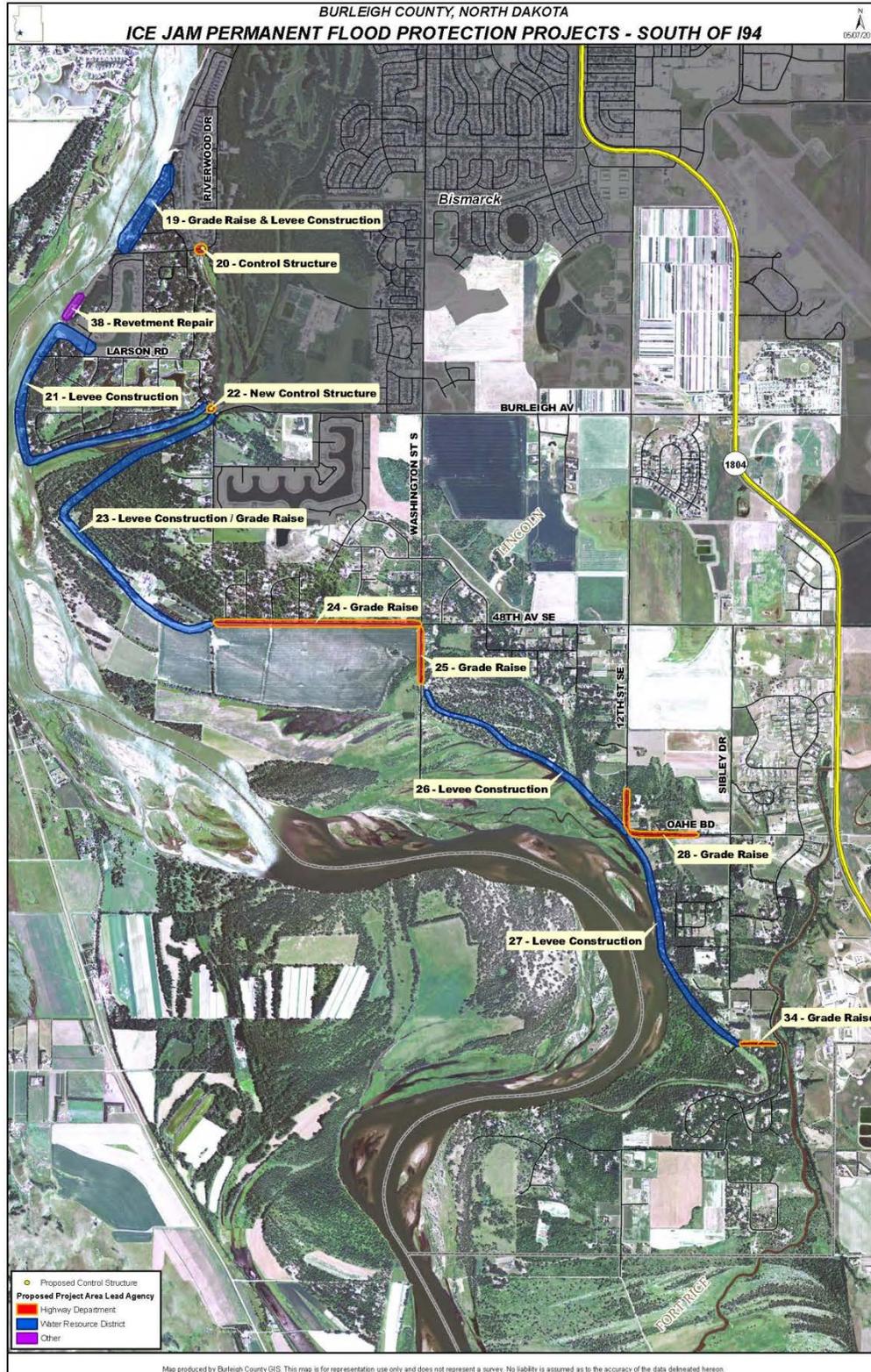
Source: Burleigh County GIS

### Ice Jam Permanent Flood Protection Projects – North of Interstate 94



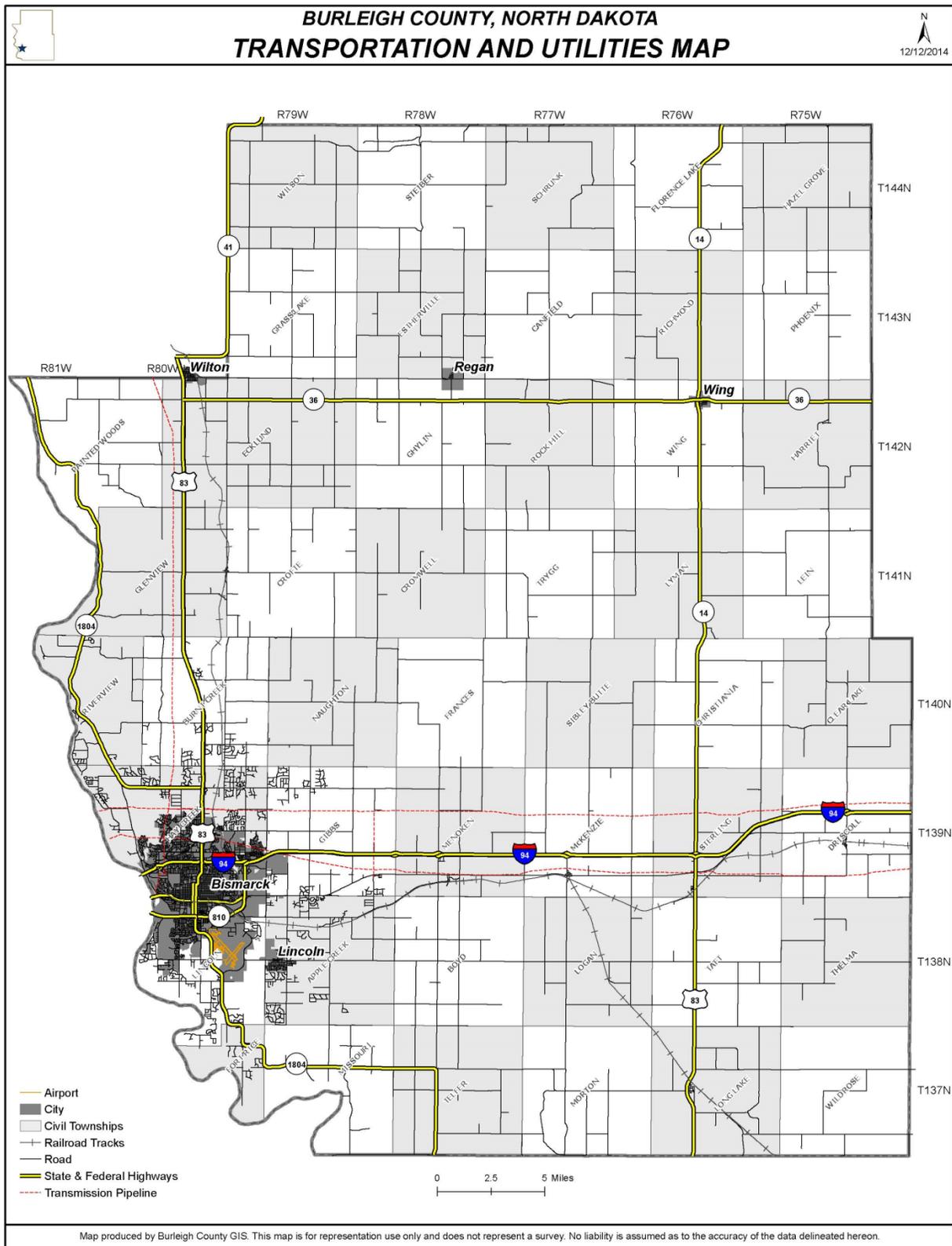
Source: Burleigh County GIS and available [online](#)

### Ice Jam Permanent Flood Protection Projects – South of Interstate 94



Source: Burleigh County GIS and available [online](#)

### Major Roadways in Burleigh County



Source: Burleigh County GIS

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## ATTACHMENT 4: MITIGATION CAPABILITIES

### Bismarck Rural Fire Department

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions.)
  - a. Respond to fires in order to protect lives, limit injuries, and minimize damage to property and the environment.
  - b. Respond to accidents in order to provide rescue assistance.
  - c. Assist Emergency Medical Services in providing emergency assistance to sick and injured (first responders).
  - d. Provide standard firefighting manpower and equipment.
  - e. Respond to spills and releases of hazardous materials and assist in mitigating the detrimental human and environmental effects of these occurrences.
  - f. Respond to emergencies resulting from natural occurrences such as storms, floods, etc., and assist in mitigating the detrimental results of these occurrences.
  - g. Provide training for department members that enables them to effectively and efficiently carry out their respective duties and responsibilities.
  - h. Develop and provide educational programs that promote the prevention of fires and encourage fire-safe and fire-smart activities.
  - i. Assist in enforcement of fire ordinances.
  - j. Fire investigation.
  - k. Provide assistance to other jurisdictions, as department resources and commitments allow.
  - l. Inspections and preplanning within the fire district to reduce hazards and aid in fire prevention.
  - m. Assist with the County's Tier Two reporting for hazardous materials.
  - n. In disaster situations, provide assistance in warning, rescue, evacuation, and situation updates.
2. Responsibility and authority in regulating, inspecting, or funding of projects:
  - a. None
3. Leadership and coordination with other government agencies:
  - a. Local Agencies: In efforts to decrease vulnerability to hazards, the Bismarck Rural Fire Department coordinates with various local agencies. These agencies include Bismarck/Burleigh Emergency Management, Bismarck Fire Department, Bismarck Police Department, Burleigh County Sheriff's Department, local Public Works, and local Emergency Medical Services.
  - b. Non-local Agencies: North Dakota State Fire Marshal and the Federal Emergency Management Agency.
4. General recommendations/Emergency Management concerns:
  - a. None.

**Bismarck/Burleigh Public Health**

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions)
  - a. Deal with bona fide health hazards using cause and effect in those areas for both mitigation and risk reduction. If it is a hazard affecting any number of persons and within the scope of public health, Bismarck/Burleigh Public Health will mitigate or exercise risk reduction through several methods ranging from enforcement of statutes to immunization programs.
  - b. Environmental Health has the knowledge and also access to the State Health Department for mitigation of incidents with hazardous or toxic wastes.
  - c. Programs include: public health nursing, immunization programs, emergency preparedness, and tobacco cessation.
2. Responsibility and authority in the regulating, inspecting or funding of projects.
  - a. Bismarck/Burleigh Public Health is a unit of state government that operates through agreements or Memorandums of Understanding with the North Dakota Department of Health to enforce state public health statutes within the five-county district. Tax levies provide funding. There are no funding programs for non-operational programs.
3. Leadership and coordination with other government agencies:
  - a. Local Agencies: Within the scope of public health, Bismarck/Burleigh Public Health coordinates with the following local agencies: Bismarck/Burleigh Emergency Management, local law enforcement agencies (city and county), local school boards, hospitals, clinics, United States Postal Service, volunteer agencies, and planning and zoning agencies.
  - b. Non-local Agencies: Within the scope of public health, Bismarck/Burleigh Public Health coordinates with the following agencies: North Dakota Department of Health and state and federal law enforcement agencies.
4. General recommendations/Emergency Management concerns:
  - a. Public Health is normally underfunded and understaffed at all levels of government. Should Bismarck/Burleigh Public Health be called upon for expertise at a time of emergency or disaster, it normally does not have instrumentation for site level determinations of any kind without support from other agencies.
  - b. Public health agencies should be included in equipment storage; e.g., FEMA equipment "stored" and used at public health agencies, rather than being stored at a warehouse. For example, radio equipment that belongs to FEMA is based at county emergency management offices; the same could be done with air sampling equipment or other instruments/kits etc., which could be used by public health agencies both for daily work and at a time of emergency or disaster.

**Burleigh County Emergency Management**

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions.)
  - a. Coordinate emergency planning and response activities with numerous city and county agencies. Planning encompasses preparedness, response, recovery, and mitigation.
  - b. Responsible for daily operations of the Emergency Operations Center.
  - c. Update and exercise emergency operations and mitigation plans.
  - d. Coordinate State-sponsored training for city and county agencies including; law enforcement, public health, social services, fire departments, emergency medical services, etc.
  - e. Coordinate the County's Local Emergency Planning Committee.
  - f. Coordinate the County's Tier II reporting for hazardous materials.
  - g. Coordinate public awareness and educational programs via newspapers, radio, and schools to decrease vulnerability to hazards.
  - h. Coordinate timely and effective public information releases during emergency situations.
  - i. During a disaster declaration, emergency management will have all county resources at their disposal including manpower, communications, and equipment.
  - j. With effective planning, training, and exercising, emergency management can help to mitigate potential hazards within the county.
  - k. Assist in damage assessment and coordinate with state and federal agencies for recovery assistance.
2. Responsibility and authority in the regulating, inspecting, or funding of projects:
  - a. Assist with applications for federal and state funding such as the Hazard Mitigation Grant Program.
3. Leadership and coordination with other government agencies:
  - a. Local Agencies: Burleigh County Emergency Management coordinates with appropriate local agencies to ensure preparedness, response, recovery, and mitigation. These agencies include: Burleigh County Commissioners, Bismarck/Burleigh Public Health, Burleigh County Highway Department, Burleigh County Sheriff's Department, and various other law enforcement, fire, communication, and emergency medical agencies.
  - b. Non-local Agencies: Burleigh County Emergency Management coordinates with numerous state and federal agencies. These agencies include the North Dakota Department of Emergency Services, North Dakota Highway Patrol, North Dakota Health Department, North Dakota Department of Transportation, and the Federal Emergency Management Agency.
4. General recommendations/Emergency Management concerns:
  - a. A listing of eligible mitigation projects maintained for available grant funds.
  - b. Burleigh County is constantly striving to improve planning and exercise activities and response capabilities; however, the threat of potential hazards is increasing with increasing population and transportation thereby increasing the need for resources, training, and awareness.

**Burleigh County Extension Service**

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions.)
  - a. The Burleigh County Extension Service is linked in a unique partnership with North Dakota State University and the United States Department of Agriculture to provide practical, research-based information and educational programs to address critical issues facing individuals, families, agricultural producers, business operators, and communities.
  - b. County Extension Agents serve as subject-matter experts, educational planners, adult and youth teachers and community facilitators in several areas including agriculture and natural resources, horticulture, family and consumer sciences, 4-H and youth community development.
  - c. Provide planning, designing, implementing, and evaluating of educational programs for livestock and forage clientele.
  - d. Areas of responsibility include beef and dairy cattle, swine, other livestock, water quality, waste management, and forages.
  - e. Provide programming for county citizens in the areas of family financial management, environmental concerns, housing, health and wellness, aging, foods and nutrition, parenting, and human development.
  - f. Serve as an information resource in dealing with drought, winter storms, summer storms etc. in relation to agriculture, environment, water resources, etc.
  - g. Assist with damage assessment related to agriculture.
2. Responsibility and authority in regulating, inspecting, or funding of projects:
  - a. Authority is at federal level.
3. Leadership and coordination with other government agencies:
  - a. Local Agencies: Bismarck/Burleigh Emergency Management and Bismarck/Burleigh Public Health.
  - b. Non-local Agencies: North Dakota State University, North Dakota State Health Department, United States Department of Agriculture, and Farm Service Agency.
4. General recommendations/Emergency Management concerns:
  - a. Urban development taking over agricultural lands.

**Burleigh County Highway Department**

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions)
  - a. Design culverts and overflow sections. The County Highway Department follows a very detailed list of design standards for all projects within the county.
  - b. Continually working with the Department of Transportation on various projects since the DOT dispenses federal funding. While the DOT provides technical advice concerning guidelines and standards, they do not provide equipment, materials, or personnel.
2. Responsibility and authority in the regulating, inspecting or funding of projects:
  - a. Responsible for and have authority to regulate and inspect all projects completed within the county.
  - b. All projects funded by the state or federal government are designed by a professional engineer and meet the usual acceptable federal standards. Inspection of federal aid projects is the responsibility of the engineering staff and is overseen by the North Dakota Department of Transportation to ensure standards are met. Most county projects are designed with in-house expertise and engineers are consulted only if in-house schedules are overloaded or if problems arise.
  - c. All funding in one way or another comes through the county, whether it is a certain percentage of the federal aid project or 100% of the county projects.
3. Leadership and coordination with other government agencies:
  - a. Local Agencies: The County Highway Department interacts frequently with the Sheriff's Department on road usage and speed zones. There is almost daily contact with organized township boards concerning safety, road repairs, road improvements, drainage, and signing. There is considerable interaction with City Planner and Building Inspector concerning rural subdivision roadway development and zoning code enforcement. The County Road Department coordinates with various county agencies concerning right of way and right of way purchasing. The legal aspect of right of way purchasing is overseen by the States Attorney's Office. The land values are occasionally developed by the Tax Equalization office and approved by the County Commission.
  - b. Non-local Agencies: The County Highway Department coordinates with various State and Federal agencies for technical assistance, permitting, environmental concerns, archeological sites, and cultural issues. These agencies include the North Dakota Department of Transportation, US Fish and Wildlife, Corp of Engineers, and the North Dakota Historical Society.
4. General recommendations/Emergency Management concerns:
  - a. Burleigh County Highway Department should assist local government with floodplain management and water development permitting.

**Burleigh County Water Resource Board**

1. Mitigation and Risk Reduction
  - a. Assist with water damage assessment
  - a. Provide maps
  - b. Floodplain Administrator
  
2. Non-local agencies – State Water Commission

**Burleigh County Sheriff's Department**

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions.)
  - a. Responsible for law enforcement and criminal investigation in unincorporated areas of the county and in smaller towns that do not have police departments.
  - b. Provide 911 emergency response through Bismarck/Burleigh Combined Communications.
  - c. Provide standard law enforcement manpower and equipment.
  - d. In disaster situations, provide; warning, rescue assistance, evacuation assistance, security, traffic control, and information assistance.
  - e. Have mutual aid agreements with all surrounding counties and the North Dakota State Highway Patrol.
2. Responsibility and authority in the regulating, inspecting, or funding of projects:
  - a. None
3. Leadership and coordination with other government agencies:
  - a. Local Agencies: Within the scope of law enforcement, the Burleigh County Sheriff's Department coordinates with various local agencies. These agencies include Bismarck/Burleigh Emergency Management and various local police departments.
  - b. Non-local Agencies: Burleigh County Sheriff's Department coordinates with appropriate state and federal agencies including; North Dakota Highway Patrol, North Dakota Attorney Generals Office, Bureau of Criminal Investigation, North Dakota State Radio, North Dakota Department of Transportation, and Federal Bureau of Investigation.
4. General recommendations/Emergency Management concerns:
  - a. None.

## **Other Agency Resources**

Basin Electric: Provide engineering expertise and damage assessment (utilities).

Burleigh County Social Services: Temporary assistance to needy families (TANF), food stamps, medical assistance, childcare assistance, child protection and family social work services, home and community-based services for the elderly and disabled.

Capital Electric: Provide engineering expertise and damage assessment (utilities).

Kidder County Ambulance (Steele): Emergency response, patient care, transport, and public awareness and continuing education programs.

Metro Area Ambulance Service: Emergency response, patient care, transport, and public awareness and continuing education programs. Metro also has a disaster response trailer available.

Montana Dakota Utilities: Provide engineering expertise and damage assessment (utilities).

North Dakota Agriculture Department: Assists with situation and damage assessment; coordination with USDA; hazmat technical assistance; state land use program.

North Dakota Army Corps of Engineers: Water and dam management within the county. Provide technical expertise, sandbags, and heavy equipment.

North Dakota Fire Marshal: Hazmat route utilization; hazmat technical assistance; situation and damage assessment.

North Dakota Forestry Service: Debris removal from recreational facilities; technical assistance; situation and damage assessment.

North Dakota Game and Fish: Technical assistance; debris removal from recreational facilities; facility improvements; situation and damage assessment.

North Dakota Highway Patrol: Situation and damage assessment; provide transportation resources for movement of state personnel, supplies, and equipment to include air and ground reconnaissance; traffic control.

North Dakota Human Services: Insure liaison with private relief agencies for disaster victims.

North Dakota Job Service: Situation assessment and administration of disaster unemployment assistance programs.

North Dakota State Radio Communications: Exercise readiness of warning systems and communication support.

South Central Regional Water District: Delivers a reliable supply of safe, affordable, high-quality water to members in a five-county area in central North Dakota including rural Burleigh County.

Sterling Rural Fire Department: General fire suppression, rescue, hazardous materials response, public awareness and educational programs.

Wilton Ambulance: Emergency response, patient care, transport, and public awareness and continuing education programs.

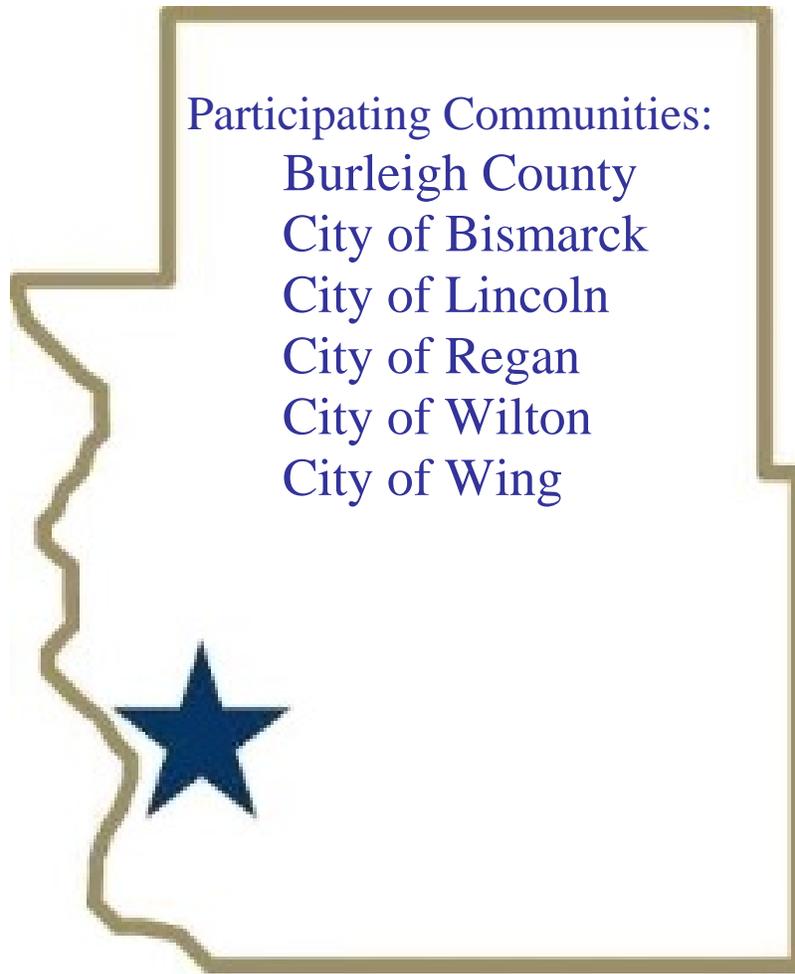
Wilton Rural Fire Department: General fire suppression, rescue, hazardous materials response, public awareness and educational programs.

Wing Ambulance: Emergency response, patient care, transport, and public awareness and continuing education programs.

Wing Rural Fire Department: General fire suppression, rescue, hazardous materials response, public awareness and educational programs.



# Burleigh County Multi-Hazard Mitigation Plan Appendices



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**APPENDIX A: INVITED STAKEHOLDERS AND PARTICIPATION**

| Stakeholder Participation                | 01-13-15<br>Burleigh<br>County<br>Water<br>Resource | 01-07-15<br>City of<br>Lincoln<br>Meeting | 01-07-15-<br>Regan &<br>Wilton<br>Meeting | 12-22-14<br>Public<br>Health<br>Meeting | 12-22-14<br>Planning<br>Team<br>Meeting<br>Invited | 12-22-14<br>Planning<br>Team<br>Meeting<br>Attended | 11-12-14<br>LEPC<br>Meeting<br>Invited | 11-12-14<br>LEPC<br>Meeting<br>Attended | 10-29-14<br>Dept Head<br>Meeting<br>Attended | 02-03-14<br>Burleigh<br>County<br>Survey<br>Invited | 01-27-14<br>Planning<br>Team<br>Meeting<br>Invited | 01-27-14<br>Planning<br>Team<br>Meeting<br>Attended |
|--|---|---|---|---|--|---|--|---|--|---|--|---|
| American Red Cross                       |   |   |   |   |  |   |  |   |  | X   |  |   |
| Basin Electric Power Cooperative         |   |   |   |   |  |   | X                                      |   |  |   |  |   |
| Bismarck Emergency Management            |   |   |   |   |  |   | X                                      | X                                       |  | X   |  |   |
| Bismarck Environmental Health            |   |   |   |   |  |   | X                                      |   |  |   |  |   |
| Bismarck Fire Department                 |   |   |   |   |  |   | X                                      |   |  |   |  |   |
| Bismarck Police Department               |   |   |   |   |  |   | X                                      |   |  |   |  |   |
| Bismarck Public Information Officer      |   |   |   |   |  |   | X                                      |   |  |   |  |   |
| Bismarck Public Schools                  |   |   |   |   |  |   | X                                      | X                                       |  |   |  |   |
| Bismarck Public Works                    |   |   |   |   |  |   | X                                      |   |  |   |  |   |
| Bismarck Rural Fire Department           |   |   |   |   | X  |   | X                                      | X                                       |  | X   | X  | X   |
| Bismarck/Burleigh Combined Comm          |   |   |   |   |  |   |  |   |  | X   |  |   |
| Bismarck/Burleigh Public Health          |   |   |   | X                                       |  |   |  | X                                       |  | X   |  |   |
| Burleigh County Accountant               |   |   |   |   |  |   |  |   | X  | X   |  |   |
| Burleigh County Auditor                  |   |   |   |   |  |   |  |   |  | X   |  |   |
| Burleigh County Building/Planning/Zoning | X   |   |   |   | X  | X   |  |   | X  | X   | X  | X   |
| Burleigh County Commission               | X   |   |   |   | X  |   | X                                      |   |  | X   | X  |   |
| Burleigh County Emergency Management     | X   | X   | X   | X                                       | X  | X   | X                                      | X                                       | X  | X   | X  | X   |
| Burleigh County Extension Service        |   |   |   |   |  |   |  |   |  | X   |  |   |
| Burleigh County GIS                      |   |   |   |   |  |   |  |   |  |   | X  | X   |
| Burleigh County Highway Department       |   |   |   |   | X  | X   |  |   | X  | X   | X  | X   |
| Burleigh County Human Resources          |   |   |   |   |  |   |  |   | X  | X   |  |   |
| Burleigh County Recorder                 |   |   |   |   |  |   |  |   | X  | X   |  |   |
| Burleigh County Sheriff's Department     |   |   |   |   | X  |   | X                                      | X                                       | X  | X   | X  |   |
| Burleigh County Social Services          |   |   |   |   |  |   |  |   | X  | X   |  |   |
| Burleigh County State's Attorney         |   |   |   |   |  |   |  |   |  | X   |  |   |
| Burleigh County Veteran Services         |   |   |   |   |  |   |  |   | X  | X   |  |   |
| Burleigh County Water Resource District  |   |   |   |   |  |   |  |   |  |   |  |   |
| Burlington Northern Santa Fe Railroad    |   |   |   |   |  |   | X                                      |   |  |   |  |   |
| Cenex                                    |   |   |   |   |  |   | X                                      |   |  |   |  |   |
| Central Dakota Amateur Radio Club        |   |   |   |   |  |   |  |   |  | X   |  |   |

| Stakeholder Participation          | 01-13-15<br>Burleigh<br>County<br>Water<br>Resource | 01-07-15<br>City of<br>Lincoln<br>Meeting | 01-07-15-<br>Regan &<br>Wilton<br>Meeting | 12-22-14<br>Public<br>Health<br>Meeting | 12-22-14<br>Planning<br>Team<br>Meeting<br>Invited | 12-22-14<br>Planning<br>Team<br>Meeting<br>Attended | 11-12-14<br>LEPC<br>Meeting<br>Invited | 11-12-14<br>LEPC<br>Meeting<br>Attended | 10-29-14<br>Dept Head<br>Meeting<br>Attended | 02-03-14<br>Burleigh<br>County<br>Survey<br>Invited | 01-27-14<br>Planning<br>Team<br>Meeting<br>Invited | 01-27-14<br>Planning<br>Team<br>Meeting<br>Attended |
|------------------------------------|---|---|---|---|--|---|--|---|--|---|--|---|
| City of Bismarck                   |   |   |   |   |  |   | X                                      |   |  |   |  |   |
| City of Lincoln                    |   | X   |   |   |  |   | X                                      |   |  | X   |  |   |
| City of Regan                      |   |   | X   |   |  |   |  |   |  | X   |  |   |
| City of Wilton                     |   |   | X   |   |  |   |  |   |  | X   |  |   |
| City of Wing                       |   |   |   |   |  |   |  |   |  | X   |  |   |
| Custer District Health             |   |   |   |   |  |   | X                                      |   |  |   |  |   |
| DMVW Railroad                      |   |   |   |   |  |   | X                                      |   |  |   |  |   |
| Emmons County Emergency Management |   |   |   |   |  |   |  |   |  | X   |  |   |
| General Sibley Park                |   |   |   |   |  |   |  |   |  | X   |  |   |
| Kidder County Emergency Management |   |   |   |   |  |   |  |   |  | X   |  |   |
| Lincoln Police Department          |   | X   |   |   |  |   |  |   |  | X   |  |   |
| Media                              |   |   |   |   |  |   | X                                      |   |  | X   |  |   |
| Metro Area Ambulance               |   |   |   |   |  |   | X                                      |   |  | X   |  |   |
| Morton County Emergency Management |   |   |   |   |  |   | X                                      |   |  | X   |  |   |
| National Weather Service           |   |   |   |   |  |   |  |   |  | X   |  |   |
| ND Carriers Association            |   |   |   |   |  |   | X                                      |   |  |   |  |   |
| Safety Kleen                       |   |   |   |   |  |   | X                                      | X                                       |  |   |  |   |
| Salvation Army                     |   |   |   |   |  |   |  |   |  | X   |  |   |
| Sanford Medical Center             |   |   |   |   |  |   | X                                      | X                                       |  | X   |  |   |
| SW Central Emergency Preparedness  |   |   |   | X                                       |  |   | X                                      |   |  | X   |  |   |
| St Alexius Medical Center          |   |   |   |   |  |   | X                                      |   |  | X   |  |   |
| Sterling Rural Fire Department     |   |   |   |   |  |   | X                                      |   |  | X   |  |   |
| United Tribes Technical College    |   |   |   |   |  |   |  |   |  | X   |  |   |
| University of Mary                 |   |   |   |   |  |   |  |   |  | X   |  |   |
| Wilton Ambulance                   |   |   | X   |   |  |   | X                                      |   |  | X   |  |   |
| Wilton Fire Department             |   |   | X   |   |  |   | X                                      |   |  |   |  |   |
| Wing Ambulance                     |   |   |   |   |  |   | X                                      |   |  |   |  |   |
| Wing Rural Fire Department         |   |   |   |   |  |   | X                                      |   |  | X   |  |   |



*Burleigh County*

Emergency Management  
 2301 University Dr, Bldg 21  
 Bismarck ND 58504  
 (701) 222-6727

**Multi-Hazard Mitigation Plan  
 Planning Team**

January 27, 2014  
 10:00 AM

Burleigh County Emergency Operations Center

**A G E N D A**

1. Confirm plan purpose
2. Review current mitigation plan
3. Refine plan scope and schedule
4. Establish responsibilities
5. Develop an outreach strategy

|  |   |
|--|---|
|  | <p><b>Multi-Hazard Mitigation Plan<br/>                 Planning Team Meeting<br/>                 January 27, 2014</b></p> |
|--|---|

|            | Name             | Title                                       | Agency                               | Telephone    | E-mail   |
|------------|------------------|---|--------------------------------------|--------------|--|
| <i>ms</i>  | Mary Senger      | Emergency Manager                           | Burleigh County Emergency Management | 701-222-6727 | <a href="mailto:msenger@nd.gov">msenger@nd.gov</a>                     |
|            | Tom Schroeder    | Deputy, Alternate Emergency Manager         | Burleigh County Sheriff's Department | 701-222-6650 | <a href="mailto:tom@burleighsd.com">tom@burleighsd.com</a>             |
|            | Jim Peluso       | Commissioner                                | Burleigh County Commission           | 701-222-2820 | <a href="mailto:pelusohockey@yahoo.com">pelusohockey@yahoo.com</a>     |
| <i>RZ</i>  | Ray Ziegler      | Building Official, Floodplain Administrator | Building/Planning/Zoning             | 701-221-3727 | <a href="mailto:rziegler@nd.gov">rziegler@nd.gov</a>                   |
| <i>AK</i>  | Al Klein         | Fire Chief, LEPC Chair                      | Bismarck Rural Fire Department       | 701-258-5792 | <a href="mailto:al.bfrd@midconetwork.com">al.bfrd@midconetwork.com</a> |
| <i>GC</i>  | Greg Carlson     | GIS Coordinator                             | Burleigh County Highway Department   | 701-221-6870 | <a href="mailto:gre Carlson@nd.gov">gre Carlson@nd.gov</a>             |
| <i>MSH</i> | Marcus Hall      | Engineer                                    | Burleigh County Highway Department   | 701-221-6870 | <a href="mailto:mahall@nd.gov">mahall@nd.gov</a>                       |
| <i>ek</i>  | Gaylene Kirkhorn | Office Assistant                            | Emergency Management                 | 701-222-6727 | <a href="mailto:gkirkhorn@nd.gov">gkirkhorn@nd.gov</a>                 |



**Burleigh County  
Local Emergency Planning Committee  
2301 University Dr, Bldg 21  
Bismarck, ND 58504  
(701) 222-6727**

**Al Klein**  
Chairperson  
Bismarck Rural Fire Department  
5800 E Main Ave  
Bismarck, ND 58501  
701-258-5792  
[Al.klein@midconetwork.com](mailto:Al.klein@midconetwork.com)

**Gary Stockert**  
Vice Chairperson  
City of Bismarck Emergency Mgt  
2301 University Dr, Bldg 21  
Bismarck, ND 58504  
701-222-6727  
[gstockert@nd.gov](mailto:gstockert@nd.gov)

**Mary Senger**  
Secretary/Treasurer  
Burleigh County Emergency Manager  
2301 University Dr, Bldg 21  
Bismarck, ND 58504  
701-222-6727  
[msenger@nd.gov](mailto:msenger@nd.gov)

**M E M O R A N D U M**

**TO:** Local Emergency Planning Committee Member  
**FROM:** Mary H. Senger, Emergency Manager  
**DATE:** October 27, 2014  
**SUBJECT:** NEXT MEETING

Section 303(a) of SARA Title III (Superfund Amendment and Reauthorization Act of 1986) requires that each Local Emergency Planning Committee conduct meetings as required. Our next meeting will be held on November 12th, 10:00 AM at the Emergency Operations Center, 2301 University Dr, Building 21 at the Bismarck Airport (Maintenance Exit).

**Agenda**

1. Approval of October 3, 2013 Meeting Minutes
2. Community Right to Know Act
3. Tier II reporting
4. Committee membership
5. Financial report
6. Requests for expenditures
7. Public education
8. Election of officers
9. Any other items



# Burleigh County

**Department Head Meeting**

**221 N. 5<sup>th</sup> St.**

**Bismarck, ND 58501**

**Auditor/Treasurer**  
Kevin Glatt

**Building/Planning/Zoning**  
Ray Ziegler

**Emergency Manager**  
Mary Senger

**Extension Agent**  
Shaundra Ziemann-Bolinska

**Finance Director**  
Clyde Thompson

**Highway Engineer**  
Marcus Hall

**Human Resources**  
Tammy Terras

**Recorder**  
Debbie Kroshus

**Sheriff**  
Pat Heinert

**Social Services**  
Kim Osadchuk

**State's Attorney**  
Richard Riha

**Veterans Service Officer**  
Mark Landis

**October 29, 2014**  
**9:00 AM**  
**Tom Baker Meeting Room**  
**City/County Building**

## AGENDA

**Old Business**

None

**New Business**

1. New PERKS employee discount program
2. BSC Training overview
3. Evaluations and personnel actions-salary increases
4. United Way Presentation (Jenna Gallo)
5. Multi-Hazard Mitigation Plan

Any other business.



# Burleigh County

Emergency Management  
2301 University Dr, Bldg 21  
Bismarck ND 58504  
(701) 222-6727

## Multi-Hazard Mitigation Plan Planning Team

December 22, 2014  
10:00 AM  
Burleigh County Emergency Operations Center

### A G E N D A

1. Review draft mitigation plan
  - a. Layout and content
  - b. Mitigation projects and priorities
  - c. Mitigation capabilities
2. Approval process



### Multi-Hazard Mitigation Plan Planning Team Meeting December 22, 2014

**Please Print**

| Name           | Title             | Agency                               | Telephone |
|----------------|-------------------|--------------------------------------|-----------|
| Mary Senger    | Emergency Manager | Burleigh County Emergency Management | 222-6727  |
| Marcus J. Hill | County Engineer   | Burleigh County                      | 204-7748  |
| Ray Ziegler    | Building Official | Building/Planner                     | 221-3727  |
|                |                   |                                      |           |
|                |                   |                                      |           |



# Burleigh County

Emergency Management  
 2301 University Dr, Bldg 21  
 Bismarck ND 58504  
 (701) 222-6727

## Multi-Hazard Mitigation Plan

January 6, 2015  
 10:00 AM  
 Wilton City Hall

## A G E N D A

1. Review draft mitigation plan
  - a. Layout and content
  - b. Mitigation projects and priorities
  - c. Mitigation capabilities
2. Approval process

|  |   |
|--|---|
|  | <b>Multi-Hazard Mitigation Plan</b><br><b>Regan/Wilton Meeting</b><br>January 6, 2015 |
|--|---|

**Please Print**

| Name                     | Title             | Agency                               | Telephone | E-mail                  |
|--------------------------|-------------------|--------------------------------------|-----------|-------------------------|
| Mary Senger              | Emergency Manager | Burleigh County Emergency Management | 222-6727  | msenger@nd.gov          |
| JD Young Bird            | Fire Chief        | Wilton Fire Protection               | 226-3430  | jyoungbird@nd.gov       |
| Lee Ann Domonoske Keller | Mayor             | Wilton Ambulance / City of Wilton    | 220-6893  | domonoske@bektel.com    |
| Jamie Scherhames         | Municipal Judge   | City of Wilton                       | 652-5816  | jamie@weckerlyfarms.com |



## Burleigh County

Emergency Management  
 2301 University Dr, Bldg 21  
 Bismarck ND 58504  
 (701) 222-6727

### Multi-Hazard Mitigation Plan

January 7, 2015  
 10:00 AM  
 Lincoln City Hall

## AGENDA

1. Review draft mitigation plan
  - a. Layout and content
  - b. Mitigation projects and priorities
  - c. Mitigation capabilities
  
2. Approval process

**Multi-Hazard Mitigation Plan**  
**Lincoln Meeting**  
**January 7, 2015**

**Please Print**

| Name                | Title                 | Agency                               | Telephone | E-mail                                |
|---------------------|-----------------------|--------------------------------------|-----------|---------------------------------------|
| Mary Senger         | Emergency Manager     | Burleigh County Emergency Management | 222-6727  | msenger@nd.gov                        |
| Proberta Unterscher | City Auditor          | City of Lincoln                      | 258-7969  | cityoflincoln@midcontinentnetwork.com |
| BOB JOHNSTON        | MAYOR                 | CITY OF LINCOLN                      | 222-3504  | MCOL@BIS-MIDCONET                     |
| Ben Newman          | Chief                 | Lincoln PD                           | 391-5804  | bennewman@nd.gov                      |
| Robert Dickson      | public Works Director | city of Lincoln                      | 391-5805  | rmx@midco.net                         |



**BURLEIGH COUNTY WATER RESOURCE DISTRICT AGENDA**  
**Tuesday, January 13<sup>th</sup>, 2015**  
**Tom Baker Meeting Room – City County Building**  
 8 a.m. - Call to Order

1. Roll Call (Fleck, Weixel, Reep, Larson, Detwiller)
2. Introduction and welcome new board members
3. **Approval of Minutes of (12-9-14)** ..... 3-7
4. **Reorganization - Election of Officers**
  - Chairman
  - Vice Chairman
  - Secretary/Treasurer
  - Reappointment of Administrative Secretary, Engineer & Legal Counsel ..... 8-11
  - Review and Approve 2015 Portfolios and Schedule ..... 12-13
5. **McDowell Dam**
  - Low Level Drawdown – work on hold until Spring (Mike)
  - Water Permit Applications Approved update – (Mike)
  - NRCS Dam Assessment of McDowell - Studies and shared information (Craig)
  - Letter to landowner to discuss land purchase buffer (Gordon) – See Map ..... 14-15
  - Park District Agreement modifications (Gordon/Dave) ..... 16-19
  - Strategic Plan Update – Memo (Gordon)
  - McDowell Dam revenue payment adjustment ..... 20-21
  - USDA Letter re: covered commodities ..... 22-24
  - Insurance
    - Aero Club – Mona ..... 25-26
6. **County Engineer Items**
  - MRCC Resolution
    - Resolution No. 1 – Resolution of Necessity (signed copy – informational) ..... 27-28
    - Resolution No. 2 – Approval of Engineers Report ..... 29
    - Certified Assessment list – Draft (approval after MRCC Meeting)
    - Meeting with MRCC – Department of Corrections (funding and relocation)
    - Missouri River Day Use Park
    - Public Informational Meeting (Mike/Craig)
    - Public Hearing – Tentative for March
  - Country Creek Maintenance District
    - Update on Subdivision Approval
  - Ash/Ward Coulee – Missouri River (no updates)
7. **Comments from Members of the Public**
8. **Financial Reports**
  - End of December Financial Data ..... 30-33
9. **Approval of Bills – Amount \$18,763.75** ..... 34
10. **Drainage Complaints/Issues**
  - Eldin Spier/UTTC – Update

11. Projects

- Hogue Island (FM 39)
  - Sale of Lots – Authorize Auction Process Template provided – on hold until new Board members are in place and briefed. (Michael) ..... 35-44
  - Create advertisement format – February (Craig/Dave)
  - Establish and record deed restrictions (Dave)
  - Auction – March/April
- Burnt Creek Flood Control Project (FM #7)
  - Advertise for Bid in February 2015 – Opening date prior to March meeting
  - Low level channel (Old Burnt Creek) capacity concerns – notice to landowners
  - Landowner Easement Letter (mail and contact)
- Missouri River Snagging & Clearing (all Board members invited)
  - Hydraulic Analysis –USGS Report February
- Apple Creek Industrial Park
  - Submitted signed cost share agreement to SWC (mailed)
  - Awaiting receipt of Bond – landowners notified (landowner discussions with Art Mariner pending)
  - Storm Water Management Plan (KLJ – February 2014)
  - Apple Creek Drainage Permit – Bismarck Airport Authority Update on contacts with KLJ .... 45-46

12. Storm Water Management

13. Break

14. Other Old Business

- Removal of items in storage room – re-scheduled for January 22<sup>nd</sup>
- Policy Manual – Preliminary Draft Update (Michael, Dave, Mona)
  - Portfolio Assignments to Complete – individual timelines

15. New Business

- **Burleigh Multi-Hazard Mitigation Plan (Mary Senger project summary request) - Terry** ..... 47
- Missouri River Easement Documentation and Mapping (Terry)
- Records request from State Auditor ..... 48-51

16. Correspondence or Document Information

- ND Public Finance Authority letter re: Audit Requirements ..... 52
- Policy Matters by Larry Larson ..... 53-54
- Plats & SWMP – Emailed
  - Apple Creek Road Subdivision – resubmitted City Plat
  - Boulder Ridge Seventh Addition
  - Reuter’s Subdivision Resubmitted City Plat
  - Lot 1A Shop Condos – SWMP
  - Street Name Change: Global Drive
  - Apple Creek Road Subdivision – City Final
  - Promontory Point Sixth Addition
  - RDO Hay Creek Industrial Addition
  - Willow View

17. Detailed Bills ..... 55

18. Next Meeting: Tuesday, February 10<sup>th</sup>

19. Adjourn

**Note: Bold Items Require Board Action**

## APPENDIX B: PUBLIC INFORMATION

## February 24, 2014 Community Mitigation Planning Public Input Meeting

**NEWS RELEASE**

**For Immediate Release:**  
February 19, 2014

**For More Information Media Contact:**  
Gary Stockert, Bismarck Emergency Manager  
Phone: (701) 222-6727

Mary Senger, Burleigh County Emergency Manager  
Phone: (701) 222-6727

**Bismarck and Burleigh County Emergency Managers to Host  
Community Mitigation Planning Public Input Meeting Feb. 24**

BISMARCK, N.D. – Bismarck and Burleigh County Emergency Managers are seeking your input on how we can make our community safer from potential hazards. You're invited to participate and share your ideas about the development of the Bismarck and Burleigh County Mitigation Plans. A public input meeting is scheduled for February 24, 5:30 p.m., at the Bismarck Veterans Memorial Public Library, Room B, 515 N. Fifth St., Bismarck.

As a participant of the meeting you will have the opportunity to express your ideas and identify potential community-wide hazards, related vulnerabilities and mitigation approaches that would minimize risk and impact to the community. Information shared in these conversations will be gathered to identify key themes, and allow subsequent planning and action in the development of a community specific mitigation plan.

No training or previous experience with mitigation planning is necessary. For residents interested in learning more about mitigation planning on a personal or business level, visit the independent study course titled, "Protecting Your Home or Small Business From Disaster" available at: <http://www.training.fema.gov/EMIWeb/IS/courseOverview.aspx?code=is-394.a>

For more information visit [www.bismarck.org](http://www.bismarck.org) or [www.Burleigh.co.com](http://www.Burleigh.co.com)

###

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- Auditor/Treasurer/Tax Equalization
- Building/Planning/Zoning
- Combined Communications (911)
- Emergency Management
  - Accessible Emergency Preparedness Information
  - All Hazards Radio
  - Automated External Defibrillator
  - Fire
  - Flood
  - Hazardous Materials
  - Homeland Security
  - Mitigation
  - National Preparedness Month
  - Shelter In Place
  - Sirens
  - Summer Weather Awareness
  - Terrorism
  - Winter Weather Awareness
- Links
- Training
- Frequently Asked Questions
- Extension Office
- Highway Department
- Human Resources
- Library
- Public Health
- Recorder

## DEPARTMENTS



PRINTER FRIENDLY PAGE 

**Mitigation**

**Burleigh County wants your input on how to make our community safer!**

An inter-agency team has initiated a major effort to revamp the current Burleigh County Multi-Hazard Mitigation Plan by re-examining the hazards facing our communities and strategies to mitigate (reduce or eliminate) their impact.

Community input will be essential throughout the planning process. Citizens are asked to complete a brief questionnaire and review the current plan. A draft plan of the updates will be posted as the process ensues.

Complete the [survey](#) (less than 5 minutes) by February 28, 2014.

---

**Bismarck and Burleigh County Emergency Managers Host Community Mitigation Planning Public Input Meeting Feb. 24**

BISMARCK, N.D. - Bismarck and Burleigh County Emergency Managers are seeking your input on how we can make our community safer from potential hazards. You're invited to participate and share your ideas about the development of the Bismarck and Burleigh County Mitigation Plans. A public input meeting is scheduled for February 24, 5:30 p.m., at the Bismarck Veterans Memorial Public Library, Room B, 515 N. Fifth St., Bismarck.

As a participant of the meeting you will have the opportunity to express your ideas and identify potential community-wide hazards, related vulnerabilities and mitigation approaches that would minimize risk and impact to the community. Information shared in these conversations will be gathered to identify key themes, and allow subsequent planning and action in the development of a community specific mitigation plan.

No training or previous experience with mitigation planning is necessary. For residents interested in learning more about mitigation planning on a personal or business level, visit the independent study course titled, "[Protecting Your Home or Small Business From Disaster](#)"

 **Burleigh County Emergency Management** created an event.  
February 20



**Community Mitigation Planning Public Input Meeting**  
Monday, February 24 at 5:30pm  
Bismarck Public Library in Bismarck, North Dakota

Like · Comment · Stop Notifications · Share

33 people reached [Boost Post](#)

**Emergency managers seek comment**

Burleigh County and Bismarck emergency managers are seeking comments about how to make the community safer from potential hazards. Residents can share their ideas about Bismarck and Burleigh County mitigation plans Monday at the Bismarck Public Library. The meeting begins at 5:30 p.m.

Participants can share ideas and identify potential community-wide hazards and mitigation approaches that would lower risk to the community. Comments received will be used to draw up a specific community mitigation plan.

For more information, visit [www.bismarck.org](http://www.bismarck.org) or [www.Burleigh.co.com](http://www.Burleigh.co.com).

Source: The Bismarck Tribune Newspaper

## Comments wanted about hazards mitigation for Burleigh, Bismarck

Recommend 0

Tweet 0

+1 0

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February 19, 2014 5:38 pm • [Bismarck Tribune Staff](#)

BISMARCK, N.D. — Burleigh County and Bismarck emergency managers are seeking comments about how to make the community safer from potential hazards. Residents can share their ideas about Bismarck and Burleigh County mitigation plans Monday at the Bismarck Public Library. The meeting begins at 5:30 p.m.

Participants can share ideas and identify potential community-wide hazards and mitigation approaches that would lower risk to the community. Comments received will be used to draw up a specific community mitigation plan.

For more information, visit [www.bismarck.org](http://www.bismarck.org) or [www.Burleighco.com](http://www.Burleighco.com).

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Source: The Bismarck Tribune [website](#)



**Local Mitigation Plans  
Public Input Meeting**

February 24, 2014  
7:00-8:00 PM  
Bismarck Library, Room B

**Agenda**

1. Mitigation Plans – Bismarck and Burleigh
2. Mitigation Plan Purpose
3. Hazards Overview
4. **Public Input: Hazard Identification**
5. **Public Input: Identification of hazard related Vulnerabilities**
6. **Public Input: Identification of Mitigation Actions**



Local Mitigation Plans - Public Input Meeting  
February 24, 2014 5:30 – 6:30 PM  
Bismarck Library, Room B  
**PARTICIPANT FEEDBACK FORM**



**Hazard Identification:**

1. Identify the hazard(s) of highest concern to you which has potential for significant impact to our community. The hazard may be a natural hazard, human-caused, or technological hazard.

|  |
|--|
|  |
|  |
|  |

**Identification of related risk and vulnerability:**

2. Based on the hazard(s) you identified in question #1, **describe the risk and the primary vulnerability(s) in your opinion.** "Risk" is the potential for damage or loss (frequency and likelihood of occurrence). "Vulnerability" may be described as community assets (people, places, things) which are susceptible to damage or injury from the hazard.

|  |
|--|
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**Mitigation Ideas:**

3. Based on the vulnerability(s) you described in #2, **what mitigation** (preventative) **measures** would you recommend be considered? Mitigation measures are those actions taken BEFORE an incident that eliminate or minimize risk, impact, or vulnerability.

|  |
|--|
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|  |

The meeting was publicly advertised:

- Radio
- Television
- The Bismarck Tribune
- City of Bismarck website
- Burleigh County website
- Burleigh County social media

Public attendance was zero.



Source: Burleigh County Emergency Manager

**September 13, 2014 National Weather Service Open House**

The National Weather Service hosted a community open house on September 13, 2014 during National Preparedness Month. The event was advertised in The Bismarck Tribune, radio, television, websites, and social media.



Source: National Weather Service, Bismarck

Emergency Management provided outreach and presented numerous materials on preparedness and mitigation, including but not limited to:

- Every Season to Prepare pamphlet
- Shelter In Place Brochure
- National Flood Insurance Program information
- Outdoor Warning System



Source: Burleigh County Emergency Manager



Source: Burleigh County Emergency Manager



**Burleigh County Emergency Management**

We're at the US National Weather Service Bismarck North Dakota open house until 3 today--come and visit!



178 people reached

[Boost Post](#)

**APPENDIX C: BURLEIGH COUNTY PUBLIC SURVEY**

**We need your help!**

Burleigh County is currently engaged in a planning process to become less vulnerable to disasters caused by natural and human-caused hazards, and your participation is important to us! Burleigh County, along with participating local jurisdictions and other participating partners, is now working to update the Burleigh County Multi-Hazard Mitigation Plan. The purpose of the Plan is to identify and assess our community's hazard risks and determine how to minimize those risks.

This survey questionnaire provides an opportunity for you to share your opinions and participate in our mitigation planning process. The information you provide will help us better understand your hazard concerns and can lead to mitigation activities that should help lessen the impact of future hazard events. A public hearing will also be scheduled at a later date.

**Please help us by completing this survey by February 28, 2014.**

If you have any questions regarding the survey or would like to learn about more ways you can participate in the update of the Burleigh County Multi-Hazard Mitigation Plan, please contact the Burleigh County Emergency Manager, Mary Senger via email [msenger@nd.gov](mailto:msenger@nd.gov), phone 701-222-6727, or submit in writing to Burleigh County Emergency Management, 221 N 5<sup>th</sup> St, Bismarck, ND 58501.

**1. Where do you live?**

- Unincorporated Burleigh County
- City of Bismarck
- City of Lincoln
- City of Regan
- City of Wilton
- City of Wing
- I don't live in Burleigh County, but I would like to participate

**2. Have you ever experienced or been impacted by a disaster?**

- Yes
- No

**If "Yes", please explain:**

**3. How concerned are you about the possibility of your community being impacted by a disaster?**

- Extremely concerned
- Somewhat concerned
- Not concerned

**4. Please select the one hazard you think is the highest threat to your area:**

- Communicable Disease (Including Human, Animal, and Plant Diseases)
- Dam Failure
- Drought
- Flood (Including Riverine, Levee failure, Closed Basin, Ice Jam, and Flash Floods)
- Geologic Hazards (Including Landslide, Earthquake, and other Geologic/Mining Hazards)
- Hazardous Materials Release (Including Oil and Gas Industry)
- Homeland Security Incident (Including Multiple Types of Terrorism and Cyber-Terrorism)
- Severe Summer Weather (Including Tornadoes, Hail, Downbursts, Thunderstorm Winds, Lightning, and Extreme Heat)
- Severe Winter Weather (Including Blizzards, Heavy Snow, Ice Storms, and Extreme Cold)
- Shortage or Outage of Critical Materials or Infrastructure
- Transportation Accident (Including Vehicular, Railway, and Aircraft Accidents)
- Urban Fire or Structure Collapse
- Wildland Fire
- Windstorm

**5. Please select the one hazard you think is the second highest threat to your area:**

- Communicable Disease (Including Human, Animal, and Plant Diseases)
- Dam Failure
- Drought
- Flood (Including Riverine, Levee failure, Closed Basin, Ice Jam, and Flash Floods)
- Geologic Hazards (Including Landslide, Earthquake, and other Geologic/Mining Hazards)
- Hazardous Materials Release (Including Oil and Gas Industry)
- Homeland Security Incident (Including Multiple Types of Terrorism and Cyber-Terrorism)
- Severe Summer Weather (Including Tornadoes, Hail, Downbursts, Thunderstorm Winds, Lightning, and Extreme Heat)
- Severe Winter Weather (Including Blizzards, Heavy Snow, Ice Storms, and Extreme Cold)
- Shortage or Outage of Critical Materials or Infrastructure
- Transportation Accident (Including Vehicular, Railway, and Aircraft Accidents)
- Urban Fire or Structure Collapse
- Wildland Fire
- Windstorm

**6. Is there another hazard not previously listed that you think is a wide-scale threat to your area?**

- Yes
- No

**If "Yes", please explain:**

**7. Is your home located in a floodplain?**

- Yes
- No
- I don't know

**8. Do you have flood insurance?**

- Yes
- No
- I don't know

**If "No," why not?**

- Not located in floodplain
- Too expensive
- Not necessary because it never floods
- No necessary because I'm elevated or otherwise protected
- Never really considered it
- Other (please explain)

**9. In your opinion, what are some steps your local government could take to reduce or eliminate the risk of future hazard damages in your community?**

**10. A number of community-wide activities can reduce our risk from hazards. In general, these activities fall into one of the following six broad categories. Please tell us how important you think each one is for your community to consider pursuing.**

|  | Very<br>Important        | Somewhat<br>Important    | Not<br>Important         |
|--|--------------------------|--------------------------|--------------------------|
| <b>Prevention</b> --Administrative or regulatory actions that influence the way land is developed and buildings are built. Examples include planning and zoning, building codes, open space preservation, and floodplain regulations.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>Property Protection</b> --Actions that involve the modification of existing buildings to protect them from a hazard or removal from the hazard area. Examples include acquisition, relocation, elevation, structural retrofits, and storm shutters.                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>Natural Resource Protection</b> --Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. Examples include floodplain protection, habitat preservation, slope stabilization, riparian buffers, and forest management. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>Structural Projects</b> --Actions intended to lessen the impact of a hazard by modifying the natural progression of the hazard. Examples include dams, levees, detention/retention basins, channel modification, retaining walls, and storm sewers.                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>Emergency Services</b> --Actions that protect people and property during and immediately after a hazard event. Examples include warning systems, evacuation planning, emergency response training, and protection of critical emergency facilities or systems.                  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>Public Education and Awareness</b> --Actions to inform citizens about hazards and the techniques they can use to protect themselves and their property. Examples include outreach projects, school education programs, library materials, and demonstration events.             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**11. This survey may be submitted anonymously; however, if you provide us with your name and contact information below we will have the ability to follow up with you to learn more about your ideas or concerns (optional):**

|                |                      |
|----------------|----------------------|
| <b>Name</b>    | <input type="text"/> |
| <b>Address</b> | <input type="text"/> |
| <b>Phone</b>   | <input type="text"/> |
| <b>E-mail</b>  | <input type="text"/> |

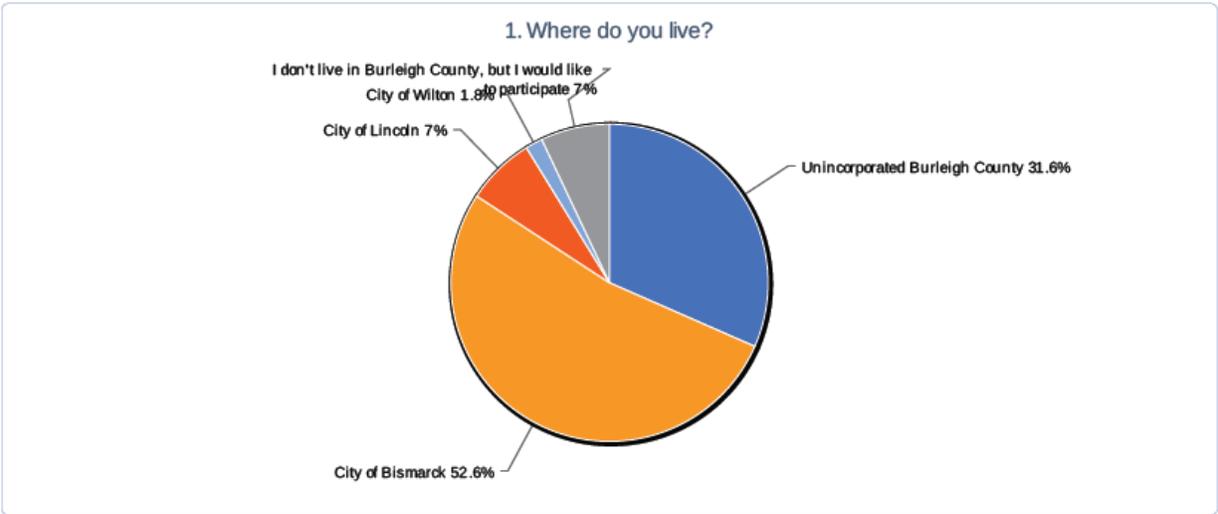
### Survey Results



Online Surveys, Data Collection and Integration  
www.SurveyGizmo.com

#### Summary Report - Feb 24, 2014

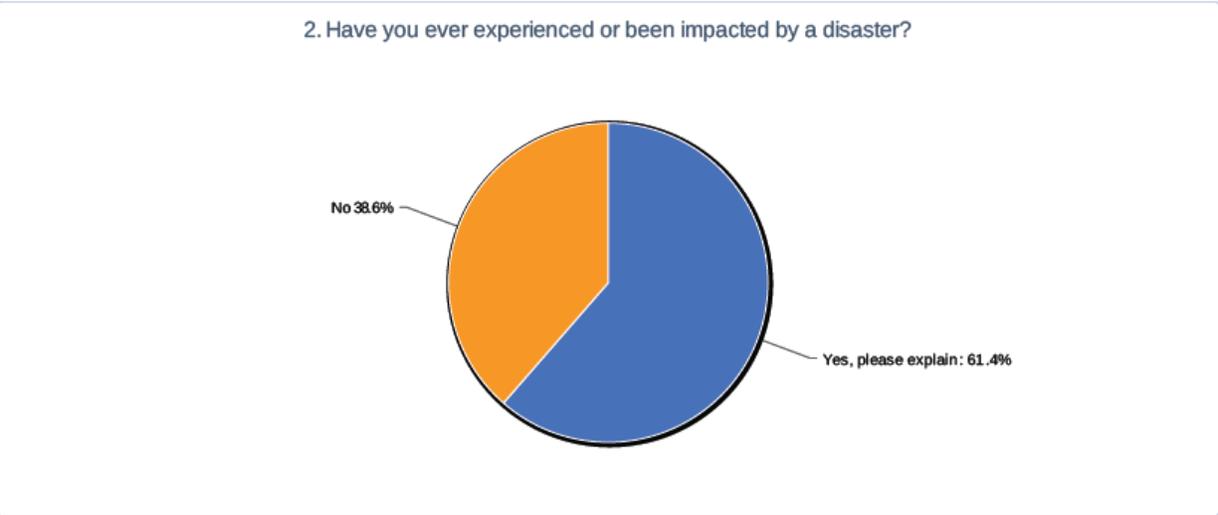
Survey: Public Participation Survey for the Burleigh County Multi-Hazard Mitigation Plan Update



#### 1. Where do you live?

| Value  | Count | Percent % |
|--|-------|-----------|
| Unincorporated Burleigh County                                   | 18    | 31.6%     |
| City of Bismarck   | 30    | 52.6%     |
| City of Lincoln  | 4     | 7.0%      |
| City of Regan  | 0     | 0.0%      |
| City of Wilton   | 1     | 1.8%      |
| City of Wing   | 0     | 0.0%      |
| I don't live in Burleigh County, but I would like to participate | 4     | 7.0%      |

| Statistics      |      |
|-----------------|------|
| Total Responses | 57   |
| Sum             | 56.0 |
| Avg.            | 1.1  |
| StdDev          | 1.6  |
| Max             | 10.0 |

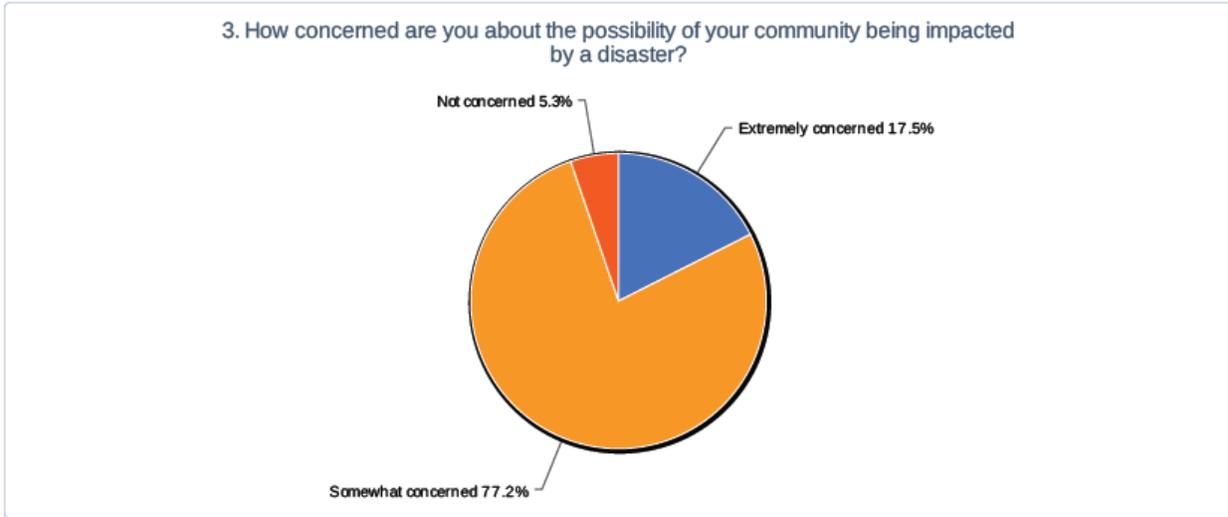


**2. Have you ever experienced or been impacted by a disaster?**

| Value                | Count | Percent % | Statistics      |    |
|----------------------|-------|-----------|-----------------|----|
| Yes, please explain: | 35    | 61.4%     | Total Responses | 57 |
| No                   | 22    | 38.6%     |                 |    |

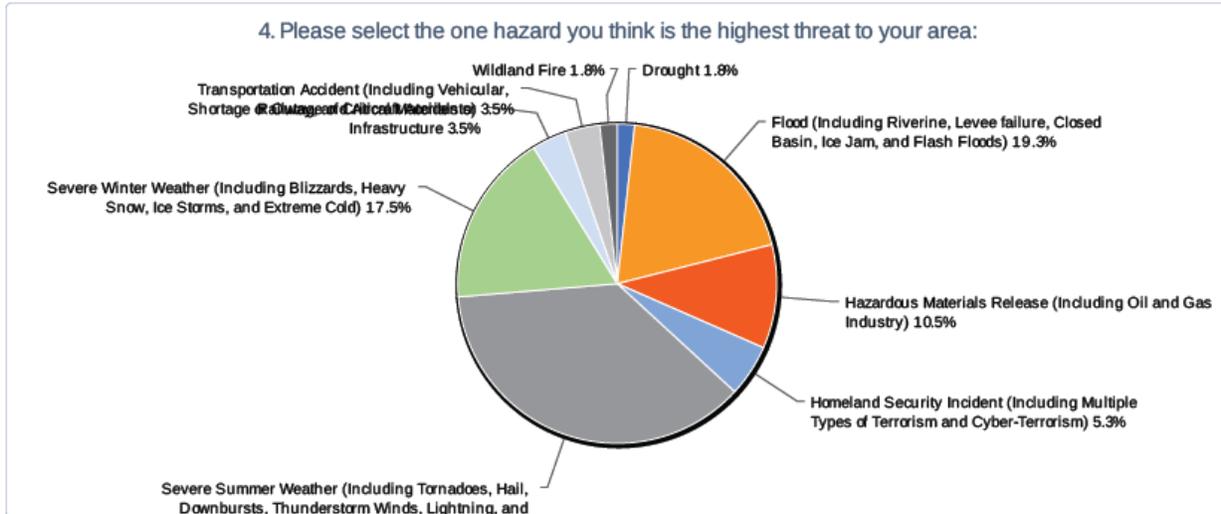
| Open-Text Response Breakdown for "Yes, please explain: "  | Count |
|---|-------|
| 2009 & 2011 Floods  | 1     |
| 2009 & 2011 floods  | 1     |
| 2009 and 2011 Flood   | 1     |
| 2011 Floods   | 1     |
| 2011 flood  | 6     |
| 2011 flood inundated my property  | 1     |
| Family was displaced during the 2011 Flood  | 1     |
| Fargo flooding  | 1     |
| Flood   | 1     |
| Flood 2009 and 2011   | 1     |
| Flood 2011  | 3     |
| Flooding  | 1     |
| Floods, hurricanes, tornadoes, fires  | 1     |
| Red river flood 2009  | 1     |
| Response agency so have assisted with various tornados,flood response,ect.  | 1     |
| The flood   | 1     |
| Wildfire  | 1     |
| flood   | 2     |
| flood of 97 in grand forks  | 1     |
| flooding  | 1     |
| floods  | 1     |
| power failure with ice storm a couple years ago   | 1     |
| storms  | 1     |
| summer and winter storms  | 1     |
| summer storm  | 1     |
| The record snowfall from April 2013 made travel extremely difficult. Roads in my neighborhood were not plowed until nearly two days after the snow ended. I was stuck at home and not able to leave because of the poor road conditions in my neighborhood. It was frustrating to look out and see the main roads in great shape, but poor neighborhood roads kept many trapped at home well after the storm ended. | 1     |
| Flood 2011 No flood at my home but all but one access road was blocked either by flood water or a dike. Personal disaster was \$16,000 hail damage in 2010.   | 1     |



**3. How concerned are you about the possibility of your community being impacted by a disaster?**

| Value               | Count | Percent % |
|---------------------|-------|-----------|
| Extremely concerned | 10    | 17.5%     |
| Somewhat concerned  | 44    | 77.2%     |
| Not concerned       | 3     | 5.3%      |

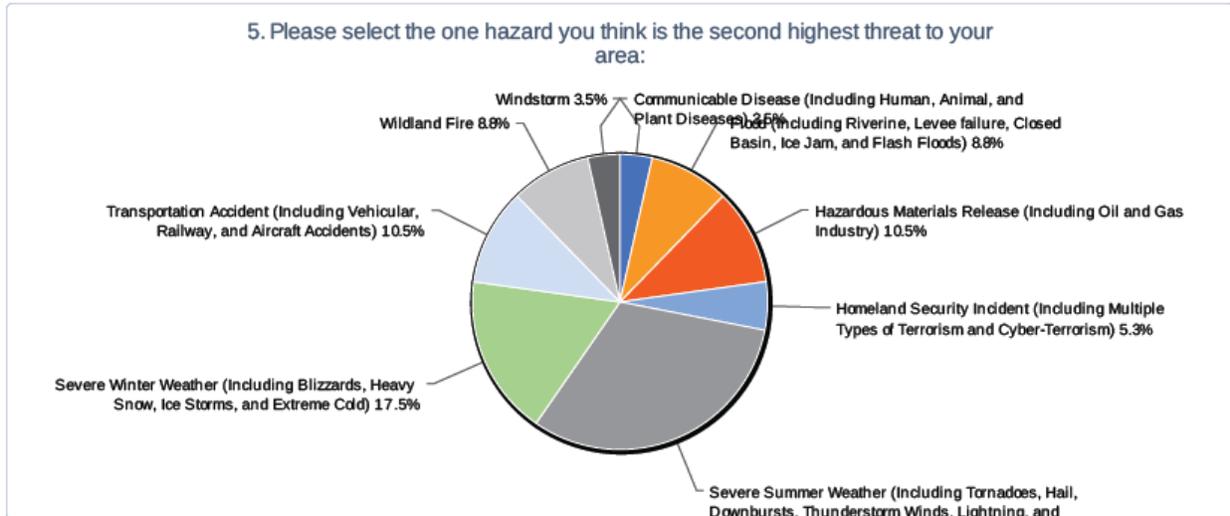
| Statistics      |    |
|-----------------|----|
| Total Responses | 57 |



4. Please select the one hazard you think is the highest threat to your area:

| Value  | Count | Percent % |
|--|-------|-----------|
| Communicable Disease (Including Human, Animal, and Plant Diseases)   | 0     | 0.0%      |
| Dam Failure  | 0     | 0.0%      |
| Drought  | 1     | 1.8%      |
| Flood (Including Riverine, Levee failure, Closed Basin, Ice Jam, and Flash Floods)                             | 11    | 19.3%     |
| Geologic Hazards (Including Landslide, Earthquake, and other Geologic/Mining Hazards)                          | 0     | 0.0%      |
| Hazardous Materials Release (Including Oil and Gas Industry)   | 6     | 10.5%     |
| Homeland Security Incident (Including Multiple Types of Terrorism and Cyber-Terrorism)                         | 3     | 5.3%      |
| Severe Summer Weather (Including Tornadoes, Hail, Downbursts, Thunderstorm Winds, Lightning, and Extreme Heat) | 21    | 36.8%     |
| Severe Winter Weather (Including Blizzards, Heavy Snow, Ice Storms, and Extreme Cold)                          | 10    | 17.5%     |
| Shortage or Outage of Critical Materials or Infrastructure   | 2     | 3.5%      |
| Transportation Accident (Including Vehicular, Railway, and Aircraft Accidents)                                 | 2     | 3.5%      |
| Urban Fire or Structure Collapse   | 0     | 0.0%      |
| Wildland Fire  | 1     | 1.8%      |
| Windstorm  | 0     | 0.0%      |

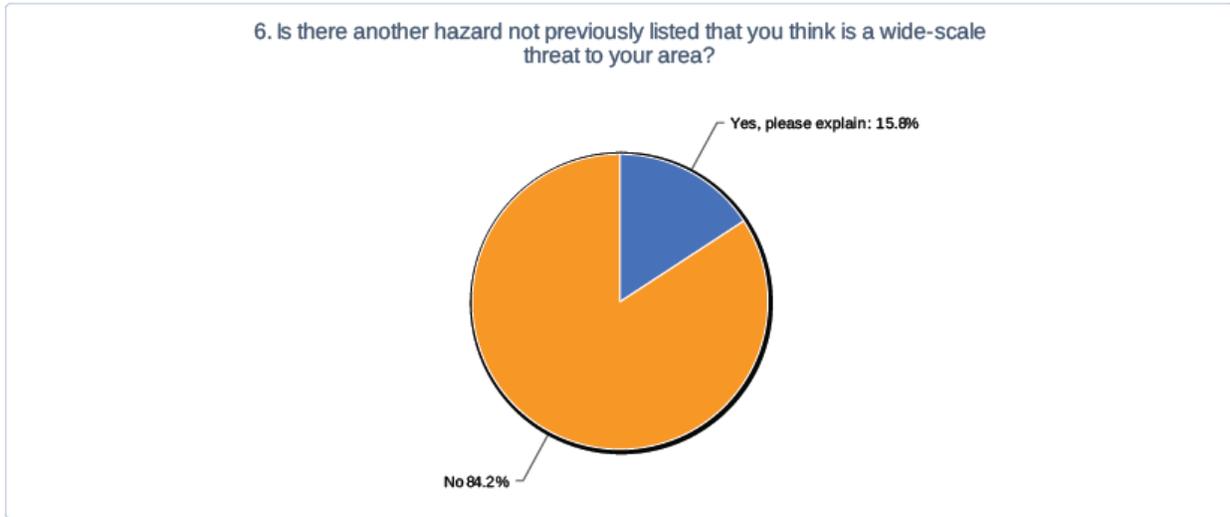
| Statistics      |    |
|-----------------|----|
| Total Responses | 57 |



5. Please select the one hazard you think is the second highest threat to your area:

| Value  | Count | Percent % |
|--|-------|-----------|
| Communicable Disease (Including Human, Animal, and Plant Diseases)   | 2     | 3.5%      |
| Dam Failure  | 0     | 0.0%      |
| Drought  | 0     | 0.0%      |
| Flood (Including Riverine, Levee failure, Closed Basin, Ice Jam, and Flash Floods)                             | 5     | 8.8%      |
| Geologic Hazards (Including Landslide, Earthquake, and other Geologic/Mining Hazards)                          | 0     | 0.0%      |
| Hazardous Materials Release (Including Oil and Gas Industry)   | 6     | 10.5%     |
| Homeland Security Incident (Including Multiple Types of Terrorism and Cyber-Terrorism)                         | 3     | 5.3%      |
| Severe Summer Weather (Including Tornadoes, Hail, Downbursts, Thunderstorm Winds, Lightning, and Extreme Heat) | 18    | 31.6%     |
| Severe Winter Weather (Including Blizzards, Heavy Snow, Ice Storms, and Extreme Cold)                          | 10    | 17.5%     |
| Shortage or Outage of Critical Materials or Infrastructure   | 0     | 0.0%      |
| Transportation Accident (Including Vehicular, Railway, and Aircraft Accidents)                                 | 6     | 10.5%     |
| Urban Fire or Structure Collapse   | 0     | 0.0%      |
| Wildland Fire  | 5     | 8.8%      |
| Windstorm  | 2     | 3.5%      |

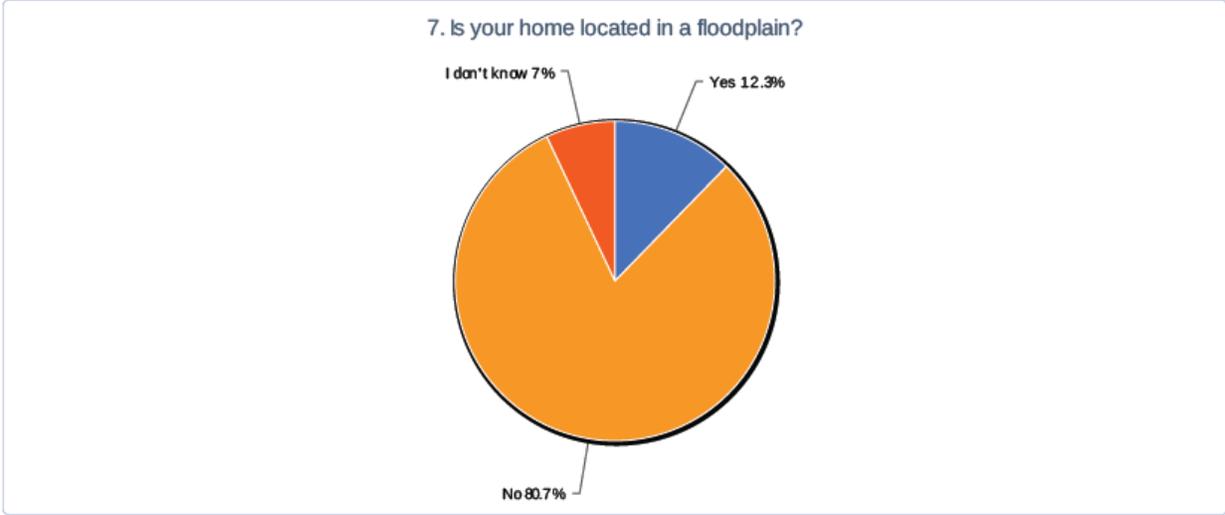
| Statistics      |    |
|-----------------|----|
| Total Responses | 57 |



**6. Is there another hazard not previously listed that you think is a wide-scale threat to your area?**

| Value                | Count | Percent % | Statistics      |    |
|----------------------|-------|-----------|-----------------|----|
| Yes, please explain: | 9     | 15.8%     | Total Responses | 57 |
| No                   | 48    | 84.2%     |                 |    |

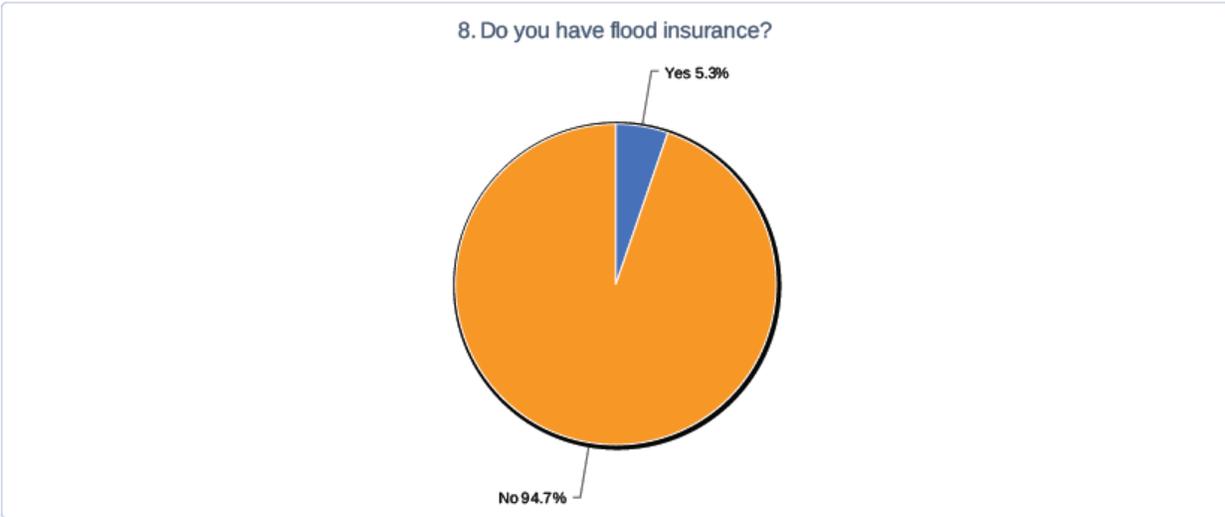
| Open-Text Response Breakdown for "Yes, please explain: "            |  | Count |
|---|--|-------|
| Flooding due to an ice jam  |  | 1     |
| Gangs, crime, drugs = homeland security issues not just "terrorism" |  | 1     |
| Gas Pipeline Rupture  |  | 1     |
| Terrorist or Solar generated Electro-Magnetic Pulse                 |  | 1     |
| active shooter  |  | 1     |
| crime   |  | 1     |
| power outage  |  | 1     |
| severe summer weather   |  | 1     |
| traffic Increased   |  | 1     |



**7. Is your home located in a floodplain?**

| Value        | Count | Percent % |
|--------------|-------|-----------|
| Yes          | 7     | 12.3%     |
| No           | 46    | 80.7%     |
| I don't know | 4     | 7.0%      |

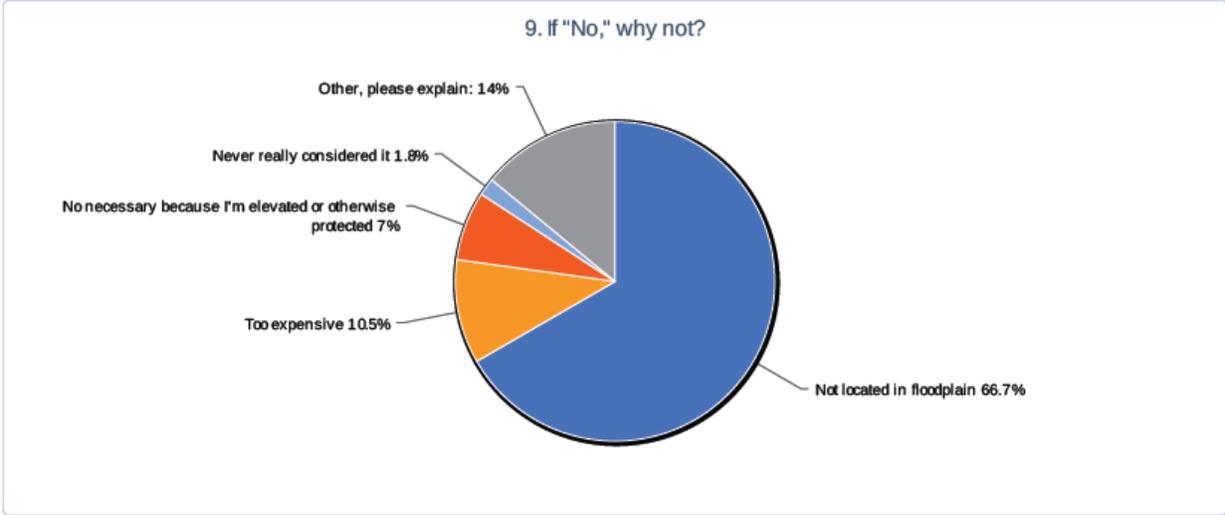
| Statistics      |    |
|-----------------|----|
| Total Responses | 57 |



**8. Do you have flood insurance?**

| Value        | Count | Percent % |
|--------------|-------|-----------|
| Yes          | 3     | 5.3%      |
| No           | 54    | 94.7%     |
| I don't know | 0     | 0.0%      |

| Statistics      |    |
|-----------------|----|
| Total Responses | 57 |



**9. If "No," why not?**

| Value  | Count | Percent % |
|--|-------|-----------|
| Not located in floodplain                                | 38    | 66.7%     |
| Too expensive  | 6     | 10.5%     |
| Not necessary because it never floods                    | 0     | 0.0%      |
| No necessary because I'm elevated or otherwise protected | 4     | 7.0%      |
| Never really considered it                               | 1     | 1.8%      |
| Other, please explain:                                   | 8     | 14.0%     |

| Statistics      |    |
|-----------------|----|
| Total Responses | 57 |

| Open-Text Response Breakdown for "Other, please explain:"   | Count |
|---|-------|
| I bought an unwettable home because I'm a hydrologist.  | 1     |
| I have flood insurance see above.   | 1     |
| I have flood insurance. This question should not have been a required field.  | 1     |
| We have flood insurance   | 1     |
| have been putting off getting it  | 1     |
| haven't received information about it   | 1     |
| FEMA didn't pay any more to those with insurance than those without. It doesn't cover basements.  | 1     |
| it is very expensive and it doesnt cover the damage we sustained in flood. we received 1,000 from Fema and spent \$50,000 out of pocket. We paid our mortgage and do not owe a penny to the bank so abandoned our flood insurance the bank made us have for the loan. | 1     |



|   |  |
|---|--|
| 1 | regarding floods, when trying to prepare in 2011, there were not many good resources to assess the chances of water reaching us. We are not considered in a flood zone even though we are a couple feet lower than many properties on the banks of the river. Water did find us eventually, but we had no idea where it would come from. A map of elevations was eventually made available but it would have been good to have one that was specifically designed to show flood potential, and have it much earlier. |
| 1 | One of my biggest current concerns is the ability of local communities to recover from a disaster if any infrastructure is damaged. It is difficult enough to find affordable housing with the building boom in the region, and a disaster would only exacerbate that problem. I think being prepared for a potential influx of out of town contractors is a potential big concern.  |
| 1 | More restrictive zoning. We allow people to build in areas knowing that a disaster, such as a flood, is only a matter of time.   |
| 1 | Stop supporting bismarck's expansion into the flood plains for one. Place stricter regulations on railway companies' use of older rail cars, the condition of the oil cars and the number of oil cars transported on any one load.   |
| 1 | Support state and federal efforts to create pipeline infrastructure for transporting energy (oil, natural, gas) and mitigate truck and rail usage  |
| 1 | Reroute semi truck that carry oil or gas from I-94 to other highway with less population. And improve emergency services to all especially deaf commuinity.  |
| 1 | expand roads...I.e.66th st...other the Washington there are no other roads that so straight N and S...E and W at least there is the interstate. Also the brainless group who aloud people to build in the middle of the river. I mean really come on. Truly no common sense.   |
| 1 | More combined agency drills including NDDDES, Sheriff, Police, State Radio, Bismarck Central Dispatch, Department of Health, Sanford, St Alexius, Hazmat crews   |
| 1 | Consolidate the Bismarck and Burleigh County Emergency Management offices into one organization under the county as it once was. This would ensure better coordination between the city and county during widespread emergencies, and better synchronize all other efforts on a day to day basis   |

**11. A number of community-wide activities can reduce our risk from hazards. In general, these activities fall into one of the following six broad categories. Please tell us how important you think each one is for your community to consider pursuing.**

|   | Very Important | Somewhat Important | Not Important | Responses |
|---|----------------|--------------------|---------------|-----------|
| <b>Prevention: Administrative or regulatory actions that influence the way land is developed and buildings are built. Examples include planning and zoning, building codes, open space preservation, and floodplain regulations.</b>  | 66.7%<br>38    | 28.1%<br>16        | 5.3%<br>3     | 57        |
| <b>Property Protection: Actions that involve the modification of existing buildings to protect them from a hazard or removal from the hazard area. Examples include acquisition, relocation, elevation, structural retrofits, and storm shutters.</b>                           | 40.4%<br>23    | 52.6%<br>30        | 7.0%<br>4     | 57        |
| <b>Natural Resource Protection: Actions that, in addition to minimizing hazard loss, also preserve or restore the functions of natural systems. Examples include floodplain protection, habitat preservation, slope stabilization, riparian buffers, and forest management.</b> | 49.1%<br>28    | 43.9%<br>25        | 7.0%<br>4     | 57        |
| <b>Structural Projects: Actions intended to lessen the impact of a hazard by modifying the natural progression of the hazard. Examples include dams, levees, detention/retention basins, channel modification, retaining walls, and storm sewers.</b>                           | 59.6%<br>34    | 38.6%<br>22        | 1.8%<br>1     | 57        |
| <b>Emergency Services: Actions that protect people and property during and immediately after a hazard event. Examples include warning systems, evacuation planning, emergency response training, and protection of critical emergency facilities or systems.</b>                | 87.7%<br>50    | 12.3%<br>7         | 0.0%<br>0     | 57        |
| <b>Public Education and Awareness: Actions to inform citizens about hazards and the techniques they can use to protect themselves and their property. Examples include outreach projects, school education programs, campaigns, and social media.</b>                           | 64.9%<br>37    | 31.6%<br>18        | 3.5%<br>2     | 57        |



## *Burleigh County*

Emergency Management  
2301 University Dr, Bldg 21  
Bismarck ND 58504  
(701) 222-6727

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### **NEWS RELEASE FOR IMMEDIATE RELEASE**

Contact: Mary Senger, Burleigh County Emergency Manager  
701-222-6727

February 3, 2014

#### **Burleigh County Seeks Community Input on Mitigation Plan Update**

Bismarck, ND—Burleigh County wants your input on how to make our community safer!

An inter-agency team has initiated a major effort to revamp the current Burleigh County Multi-Hazard Mitigation Plan by re-examining the hazards facing our communities and strategies to mitigate (reduce or eliminate) their impact.

Community input will be essential throughout the planning process. Citizens are asked to complete a brief questionnaire by February 28<sup>th</sup> and review the current plan. Both items are located on the Burleigh County Website: [www.burleighco.com](http://www.burleighco.com) under the Emergency Management Department's mitigation section. If you have a mitigation idea that could reduce the impact of future emergencies or disasters in Burleigh County, please visit the website or contact Burleigh County Emergency Management directly through Mary Senger, 701-222-6727. A draft plan of the updates will be posted as the process ensues.

The current plan has been approved by the Federal Emergency Management Agency through March, 2015 and requires a mandatory update every five years. Participating jurisdictions are eligible for all Hazard Mitigation Assistance grant programs.

Mitigation is the effort to reduce loss of life and property by lessening the impact of disasters. Mitigation's value to society includes:

- Creating safer communities by reducing losses of life and property.
- Enabling individuals and communities to recover more rapidly from disasters.
- Lessening the financial impact of disasters on individuals and communities.

Disaster aid to North Dakota for spring 2011 flooding was more than \$400 million (Source: FEMA). As a result, Burleigh County has been working on several mitigation projects to include a new pumping station as well as grade raises and control structures.

###

 **Burleigh County Emergency Management** shared a link.  
February 3

Burleigh County wants your input on how to make our community safer! An inter-agency team has initiated a major effort to revamp the current Burleigh County Multi-Hazard Mitigation Plan by re-examining the hazards facing our communities an... See More



**Public Participation Survey for the Burleigh County Multi-Hazard Mitigation Plan Update**  
[www.surveygizmo.com](http://www.surveygizmo.com)

Public Participation Survey for the Burleigh County Multi-Hazard Mitigation Plan Update . Created using SurveyGizmo, online survey software.

Like - Comment - Share 👍 8 💬 1 ➦ 1 Share

 Todd Schulz, Raymond Morrell, Sean Johnson and 5 others like this.

 Write a comment... 

 **Karen Wolfer** make sure there are NO MORE FLOODS!  
Like · Reply · February 8 at 5:55pm

Write a comment...

2,326 people reached 

FIND IT FAST



# Burleigh County

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## DEPARTMENTS



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**Mitigation**

**Burleigh County wants your input on how to make our community safer!**

An inter-agency team has initiated a major effort to revamp the current Burleigh County Multi-Hazard Mitigation Plan by re-examining the hazards facing our communities and strategies to mitigate (reduce or eliminate) their impact.

Community input will be essential throughout the planning process. Citizens are asked to complete a brief questionnaire and review the current plan. A draft plan of the updates will be posted as the process ensues.

Complete the [survey](#) (less than 5 minutes) by February 28, 2014.

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**Bismarck and Burleigh County Emergency Managers Host Community Mitigation Planning Public Input Meeting Feb. 24**

BISMARCK, N.D. - Bismarck and Burleigh County Emergency Managers are seeking your input on how we can make our community safer from potential hazards. You're invited to participate and share your ideas about the development of the Bismarck and Burleigh County Mitigation Plans. A public input meeting is scheduled for February 24, 5:30 p.m., at the Bismarck Veterans Memorial Public Library, Room B, 515 N. Fifth St., Bismarck.

As a participant of the meeting you will have the opportunity to express your ideas and identify potential community-wide hazards, related vulnerabilities and mitigation approaches that would minimize risk and impact to the community. Information shared in these conversations will be gathered to identify key themes, and allow subsequent planning and action in the development of a community specific mitigation plan.

No training or previous experience with mitigation planning is necessary. For residents interested in learning more about mitigation planning on a personal or business level, visit the independent study course titled, "[Protecting Your Home or Small Business From Disaster](#)"



APPENDIX D: CITY OF BISMARCK PUBLIC SURVEY

The screenshot shows the City of Bismarck website interface. At the top, there is a navigation bar with links for Departments, City Commission, Community Links, Residents, Business, Visitors, and I Want to... The date is Thursday, March 27, 2014. The main banner features the Bismarck logo and the text "Capital City of North Dakota" over a collage of images including a golfer, a tractor, a woman with a child and dog, and a museum display.

The page content includes:

- Home > Forms
- Bismarck Mitigation Planning - Public Input Survey**
- Introduction: Bismarck is seeking your input on how we can make our community safer from all potential hazards. Bismarck is developing a community specific mitigation plan to ensure we identify risks and vulnerabilities that may be addressed through mitigation efforts.
- Purpose: Your input helps ensure hazards along with associated risks and vulnerabilities are identified as well as suggested mitigation (preventative) actions.
- Flexibility: You may complete this survey multiple times as you wish, focusing on a separate hazard each time.
- Mitigation Definition:** Sustained action taken to reduce or eliminate long-term risk before an incident occurs.
- Mitigation Planning Purpose Statement:** To protect life, property, environment, economy, and quality of life within the City of Bismarck from hazard/disasters through mitigation planning efforts to include identification of applicable mitigation strategies to eliminate or minimize risk and/or impact.
- To take survey, simply click within the text boxes and type your responses.**
- Survey time will vary depending on your level of response to questions 1 through 3. It should take less than one minute to complete questions 4 through 10.**
- Hazard Identification:**
  1. Identify **one** significant hazard of highest concern to you which has potential for significant impact to our community. The hazard may be a natural hazard, human-caused, or technological hazard. A sample list is included at the end of this survey for your reference. **You may repeat this survey to identify additional hazards as desired.**
- Identification of Related Risk and Vulnerability:**
  2. Based on the one hazard you identified in question #1, **describe the risk and the primary vulnerability(s) in your opinion.** "Risk" is the potential for damage or loss (frequency and likelihood of occurrence). "Vulnerability" may be described as community assets (people, places, things) which are susceptible to damage or injury from the hazard.
- 3. Based on the vulnerability(s) you described in #2, **what mitigation**

The page also features a sidebar with various services like Agendas & Minutes, Capital Area Transit (CAT), and a utility menu with icons for Bids & RFPs, Report a Concern, Jobs, How Are We Doing?, Online Services, and Maps.

(preventative) **measures** would you recommend be considered? Mitigation measures are those actions taken before an incident that eliminate or minimize risk, impact or vulnerability.

**General Guidance Regarding Question #3:** Mitigation measures are investments in the community's future safety and sustainability. Mitigation helps to prevent injury and loss of life, prevent damage to community assets, and reduce risk. Types of mitigation actions typically fall into these categories: Local Plans and Regulations (ex: ordinances, building codes, zoning, etc.), Structural Projects (ex: Modifying existing structures and infrastructure to protect or remove from a hazard area), Natural System Protection (ex: erosion control or wetlands restoration) and Education and Awareness Programs.

4. I live in Bismarck.  Yes  No

4a. I live in Burleigh County?  Yes  No

5. I work in Bismarck.  Yes  No

6. I live in Morton County.  Yes  No

7. Name (Optional)

8. Phone (optional)

9. Email (Optional)

10. General Comments (Optional)

Specific hazards to be addressed through mitigation planning efforts in 2014 and beyond are not limited to those listed below. However, this list provides for examples of wide-area hazards potentially affecting all or much of the community. You may use this list to assist you with ideas if you wish to complete the survey again. When identifying hazards, you are not limited to the list below.

|                                   |  |
|-----------------------------------|--|
| • Biological Infestation          | • Active Shooter   |
| • Communicable Disease            | • Aircraft Accident  |
| • Dam Failure                     | • Hazardous Materials Release  |
| • Drought                         | • Homeland Security Incident (ex: Terrorism)   |
| • Flood                           | • Train Derailment   |
| • Fire                            | • Shortage or Outage of Critical Materials or Infrastructure (ex: extended power outage) |
| • Wildland Fire                   |  |
| • Geologic Hazard (ex: landslide) | • Tornado  |
| • Thunderstorm                    | • Winter Storm   |

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Source: City of Bismarck website

**Bismarck Mitigation Planning - Public Input Survey Feedback  
March 27, 2014**

| Question 1: Hazard Identification   | Question 2: Vulnerability<br>Based on the one hazard you identified in question #1, describe the risk and the primary vulnerability(s) in your opinion. | Question 3: Mitigation Ideas<br>Based on the vulnerability(s) you described in #2, what mitigation (preventative) measures would you recommend be considered?  | Bismarck Resident | Works in Bismarck | General Comments   |
|---|---|--|-------------------|-------------------|--|
| Identify one significant hazard of highest concern to you which has potential for significant impact to our community.  | medium risk people and places vulnerable especially along tributaries (small streams and creeks in NE & NW Bismarck) and Missouri river flood plain.    | more stringent building codes, flood proof basement construction standards, more staff for stormwater enforcement.   | Yes               | Yes               |  |
| Water, development of subdivisions and having builders and landscapers follow what the city has implemented for correct water diversions and erosion control.                     | Risk is the loss of personal property, buildings, building values resale and arguments between neighbors.   | Stay on builders and landscapers to use proper erosion control. Comment after comment I hear is "its cheaper to pay the cities fines that it is to do proper erosion control. Landscapers like builders should be certified some how. I suggest builder and landscapers must apply for building permits (builders do) but at the same time educate them on the correct water flow pattern the city has issued and sign a waiver they will go by these guidelines. I can give you my PERSONAL experience of a bad landscaper and I have three or four others fighting with water in there basements due to the neighbors landscaping or there own.          | Yes               | Yes               | I am not just mad cause I have a water issue I am mad that builders are allowed to build in dumb areas and nothing is being considered (I don't feel). When a large structures come into developments after the fact it changes water flow to homes. KLJ comes to mind and I have evidence of the changes it has done on our street after it was built and asphalt laid down. #1 |
| Flood and building in areas that are above base flood elevation but without common knowledge of water flow or possible changes.   | Risk, loss of life, buildings, values, resale, and homes going back to a bank. Losing community flood insurance by being put on probation by FEMA.      | Knowledge to builders, engineers, the city officials on how flood is not just the river, it is heavy rain, rapid ice and snow melt. I know of several homes built after 1985 that where not built to FEMA guidelines and or county guidelines. One of which an engineer told the owner/builder as long as the main floor is two feet above BFE we are ok. This Senior engineer and I fought back and forth and then I showed him FEMA guidelines and city/county guidelines and what is considered a basement buy FEMA. A crawlspace in ND is a basement unless it is above ground and more people need to know this. I could go on forever on this topic. | Yes               | Yes               | I am not just mad cause I have a water issue I am mad that builders are allowed to build in dumb areas and nothing is being considered (I don't feel). When a large structures come into developments after the fact it changes water flow to homes. KLJ comes to mind and I have evidence of the changes it has done on our street after it was built and asphalt laid down. #1 |
| Red Light runners. I have watched countless times someone or people go threw a red light on hwy 83 at every intersection. This is not just on hwy 83 but where I see it the most. | peoples lives.  | We need more man power to help in N Bismarck and it is nothing for someone to run a red light cause they want to, or they are simply not paying attention to the road rather there cell phone. ( I am guilty of liking my cell too) I think we all know we need better and more man power in this community. Growing pains or not we need to make it happen.   | Yes               | Yes               | I watched three people go threw a red light on frontier and 3rd with a cop sitting right at the light first in line. He/she not sure was to busy on there laptop or didn't care.   |

All responses received March 2014.

Source: Bismarck Emergency Management



## NEWS RELEASE

**For Immediate Release:**

March 6, 2014

**For More Information Media Contact:**

Gary Stockert  
Bismarck Emergency Manager  
Phone: (701) 222-6727

### **Bismarck Seeks Citizen Input on Development of Mitigation Plan**

BISMARCK, N.D. – The City of Bismarck is seeking citizen input on how we can make our community safer from potential hazards. Bismarck residents are invited to share their ideas regarding the development of the Bismarck Community Specific Mitigation Plan by completing an on-line survey through March 17, at: <http://bismarck.org/forms.aspx?FID=262>.

As a survey participant, citizens have the opportunity to express their ideas and identify potential community-wide hazards, related vulnerabilities and mitigation approaches that would minimize risk and impact to the community. Information shared in the survey will be gathered to identify key themes, and allow subsequent planning and action in the development of a community specific mitigation plan. Survey input will be shared with hazard specific planning teams.

For more information visit [www.bismarck.org/emergencymanagement](http://www.bismarck.org/emergencymanagement)

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