McLean County, North Dakota

MULTI-HAZARD MITIGATION PLAN

November 2022 Update

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McLean County
NORTH DAKOTA

Table of Contents

1 Introduction

Section 1 provides a general introduction to hazard mitigation and an introduction to the McLean County Multi-Hazard Mitigation Plan. This section is divided into four sub-sections:

- 1.1 Hazard Mitigation Planning
- 1.2 Purpose and Authority
- 1.3 Scope
- 1.4 Planning Process
- 1.5 What's Changed in the Plan
- 1.6 Plan Organization

1.1 HAZARD MITIGATION PLANNING

Natural and technological/human-caused hazards have a direct impact on residents and property in McLean County. While it is impossible to eliminate most hazards, it is possible to mitigate their negative effects. Hazard mitigation is defined as any sustained action taken to reduce or eliminate long-term risk to human life and property from hazards. Successful mitigation actions must be practical, cost-effective, politically acceptable and supportedby a sound planning process.

1.2 PURPOSE AND AUTHORITY

The purpose of the McLean County Multi-Hazard Mitigation Plan is to promote sound public policy designed to protect citizens, critical facilities, infrastructure, private property, and the environment from natural and technological/ human-caused hazards. The Federal Emergency Management Agency (FEMA) identifies the primary benefits of hazard mitigation planning as:

- Identifying actions for risk reduction that are agreed upon by stakeholders and the public.
- Focusing resources on the greatest risks and vulnerabilities.
- Building partnerships by involving citizens, organizations, andbusinesses.
- Increasing education and awareness of threats and hazards, as wellas their risks.
- Communication priorities to state and federal officials.
- Aligning risk reduction with other community objectives.

The Robert T. Stafford Disaster Relief and Emergency Assistance Act (Public Law 93-288), as amended by the Disaster Mitigation Act of 2000, provides legal basis for state, local and Tribal governments to reduce risks from natural hazards through mitigation planning. All state, local and tribal governments are required to have an approved hazard mitigation plan to receive funding for certain types of non-emergency disaster assistance, including mitigation actions. The McLean County Multi-Hazard Mitigation Plan is an update of McLean County's 2016 Multi-Hazard Mitigation Plan (2016 Plan). FEMA requires hazard mitigation plans to be updated every five years to maintain a jurisdiction's eligibility for grant funding.

1.3 SCOPE

The McLean County Multi-Hazard Mitigation Plan includes a risk and vulnerability assessment that residents,

organizations, local governments, and other interested participants can utilize when planning for hazards. The McLean County Multi-Hazard Mitigation Plan also includes an evaluation of mitigation actions that will assist each adopting jurisdiction in reducing risk and preventing loss from future hazard events. Additionally, all participating jurisdictions are eligible to apply for funds through FEMA's Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM) program and Flood Mitigation Assistance (FMA) program to help fund the implementation of mitigation actions.

Jurisdictions that participated in this planning process are adopting the McLean County Multi-Hazard Mitigation Plan by the official method of approval based on legal authority. To be eligible for future funds through the Hazard Mitigation Grant Program, Pre-Disaster Mitigation program and Flood Mitigation Assistance program, jurisdictions must either adopt a hazard mitigation plan and participate in the planning process or be sponsored by a jurisdiction that has done so.

1.4 PLANNING PROCESS

FEMA identifies four essential steps to the hazard mitigation planning process:

- **Resource organization**: Involving interested community members,and reaching out to critical stakeholders and those with technical expertise required during the planning process.
- **Risk assessment**: Identifying hazard characteristics and potentialconsequences, including effects on critical facilities.
- **Develop mitigation actions**: Determining priorities and alternative ways to minimize the effects of identified hazards.
- **Plan implementation and progress monitoring**: Implementing the McLean County Multi-Hazard Mitigation Plan brings it to life and monitoring ensures the plan remains relevant as conditions change.

The success of the plan and implementation of mitigation actions is dependent on public participation during all four steps of the planning process. Public involvement for the plan included planning team meetings, public meetings, commission and city council meetings and a community survey. Local planning documents were also reviewed and incorporated into the document when applicable.

Detailed information about the planning process can be found in Appendix A.

1.5 WHAT'S CHANGED IN THE PLAN

Developing the McLean County Multi-Hazard Mitigation Plan involved a comprehensive review and update of each section of the 2016 Plan. The following were addressed during the update:

- Participating Jurisdictions
  The 2016 Plan included 12 participating jurisdictions. The City of Mercer did not participate but are participants in the update.
- Hazard Addressed
  All of the 2016 Plan hazards were carried forward. One technological/human-caused hazard has been added: Major Transportation (roadway and railway)Incident. Finally, Space Weather is addressed in the update, although in a cursory manner.

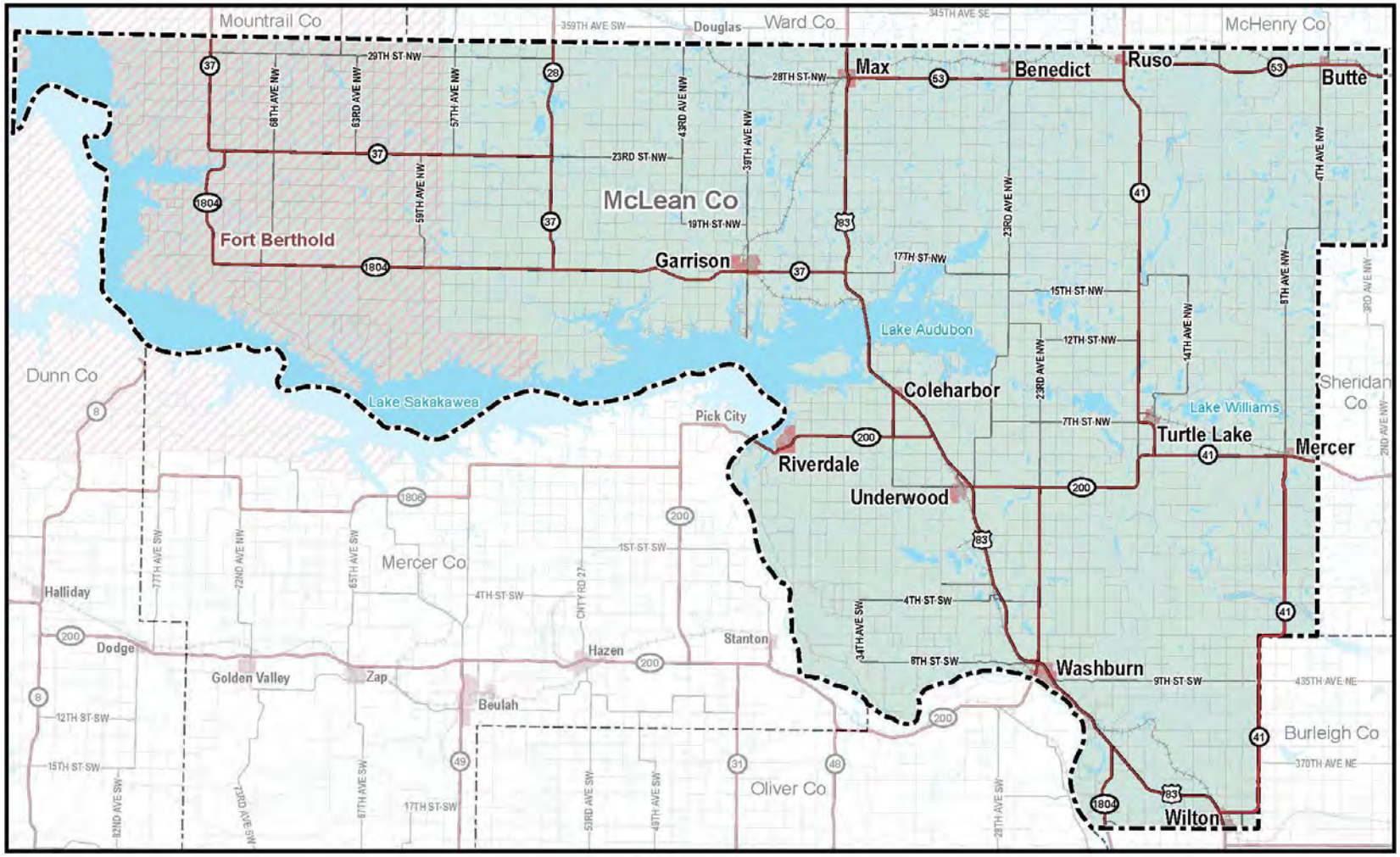
- Organization of the Plan
  For four hazards, the sections include an overview of the hazard followed by discussion of each sub-hazard. For example, Section 4.6, Extreme Summer Weather includes an Overview and sub-sections on Heat Wave, Hail, Thunderstorm and Lightning, Strong Winds, and Tornado.
- Changes in local vulnerability and capabilities are reflected
- Risk assessment has expanded from consideration of analysis of the probability and magnitude of each event to determine overall hazard risk to utilizing Priority Risk Index (PRI) calculations. (Chapter 6).
- Updated data[1] including 2020 U.S. Census when available, has been incorporated.
- Current FEMA requirements are reflected in the update.
- Terminology Updates
- The Communicable Disease section is now the Public Health Incident with a Human and an Agricultural sub-section.
- Homeland Security Incident is now called Security Incident with two subsections, Active Attack and Cyber Threat.

1.6 PLAN ORGANIZATION

The McLean County Multi-Hazard Mitigation Plan is organized into nine chapters and seven appendices:

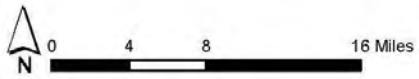
- Chapter 1: Introduction
- Chapter 2: Community Profiles
- Chapter 3: Hazard Identification and Screening
- Chapter 4: Natural Hazards
- Chapter 5: Technological/Human-Caused Hazards
- Chapter 6: Risk Assessment
- Chapter 7: Capability Assessment
- Chapter 8: Goals and Mitigation Actions
- Chapter 9: Plan Maintenance
- Appendix A to Appendix K

[1] Data limitations are a challenge. Information on many hazards depend on reporting but there are few "weather spotters" or others reporting. US Census is over 10 years old, and 2020 Census data releases are on-going. Few current population details and fewer population projections are available.



McLean County

Source: NDGISHUB



- McLean County
- Other County Boundary
- Cities
- Fort Berthold Reservation
- Highways
- Railroads
- Open Water

Figure 2.1-1

McLean County
NORTH DAKOTA

2 Community Profiles

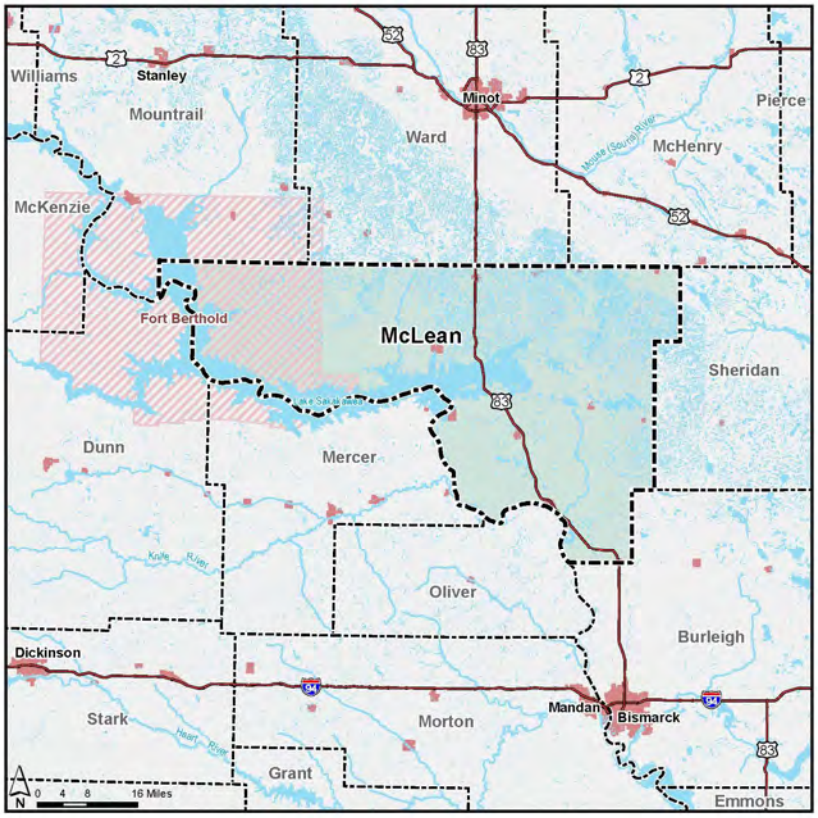


Figure 2.1-2 Location and Surrounding Counties

2.1 GEOGRAPHY

McLean County, located in central North Dakota, is surrounded by Burleigh, Dunn, Mercer, McHenry, Mountrail, Oliver, Sheridan, and Ward Counties, and includes part of the Fort Berthold Indian Reservation. Lake Sakakawea, a reservoir on the Missouri River, forms part of the county's border. A general map of the county, including major features and neighboring jurisdictions, is presented as Figure 2.1-1 and 2.1-2. Major roadways include U.S. Highway 83, and numerous state highways. The county is also served by three railroad lines.

2.2 JURISDICTIONAL INFORMATION

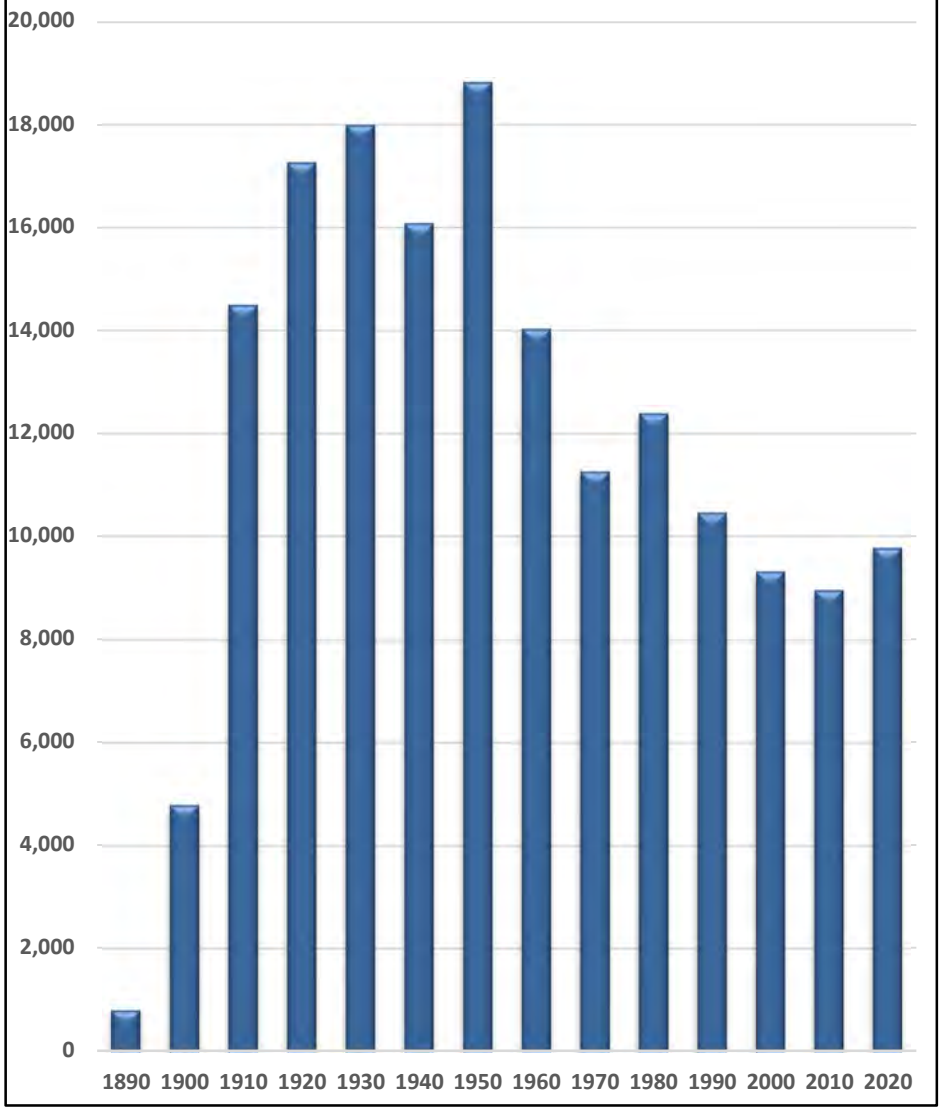
McLean County includes 12 incorporated cities: Benedict, Butte, Coleharbor, Garrison, Max, Mercer, Riverdale, Ruso, Turtle Lake, Underwood, Washburn, and Wilton (partially located in Burleigh County). Washburn is the county seat and among the cities Garrison has the largest population. The countyalso has several unincorporated communities.

The Fort Berthold Indian Reservation, located in western McLean county north of Lake Sakakawea, is home for the Mandan, Hidatsa, and Arikara (MHA) Nation, also known as the Three Affiliated Tribes. The Reservation consists of 988,000 total acres, with approximately 300,000 acres in McLean County. The Fort Berthold Indian Reservation is not a participating jurisdiction; the reservation's plan was adopted In December 2019.

2.3 POPULATION AND DEMOGRAPHICS

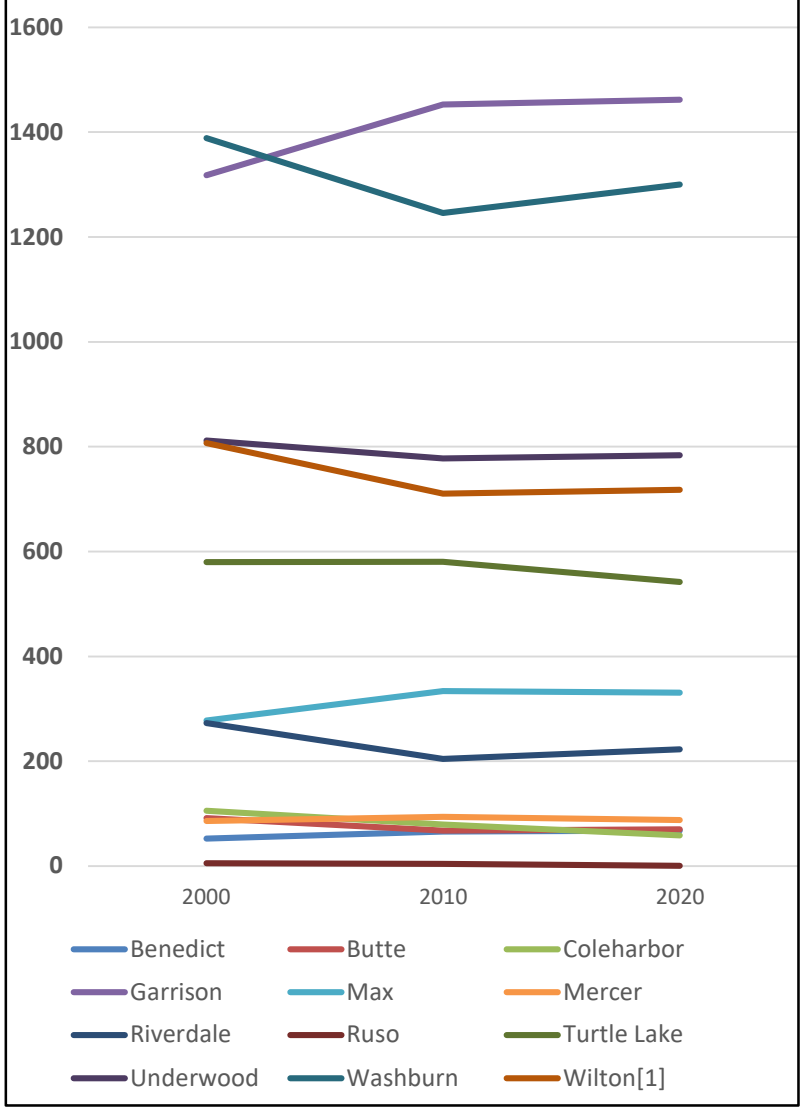
Population trends for the county are shown in Figure 2.3-1. The county experienced declining population from 1950 to 2010. The trend has recently reversed, with the county experiencing a 6.2% population increase since 2010. Summarized demographic information for McLean County and North Dakota is shown in Table 2.3-1. The county is significantly different from the overall state in a few

Figure 2.3-1
COUNTY POPULATION
1980 - 2020



Source U.S. Census

Figure 2.3-2
CITY POPULATION
2000 - 2020



Source U.S. Census

important areas. The county's population density of 4.2 persons per square mile is approximately half the statewide rate and the county has about 8.5% more persons aged 65 and over than the statewide percentages.

Table 2.3-1
COUNTY DEMOGRAPHICS

	McLean County	North Dakota
Population	9,771	779,094
Persons under 5 years	6.2%	7.1%
Persons under 18 years	22.0%	23.6%
Persons 65 years and over	24.2%	15.7%
Persons per square mile	4.2	9.7
White not Hispanic	88.3%	83.7%
Hispanic or Latino	2.6%	4.1%
Native American or Alaska Native	7.6%	5.6%
Black or African American	0.5%	3.4%
Asian	0.3%	1.7%
Two or More Races	2.0%	2.3%
Foreign born	1.2%	4.1%
Language other than English spoken at home	3.4%	6.0%
Median household income	$68,529	$64,894
Persons below poverty level	9.4%	10.6%
Average household size	2.18	2.3

Source 2020 US Census

POPULATION CHANGES

Recent population trends for each city are summarized in Table 2.3-2. Many experienced large population declines from 2000 to 2010. That trend has slowed down for some as shown in Figure 2.3-2 with some cities experiencing gains.

Table 2.3-2
POPULATION CHANGES 2010 - 2019

Geography	2010	2019	2010-2019	
			Change	% Change
Benedict	66	52	-14	-21.2%
Butte	68	95	27	39.7%
Coleharbor	79	72	-7	-8.9%
Garrison	1,453	1,623	170	11.7%
Max	334	316	-18	-5.4%
Mercer	94	68	-26	-27.7%
Riverdale	205	210	5	2.4%
Ruso	4	n/a	n/a	n/a
Turtle Lake	581	562	-19	-3.3%
Underwood	778	803	25	3.2%
Washburn	1,246	1,391	145	11.6%
Wilton	711	808	97	13.6%
McLean County	8,962	9584	622	6.9%
McLean County Population 2020 U.S. Census		9,771	809	9.0%

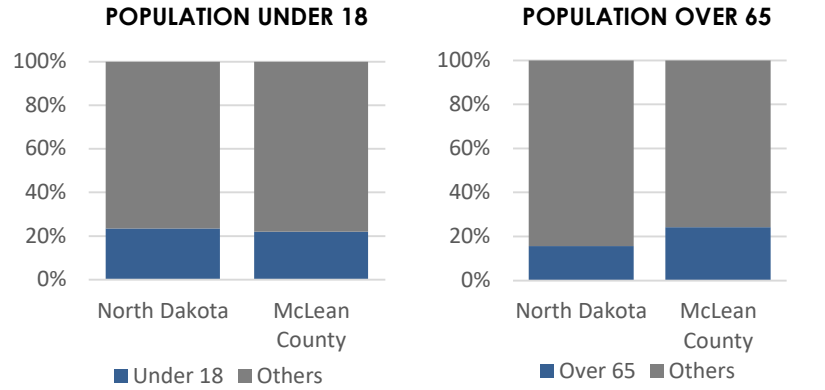
Source 2020 U.S. Census and ACS 2019 estimates

VULNERABLE POPULATION

An important element of any hazard mitigation plan is considering the community's vulnerable population, its children and elderly. Table 2.3-1 indicate that almost half of county residents meet that definition. The county's overall vulnerable population is almost 7% higher than the state's percentage. This is a factor in the county's future growth potential and important to consider in this plan as the very young and the old are generally more vulnerable to the

effects of severe weather events especially if exposure is for a lengthy period.

Figure 2.3-3 Vulnerable Population Countywide



2.4 ECONOMY

Understanding the county and its economy is important in estimating the impact of hazard events. McLean County's 2020 resident population was 9,771. The county's unemployment rate in late 2021was 2.7%, slightly higher than the North Dakota rate. Overall the most common industries in the county, by number of employees, are Agriculture, Forestry, Fishing & Hunting (618 people), Health Care & Social Assistance (603 people), and Educational Services (388 people). See Figure 2.3-4.

The county's largest employers are shown in Table 2.3-4. The top employers in 2020 include mining, health care, school districts, and McLean County.

Figure 2.3-4 Employment by Industries

Table 2.3-4 McLean County's Largest Employers, 2020		
Rank	**Employer**	**Industry**
1	The Falkirk Mining Co.	Mining
2	CHI Garrison Memorial Hospital	Hospital
3	Garrison School District	Educational Services
4	CHI St Alexius Health – Turtle Lake	Hospital
5	McLean County	Local Government
6	Krause's Market	Food and Beverage Store
7	Washburn School District #4	Educational Services
8	US Military in North Dakota	Federal Government
9	Benedictine Living Ctr of Garrisoned Government	Nursing and Residential Care Facilities

Source: NS Labor Market Information, 2020

AGRICULTURE

This industry is a driving force of the McLean County economy. The most recent agricultural Information, the 2017 Census of Agriculture, reveals a trend to larger farms.

Agriculture can be impacted by number of natural disasters including drought, excessive moisture, flood, frost, tornado, snowstorm, or wildfire, etc. All of those natural disasters can be devastating to the farmer and to the county as a whole. Disaster-related payments to McLean County farmers have included premium subsidies and funds to compensate, in part, farmers who experience losses is due to natural disasters.

Table 2.3-5 McLean County Agriculture Summary		
	2017	**% Change Since 2012**
Number of Farms	762	-12
Land in Farms	1,045,419	-6
Average Size of Farms	1,372	+7
Farm by Size	**Number**	**% of Total**
1 to 179 acres	247	33%
180 to 499 acres	140	18%
500 to 999 acres	103	14%
1,000+ acres	272	36%

ENERGY

Energy production is another significant element of the county's economy. Garrison Dam includes a hydro-electric generating plant that has a maximum power generation capability of 583,300 Kw. Coal Creek Station, located near Underwood, uses roughly 22,000 tons of lignite per day, or about 7.5 to 8.0 million tons per year, supplied by the adjoining Falkirk Mine. The Blue Flint Ethanol Facility is also located near Underwood.

2.5 CLIMATE AND WEATHER

Average temperature, precipitation, and snowfall data for McLean County over the last decade are shown in Table 2.4-1. Data from the NWS Cooperative Network Weather Station in Turtle Lake is used for both tables. Figure 2.4-2

shows a wide range in the minimum and maximum temperature for the months of March and November. See also Appendix K.

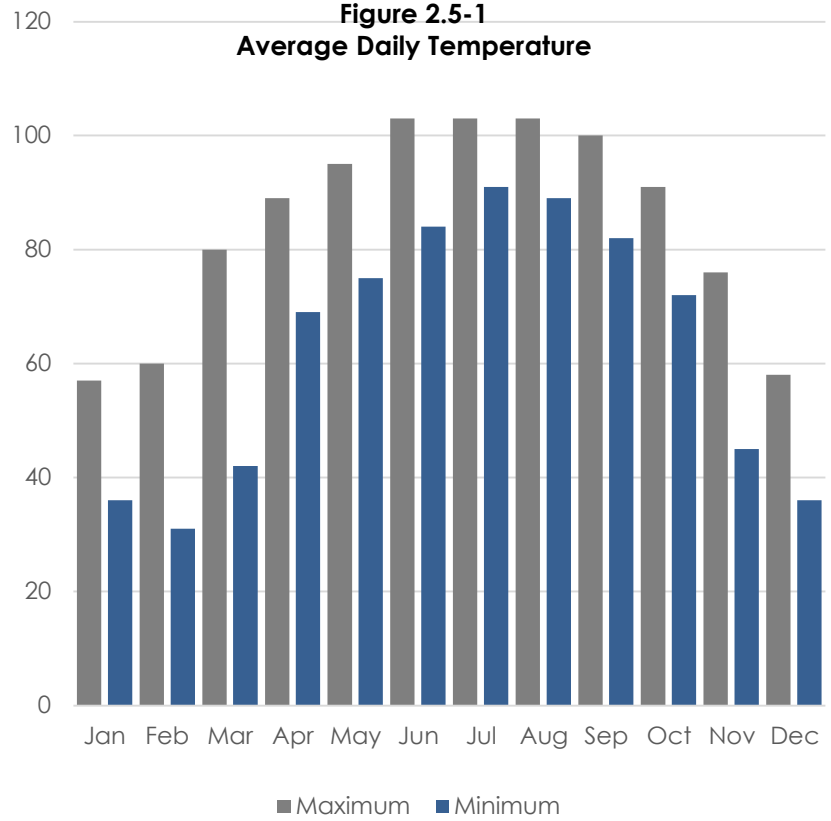
Table 2.5-1
COUNTY WEATHER STATISTICS - 2000-2020

	Temperature		Precipitation	Snowfall
	Avg. Daily (°F)		Avg Monthly (inches)	Avg Monthly (inches)
	Max	Min		
Jan	57	36	.44	7.0
Feb	60	31	.48	5.0
Mar	80	42	.84	5.0
Apr	89	69	1.34	2.9
May	95	75	2.48	1.2
Jun	103	84	3.47	0.0
Jul	103	91	2.76	0.0
Aug	103	89	2.18	0.0
Sep	100	82	1.63	0.0
Oct	91	72	1.42	2.2
Nov	76	45	.580	2.5
Dec	58	36	0.68	8.2
Annual	*103*	92	*18.59*	44.4

Table 2.5-2
COUNTY WEATHER EXTREMES

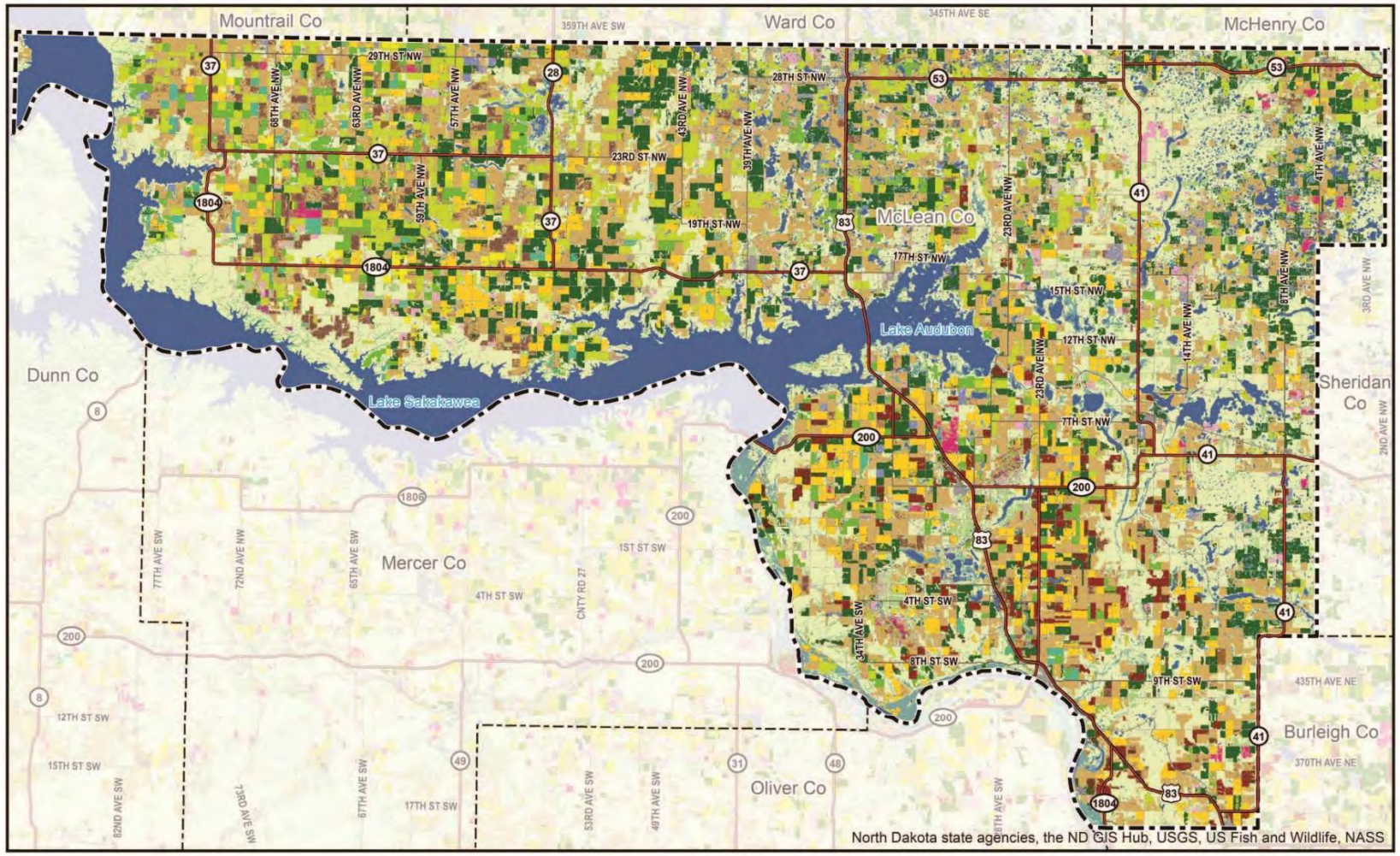
Highest Max Temperature	115° F	7/7/1936
Lowest Min Temperature	45° F	2/16/1936
Highest Daily Precipitation	3.95"	7/30/1956
Greatest Snowfall	17.0"	2/28/1951

Figure 2.5-1
Average Daily Temperature



2.6 EXISTING LAND USE

The following two figures reflect McLean County land uses. Figure 2.5-3 focuses on vegetation. The grassland/pasture areas, shown in light green follow the Missouri River and along the gullies. Cropland is detailed on this map. Developed areas, a small part of the overall county, are shown in gray. Figure 2.5-4, a typical land use map, shows developed areas in shades of red and vegetation (forest, shrub, and agriculture) in shades of green.



2017 NASS Land Use

Source: NDGISHUB, USDA NASS (National Agricultural Statistics Service)

N 0 4 8 16 Miles

Developed	Winter Wheat	Rape Seed	Other Crops	Triticale
Corn	Other Small Grains	Mustard	Onions	Dbl Crop WinWht/Sorghum
Sorghum	Rye	Alfalfa	Lentils	Barren
Soybeans	Oats	Other Hay/Non Alfalfa	Peas	Forest
Sunflower	Millet	Buckwheat	Clover/Wildflowers	Shrubland
Barley	Canola	Sugarbeets	Sod/Grass Seed	Grassland/Pasture
Durum Wheat	Flaxseed	Dry Beans	Fallow/Idle Cropland	Wetlands
Spring Wheat	Safflower	Potatoes	Radishes/Turnips	Open Water

Figure 2.5-2

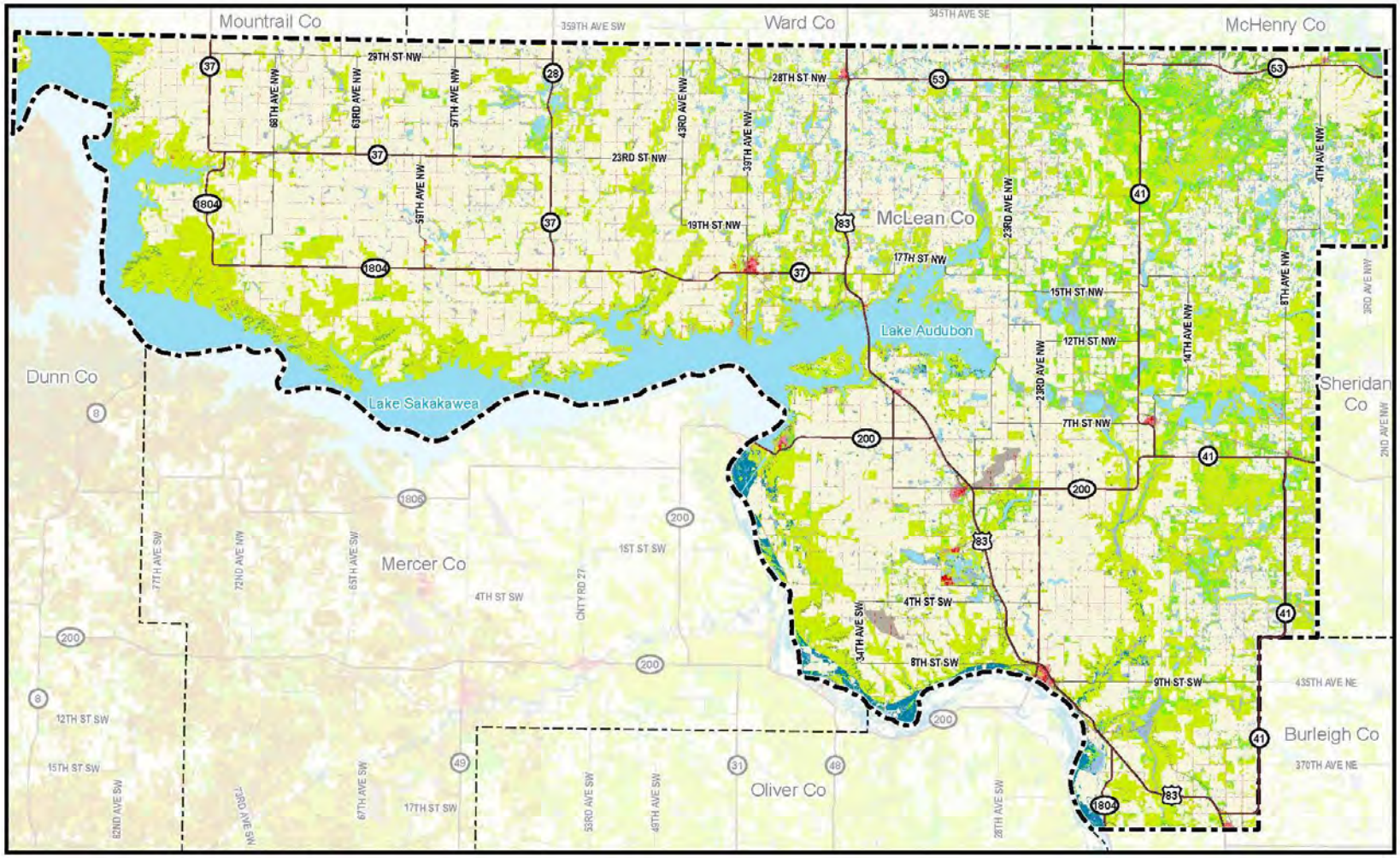

Mountrail Co
Ward Co
McHenry Co
McLean Co
Dunn Co
Sheridan Co
Mercer Co
Oliver Co
Burleigh Co
Lake Audubon
Lake Sakakawea
359TH AVE SW
345TH AVE SE
29TH ST NW
28TH ST NW
23RD ST NW
19TH ST NW
17TH ST NW
15TH ST NW
12TH ST NW
7TH ST NW
4TH ST SW
8TH ST SW
9TH ST SW
1ST ST SW
12TH ST SW
15TH ST SW
17TH ST SW
435TH AVE NE
370TH AVE NE
68TH AVE NW
63RD AVE NW
57TH AVE NW
53RD AVE NW
43RD AVE NW
39TH AVE NW
33RD AVE NW
23RD AVE NW
14TH AVE NW
8TH AVE NW
4TH AVE NW
3RD AVE NW
2ND AVE NW
77TH AVE SW
72ND AVE NW
67TH AVE SW
63RD AVE SW
53RD AVE SW
49TH AVE SW
34TH AVE SW
28TH AVE SW
82ND AVE SW
CNTY RD 27
2019 NLCD Land Use
Source: MRLC (Multi-Resolution Land Characteristics Consortium)
NLCD (National Land Cover Database)
Developed, Open Space
Developed, Low Density
Developed, Medium Density
Developed, High Density
Barren Land (Rock/Sand/Clay)
Deciduous Forest
Evergreen Forest
Mixed Forest
Shrub/Scrub
Grassland/Herbaceous
Pasture/Hay
Cultivated Crops
Woody Wetlands
Emergent Herbaceous Wetlands
Open Water
McLean County Boundar
Other County Boundary
Highways
Railroads
N
0
4
8
16 Miles
McLean County
NORTH DAKOTA

Figure 2.5-3

3 Hazard Identification and Screening

3.1 HAZARDS OVERVIEW

McLean County is subject to numerous natural and technological/human-caused hazards. Many can create significant levels of damage and have a negative impact on the local economy. The FEMA publication "Understanding Your Risks—Identifying Hazards and Estimating Losses" identifies to a four-step process.

3.2 HAZARDS IDENTIFICATION

A preliminary list of hazards to include in the McLean County Multi-Hazard Mitigation Plan was established by first reviewing the 2016 Plan, the14 hazards included in the 2019 State of North Dakota Enhanced Mission Area Operations Plan (NDDES Plan), the hazards included in the hazard mitigation plans of adjacent counties and the Fort Berthold Reservation.

McLean County has been included in the two Presidential Disaster Declarations since the last plan was adopted in 2016, the two statewide declarations related to COVID-19. The county has not been included in any other Presidential Declarations since 2016. Figure 3.2-1 is the state's most recent depiction of these declarations.

The NOAA Storm Event Database data for the cities and the unincorporated areas of the county were reviewed. These records indicate the frequency of winter storms, hail events and high winds.

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Table 3.2-1
Hazards Addressed in the North Dakota, Adjacent Counties, and MHA Nation's Hazard Plans

HAZARD	North Dakota	2016 Plan	Adjacent Counties								MHA
			Burleigh	Dunn	McHenry	Mercer	Mountrail	Oliver	Sheridan	Ward	
Drought	■	■	■	■	■	■	■	■	■	■	■
Flood	■	■	■	■	■	■	■	■	■	■	■
Geologic Hazards	■	■	■		■	■	■	■	■	■	■
Extreme summer weather	■	■	■	■	■	■	■	■	■	■	■
Extreme Winter Weather	■	■	■	■	■	■	■	■	■	■	■
Wildland/Rural Fires	■	■	■	■	■	■	■	■	■	■	■
Extreme Wind	■	■	■	■	■	■	■	■	■	■	■
Public Health Incident	■	■	■	■	■	■	■	■	■	■	■
Dam Failure	■	■	■	■			■			■	
Hazardous Materials (HAZMAT) Incident	■	■	■	■	■	■	■	■	■	■	■
Security Incident	■	■	■	■	■	■	■	■	■	■	■
Shortage of Critical Materials	■			■			■				
Transportation Accidents	■		■	■			■				■
Space Weather	■		■				■				
Urban/Structural Fire	■	■	■	■	■	■	■	■	■	■	■

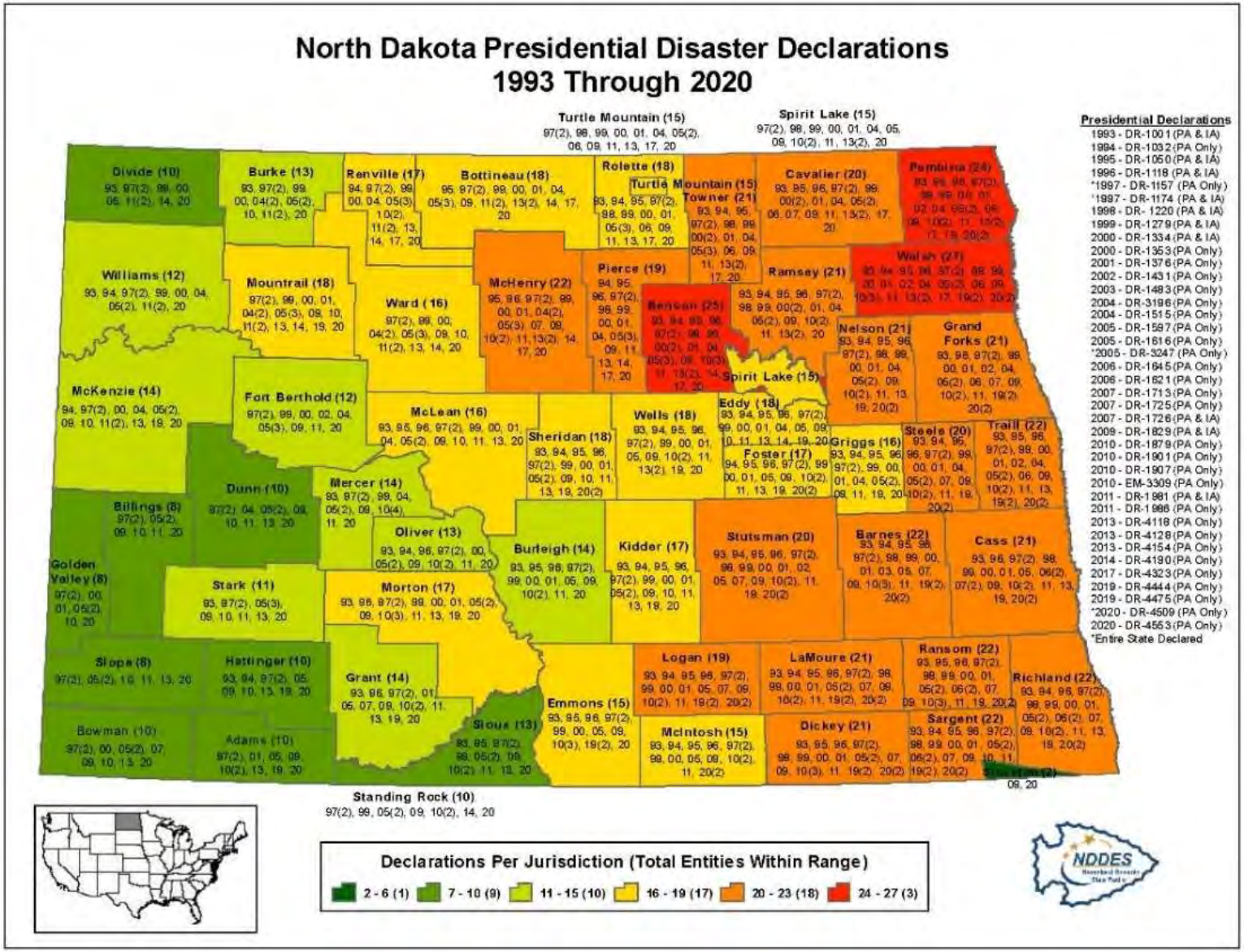


Figure 3.2-1 North Dakota Presidential Disaster Declarations, 1983-2020

3.3 COMMUNITY SURVEY

A community survey was developed to learn what concerns McLean County residents the most about potential disasters and learn what they are doing to prepare their homes and their families for a future hazard event. The survey was delivered on the project website and as a four-page insert to 2,800 subscribers in the December 2nd edition of three McLean County newspapers. Paper copies were also available at the county courthouse. In total, 84 responses were received from the paper survey and 26 online. See Appendix B.

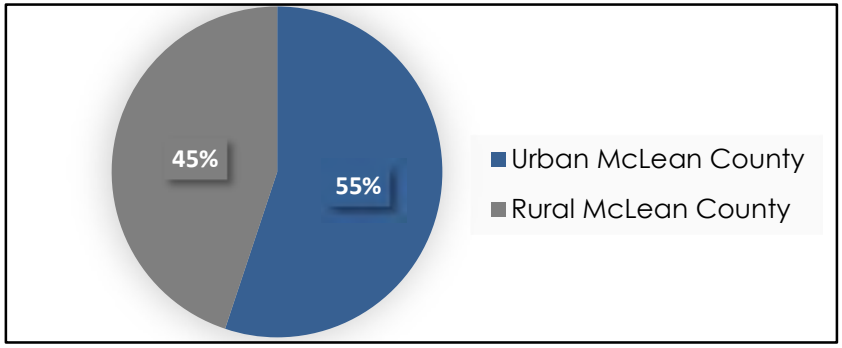


Figure 3.3-1 Residence of Respondents

KEY TAKEAWAYS

- The majority of responses came from individuals living in Garrison, Washburn, and rural McLean County (Figure 3.3-1). Most cities had at least a response to the survey.
- Newspapers were the most preferred methods of communication for information on hazard events. (Figure 3.3-3)
- Respondents ranked drought as the most probable risk, followed by extreme summer weather and extreme winter weather. (Figure 3.3-3).
- Dam failure, urban fire, and some hazardous materials (HAZMAT) incidents were rated the least probable hazards. Extreme winter weather, heat waves, and HAZMAT incidents received moderate risk ratings.
- Over 50% of respondents scored "highly unlikely" for dam failure and about a third considered flooding, major urban fire, pipeline incident, or a HAZMAT incident with the Air Force facilities as highly unlikely.
- About a third expected dam failure to cause a catastrophic impact. Less than 15% rated tornado, terrorism and violence, drought, and urban fire or wildfire) as catastrophic. (Figure 3.3-4)
- Most respondents reported that they were taking some actions to prepare their homes and their families for a future hazard event. (Figure 3.3-2)

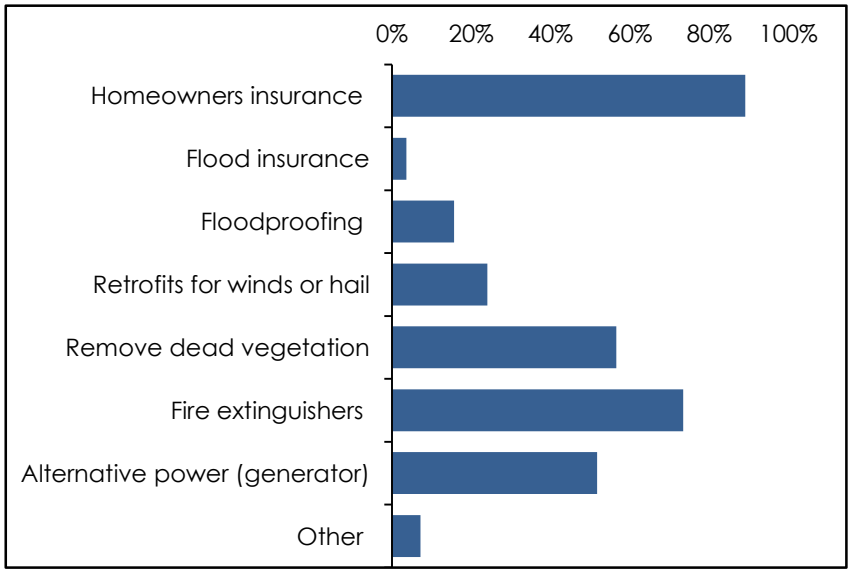


Figure 3.3-2 Actions have you taken to reduce risks to home and property to prepare for potential hazard incidents

Figure 3.3-3
In your opinion, how likely is it that each of these hazards will impact McLean County?

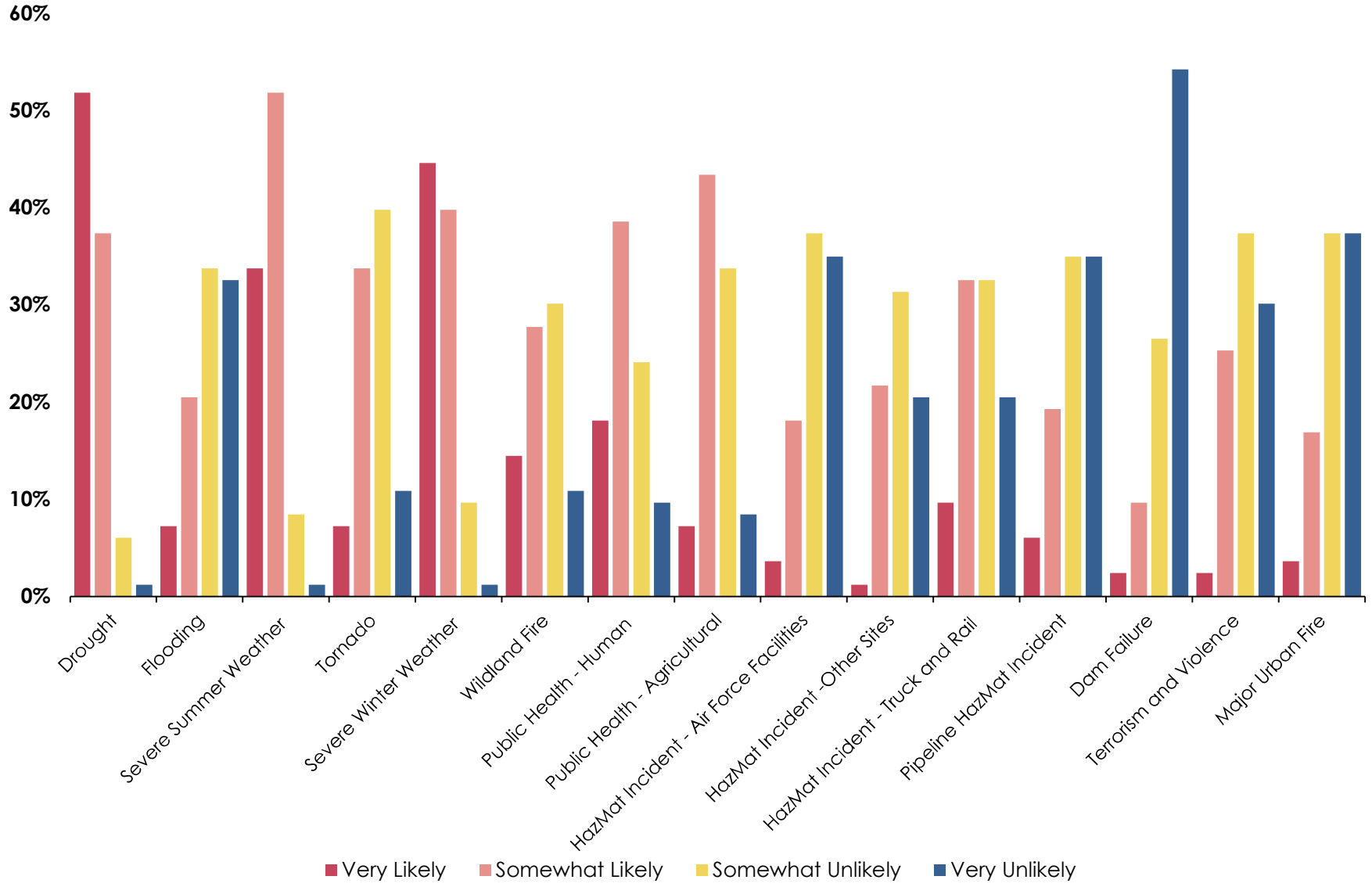
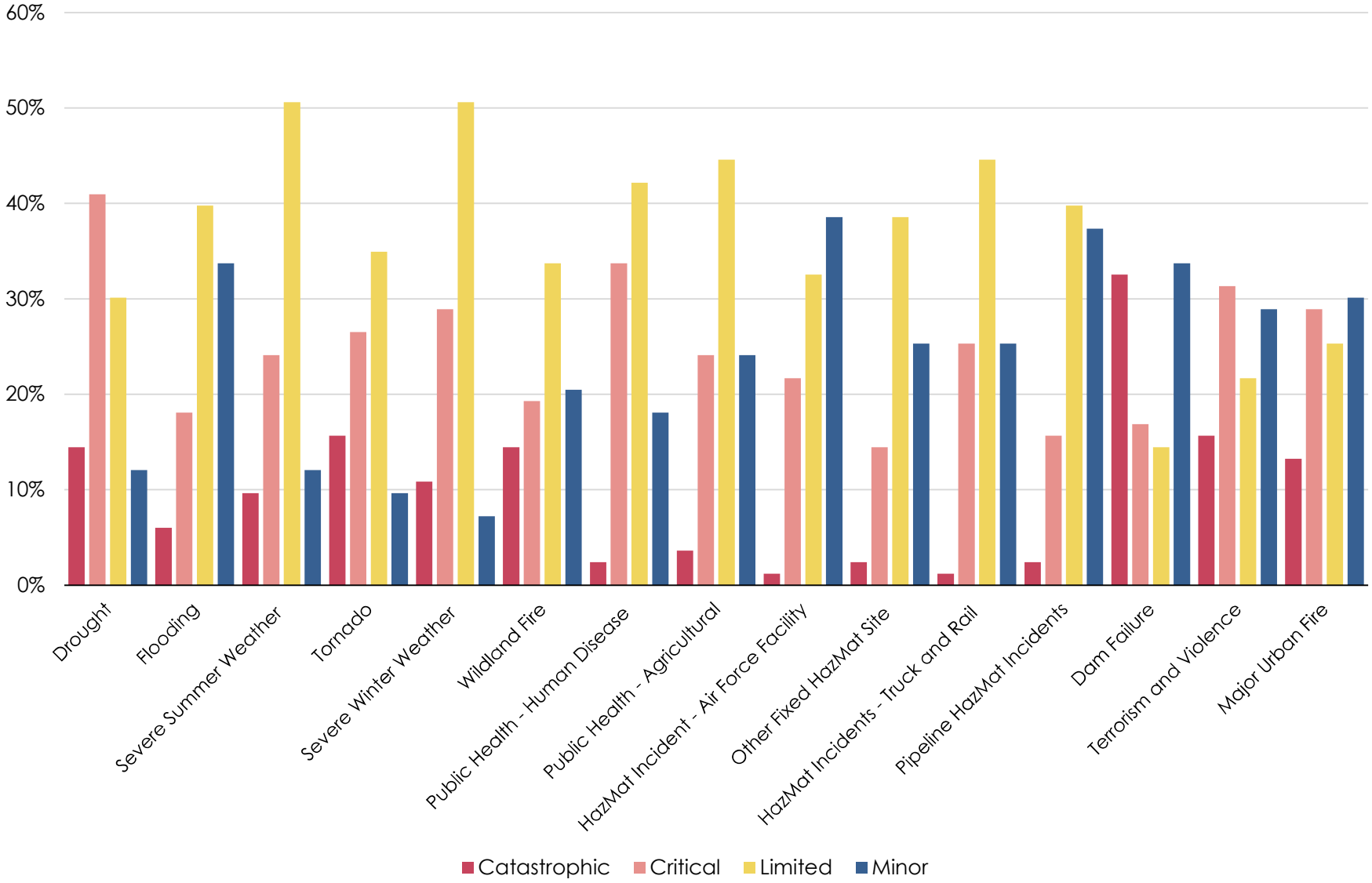


Figure 3.3-4
In your opinion, how much impact will each of these hazards have on the part of McLean County where you live?



3.4 HAZARDS PROFILED IN THE PLAN

Table 3.4-1lists the hazards profiled in the McLean County Multi-Hazard Mitigation Plan. Hazards excluded from the NDDES Plan were never considered for McLean County. Most hazards are the same as in the county's 2016 Plan.

NATURAL HAZARDS

- **DROUGHT**
- **FLOOD**
- **GEOLOGIC HAZARDS**
  Earthquake and Landslide
- **MAJOR WILDLAND/RURAL FIRE**
- **EXTREME SUMMER WEATHER**
  Heat Wave, Hail, Strong Wind, Tornado, Thunderstorm and Lightning
- **EXTREME WINTER WEATHER**
  Cold Wave, Blizzard, Heavy Snow, and Ice Storms

TECHNOLOGICAL/ HUMAN-CAUSED HAZARDS

- **DAM FAILURE**
- **HAZMAT INCIDENT**
  Pipeline, hazardous materials In Transit (road and rail), Minot AFB Missile Silo Facilities, Other Fixed Sites' Releases or Spills.
- **PUBLIC HEALTH INCIDENT**
  Human-Related and Agricultural-Related Incidents
- **SIGNIFICANT SECURITY INCIDENT**
  Active Attack and Cyber Threat
- **SIGNIFICANT TRANSPORTATION INCIDENT**
- **SIGNIFICANT URBAN FIRE**

- Wildland fire and urban fire have been renamed Major Wildland/Rural Fire and Major Urban Fire to indicate that these are not small local incidents.
- Communicable Disease is renamed Public Health Incident to reflect current terminology.
- Homeland Security Incident is simply called Security Incident
- The Shortage of Critical Materials hazard, which is included in the NDDES Plan and the plans of two adjacent counties, was not included in the 2016 Plan because the issue is reflected in the impacts of other hazards. It is not included here for the same reason.
- Although Space Weather, which is included in the NDDES Plan, has potential significant economic consequences across the nation, there is little specific information available at this time. NDDES has recently commissioned a study that will examine the risks and vulnerabilities associated with space weather and electromagnetic pulse. McLean County will reconsider including this hazard in a future plan update.

Each of the listed hazards is not always relevant to all the participating jurisdictions in the same way. Only a few communities are exposed to dam failure; some are more vulnerable to wildland/rural fire than others.

Information for each hazard is limited by available data. . Natural Hazards are presented in Chapter 4, followed by the Technological/Human-Caused Hazards in Chapter 5.

3.5 HAZARD ANALYSIS

Each hazard discussion includes the following information. Some elements also included in the hazards' risk analysis.

SUMMARY TABLE

This table indicates the location, probability, impact, warning time, duration, and Priority Risk Index (PRI) score of the hazard. Where risk of the hazard is different depending on the location, each city is addressed separately in addition to including a countywide summary. Some hazards are presented by their sub-hazard. For example, the geological hazard analyzed earthquake and landslide.

HAZARD PROFILE

This section includes a description of the hazard including how it may impact McLean County.

HISTORY

This section addresses previous occurrences of the hazards.

PROBABILITY

This section estimates the likelihood of the hazard occurring in McLean County. For most hazards, probability is a countywide consideration, and all of the cities are included in the countywide discussion and risk analysis.

For some hazards including flood, wildland/rural fire, dam failure, and HAZMAT incident, the probability of an incident depends on where the city is located compared to the location or extent of the exposure to the hazard incident. is different in different areas of the county. For example, cities that are close to a pipeline have some risk of exposure to a potential hazard event related to the pipeline, whereas a city that is many miles away from any pipeline would not have that risk. Distance have been calculated for these hazards and nearby cities in assessing the risk potential.

VULNERABILITY

This section identifies specific risks, as applicable, for people, property, agriculture, and critical facilities.

EXISTING CAPABILITIES

This section addresses the regulations, personnel, and facilities in place to address the hazard. For some hazards there are state and national capabilities that also apply.

CHANGES IN DEVELOPMENT

This section describes how changes in development have impacted vulnerability since the 2016 Plan was adopted. Future development may also be discussed including how exposure to the hazard may change in the future or how new development may affect hazard risk.

IMPACTS

This section describes potential impacts from a hazard event, where applicable, for people, property, agriculture, critical facilities, and the economy.

SPATIAL EXTENT

This element of the PRI score calculations estimates how large of an area could be impacted by a hazard event,

KEY ISSUES AND RELATED MITGATION PROJECTS

This section lists the primary issue(s) related to the hazard and provide the basis for the listed mitigation actions.

NATIONAL RISK INDEX

FEMA's National Risk Index Maps are included for the profiled natural hazards. See also Appendix D.

4 Natural Hazards

4.1 OVERVIEW

Natural hazards are presented in this chapter. A generalized risk summary for each hazard, by jurisdiction, is indicated in Table 4.1-1. See Chapter 6 for the risk analysis.

Table 4.1-1
Priority Risk Index (PRI) Score
Natural Hazards

RISK LEVEL (High / Moderate / Low / Very Low)	Countywide	Benedict	Butte	Coleharbor	Garrison	Max	Mercer	Riverdale	Ruso	Turtle Lake	Underwood	Washburn	Wilton
Drought	High	High	High	High	High	High	High	High	High	High	High	High	High
Flood - Riverine	Low	Very Low	Very Low	Very Low	Low	Very Low	Very Low	Low	Very Low	Very Low	Very Low	Low	Very Low
Flood - Other	Low	Low	Very Low	Very Low	Very Low	Low	Low	Very Low	Low	Low	Low	Very Low	Very Low
Geologic Hazards	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Severe Summer[2]	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Heat Wave	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Severe Winter	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Wildland Fire	Low	Low	Very Low	Very Low	Very Low	Very Low	Low	Low	Very Low	Very Low	Very Low	Low	Very Low

DROUGHT

As agriculture is a key component of McLean County's economy, a significant drought can have serious impacts. Area growth has increased demand for water; this can be challenging, particularly during times of drought.

FLOOD

Generally, McLean County experiences one flood event every two years. These flood events are primarily related to heavy rainfall and snowmelt runoff.

GEOLOGIC HAZARDS

This discussion addresses both earthquakes and landslides. McLean County has minimal risk of an earthquake event. The Cities of Coleharbor, Garrison, Riverdale, Underwood, Washburn, and Wilton are within the area designated as "Moderate Susceptibility/Low Incidence" of landslides; the rest of the county is designated "Low Incidence."

EXTREME SUMMER WEATHER

The county averages approximately nine days per year with an extreme summer weather event. Strong wind and hail are the most common events. Section 4.6 and the risk analysis in Chapter 6 address the summer weather hazards, hail, heat wave, strong winds and tornado separately.

EXTREME WINTER WEATHER

McLean County averages approximately six days per year with a severe winter weather event. Section 4.7 and the risk analysis in Chapter 6 address the winter weather hazards, cold wave, blizzard, heavy snow, and ice storm separately.

MAJOR WILDLAND/RURAL FIRE

Most years, the county experiences a wildland/rural fire greater than 100 acres and property damage is minimal.

[2] Includes all Summer Weather except Heat Wave

4.2 DROUGHT

RISK LEVEL- High | Moderate | Low | Very Low

Risk for rural county + all cities	Location	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score[3]
	Regional	Likely	Critical	Large	More than 24 hrs.	More than a week	3.08

HAZARD PROFILE

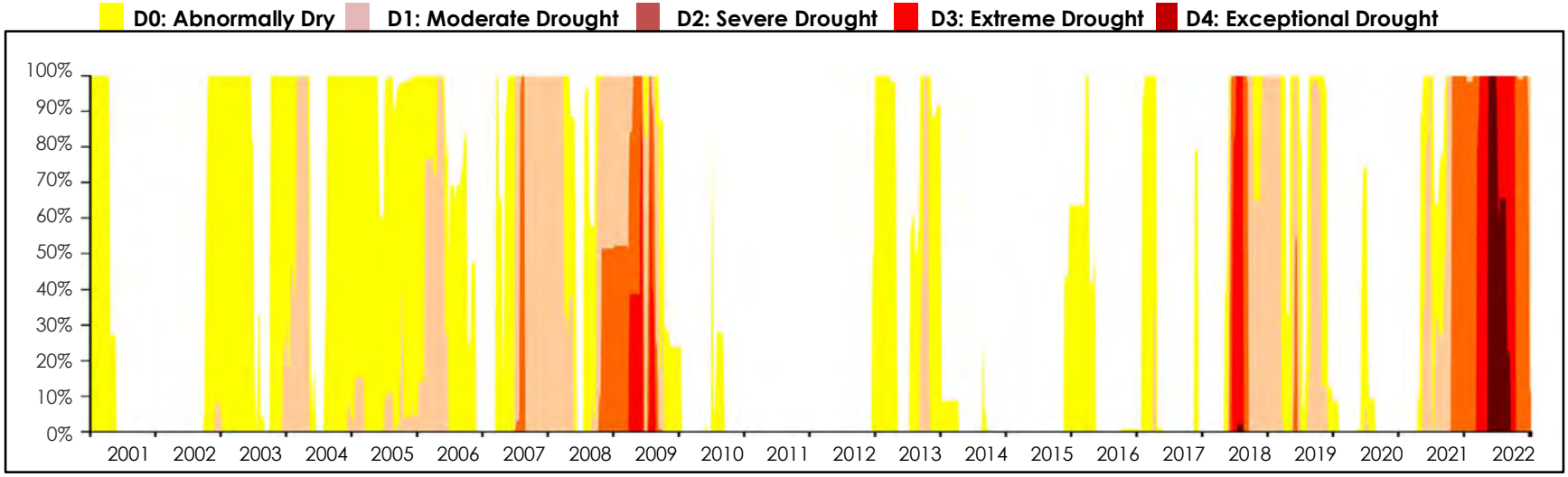
Drought is generally defined as a deficiency of precipitation over anextended period. If severe enough, this deficiency has potential to reduce soil moisture and water below the minimum necessary for sustaining plant, animal, and human life systems. Droughts appear gradually part of North Dakota's flood to drought hydrological cycle. It is often difficult to pinpoint their beginning and end.

In addition, drought can lead to or be exacerbated by other hazards, such as a heat wave. See the Heat Wave discussion in Section 4.5. Drought can last multiple years, and even persistover decades. Figure 4.2-1 shows intensity of drought across McLean County from 2001 to late 2021 using a five-category system[4], from Abnormally Dry (D0) conditions to (D4) Exceptional Drought

D0 - Abnormally Dry
Crop germination is poor. Grass fires increase

D1 - Moderate Drought
Crops and pastures are water stressed. Fire danger increases. Farmers encouraged to have a drought plan.

Figure 4.2-1
Percent of McLean County in Drought Categories D0 to D4



[3] Priority Risk Index (PRI) Scores range from 1-4. See Chapter 6

[4] Source: www.drought.gov/states/north-dakota

D2 - Severe Drought
Soil moisture is low; pasture and rangeland are dry; crop conditions are poor; hay yields are low, and cattle are sold. Open burn and firework restrictions are implemented; fire activity intensifies. Conditions are dusty; air quality is poor.

D3 - Extreme Drought
Crops stop growing; pastures go dormant, haying of conservation areas is authorized. Large wildfires burn.

D4 - Exceptional Drought
Wheat is baled for hay; numerous tests are conducted on water nitrate level and quality and high nitrate levels in forage; Farm Service Agency increases staffing; producers cull cattle. Wildfires are immense; rural/volunteer fire departments are stressed.

HISTORY

According to the drought.gov website, North Dakota has had drought occurrences in most of 2000-2020 (Figure 4.2-1). The figure also shows the most severe drought classification for each year. The website also indicates[5] that with precipitation 2.63 inches below normal, the year 2021 was the 26th driest year to date over the past128 years.

The U.S. Drought Monitor weekly reports show the location and intensity of drought across the county. Figure 4.2-2- through Figure 4.2-7 are excerpts from those snapshots of the McLean County drought conditions in 2021. Here as in previous years, there are few differences between the jurisdictions. The legend for these graphics is the same as for Figure 4.2-1.

Background to the 2021 Drought Conditions
North Dakota was warmer than average in summer and fall 2021. Figure 4.2-8 indicates the departures from normal temperatures in McLean County. Eastern McLean County was about four degrees warmer than normal and

Figure 4.2-2 McLean County Drought Conditions
1/19/2021 All cities and most of the county are the same.

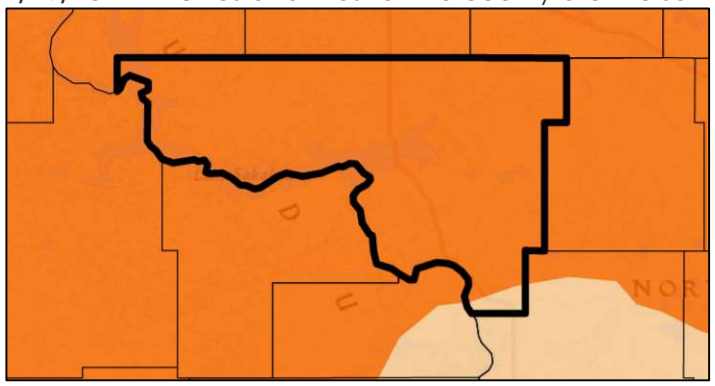
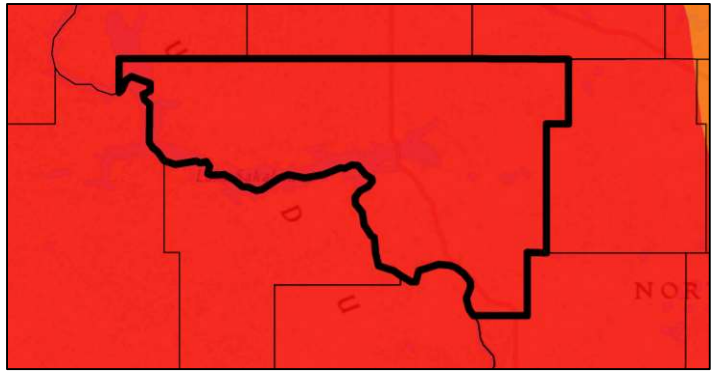


Figure 4.2-3 McLean County Drought Conditions
4/6/2021 All cities and all areas of the county are the same.



[5] McLean County Conditions | Drought.gov

Figure 4.2-4 McLean County Drought Conditions
6/15/2021 All cities and most of the county are the same.

Figure 4.2-5 McLean County Drought Conditions
8/17/2021 At this time, there are differences between the eastern and western parts of McLean County. All of the cities, except Garrison are located in the eastern area of this map; Garrison is on the edge of the two drought levels.

- The east was about six degrees warmer than the west.
- Precipitation countywide was less than normal (Figure 4.2-8).
- At this time, the cities in the eastern area of the county were more impacted by drought those in the west.

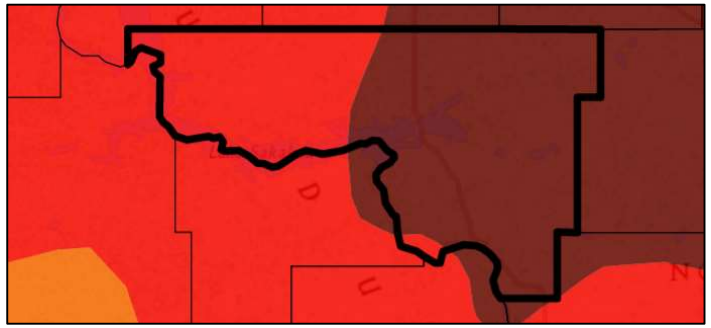
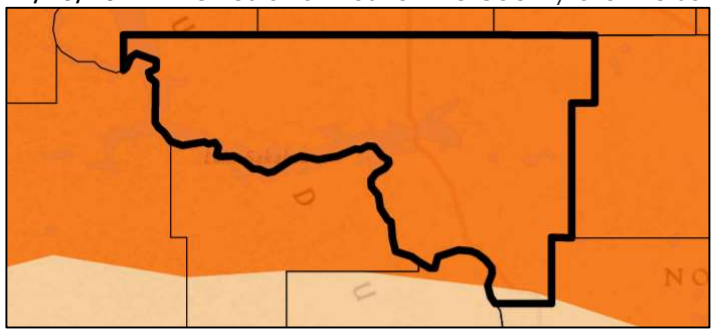


Figure 4.2-6 McLean County Drought Conditions
9/28/2021 All cities and most of the county are the same.

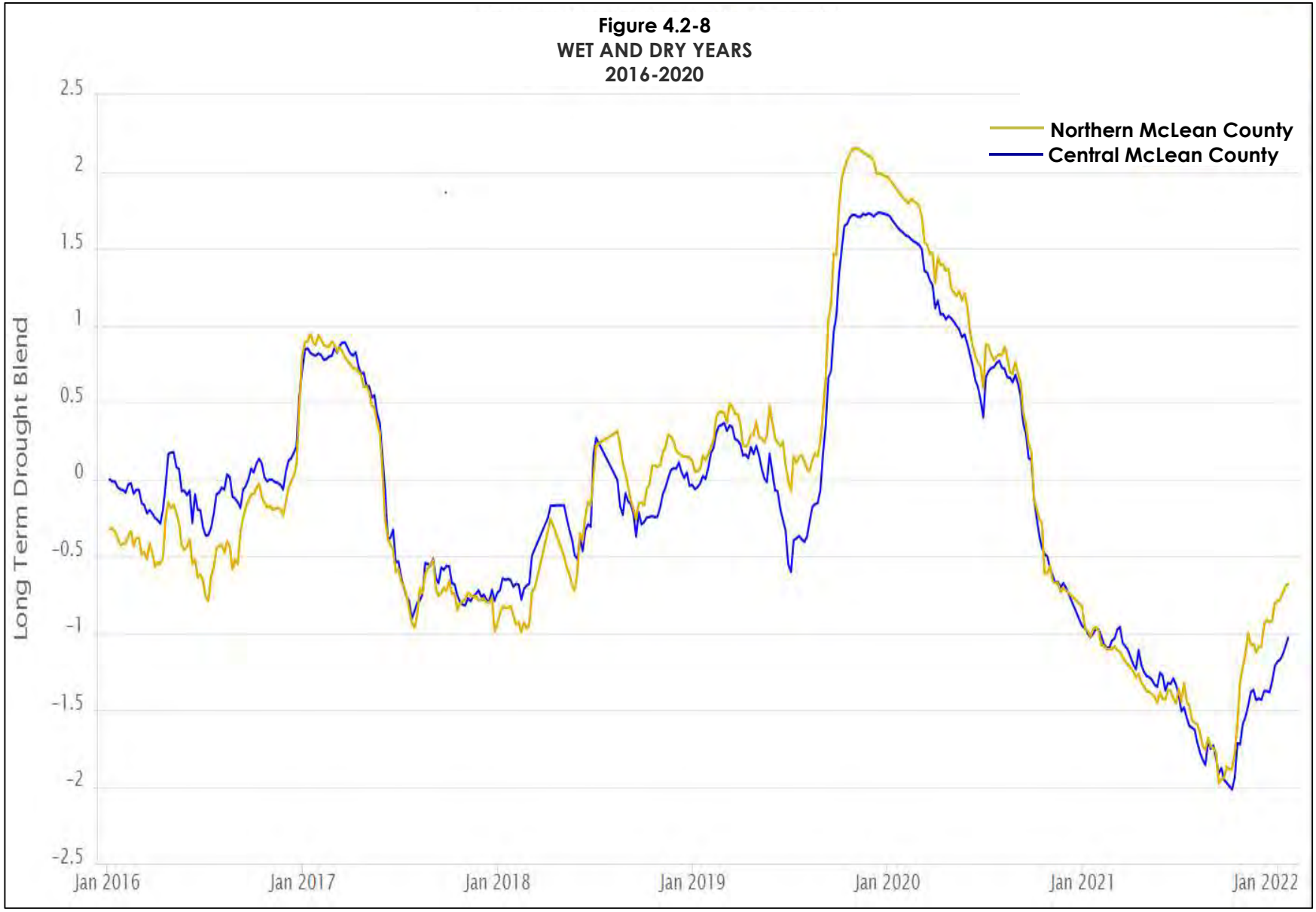
Figure 4.2-7 McLean County Drought Conditions
11/23/2021 All cities and most of the county are the same.



LOCATION

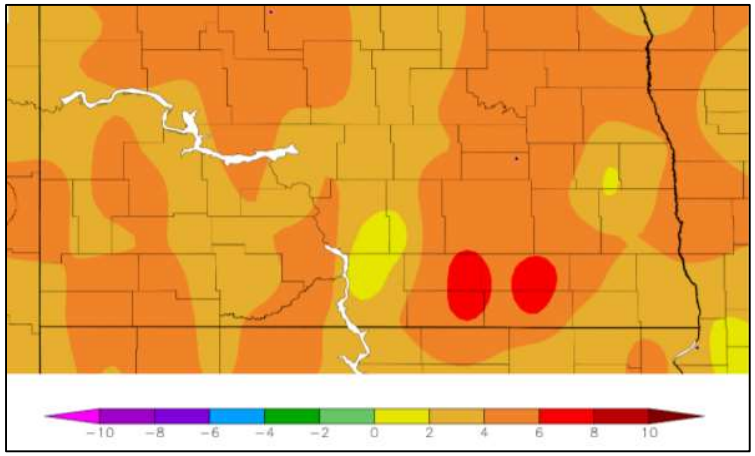
Drought occurs at a regional level. All parts of McLean County have a similar risk of a drought event but there will be variations in severity. Figure 4.2-8 depicts the drought-flood cycle over the past five years in two location within McLean County. The blue line is an area surrounding Underwood and the brown line reflects an area between Max and Benedict, This work by Climate Engine group (Climateengine.org) is contributing to developing long-term drought predictions.

Figure 4.2-8
WET AND DRY YEARS
2016-2020



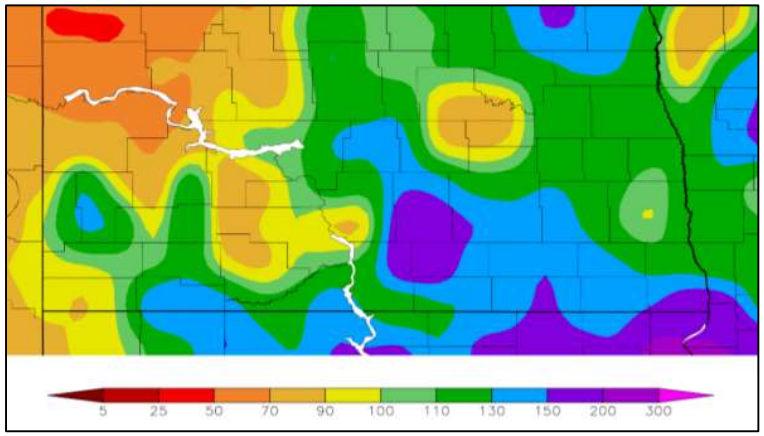
Source: ClimateEngine.org

Figure 4,2-9 Departure from Normal Temperature 7/26/2021 – 11/22/2021



Source U.S. Drought Monitor weekly reports

Figure 4.2-10 Departure from Normal Precipitation 7/26/2021 – 11/22/2021



Source U.S. Drought Monitor weekly reports

PROBABILITY

The frequency of droughts is difficult to forecast. It appears that the occurrences of drought are cyclical in nature (Figure 4.2-8), and a severe drought can be expected approximately once per decade. According to recent predictions by the National Weather Service (NWS), the current drought is expected to persist in McLean County at least through spring 2022.

VULNERABILITY

PEOPLE

The entire population of McLean County is vulnerable to drought events. Severe drought conditions can increase the risk of mortality for adults 65 and over[6], According to the most recent U.S. Census American Community Survey (ACS 2019), approximately 1,130 residents in the county are 65 years of age or older.

Table 4.2-1
Age 65 or Older - City Residents

Jurisdiction	#	Jurisdiction	#	Jurisdiction	#
Benedict	22	Max	66	Turtle Lake	183
Butte	25	Mercer	6	Underwood	129
Coleharbor	19	Riverdale	21	Washburn	203
Garrison	445	Ruso	0	Wilton	138

Source U.S. Census ACS 2019

PROPERTY

No structures, including critical, strategic, and key facilities are anticipated to be directly affected by a drought and all are expected to be operational during a drought event. However, droughts contribute to conditions conducive to

wildland/rural fires. Open land or structures located along the wildland-urban area interface are at particular risk during drought. As water levels in ponds and streams fall with drought conditions, the amount of water available to respond to urban fire and wildland/rural fire may decrease and dried up cropland is more susceptible to fire events. Water-related recreational opportunities may also decrease during a drought.

AGRICULTURE

The farmers and agricultural producers of McLean County are susceptible to damage from drought. McLean County's top crops include wheat for grain. canola, forage, dry edible peas, and soybeans. Prolonged periods of dry weather are the most difficult and damaging problem faced by crop growers and agricultural suppliers. Livestock are vulnerable to drought conditions due to lack of drinking water poor pasture conditions and critical hay shortages. A majority of North Dakota cattle producers rely on dugouts or stock dams for their cattle's drinking water, but those sources rely on surface water runoff, which North Dakota has had very little of over the past year-and-a-half. KX News reported that some water well drillers are scheduled out up to two years[7].

EXISTING CAPABILITIES

There are multiple sources of water for domestic, agricultural, and other users in the county. The three rural water districts are: McLean-Sheridan Water District, Garrison and Max Rural Water District, and the North Prairie Regional Water District. Some municipalities withdraw and treat surface waters, others treat water provided by rural water. Groundwater sources are the Lake Nettie Aquifer and Missouri River Aquifer. These are not considered especially susceptible to drought and were adequate even for the recent long-term drought When demand increased significantly over previous years, timely water treatment did become a challenge at times. Surface water sources are the Missouri River and Lake Sakakawea. See Chapter 7. Public water systems are monitored by the North Dakota Department of Health, and water permit applications are maintained by the North Dakota State Water Commission.

The USDA Farm Service Agency (FSA) has a field office located in Garrison and North Dakota State University Extension has a field office located in Washburn. Both agencies offer general education relating to drought management best practices. The FSA field office also assists with the distribution of drought indemnity payments to agricultural producers.

Nationally, the U.S. Drought Monitor provides a summary of drought conditions across the United States weekly and agricultural users facing challenges during the drought have found some assistance through state and federal relief programs.

CHANGES IN DEVELOPMENT

Increased demand for water and the recent drought has increased aquifer withdrawals significantly. Those who provide water to domestic, agricultural, and other users have prepared for the current or a future drought event. With their experience in past droughts, For example, the City of Garrison selected the elevation and location of its

s

[7] Persistent drought has water well drillers booked solid for 2-years | KX NEWS (kxnet.com)

water intake in Lake Sakakawea to "provide a dependable supply of water even during dry periods and draw water from the main body of Lake Sakakawea rather than a bay"

IMPACT

Droughts are often measured by agricultural damage. These impacts are highly variable based on severity, length of time, amount of stored water in the soil, and meteorological factors such as temperature, humidity, and wind. Impacts are also greatly affected by human factors such as local water demand and water management practices. In McLean County, the recent drought has had serious impacts. FEMA estimates of the impact of drought are presented in Table 4.2-2 and Table 4.2-3.

Table 4.2-2
DROUGHT - EXPECTED ANNUAL LOSS VALUES[8]

Total	Building Value	Population Equivalence	Population	Agricultural Value
$119,764	n/a	n/a	n/a	$119,764

Source for Table 4.2-2 and Table 4.2-3
https://hazards.fema.gov/nri/report

Table 4.2-3
DROUGHT - HISTORIC LOSS RATIOS

Overall Rating	Building Value	Population	Agriculture Value
Very Low	n/a	n/a	$9.86 per $100K

PEOPLE

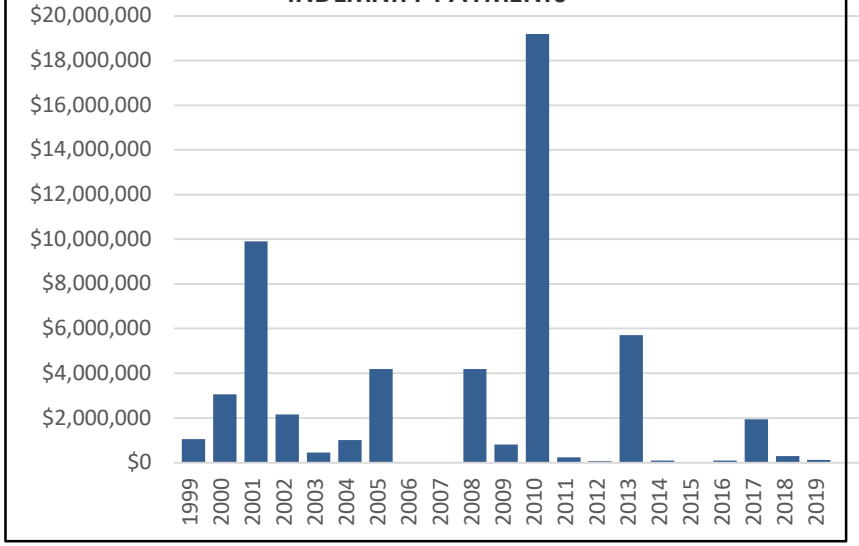
Drought impacts can include reduced incomes, higher incidents of heat stroke, anxiety, or depression about economic losses, and even loss of human life. In the early days of the recent drought, many residential wells went dry and they, like the cattle producers, many waited months for well drillers to meet their needs.

PROPERTY

In addition to the negative impact on agricultural activities, drought conditions also increase in wildfire risk which can destroy property, neighborhoods, crops, and habitats.

AGRICULTURE

Figure 4.2-11
CROP AND LIVESTOCK INDEMNITY PAYMENTS



Source: 2019 USDA Crop Disaster Loss Designations - All Drought Types

[8] See Appendix D

Potential impacts include crop and livestock losses. Single-season livestock losses include lost forage production (on both hay and grazing land) and increased mortality. Multi-year losses could include the cost of reestablishing pastures and reduced meat production in subsequent years due to forced sales in the drought year.

ECONOMY

Agriculture is a key component of the county's economy. Federal indemnity programs provide financial assistance to help reduce the impact of drought-related agricultural losses. Prolonged drought can produce significant economic impacts and could result in local cattle producers reducing herd sizes. Figure 4.2-11 shows crop and livestock indemnity payments for McLean County.

In addition to a drought's direct impact on farmers and agricultural producers, the indirect impact extends to related businesses across the county including:

Benedict
McLean Grain Elevators
Butte
Agricultural Equipment & Supplies
Coleharbor
Farm Equipment Parts & Repair
Water Well Drilling & Service
Farm Equipment Dealers & Supplies
Garrison
Farm Equipment Parts, Supplies & Repair, Fertilizers Dealers, Trucking Motor Freight lumber Yard, JM Grain Inc Elevator
Max
Max Farmers Elevator
Ruso
n/a
Turtle Lake
Equity Elevator & Trading Co.
Underwood
Grain Cleaning, Farm Supply, Seed & Processing and Wholesale Ag Products
Blue Flint Ethanol, LLC
Washburn
SRS Commodities Limited and Wilton Farmers Union Elevator
Fertilizers Dealers, tractor repair and service
Wilton
Wilton Farmers Union Elevator

Another economic impact, the loss of recreation opportunities, includes decreased fishing opportunities because of low water levels and limitations on camping due to the threat of fire due to the dry conditions.

KEY ISSUES AND RELATED MITGATION ACTIONS

KEY ISSUE

Agriculture is a key component of McLean County's economy. A significant drought has the potential to greatly affect the industry and the county as a whole.

Related Mitigation Action
#1 Continue to support programs assisting farmer and ranchers in need during times of drought,

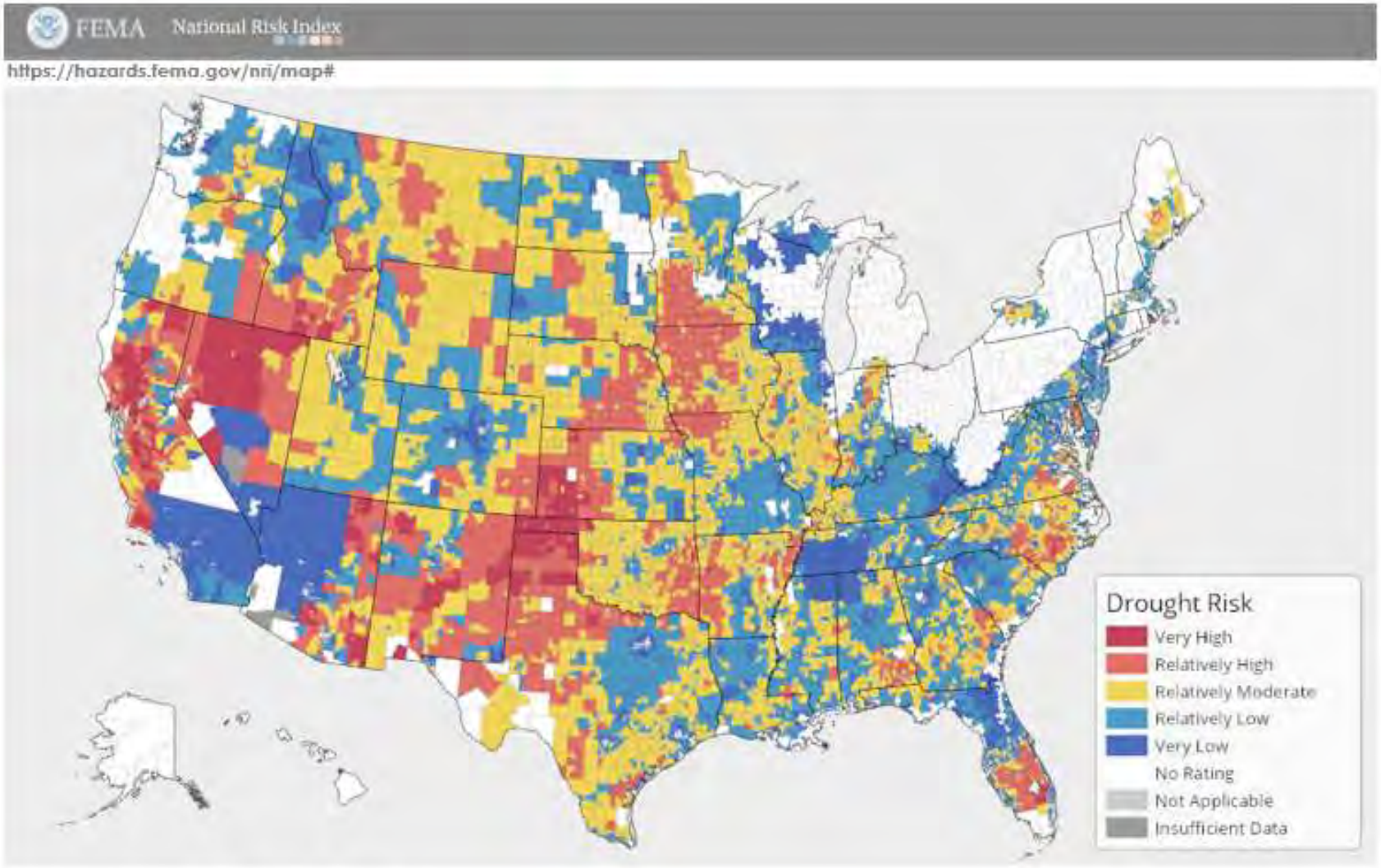
KEY ISSUE

Providing information to the public about the risks of drought and coordinating of a response are critical.

Related Mitigation Actions
#D Improve inter-departmental radio communication and prepare for the rollout of Statewide Interoperability Radio Network (SIRN 2020).
#I Distribute hazard Information via the county and city websites, social media, traditional media, and other existing interfaces.
#15 Utilize a redundant and multiple methods for local warnings if primary communications are interrupted.
#17 Continue to support mutual aid agreements and on-scene incident command.
#19 Identify location and organize outreach to vulnerable populations during hazard events

NATIONAL RISK INDEX

FEMA's National Risk Index Map for drought risk follows.



Hazard Type Risk Ratings

Compared to the rest of the U.S., **McLean County, ND's** risk to Drought is **Relatively Low**
See Appendix D for additional information.

4.3 FLOOD

RISK LEVEL- High | Moderate | Low | Very Low

Jurisdiction	Location		Probability		Impact		Spatial Extent		Warning Time	Duration		PRI Score[9]			
	Riverine	Inland	Riverine	Inland	Riverine	Inland	Riverine	Inland		Riverine	Inland	Riverine Flood Risk		Inland Flood Risk	
Rural County	Regional	Local	Possible	Likely	Limited	Minor	Limited	Moderate	3 - 6 to 12 hours	More than a week	Less than 24 hrs.	2.00		2.10	
Benedict	Regional	Local	Unlikely	Unlikely	n/a	Minor	n/a	Moderate	"	"	"	1.40		2.30	
Butte	Regional	Local	Unlikely	Unlikely	n/a	Minor	n/a	Small	"	"	"	1.40		1.90	
Coleharbor	Regional	Local	Unlikely	Unlikely	n/a	Minor	n/a	Small	"	"	"	1.40		1.90	
Garrison	Regional	Local	Possible	Possible	Limited	Minor	Small	Small	"	"	"	2.00		1.90	
Max	Regional	Local	Unlikely	Possible	n/a	Minor	n/a	Moderate	"	"	"	1.40		2.30	
Mercer	Regional	Local	Unlikely	Possible	n/a	Minor	n/a	Moderate	"	"	"	1.40		2.30	
Riverdale	Regional	Local	Possible	Possible	Limited	Minor	Small	Small	"	"	"	2.00		1.90	
Ruso	Regional	Local	Unlikely	Possible	n/a	Minor	n/a	Moderate	"	"	"	1.60		2.30	
Turtle Lake	Regional	Local	Unlikely	Possible	n/a	Minor	n/a	Moderate	"	"	"	1.60		2.30	
Underwood	Regional	Local	Unlikely	Unlikely	n/a	Minor	n/a	Moderate	"	"	"	1.60		2.30	
Washburn	Regional	Local	Possible	Unlikely	Limited	Minor	Small	Small	"	"	"	2.00		1.90	
Wilton	Regional	Local	Unlikely	Possible	n/a	Minor	n/a	Small	"	"	"	1.60		1.90	

HAZARD PROFILE

FEMA defines flooding as a general and temporary condition of partial or complete inundation of two or more acres of normally dry land area or of two or more properties. Primary causes of flooding in North Dakota include heavy rain/flash flooding, rapid snowmelt, ice jams and increased seasonal moisture. The three types of flooding are discussed below.

Riverine Flooding occurs from an overflow of inland waters like the Missouri River. The area adjacent to a river channel is its floodplain, the area inundated by the flood that has a one percent chance of being equaled or exceeded during any year. It can also be termed the "one percent" flood since this relates the event to an annual time period instead of a 100-year time period".

Flash Flooding occurs when water levels rise at an extremely fast rate due to intense rainfall over a brief period, and sometimes combined with rapid snowmelt, ice jam release, frozen ground, or saturated soil.

[9] Priority Risk Index (PRI) Scores range from 1-4. See Chapter 6.

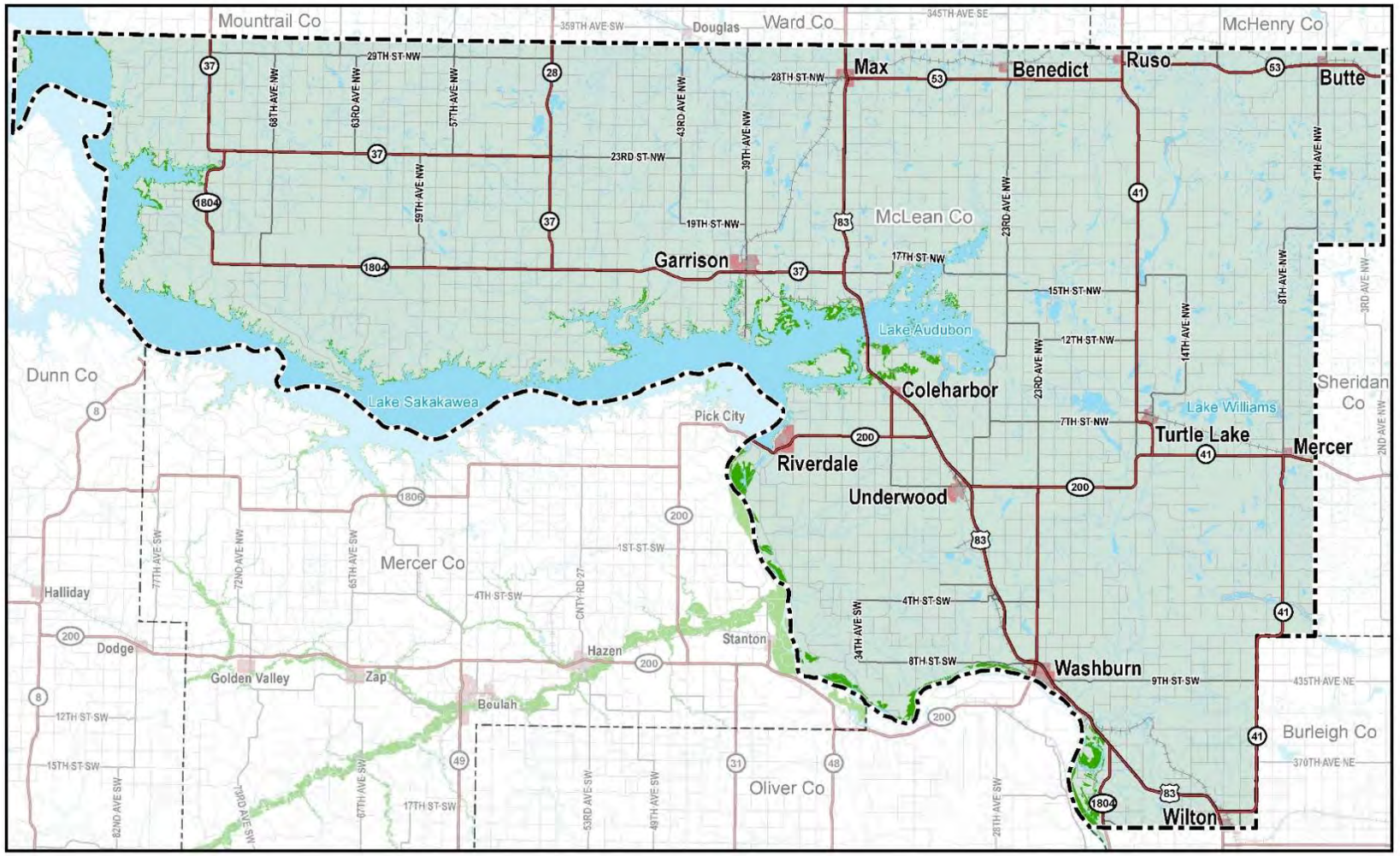
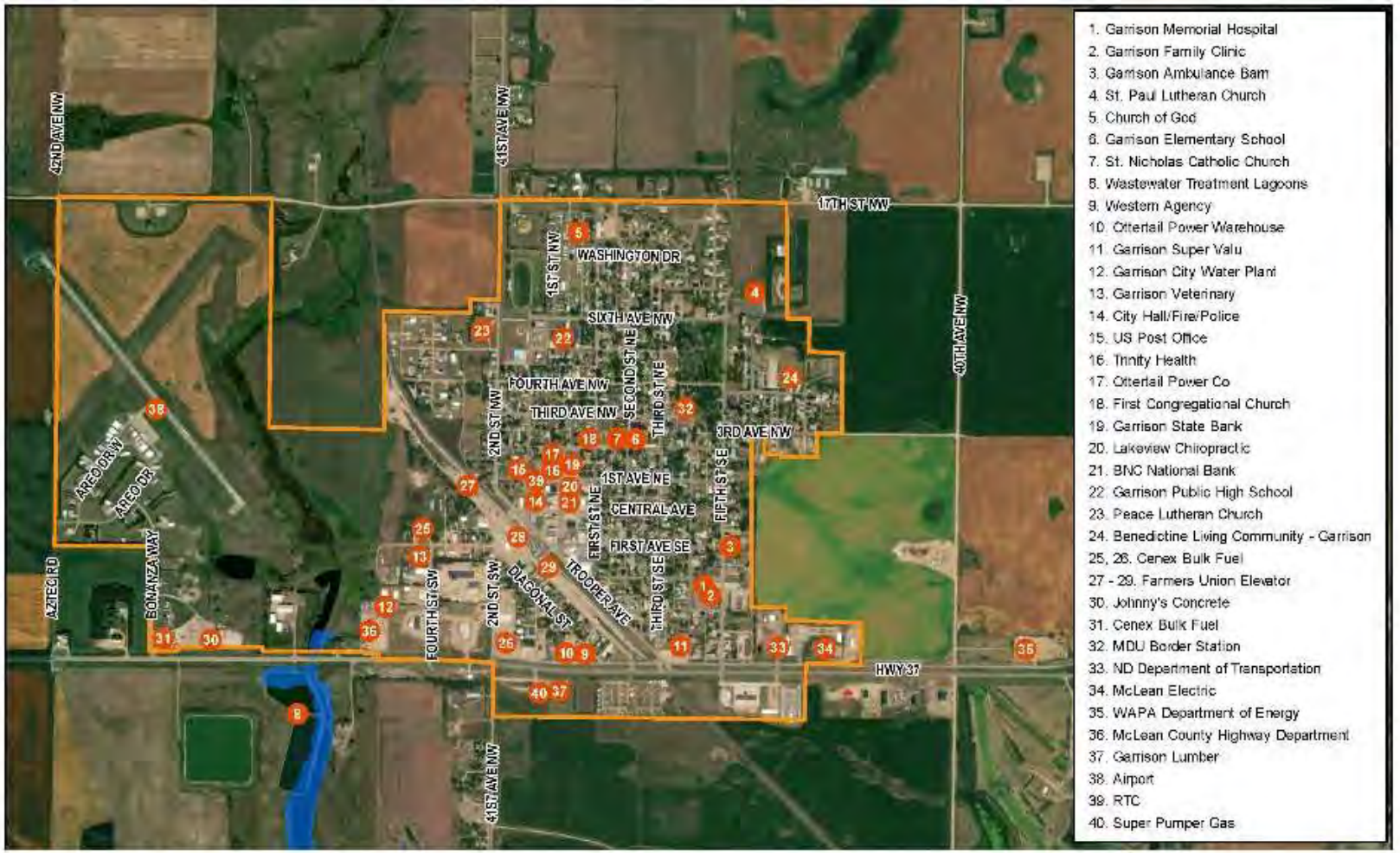

Mountrail Co
Douglas
Ward Co
McHenry Co
Max
Benedict
Ruso
Butte
Garrison
McLean Co
Lake Audubon
Coleharbor
Lake Sakakawea
Dunn Co
Pick City
Riverdale
Underwood
Lake Williams
Turtle Lake
Mercer
Sheridan Co
Mercer Co
Halliday
Dodge
Golden Valley
Zap
Hazen
Stanton
Beulah
Washburn
Burleigh Co
Oliver Co
Wilton
100-Year Floodplain
Source: FEMA Flood Map Service Center
100-Year Floodplain
Open Water
Highways
Railroads
McLean County
Other County Boundary
Cities
N
0
4
8
16 Miles
McLean County
NORTH DAKOTA

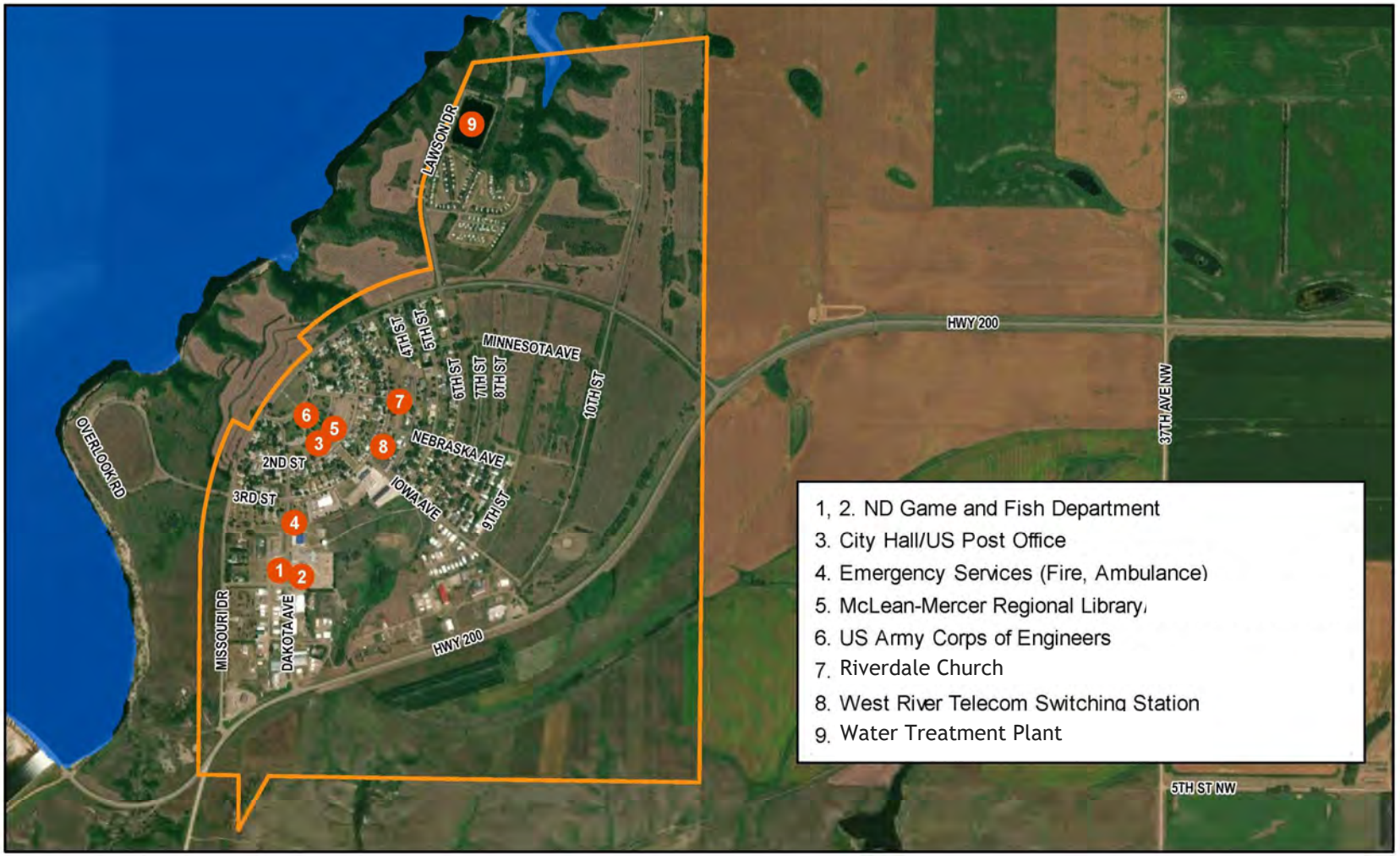
Figure 4.3-1



100-Year Floodplain
Critical, Strategic & Key Facilities - Garrison

Source: NDGISHUB, ESRI, FEMA

Figure 4.3-2



100-Year Floodplain
Critical, Strategic & Key Facilities - Riverdale

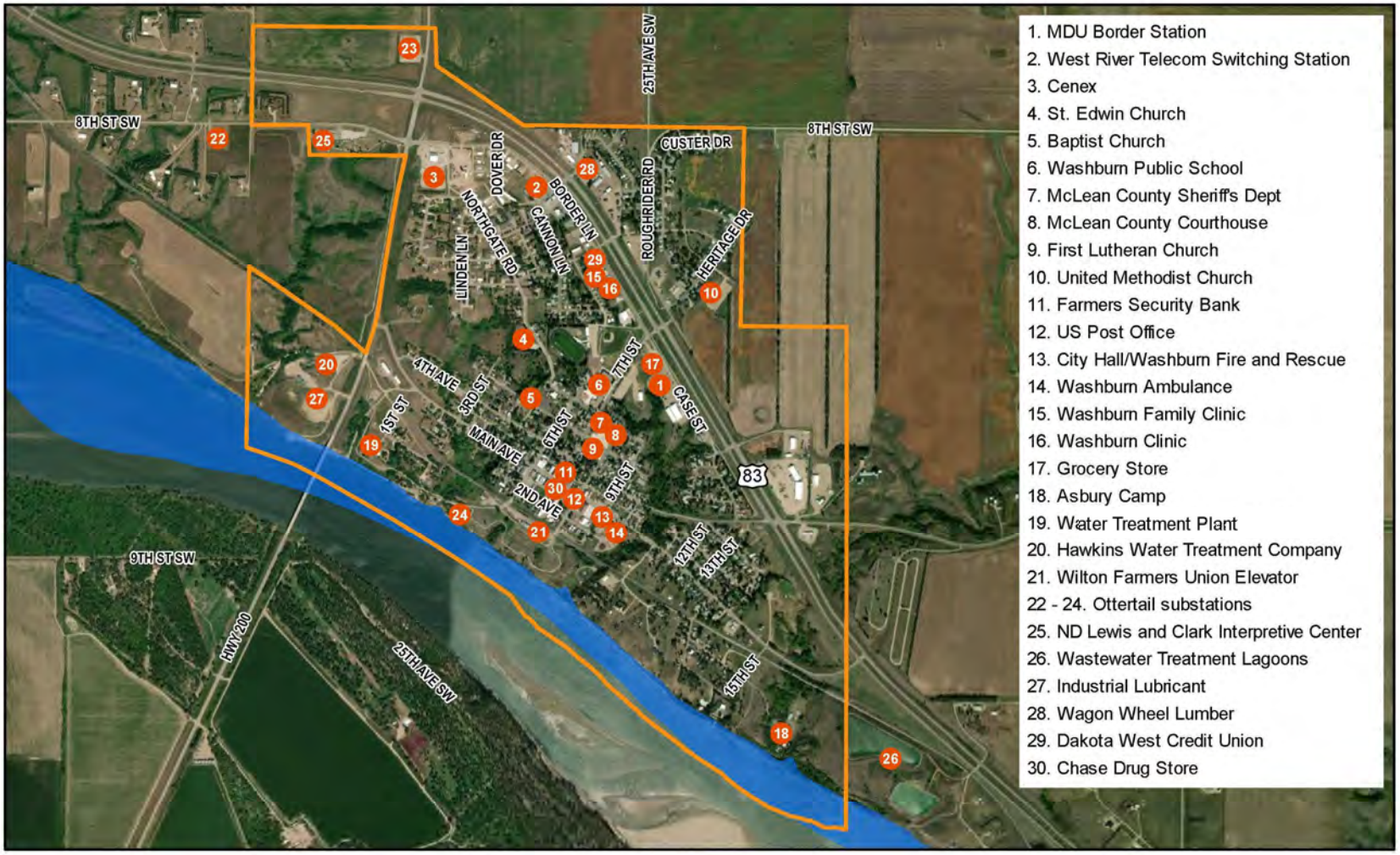
Figure 4.3-3

Source: NDGISHUB, ESRI, FEMA

100-Year Floodplain
City Boundary

N 0 750 1,500 3,000 Feet

McLean County
NORTH DAKOTA



100-Year Floodplain
Critical, Strategic & Key Facilities - Washburn

Figure 4.3-4

Source: NDGISHUB, ESRI, FEMA

100-Year Floodplain
City Boundary

N 0 600 1,200 2,400 Feet

McLean County
NORTH DAKOTA

Localized/Stormwater Flooding occurs when heavy rainfall and an accumulation of runoff overburden a stormwater drainage system. Culverts and other drainage structures are blocked by sediment buildup, vegetation, or debris. An example of this type of flooding is the flooding in Washburn's Painted Woods Lake area. There, flooding caused by 10 to 12-feet-tall cattails and years of sediment buildup brought flooding to adjacent farmland[10].

Figure 4.3-5 Painted Woods Wildlife Management Area

HISTORY

McLean County was included in ten flood-related Presidential Disaster Declarations between 1989 and 2014. Since then, the county has experienced no significant flood event.

The Missouri River and Lake Sakakawea can experience elevated water levels during the spring. Ice jams in the region are often related to flooding but historically in McLean County most flooding has occurred along small creeks resulting in no major impacts or reported damages. The most recently reported ice jams were at Deepwater Creek near Raub in 2004 and 2010.

RECORDED FLOOD EVENTS[11]

Rural County - Three reported flood events 1996-2015 and a 2018 flash flood in Roseglen
Benedict - No reported flood event 1996-2021
Butte - No reported flood event 1996-2021
Coleharbor - No reported flood event 1996-2014
Garrison - One reported flood event 1996-2015 and no reported event 2015-2021
Max - One reported flood event 1996-2021
Mercer - No reported flood event 1996-2021
Riverdale - Two reported flood events 1996-2015 and none reported 2015-2021
Ruso - No reported flood event 1996-2021
Turtle Lake - No reported flood event 1996- 2021
Underwood - No reported flood event 1996- 2021
Washburn - One reported flood event 1996-2021
Wilton - No reported flood event 1996-2021

REPETITIVE LOSS ANALYSIS

A repetitive loss property is a property for which two or more flood insurance claims of more than $1,000 have been paid by the NFIP within any 10-year period since 1978. The most recent NFIP records show one repetitive property within the City of Garrison, a single-family structure, which has not been mitigated, as of July 18, 2022.

[10] https://www.mooreengineeringinc.com/2017/08/07/flood-control-fishing-funding-washburn-wildlife-area-expansion/

[11] Results 1996-2015 from 2016 Plan; recent from www.ncdc.noaa.gov/

LOCATION

Riverine and stream-related flooding is often a regional issue. Flash flooding and stormwater flooding is a county-wide issue with local impacts.

PROBABILITY

By definition, areas designated Zone A (100-Year Floodplain) on a FEMA regulatory FIRM map are areas that have a one-percent chance of being inundated by a flood event in any given year. This delineation is a useful way to identify the county's most at-risk areas, but while weather forecasting can project periods of heavy rain, the likelihood of flooding, particularly for non-riverine flooding is difficult to predict,

VULNERABILITY

PEOPLE AND PROPERTY – RIVERINE FLOODING

Those living and working in the designated Zone A (100-Year Floodplain) along the Missouri River are vulnerable to riverine flooding (Figure 4.3-13). Within McLean County, three cities include FIRM Zone A (100-Year Floodplain) areas within their boundaries. See Figure 4.3-14 (Garrison), Figure 4.3-15 (Riverdale) and Figure 4.3-16 (Washburn). These figures also show the cities' key facilities.

ADDITIONAL FLOODING VULNERABILITY

Base Level Engineering (BLE) is a non-regulatory FEMA product that does not replace the regulatory FIRM riverine floodplain mapping but provides additional information on areas identified as prone to flooding. Because the cities in McLean County have varying risks for flooding, the BLE data are presented separately for each in Figure 4.3-13 to Figure 4.3-16.

- The City of Benedict does not include any areas designated Zone A (100-Year Floodplain). The city does have one property with structures, which has a one percent chance of flooding.
- The City of Butte does not include any areas designated Zone A (100-Year Floodplain). The city does have three properties with structures, which have a one percent chance of flooding.
- The City of Coleharbor does not include any areas designated Zone A (100-Year Floodplain). The city does have two properties with structures, which have a one percent chance of flooding.
- The City of Garrison has a FIRM (Figure 4.3-2) and land that is within the designated Zone A (100-Year Floodplain). The Garrison wastewater treatment facility is the only known critical facility located in an identified floodplain. The city also has 43 properties with structures, which have a one percent chance of flooding.
- The City of Max does not include any areas designated Zone A (100-Year Floodplain). The city does have two properties with structures, which have a one percent chance of flooding.
- The City of Mercer does not include any areas designated Zone A (100-Year Floodplain). The city does have five properties with structures, which have a one percent chance of flooding.
- The City of Riverdale has a FIRM (Figure 4.3-3) and a narrow band of land along the Missouri River that is designated Zone A (100-Year Floodplain). No known critical facility located in an identified floodplain. The city does have one property with structures, which has a one percent chance of flooding.

- The City of Ruso does not include any areas designated Zone A (100-Year Floodplain). The city has no properties with structures, which have a one percent chance of flooding.
- The City of Turtle Lake does not include any areas designated Zone A (100-Year Floodplain). The city does have 20 properties with structures, which have a one percent chance of flooding.
- The City of Underwood does not include any areas designated Zone A (100-Year Floodplain). The city does have 20 properties with structures, which have a one percent chance of flooding.
- The City of Washburn has a FIRM (Figure 4.3-4) and a narrow band of land along the Missouri River that is designated Zone A (100-Year Floodplain). A few homes and other uses are close to the floodplain, but no known critical facility located in an identified floodplain. The city does have four properties with structures, which have a one percent chance of flooding.
- The City of Wilton does not include any areas designated Zone A (100-Year Floodplain). The city does have 11 properties with structures, which have a one percent chance of flooding.

Figure 4.3-6
FEMA Base Level Engineering (BLE) Maps for the Cities of McLean County

City of Benedict - FEMA BLE Map

City of Butte - FEMA BLE Map

City of Coleharbor - FEMA BLE Map

City of Garrison - FEMA BLE Map **See also Figure 4.3-2**

City of Max - FEMA BLE Map

City of Mercer - FEMA BLE Map

City of Riverdale - FEMA BLE Map See also Figure 4.3-3

City of Ruso - FEMA BLE Map

City of Turtle Lake - FEMA BLE Map

City of Underwood- FEMA BLE Map

City of Washburn - FEMA BLE Map See also Figure 4.3-4

City of Wilton- FEMA BLE Map

ADDITIONAL RESOURCES

The primary initiatives of the North Dakota State Water Commission are:

- Address imminent flood or dam related threats to human life, primary residences, or emergency response efforts.
- Support projects that protect primary residences or businesses from flooding in population centers or involve flood recovery.
- Support advancement of federally authorized flood control projects.

PEOPLE AND PROPERTY – STORMWATER FLOODING

Vulnerability to stormwater flooding is due to design failure or lack of proper maintenance.

EXISTING CAPABILITIES

Locally, the McLean County Water Resource District is responsible for dealing with all water issues in the county. McLean County uses "CodeRED" to notify the public of flood hazard events and other emergencies.

The county and six cities (Coleharbor, Garrison, Max, Underwood, Washburn, and Wilton) participate in the National Flood Insurance Program as shown in Table 4.3-1, have Floodplain Administrators (Table 7.1-2) and floodplain ordinances (Table 7.1-3). The county and these six cities now use the North Dakota Risk Assessment Map Service (NDRAM) to visually display current flood risks, both approximate floodplains from BLE and effective regulatory floodplains from FEMA's NFIP. This new tool will also provide them with water surface elevations, flood depths, and the

ability to download engineering model data and print customized maps making it useful for their planning, mitigation, and disaster recovery actions.

Table 4.3-1
PARTICIPATING IN THE NATIONAL FLOOD INSURANCE PROGRAM

Community	Initial FHBM Identified	Initial FIRM Identified	Current Eff Map	Reg-Emer Date
County	-	06/4/87	08/19/10	06/4/87
Coleharbor	-	08/19/10	NSFHW	05/15/84
Garrison	12/26/75	08/19/10	08/19/10	05/15/84
Max	-	08/19/10	NSFHW	04/12/89
Underwood		08/19/10	NSFHW	01/30/84
Washburn	03/22/74	08/19/10	08/19/10	08/19/10
Wilton	11/14/75	08/19/10	NSFHW	04/25/97
MHA	06/28/74	04/05/88	04/05/88	04/05/88

Source: www.fema.gov/cis/ND.pdf
Note: only part of the Fort Berthold Reservation is in McLean County

The county's Floodplain Administrator is responsible for floodplain administration in rural McLean County as well as the cities without a floodplain administrator.

NATIONAL FLOOD INSURANCE PROGRAM

On the federal level, FEMA provides the National Flood Insurance Program (NFIP), support in a flooding event and guidance in preparing for floods. Most homeowner insurance does not cover flood damage; flood insurance is a separate policy. makes flood insurance available to residents in NFIP-participating communities that adopt and enforce a local floodplain management ordinance which is intended to prevent unsafe development in the floodplain, thereby reducing future flood damages. Table 4.3-1 indicates the participating communities.

[12] See Appendix D

FLOOD INSURANCE RATE MAPS (FIRM)

The FEMA Regulatory Flood Insurance Rate Maps display the effective regulatory floodplains from FEMA's NFIP. Parts of three cities, Garrison (Figure 4.3-14), Riverdale (Figure 4.3-15), and Washburn (Figure 4,3-16) are designated Zones A (also known as a 100-year floodplain) areas with a one percent annual chance of flooding

CHANGES IN DEVELOPMENT

The likelihood of future flood damage can be reduced through appropriate land use planning including consideration of the BLE data, building siting, and compliance with applicable state and federal regulations. Both regulations and personnel are in place to address this.

IMPACT

The impact of flood event varies depending on the severity, length of time, location, and extent of the incident area. Outside of the incident area are likely to be light or moderate, FEMA estimates of the flood impact are presented in Table 4.3-2 and Table 4.3-3.

PEOPLE

Flooding, especially flash floods, can put people at risk during the event. After a flood there can be health risks from debris and standing water. There are costs and inconvenience in repairing flood damaged property and there can also be psychological impacts from seeing one's home damaged and worry that it could happen again.

Table 4.3-2
RIVERINE FLOODING - EXPECTED ANNUAL LOSS VALUES[12]

Total	Building Value	Population Equivalence	Population	Agricultural Value
$63,662	$39,293	$4,392	0.00	$19,977

Table 4.3-3 RIVERINE FLOODING - HISTORIC LOSS RATIOS[13]			
Overall Rating	**Building Value**	**Population**	**Agriculture Value**
Very Low	$9.20 per $1K	2.90 per 100K	$3.80 per $10

Source for Table 4.3-2 and Table 4.3-3
https://hazards.fema.gov/nri/report

PROPERTY

A flood event could include property damage. Buildings, transportation, and utility infrastructure may be damaged or destroyed in the incident area(s). Additional impacts could include agricultural loss (crops, livestock), contamination of water supplies, economic loss, a disruption in commercial activities, road closures and detours, and delayed emergency responses. For less serious flood events, the most common impact on structures is flooded basements due to saturated soil.

CRITICAL, STRATEGIC, AND KEY FACILITIES

No critical facilities have a history of flooding. See (Figure 4.3-2, Figure 4.3-3, and Figure 4.3-4), The FEMA FIRM Zone A for Garrison shows that the wastewater treatment lagoons located within the floodplain. The lagoons are elevated and have no history of flood damages.

AGRICULTURE

The NDDES Plan information about flood-related crop insurance payments for riverine flooding in McLean County from 2003 to 2018 shows a total between $1M and $1.5M. In 2020 there was only one claim for flood-related crop loss.

KEY ISSUES AND RELATED MITGATION PROJECTS

KEY ISSUE

McLean County's experience would indicate a lower risk of significant flooding, but flood events are possible.

Related Mitigation Actions

#A Organize a floodplain management workshop
#E Acquire and remove repetitive loss properties
#2 Review adopted floodplain ordinances
#4 Drainage improvements and/or elevation for rural roads throughout the county, as needed

KEY ISSUE

Providing information to the public about flood risks and coordinating of a response to a flood event are critical.

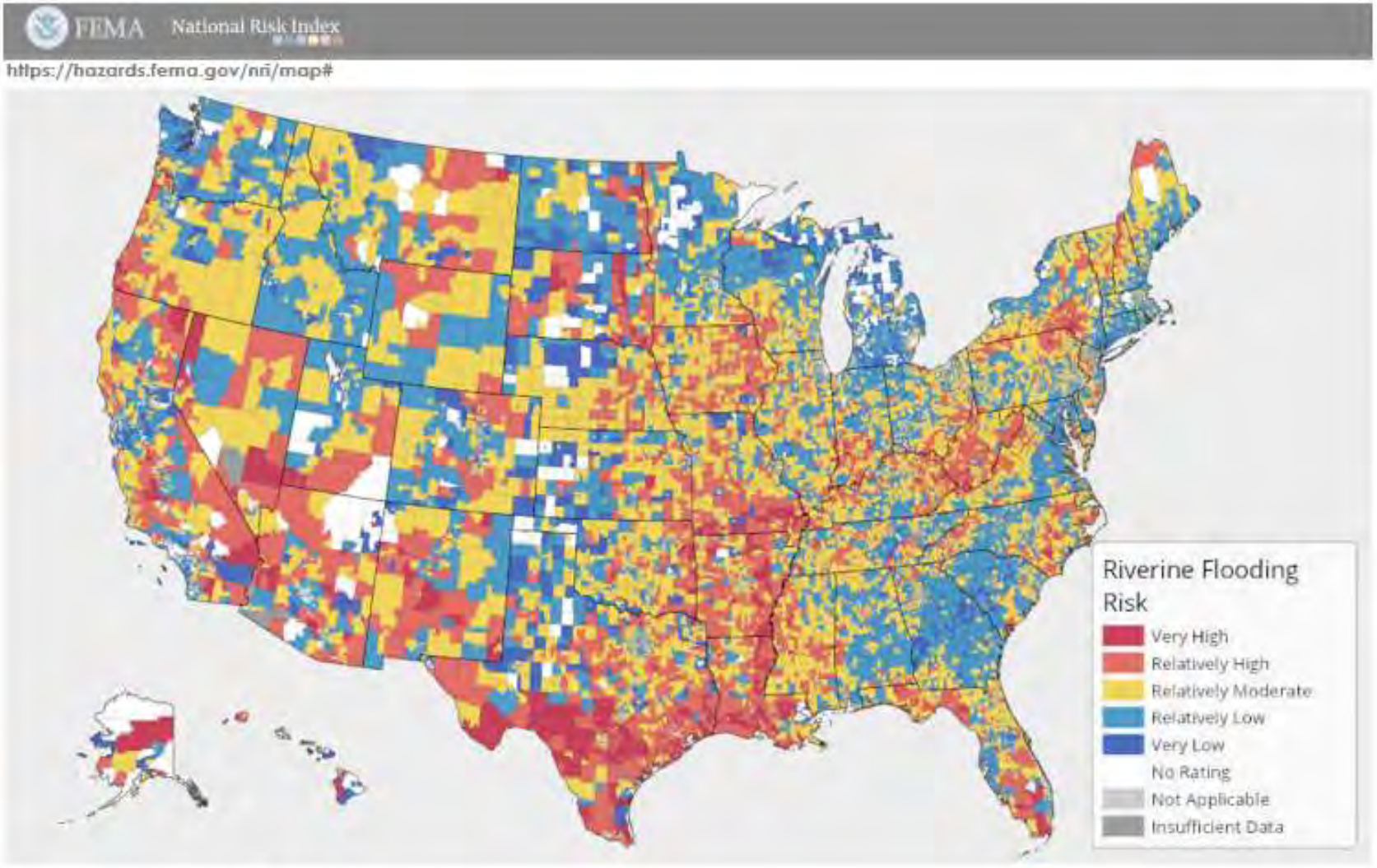
Related Mitigation Actions

#D Improve inter-departmental radio communication and prepare for the rollout of Statewide Interoperability Radio Network (SIRN 2020).
#I Distribute hazard Information via the county and city websites, social media, traditional media, and other existing interfaces.
#15 Utilize a redundant and multiple methods for local warnings if primary communications are interrupted.
#17 Continue to support mutual aid agreements and on-scene incident command.
#19 Identify location and organize outreach to vulnerable populations during hazard events

NATIONAL RISK INDEX

FEMA's National Risk Index Map for riverine flooding risk follows. See also Appendix D.

[13] See Appendix D



Hazard Type Risk Ratings

Compared to the rest of the U.S., **McLean County, ND's** risk to Riverine Flooding is **Very Low**
See Appendix D for additional information.

4.4 GEOLOGIC HAZARDS

RISK LEVEL- High | Moderate | Low | Very Low

Hazard Risk applies to:	Hazard	Location	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score[14]
All cities + rural county	Earthquake	Regional	Unlikely	Minor	Negligible	Less than 6 hours	Less than 24 hours	**1.20**
Coleharbor, Garrison, Riverdale, Underwood, Washburn, and Wilton	Landslide	Local	Possible	Minor	Negligible	6 to 12 hours	Less than 24 hours	**1.20**
All other cities	Landslide	Local	Unlikely	Minor	Negligible	6 to 12 hours	Less than 6 hours	**1.05**

OVERVIEW

Earthquakes and landslides are the two geologic hazards which pose any, although unlikely, threat to the county.

Earthquake

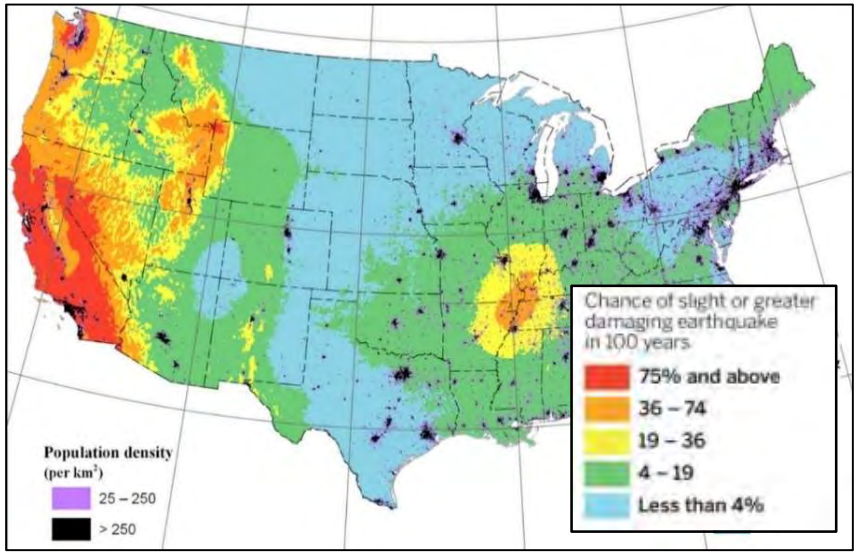


Figure 4.4-1 USGS 2019 Earthquake Risk Map See Table 4.4-2
Source.usgs.gov/media/images/2018-nshm-chance-shaking-image

HAZARD PROFILE

An earthquake is defined by US Geological Survey (USGS) as a sudden movement of the earth caused by the abrupt release of strain that has accumulated over a long time.

Figure 4.4-2 The Five Recorded North Dakota Earthquakes
Source.usgs.gov

HISTORY AND LOCATION

Figure 4.4-2 shows the location of five earthquakes since 1915 . The closest was on November 15, 2008 about 30

[14] Priority Risk Index (PRI) Scores range from 1-4. See Chapter 6

miles east of the county's eastern border. There are few differences between the local jurisdictions. There is no earthquake history in McLean County. While earthquakes are an unlikely hazard event, they would be considered to be a regional hazard.

PROBABILITY

According to the USGS (Figure 4.4-1), the probability of a slight or greater damaging earthquake in the region is less than four percent in 100 years.

VULNERABILITY

"Earthquakes have been felt in North Dakota but usually do not result in damage"[15].

PROPERTY

Figure 4.4-1 represents the region in a blue color indicating Intensity IV on the Modified Mercalli Intensity (MMI Scale). Even at the Intensity V level, which is more intense than predicted, it is likely that only the county's oldest housing structures would be impacted (Table 4.4-2). The U.S. Census ACS 2019 estimates show 933 housing units in the county (15% of total) were built before 1939 (Table 4.4-1).

Table 4.4-2
MODIFIED MERCALLI INTENSITY (MMI) SCALE

MMI Scale	People's Reaction	Furnishings	Built Environment
I	Not felt		
II	Felt by few	Delicately suspended objects may swing.	
III	Felt by several; vibration like the passing of a truck.	Hanging objects may swing appreciably.	
IV	Felt by people walking	Dishes rattle.	Walls creak; windows rattle.
V	Felt by nearly all; frightens a few. Sleepers awake.	Pictures swing out of place; small objects move; a few objects fall from shelves.	A few instances of cracked plaster and cracked windows.

PEOPLE

Applying the county's average 2020 household size of 2.18 persons, there are between 1,800 and 2,000 McLean County residents, and about half of them living in cities, who have some vulnerability to earthquakes.

Table 4.4-1
HOUSING UNITS AND PEOPLE VULNERABLE TO AN EARTHQUAKE

	Benedict	Butte	Coleharbor	Garrison	Max	Mercer	Riverdale
Older Structures	5	33	6	129	37	13	0
Residents	10	71	13	281	80	28	0

	Ruso	Turtle Lake	Underwood	Washburn	Wilton	Rural McLean County
Older Structures	0	45	52	149	99	365
Residents	0	98	113	324	215	795

[15] NDDES Plan page 160

CRITICAL, STRATEGIC, AND KEY FACILITIES

The oldest facilities in each of the participating cities and rural McLean County, including some city halls, churches, and grain elevators, would be most vulnerable during an earthquake but there is no history of earthquakes in the county causing structure damage.

EXISTING CAPABILITIES

The State Building Code prohibits construction on steep slopes and provides general standards that contribute to earthquake resiliency.

McLean County uses their "CodeRED" to notify the public of hazard events and other emergencies. A link to the program is on the county website.

CHANGES IN DEVELOPMENT

Building codes substantially reduce the costs of damage to future structures from earthquakes. Future construction in the county must follow the applicable requirements of the State Building Code which provides general standards that contribute to earthquake resiliency.

IMPACT

As stated previously, earthquakes are unlikely and the impact of any earthquake in McLean County is expected to be minor. The FEMA estimates of the impact of an earthquake are presented in Table 4.4-2 and Table 4.4-3.

Table 4.4-2
EARTHQUAKE - EXPECTED ANNUAL LOSS VALUES[16]

Total	Building Value	Population Equivalence	Population	Agricultural Value
$454	$434	$20	0.00	n/a

Source for Table 4.4-2 and Table 4.4-3
https://hazards.fema.gov/nri/report

Table 4.4-3
EARTHQUAKE - HISTORIC LOSS RATIOS[17]

Overall Rating	Building Value	Population	Agriculture Value
Very Low	$1.68 per $100	1.40 per 10K	n/a

PEOPLE

The McLean County residents who live in older structures and those who work in the older structures, may not be impacted at all, or have minor impact

PROPERTY INCLUDING CRITICAL, STRATEGIC, AND KEY FACILITIES

Structures built before 1939 including residences, agricultural structures, some city halls, churches, and grain elevators, may not be impacted at all or be impacted in a minor way by an earthquake.

KEY ISSUES AND RELATED MITGATION ACTIONS

Key issues and related mitigation actions for both earthquake and landslide events are located at the end of the landslide discussion.

.

"Earthquakes not North Dakota's problem"
Bismarck Tribune March 31, 2016

[16] See Appendix D

[17] See Appendix D

Landslide

HAZARD PROFILE

The US Geological Survey (USGS) defines a landslide as a movement of rock, soil, artificial fill, or a combination thereof on a slope in a downward or outward direction. The primary causes of landslides are slope saturation by water from intense rainfall, snowmelt, or changes in groundwater levels on primarily steep slopes, earthen dams, and the banks of lakes, reservoirs, canals, and rivers.

HISTORY

Minor landslides have occurred in areas along the Missouri River and local creeks shown in pink on Figure 4.4-4, There is no history of a landslide causing significant damage in the county or in any of the cities, but rural roads have had minor damage in the past.

LOCATION

Landslides are local in impact. The North Dakota Geological Society(NDGS) maps indicate areas along the Missouri River, and creeks, which indicate areas of previous and susceptibility to landslide events (Figure 4.4-4).

Figure 4.4-3 Missouri River in the winter
Source: mcleancountynd.gov

which shows the Washburn area. The coulee north of Riverdale (Figure 4.4-5),streams and coulees across rural McLean County with the same landslide susceptibility.

PROBABILITY

The USGS and NDGS landslide susceptibility data and maps, which provide tools for hazard assessment prior to an event that may cause landslides, designate areas across the U.S. as having "very-high", "high", and "moderate" susceptibility. As during preparation of the 2016

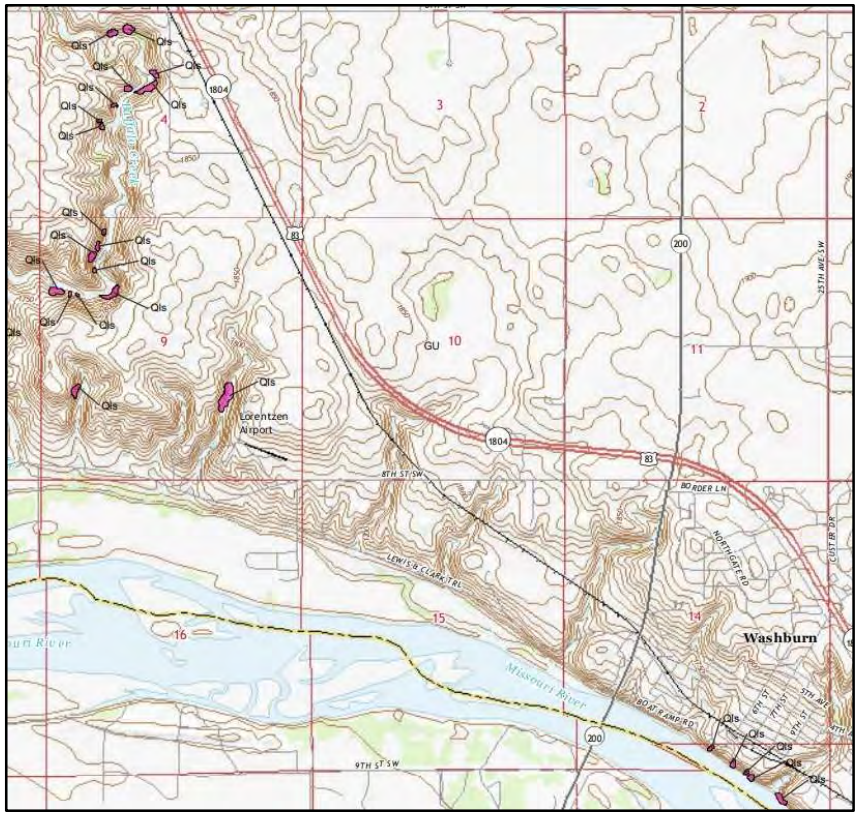


Figure 4.4-4 Landslide Susceptibility (Areas in pink are landslides)
Source: www.dwr.nd.gov

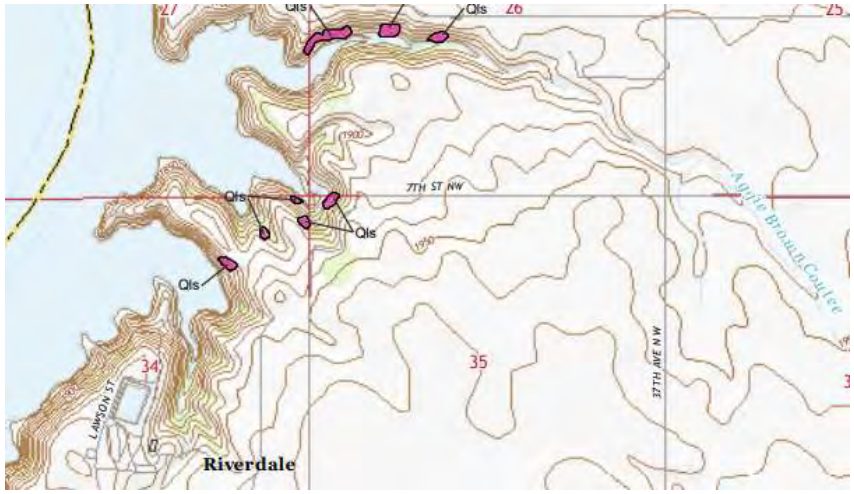


Figure 4.4-5 Landslide Susceptibility (Areas in pink are landslides)
Source: www.dwr.nd.gov

Plan, the western part of McLean County is designated "Moderate susceptibility/low incidence" of landslide as defined by USGS and The rest of the county is designated as having low incidence.

VULNERABILITY

PEOPLE AND PROPERTY

The Cities of Coleharbor, Garrison, Riverdale, Underwood, Washburn, and Wilton are within the area designated as having "Moderate susceptibility/low incidence" ; the rest of the cities are in the area designated "low Incidence." Of the designated cities, only the areas near Riverdale and Washburn are mapped by the NDGS.as being landslide susceptible

People and existing developed properties are unlikely to sustain serious physical harm as a result of landslides in McLean County. Impacts would be relatively minor and highly localized. There are some rural roads that could sustain minor damage from small landslides during times of increased moisture but as mentioned above, no landslide event in the county has resulted in injuries or fatalities.

CRITICAL, STRATEGIC, AND KEY FACILITIES

The moderate susceptibility landslide hazard area shown in Figure 4.4-3 in green includes about 105 critical facilities, but it is likely that very few of these facilities are actually vulnerable to landslide. There is no history of landslides in the county causing structure damage.

EXISTING CAPABILITIES

The State building code provides general standards that prohibit construction on steep slopes and lessen potential for damage due to any landslide event. The county's handout to developers (Appendix F). can also address this matter.

McLean County uses their "CodeRED" to notify the public of hazard events and other emergencies. A link to the program is on the county website.

CHANGES IN DEVELOPMENT

Although McLean County faces low susceptibility and incidence of landsides, future development projects should consider slope and soil slippage potential at the planning, engineering, and architectural design stage with the goal of reducing vulnerability.

IMPACT

The number of people and developed properties that are actually vulnerable to a landslide is very low and, as stated previously, a landslide that is more than a minor event. is

unlikely and any impact is expected to be minimal. The FEMA estimates of the impact of an earthquake are presented in Table 4.4-2 and Table 4.4-3.

Table 4.4-4
LANDSLIDE - EXPECTED ANNUAL LOSS VALUES[18]

Total	Building Value	Population Equivalence	Population	Agricultural Value
$13,074	$656	$12,417	0.00	n/a

Source for Table 4.4-4 and Table 4.4-4
https://hazards.fema.gov/nri/report

Table 4.4-5
LANDSLIDE - HISTORIC LOSS RATIOS[19]

Overall Rating	Building Value	Population Equivalence	Population	Agricultural Value
Very Low	$2.25 per $10K	1.12 per 10K	n/a	Very Low

PEOPLE AND PROPERTY INCLUDING CRITICAL, STRATEGIC, AND KEY FACILITIES

There is no history of injuries or fatalities related to landslide in McLean County. A landslide event, if one should happen close to a developed area of the county or a roadway, could cause minor property damage or result in the need for debris removal. but significant damage is not anticipated.

KEY ISSUES AND RELATED MITGATION PROJECTS FOR BOTH EARTHQUAKE AND LANDSLIDE EVENTS

KEY ISSUE

McLean County's experience would indicate a lower risk of an earthquake event or a landslide that causes more than minor damage and the need for debris removal but both earthquakes and landslides are possible.

Related Mitigation Actions

#18 Continue to support upgrading existing or purchase new equipment and infrastructure for emergency services including snow removal services, as needed.

KEY ISSUE

Providing information to the public about the risks of an earthquake or landslide event and coordinating of a response to an event are critical.

Related Mitigation Actions

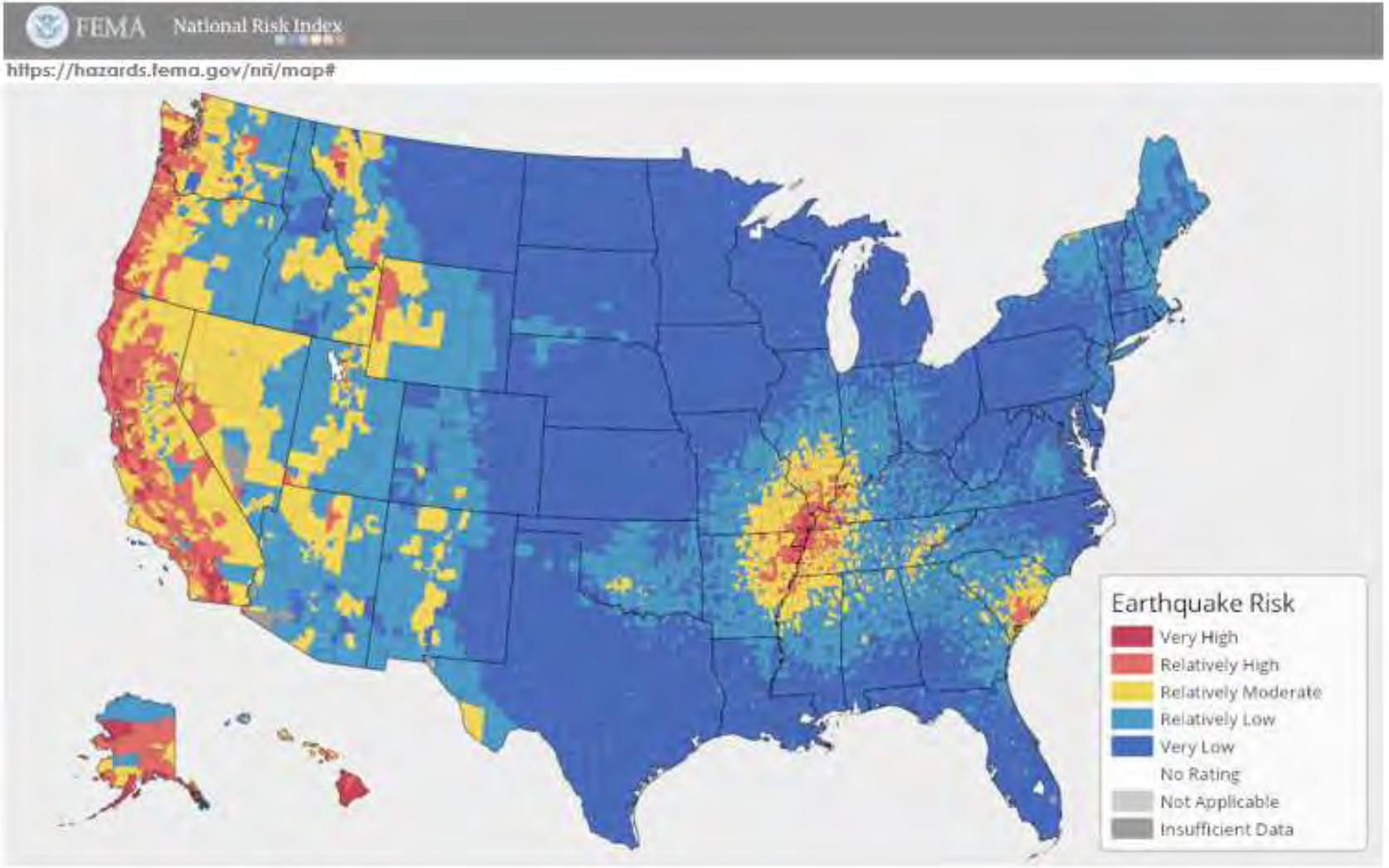
#D Improve inter-departmental radio communication and prepare for the rollout of Statewide Interoperability Radio Network (SIRN 2020).
#I Distribute hazard Information via the county and city websites, social media, traditional media, and other existing interfaces.
#15 Utilize a redundant and multiple methods for local warnings if primary communications are interrupted.
#17 Continue to support mutual aid agreements and on-scene incident command.
#19 Identify location and organize outreach to vulnerable populations during hazard events

NATIONAL RISK INDEX

National Risk Index maps on earthquake and landslide follow. See also Appendix D.

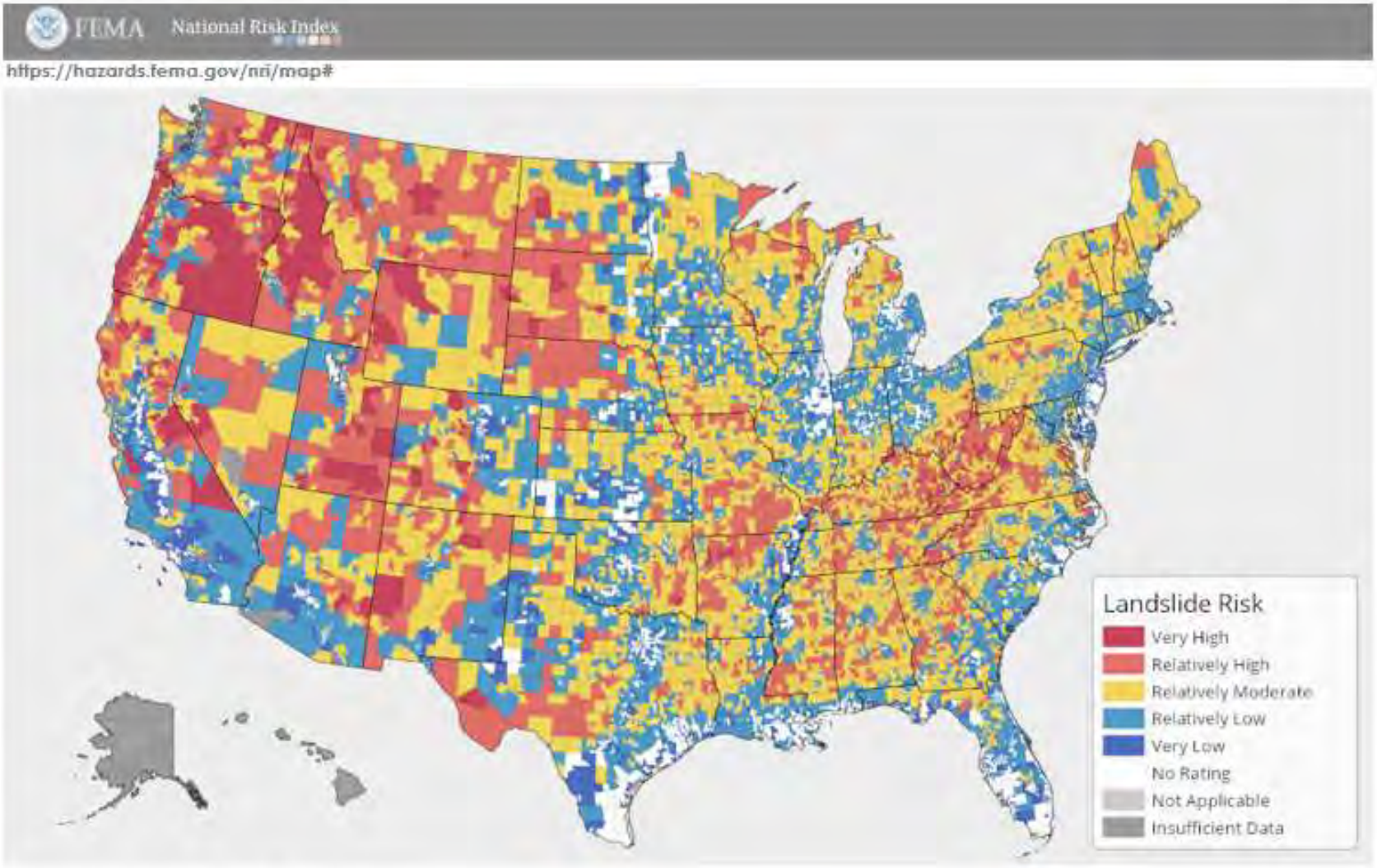
[18] See Appendix D

[19] See Appendix D



Hazard Type Risk Ratings

Compared to the rest of the U.S., **McLean County, ND's** risk to Earthquake is **Very Low**
See Appendix D for additional information.



Hazard Type Risk Ratings

Compared to the rest of the U.S., **McLean County, ND's** risk to Landslide is **Relatively Low**

4.5 MAJOR WILDLAND/RURAL FIRE

RISK LEVEL- High | Moderate | Low | Very Low

Jurisdiction	Location	Probability	Impact	Spatial Extent[20]	Warning Time	Duration	PRI Score[21]
Rural County	Local	Very Likely	Limited	Moderate	6- 12 hrs.	Less than 24 hrs.	**2.08**
Benedict	Local	Likely	Limited	Moderate	6- 12 hrs.	Less than 6 hrs.	**2.28**
Butte	Local	Possible	Limited	Small	6- 12 hrs.	Less than 6 hrs.	**1.76**
Coleharbor	Local	Possible	Limited	Negligible	6- 12 hrs.	Less than 6 hrs.	**1.56**
Garrison	Local	Likely	Limited	Small	6- 12 hrs.	Less than 6 hrs.	**1.76**
Max	Local	Possible	Limited	Negligible	6- 12 hrs.	Less than 6 hrs.	**1.56**
Mercer	Local	Very Likely	Limited	Large	6- 12 hrs.	Less than 6 hrs.	**2.28**
Riverdale	Local	Likely	Limited	Moderate	6- 12 hrs.	Less than 6 hrs.	**2.28**
Ruso	Local	Possible	Limited	Negligible	6- 12 hrs.	Less than 6 hrs.	**1.56**
Turtle Lake	Local	Possible	Limited	Negligible	6- 12 hrs.	Less than 6 hrs.	**1.40**
Underwood	Local	Possible	Limited	Negligible	6- 12 hrs.	Less than 6 hrs.	**1.56**
Washburn	Local	Likely	Limited	Moderate	6- 12 hrs.	Less than 6 hrs.	**2.28**
Wilton	Local	Possible	Limited	Small	6- 12 hrs.	Less than 6 hrs.	**1.76**

OVERVIEW

The wildland/rural fire hazard is regional in nature. There is potential for wildland/rural fire across McLean County and that threat varies each year depending on the weather. In April 2021, North Dakota Governor Doug Burgum said, "North Dakota must be prepared to respond to wildland fires during periods of ongoing dry conditions and drought patterns" This chapter addresses that challenge.

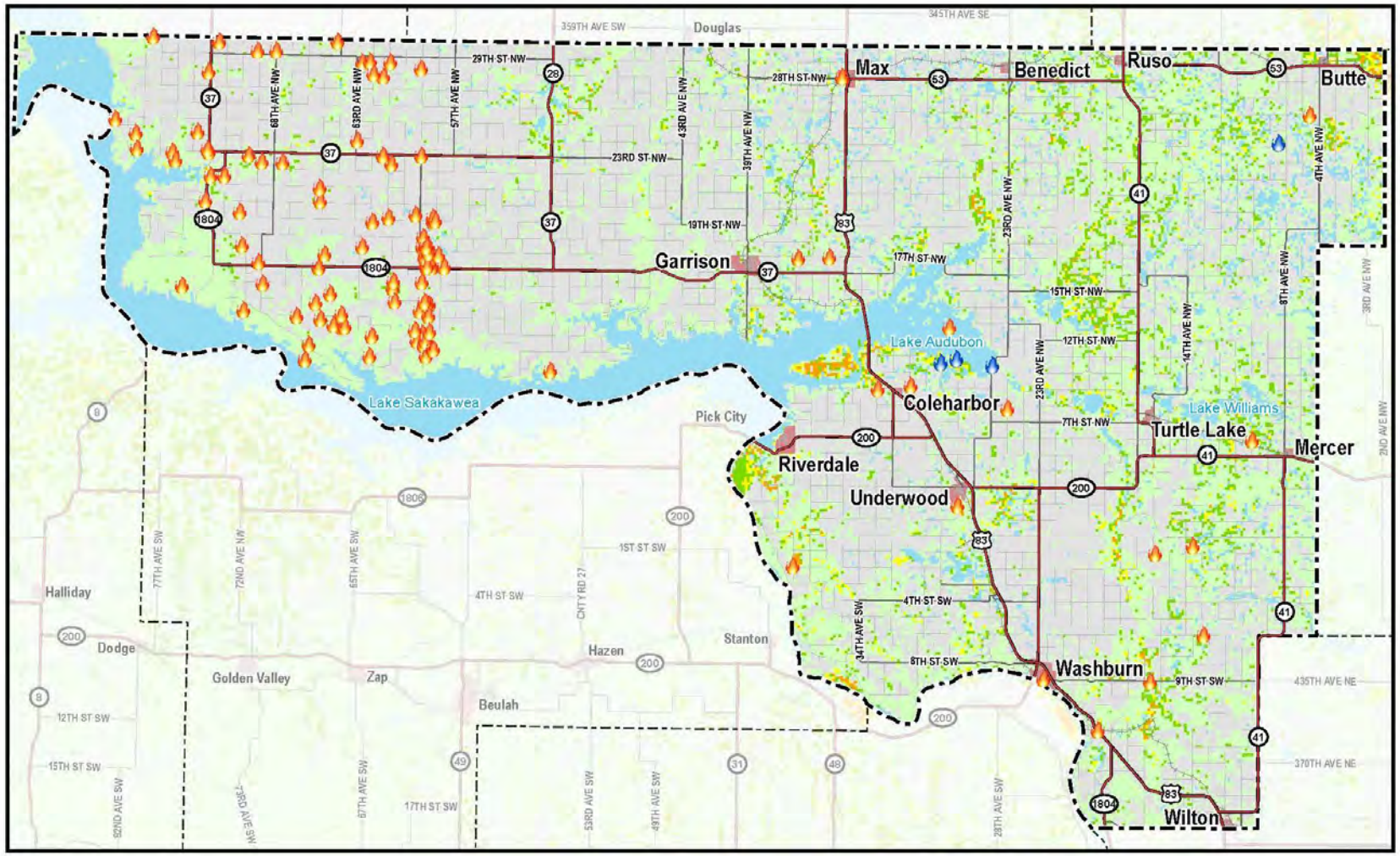
HAZARD PROFILE

Although wildland/rural fires are both natural and human-caused, discussion is included in this chapter only. Figure 4.5-1 shows the location of recorded wildland/rural fires and areas with wildfire potential according to the USDA. Wildland/rural fires pose threats anywhere that structures are built close to natural vegetation.

WILDLAND-URBAN INTERFACE AREAS

The three major factors that contribute to the occurrence and severity of wildfires are the fuels supporting the fire, the weather conditions during a fire event and the topography in which the fire is burning. Both topography and weather are beyond local control. Fuel is the only factor influencing fire behavior that humans have the ability to manage.

[20] Spatial extent relates to the percentage of a jurisdiction
[21] Priority Risk Index (PRI) Scores range from 1-4. See Chapter 6.



Recent Wildland Fires and Hazard Potential

Source: National Interagency Fire Center, USDA 2020

Wildfire Hazard Potential:
- High
- Moderate
- Low
- Very Low
- Limited Burnability
- Water

Wildfires (2003-2021):
- Prescribed Fire
- Wildland Fire
- McLean County Boundary
- Other County Boundary
- Cities

N 0 4 8 16 Miles

Figure 4.5-1

The most prevalent fuels in McLean County are of the grass and brush groups. These fuels generally burn with a low intensity, but can spread quickly. Much of the county is agricultural land, which is not considered to be a significant fuel; however, in times of drought or during harvest season agricultural fields may present a wildfire risk. Figure 4.5-1 designates these areas as "limited burnability".

HISTORY

Figure 4.5-1 also indicates wildland fires in McLean County between 2003 and 2021. Most have occurred in the sparsely developed area in Northwest McLean County. Historically, a wildland-urban interface is an area of at least 1,000 feet around each of the county's existing developed areas as illustrated on Figure 4.5-2. This approach does not account for the existing vegetation in these buffer areas.

Figure 4.5-2 Wildland-Urban Interface (1,000-foot buffer around each city)

Table 4.5-1
VULNERABLE CRITICAL, STRATEGIC, AND KEY FACILITIES

RURAL AREAS OF THE COUNTY Ottertail and Snake Creek substations Washburn Municipal Airport McLean-Sheridan Rural Water Fort Stevenson State Park Coal Creek Station Falkirk Mining Co	**MERCER** Wastewater Lagoons
BENEDICT Ottertail Substation Sewage Lift Station	**RIVERDALE** Water Treatment Facility Wastewater Lagoons City Shop + City Maintenance MSC EMS Lift Station
BUTTE Wastewater Treatment Lagoons	**RUSO** n/a
COLEHARBOR Ottertail substation	**TURTLE LAKE** City Shop Farmers Union Oil Company Ottertail Substation Equity Elevator and Trading
GARRISON Airport Cenex Bulk Fuel Plant MDU Border Station Wastewater Lagoons Ottertail Substation McLean County Highway Department USDA Farm Service Agency ND DOT McLean Electric WPA Department of Energy Garrison Ambulance Barn	**UNDERWOOD** City Hall Wastewater Treatment Lagoons ND DOT
	WASHBURN Wastewater Treatment Lagoons Ottertail substation ND Lewis and Clark Interpretive Center Washburn Clinic/Chiropractic
	WILTON Elevator Wastewater Treatment Lagoons Cenex Bulk Fuel Plant
MAX n/a	

The Silvis Lab at the University of Wisconsin-Madison[22] has refined the wildland-urban interface concept. Their wildland-urban interface areas identify specific locations where fire can spread from vegetation to structures, or from structures to vegetation. Any areas where structures are located within or adjacent to natural vegetation are included within the wildland-urban interface. Their work starts with mapping existing vegetation, similar to North Dakota's NDGISHub Land Use Land Cover mapping (Figure 2.5-3) and develop map two types of Wildland-Urban Interface (WUI) designations. Excerpts from their work are shown as Figure 4.5-3.

Because the cities have varying risks, specific information on each city is presented on the next few pages. These maps show two types of Wildland-Urban Interface (WUI) areas: intermix and interface.

The **Intermix WUI** (yellow overlay)are areas where housing and vegetation intermingle.

The **Interface WUI** (orange overlay)are areas with housing in the vicinity of contiguous wildland vegetation.

LOCATION

Wildland/Rural Fire is usually a localized event, but the extent of a potential event varies widely.

[22] Wildland-Urban Interface (WUI) Change 1990-2010 – SILVIS LAB – UW–Madison (wisc.edu)

Figure 4.5-3

Wildland-Urban Interface (WUI) Maps for the cities of McLean County

In the **Intermix WUI**, housing and vegetation intermingle and in the **Interface WUI**, housing is close to contiguous wildland vegetation.

Wildland-Urban Interface (WUI) Maps for the cities of McLean County

In the **Intermix WUI**, housing and vegetation intermingle and in the **Interface WUI**, housing is close to contiguous wildland vegetation.

Wildland-Urban Interface (WUI) Maps for the cities of McLean County

In the **Intermix WUI**, housing and vegetation intermingle and in the **Interface WUI**, housing is close to contiguous wildland vegetation.

PROBABILITY

Based on previous experience, it is highly likely that there will be wildland/rural fire events in the county in the future. Some would be small fires with a very low rate of spread that are typically easy to suppress by firefighters with basic training and non-specialized equipment. Other fire events could have significant potential for harm or damage to life and property.

VULNERABILITY

PEOPLE

Wildfire can cause fatalities and human health hazards. Ensuring procedures are in place for rapid warning and evacuation are essential to reducing vulnerability. Residents of the county's rural areas and those in the wildland-urban interface areas are generally at a higher risk of wildland/rural fire.

PROPERTY

Potentially vulnerable property includes the wildland-urban interface areas shown on all of the Figure 4.5-3 maps.

CRITICAL, STRATEGIC, AND KEY FACILITIES

Although nearly all of these key facilities are within urbanized areas, which are considered defensible space for wildfire, several critical facilities are located along the edges of cities near the wildland-urban interface or in rural areas. Facilities within 100 yards of the edge of town, or the county's rural areas are listed in Table 4.5-1.

EXISTING CAPABILITIES

- All McLean County is served by a fire protection district and interlocal agreements are in place.
- For most cities and rural locations, response to a fire originates from a local fire station (See Chapter 7) but for some remote areas, response time may be lengthy.
- McLean County has the power to enact a burn ban, when necessary.
- McLean County uses "CodeRED" to notify the public of hazard events and other emergencies

CHANGES IN DEVELOPMENT

Although McLean County faces low susceptibility and incidence of wildland/rural fire, any growth within the wildland-urban interface area would increase the vulnerability of people, property, and infrastructure to wildfires. There are no review requirements or regulations for development in a wildland-urban interface area.

IMPACT

The impact of a wildland/rural fire varies depending on its severity and length of time. In McLean County, the recent drought has had serious impacts. FEMA estimates of the impact of drought are presented in Table 4.5-2 and Table 4.5-3.

Table 4.5-2
WILDLAND/RURAL FIRE - HISTORIC LOSS RATIOS

Overall Rating	Building Value	Population	Agriculture Value
Very Low	$4.00 per $10	6.04 per 10K	$1.25 per $100

Source for Table 4.5-2 and Table 4.5-3
https://hazards.fema.gov/nri/report

Table 4.5-3 WILDLAND/RURAL FIRE - EXPECTED ANNUAL LOSS VALUES[23]				
Total	**Building Value**	**Population Equivalence**	**Population**	**Agricultural Value**
$26,269	$24,531	$1,557	0.00	$181

PEOPLE

Depending on the magnitude of a wildland/rural fire incident, the impact on people experiencing a fire as well as the impact on responders, could be minimal or devastating. Among the possible impacts for residents are evacuation from homes and businesses, air quality issues, replacement, and cleanup expenses. Responders face personal danger and equipment loss during their fire suppression efforts.

PROPERTY + CRITICAL, STRATEGIC, AND KEY FACILITIES

Wildland/rural fires frequently damage community infrastructure, including roadways, communication networks and facilities, power lines, and water distribution systems. Restoring basic services is critical and a top priority. Utilities and communications repairs may also be necessary for equipment damaged by a fire. This can include power and phone lines, transformers, and cell phone towers.

KEY ISSUES AND RELATED MITGATION PROJECTS

KEY ISSUE

As shown in Table 2.3-1 and Table 2.3-2, parts of the county are growing in population. Some of that increase is in wildland-urban interface areas, placing more individuals and structures at risk for wildland/rural fire.

Related Mitigation Action

#11 Continue to support the recruitment and training of volunteers to address wildland/rural fire, urban fire, and ambulance services.
#12 Work with Rural Water to establish hydrants in areas distant from existing hydrants for fire suppression use.
#13 In wildland-urban interface areas, consider providing vegetation management services to elderly or disabled residents who need help to remove flammable materials near their homes.
#14 Coordinate with rural landowners to identify and gain access to water sources for fire suppression
#18 Continue to support upgrading existing or purchase new equipment and infrastructure for emergency services including snow removal services, as needed.

KEY ISSUE

A serious concern in the smaller communities is the aging of the volunteer firefighters and the difficulty in recruiting and keeping volunteers.

Related Mitigation Action

#11 Continue to support the recruitment and training of volunteers to address wildland/rural fire, urban fire, and ambulance services

KEY ISSUE

Construction practices and building codes can increase fire resistance and fire safety of structures. Techniques for reducing vulnerability to wildfire include using street design to ensure accessibility to fire trucks, incorporating fire resistant materials in building construction, and using

[23] See Appendix D

landscaping practices to reduce flammability and the ability for fire to spread.

Related Mitigation Action
#10 Continue to review construction under the North Dakota State Building Code and consider adopting fire codes and fire suppression requirements in new construction.

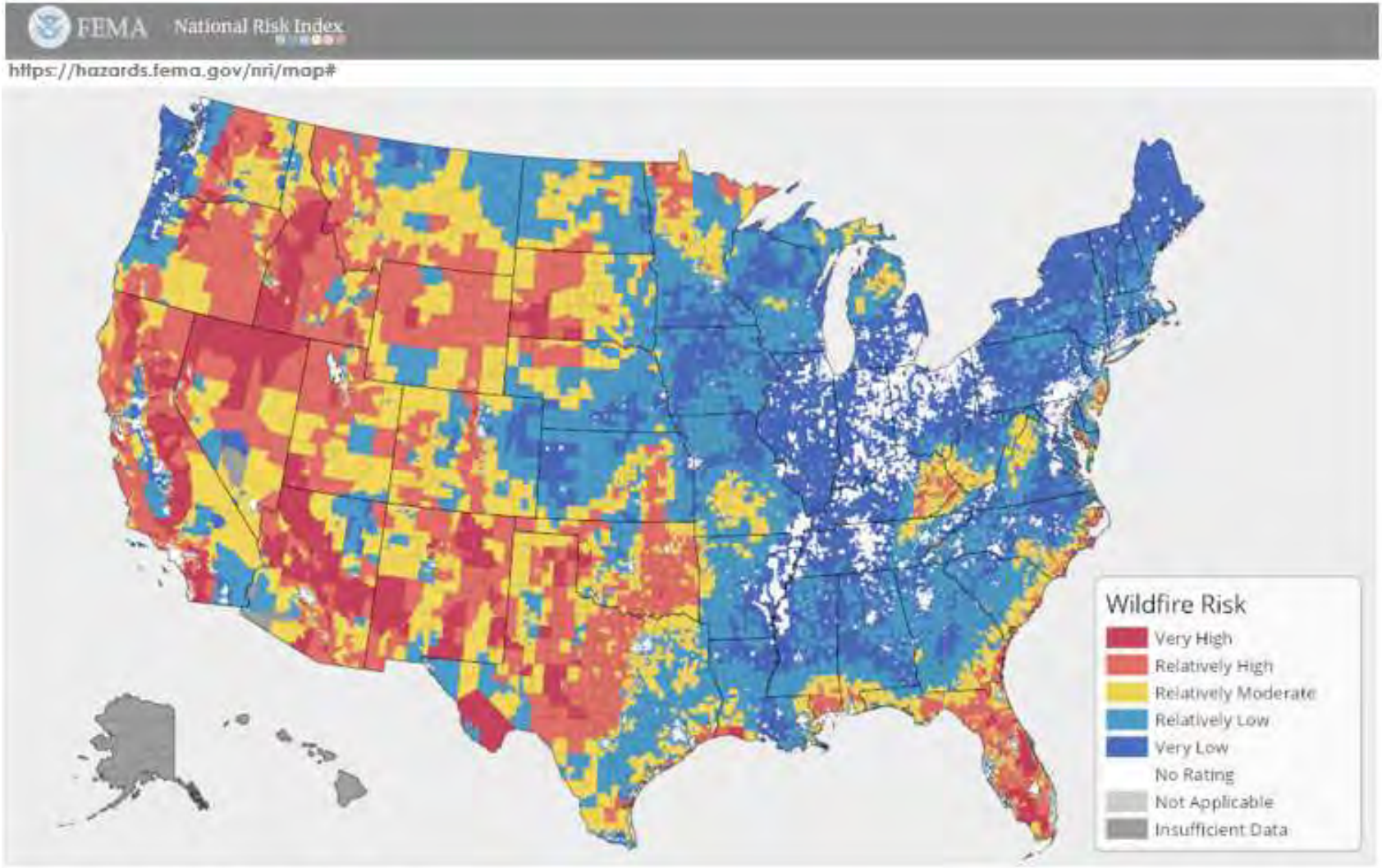
.

KEY ISSUE
Providing information to the public about the risks of Wildland/Rural Fire and coordinating of a response to a Wildland/Rural Fire event are critical.

Related Mitigation Actions
#D Improve inter-departmental radio communication and prepare for the rollout of Statewide Interoperability Radio Network (SIRN 2020).
#H Participate in Firewise education program for homeowners and implement best practices during wildfire season
#I Distribute hazard Information via the County website, social media, traditional media, and other existing interfaces.
#16 Utilize a redundant and multiple methods for local warnings if primary communications are interrupted.
#18 Continue to support mutual aid agreements and on-scene incident command.
#20 Identify location and organize outreach to vulnerable populations during hazard events

NATIONAL RISK INDEX

The National Risk Index map on wildfire follows. See also Appendix D.



Hazard Type Risk Ratings

Compared to the rest of the U.S., **McLean County, ND's** risk to Wildfire is **Very Low**
See Appendix D for additional information.

4.6 EXTREME SUMMER WEATHER

RISK LEVEL- High | Moderate | Low | Very Low

	Hazard	Probability	Impact		Spatial Extent	Warning Time	Duration	PRI Score[24]			
			Rural	City				Rural		City	
Risk for county + all cities	Hailstorm	Likely	Minor	Limited	Small	Less than 6 hrs.	Less than 6 hrs.	2.10		2.45	
	Heat Wave	Likely	Limited	Limited	Large	More than 24 hrs.	More than 24 hrs.	2.57		2.57	
	Strong Wind	Likely	Minor	Limited	Small	Less than 6 hrs.	Less than 6 hrs.	2.10		2.45	
	Thunderstorm + Lightning	Likely	Minor	Limited	Small	Less than 6 hrs.	Less than 6 hrs.	2.10		2.45	
	Tornado	Possible	Limited	Critical	Small	Less than 6 hrs.	Less than 6 hrs.	2.18		2.44	

OVERVIEW

This section addresses multiple extreme summer weather hazards: hail, heat wave, strong wind, thunderstorm, lightning, and tornado. These hazards are considered together here when discussing their history and location. Most of the discussion is specific to each summer weather hazard, Key issues related to all summer weather hazards and proposed mitigation actions are presented at the end of this section.

LOCATION

Extreme summer weather is a regional and countywide concern impacting people of all ages, agriculture, and the economy of the area; all parts of McLean County face similar exposure and risk of these hazards. Table 4,6-1 indicates the locations within the county with the most impact from these events since the 2016 Plan.

Table 4.6-1
Recorded Summer Weather Events - 2016 to 2020

Location	Hail	Strong Wind	Thunder-storm	Funnel Cloud/ Tornado	Location	Hail	Strong Wind	Thunder-storm	Funnel Cloud/ Tornado
COUNTY	4	8	5	3	RUSO	2	0	0	0
COLEHARBOR	2	3	2	1	TURTLE LAKE	5	4	4	0
GARRISON	5	22	9	0	UNDERWOOD	1	5	5	0
MAX	2	0	0	2	WASHBURN	4	6	6	0
MERCER	1	2	2	0	WILTON	2	3	2	0
RIVERDALE	1	1	1	1	TOTAL	29	54	36	7

HISTORY

The experience of extreme summer weather in McLean County includes the events included in Table 4.6-1.

CHANGES IN DEVELOPMENT

Construction practices and building codes can help lessen damage from some summer weather hazards. Discussion is included for each summer weather hazard.

[24] Priority Risk Index (PRI) Scores range from 1-4. See Chapter 6.

Hailstorm

HAZARD PROFILE

Nationally, hailstorms range in extent from a few acres up to hundreds of square miles, although small events are most common. Hailstones can fall at more than 100 mph, and reach eight inches in diameter[25]; however, most hailstones are less than two inches in diameter. A severe hailstorm event is defined as a storm producing hailstones greater than 0.75 inches in diameter.

Hailstorms frequently accompany thunderstorms, but larger-scale hailstorms tend to occur in a more localized area within a thunderstorm. The onset of thunderstorms with hail is generally rapid but advances in meteorological forecasting allow for some warning. These storms usually pass in a few hours.

HISTORY

According to the National Climatic Data Center, the largest hailstone recorded in McLean County since 1996 was 2.75 inches in diameter, which occurred in June 2009.

Hail events have been recorded 29 times in the county since the 2016 Plan was adopted (Table 4.6-1). It should be noted that hailstorms, especially those in the county's rural areas where damage is less likely to occur, are recorded less often than those in the county's cities.

PROBABILITY

Given the county's experience with hailstorm events it is very likely that hail events will continue.

[25] The largest hailstone recorded in the U.S. was found in Vivian, South Dakota on July 23, 2010; it measured eight inches in diameter.

VULNERABILITY

PEOPLE AND PROPERTY

Hailstorms presents a hazard for property, crops, livestock, and occasionally human life. All of McLean County is vulnerable to the impact of hailstorms but automobiles, residential roofs, windows, and siding are most vulnerable. Also, people across the county are at risk for severe injury if they do not seek shelter.

EXISTING CAPABILITIES

- Warning sirens and cell phone alerts can notify residents to take cover. The county's emergency shelters could protect people during a serious hailstorm event.
- McLean County uses "CodeRED" to notify the public of hazard events and other emergencies.
- Both McLean County and the City of Washburn have been approved as StormReady communities.

CHANGES IN DEVELOPMENT

Construction practices and building codes can help lessen damage from some summer weather hazards.

IMPACT

The impact of a hailstorm event varies depending on its severity and length of time. The FEMA estimates of the impact are presented in Table 4.6-2 and Table 4.6-3.

Table 4.6-2
HAILSTORM- EXPECTED ANNUAL LOSS VALUES[26]

Total	Building Value	Population Equivalence	Population	Agricultural Value
$56,106	$13,538	$20,424	0.00	$22,145

Source for Table 4.6-2 and Table 4.6-3:
https://hazards.fema.gov/nri/report/v

[26] See Appendix D

Table 4.6-3 HAILSTORM - HISTORIC LOSS RATIOS[27]			
Overall Rating	**Building Value**	**Population**	**Agriculture Value**
Very Low	$4.26 per $1M	1.27 per 10M	$5.32 per $100K

PEOPLE
Hail has been known to cause injury to humans; occasionally, these injuries can be fatal.

PROPERTY + CRITICAL, STRATEGIC, AND KEY FACILITIES
Fortunately, the average hailstorm lasts only a few minutes, and seldom more than 15 minutes. Common impacts from hail include broken windows, damaged roofing, shingles, and siding, dented or broken gutters, and damaged vehicles.

AGRICULTURE
The impact of hail on crops depends on the size of the hailstones, duration of the storm, and the growth stage of the plants[28]. Even relatively small hail can shred plants to ribbons in a matter of minutes. Crop damage ranges from moderate to a total loss. In the year 2020 alone, there were 31 recorded claims due to hail damage, Crops included barley, canola, corn. dry beans, dry peas, flax, oats, soybeans, and wheat. Heavy hail events can also kill and injure livestock.

KEY ISSUES AND RELATED MITGATION ACTIONS
Key issues and related mitigation actions for all summer weather hazards are located at the end of the overall summer weather hazards section.

[27] See Appendix D

Heat Wave

HAZARD PROFILE
According to the NWS, there is no universal definition for a heat wave or "extreme heat," but they define it as "a period of abnormally and uncomfortably hot and unusually humid weather, typically lasting two or more days." According to NOAA, heat is the number one weather-related killer among natural hazards, followed by frigid winter temperatures[1] The NWS devised the Heat Index (Table 4.6-4), as a mechanism to better inform the public of heat dangers. some populations, such as the elderly and young, are more vulnerable to heat danger than other segments of the population.

Table 4.6-4 HEAT INDEX VALUES AND EFFECTS		
Classification	**Heat Index**	**Description of Risks**
Caution	80°- 90°	Fatigue possible with prolonged exposure and/or physical activity
Extreme Caution	90°- 105°	Heat cramps, and heat exhaustion possible with prolonged exposure and/or physical activity
Danger	105°- 130°	Heat cramps, and heat exhaustion likely, and heatstroke possible with prolonged exposure and/or physical activity
Extreme Danger	130° or higher	Heatstroke is highly likely with continued exposure

[28] https://crops.extension,iastate.edu

HISTORY

Summer temperatures in McLean County typically range from the mid to high 90s to the low 100's but as Table 4.6-6 shows, significantly higher temperatures have been recorded. The highest recorded temperature in the county (at the Washburn monitoring station) is 115°F recorded in July 1936.

LOCATION

Heat waves are a regional or multi-regional issue

PROBABILITY

Months with elevated temperatures typically extend from May to September in North Dakota. This pattern is expected to continue. Results of the recent community survey indicate that 76% of those responding expect heat waves to be likely or very likely in the next five years.

VULNERABILITY

PEOPLE

A heat wave can affect many people and to varying degrees. Often the elderly and very young, the most vulnerable within the county's population, are at increased risk of heat-related illness, dehydration, heat stroke and exhaustion. Table 4.6-3 presents heat disorders associated with high temperatures. According to 2020 U.S. Census, approximately 2,018 residents in the county, 24.2% of the total population, are 65 years of age or older. For city totals of those over 65 and under 18 (Table 4.6-5).

Table 4.6-5
VULNERABLE AGE GROUPS

McLean County	Under 18	Over 65	City	Under 18	Over 65
	2,065	2,194	Mercer	6	22
City	18	65	Riverdale	21	71
Benedict	17	21	Ruso	0	0
Butte	22	25	Turtle Lake	115	183
Coleharbor	4	19	Underwood	195	129
Garrison	345	445	Washburn	298	203
Max	74	66	Wilton	166	138

Source ACS 2019 estimates and the McLean County cities

PROPERTY + CRITICAL, STRATEGIC, AND KEY FACILITIES

Extreme heat is unlikely to cause significant damages to the built environment. However, road surfaces can be damaged as asphalt softens, and concrete sections may buckle under expansion caused by heat. Train rails may also distort or buckle under the stress of head induced expansion. Power transmission lines may sag from

Table 4.6-6
HIGHEST RECORDED TEMPERATURE BY MONTH
2015 to 2021

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
Highest Recorded Temperature	48°F	60°F	68°F	80°F	95°F	99°F	100°F	104°F	95°F	85°F	73°F	58°F
Year	2021	2016	2016	2018	2018	2021	2021	2018	2021	2021	2020	2021

expansion and if contact is made with vegetation the line may short out causing power outages.

EXISTING CAPABILITY

The county, cities, media and health-related entities and the media, regularly inform residents during the summer months of the danger of excessive heat and how best to deal with it. The importance of not leaving children and pets in closed cars when it is hot is a frequent message.

CHANGES IN DEVELOPMENT

McLean County has experienced residential, commercial, and industrial growth in recent years. Additional development will expose more persons and businesses to the negative impact of a heat wave. Although unlikely in McLean County, increases in impervious surface area can exacerbate heat conditions creating localized "heat islands."

IMPACT

The impact of a heat wave varies depending on its severity and length of time. The FEMA estimates of the impact are presented in Table 4.6-7 and Table 4.6-8.

Table 4.6-7
HEAT WAVE - EXPECTED ANNUAL LOSS VALUES[29]

Total	Building Value	Population Equivalence	Population	Agricultural Value
$85,990	$771	$79,586	0.01	$5,633

Source for Table 4.6-7 and Table 4.6-8:
https://hazards.fema.gov/nri/report

Table 4.6-8
HEAT WAVE - HISTORIC LOSS RATIOS[30]

Overall Rating	Building Value	Population	Agriculture Value
Very Low	$1.00 per $1M	2.03 per 1M	$5.52 per $100K

PEOPLE

Those at greatest risk for heat-related illness include infants and children up to four years of age, people 65 years of age and older, and people who are ill or on certain medications. However, even young, and healthy individuals are susceptible if they participate in strenuous physical activities during hot weather.

PROPERTY AND ECONOMY

A heat wave could potentially put a strain on infrastructure such as power generation and water systems due to higher demand. An extended heat wave may also disrupt the local economy if farming and livestock production declines, resulting in income loss for famers and others affected.

KEY ISSUES AND RELATED MITGATION ACTIONS

Key issues and related mitigation actions for all summer weather hazards are located at the end of the overall summer weather hazards section.

[29] See Appendix D

[30] See Appendix D

Strong Wind

HAZARD PROFILE

McLean County is within Zone II on Figure 4.6-1 which indicates that speeds of up to 160 mph may occur.

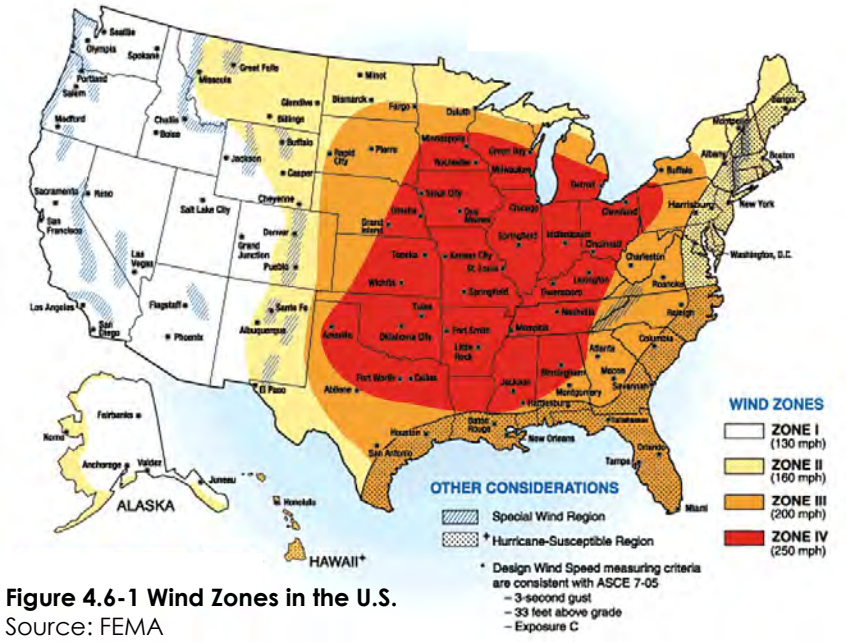


Figure 4.6-1 Wind Zones in the U.S.
Source: FEMA

The National Centers for Environmental Information (NCEI)divides wind events into High Wind, Strong Wind, Thunderstorm Wind, Tornado and Hurricane.

- **High Wind** – Sustained non-convective winds of 40mph or greater lasting for one hour or longer or winds (sustained or gusts) of 58 mph for any duration on a widespread or localized basis.
- **Strong Wind** – Non-convective winds gusting less than 58 mph, or sustained winds less than 40 mph, resulting in a fatality, injury, or damage.
- **Thunderstorm Wind** – Winds, arising from convection (occurring within 30 minutes of lightning being observed or detected), with speeds of at least 58 mph, or winds of any speed (non-severe thunderstorm winds below 58 mph) producing a fatality, injury, or damage.

Because the FEMA National Risk Index (Appendix D) refers to damaging winds as Strong Winds, this hazard mitigation plan uses the same term.

HISTORY

Figure 4.6-2 depicts the strongest non-tornado wind gusts recorded in North Dakota, Only four counties have ever recorded winds stronger than McLean County has. High winds have been recorded 56 times since the 2016 Plan was adopted as shown in Table 4.6-1.

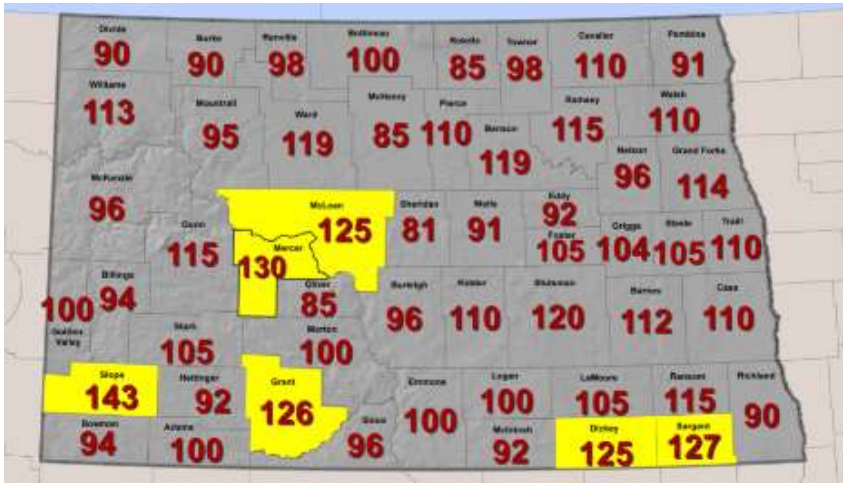


Figure 4.6-2 Recorded Strong Winds
Source: NDDES Plan

LOCATION

The extent of a strong wind event often corresponds to a thunderstorm, but that thunderstorm could be local or span many miles and travel long distances, covering a significant area in one event into multip0le counties and beyond,

PROBABILITY

Given the county's experience with this hazard, it is very likely that the current pattern will continue.

VULNERABILITY

FEMA advises that "Severe winds can occur anytime, or they can accompany storms like . . . tornados, and severe thunderstorms. Flying debris or downed trees and power lines can make severe winds a threat to lives, property, and utilities.[31]"

PEOPLE

People exposed to the elements are most vulnerable to a strong wind event. A common hazard associated with wind events is falling trees and branches.

The North Dakota Highway Patrol regularly advises motorists, especially those with high-profile, long-load type vehicles to travel with care during high winds, warning that the wind may cause the vehicle to overturn or cause the attachment to swerve, whip, sway, or fail to follow in the path of the towing vehicle.

PROPERTY

Strong winds can cause trees and branches to fall and send them and other unsecured objects flying, causing damage.

EXISTING CAPABILITIES

Educational materials, like FEMA's "Protect your property from strong winds" is available. Most jurisdictions have a warning signal.

IMPACT

The impact of a strong wind event varies depending on its severity and length of time. The FEMA estimates of the impact are presented in Table 4.6-9 and Table 4.6-10.

Table 4.6-9
STRONG WIND - EXPECTED ANNUAL LOSS VALUES[32]

Total	Building Value	Population Equivalence	Population	Agricultural Value
$271,557	$163,212	$84,485	0.01	$23,860

Source for Table 4.6-9 and Table 4.6-10:
https://hazards.fema.gov/nri/report/viewer?dataLOD=Counties&dataIDs

Table 4.6-10
STRONG WIND - HISTORIC LOSS RATIOS[33]

Overall Rating	Building Value	Population	Agriculture Value
Relatively High	$8.92 per $100K	9.02 per 10M	$1.01 per $10K

[31] https://www.fema.gov/sites/default/files/2020-11/fema_protect-your-property_severe-wind.pdf

[32] See Appendix D
[33] See Appendix D

PEOPLE AND PROPERTY INCLUDING CRITICAL, STRATEGIC, AND KEY FACILITIES

Common impacts from severe winds include broken trees and branches, damaged agricultural structures, antennas, signage, building awnings, canopies, roof shingles, traffic signals and utility poles.

KEY ISSUES AND RELATED MITGATION ACTIONS

Key issues and related mitigation actions for all summer weather hazards are located at the end of the overall summer weather hazards section.

Thunderstorm and Lightning

HAZARD PROFILE

Thunderstorms are responsible for the development and formation of many extreme summer weather events. Damage resulting from thunderstorms is mainly inflicted by strong winds, large hailstones, flash flooding caused by heavy precipitation and lightning. Stronger thunderstorms are capable of producing tornadoes and waterspouts.

HISTORY

Table 4.6-11 indicates the number of recorded thunderstorm events since the 2016 Plan

LOCATION

Thunderstorms can travel distances, covering a significant area in one event; a lightning strike is usually a local event and may occur with a thunderstorm or a distance from it.

Table 4.6-11
THUNDERSTORM WINDS
2016 - 2021

	# of Thunder-storms	Max Wind Speed
COLEHARBOR	2	52 kts
GARRISON	11	71 kts
MERCER	2	74 kts
TURTLE LAKE	4	75 kts
RUSO	0	n/a
UNDERWOOD	2	75 kts
WASHBURN	8	72 kts
WILTON	1	65 kts

PROBABILITY

Thunderstorms and lightning are very likely to continue to present an ongoing risk to people and property based on past occurrences and was assumed to be uniform across the county. According to information shown on Figure 4.6-3 and elsewhere, McLean County is located in an area that experiences McLean County experiences

11.8 lightning flashes per square kilometer per year[34]. This rate is similar to the rates in surrounding counties and likely to continue or could exceed that level.

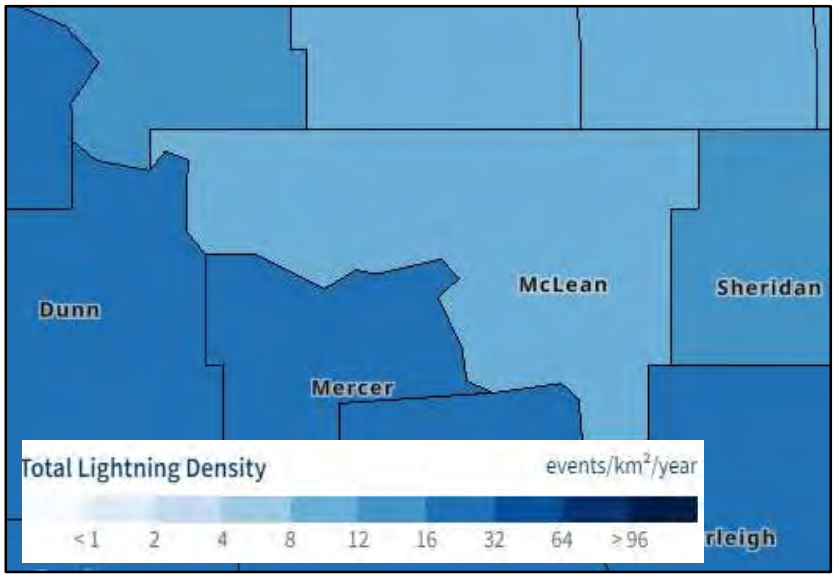


Figure 4.6-3 Lightning Density
Source: vaisala.com/

VULNERABILITY

PEOPLE AND PROPERTY

The risk of being struck by lightning is greater in open areas and on the water. As wildland/rural fires are often ignited by lightning, properties with the highest risk of damage from a lightning strike are those in the wildland-urban interface and those great distance from response capabilities, This vulnerability is increased during a drought.

EXISTING CAPABILITIES

- Response to a lightning event relates to the need for fire suppression. McLean County is well-prepared for that task. See Chapter 7.
- McLean County uses their "CodeRED" to notify the public of hazard events and other emergencies. A link to the program is on the county website.

CHANGES IN DEVELOPMENT

Future development projects should consider extreme summer weather hazards and tornado and strong wind hazards at the planning, engineering, and architectural design stage with the goal of reducing vulnerability. Buildings with high occupancies, mobile home parks and campgrounds should consider inclusion of a shelters to accommodate occupants in the event of a tornado.

IMPACT

The impact of a thunderstorm and lightning event varies depending on its severity and location. Most lightning strikes cause limited damage to specific structures and cause very few injuries or fatalities, and minimal disruption. Wildland/rural or urban fire is a frequent secondary impact. The FEMA estimates of the impact are presented in Table 4.6-12 and Table 4.6-13.

Table 4.6-13
LIGHTNING - HISTORIC LOSS RATIOS[35]

Overall Rating	Building Value	Population	Agriculture Value
Relatively Low	$1.93 per $10M	1.24 per 100M	n/a

[34] https://interactive-lightning-map.vaisala.com/

[35] See Appendix D

Table 4.6-12 LIGHTNING - EXPECTED ANNUAL LOSS VALUES				
Total	**Building Value**	**Population Equivalence**	**Population**	**Agricultural Value**
$27,614	$6,443	$21,171	0.00	n/a

Source for Table 4.6-12 and Table 4.6-13
https://hazards.fema.gov/nri/report/

PEOPLE
Loss of power could critically impact those relying on energy to service, including those that need powered medical devices. Injuries and fatalities are also possible.

PROPERTY
Property damage caused by a lightning strike usually occurs to infrastructure, such as power transmission lines and communication towers; however, occasional damage can occur to other structures.

Lightning causes thousands of dollars in damages each year to homes, businesses, churches, barns, schools, and other structures. Businesses which are forced to close from power outages lose business, creating an economic impact.

AGRICULTURE
Livestock deaths and property damage are the most common lightning-related threats in North Dakota.

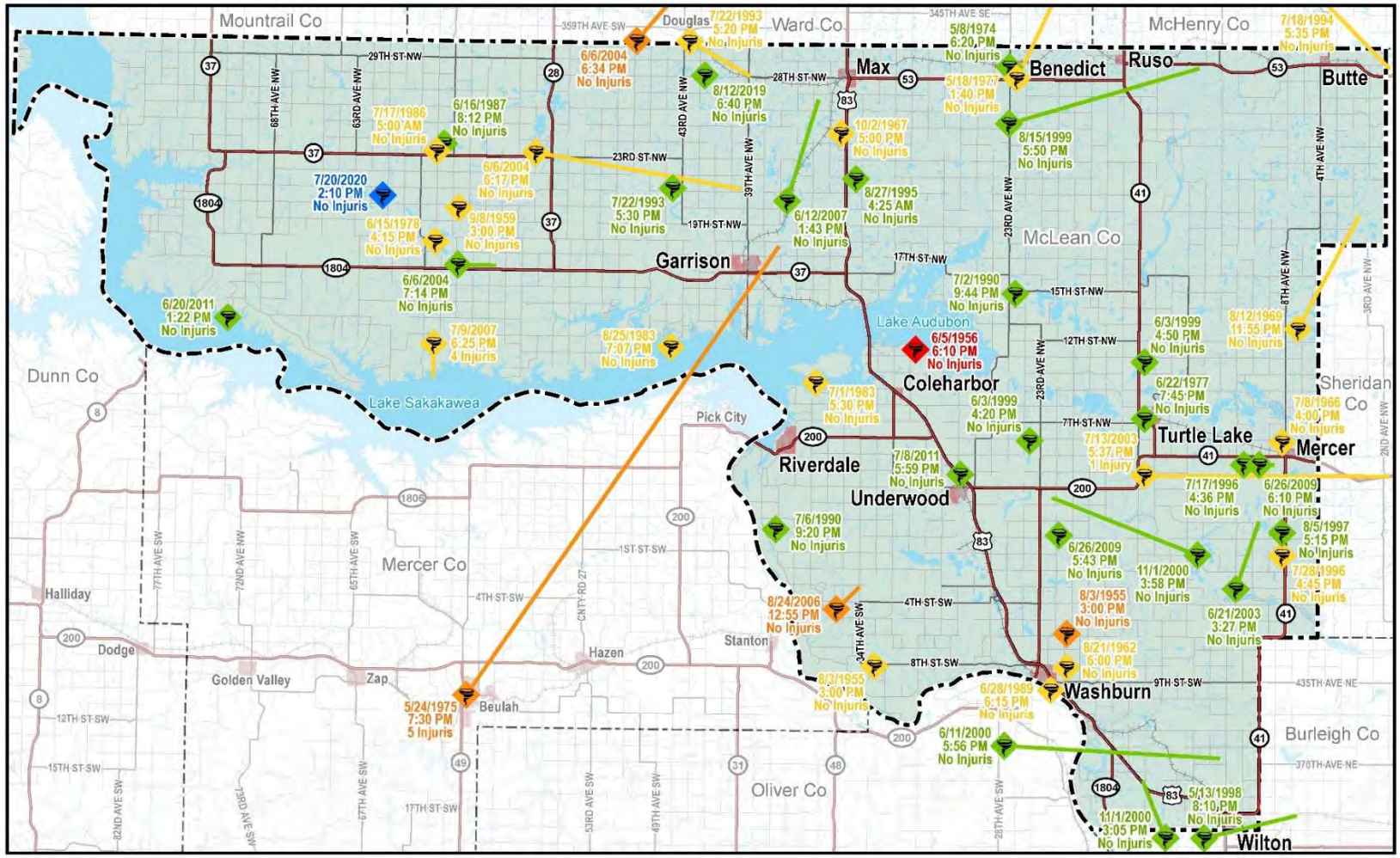
KEY ISSUES AND RELATED MITGATION ACTIONS
Key issues and related mitigation actions for all summer weather hazards are located at the end of the overall summer weather hazards section.

Tornado

HAZARD PROFILE
Tornadoes are the most destructive weather phenomenon on earth. They can produce winds ranging from 65 mph to more than 300 mph, and pose severe danger to life and property. Peak tornado season is from June to August, and most occur during evening hours. Tornadoes typically, but not always as shown on Figure 4.7-1, travel from southwest to northeast at a speed between 30 and 70 mph. They are generally on the ground for less than 10 minutes. Tornado characteristics are highly unpredictable and can change rapidly.

Tornado severity is recorded with the Fujita scale (0 to 5) determined by the damage created by a tornado. Wind speed is estimated. Wind speeds in the original Fujita scale (F Scale) were adjusted in 2007 for the scale known as the Enhanced Fujita Scale (EF Scale). Entries on Figure4.7-1 which predate 2007 reflect the F Scale and more recent events reflect the EF Scale.

HISTORY
In total, 48 tornados have been recorded in McLean County, including the ones that did not initiate in the county but passed through; those which originated in the county are shown on Figure 4.7-1.



Recorded Tornados

Source: National Oceanic and Atmospheric Administration (NOAA)
National Centers for Environmental Information (NCEI)

Initial Point:	Track:	Fujita Scale:
		F0 Tornados
		F1 Tornados
		F2 Tornados
		F3 Tornados
		Scale Unknown

- McLean County
- Other County Boundary
- Cities
- Highways
- Railroads
- Open Water

Figure 4.7-1

Figure 4.7-1 illustrates the tornado events in McLean County. A majority of which were rated 1 or 2 and none have recorded injuries. The most recent tornado was recorded west of Max in 2019. These tornadoes resulted in minimal damage, but the impact would be devastating if a large tornado were to directly strike a city or populated area.

Table 4.6-15
TORNADO - FUJITA SCALE

SCALE#	DAMAGE
0	Light damage. Peels surface off some roofs; damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.
1	Moderate damage. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
2	Considerable damage. Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
3	Severe damage. Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
4	Devastating damage. Well-constructed houses and whole frame houses completely leveled; cars thrown, and small missiles generated.
5	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 m; high-rise buildings have significant structural deformation; incredible phenomena will occur.

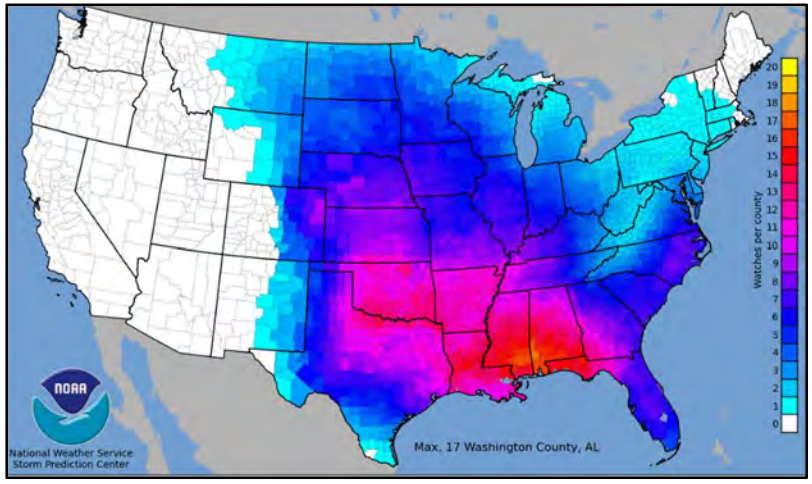


Figure 4.7-2 Tornado Watches
Source: 20ytora.png (1142×712) (noaa.gov)

LOCATION

A tornado event is usually local in character but can cross county and state lines.

PROBABILITY

Figure 4.7-2, which depicts NOAA's annual average tornado watches per year, records McLean County with five tornado watches per year. On average, actual tornado events total approximately three per year in North Dakota. Given the NOAA and local records of tornado warnings and activity in McLean County, a tornado is possible in any year but not likely to occur yearly.

VULNERABILITY

Tornado locations are completely random, meaning risk to tornado damage is not increased in one part of the county as compared to another.

PEOPLE

Everyone and every property in McLean County are vulnerable to a tornado but some people are more vulnerable because of where they live. There are approximately 257 occupied mobile homes in McLean County according to the most recent ASC estimates[36].

Applying the county's average household size of 2.18 persons, to the estimated number of mobile homes in the county, there are about 580 persons in the county with enhanced vulnerability to a tornado. Some of these people live in rural McLean County but most live in the cities.

Table 4.6-16
MOBILE HOME RESIDENTS

Jurisdiction	Mobile Homes	People	Jurisdiction	Mobile Homes	People
Benedict	10	18	Riverdale	8	38
Butte	0	0	Ruso	0	0
Coleharbor	13	28	Turtle Lake	7	33
Garrison	24	52	Underwood	15	71
Max	35	76	Washburn	66	313
Mercer	0	0	Wilton	58[37]	126
			Rural McLean County	27	58

Source: ACS 2019 estimates and the McLean County cities

McLean County also has hundreds of campsites and RV sites. These areas are listed in Table 4.6-17. These facilities are vulnerable to tornadoes and other extreme summer weather because they do not have shelters on-site and are not located near a shelter.

Table 4.6-17
RV PARKS AND CAMPGROUNDS

Benedict	-	
Butte	Butte City Park Campground	
Coleharbor	Wolf Creek East Totten Trail Campground	
Garrison	• Stoney Hill RV Park • Indian Hills Resort • Sportsmen's Centennial Park • Sakakawea RV • Northview Trailer Court RV Park	
Max	-	
Mercer	-	
Riverdale	Morning Star Campground	
Ruso	Long Lake Boating Access	
Turtle Lake	-	
Underwood	Embers Estate & RV Park	
Washburn	Northview RV Park Washburn RV Park	
Wilton	City of Wilton Campground/RV Park	
Rural McLean County	• Lake Sakakawea • Lake Audubon • Indian Hills Resort • Sportsmen's Centennial Park • Fort Stevenson State Park • East Totten Trail Campground • East Park	• Downstream Campground (below Garrison Dam) • Ft. Mandan • Brush Lake • Crooked Lake • Strawberry Lake • Hecker's Lake • West Park

[36] 2019: ACS 5-Year Estimates Subject Tables

[37] Partly in Burleigh County

PROPERTY AND AGRICULTURE

Depending on the size of the tornado and its path, a tornado is capable of damaging and destroying almost anything. In other parts of the state, tornado events have damaged grain bins, crops, campers, trailers, houses, garages, trees, roofs, and a county fair storage building[38]. That same vulnerability exists in McLean County.

EXISTING CAPABILITIES

- McLean County uses their "CodeRED" to notify the public of hazard events and other emergencies. A link to the program is on the county website.
- Outdoor warning sirens are in place in the cities of Coleharbor, Garrison, Max, Mercer, Riverdale, Turtle Lake, Underwood, Washburn, and Wilton plus Brush Lake.
- Shelters are listed in Chapter 7.

CHANGES IN DEVELOPMENT

Construction practices and building codes can help maximize the resistance of the structures to damage.

IMPACT

The FEMA estimates of the impact are presented in Table 4.6-18 and Table 4.6-19.

Table 4.6-18
TORNADO - EXPECTED ANNUAL LOSS VALUES

Total	Building Value	Population Equivalence	Population	Agricultural Value
$187,439	$92,357	$93,420	0.01	$1,663

Source for Table 4.6-12 and Table 4.6-13
https://hazards.fema.gov/nri/report/

[38] Tornado in Mott County, July 19, 2019

Table 4.6-19
TORNADO - HISTORIC LOSS RATIOS[39]

Overall Rating	Building Value	Population	Agriculture Value
Very Low	$9.04 per $100K	1.79 per 1M	$1.23 per $100K

PEOPLE AND PROPERTY

Damage from a tornado is both direct (See the Fujita Scale, Table 4.6-16, for descriptions of the possibilities). indirect damage often results from damage to infrastructure.

AGRICULTURE

To date, in McLean County, no damage to agriculture has been recorded from a tornado, but it is possible.

KEY ISSUES AND RELATED MITGATION PROJECTS
ALL SUMMER STORM EVENTS

Extreme summer weather hazards include: hail, heat wave, strong wind, thunderstorm, lightning, and tornado

KEY ISSUE

McLean County averages approximately six days per year with a summer storm event. Providing information to the public about the risks of extreme summer weather, how to prepare for it can save lives.

Related Mitigation Action

#D Improve inter-departmental radio communication and prepare for the rollout of Statewide Interoperability Radio Network (SIRN 2020).
#I Distribute hazard Information via the county and city

[39] See Appendix D

websites, social media, traditional media, and other existing interfaces.
#15 Utilize a redundant and multiple methods for local warnings if primary communications are interrupted.
#17 Continue to support mutual aid agreements and on-scene incident command.
#19 Identify location and organize outreach to vulnerable populations during hazard events

KEY ISSUE

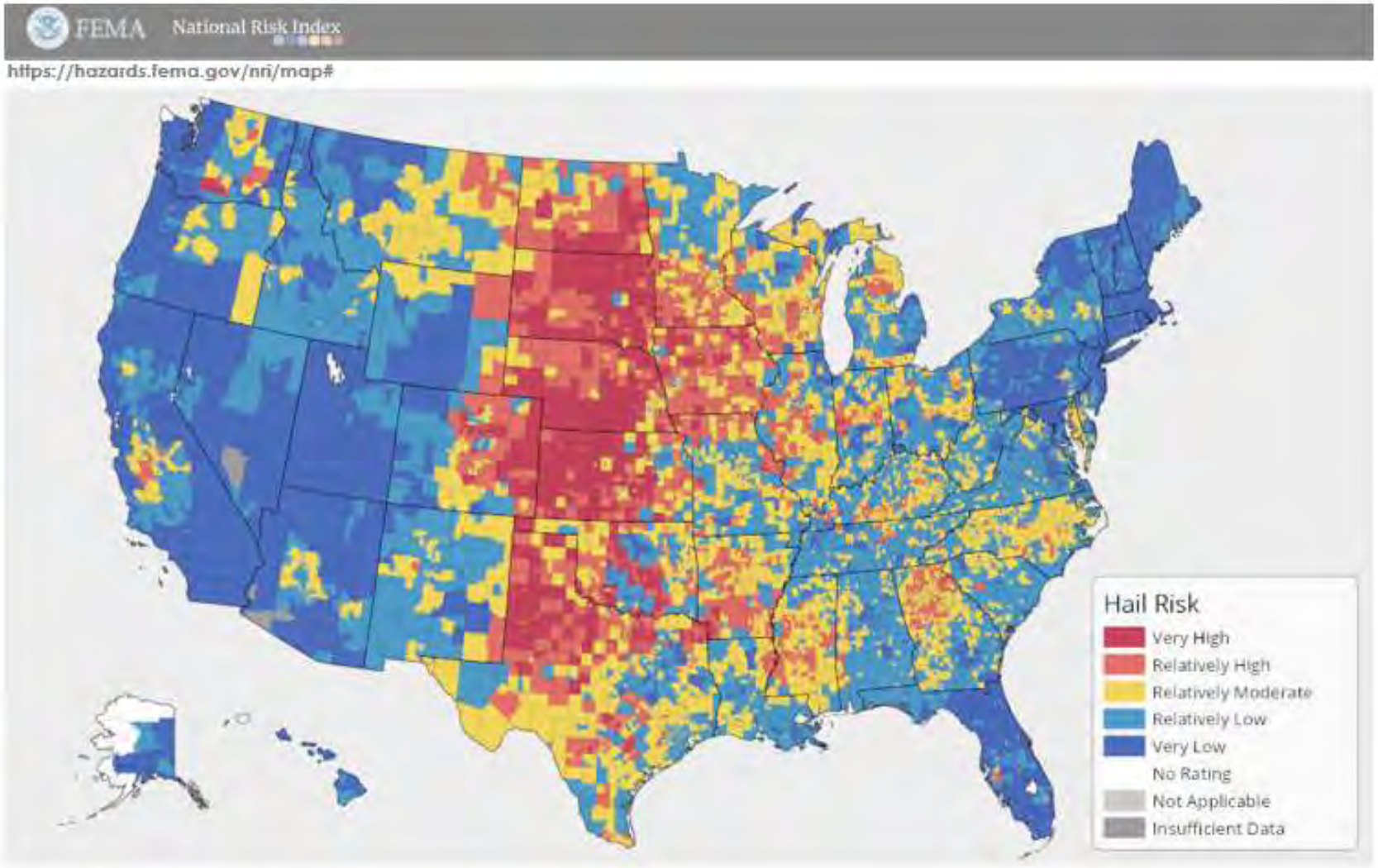
Preparing for severe summer storms and coordinating of a response are critical.

Related Mitigation Action

#D Improve inter-departmental radio communication and prepare for the rollout of Statewide Interoperability Radio Network (SIRN 2020).
#6 Evaluate zoning and building code tiedown requirements
#7 Install and maintain surge protection on critical equipment
#15 Utilize a redundant and multiple methods for local warnings if primary communications are interrupted.
#16 Identify existing buildings with potential for retrofit use as tornado shelters and/or shelters for evacuation.
#18 Continue to support upgrading existing or purchase new equipment and infrastructure for emergency services, as needed.

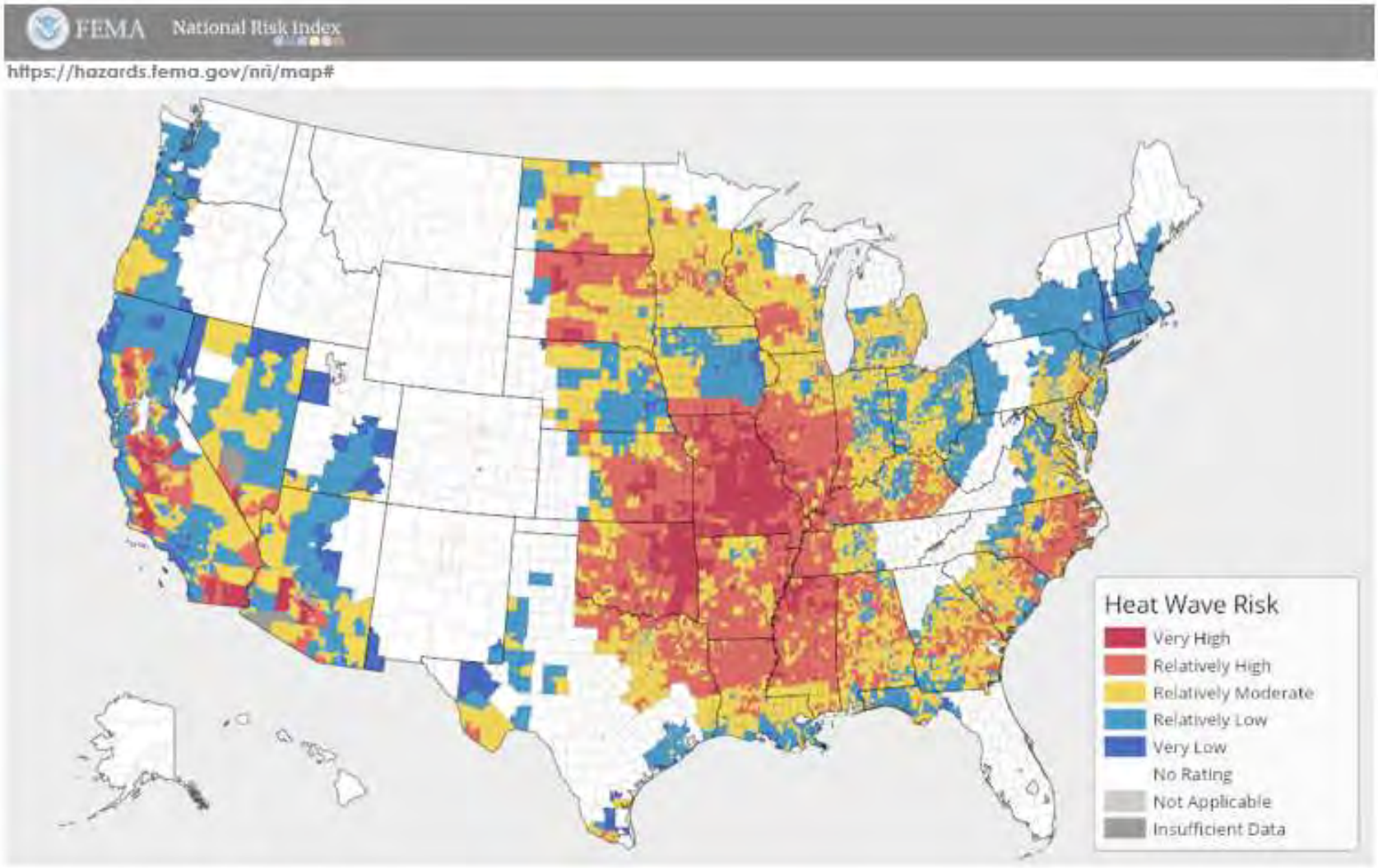
NATIONAL RISK INDEX

National Risk Index maps on summer weather, hail, heat wave, strong wind, lightning, and tornado, risks follow. See also Appendix D.



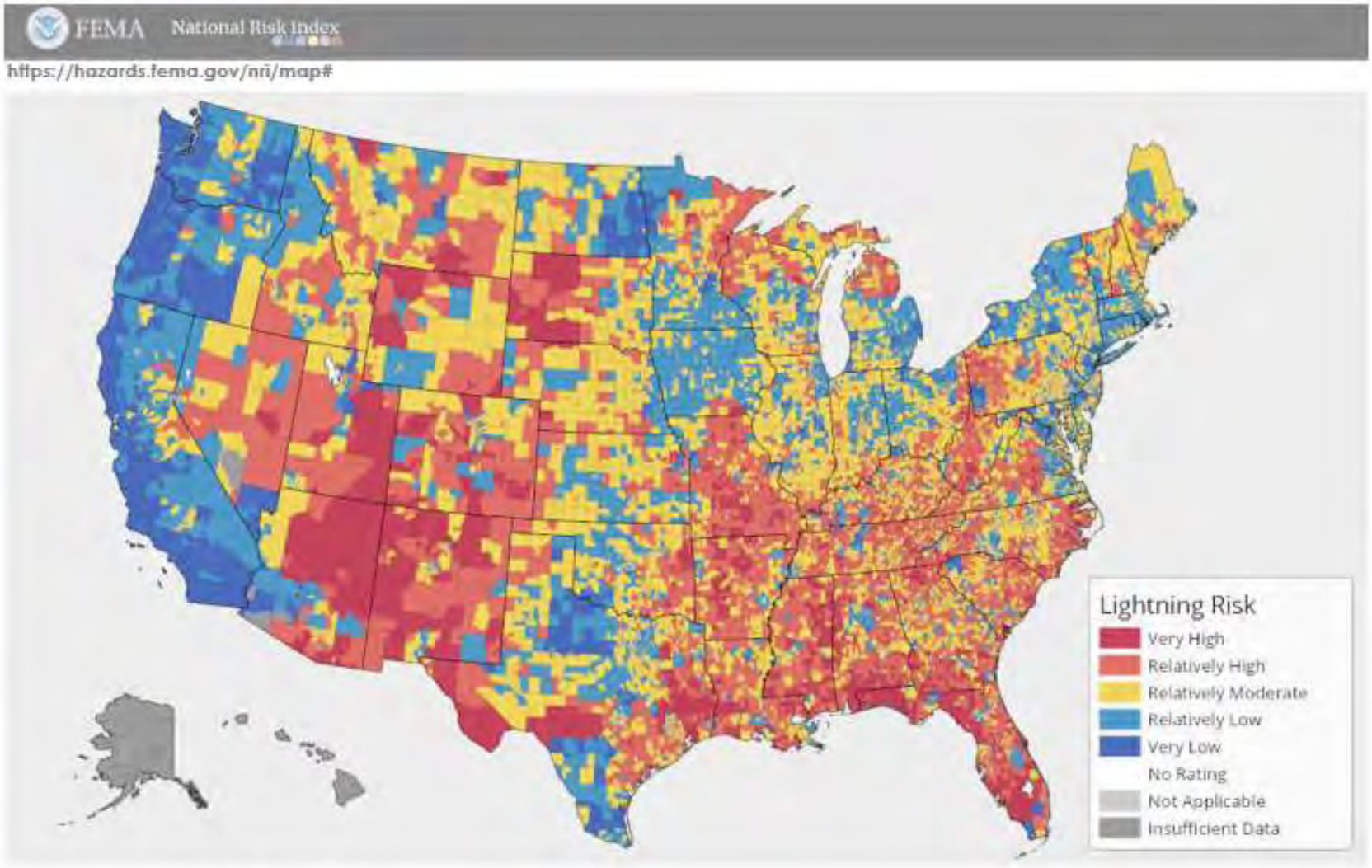
Hazard Type Risk Ratings

Compared to the rest of the U.S., **McLean County, ND's** risk to Hail is **Relatively Low**
See Appendix D for additional information.



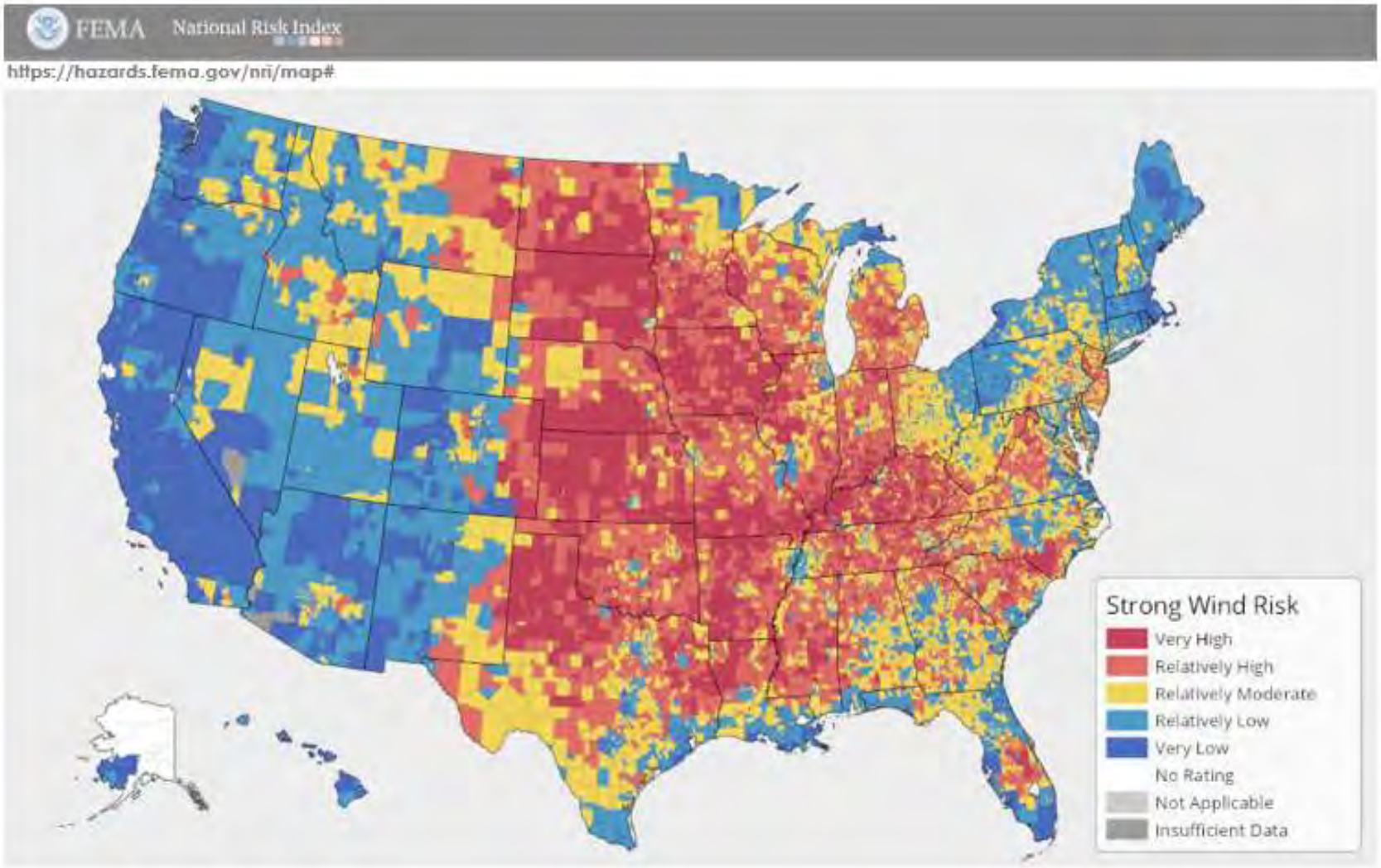
Hazard Type Risk Ratings

Compared to the rest of the U.S., **McLean County, ND's** risk to Heat Wave is **Relatively Low**
See Appendix D for additional information.



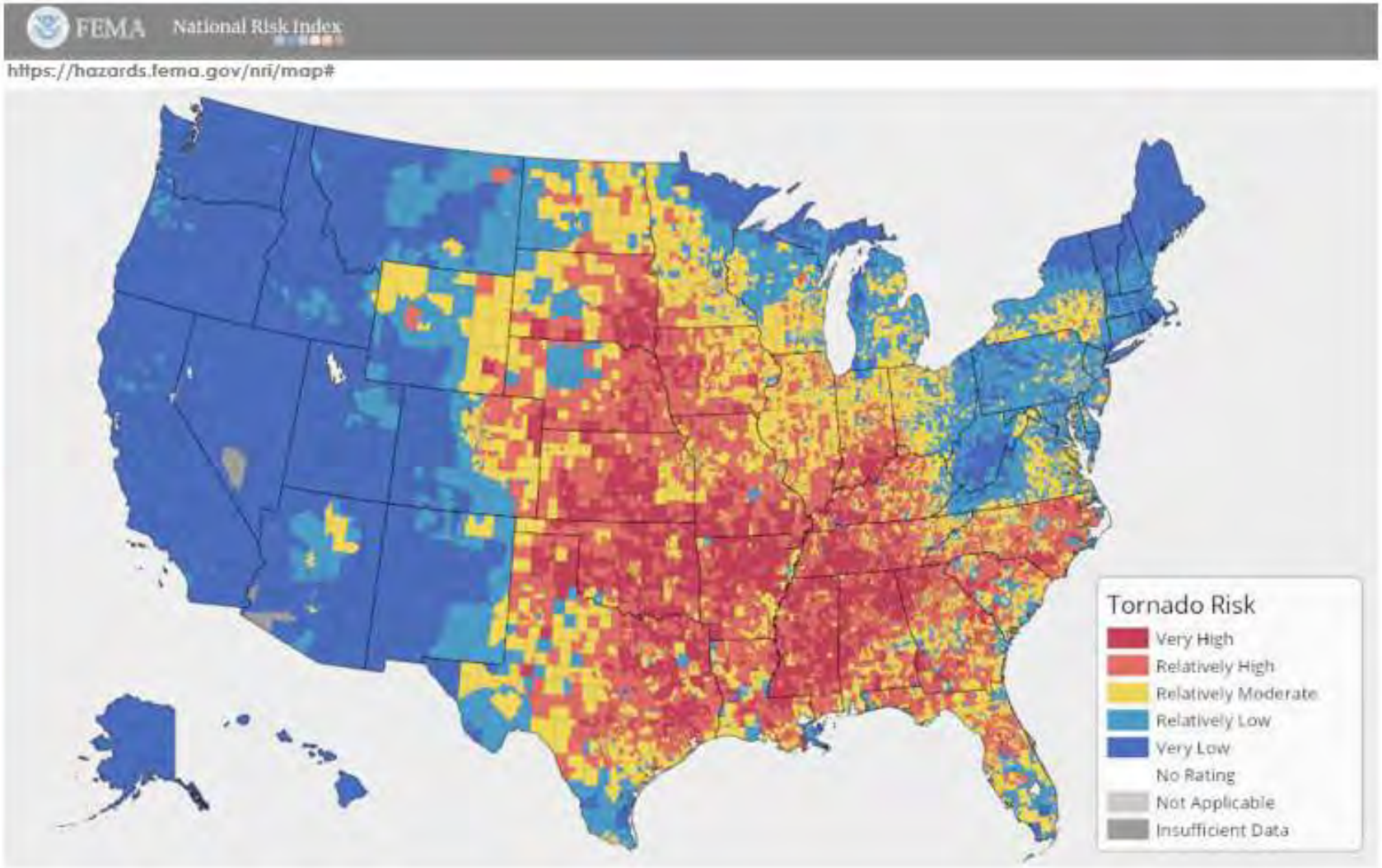
Hazard Type Risk Ratings

Compared to the rest of the U.S., **McLean County, ND's** risk to Lightning is **Very Low**
See Appendix D for additional information.



Hazard Type Risk Ratings

Compared to the rest of the U.S., **McLean County, ND's** risk to Strong Wind is **Relatively Low**
See Appendix D for additional information.



Hazard Type Risk Ratings

Compared to the rest of the U.S., **McLean County, ND's** risk to Tornado is **Relatively Low**
See Appendix D for additional information.

4.7 EXTREME WINTER WEATHER

RISK LEVEL- High | Moderate | Low | Very Low

Risk for county + all cities	Hazard	Location	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score[40]	
	Extreme Winter Weather	Regional	Highly Likely	Limited	Large	More than 24 hrs.	Less than a week	2.85	

OVERVIEW

Winter weather can range from moderate snowfall over a period of a few hours to blizzard conditions with blinding wind-driven snow. Events may include snow, sleet, freezing rain, or a mix of them and can be accompanied by extremely cold temperatures. Extreme winter weather is a significant hazard in McLean County between October and April most years.

LOCATION

All of North Dakota and beyond is susceptible to extreme winter weather and freeze events. Some ice and winter storms may be large enough to affect several states, or the region while others might affect limited, localized areas.

HISTORY

Table 4.7-1
Recorded Winter Weather Event 2016 - 2020

	Cold Wave	Blizzard/ Heavy Snow		Cold Wave	Blizzard/ Heavy Snow
COUNTY	3	6	RUSO	0	0
COLEHARBOR	0	0	TURTLE LAKE	0	0
GARRISON	0	1	UNDERWOOD	0	3
MAX	0	2	WASHBURN	0	0
MERCER	0	0	WILTON	0	0
RIVERDALE	0	0	TOTAL	3	12

[40] Priority Risk Index (PRI) Scores range from 1-4. See Chapter 6.

Cold Wave

HAZARD PROFILE

What is considered a cold wave varies according to the normal climate of a region. A cold wave often accompanies other extreme winter weather elements such as precipitation amount (rain, sleet, ice, and/or snow)and is often further impacted by high winds.

HISTORY

Winter temperatures in McLean County typically range from the 20s and 30s (high) to single digits to 20s (lows) but as Table 4.7-2 shows, significantly lower temperatures have been recorded. Information obtained from the National Climatic Data Center indicates that there have been at least 27 occurrences of a cold wave since 1996 (when records for this hazard began).

Table 4.7-2
LOWEST RECORDED TEMPERATURES 2016 - 2021

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
-31°F	-32°F	-17°F	-7°F	24°F	40°F	45°F	39°F	28°F	6°F	-5°F	-27°F
2019	2021	2019	2018	2021	2019	2016	2021	2018	2020	2019	2017

PROBABILITY – COUNTY AND CITIES

A cold wave is a common occurrence in North Dakota during the winter months. Future cold waves impacting McLean County and the cities each year is inevitable but as Table 4.7-1 illustrates, only some of those events are recorded.

VULNERABILITY

PEOPLE AND PROPERTY

The most common cold-related problems are hypothermia and frostbite. Children and older adults are more vulnerable to cold temperature exposure.

Table 4.7-3
VULNERABLE AGE GROUPS

McLean County	Under 18	Over 65	City	Under 18	Over 65
	2,065	**2,194**	Mercer	6	22
City	**18**	**65**	Riverdale	21	71
Benedict	3	22	Ruso	0	0
Butte	22	25	Turtle Lake	115	183
Coleharbor	4	19	Underwood	195	129
Garrison	345	445	Washburn	298	203
Max	74	66	Wilton	166	138

There are approximately 257 occupied mobile homes in McLean County according to the U.S. CENSUS ACS 2019 estimates. These residents and those living in recreational vehicles, and/or poorly insulated homes are another group that would be vulnerable to severe cold as they may find it difficult to adequately heat their homes.

Applying the county's average household size of 2.18 persons, to the estimated number of mobile homes in the county, there are approximately 560 persons in the county with this vulnerability to extreme winter weather. As Table 4.6-16 demonstrates, some of these people live in rural McLean County but most live in the cities.

AGRICULTURE

The livestock industry can also be severely impacted by a cold wave. The inability to get feed and water to livestock can quickly escalate to a critical situation, and can lead to dehydration, a major cause of livestock causalities.

UTILITIES

Beyond the vulnerability of people and livestock, a cold wave poses a significant threat to utility production. As temperatures drop, increased demand for heating trains the electrical grid, which can lead to temporary outages.

EXISTING CAPABILITIES

McLean County and its cities maintain or have access to facilities that could be used warming stations for stranded motorists and residents without electricity and heating in a cold wave. Table 7.3-4 lists the shelters.

CHANGES IN DEVELOPMENT

McLean County has experienced residential, commercial, and industrial growth in recent years. Additional development will expose more persons and businesses to the negative impact of a cold wave. Education materials could provide valuable information to those who are new to the area, as would warming stations for stranded motorists and residents who have lost electricity and heating due to cold waves and the related ice storms

IMPACT

The impact of a cold wave varies depending on its severity and length of time. The FEMA estimates of the impact are presented in Table 4.7-4 and Table 4.7-5.

Table 4.7-4
COLD WAVE - EXPECTED ANNUAL LOSS VALUES[41]

Total	Building Value	Population Equivalence	Population	Agricultural Value
$220,674	$877	$218,686	0.03	$1,111

Source for Table 4.7-4 and Table 4.7-5:
https://hazards.fema.gov/nri/report/

Table 4.7-5
COLD WAVE - HISTORIC LOSS RATIOS[42]

Overall Rating	Building Value	Population	Agriculture Value
Very Low	$2.42 per $10M	1.18 per 1M	$2.31 per $1M

PEOPLE

Structure fires and carbon monoxide poisoning are a possible impact of a cold wave, as people rely on a fireplace and auxiliary heating devices, such as portable heaters and fuel burning lanterns.

PROPERTY + CRITICAL, STRATEGIC, AND KEY FACILITIES

Freezing pipes are common during a cold wave and there are few facilities have back-up generators.

AGRICULTURE

In the year 2020 alone, there were 31 recorded crop loss claims due to "cold wet weather", Crops included wheat, canola, flax, corn, dry beans, sunflowers, and soybeans.

KEY ISSUES AND RELATED MITGATION ACTIONS

Key issues and related mitigation actions for all winter weather hazards are located at the end of the overall winter weather hazards section.

[41] See Appendix D

[42] See Appendix D

Blizzards, Heavy Snow, and Ice Storms

HAZARD PROFILE

A blizzard is defined by the NWS as a storm producing winds of 35 mph or more, with snow and/or blowing snow reducing visibility to less than 0.25 miles for at least three hours. A closely related weather event known as a surface blizzard occurs when heavy winds blow snow that has already fallen. Both traditional and surface blizzards can reduce visibility, disrupting transportation and communication systems in the area.

Heavy snow is defined as six or more inches of snow in 12 hours, or eight or more inches of snow in 24 hours. Heavy snow can damage property and make roads impassable for extended periods. Homes and businesses lacking the capability of supporting heavy snow loads could experience roof collapse.

Blowing snow resulting in road hazards was a commonly identified impact during stakeholder meetings. Wind is particularly problematic blowing snow onto U.S. 83 near Lake Sakakawea and Lake Audubon.

HISTORY

Since the 2016 Plan, there were between up to four significant recorded snow or blizzard events every year and record levels of snow accumulation occurred during 2016/2017.

Table 4.7-6
MONTHLY HIGHEST SNOW DEPTH

NOV	DEC	JAN	FEB	MARCH
20"	30"	31"	21"	18"
2016	2016	2017	2017	2016

Turtle Lake ND, Winter 2016

LOCATION

Blizzards, heavy snow, and ice storms are regional events which usually extend across rural McLean County and all of the cities similarly.

PROBABILITY

COUNTY AND CITIES

The history of blizzards and heavy snow in the county and all of the cities equates to an annual probability greater

Table 4.7-7
SNOW REMOVAL RESPONSIBILITIES

State roads – State	City roads – cities	BIA roads – BIA
County roads – McLean County	MHA reservation roads - MHA	Access roads to missile facility sites – U.S. Air Force

than 100%. Therefore, the overall probability of extreme winter weather in the county is considered highly likely.

VULNERABILITY

PEOPLE IN RURAL COUNTY AND ALL CITIES

Vulnerabilities for blizzards, heavy snow, and ice storms apply to all those living and working in the county. These winter hazards are considered deceptive killers because most deaths are indirectly related to the weather event.

EXISTING CAPABILITIES

SNOW REMOVAL

The county and city snow removal operations have snow and ice removal standards that are set with safety as a primary goal. Emergency snow removal route priorities are established. Some jurisdictions use local government equipment and employees for this work. Others use private contractors for all or some of the work and the rest use volunteers and their equipment

Each year's budgets include funding for this expense. Year to year there are often increased costs of snow clearing but the challenge is that the funds needed in any one year varies significantly depending on the weather.

Winter storms can create unexpected bills. For example, McLean County's snow removal expense for one January alone amounted to $753,741, an amount that was 11 times higher than the average January expense for the previous six years and nearly 18 times higher than the previous January. Unexpected expenses like that could require a jurisdiction to consider either raising taxes or cutting services elsewhere to increase the snow clearing budget.

Snow Event April; 2022
Photo: McLean County Independent Newspaper

EMERGENCY SHELTERS

Typically, the informal temporary emergency warming places for travelers to stop until they can move on, are 24-hour businesses along the highway. Severe weather shelters (Table 7.3-4) are emergency locations where people can get out of dangerous temperatures to prevent injury or loss of life. These shelters provide food and typically places to sleep. Stranded travelers and families that have lost heat or electricity are the population that these shelters are established to assist. Facilities with backup generators are:

Garrison	Garrison Memorial Hospital
Max	City Hall/Civic Center
Riverdale	Basement of (all faith/non-denominational) Riverdale Church on 3rd St/Montana Ave
Turtle Lake	Community Memorial Hospital
Underwood	City Hall
Washburn	Memorial Building
Wilton	Memorial Hall

OTHER CAPABILITIES

- Utilities provide alerts and on their websites track outages and their progress responding to an outages.
- McLean County uses their "CodeRED" to notify the public of hazard events and other emergencies. A link to the program is on the county website.
- Snow removal on rural and city roads is generally timely and effective.

CHANGES IN DEVELOPMENT

Future development could potentially increase vulnerability to this hazard if new development layout and building design do not reflect the potential impact of the extreme winter event hazard.

IMPACT FROM ICE STORMS

An ice storm produces heavy and damaging accumulations of ice due to a combination of rain and below freezing surface temperatures. As mentioned above, accumulated ice can bring down trees and power lines, threaten livestock and make roads and sidewalks extremely treacherous to motorists, and pedestrians.

The impact of blizzards, heavy snow, and ice storms varies depending on severity and duration. FEMA estimates of the impact are presented in Table 4.7-8 and Table 4.7-9.

PEOPLE

Wind, ice, heavy snow, and extremely cold temperatures can combine to create hazardous conditions and trap residents in their homes without heat or electricity. People who travel daily face increased road hazards> Other travelers are sometimes stranded in the area due to blizzards and ice storms.

Table 4.7-8
ICE STORM - EXPECTED ANNUAL LOSS VALUES

Total	Building Value	Population Equivalence	Population	Agricultural Value
$235,854	$197,148	$38,706	0.01	n/a

Source for Table 4.7-8 and Table 4.7-9:
https://hazards.fema.gov/nri/report/

Table 4.7-9
ICE STORM - HISTORIC LOSS VALUES

Overall Rating	Building Value	Population	Agricultural Value
Relatively High	$197,148	0.01	n/a

Power outages during very cold winter storm conditions, especially ice storms, can also create potentially dangerous situations. As noted previously, approximately 2,194 residents in the county are 65 years of age or older. This age group accounts for the largest percentage of hypothermia victims. In addition, if the power is out for an extended period, residents are forced to find alternative means to heat their homes. The danger arises from carbon monoxide released from improperly ventilated heating sources such as space or kerosene heaters, furnaces, and blocked chimneys. House fires also occur more frequently in the winter due to lack of proper safety precautions when using an alternative heating source.

The leading cause of death during winter storms is from automobile or other transportation accidents due to poor visibility and/or slippery roads. Additionally, exhaustion and heart attacks caused by overexertion may result from winter storms.

PROPERTY

It is difficult to estimate the impact of winter weather on property in the county. The most likely damages involve roof collapse dueto heavy snow loads. Roof collapse from the weight of heavy snow is most likely for older structures. According to, there are approximately 900 housing units in the county that were built before 1939. Table 4.7-10. indicates where those buildings are located. Winter weather can also result in an increased risk of structure fire due to use of portable heaters and fireplaces during events that involve extremely cold temperatures.

Table 4.7-10
HOUSING UNITS BUILT BEFORE 1939

City	Units	Persons	City	Units	Persons
Benedict	10	14	Riverdale	70	153
Butte	21	46	Ruso		0
Coleharbor	15	33	Turtle Lake	35	76
Garrison	77	168	Underwood	61	133
Max	25	55	Washburn	84	183
Mercer	10	22	Wilton	84	183

Source ACS 2019 estimates and the McLean County cities

PROPERTY INCLUDING CRITICAL, STRATEGIC, AND KEY FACILITIES

The possibility of roof collapse from heavy snow is a concern to property owners as is loss of power. Even small accumulations of ice can be hazardous and significant icing events can be devastating to power lines and trees, affecting power and communications to thousands of homes in a single event and can cause a serious hazard to motorists and pedestrians.

Issues for critical facilities resulting from extreme winter weather are the same as for other properties but complicated when the facilities become inaccessibility due to blocked roads, and power outages. Blizzards, heavy snow, and ice storms can have multiple impacts on the county's important facilities.

- Some older facilities may be vulnerable to roof collapse from the heavy snow.
- Buildings need to close because employees and/or customers cannot get to them because of driving conditions. Closures could also result from power loss related to ice storms downing power lines.

AGRICULTURE

Extreme winter weather can cause significant livestock fatalities. According to the 2017 Census of Agriculture, the market value of livestock in McLean County was $26.1 million. Losses vary based on storm severity and duration, but losses to unprotected livestockcan be significant following a major storm event. Winter storms in the spring season have the potential to affect calving operations.

KEY ISSUES

EXTREME WINTER WEATHER EVENTS

COLD WAVE, BLIZZARD, HEAVY SNOW, AND ICE STORM AND RELATED MITGATION PROJECTS

KEY ISSUE

A winter weather event that causes a power outage may make it difficult for residents to heat their homes. Elderly residents and residents in mobile homes are the most vulnerable to cold waves. Approximately 3,500 residents in the county are elderly or live in a mobile home.

Related Mitigation Action
#16 Identify existing buildings with potential for retrofit use as tornado shelters, shelters for evacuation, or warming stations after power loss.

KEY ISSUE
Travelers, both those passing through the area and those on local trips can be stranded during a blizzard or icy road condition.

Related Mitigation Action
#8 Study and support pre-arranged shelters for stranded motorists/travelers, and others.

KEY ISSUE
There are residents of McLean County who become very vulnerable with the loss of power. Many have generators to address the issue. Some may need to be evacuated.

Related Mitigation Action
#9 Conduct an annual review of snow plowing priorities which include consideration of the vulnerable population.
#16 Identify existing buildings with potential for retrofit use as tornado shelters. shelters for evacuation, or warming stations after power loss.

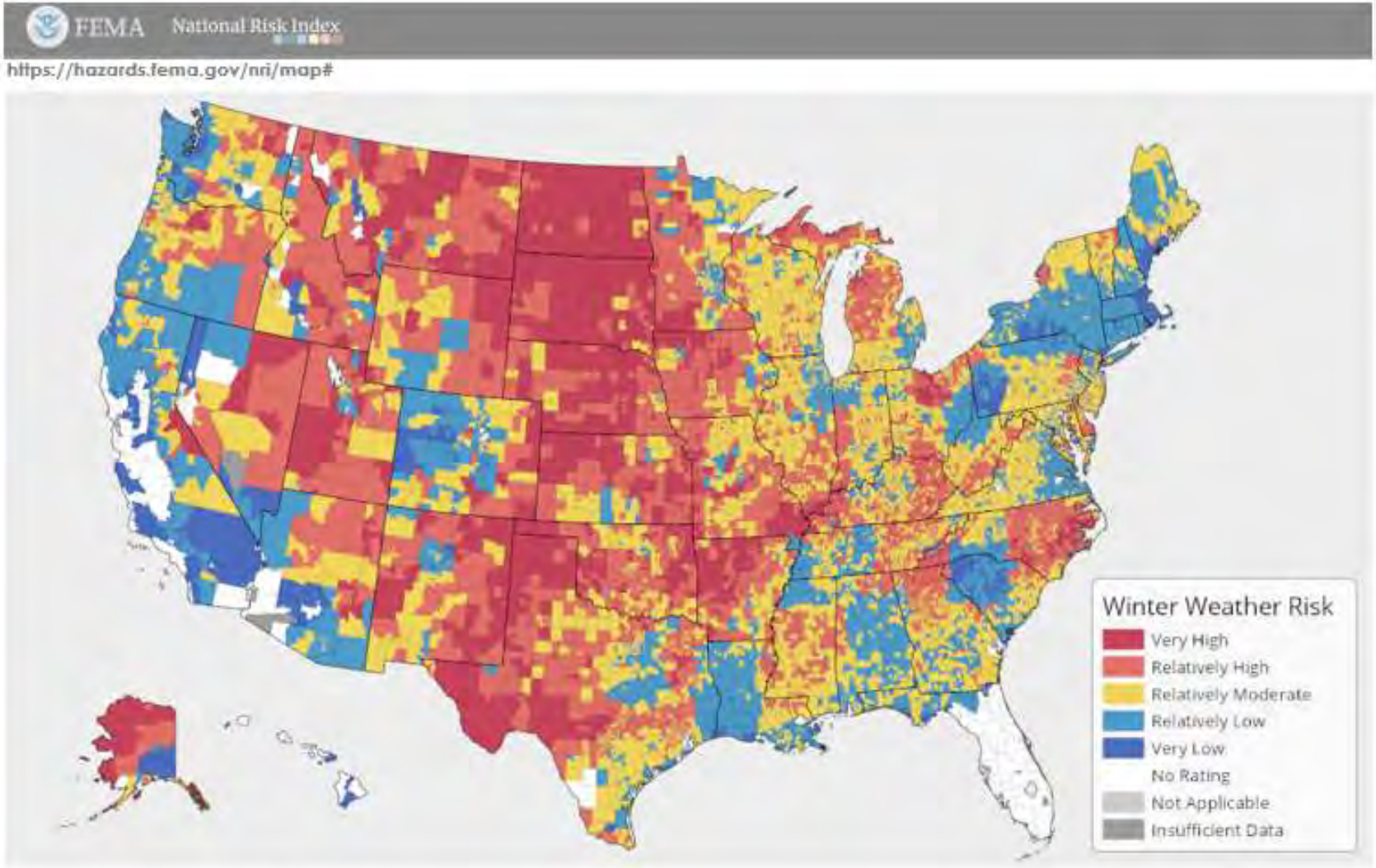
KEY ISSUE
Providing information to the public about the risks of extreme winter weather and coordinating responses to these events are critical.

Related Mitigation Actions
#D Improve inter-departmental radio communication and prepare for the rollout of Statewide Interoperability Radio Network (SIRN 2020).
#I Distribute hazard Information via the county and city websites, social media, traditional media, and other existing interfaces.
#15 Utilize a redundant and multiple methods for local warnings if primary communications are interrupted.
#17 Continue to support mutual aid agreements and on-scene incident command.
#19 Identify location and organize outreach to vulnerable populations during hazard events

KEY ISSUE
Snow removal is an expected and in some locations a significant annual expense

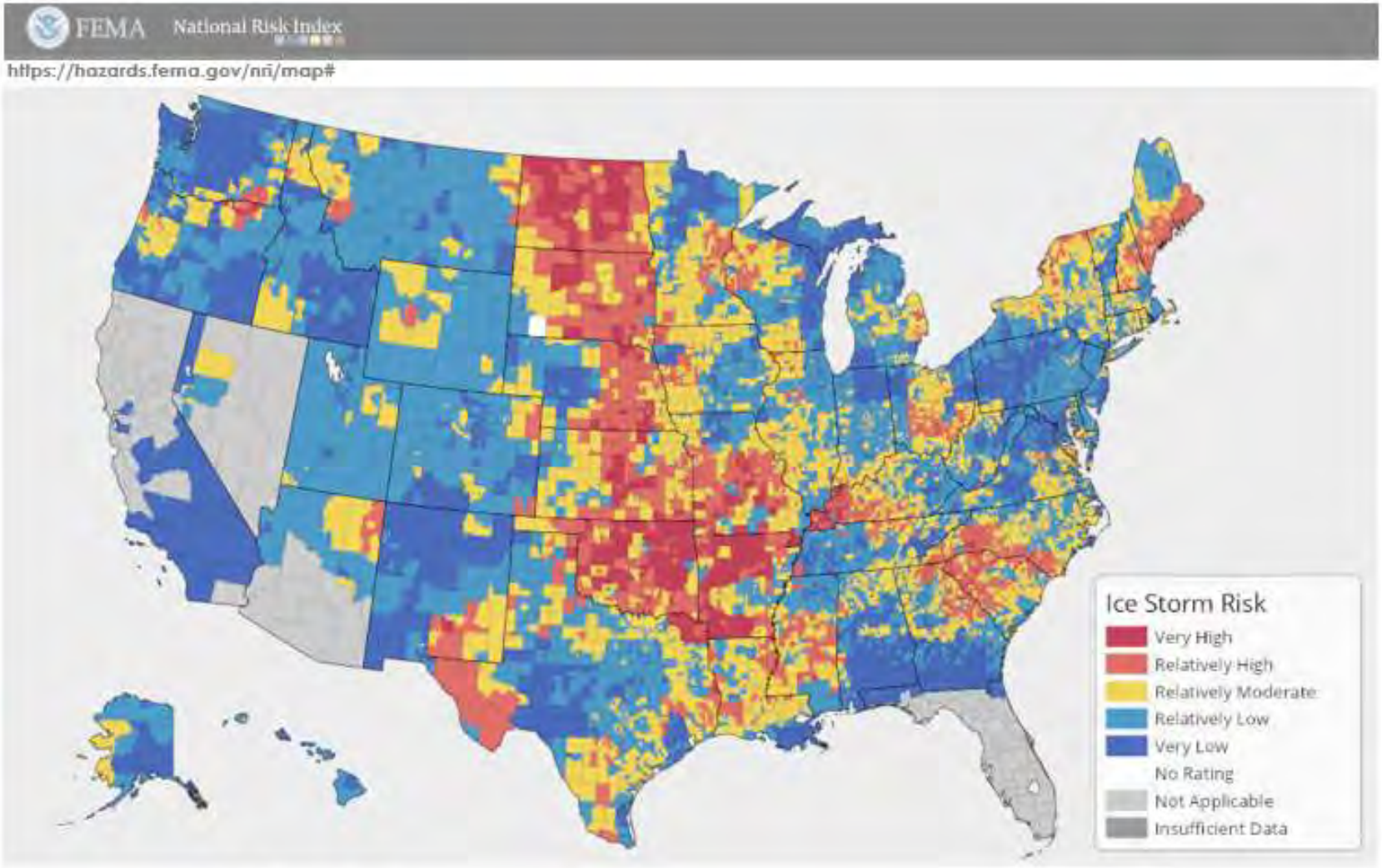
Related Mitigation Action
#18 Continue to support upgrading existing or purchase new equipment and infrastructure for emergency services including snow removal services, as needed.

NATIONAL RISK INDEX
The NATIONAL RISK INDEX Maps for Winter Weather and Ice Storm risk follow. See also Appendix D.



Hazard Type Risk Ratings

Compared to the rest of the U.S., **McLean County, ND's** risk to Winter Weather is **Relatively High**
See Appendix D for additional information.



Hazard Type Risk Ratings

Compared to the rest of the U.S., **McLean County, ND's** risk to Ice Storm is **Relatively Moderate**
See Appendix D for additional information.

5 Technological/Human-Caused Hazards

5.1 OVERVIEW

Technological/Human-Caused Hazards are profiled for McLean County in this section. Hazards are listed and the overall risk scores are presented in Table 5.1-1. See Chapter 6 for the risk analysis.

Table 5.1-1
Priority Risk Index (PRI) Scores - Technological Hazards

RISK LEVEL: High / Moderate / Low / Very Low	Countywide	Benedict	Butte	Coleharbor	Garrison	Max	Mercer	Riverdale	Ruso	Turtle Lake	Underwood	Washburn	Wilton
DAM FAILURE													
PUBLIC HEALTH INCIDENT - Human													
PUBLIC HEALTH INCIDENT - Agricultural													
HAZMAT INCIDENT - In Transit (Rai or Truck)													
HAZMAT INCIDENT - Pipeline													
HAZMAT INCIDENT - AF Missile Silo Facilities													
SECURITY – Active Attacker													
SECURITY – Cyber Threat													
TRANSPORTATION INCIDENT (road + rail)													
MAJOR URBAN FIRE													

DAM FAILURE

Garrison Dam would have a large regional impact in the event of failure, but there are few properties in McLean County located within the dam failure inundation area.

PUBLIC HEALTH INCIDENT

The public became more aware of this hazard during the COVID-19 pandemic. Human and agricultural disease have the potential to greatly impact the health and economy of the county.

HAZMAT INCIDENT

Many McLean County residents, including virtually all city residents, live in areas with a risk of a HAZMAT incident from one or multiple sources. There were seven reported HAZMAT incidents in the county between 2016 and 2021 (Table 5.3-1).

SIGNIFICANT SECURITY INCIDENT

Violence and cyber threats are an ongoing concern, but it is unlikely a large-scale event will occur in the county.

SIGNIFICANT TRANSPORTATION INCIDENT

Transportation routes, both rail and roadway present a risk for a HAZMAT release as do the pipelines.

SIGNIFICANT URBAN FIRES

There is no history of large-scale urban fire in the county, but it is an ongoing concern.

5.2 DAM FAILURE (Garrison Dam)

RISK LEVEL- High | Moderate | Low | Very Low

Jurisdiction	Location	Probability[43]	Impact	Spatial Extent	Warning Time	Duration	PRI Score[44]
Rural County	Regional	Possible	Limited	Moderate	Less than 6 hrs.	More than 24 hrs.	**1.97**
Garrison	Regional	Possible	Limited	Moderate	Less than 6 hrs.	Less than 1 week	**2.00**
Riverdale	Regional	Possible	Limited	Moderate	Less than 6 hrs.	Less than 1 week	**2.00**
Washburn	Regional	Possible	Limited	Moderate	Less than 6 hrs.	Less than 1 week	**2.00**
All Other Cities	Regional	Unlikely	Minor	Negligible	Less than 6 hrs.	Less than 1 week	**1.20**

HAZARD PROFILE

A dam is defined as an artificial barrier across a watercourse or natural drainage area that may impound or divert water. Dams have many potential uses, including hydro-electric power generation, irrigation, flood control, water supply and recreation. Dam structures can be earthen or from manmade materials. There are 129 dams in McLean County (Figure 5.2-1 and Table 5.2-1). The Garrison Dam is classified as a high hazard dam and the Yanktonai is a significant hazard dam.

A dam failure is a sudden, uncontrolled release of impounded water which may be caused by natural events, human-caused, or a combination. In McLean County, the potential for a flood occurring solely as a result of dam failure is a real, if not likely, possibility.

The Association of State Dam Officials identifies five primary causes of dam failure, which are often interrelated:

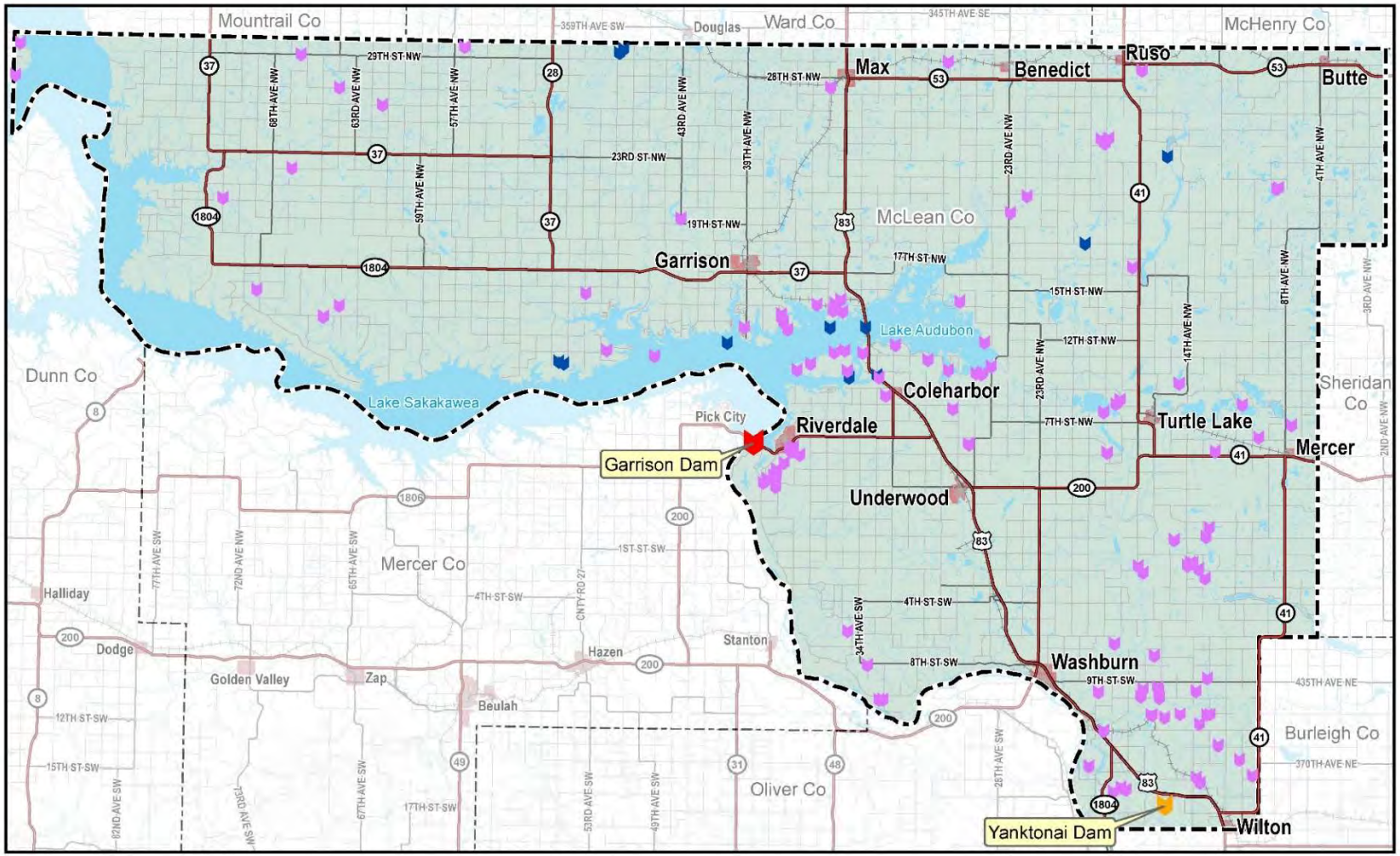
- Overtopping of a dam occurs when water from the reservoir spills over the top of the dam, creating instability in the structure. This can occur during a major flood event if the spillways are not adequately designed or if there is blockage in the spillway.
- Foundation defects, including settlement and slope instability. "Piping" describes the process that occurs as seepage pathways create eroded pipes through a structure.
- Seepage often occurs around hydraulic structures and earthen features. If left unchecked can gradually reduce the dam structure's stability.
- Structural failure of materials used to construct the dam.
- Inadequate maintenance.

The Association of State Dam Officials, the US Army Corps of Engineers and FEMA utilize a rating system to determine potential hazard to property or life if a dam were to suddenly fail.

Low: Dams located in rural or agricultural areas where there is little possibility of future development. Failure of low hazard dams may result in damage to agricultural land, township and county roads and farm buildings other than residences. No loss of life is expected if the dam fails.

[43] In this table, "Probability" and "Impact" refers to failure of the Garrison Dam impacting an area.

[44] Priority Risk Index (PRI) Scores range from 1-4. See Chapter 6.



Dam Locations and Ratings

Source: North Dakota Department of Water Resources

Hazard Rating:
- High
- Significant
- Low
- Undetermined
- Open Water

- Highways
- Railroads
- McLean County
- Other County Boundary
- Cities

N 0 4 8 16 Miles

Figure 5.2-1

McLean County
NORTH DAKOTA

Significant: Dams located in predominantly rural or agricultural areas where failure may damage isolated homes, main highways, railroads, or cause interruption of minor public utilities. Potential for the loss of life may be expected if the dam fails.

High: Dams located upstream of developed and urban areas where failure may cause severe damage to homes, industrial and commercial buildings, and major public utilities. Potential for loss of life if the dam fails. High hazard dam reservoirs must be at least 50 acre-feet.

GARRISON DAM

Figure 5.2-2 Missouri River Dams
Source: US Army Corps of Engineers

The Garrison Dam, a high-hazard dam, was constructed as one of six dams on the Missouri River for flood control, navigation, irrigation, and hydropower. The dam. located west of Riverdale and across Lake Sakakawea from Garrison, has been operating since 1955.

There is an Emergency Action Plan (EAP) in place for this dam. The lead planner and project manager for a dam safety modification study for Garrison Dam by the U.S. Army Corps of Engineers recently described the risk of dam failure to the Dickinson Press:

Figure 5.2-3 Garrison Dam Spillway
Source: The Dickinson Press

"Although [an uncontrolled reservoir release] has a low probability of occurring . . . in all, 12 states including North Dakota, South Dakota, Nebraska, Iowa, Missouri, and Kansas, could sustain impacts in the event of a Garrison spillway failure",

". . . bridges and roads would be washed away and [an uncontrolled reservoir release] would cause numerous and significant travel and commerce delays. . . . Life safety is the Corps' No. 1 priority, and we take these issues very seriously. We want to ensure that Garrison is constructed, maintained, and operated as safely as possible. Garrison Dam's a safe dam. . . .Risk assessment combines weighing the probability of spillway failure with the consequences. . . .The consequences of failure are high. The probability is low."

Source: The Dickinson Press, May 9, 2021

HISTORY

No McLean County dam is included in a search of the Dam Failure Incident Database[45]. In 2012, the US Army Corps of Engineers developed the Missouri River Hydraulic Modeling and Mapping for the 2011 Garrison Dam - 150,000 cubic feet per second (cfs) Projected Inundation. The McLean County maps from that study are presented in Appendix H. Areas identified in those maps with projected eight to ten feet of flooding or above are very similar to FEMA's 100-year flooding maps (Figure 5.2-4) for example, but go beyond that to include flooding of more areas at lower depths as shown in Figure 5.2-5) for the same area.

Figure 5.2-4 100 Year Flood – south of Washburn
Source: FEMA

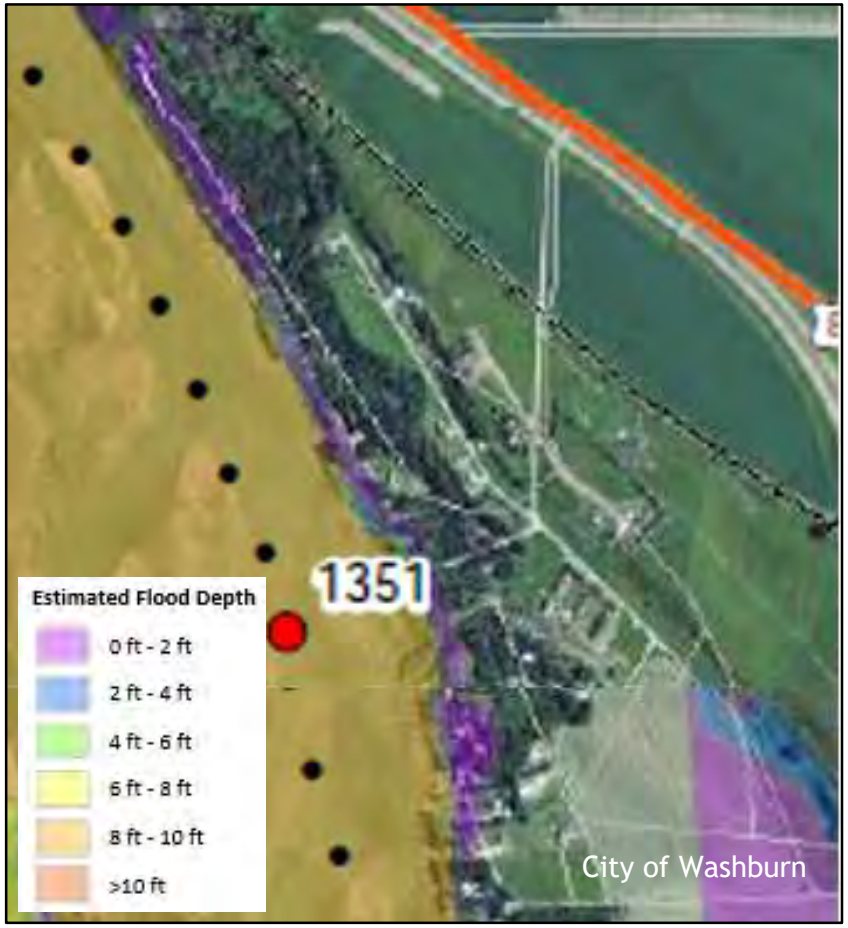


Figure 5.2-5 Projected Inundation south of Washburn according to the 2012 US Army Corps of Engineers' Missouri River Inundation Hydraulic Modeling and Mapping
Source: US Army Corps of Engineers

[45] Incidents Search | Association of State Dam Safety

YANKTONAI DAM

Yanktonai Dam is located near U.S. 83 in rural McLean County almost 11 miles from Washburn, near Wilton.

Figure 5.2-6 Yanktonai Dam

LOCATION

With the exception of the Garrison Dam and the Yanktonai Dam, any failure of a McLean County dam, is local in nature, with the potential inundation areas depending on many elements including local area topography. See the May 9, 2021 quotes above regarding the Garrison Dam. Because the Yanktonai Dam is located upstream of U.S.83, its location could be considered regional.

PROBABILITY

Probability is based on hazard frequency over a 10-year period and the regular inspection and upkeep required of the high hazard dams lessens their probability of failure. Since dam failures occur less than once every 10 years, an incident at the Garrison Dam is generally considered possible but not likely. Without an EAP, the probability of Yanktonai Dam failure is not known, but considered unlikely. The probability of failure of the low hazard dams is unknown.

VULNERABILITY

POPULATION

- See the May 9, 2021 comments on the Garrison Dam quoted above.
- Based on the 2012 US Army Corps of Engineers' Missouri River Inundation Hydraulic Modeling and Mapping documents, there are approximately 35 residential properties located downstream of the Garrison Dam in McLean County that would likely be flooded with release of 150,000 cfs from the dam similar to the 2011 event. Any release beyond that would cause additional flooding.
- Yanktonai Dam does not have an EAP, which limits vulnerability analysis. Based on analysis of aerial

imagery, there are three residential properties located downstream of the dam and may be vulnerable in the event of failure of that dam (Figure 5.2-6).

PROPERTY

- Based on the 2012 study by the US Army Corps of Engineers there is significant farmland, conservation areas and a number of structures in McLean County located within the 2011 dam inundation area for Garrison Dam. In the area north of the bridge in Washburn that are includes the Fort Mandan reconstruction and the Washburn 4H in addition to a few residences and both farm and residential accessory structures. In the area south of the bridge for about five miles there are about 35 homes located within the inundation area of just on its edge. This area also includes both agricultural and residential accessory structures. Any discharge beyond that limit would impact additional structures, including homes.
- As mentioned above, Yanktonai Dam does not have an EAP, but based on aerial imagery, there are three residential properties located downstream that may be vulnerable in the event of failure. U.S. 83 which is a critical regional facility, is located approximately 6,000 feet downstream of the dam and may be inundated in the event of dam failure.
- By definition, low hazard dams do not pose a risk to structures but failure of any these dams found across the county may cause local agricultural or environmental damage.

EXISTING CAPABILITIES

The Garrison Dam has an Emergency Action Plans (EAPs) in place. This is a formal document that identifies potential emergency situations that could occur at a dam and specifies the course of project to be taken when an emergency situation arises.

McLean County uses their "CodeRED" to notify the public of hazard events and other emergencies. A link to the program is on the county website.

The ND State Water Commission has developed material for the public on dam safety which would be useful in understanding the risks involved with dams. The state's dam safety program includes reviewing construction permit applications for dams, conducting dam inspections, maintaining an inventory of dams, determining the hazard classification of dams, and assisting with emergency preparedness activities. EAPs are required for all high hazard and medium hazard dams. In addition, dam owners are responsible for developing, testing, and updating an EAP for their dam[46].

IMPACT

Dam failures are of particular concern because the failure of a large dam has the potential to cause more death and destruction than the failure of any other manmade structure. This is because of the destructive power of the flood wave that would be released by the sudden collapse of a large dam. FEMA's "Assessing the Consequences Guide" identifies potential direct and indirect consequences of dam failure. The list include:

[46] www.swc.nd.gov

DIRECT CONSEQUENCES

- Injuries and/or loss of life
- Damage to commercial structures and/or their contents
- Damage to residential structures and/or their contents
- Damage to equipment and supplies at industrial sites
- Damage to facilities that provide services
- Flooding of transportation, water, electrical, and communication infrastructure
- Loss of livestock and agricultural crops
- Loss of recreation opportunities
- Loss of electrical generation
- Debris removal costs
- Sediment removal costs
- Cost to repair or rebuild dam

INDIRECT CONSEQUENCES

- Increased traffic congestion while repairs occur
- Prolonged operations of temporary shelters for residents of the inundation area

CHANGES IN DEVELOPMENT

McLean County that has experienced residential, commercial, and industrial growth in recent years. While floodplain regulations limit development along parts of the river and the likelihood of dam failure is low, current zoning and land use ordinances in McLean County and the cities do not specifically consider dam inundation areas during the review of new development.

KEY ISSUES AND RELATED MITGATION STRATEGIES

Key Issues are identified for each hazard addressed in the McLean County Multi-Hazard Mitigation Plan. The key issues for incidents related to dam failure are listed below as well as the mitigation actions which have been designed to address the issues.

KEY ISSUE

Garrison Dam would have a significant regional impact in the event of failure.

Related Mitigation Actions

#16 Identify existing buildings with potential for retrofit use as . . . shelters for evacuation .
#17 Continue to support mutual aid agreements and on-scene incident command.

KEY ISSUE

Providing information to the public about the risks of a Dam Failure and coordinating of a response to a Dam Failure event are critical.

#D Improve inter-departmental radio communication and prepare for the rollout of Statewide Interoperability Radio Network (SIRN 2020).
#I Distribute hazard Information via the county and city websites, social media, traditional media, and other existing interfaces.
#15 Utilize a redundant and multiple methods for local warnings if primary communications are interrupted.
#17 Continue to support mutual aid agreements and on-scene incident command.
#19 Identify location and organize outreach to vulnerable populations during hazard events

5.3 HAZMAT INCIDENT- Incidents while HAZMAT is in transit

RISK LEVEL- High | Moderate | Low | Very Low

Jurisdiction	Location	#[47]	Probability		Impact	Spatial Extent	Warning Time	Duration	PRI Score[48]	
			Road or Rail	Pipeline						
Rural County	Local	3	Possible	Unlikely	Minor	Negligible	Less than 6 hrs.	Less than 6 hrs.	**2.29**	
Benedict	Local	1	Possible	n/a	Minor	Negligible	Less than 6 hrs.	Less than 6 hrs.	**2.05**	
Butte	Local	2	Possible	n/a	Minor	Negligible	Less than 6 hrs.	Less than 6 hrs.	**2.05**	
Coleharbor	Local	2	Possible	n/a	Minor	Negligible	Less than 6 hrs.	Less than 6 hrs.	**2.05**	
Garrison	Local	2	Possible	n/a	Minor	Negligible	Less than 6 hrs.	Less than 6 hrs.	**2.05**	
Max	Local	2	Possible	n/a	Minor	Negligible	Less than 6 hrs.	Less than 6 hrs.	**2.05**	
Mercer	Local	0	Unlikely	n/a	Minor	Negligible	Less than 6 hrs.	Less than 6 hrs.	**1.35**	
Riverdale	Local	1	Possible	n/a	Minor	Negligible	Less than 6 hrs.	Less than 6 hrs.	**1.97**	
Ruso	Local	2	Possible	n/a	Minor	Negligible	Less than 6 hrs.	Less than 6 hrs.	**2.05**	
Turtle Lake	Local	1	Possible	Unlikely	Minor	Negligible	Less than 6 hrs.	Less than 6 hrs.	**2.21**	
Underwood	Local	3	Possible	Unlikely	Minor	Negligible	Less than 6 hrs.	Less than 6 hrs.	**2.29**	
Washburn	Local	2	Possible	n/a	Minor	Negligible	Less than 6 hrs.	Less than 6 hrs.	**2.05**	
Wilton	Local	3	Possible	Unlikely	Minor	Negligible	Less than 6 hrs.	Less than 6 hrs.	**2.29**	

OVERVIEW

A hazardous material is any substance that has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors. Common hazardous materials found in North Dakota include natural gas, anhydrous ammonia, and crude oil.

HISTORY

Table 5.3-1 indicates the reported HAZMAT incidents in McLean County between 2016 and 2021. Prior to the Unified Spill Reporting System that started on January 1, 2021, reports of environmental incidents in North Dakota were submitted to one of three agencies, the Department of Emergency Services, Department of Environmental Quality and the Department of Mineral Resources' Oil and Gas Division of the North Dakota Industrial Commission. Early reports indicate few incidents in McLean County and none for many years,

[47] The # indicates the total hazmat lines. 3= road+rail+pipeline

[48] Priority Risk Index (PRI) Scores range from 1-4. See Chapter 6.

Table 5.3-1 REPORTED HAZMAT INCIDENTS - 2016-2021			
YEAR	**INCIDENT**	**MATERIAL**	**LOCATION**
2016	Equipment Leak	Hydraulic Fluid	Rural County
2017	-	-	-
2018	-	-	-
2019	-	-	-
2020	Truck Leak	Hydraulic Fluid	Benedict
	Bulk Storage Tank Release	Anhydrous Ammonia	Washburn
2021	Truck accident	Diesel	Washburn
	Small oil spill on city street	Oil	Washburn
	Loading accident	Herbicide	Max
	Accidental spill on cattails	Bentonite	Turtle Lake

Source: https://northdakota.hazconnect.com

Pipelines

Reports from the USDOT provides detail and incident history for the pipeline systems in the State of North Dakota between 1998 and 2018.

Significant incidents are those incidents reported by pipeline operators with any of the following conditions met: 1) fatality or injury requiring in-patient hospitalization; 2) $50,000 or more in costs, measured in 1984 dollars; 3) highly volatile liquid releases of five barrels or more or other liquid releases of 50 barrels or more; and 4) liquid releases resulting in an unintentional fire or explosion. According to these reports, there were 112 pipeline incidents that caused one fatality, four injuries and $55,565,170 in damage over the period of 1998 - 2017. As of August 2018, there have been 16 pipeline incidents with roughly $1,939,461 in damage (US Department of Transportation, 2018a). . . On average, North Dakota experienced six incidents, less than one fatality, less than one injury and $2,778,259 in damages each year (US Department of Transportation, 2018).

LOCATION

Hazardous material incidents are a national issue and also an issue for McLean County. These spills/releases occur at fixed sites that manufacture, store, or use Tier II materials, during transfer operations and while hazardous materials being transported by pipeline, truck, or rail.

Because rural McLean County and the cities have varying risks for a HAZMAT incident, the risk for rural McLean County and each city is addressed separately in the risk calculations presented in Chapter 6.

This section presents two types of operations that involve hazardous materials: Fixed Sites and those that are Transportation-Related.

KEY ISSUES AND RELATED MITGATION ACTIONS

Key issues and related mitigation actions for all types of HAZMAT incidents are located at the end of the overall HAZMAT section.

Fixed HAZMAT Sites

North Dakota requires HAZMAT operators to submit Tier II Chemical Inventory Reports to the county annually. These reports help local fire departments, other responders, and the county to plan for and respond to emergencies.

Fixed Sites – Oil and Gas Development

Rigs and production facilities in McLean County are located primarily on the county's northwest as shown on Figure 5.3-1. The location of these facilities is regulated by the North Dakota Industrial Commission.

PROBABILITY/IMPACT

An incident with these facilities is possible but in McLean County they are located in a rural area. Accidental releases may be due to equipment failure, human error, or occur during natural hazard events or during another technological/man-made hazard event.

Fixed Sites - Minot Air Force Base Facilities

Minot Air Force Base oversees active Minuteman III missile launch facilities (silos) located in McLean County. These missiles contain nuclear material. monomethyl hydrazine, nitrogen tetroxide, and could be hazardous if accidentally or intentionally damaged or tampered with, however, these systems contain a very high level of security and protection by the United States Air Force.

These facilities are operated by the 91st Missile Wing assigned to Minot Air Force Base. Assistance from local fire crews and law enforcement could be required during an incident. The most common incident is potential fuel leaking from missiles. Any HAZMAT incident activates an emergency 2,800- foot safety zone around the missile silo, could necessitate the closure of nearby roads and evacuation of residents. County fire crews and law enforcement could be utilized to establish the safety establish the safety zone and assist with traffic control.

PROBABILITY/IMPACT

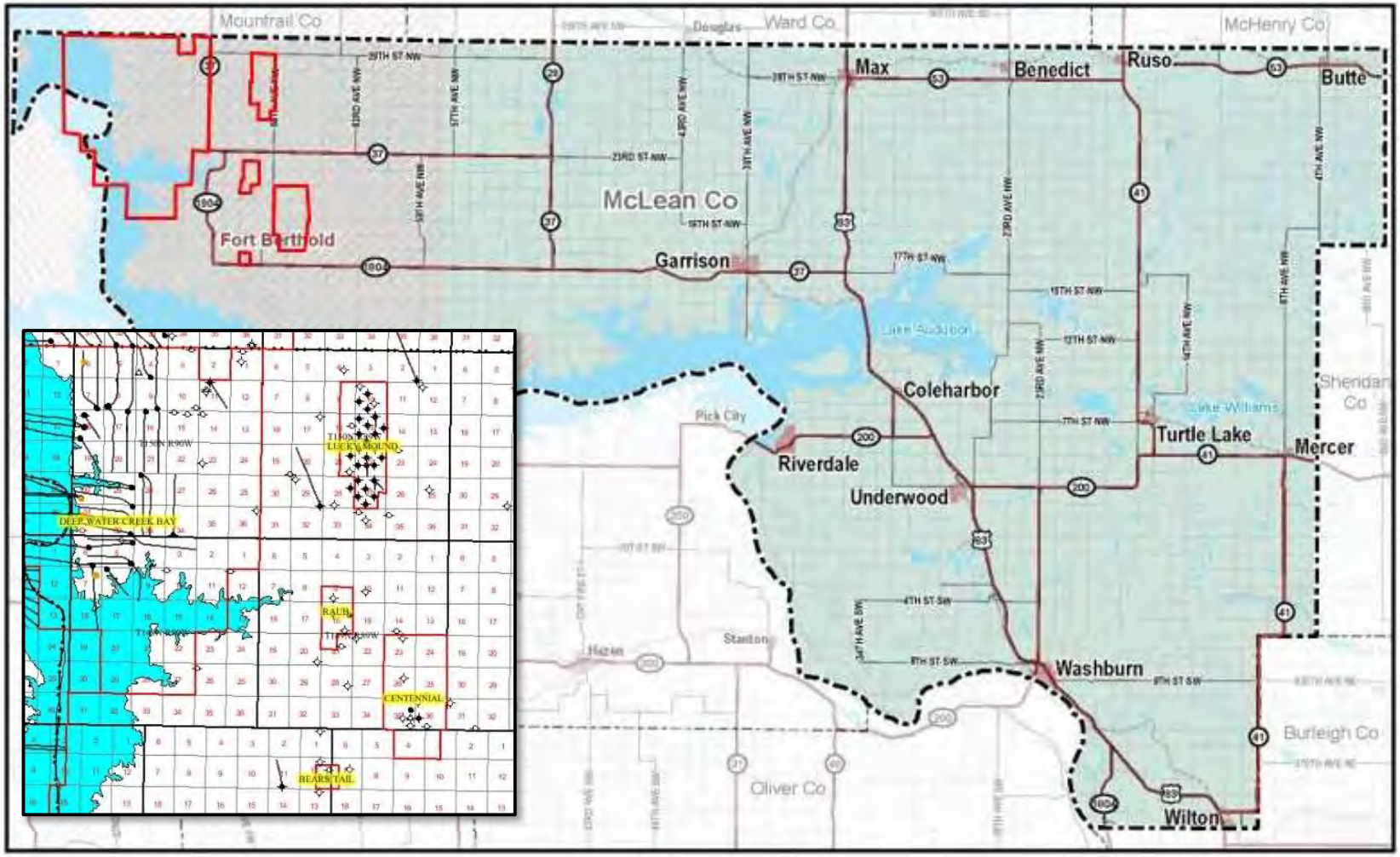
An incident with these facilities is unlikely and based on previous experience, any impacts are expected to be minor or limited. More serious impacts are not outside the realm of possibilities.

VULNERABILITY

Areas around missile launch facilities need to remain open and undeveloped to protect public safety and to allow unrestricted military access and operation. McLean County provides notification to the Air Force Base of any proposed development within two miles of a launch facility.

Missile launch facilities are located within an existing circular no-build easement with a 1,200-foot radius. Within these easements, the military has the right to prohibit habitable structures and remove existing or future buildings which are used for habitation. Only the City of Ruso is within the 1,200-foot radius of a facility and it is right at the edge.

Most easements were purchased more than 50 years ago, so current landowners may not be aware of restrictions on the property. Following the transfer of land ownership, development plans may be prepared without this knowledge. In the event of an emergency, the military evacuate an area beyond the easement, extending to a radius of 2,500 feet from the missile launch facility.



McLean County

Source: NDGISHUB

McLean County
Other County Boundary
Cities
Fort Berthold Reservation
Highways
Railroads
Open Water

Figure 5.3-1

McLean County
NORTH DAKOTA

Other HAZMAT Fixed Sites

Other typical Tier II facilities include bulk fuel plants, anhydrous ammonia plants, propane plants, agricultural processing plants, energy producing sites (Figure 5.3-1) and transload facilities. These exist in every part of the county. These Tier II facilities are not shown on the map due to security concerns, although their hazard areas are utilized to calculate risks and vulnerabilities.

HAZMAT – In Transit or Pipeline

HAZARD PROFILE

A transportation HAZMAT incident is the accidental release of oil, gas, or chemical substances during highway or rail transport. These incidents pose a great potential for public exposures, both nearby populations and motorists.

Pipeline failures are low-probability, potentially high-consequence events. A pipeline transportation incident occurs when a break in a pipeline creates the potential for an explosion or a leak of a hazardous material (oil, gas, etc.) possibly requiring evacuation. An underground pipeline incident can be caused by environmental disruption, accidental damage, or sabotage. Incidents can range from a small, slow leak to a large rupture where an explosion is possible. Inspection and maintenance of the pipeline system along with marked gas line locations and an early warning and response procedure can lessen the risk to those near the pipelines.

LOCATION

Incidents involving the transporting of hazardous materials are possible across the nation as well as in McLean County. Figure 5.3-2 depicts locations of roadways, rail and pipelines that have potential of transporting hazardous materials.

VULNERABILITY

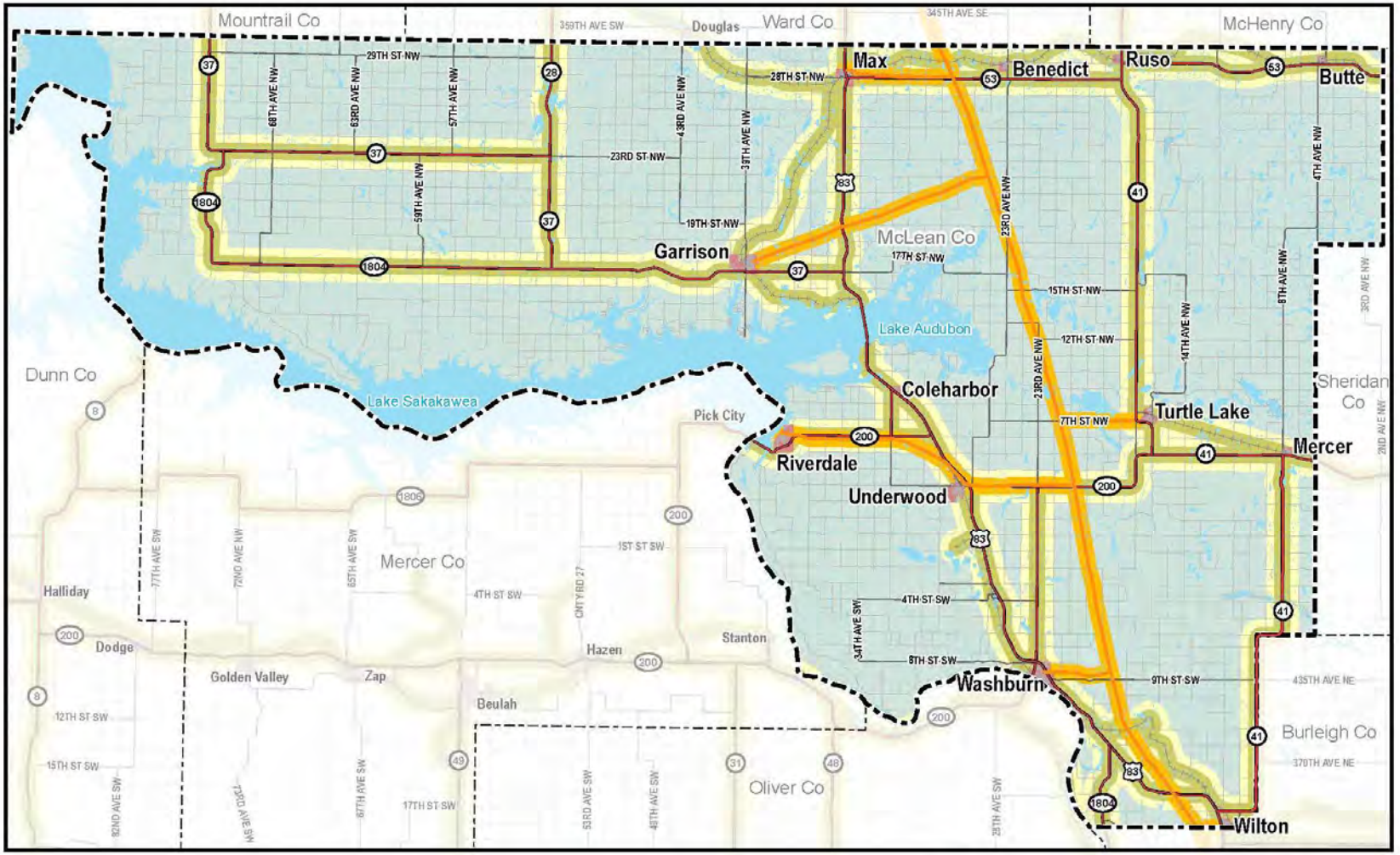
PEOPLE, PROPERTY + CRITICAL, STRATEGIC, AND KEY FACILITIES

As Figure 5.3-2 illustrates, the many locations where the roadways, railways, and pipelines capable of transporting hazardous materials go through the county's populated areas. Table 5.3-2 lists the locations with vulnerability.

Table 5.3-2
Hazardous Materials in Transit – Vulnerable Locations

	Countywide	Benedict	Butte	Coleharbor	Garrison	Max	Mercer	Riverdale	Ruso	Turtle Lake	Underwood	Washburn	Wilton
Roadway	■	■	■	■	■	■		■	■	■	■	■	■
Rail	■	■	■	■	■	■			■		■	■	■
Pipeline	■									■	■		■

As noted in the USDOT report mentioned above, there are vulnerabilities related to pipeline operations. Most of the cities are vulnerable to risks from more than one hazard.



Hazardous Materials Buffer Areas

Source: NDGISHUB, ND Pipeline Authority

Highways
Railroads
Highway and Railroad 1/2-Mile Buffer
Highway and Railroad 1-Mile Buffer
Natural Gas Pipelines
Natural Gas Pipeline 1/2-Mile Buffer
McLean County
Other County Boundary
Cities
Open Water

N 0 4 8 16 Miles

Figure 5.3-2

McLean County
NORTH DAKOTA

PROBABILITY

HAZMAT incident during transit by truck or rail at any of the locations shown on Figure5.3-2 is possible, a rating that is between somewhat likely and somewhat unlikely.

The survey result for a pipeline incident shows that about 70% of respondents thought that a pipeline incident was unlikely. Community survey results on this question is shown in Table 3.5-1.

Excerpt from Table 3.5-1
COMMUNITY SURVEY RESULTS

HAZARDS	Very Likely	Somewhat Likely	Somewhat Unlikely	Very Unlikely
HAZMAT Incidents - Truck and Rail	9.6%	32.5%	32.5%	20.5%
Pipeline HAZMAT Incidents	6.0%	19.3%	34.9%	34.9%

IMPACT

HAZMAT incident during transit by truck, rail, or pipeline usually have a limited impact.

EXISTING CAPABILITIES

Industrial Commission

Pipeline operators are required to coordinate all safety preparedness and response activities with the communities.

In McLean County, incidents can be resolved by pipeline company emergency crews, local and state responders. See Section 7.

McLean County uses their "CodeRED" to notify the public of hazard events and other emergencies. A link to the program is on the county website.

CHANGING DEVELOPMENT

Figure 5.3-2 illustrates potential buffer areas along the pipelines that would provide and maintain separation between habitable buildings and an oil or gas pipeline corridor so as to minimize risk of harm to people and property. In other jurisdictions they range in width and generally require consideration when a property is rezoned or developed.

Recommendations for initial evacuation in the case of fire for common hazardous materials are shown below:

- Crude oil, petroleum, and diesel fuel: ½ mile evacuation
- Propane, natural gas: one mile evacuation
- Anhydrous ammonia: one mile evacuation
- Chlorine: ½ mile evacuation
- Ammonium nitrate fertilizers: ½ mile evacuation

KEY ISSUES AND RELATED MITGATION STRATEGIES ALL HAZMAT INCIDENTS

Key Issues are identified for each hazard addressed in this Hazard Plan. The key issues for all of the hazards related to HAZMAT incidents are listed below as well as the mitigation actions which have been designed to address the issues.

KEY ISSUES

HAZMAT incidents are not common in McLean County. Respondents to the community survey had different opinions on the probability of a spill or release depending on the source. As the excerpt from Table 3.5-1 indicates, respondents ranked oil to be the most likely. A total of 76%

of them said that it is very likely or somewhat likely that there will be a releases from hazardous materials in transit. As most McLean County residents live, work or travel near the path of hazardous materials in transit, this is an important issue that should be addressed.

Related Mitigation Actions
#8 Continue supporting hazardous materials training for first responders
#21 Identify existing buildings with potential for retrofit use as tornado shelters. shelters for evacuation, or warming stations after power loss.
#22 Continue to support mutual aid agreements and on-scene incident command.

KEY ISSUE
Providing information to the public about the risks of a HAZMAT event and coordinating responses to these events are critical.

Related Mitigation Actions
#D Improve inter-departmental radio communication and prepare for the rollout of Statewide Interoperability Radio Network (SIRN 2020).
#I Distribute hazard Information via the county and city websites, social media, traditional media, and other existing interfaces.
#15 Utilize a redundant and multiple methods for local warnings if primary communications are interrupted.
#17 Continue to support mutual aid agreements and on-scene incident command.
#19 Identify location and organize outreach to vulnerable populations during hazard events

5.4 PUBLIC HEALTH INCIDENT

RISK LEVEL- High | Moderate | Low | Very Low

Risk applies to county + all cities	Hazard	Location	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score[49]	
	Human Disease	National	Very Likely	Limited	Small	More than 24 hrs.	More than a week	**2.22**	
	Agricultural Disease	Regional	Very Likely	Limited	Small	More than 24 hrs.	More than a week	**2.13**	

OVERVIEW

This hazard includes human, animal, and plant diseases with the potential for high infection rates in humans and those which can cause the destruction of livestock or crops. McLean County's hazard mitigation approach to this hazard echoes the approach of the North Dakota Department of Health.

". . .dedicated to creating and promoting a state of readiness and prompt response to protect the health of North Dakotans during catastrophic events, large scale disasters and emergencies. We accomplish our mission by coordinating education, assessment, planning, response, and support services involving public health providers, private medical providers, public safety agencies and government officials."

Human Disease Incidents

HAZARD PROFILE

An incident related to human disease is defined as a medical, health, or environmental threat to the general public (such as contamination, epidemics, and vector-borne diseases). The list of diseases tracked by McLean County is included as Appendix E.

HISTORY

Influenza or "flu" is included in the list of diseases that are reportable with detailed records are maintained. Table 5.4-1 provides information from the seasonal summaries regarding influenza outbreaks in McLean County and the State of North Dakota. The most recent report shows that McLean County's percentage of influence cases is considerably higher than the county's percentage of the state population.

Table 5.4-1
INFLUENZA OCCURRENCES

Years	Statewide Cases	McLean County Cases	% of ND Cases in McLean County
2016-2017	7,507	96	1.28%
2017-2018	8530	85	1.00%
2018-2019	7946	89	1.12%
2019-2020	12,498	225	1.80%
2020 Census	North Dakota Population	McLean County Population	McLean County % of ND Population
	779,094	9,771	1.25%

Source: North Dakota Influenza Season Final Reports, 2020

[49] Priority Risk Index (PRI) Scores range from 1-4. See Chapter 6.

Another communicable disease that is tracked by the North Dakota Department of Health is pertussis, also known as whooping cough. Pertussis is a very contagious bacterial infection caused by the Bordetella bacteria. It is only found in humans and is spread from person to person by coughing or sneezing while in close contact with others. Pertussis starts with cold like symptoms and can become a series of coughing fits for several weeks.

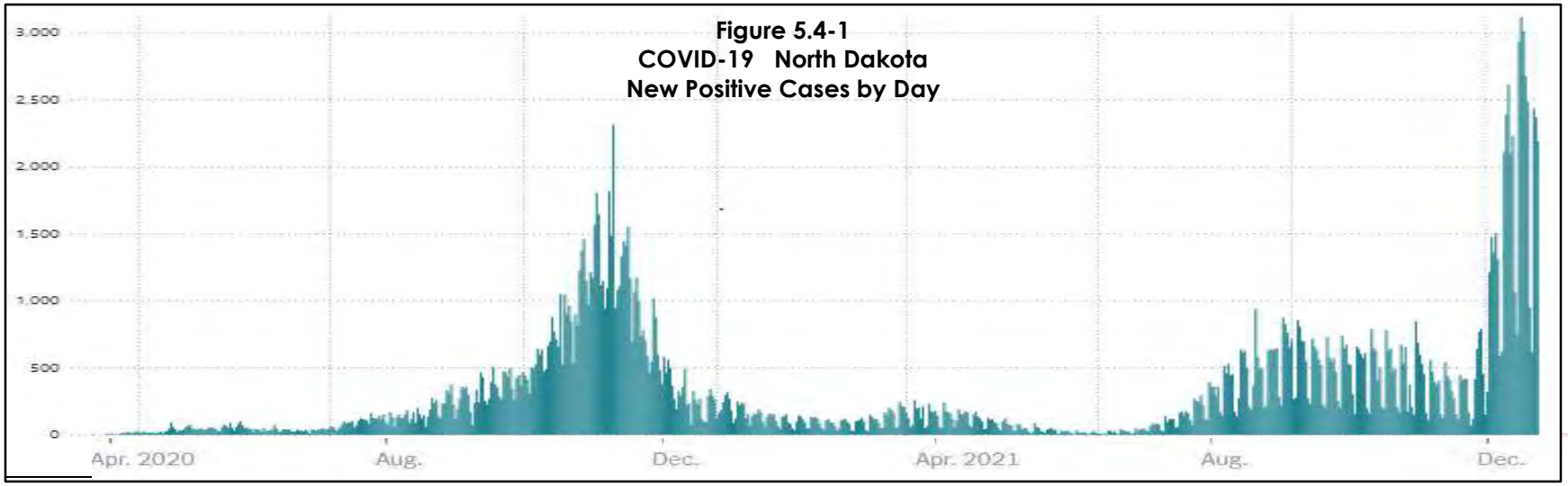
Other illnesses of particular concern, include food-borne illnesses, such as E. coli and Salmonella, plus Measles, Meningitis, West Nile Virus, Severe Acute Respiratory Syndrome (SARS), and COVID-19. The 2016 Plan included the following text which was written before COVID-19: *"Based on the available data, there have been several occurrences of the communicable disease hazard within McLean County – at least one occurrence of at least one communicable disease in each of the previous nine years. Therefore, using the scale provided earlier in this section, the probability of a future single occurrence is high. Whether this single occurrence would be sufficient to create a hazardous situation for the county would depend entirely on the specific details of the specific situation."*

According to the Centers for Disease Control (CDC), rodents and other pests can carry harmful diseases and cause community health problems especially after a natural disaster. Local experience is limited but there are reports elsewhere in the region including the Minor Air Force Base and the City of Bismarck[50].

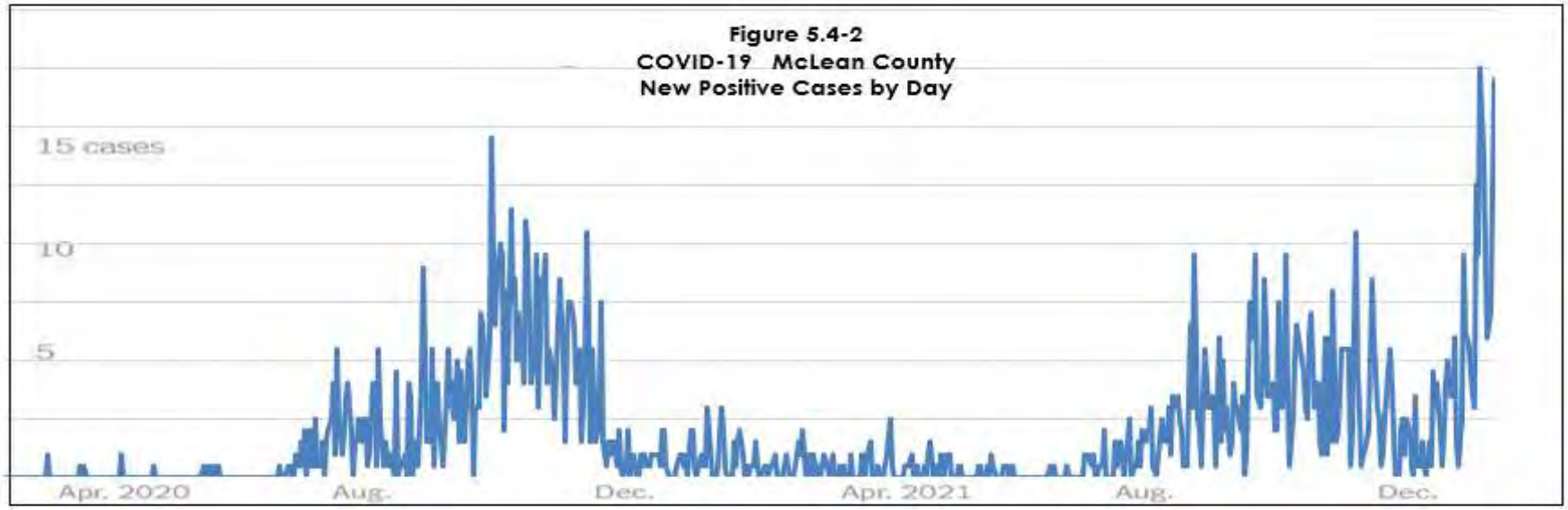
COVID-19 PANDEMIC

On March 13, 2020, Governor Doug Burgum signed Executive Order 2020-3 declaring a state of emergency in

Figure 5.4-1
COVID-19 North Dakota
New Positive Cases by Day



[50] www.cdc.gov/disasters/rodents.html, www.minot.af.mil/News/Article-Display/Article/1919329/ten-thousand-rodent-intruders/, https://bismarcknd.gov/DocumentCenter/View/38351/urban-rodent



Source: NDDoH

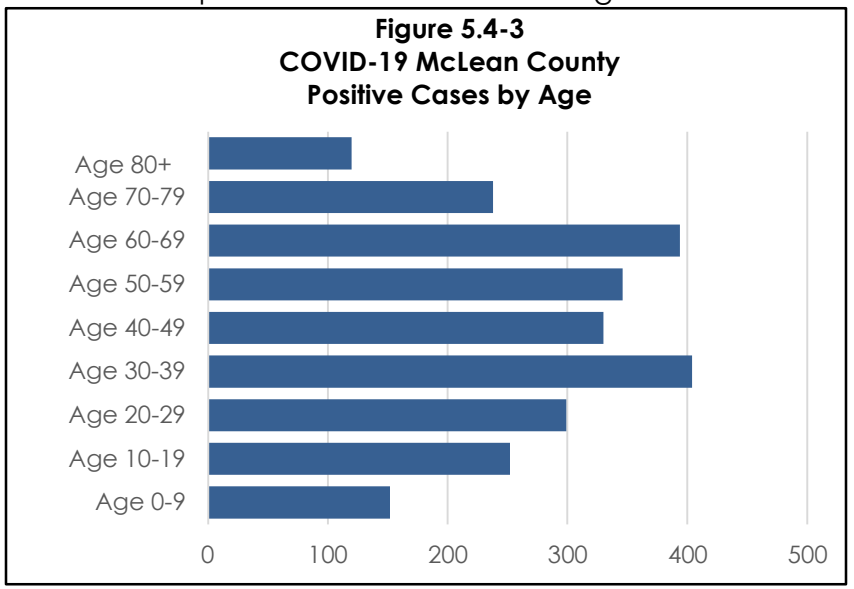
response to COVID-19 public health crisis. Figure 5.2-4 and Figure 5.2-5 illustrate the course of the COVID-19 pandemic in North Dakota and McLean County from onset through the end of 2021. The scale of the pandemic is different, but the patterns are similar.

VULNERABILITY

PEOPLE

Since the beginning of the pandemic, at least 1 in 4 residents have been infected with COVID-19, a total of 2,657 reported cases[51]. January 2022 was the month with the most reported cases in McLean County.

The age groups most impacted by the virus have changed over time. In the early days of the coronavirus pandemic, the general consensus was that COVID-19 was primarily threatening to the elderly and people with preexisting conditions. The January 2022 McLean County age distribution of positive cases is shown on Figure 5.4-3.



[51] Total through the end of January 2022.

LOCATION
Communicable disease outbreaks are usually regional or national in extent.

IMPACTS
Communicable disease outbreaks and pandemics have an immediate impact on life and health safety. The extent of the impact will be contingent on the type of infection or contagion, the severity of the outbreak, and the speed at which it is transmitted. Property and infrastructure could be affected if large portions of the population were affected and unable to perform maintenance and operations tasks. This would be particularly disruptive if those impacted were first responders or other essential personnel.

PROBABILITY
The County's experience with influenza recognizes that communicable disease will very likely appear each year. Generally, a pandemic, including something similar to the COVID-19 pandemic, was regarded as highly likely by public health professionals but the public in McLean County and across the country did not anticipate anything like the COVID-19 experience before the first cases were recorded.

Based on past and current experience, the probability of a future single public health incident is high. Whether this single occurrence would be sufficient to create a serious hazard incident for the county would depend entirely on the details of the specific situation.

CHANGES IN DEVELOPMENT
McLean County that has experienced significant population growth in recent years and both business and recreational travel are increasing. Both of these changes increase the potential for increases in communicable diseases.

EXISTING CAPABILITIES
the North Dakota Department of Health addresses the state's public health issues:

"To accomplish our mission, the North Dakota Department of Health is committed to: improving the health status of the people of North Dakota; improving access to and delivery of quality health care and wellness services; promoting a state of emergency readiness and response; achieving strategic outcomes using all available resources; strengthening and sustaining stakeholder engagement and collaboration; and managing emerging public health challenges."

HOSPITALS AND CLINICS
Health care facilities in the county include:

- Community Memorial Hospital
- First District Health Unit
- Garrison Family Clinic
- Garrison Memorial Hospital
- Garrison Community Clinic
- Washburn Clinic
- Washburn Family Clinic
- Underwood Clinic
- Northland Community Health Center

Agricultural Disease Incidents

HAZARD PROFILE

ANIMAL/CROP/PLANT DISEASE

An outbreak of disease that can be transmitted from animal to animal or plant to plant represents an agricultural disease. Of most concern are those diseases that spread rapidly and cause a significant economic implication or public health impact. In McLean County, this concern would be focused on those diseases that impact the county's most valuable agricultural products, its crops (grains, oilseeds, dry beans and dry) and livestock (cattle and calves). A comprehensive list of reportable conditions is maintained by the ND Department of Agriculture. See Appendix E.

HISTORY

Diseases that are a threat to cattle include Bovine Tuberculosis and Anthrax. According to the North Dakota Department of Health, there has been no reports of tuberculosis in cattle in North Dakota recently; the closest were three cases in South Dakota in 2017. Anthrax is much more common. It has been most frequently reported in northeast, southeast, and south-central North Dakota, according to the North Dakota Department of Agriculture, but they suspect it in almost every part of the state. North Dakota has had a few cases of Anthrax recently; 13 cases were recorded between 2006 and 2017. None were recorded in McLean County or the adjacent counties during that time. Two cases were reported in North Dakota in 2020 and two more, this time in Kidder County, in 2021.

VULNERABILITY

McLean County producers are always concerned about animal/crop/plant disease, but the recent drought stress years (2020 and 2021) has intensified disease pressure.

LOCATION

These diseases are regional in nature. North Dakota regularly tracks outbreaks in the adjoining states.

IMPACT

PEOPLE + ECONOMY

Crop/plant pest infestations can cause widespread crop/plant loss and severe economic hardship on farmers landowners and related businesses. Once infestation occurs, the pest may become endemic, causing repeated losses in subsequent growing years. Similarly, livestock disease can seriously impact producers and their related businesses.

PROBABILITY

Based on past experience it is highly likely that there will be some crop/plant infestation and some livestock disease each year. The severity of any one disease or its location, is harder to predict.

CHANGES IN DEVELOPMENT

Every year in the United States thousands of acres of farmland and grazing pasture are lost due to urbanization and the growth of existing cities. McLean County has experienced residential, commercial, and industrial growth in recent years, much of it on the urban fringes. Nationally, the negative impact of this growth on agriculture is well documented.

EXISTING CAPABILITY

As stated previously, both the North Dakota Department of Health and the North Dakota Department of Agriculture address the public health issues. In September 2021, when a second case of anthrax was reported in North Dakota beef cattle, the Department was ready with information and recommendations for the local producers.

CRITICAL, STRATEGIC, AND KEY FACILITIES

No critical, strategic, or key facility in McLean County would be physically damaged by these incidents but a serious outbreak could impact the agricultural industry and the county's economy.

KEY ISSUES AND RELATED MITGATION STRATEGIES

ALL PUBLIC HEALTH HAZARDS

Key Issues are identified for each hazard addressed in the McLean County Multi-Hazard Mitigation Plan . The key issues for all of the public health hazards are listed below as well as the mitigation actions which have been designed to address the issues.

KEY ISSUES

Public health incidents, both from human and agricultural disease, have the potential to greatly impact both the health and economy of the county. Providing information to the public about the risks of a Public Health incidents and coordinating responses to these events are critical.

Related Mitigation Action

#D Improve inter-departmental radio communication and prepare for the rollout of Statewide Interoperability Radio Network (SIRN 2020).
#I Distribute hazard Information via the county and city websites, social media, traditional media, and other existing interfaces.
#15 Utilize a redundant and multiple methods for local warnings if primary communications are interrupted.
#17 Continue to support mutual aid agreements and on-scene incident command.
#19 Identify location and organize outreach to vulnerable populations during hazard events

5.5 SECURITY INCIDENT

RISK LEVEL- High | Moderate | Low | Very Low

Risk applies to county + all cities	Hazard	Location	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score[52]
	Active Attack	Local	Possible	Limited	Small	Less than 6 hrs.	Less than 6 hrs.	1.83
	Cyber Threat	Local	Possible	Limited	Large	Less than 6 hrs.	Less than 24 hrs.	2.70

OVERVIEW

As the ND Plan noted "The probability of an attack or armed assault event affecting North Dakota directly is difficult to determine. There are no specific terrorist targets that have been identified in the North Dakota; however, the storage of missiles, military presence, and energy facilities make parts of the state possible targets. As with any area, a shooting by a disgruntled employee or student is also possible."

HAZARD PROFILES

North Dakota jurisdictions' hazard mitigation plans are designed to address the concerns of each specific jurisdiction. to the people and businesses of McLean County on the potential for active attack[53] incidents and cyber threats. Profiles of these two hazards follow.

LOCATION

Active attack and cyber threat incidents are a national concern that can have significant local implications,

https://crimegrade.org/safest-places-in-mclean-county-nd/

HISTORY

There have been active attack and cyber threat incidents in the State of North Dakota
but to date none of significance in McLean County.

PROBABILITY

As stated above,, it is possible that residents, businesses, and local governments in McLean County will experience hazard incidents of these types in the next five year, Responses in the Community Survey indicate that 67% believe that acts of violence are either "somewhat unlikely" or "very unlikely".

See discussion on the next few pages regarding Active Attacker Incident and Cyber Threat.

[52] Priority Risk Index (PRI) Scores range from 1-4. See Chapter 6.
[53] This term is used instead of "active shooter" to include a range of attack methodologies.

Active Attacker Incident

Active Attacks are examples of human-caused hazards that are intentional and often planned. The attack can be perpetrated by an individual or group. Nationally, groups involved include eco-terrorism/ terrorists, state sponsors of terrorism, gangs, organized crime, and homegrown violent extremism/extremists. These attacks can take place at large venue locations such as stadiums, government facilities, industrial facilities, or even outdoor festivals. Schools can present a special hazard when emergency situations arise as they are a gathering place for a large number of people, mostly children and/or young adults.

VULNERABILITIES

A few locations in McLean County, like the county courthouse, have security at the entrance but most government offices and businesses do not and remain vulnerable to violence.

CHANGES IN DEVELOPMENT

McLean County that has experienced residential, commercial, and industrial growth. As the county continues to develop, more people and businesses will be exposed to these threats.

EXISTING CAPABILITIES

The McLean County Sheriff Department and the Police Department in Garrison provide the primary response capabilities for any active attacker incident. Additional assistance is available from adjacent counties, and the Three Affiliated Tribes Police Department. See Chapter 7.

McLean County uses their "CodeRED" to notify the public of hazard events and other emergencies. A link to the program is on the county website.

IMPACT

PEOPLE

The immediate impact of an active attack incident is limited but as news of the event spreads, the fear of violence or threat of a copycat incident exacerbates the initial impact.

PROPERTY + CRITICAL, STRATEGIC AND KEY FACILITIES

No critical, strategic, or key facility is expected to be physically damaged by the actions of an active attacker, but as potential targets of an attack are unknown, it is possible.

KEY ISSUES AND RELATED MITGATION STRATEGIES

Key Issues are identified for each hazard addressed in the McLean County Multi-Hazard Mitigation Plan. The key issues for an active attacker incidents are listed below as well as the mitigation actions which have been designed to address the issues.

KEY ISSUES

Active attacker incidents are a national problem without easy solutions. Evacuation and other protocols are needed in every location where people gather. Local coordination is essential.

Related Mitigation Actions

#D Improve inter-departmental radio communication and prepare for the rollout of Statewide Interoperability Radio Network (SIRN 2020).

#I Distribute hazard Information via the county and city

websites, social media, traditional media, and other existing interfaces.
#15 Utilize a redundant and multiple methods for local warnings if primary communications are interrupted.
#17 Continue to support mutual aid agreements and on-scene incident command.
#19 Identify location and organize outreach to vulnerable populations during hazard events

Cyber Threat

HAZARD PROFILE

For purposes of this Hazard Profile, the cyber threat is considered a human caused technological threat, though it is acknowledged that cyber emergencies could result from the physical destruction of infrastructure during an earthquake or other natural disaster. Cyber emergencies can be caused accidentally from faults in software programming code, or deliberately by malicious hackers. A threat may last from minutes to days. Nationally, targets have included private businesses, utilities, public services, and transportation facilities,

VULNERABILITIES

In North Dakota, the Department of Information Technology (NDIT) estimates that the department has experienced about 237 million cyber threats each month with the attacks seeking personal information for fraudulent purposes. The department has reported that many of the hackers are blocked and do not succeed[54].

PEOPLE

Individuals are vulnerable to loss of privacy, loss of financial resources, loss or corruption of critical information, loss of time spent resolving or responding to attacks, and several other negative consequences.

PROPERTY + CRITICAL, STRATEGIC AND KEY FACILITIES

Like the population, businesses including key facilities are loss of financial resources, loss or corruption of critical information, loss of time spent resolving or responding to attacks, and several other negative consequences.

[54] www.grandforksherald.com

EXISTING CAPABILITIES

NDIT regularly reminds us that our "day-to-day life depends on the country's 16 sectors of critical infrastructure, which supply food, water, financial services, public health, communications, and power along with other networks and systems. A disruption to this system, which is operated via the internet, can have significant and even catastrophic consequences for our nation."

McLean County uses "CodeRED" to notify the public of hazard events and other emergencies.

IMPACT

A significant cyber incident could create considerable challenges for McLean County's citizens, businesses and local governments that depend on networked systems for commerce, utilities, communication, and essential services.

PEOPLE

Cyber-attacks can impact individuals by loss of privacy, loss of financial resources, loss or corruption of critical information, loss of time spent resolving or responding to attacks, and several other negative consequences.

PROPERTY + CRITICAL, STRATEGIC AND KEY FACILITIES

Cyber-attacks can disrupt electronic operations or functions of critical facilities resulting in potentially catastrophic direct and indirect consequences. Recent attacks on infrastructure components across the nation have shown that cyber threats have been a relatively low priority in the development of computer software and internet systems. Today, cyber security and critical infrastructure protection are among the most important national and local security issues, and they will only become more challenging in the years to come.

North Dakota's cyber security strategy, which was accelerated by the passing of Senate Bill 2110 in February 2019, has focused largely on giving the NDIT authority on cyber security matters for the state's 400 public entities. In the past year, the strategy has broadened with targeted initiatives, such as a statewide awareness campaign, incorporating efforts to make individuals more resilient against cyber threats[55].

KEY ISSUES AND RELATED MITGATION STRATEGIES

Cyber security measures are in place through the county's internet service provider. Existing protection for city governments, schools, business, agencies and individual persons and households is unknown. Providing information to the public about the risks of Cyber Attacks is critical.

Related Mitigation Actions

#D Improve inter-departmental radio communication and prepare for the rollout of Statewide Interoperability Radio Network (SIRN 2020).
#I Distribute hazard Information via the county and city websites, social media, traditional media, and other existing interfaces.
#15 Utilize a redundant and multiple methods for local warnings if primary communications are interrupted.
#17 Continue to support mutual aid agreements and on-scene incident command.
#19 Identify location and organize outreach to vulnerable

[55] www.govtech.com

5.6 SIGNIFICANT TRANSPORTATION INCIDENT

RISK LEVEL- High | Moderate | Low | Very Low

Risk applies to county + all cities	Hazard	Location	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score[56]
	Road Incident	Local	Likely	Limited	Negligible	Less than 6 hrs.	Less than 6 hrs.	2.13
	Railway Incident	Local	Possible	Limited	Negligible	Less than 6 hrs.	Less than 24 hrs.	1.93

populations during hazard events

OVERVIEW

As with a major urban fire, a major transportation incident is one that threatens life and property and is beyond normal day-to-day response capability. In McLean County, these incidents primarily involve roadway and railroad incidents.

Roadway Transportation Incident

HAZARD PROFILE

McLean County's transportation system forms a network connecting its communities, businesses, and people. As Figure 5.6-1 shows, roadway incidents occur in most parts of the county. A major transportation incident is problematic in any location, but even more so in a county like McLean County where alternative roadway routes are limited. These incidents which impact both those directly involved in the incident and all those impacted by the incident, call for emergency traffic management planning, interagency coordination, and mutual aid.

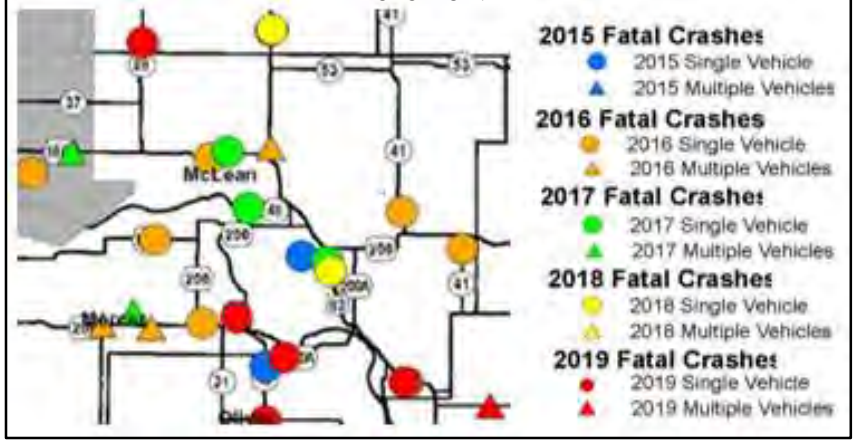
HISTORY

Transportation incidents in McLean County are primarily of small magnitude incidents, some with fatalities. The fatal crashes from 2015 to 2019, documented by NDDOT, are shown on Figure 5.6-2. The McLean County summary report for 2021 shows seven accidents needing medical attention and 12 accidents not requiring medical attention

VULNERABILITY

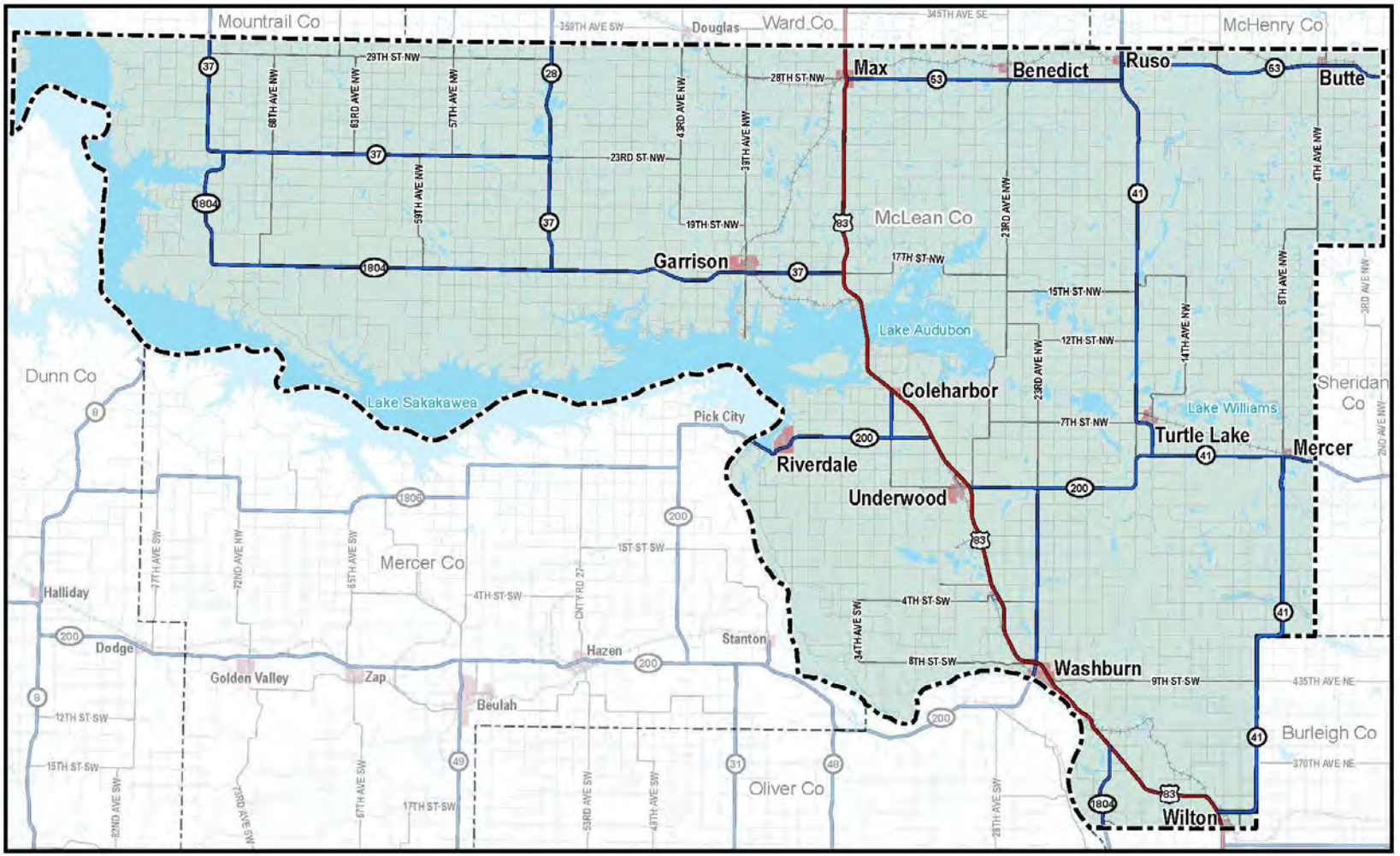
As the number of roadways within and surrounding McLean County is limited, a major transportation incident takes on more significance than it would in other locations where more alternative routes are possible.

Figure 5.6-1
McLean County Fatal Crashes
2015-2019



Source: NDDOT

[56] Priority Risk Index (PRI) Scores range from 1-4. See Chapter 6.



McLean County Roadways

Source: NDGISHUB

N 0 4 8 16 Miles

US Highways
State Highways
Major Collectors
Local Roads
Railroads
McLean County
Other County Boundary
Cities
Open Water

Figure 5.6-1

McLean County
NORTH DAKOTA

LOCATION

Roadway incidents, even major incidents are usually a local event. Should a roadway incident block travel for a considerable time, the impact on commerce and the economy could be regional. An incident of almost any magnitude involving the U.S. Highway 83 where it crosses Lake Audubon. could have regional impacts.

PROBABILITY

Major and minor traffic incidents occur regularly and result in property damage and injury/death. Incidents involving multiple vehicles and significant injury are not uncommon (Figure 5.6-1). Speed and/or aggressive, distracted driving and driving under the influence are factors in many incidents.

CHANGES IN DEVELOPMENT

McLean County that has experienced residential, commercial, and industrial growth in recent years. As the county and the region continues to develop, the number of automobiles and trucks on the road, for both local and through trips will also increase.

EXISTING CAPABILITIES

The North Dakota Vision Zero Plan identifies partners and "E" strategies to reduce motor vehicle fatalities and injuries in the state. The "E" strategies: Education, Environment, Engineering and Emergency Medical Services. Major traffic incidents of over two hours in duration present unique challenges for traffic incident management. McLean County, city law enforcement and additional law enforcement are utilized, as needed, to establish the safety zone and assist with traffic controls.

McLean County uses their "CodeRED" to notify the public of hazard events and other emergencies. A link to the program is on the county website.

IMPACT

Specific impacts could include blocked roads, economic loss, human loss, and injuries due to the incident and potentially loss due to delays in emergency medical service. Inconvenience is always a theme when discussing transportation incidents. The extent of potential impacts of this hazard varies depending on the severity of the incident, the time needed to clear it, the related damage to transportation infrastructure and the alternatives available at the time. Severe wintry conditions with high winds, icy roads, heavy snow fall, and limited visibility also contribute. Incidents involving trucks carrying hazardous materials or buses and other high-occupancy vehicles could trigger a response that exceeds the normal day-to-day capabilities of local response agencies.

Railway Transportation Incident

HAZARD PROFILE

Railroad companies in McLean County operate miles of tract, and crossings. The majority of freight is agricultural and processed products. Countywide there are 201 railroad crossings. Table5.6-1 illustrates the various types of crossing recorded by the Federal Railroad Administration.

A railway transportation incident is a train incident that directly threatens life and/or property, or adversely impacts a community's capability to provide emergency services.

HISTORY

The Federal Railroad Administration recorded railroad accidents/incidents from 2016 to 2021 is presented in Table 5.6-1.

Table 5.6-1
RAILWAY CROSSINGS

	Rural County	Benedict	Butte	Coleharbor	Garrison	Max	Mercer	Riverdale	Ruso	Turtle Lake	Underwood	Washburn	Wilton
RAILROAD													
BNSF								No record found					2
DMVW				13	28	10					17	28	9
SOO (CP)	6	14	19	1	2	25			6		2	1	
ROADWAY TYPE													
US-83						1						1	
County Road		1			3	1				1			
City Street		1			1	4	2		1				
Principal Arterial Rural											1		
Minor Arterial Rural									1				1
Major Collector Rural			1	1	3	2					1	4	
Local Rural	2	3	3	1	6	7			2	1	4	12	4
Local Access		1	5	9	1	10			2		6	5	3
Field Access	1	1		1	12						4		1
Private	3	7	10	1	1	9						1	
Unknown				1	3	1	9			5	3	6	2

Source: railroads,dot,gov

VULNERABILITY

PEOPLE AND PROPERTY

Vulnerabilities extend to those working on the railroad, those involved in railroad-automobile crashes and even more people in the rare incident if a derailment,

CRITICAL, STRATEGIC AND KEY FACILITIES

No critical, strategic, or key facility is expected to be physically damaged by a major transportation incident, but any related fires or explosion could cause damage.

Trains carrying hazardous materials are especially problematic. These incidents may include derailments, collisions, and highway/rail crossing accidents. Train incidents can result from a variety of causes, including human error, mechanical failure, faulty signals, and/or problems with the track. Results of an incident can range from minor "track hops" to catastrophic hazardous material incidents and even human/animal casualties.

Tables in the NDDES Plan summarize the number of trains carrying over 1,000,000 gallons of crude oil through different counties in North Dakota. The state averages about 60 trains per year that carry over 1,000,000 gallons of crude oil. Between 2014 and 2016, the number of trains carrying this large quantity of crude oil decreased statewide on the CP Railway.

Table 5.6-2
RAILROAD ACCIDENTS/INCIDENTS

	2016	2017	2019	2020	2021
Total Accidents/Incidents	2	4	1	1	2
Total Fatalities	0	0	0	0	0
Total Injuries	1	4	1	1	0
Employee on Duty Fatalities	0	0	0	0	0
Employee on Duty Injuries	1	4	1		1
Cases of Trespasser Deaths	0	0	0	0	0
Passengers Killed in train accidents or crossing incidents	0	0	0	0	
Passengers injured in train accidents or crossing incidents	0	0	0	0	
Train accidents (not at a grade crossing)	1	0	0	0	2
Highway-Rail Incident	0	0	0	0	0
Other Accidents/Incidents	1	4	1	1	0

Source: railroads,dot,gov
NOTE: No records for 2018 were available

LOCATION

Railway transportation incidents will have a local or regional impact depending on the type of accident/ incident. In the unlikely event of a derailment or rail-related HAZMAT incident, there would likely be economic damage caused by shipping delays and disruption of service.

PROBABILITY

Based on recent experience, it seems unlikely but possible that in McLean County there will be significant railroad incidents in the next five years.

IMPACT

As with significant roadway incidents, specific impacts could include blocked roads and rail lines, economic loss, human loss, and injuries due to the incident and potentially loss due to delays in emergency medical service.

CHANGES IN DEVELOPMENT

McLean County and the state has experienced residential, commercial, and industrial growth in recent years. As the county continues to develop, more people and businesses will be traveling and conflicts between the traveling public and the railroads are inevitable. Without zoning and/or land use limitations on areas close to the railroad, a threat remains of the impact of any derailment or rail-related HAZMAT incident, would have on adjacent development.

EXISTING CAPABILITIES

- Many of the first responders in the county are prepared for a railroad incident and some are also HAZMAT trained. See also the discussion in Section 5.3 regarding The Canadian Pacific HAZMAT response team.
- McLean County uses their "CodeRED" to notify the public of hazard events and other emergencies. A link to the program is on the county website.
- North Dakota Legislature's railroad inspection program, which has identified thousands of train and track defects in the last six years, is scheduled to sunset in 2025.

NORTH DAKOTA CENTURY CODE

Railroad Crossings - NDCC 24-09

Regulates railroad crossing systems and signage.

- Allows jurisdictions to create stricter regulations.
- The State Department of Transportation must approve warning systems.

Railroad Bridges, Crossings, Intersections, and Fences. - NDCC 49-11

Regulates the construction and maintenance of railroad bridges, crossings, Intersections, and Fences

- Requires railroad corporations to keep bridges and abutments in good repair.
- Limits blocking or obstructing crossings by a train.

According to a NDDOT spokesperson, the state upgrades about 10 crossings per year. Those upgrades could be anything, from adding reflectors to sign posts to installing flashing lights and gates. Out of the 10 crossings, three or four are generally upgraded to flashing lights and gates each year. Over the last five years, three McLean County crossings have had flashing lights and gates newly installed, according to DOT data.

KEY ISSUES FOR ROADWAY AND RAILROAD HAZARDS AND RELATED MITGATION STRATEGIES

The key issues for both major vehicular and major rail transportation incidents are listed below as well as the mitigation actions designed to address the issues.

KEY ISSUES

While major road and rail transportation incidents are unlikely in McLean County over the next five years, these hazard events are compounded if and when hazardous materials transported. The county and its regional partners are well-prepared to respond to these events, but coordination and communication is essential.

Related Mitigation Actions

#8 Continue supporting hazardous materials training for first responders

#22 Continue to support mutual aid agreements and on-scene incident command.

KEY ISSUE

Providing information to the public about the risks of a Major Road and Rail Incidents and coordinating responses to these events are critical.

Related Mitigation Actions

#D Improve inter-departmental radio communication and prepare for the rollout of Statewide Interoperability Radio Network (SIRN 2020).

#I Distribute hazard Information via the county and city websites, social media, traditional media, and other existing interfaces.

#15 Utilize a redundant and multiple methods for local warnings if primary communications are interrupted.

#17 Continue to support mutual aid agreements and on-scene incident command.

#19 Identify location and organize outreach to vulnerable populations during hazard events

5.7 MAJOR URBAN FIRE

RISK LEVEL- High | Moderate | Low | Very Low

Risk applies to county + all cities	Location	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score[57]
	Local	Possible	Limited	Negligible	Less than 6 hrs.	Less than 24 hrs.	**1.94**

HAZARD PROFILE
For hazard mitigation purposes, major urban fires involving large buildings and/or multiple properties are of primary concern. The effects of a major urban fire include minor to significant property damage, loss of life, and residential or business displacement

HISTORY
Structural fires are almost a daily occurrence in some communities. Nearly all are quickly extinguished by on- site personnel or local fire departments (Figure 5.7-1).

LOCATION
Even with their size, a major urban fire has only local impact.

PROBABILITY
Modern fire codes and fire suppression requirements in new construction, including sprinkler requirements for certain construction building renovations, smoke detectors, plus improved firefighting equipment, training, and techniques lessen the chance and impact of a major urban fire.

VULNERABILITY
PEOPLE
Public and firefighter safety is the first priority in all fire suppression activities. A major urban fire is a real threat to the health and safety of the emergency services. Most fire-fighters and other emergency responders serve part-time and can be called away from their normal work to attend to fires.

PROPERTY
Most structural fires occur in residential structures, During colder months, clogged chimneys, faulty furnaces, and fireplaces can increase the probability of structural fires. The improper use of emergency generators also contributes to the risk of a structural fire. The occurrence of a fire in a commercial or industrial facility could affect more people and pose a greater threat to those near the fire because of the volume or type of the material involved.

CRITICAL, STRATEGIC AND KEY FACILITIES
Almost all of these important facilities are located in the cities' most urban areas. In McLean County as elsewhere, critical, strategic, and key facilities could be physically damaged by a major urban fire,

[57] Priority Risk Index (PRI) Scores range from 1-4. See Chapter 6.

EXISTING CAPABILITIES

Firefighting professionals from within McLean County and the region and beyond would respond to a major urban fire. Figure 5.7-1 depicts the Fire Districts serving the county. Three of them, the Parshall Fire Protection District, the Plaza Fire Protection District, and the Ryder-Makoti Fire Protection District are headquartered outside of the county.
McLean County uses their "CodeRED" to notify the public of hazard events and other emergencies. A link to the program is on the county website.

IMPACT

Specific impacts could include economic loss, human loss, and injuries due to the incident and potentially loss due to delays in emergency medical service.

CHANGES IN DEVELOPMENT

McLean County that has experienced residential, commercial, and industrial growth in recent years. At times, the development-related regulations have not met the challenge or pace of development and more persons and businesses are exposed to this risk.

KEY ISSUES AND RELATED MITGATION STRATEGIES

Key Issues are identified for each hazard addressed in the McLean County Multi-Hazard Mitigation Plan. The key issues for major urban fire incidents are listed below as well as the mitigation actions which have been designed to address the issues.

KEY ISSUES

While major urban fires are not common in McLean County, their impact on area residents and business owners can be devastating. Adequate local government response requires coordination and communication.

Related Mitigation Actions

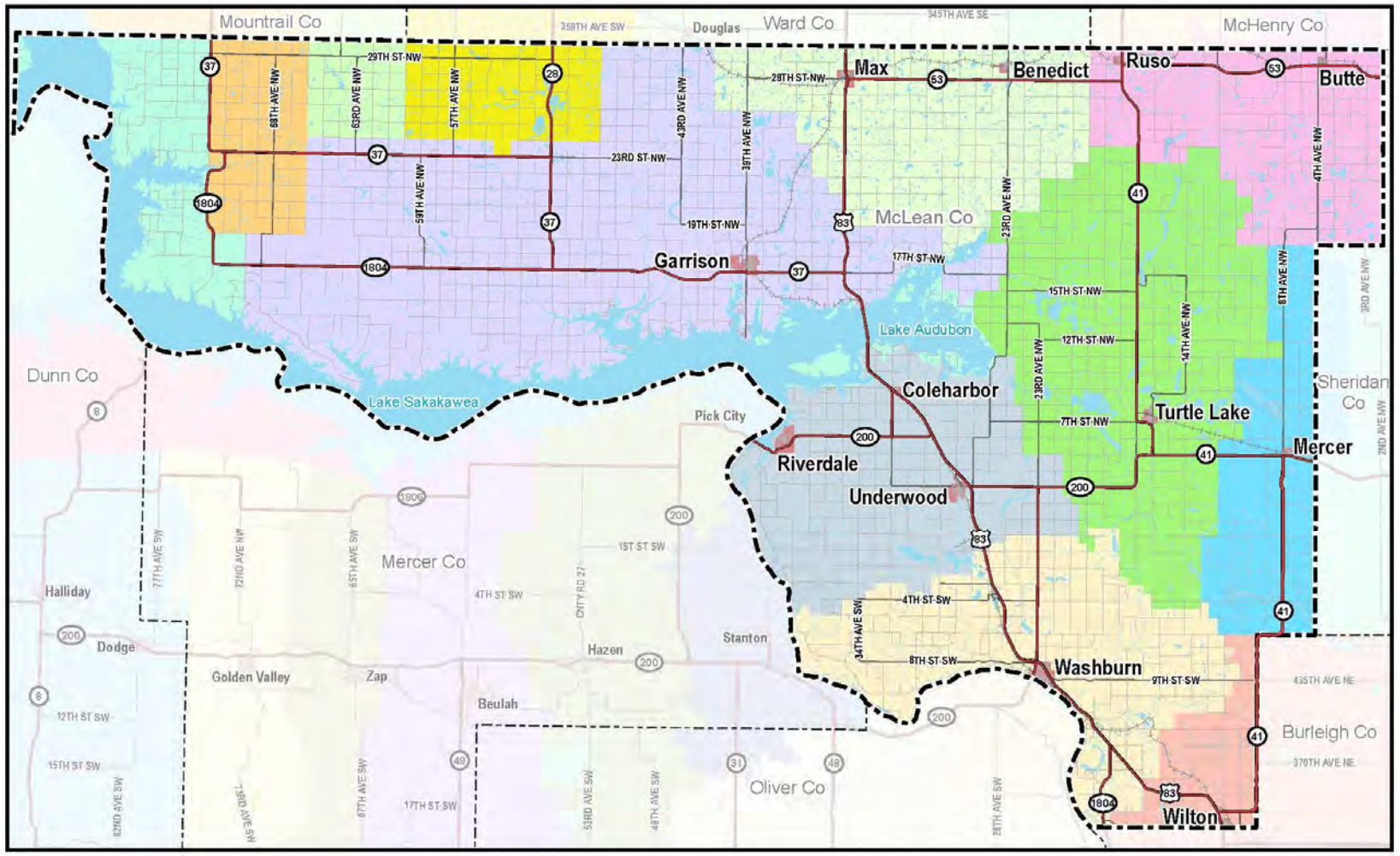
#10 Continue to review construction under the North Dakota State Building Code and consider adopting fire codes and fire suppression requirements in new construction.
#11 Continue to support the recruitment and training of volunteers to address wildland/rural fire, urban fire, and ambulance services.
#17 Continue to support mutual aid agreements and on-scene incident command.
#18 Continue to support upgrading existing or purchase new equipment and infrastructure for emergency services.

KEY ISSUE

Providing information to the public about the risks of a Major Urban Fire and coordinating responses to these events are critical.

Related Mitigation Actions

#D Improve inter-departmental radio communication and prepare for the rollout of Statewide Interoperability Radio Network (SIRN 2020).
#I Distribute hazard Information via the county and city websites, social media, traditional media, and other existing interfaces.
#15 Utilize a redundant and multiple methods for local warnings if primary communications are interrupted.
#17 Continue to support mutual aid agreements and on-scene incident command.
#19 Identify location and organize outreach to vulnerable populations during hazard events



Fire Districts

Source: NDGISHUB

- Butte Fire Protection District
- Garrison Fire Protection District
- Max Fire Protection District
- Mercer Fire Protection District
- Parshall Fire Protection District
- Plaza Fire Protection District
- Ryder-Makoti Fire Protection District
- Turtle Lake Fire Protection District
- Underwood Fire Protection District
- Washburn Fire Protection District
- Wilton Fire Protection District
- Unclaimed
- McLean County Boundary
- Other County Boundary
- Cities
- Open Water

N 0 4 8 16 Miles

Figure 5.7-1

6 Risk Assessment

6.1 OVERVIEW

This Chapter describes the analysis of the potential risks related to the profiled natural and technological/human-caused hazards.

6.2 RISK ASSESSMENT METHODOLOGY

The Priority Risk Index (PRI) was used to prioritize potential hazards to McLean County because it provides a standardized numerical value so that hazards can be compared against one another (the higher the PRI value, the greater the hazard risk). PRI values are obtained by assigning varying degrees of risk to five categories for each hazard (probability, impact, spatial extent, warning time, and duration). Each degree of risk was assigned a value (1 to 4) and a weighting factor as summarized in Table 6.4-1.

Countywide PRI scores are provided at the beginning of each hazard profile. To account for different levels of risk for Flood, Wildland/Rural Fire and HAZMAT Incidents across the county, additional PRI scores for these three hazards were developed for the cities. Where applicable, ratings specific to each city were added at the beginning of a hazard profile. The results of the risk assessment and overall PRI scoring are provided in Section 6.5 Conclusions on Hazard Risk.

6.3 PRIORITY RISK INDEX FORMULA

The sum of all five risk assessment categories equals the final PRI value, demonstrated in the PRI Formula.

PRI FORMULA:

PRI = [(PROBABILITY x 30%) + (IMPACT x 30%) + (SPATIAL EXTENT x 20%) + (WARNING TIME x 10%) + (DURATION x 10%)]

The lowest possible PRI value is a 1.0 and the highest possible PRI value is 4.0.

6.4 INPUT TO RISK FACTOR SCORING

Input to these calculations is reflected in the risk factor scores. Two factors, "Warning Time" and "Duration," are scored based on previous experience with the hazard. Probability and Impact are based on experience with the hazard plus community input from the community survey, both the paper and online versions, two related questions were included to address the hazard risk:

- ***QUESTION 2***
  In your opinion, how likely is it that these hazard events will impact McLean County?
- ***QUESTION 3***
  how much impact would each of these hazards have on your part of the county?

Table 6.4-1
PRIORITY RISK INDEX ASSESSMENT

RISK ASSESSMENT CATEGORY	LEVEL	DEGREE OF RISK CRITERIA	INDEX	WEIGHT
PROBABILITY What is the likelihood of a hazard event occurring in a given year?	Unlikely	Less than 1% annual probability	1	30%
	Possible	Between 1 & 10% annual probability	2	
	Likely	Between 10 &100% annual probability	3	
	Highly Likely	100% annual probability	4	
IMPACT In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs?	Minor	Very few injuries, if any. Only minor property damage & minimal disruption on quality of life. Temporary shutdown of critical facilities.	1	30%
	Limited	Minor injuries only. More than 10% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for > a day	2	
	Critical	Multiple deaths/injuries possible. More than 25% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for > 1 week.	3	
	Catastrophic	High number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities > 30 days.	4	
SPATIAL EXTENT How large of an area could be impacted by a hazard event? Are impacts localized or regional?	Negligible	Less than 1% of area affected	1	20%
	Small	Between 1 & 10% of area affected	2	
	Moderate	Between 10 & 50% of area affected	3	
	Large	Between 50% & 100% of area affected	4	
WARNING TIME Is there usually some lead time associated with the hazard event? Have warning measures been implemented?	More Than 24 Hrs.	Self-Defined	1	10%
	12 To 24 Hrs.	Self-Defined	2	
	6 To 12 Hrs.	Self-Defined	3	
	Less Than 6 Hrs.	Self-Defined	4	
DURATION How long does the hazard event usually last?	Less Than 6 Hrs.	Self-Defined	1	10%
	Less Than 24 Hrs.	Self-Defined	2	
	Less Than 1 Week	Self-Defined	3	
	More Than 1 Week	Self-Defined	4	

6.5 CONCLUSIONS ON HAZARD RISK

PRIORITY RISK INDEX

As discussed in Section 6.2, the Priority Risk Index (PRI) was used to rate each hazard on a set of risk criteria and determine an overall standardized score for each hazard. For some hazards, like drought, the risk is similar for all jurisdictions, but for others including flood, and hazardous materials, jurisdictions are exposure to different levels of risk.

The results from the PRI have been classified into four categories based on the risk value which are summarized in Table 6.5-1. Often three categories are used but these hazards scores are closely bunched in the moderate and low risk categories. Adding the fourth category should assist in prioritizing the Mitigation Action Items.

Hazards with a PRI of above 3.0 were deemed "high risk"; hazards with a PRI between 2.5 and 3.0 were deemed "moderate risk"; hazards with a PRI between 2.0 and 2.49 were deemed "low risk" and hazards with a PRI of under 2.0 were deemed "low risk" It should be noted that although some hazards are classified as "very low" or "low risk", their occurrence of varying magnitudes is still possible. Table 6.5-2 reflects the PRI results for each jurisdiction.

Table 6.5-1
SUMMARY OF HAZARD RISK CLASSIFICATION – PRI SCORES

Risk Categories	Scores	Hazards	
High Risk – Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread.	Above 3.0	Drought	
Moderate Risk – Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.	2.5 to 3.0	Extreme summer weather (Heat) Extreme winter weather Cyber Threat	
Low Risk – Little potential impact. The occurrence and potential cost of damage to life and property is low This is not a priority hazard.	2.0 to 2.49	Flood Extreme summer weather (Hail, Strong Wind, Thunder, Lightning, Tornado) Wildland/Rural Fire	Public Health Incident HAZMAT Release (Fixed Sites, HAZMAT in Transit, Pipeline) Active Attack Major Transportation Incident - Road
Very Low Risk – Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal. This is not a priority hazard.	Under 2.0	Earthquake Landslide Dam Failure HAZMAT Release (AF Facilities)	Major Urban Fire Major Transportation Incident - Rail

Table 6.5-2
Hazard Risk Summary

	Drought	Flood		Geo-logic		Extreme Summer Weather					Extreme winter weather	Wildland/Rural Fire	Dam Failure	Public Health		Hazardous Materials				Security		Major Urban Fire	Major Road Incident	Major Rail Incident
		Flood - Riverine	Flood - Other	Earthquake	Landslide	Hail	Heat	Strong Wind	Thunder And Lightning	Tornado				Outbreak- Human	Outbreak - Agricultural	In Transit (Truck or Rail)	Pipeline	Air Force Facilities	Other Fixed Site	Active Attacker	Cyber threat			
McLean County																								
Benedict																								
Butte																								
Coleharbor																								
Garrison																								
Max																								
Mercer																								
Riverdale																								
Ruso																								
Turtle Lake																								
Underwood																								
Washburn																								
Wilton																								

7 Capability Assessment

7.1 OVERVIEW

This assessment reiterates the reality that the local jurisdictions of McLean County have variable capabilities. Due to the number of recent disasters, many local officials, community leaders, and the public are aware of the need for mitigation and practical solutions for their jurisdictions.

Mitigation activities are divided into four categories: administrative and technical, education and outreach, financial, and planning and regulatory. each identified resource in the four categories can be used to implement mitigation actions and access funding for projects.

- **Administrative and Technical Capabilities**
  Identification of administrative and technical capabilities, which include staff and tools for mitigation planning to implement specific mitigation actions.
- **Education and Outreach Capabilities**
  Identification of education and outreach programs, and methods already in place to communicate hazard-related information. The community survey indicates that the community considers Facebook is the best way for you to receive information.
- **Financial Capabilities**
  Identification of access to or eligibility to use funding resources for hazard mitigation for jurisdictions.
- **Planning and Regulatory Capabilities**
  Jurisdictional plans, policies, codes, and ordinances adopted and in place that prevent and reduce the impacts of hazards. The local governments expand on and improve these existing policies and programs to meet current and projected needs.

Table 7.1-1
EDUCATION AND OUTREACH CAPACITY/AVAILABILITY

	County	Benedict	Butte	Coleharbor	Garrison	Max	Mercer	Riverdale	Ruso	Turtle Lake	Underwood	Washburn	Wilton
Local Government Website	■				■	■	■			■			
Local Government Facebook	■	■		■	■	■				■			
Emergency Management Website/Facebook	■												
Phone Tree					■	■			■	■			

Table 7.1-2 ADMINISTRATIVE AND TECHNICAL CAPABILITIES													
	County	Benedict	Butte	Coleharbor	Garrison	Max	Mercer	Riverdale	Ruso	Turtle Lake	Underwood	Washburn	Wilton
Administrative													
County/City Council or Commission	■	■	■	■	■	■	■	■	■	■	■	■	■
Mutual Aid Agreements	■	■	■	■	■	■	■	■	■	■	■	■	■
Planning and Zoning Commission	■	■	■	■	■	■	■	■		■	■	■	■
Staff													
Emergency Management	■												
Sheriff/Police Chief	■				■								
Fire Chief	■		■		■	■	■	■		■	■	■	■
911 Coordinator/Director and User Board	■												
Public Works and/or Road Department	■				■	■		■		■	■	■	■
Building Official/Inspector	■										■	■	
Planning and Zoning Administrator	■							■				■	
Floodplain Administrator[58]	■			■	■	■					■	■	■
GIS Coordinator	■												
Technical													
GIS Services	■												
Emergency Warning Sirens	■			■	■	■	■	■		■	■	■	■
Generators at Critical Facilities (permanent)	■			■	■		■	■		■	■	■	■
HAZUS Analysis	■												
Fire Index Signs	■	■	■	■	■	■	■	■		■	■	■	■

[58] The MHA Fort Berthold Reservation, which is partly in McLean County but not a participating jurisdiction, also has a Floodplain Administrator.

Table 7.1-3
PLANNING AND REGULATORY CAPABILITIES

	County	Benedict	Butte	Coleharbor	Garrison	Max	Mercer	Riverdale	Ruso	Turtle Lake	Underwood	Washburn	Wilton
Building Code	■	■	■	■	■	■	■	■	■	■	■	■	■
Burn Bans	■												
Comprehensive Plan/Land Use Plan										■			
Emergency Operations Plan	■												
Evacuation and/or Shelter Plan(s)	■												
FEMA Flood Map, Zone A	■				■			■				■	
Flood Plain Ordinances	■												
Hazard Mitigation Plan Update Participation	■	■	■	■	■	■	■	■	■	■	■	■	■
Local Emergency Operations Plan	■												
Planning/Zoning Commission	■	■	■	■	■	■	■	■	■	■	■	■	■
Snow Removal Priority Program	■	■	■	■	■	■	■	■	■	■	■	■	■
Zoning	■	■	■	■	■	■	■	■	■	■	■	■	■

7.2 INTEGRATING HAZARD PLAN STRATEGIES INTO PLANNING MECHANISM

One way for a local government to implement the recommendations of the McLean County Multi-Hazard Mitigation Plan is to integrate its recommendations into existing local government regulations and practices. Due to the limited resources of each jurisdiction, few planning mechanisms exist in McLean County and its cities.

Neither the county nor most of the cities have a comprehensive plan but in that void, zoning ordinances, a useful tool in implementing the mitigation actions set forth in a local government's hazard mitigation plan, are in place. Development in McLean County and the cities is regulated by zoning. Benedict, Butte, Coleharbor, Garrison, Max, Mercer, Riverdale, Ruso, Turtle Lake, Underwood, Washburn, and Wilton have their own zoning. The county has a designated Land Use Administrator; other jurisdictions rely on their Planning and Zoning Commissions. The balance of the county is regulated by the McLean County Zoning Ordinance and provides a copy of their "How to avoid surprises and be a good neighbor when you are buying, building and developing in Mclean County" to

those applying for development and zoning approvals (See Appendix F). No Township has its own zoning.

The City of Turtle Lake, a city with a total population of about 560 persons, adopted a Comprehensive Plan in 2020. Its ten goals are{

1. Develop and expand local and regional development networks.
2. Be proactive and prepared for development opportunities.
3. Retain and expand local businesses to meet
4. community needs.
5. Revitalize Main Street.
6. Rehabilitate aging residential and commercial properties.
7. Be a family-friendly community.
8. Encourage active lifestyles.
9. Provide a high quality of life for senior residents.
10. Develop student and workforce skills.
11. Maintain and improve City infrastructure cost-effectively.

Should the City of Turtle Lake amend this plan in the future, a section on emergency preparedness and hazard mitigation could be included Jurisdictions that do not have a planning mechanism support countywide initiatives, as they do in zoning matters. This support is demonstrated by their participation in the McLean County Multi-Hazard Mitigation Plan. See also Chapter 9, Section 9.1 which describes the annual review of progress on city and countywide initiatives.

7.3 CRITICAL, STRATEGIC, AND KEY FACILITIES

In hazard plans, the list of critical facilities typically includes hospitals, fire stations, police stations, storage of critical records, and similar facilities. Many hazard plans, including this one, expand the list to include facilities that need to operate during the time of a hazard event. These facilities fall into several categories:

- Facilities that are essential to countywide health and welfare becomes especially important following hazard events. Examples include the county emergency operations center, law enforcement and fire facilities hospitals, clinics, and community shelters.
- Utility systems whose disruption would have a significant impact.
- Facilities with a high density of population, especially those containing vulnerable populations[59]. Examples include schools, retirement homes and large employers.
- Facilities that are a key element to the local economy and could cause significant economic damage if their function were disrupted.
- Historic, cultural, and natural resource areas that are important to the community.
- Chapter 7 includes a table that lists the utility providers serving the population, businesses, and local governments in McLean County.

  Figure 5.7-1 depicts the Fire Districts serving the county. Three of them, the Parshall Fire Protection District, the Plaza Fire Protection District, and the Ryder-Makoti Fire Protection District are headquartered outside of the county.

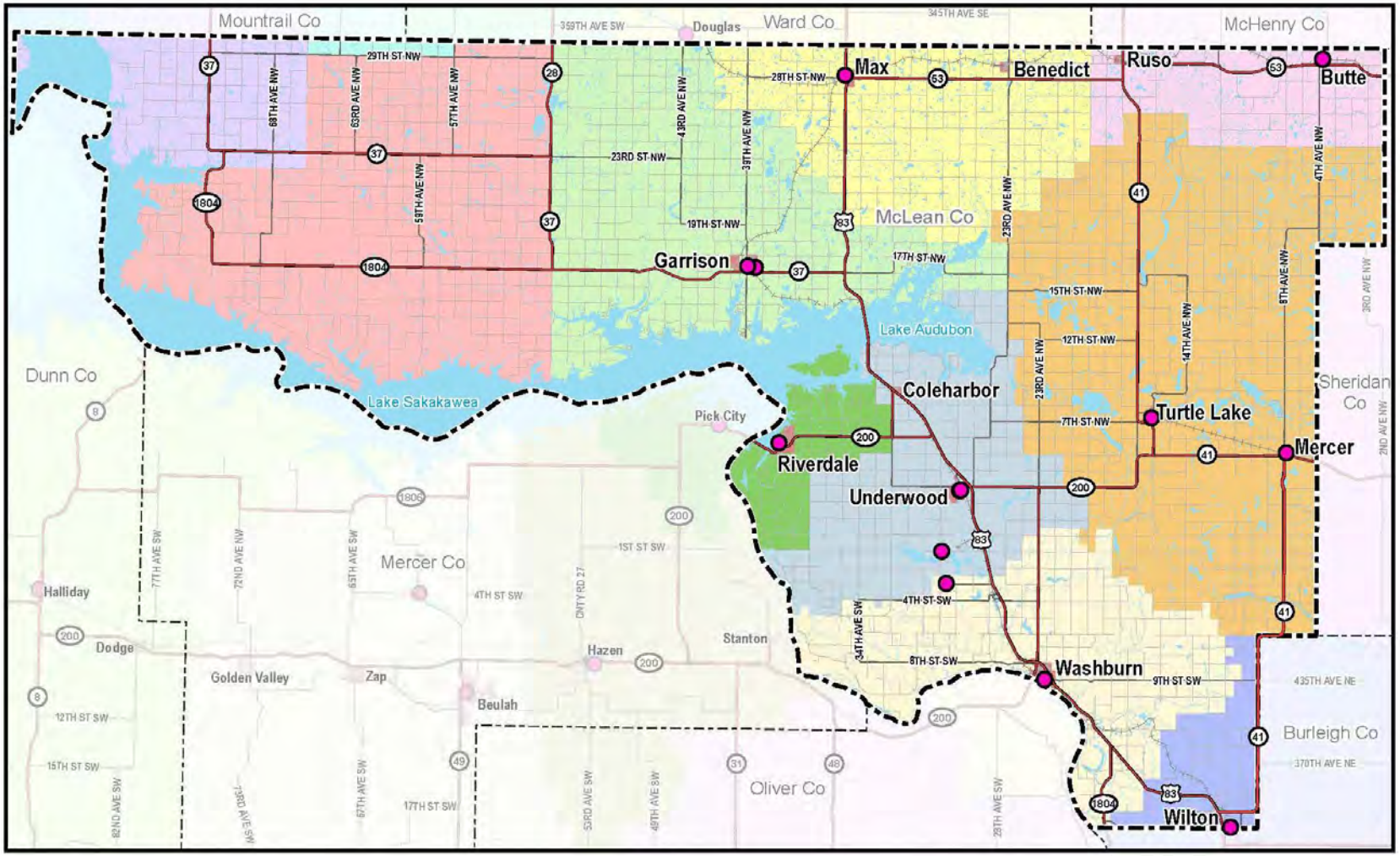
[59] See Chapter 2.

Table 7.3-2 FIRE PROTECTION													
Emergency Response and Related Services/Facilities	**County**	Benedict	Butte	Coleharbor	Garrison	Max	Mercer	Riverdale	Ruso	Turtle Lake	Underwood	Washburn	Wilton
FIRE PROTECTION AND EMS SERVICS WITHIN MCLEAN COUNTY (See also Figure 5.7-1 and Figure 8.3-1)													
Butte Fire Protection District and EMS													
Garrison Fire Protection District and EMS													
Max Fire Protection District and EMS													
Mercer Fire Protection District and EMS													
Riverdale Fire Protection District and EMS													
Turtle Lake Fire Protection District and EMS													
Underwood Fire Protection District and EMS													
Washburn Fire Protection District and EMS													
Wilton Fire Protection District and EMS													

Figure 5.7-1 depicts the Fire Districts serving the county. Three of them, the Parshall Fire Protection District, the Plaza Fire Protection District, and the Ryder-Makoti Fire Protection District are headquartered outside of McLean County.

Like the Fire Protection Service, Emergency Medical Service is provided by agencies within and outside of McLean County. See Figure 7.1-3. The Parshall EMS, Plaza EMS, Velva EMS and White Shield EMS are headquartered outside of McLean County.

Table 7.3-3 HOSPITALS AND MEDICAL CLINICS		
Garrison Memorial Hospital	Washburn Clinic	Underwood Clinic
Garrison Community Clinic	Washburn Family Clinic	Northland Community Health Center
Garrison Family Clinic	Community Memorial Hospital	First District Health Unit



Emergency Medical Services

Source: NDGISHUB,
Homeland Infrastructure Foundation-Level Data (HIFLD)

Figure 7.3-1

Table 7.3-4 SPECIAL RESPONSE UNITS	
The State of North Dakota has Regional HAZMAT response teams, with vehicles available to assist with HAZMAT incidents providing technical assistance, hazard assessment, decontamination, hot zone entry, mitigation action/supplies, and monitoring. The primary HAZMAT Technician Level Teams and the HAZMAT Operations Level Teams serving McLean County are based in Minot and Bismarck. A HAZMAT crew chief is available within minutes of a call for the team; on-scene response would be a matter of hours.	
Specialty Units: (Bomb Squad, Dive, Search & Rescue – Bismarck, and Minot Fire Dept.)	State Specialty Units: N.D. Bureau of Criminal Investigation (BCI) or N.D. Highway Patrol
LOCAL RESPONSE TO OIL, GAS INCIDENT	
Off-site - notification to state and federal agencies following established protocols.	On site: Response from oil and gas companies.

EMERGENCY SHELTERS

Finding shelter is critical in times of a hazard disaster. Shelter outside of the hazard area could include staying with family or friends, seeking a hotel room, or staying in a mass shelter. The designated shelters in McLean County are listed in Table 7.3-5.

Buildings used as emergency shelters vary in character and potential but are available to shelter people who need a place to be safe during and after a hazard event including fire, loss of power or flooding. All of the county emergency shelters have a protocol in place for gaining access when there is need but none meet FEMA's definition of a tornado storm shelter. FEMA[60], describes a storm shelter/safe room is a hardened structure specifically designed to meet FEMA criteria and provide near-absolute protection in strong wind events including tornados. An evacuation shelter is a facility that does not meet FEMA's stringent wind-related standards

Table 7.3-5 DESIGNATED EMERGENCY SHELTERS	
Garrison	Garrison City Hall
Max	City Hall/Civic Center
Riverdale	Riverdale Church - basement (an all faith/non-denominational church) on 3rd St/Montana Ave
Turtle Lake	Community Memorial Hospital
Underwood	City Hall
Washburn	Memorial Building
Wilton	Memorial Hall

Both the Red Cross and Salvation Army have assisted McLean County residents in previous disaster events. Their assistance would be important in designating any of the potential shelters as recognized emergency shelter.

[60] www.fema.gov/emergency-managers/risk-management/safe-rooms

Table 7.3-5 UTILITY PROVIDERS	County	Benedict	Butte	Coleharbor	Garrison	Max	Mercer	Riverdale	Ruso	Turtle Lake	Underwood	Washburn	Wilton
Otter Tail Power Company	■	■	■	■	■	■	■			■	■	■	■
McLean Electric Cooperative, Inc	■												
MDU Electric													■
MDU Natural Gas[61]					■	■	■	■		■	■	■	■
Central Power Electric Cooperative		■											
City of Riverdale								■					
Verendrye Electric Cooperative									■				

WATER SOURCES	County	Benedict	Butte	Coleharbor	Garrison	Max	Mercer	Riverdale	Ruso	Turtle Lake	Underwood[62]	Washburn	Wilton
Groundwater	■								■	■			
Surface Water	■				■			■			■	■	
Rural Water District	■	■	■	■	■	■	■						■

[61] https://www.montana-dakota.com/in-the-community/about-us/
[62] Underwood's water is from the City of Riverdale

- There are multiple sources of water for municipal, agricultural, domestic, and other users in McLean County. The three rural water districts are: McLean-Sheridan Water District, Garrison and Max Rural Water District, and the North Prairie Rural Water District. Some municipalities withdraw and treat water from surface waters, others treat water provided by rural water.
- Groundwater sources are the Lake Nettie Aquifer and Missouri River Aquifer. These are not considered especially susceptible to drought and were adequate even for the recent long-term drought When demand increased significantly over previous years, timely water treatment did become a challenge at times. Surface water sources are the Missouri River and Lake Sakakawea.
- Public water systems are monitored by the North Dakota Department of Health, and water permit applications are maintained by the North Dakota State Water Commission.
- The City of Ruso utilizes individual residential wells only.

8 Goals and Mitigation Actions

This Chapter Identifies the Mitigation Goals and Actions designed to mitigate risks of natural and technological/human-caused hazards in the community.

8.1 2016 MITIGATION GOALS AND ACTION ITEMS

2016 HAZARD MITIGATION GOALS

The four goals of the 2016 McLean County Multi-Hazard Mitigation Plan provided the general guiding principles that were used when developing the mitigation action items included in that plan.

2016 MITIGATION ACTIONS

The greatest challenge to completing mitigation activities has been the limited resources (time and money) of the county and each jurisdiction. Local government is run by a small number of people, some part-time. A majority of mitigation actions included in this plan can be implemented through existing county and city programs, and many require only a minimal cost. Those that require substantial costs are linked to grant programs that can provide much of the necessary funding.

2016 MITIGATION ACTIONS – STATUS

A number of the mitigation actions proposed in the 2016 Plan have been completed and progress has been made on others and many of the mitigation actions have been carried forward, some with adjustments into the McLean County Multi-Hazard Mitigation Plan. Appendix B identifies the status of each of the 2016 mitigation actions.

8.2 2022 MULTI-HAZARD MITIGATION PLAN GOALS

The Hazard Mitigation Goals of the 2016 Plan are carried forward in the McLean County Multi-Hazard Mitigation Plan and a new Hazard Mitigation Goals was added. The five goals are all priorities and presented in no particular order.

- Reduce the impacts of flooding to people and property.
- Enhance the public's awareness of hazards.
- Reduce impacts of severe summer and winter weather to people and property.
- Reduce impacts of drought and wildland/rural fires to people and property.
- Reduce the impacts of technological/human-caused hazards to people and property.

These goals represent the concerns of McLean County and its cities today as they did in 2016. No changes are proposed to the 2016 goals; those four goals are carried over into the McLean County Multi-Hazard Mitigation Plan. Adding the fifth goal to the McLean County Multi-Hazard Mitigation reflects the expanding impact of the technological/human-caused hazards on the people and economy of McLean County.

8.3 MITIGATION ACTION ITEMS – McLean County

Mitigation Action Items implement the goals identified in Section 8.2. Many of the 2016 Mitigation Actions have been incorporated into the current list. the text of a few have been modified and a range of new projects has been included.

Table 8.3-1addresses priorities, cost, project champions, funding, and timelines for McLean County and Section 8.4 presents the mitigation actions for the cities. A description of the development of the mitigation action items can be found in Appendix A-1.

MITIGATION ACTION ITEM TABLE

Table 8.3-1 presents the Mitigation Action Items, the hazards each addresses, priorities, cost, champions, partners, potential funding source(s) and a target timeline.

PRIORITIES

Mitigation Action Items are prioritized based on a generalized benefit-cost analysis. See Appendix A-1. Some have been adjusted from the 2016 Plan and many are new reflecting more specific action items.

PROJECT BENEFITS AND COSTS

Table 6,5-1, the Risk Analysis Table identifies the benefit of avoiding potential cost of damage to life and property and calculates that into the risk analysis. Here, preliminary costs are broken down as follows:

$ = Staff time or an expenditure up to $10,000
$$ = Action item costs between $10,000 and $100,000
$$$ = Action item costs over $100,000

Projects are prioritized based on a generalized benefit-cost analysis that factors in potential cost and project benefit. It is important to note that many projects involve little or no cast and other costs are eligible for grant or other outside funding. Funding options and project costs may vary year-to-year, so before moving forward with implementation the jurisdiction should perform a detailed benefit-cost analysis. The implementation timeline for each project may be highly variable based on the availability of funds.

RESPONSIBLE PARTIES - "PROJECT CHAMPIONS"

The McLean County Director of Disaster and Emergency Services (Emergency Manager) is the local champion for the plan, and responsible for maintaining energy and enthusiasm for each jurisdiction's overall mitigation program.

Responsibility for implementing mitigation actions ultimately rests with each jurisdiction. The individual responsible for overseeing implementation of mitigation actions for each jurisdiction. The Project Champion is listed in Table 8.3-2 and in the city mitigation action tables. This individual was identified during the planning process. The actual person performing the project may be different than the listed Project Champion.

PROJECT TIMEFRAME

The Project Timeframe included in Table 8.3-1 targets the year(s) when it is anticipated that the action item will be addressed. Based on funding availability, timelines in Table 8.3-1 may need adjustment.

Table 8.3-1 McLean County MITIGATION ACTION ITEMS											
#		HAZARDS	PRIORITY/ Cost	CHAMPION	PARTNERS	POTENTIAL FUNDING	TIMEFRAME				
							202	2023	2024	2025	2026
A	Organize a floodplain management workshop to be presented by the ND NFIP Coordinator for all NFIP participating community floodplain managers.[63]	Flood	HIGH / $	County Emergency Manager	State of North Dakota	County + state and fed'l grants					
B	Coordinate with landowners to identify water sources for fire suppression	Wildland/ Rural Fire	MID LEVEL/ $	County Emergency Manager	Local Fire Departments	County					
C	Install generators for the McLean-Sheridan water plant and well field	Multiple	MID LEVEL/ $$	County Commission	State of North Dakota	County + state and fed'l grants					
D	Improve inter-departmental radio communication and prepare for the rollout of Statewide Interoperability Radio Network (SIRN 2020).[64]	Multiple Hazards	HIGH / $	County Commission	State of North Dakota	County + state and fed'l grants					
E	Acquire and remove repetitive loss properties from the floodplain	Flood	MID LEVEL/ TBD	County Auditor	County Commission State of North Dakota	County + state and fed'l grants					
F	Drainage improvements and/or elevation for rural roads throughout the county	Flood	MID LEVEL/ $	County Highway	FEMA						
G	NFIP training for staff	Flood	MID LEVEL/ $	County Emergency Manager	State of North Dakota	County + state and fed'l grants					
H	Organize a Firewise education program for homeowners and implement best practices during wildfire season[65]	Wildland/ Rural Fire	MID LEVEL/ $	County Emergency Manager	Local Fire Departments	County					

[63] For the county, the focus of this action item has changed from "participate in the workshop" to "organize the workshop".
[64] This description has been expanded to address SIRN 2020
[65] For the county, the focus of this action item has changed from "participate in the education program" to "organize the education program".

Table 8.3-1 McLean County MITIGATION ACTION ITEMS											
#		HAZARDS	PRIORITY/ Cost	CHAMPION	PARTNERS	POTENTIAL FUNDING	TIMEFRAME				
							202	2023	2024	2025	2026
I	Public Education. Distribute hazard Information via County website, Social Media, Traditional Media, and Other Existing Interfaces. Topics could include preparing for winter and summer weather, water conservation, sheltering in place, flooding, generator use, wildfire protection, drought and water use, cyber security, shelter locations, ND One Call (811), etc. Share with the cities.[66]	Multiple Hazards	HIGH/ $	County Emergency Manager	Local Newspapers + McLean County Cities	County					
1	Continue to support programs assisting farmer and ranchers in need during times of drought,	Drought	MID LEVEL/ $	County Commission	USDA, ND Department of Water Resources, ND Department of Agriculture, and others	County + state and fed'l grants					
2	Review adopted floodplain ordinances	Flood	MID LEVEL/ $	County Floodplain Administrator	County Commission + City Flood Plain Administrators	County					
3	Acquire and remove repetitive loss properties from the floodplain	Flood	MID LEVEL/ TBD	County Auditor	County Commission State of North Dakota	County + state and fed'l grants					
4	Drainage improvements and/or elevation for rural roads throughout the county, as needed	Flood	LOW/ Varies	County Highway Superintendent	County Commission	County + state and fed'l grants					
5	Continue supporting hazardous materials training for first responders	HAZMAT Incident (All types)	MID LEVEL/ $	County Emergency Manager	County Commission	County + state and fed'l grants					

[66] The description of public education has been expanded.

Table 8.3-1 McLean County MITIGATION ACTION ITEMS											
#		HAZARDS	PRIORITY/ Cost	CHAMPION	PARTNERS	POTENTIAL FUNDING	TIMEFRAME				
							202	2023	2024	2025	2026
6	Evaluate zoning and building code tiedown requirements	Severe Summer Storm	MID LEVEL/ $	County Land Use Administrator	County Commission	County					
7	Install and maintain surge protection on critical equipment	Severe Summer Storm	LOW/ $	County Commission	State of North Dakota	County + state and fed'l grants					
8	Study and support pre-arranged shelters for stranded motorists/travelers, and others.	Severe Winter Storm	MID LEVEL/ $	County Emergency Manager	County Commission	County					
9	Conduct an annual review of snow plowing priorities which include consideration of the local vulnerable population.	Severe Winter Storm	MID LEVEL/ $	County Highway Superintendent	County Commission	County					
10	Continue to review construction under the North Dakota State Building Code and consider adopting fire codes and fire suppression requirements in new construction.	Structural Fire + Multiple Hazards	MID LEVEL/ $	County Land Use Administrator	Local Fire Departments + County Commission	County					
11	Continue to support the recruitment and training of volunteers to address wildland/rural fire, urban fire, and ambulance services.	Structural + Wildland/ Rural Fire	LOW/ $	County Emergency Manager	County Commission + McLean County Cities	County/ County, state, + fed'l grants					
12	Work with Rural Water to establish hydrants in areas distant from existing hydrants for fire suppression use.	Structural + Wildland/ Rural Fire	HIGH $	County Highway Superintendent	Local Fire Departments	County + state and fed'l grants					
13	In wildland-urban interface areas, consider providing vegetation management services to elderly or disabled residents who need help to remove flammable materials near their homes.	Structural + Wildland/ Rural Fire	LOW/ $	County Commission	Local Fire Departments	County/ County, state, + fed'l grants					

Table 8.3-1 McLean County MITIGATION ACTION ITEMS											
#		HAZARDS	PRIORITY/ Cost	CHAMPION	PARTNERS	POTENTIAL FUNDING	TIMEFRAME				
							202	2023	2024	2025	2026
14	Coordinate with rural landowners to identify and gain access to water sources for fire suppression	Wildland/ Rural Fire	MID LEVEL/ $	County Highway Superintendent	Local Fire Departments	County/ County, state, + fed'l grants					
15	Utilize a redundant and multiple methods for local warnings if primary communications are interrupted	Multiple Hazards	MID LEVEL/ $	County Commission	McLean County Cities	County + state and fed'l grants					
16	Identify existing buildings with potential for retrofit use as tornado shelters. shelters for evacuation, or warming stations after power loss.	Multiple Hazards	MID LEVEL/ $	County Emergency Manager	County Commission/ McLean County Cities	County + state and fed'l grants					
17	Continue to support mutual aid agreements and on-scene incident command.	Multiple Hazards	HIGH/ $	County Emergency Manager	County Commission/ McLean County Cities + Adjacent Counties	County					
18	Continue to support upgrading existing or purchase new equipment and infrastructure for emergency services including snow removal services, as needed.	Multiple Hazards	MID LEVEL/ $	County Emergency Manager	County Commission	County + state and fed'l grants					
19	Identify location and organize outreach to vulnerable populations during hazard events	Multiple Hazards	MID LEVEL/ $	County Emergency Manager	County Commission	County + state and fed'l grants					
20	Maintain a countywide inventory of emergency generators.	Multiple Hazards	MID LEVEL/ $	County Emergency Manager	County Commission	County					
21	To prepare for consideration of space weather in the next Plan update, include space weather in any hazard-related community survey. process	Space Weather	LOW/ $	County Emergency Manager	County Commission	County					

8.4 MITIGATION ACTION ITEMS – CITIES Table 8.4-1 to Table 8.4-11

Table 8.4-1
City of Benedict
MITIGATION ACTION ITEMS

#	**Note:** Mitigation Action Items D through I are carried over from the 2016 Plan. Others are new and use the same # system as in Table 8.3-1 for McLean County.	**HAZARDS** Further details in Appendix J	**PRIORITY/ Cost**	**CHAMPION**	**PARTNERS**	**POTENTIAL FUNDING**	**TIMEFRAME**				
							2022	2023	2024	2025	2026
C	Acquire generators for lift station and water system pump	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
D	Improve inter-departmental radio communication and prepare for the rollout of Statewide Interoperability Radio Network (SIRN 2020).	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
H	Participate in Firewise program for homeowners and implement best practices during wildfire season	Wildland/ Rural Fire	MID LEVEL/ $	Mayor	City Council	City					
I	Public Education. Distribute hazard Information. Topics could include preparing for winter and summer weather, water conservation, sheltering in place, flooding, generator use, wildfire protection, drought and water use, cyber security, shelter locations, ND One Call (811)	Multiple Hazards	HIGH/ $	Mayor	City Council, Local Newspapers and Social Media	City					
J	Install remote-activated warning siren	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
K	Debris removal within natural drainage way through town	Flood	MID LEVEL/ $	Mayor	City Council	City					
8	Install and maintain surge protection on critical equipment	Severe Summer Weather	LOW/ $	City Council		City					
10	Conduct an annual review of snow plowing priorities which include consideration of the local vulnerable population.	Severe Winter Weather	MID LEVEL/ $	City Council		City					
12	Continue to support the recruitment and training of volunteers to address wildland/ rural fire, urban fire, and ambulance services.	Structural + Wildland/ Rural Fire	LOW/ $	Mayor	City Council	City + state and fed'l grants					
14	In wildland-urban interface areas, consider providing vegetation management services to elderly or disabled	Structural + Wildland/	LOW/ $	City Council		City + state and fed'l					

Table 8.4-1 City of Benedict MITIGATION ACTION ITEMS											
#	**Note:** Mitigation Action Items D through I are carried over from the 2016 Plan. Others are new and use the same # system as in Table 8.3-1 for McLean County.	**HAZARDS** Further details in Appendix J	**PRIORITY/ Cost**	**CHAMPION**	**PARTNERS**	**POTENTIAL FUNDING**	**TIMEFRAME**				
							2022	2023	2024	2025	2026
	residents who need help to remove flammable materials near their homes.	Rural Fire				grants					
16	Utilize a redundant and multiple methods for local warnings if primary communications are interrupted	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
17	Identify existing buildings with potential for retrofit use as tornado shelters. shelters for evacuation, or warming stations after power loss.	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City					
18	Continue to support mutual aid agreements and on-scene incident command.	Multiple Hazards	HIGH/ $	City Council		City					
19	Continue to support upgrading existing or purchase new equipment and infrastructure for emergency services including snow removal services, as needed.	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
20	Identify location and organize outreach to vulnerable populations during hazard events	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					

Table 8.4-2
City of Butte
MITIGATION ACTION ITEMS

#	**Note:** Mitigation Action Items C through K are carried over from the 2016 Plan. Others are new and use the same # system as in Table 8.3-1 for McLean County.	**HAZARDS** Further details in Appendix J	**PRIORITY/ Cost**	**CHAMPION**	**PARTNERS**	**POTENTIAL FUNDING**	**TIMEFRAME** 2022	2023	2024	2025	2026
C	Install generator at emergency shelter	Multiple Hazards	HIGH/ $	Mayor	City Council	City					
H	Participate in a Firewise education program for homeowners and implement best practices during wildfire season.	Wildland/ Rural Fire	MID LEVEL/ $	Mayor	City Council	City					
I	Distribute hazard Information via County website, Social Media, Traditional Media, and Other Existing Interfaces. Topics could include preparing for winter and summer weather, water conservation, sheltering in place, flooding, generator use, wildfire protection, drought and water use, cyber security, shelter locations, ND One Call (811), etc. Share with the cities.	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
J	Replace warning siren	Multiple Hazards	HIGH/ $	Mayor	City Council	City					
L	Install signage to identify emergency shelters	Multiple Hazards	HIGH/ $	Mayor	City Council	City					
6	Continue supporting hazardous materials training for first responders	HAZMAT Incident (All types)	MID LEVEL/ $	Mayor	City Council	City					
8	Install and maintain surge protection on critical equipment	Severe Summer Weather	LOW/ $	City Council		City					
10	Conduct an annual review of snow plowing priorities which include consideration of the local vulnerable population.	Severe Winter Weather	MID LEVEL/ $	City Council		City					
12	Continue to support the recruitment and training of volunteers to address wildland/rural fire, urban fire, and ambulance services.	Structural + Wildland/ Rural Fire	LOW/ $	Mayor	City Council	City + state and fed'l grants					

Table 8.4-2 City of Butte MITIGATION ACTION ITEMS											
#	**Note:** Mitigation Action Items C through K are carried over from the 2016 Plan. Others are new and use the same # system as in Table 8.3-1 for McLean County.	**HAZARDS** Further details in Appendix J	**PRIORITY/ Cost**	**CHAMPION**	**PARTNERS**	**POTENTIAL FUNDING**	**TIMEFRAME**				
							2022	2023	2024	2025	2026
14	In wildland-urban interface areas, consider providing vegetation management services to elderly or disabled residents who need help to remove flammable materials near their homes.	Structural + Wildland/ Rural Fire	LOW/ $	City Council		City + state and fed'l grants					
16	Utilize a redundant and multiple methods for local warnings if primary communications are interrupted	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
17	Identify existing buildings with potential for retrofit use as tornado shelters. shelters for evacuation, or warming stations after power loss.	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
18	Continue to support mutual aid agreements and on-scene incident command.	Multiple Hazards	HIGH/ $	City Council		City					
19	Continue to support upgrading existing or purchase new equipment and infrastructure for emergency services including snow removal services, as needed.	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
20	Identify location and organize outreach to vulnerable populations during hazard events	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					

Table 8.4-3 City of Coleharbor MITIGATION ACTION ITEMS											
#	**Note:** Mitigation Action Items A through I are carried over from the 2016 Plan. Others are new and use the same # system as in Table 8.3-1 for McLean County.	**HAZARDS** Further details in Appendix J	**PRIORITY/ Cost**	**CHAMPION**	**PARTNERS**	**POTENTIAL FUNDING**	**TIMEFRAME**				
							2022	2023	2024	2025	2026
A	Participate in a floodplain management workshop to be presented by the ND NFIP Coordinator for all NFIP participating community floodplain managers	Flood	MID LEVEL/ $	Floodplain Admin.	County Floodplain Admin.	City					
D	Improve inter-departmental radio communication and prepare for the rollout of Statewide Interoperability Radio Network (SIRN 2020).	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	County					
H	Participate in Firewise education program for homeowners and implement best practices during wildfire season	Wildland/ Rural Fire	MID LEVEL/ $	City Council		City					
I	Distribute hazard Information. Topics could include preparing for winter and summer weather, water conservation, sheltering in place, flooding, generator use, wildfire protection, drought and water use, cyber security, shelter locations, ND One Call (811)	Multiple Hazards	HIGH/ $	Mayor	City Council, Local Newspapers and Social Media	City					
3	Review adopted floodplain ordinances	Flood	MID LEVEL/ $	Floodplain Admin.	County Floodplain Admin.	City					
8	Install and maintain surge protection on critical equipment	Severe Summer Weather	LOW/ $	City Council		City					
10	Conduct an annual review of snow plowing priorities which include consideration of the local vulnerable population.	Severe Winter Weather	MID LEVEL/ $	City Council		City					
12	Continue to support the recruitment and training of volunteers to address wildland/rural fire, urban fire, and ambulance services.	Structural + Wildland/ Rural Fire	LOW/ $	Mayor	City Council	City + state and fed'l grants					
16	Utilize a redundant and multiple methods for local warnings if primary communications are interrupted	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					

Table 8.4-3 City of Coleharbor MITIGATION ACTION ITEMS											
#	**Note:** Mitigation Action Items A through I are carried over from the 2016 Plan. Others are new and use the same # system as in Table 8.3-1 for McLean County.	**HAZARDS** Further details in Appendix J	**PRIORITY/ Cost**	**CHAMPION**	**PARTNERS**	**POTENTIAL FUNDING**	**TIMEFRAME**				
							2022	2023	2024	2025	2026
17	Identify existing buildings with potential for retrofit use as tornado shelters. shelters for evacuation, or warming stations after power loss.	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
18	Continue to support mutual aid agreements and on-scene incident command.	Multiple Hazards	HIGH/ $	Mayor	City Council	City					
19	Continue to support upgrading existing or purchase new equipment and infrastructure for emergency services including snow removal services, as needed.	Multiple Hazards	MID LEVEL/ $	City Council		City					
20	Identify location and organize outreach to vulnerable populations during hazard events	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					

Table 8.4-4 City of Garrison MITIGATION ACTION ITEMS											
#	**Note:** Mitigation Action Items A through I are carried over from the 2016 Plan. Others are new and use the same # system as in Table 8.3-1 for McLean County.	**HAZARDS** Further details in Appendix J	**PRIORITY/ Cost**	**CHAMPION**	**PARTNERS**	**POTENTIAL FUNDING**	**TIMEFRAME**				
							2022	2023	2024	2025	2026
A	Participate in a floodplain management workshop to be presented by the ND NFIP Coordinator for all NFIP participating community floodplain managers	Flood	MID LEVEL/ $	Floodplain Admin.	County Floodplain Admin.	City					
C	Install generator at City Hall/emergency shelter, City Auditorium. and school auditorium/emergency shelter.	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City					
D	Improve inter-departmental radio communication and prepare for the rollout of Statewide Interoperability Radio Network (SIRN 2020).	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
E	Acquire and remove repetitive loss properties from the floodplain	Flood	MID LEVEL/ TBD	City Auditor	City Council State of ND	County + state and fed'l grants					
H	Participate in Firewise education program for homeowners and implement best practices during wildfire season	Wildland/ Rural Fire	MID LEVEL/ $	Mayor	City Council	City					
I	Distribute hazard Information. Topics could include preparing for winter and summer weather, water conservation, sheltering in place, flooding, generator use, wildfire protection, drought and water use, cyber security, shelter locations, ND One Call (811).	Multiple Hazards	HIGH/ $	Mayor	City Council, Local Newspapers and Social Media	City					
2	Review adopted floodplain ordinances	Flood	MID LEVEL/ $	Floodplain Admin.	County Floodplain Admin.	City					
4	Continue supporting hazardous materials training for first responders	HAZMAT Incident (All types)	MID LEVEL/ $	Mayor	City Council	City					
7	Install and maintain surge protection on critical equipment	Severe Summer Weather	LOW/ $	City Council		City					

Table 8.4-4 City of Garrison MITIGATION ACTION ITEMS											
#	**Note:** Mitigation Action Items A through I are carried over from the 2016 Plan. Others are new and use the same # system as in Table 8.3-1 for McLean County.	**HAZARDS** Further details in Appendix J	**PRIORITY/ Cost**	**CHAMPION**	**PARTNERS**	**POTENTIAL FUNDING**	**TIMEFRAME**				
							2022	2023	2024	2025	2026
9	Conduct an annual review of snow plowing priorities which include consideration of the local vulnerable population.	Severe Winter Weather	MID LEVEL/ $	City Council		City					
11	Continue to support the recruitment and training of volunteers to address wildland/rural fire, urban fire, and ambulance services.	Structural + Wildland/ Rural Fire	LOW/ $	Mayor	City Council	City + state and fed'l grants					
13	In wildland-urban interface areas, consider providing vegetation management services to elderly or disabled residents who need help to remove flammable materials near their homes.	Structural + Wildland/ Rural Fire	LOW/ $	City Council		City + state and fed'l grants					
15	Utilize a redundant and multiple methods for local warnings if primary communications are interrupted	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
16	Identify existing buildings with potential for retrofit use as tornado shelters. shelters for evacuation, or warming stations after power loss.	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City					
17	Continue to support mutual aid agreements and on-scene incident command.	Multiple Hazards	HIGH/ $	City Council		City					
18	Continue to support upgrading existing or purchase new equipment and infrastructure for emergency services including snow removal services, as needed.	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
19	Identify location and organize outreach to vulnerable populations during hazard events	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
22	Update municipal raw water intake at Lake Sakakawea	Multiple Hazards	HIGH/ $$$	Mayor	City Council	City + state and fed'l grants					

Table 8.4-5 City of Max MITIGATION ACTION ITEMS											
#	**Note:** Mitigation Action Items A through N are carried over from the 2016 Plan. Others are new and use the same # system as in Table 8.3-1 for McLean County.	**HAZARDS** Further details in Appendix J	**PRIORITY/ Cost**	**CHAMPION**	**PARTNERS**	**POTENTIAL FUNDING**	**TIMEFRAME**				
							2022	2023	2024	2025	2026
A	Participate in a floodplain management workshop to be presented by the ND NFIP Coordinator for all NFIP participating community floodplain managers	Flood	MID LEVEL/ $	Floodplain Admin.	County Floodplain Admin.	City					
C	Install generator at city hall/civic center/shelter	Multiple Hazards	HIGH/ $$	Mayor	City Council	City + state and fed'l grants					
D	Improve inter-departmental radio communication and prepare for the rollout of Statewide Interoperability Radio Network (SIRN 2020).	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
H	Participate in Firewise program for homeowners and implement best practices during wildfire season	Wildland/ Rural Fire	MID LEVEL/ $	Mayor	City Council	City					
I	Distribute hazard Information. Topics could include preparing for winter and summer weather, water conservation, sheltering in place, flooding, generator use, wildfire protection, drought and water use, cyber security, shelter locations, ND One Call (811).	Multiple Hazards	HIGH/ $	Mayor	City Council, Local Newspapers and Social Media	City					
L	Install signage to identify emergency shelters	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City					
N	Install railroad crossing arms on 3rd Avenue SE	Multiple Hazards	MID LEVEL/ $$	Mayor	City Council	City + state and fed'l grants					
2	Review adopted floodplain ordinances	Flood	MID LEVEL/ $	Floodplain Admin.	County Floodplain Admin.	City					
5	Continue supporting hazardous materials training for first responders	HAZMAT Incident (All types)	MID LEVEL/ $	Mayor	City Council	City					

Table 8.4-5 City of Max MITIGATION ACTION ITEMS											
#	**Note:** Mitigation Action Items A through N are carried over from the 2016 Plan. Others are new and use the same # system as in Table 8.3-1 for McLean County.	**HAZARDS** Further details in Appendix J	**PRIORITY/ Cost**	**CHAMPION**	**PARTNERS**	**POTENTIAL FUNDING**	**TIMEFRAME**				
							2022	2023	2024	2025	2026
7	Install and maintain surge protection on critical equipment	Severe Summer Weather	LOW/ $	City Council		City					
9	Conduct an annual review of snow plowing priorities which include consideration of the local vulnerable population.	Severe Winter Weather	MID LEVEL/ $	City Council		City					
11	Continue to support the recruitment and training of volunteers to address wildland/rural fire, urban fire, and ambulance services.	Structural + Wildland/ Rural Fire	LOW/ $	Mayor	City Council	City + state and fed'l grants					
13	In wildland-urban interface areas, consider providing vegetation management services to elderly or disabled residents who need help to remove flammable materials near their homes.	Structural + Wildland/ Rural Fire	LOW/ $	City Council		City + state and fed'l grants					
15	Utilize a redundant and multiple methods for local warnings if primary communications are interrupted	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
16	Identify existing buildings with potential for retrofit use as tornado shelters. shelters for evacuation, or warming stations after power loss.	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City					
17	Continue to support mutual aid agreements and on-scene incident command.	Multiple Hazards	HIGH/ $	City Council		City					
18	Continue to support upgrading existing or purchase new equipment and infrastructure for emergency services including snow removal services, as needed.	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
19	Identify location and organize outreach to vulnerable populations during hazard events	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					

Table 8.4-6 City of Mercer MITIGATION ACTION ITEMS											
#	**Note:** Mitigation Action Items C through I are carried over from the 2016 Plan. Others are new and use the same # system as in Table 8.3-1 for McLean County.	**HAZARDS** Further details in Appendix J	**PRIORITY/ Cost**	**CHAMPION**	**PARTNERS**	**POTENTIAL FUNDING**	**TIMEFRAME**				
							2022	2023	2024	2025	2026
C	Install generators at the pump house, City Hall, the fire hall, and the Mercer Community Center.	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
D	Improve inter-departmental radio communication and prepare for the rollout of Statewide Interoperability Radio Network (SIRN 2020).	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
H	Participate in Firewise program for homeowners and implement best practices during wildfire season.	Wildland/ Rural Fire	MID LEVEL/ $	Mayor	City Council	City					
I	Distribute hazard Information. Topics could include preparing for winter and summer weather, water conservation, sheltering in place, flooding, generator use, wildfire protection, drought and water use, cyber security, shelter locations, ND One Call (811).	Multiple Hazards	HIGH/ $	Mayor	City Council, Local Newspapers and Social Media	City					
J	Install a warning siren at the fire hall	Multiple Hazards	HIGH/ $	Mayor	City Council	City					
5	Continue supporting hazardous materials training for first responders.	HAZMAT Incident (All types)	MID LEVEL/ $	Mayor	City Council	City					
7	Install and maintain surge protection on critical equipment.	Severe Summer Weather	LOW/ $	City Council		City					
9	Conduct an annual review of snow plowing priorities which include consideration of the local vulnerable population.	Severe Winter Weather	MID LEVEL/ $	City Council		City					
11	Continue to support the recruitment and training of volunteers to address wildland/rural fire, urban fire, and ambulance services.	Structural + Wildland/ Rural Fire	LOW/ $	Mayor	City Council	City + state and fed'l grants					
13	In wildland-urban interface areas, consider providing	Structural +	LOW/	City Council		City + state					

Table 8.4-6 City of Mercer MITIGATION ACTION ITEMS											
#	**Note:** Mitigation Action Items C through I are carried over from the 2016 Plan. Others are new and use the same # system as in Table 8.3-1 for McLean County.	**HAZARDS** Further details in Appendix J	**PRIORITY/ Cost**	**CHAMPION**	**PARTNERS**	**POTENTIAL FUNDING**	**TIMEFRAME**				
							2022	2023	2024	2025	2026
	vegetation management services to elderly or disabled residents who need help to remove flammable materials near their homes.	Wildland/ Rural Fire	$			and fed'l grants					
15	Utilize a redundant and multiple methods for local warnings if primary communications are interrupted.	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
16	Identify existing buildings with potential for retrofit use as tornado shelters, shelters for evacuation, or warming stations after power loss.	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City					
17	Continue to support mutual aid agreements and on-scene incident command.	Multiple Hazards	HIGH/ $	City Council		City					
18	Continue to support upgrading existing or purchase new equipment and infrastructure for emergency services including snow removal services, as needed.	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
19	Identify location and organize outreach to vulnerable populations during hazard events.	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					

Table 8.4-7 City of Riverdale MITIGATION ACTION ITEMS											
#	**Note:** Mitigation Action Items C through I are carried over from the 2016 Plan. Others are new and use the same # system as in Table 8.3-1 for McLean County.	**HAZARDS** Further details in Appendix J	**PRIORITY/ Cost**	**CHAMPION**	**PARTNERS**	**POTENTIAL FUNDING**	**TIMEFRAME**				
							2022	2023	2024	2025	2026
C	Install generator at water treatment plant	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
D	Improve inter-departmental radio communication and prepare for the rollout of Statewide Interoperability Radio Network (SIRN 2020).	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
H	Participate in Firewise program for homeowners and implement best practices during wildfire season	Wildland/ Rural Fire	MID LEVEL/ $	Mayor	City Council	City					
I	Distribute hazard Information. Topics could include preparing for winter and summer weather, water conservation, sheltering in place, flooding, generator use, wildfire protection, drought and water use, cyber security, shelter locations, ND One Call (811).	Multiple Hazards	HIGH/ $	Mayor	City Council, Local Newspapers and Social Media	City					
J	Install signage to identify emergency shelters	Multiple Hazards	LOW/ $	Mayor	City Council	City					
5	Continue supporting hazardous materials training for first responders	HAZMAT Incident (All types)	MID LEVEL/ $	Mayor	City Council	City					
7	Install and maintain surge protection on critical equipment	Severe Summer Weather	LOW/ $	City Council		City					
9	Conduct an annual review of snow plowing priorities which include consideration of the local vulnerable population.	Severe Winter Weather	MID LEVEL/ $	City Council		City					
11	Continue to support the recruitment and training of volunteers to address wildland/rural fire, urban fire, and ambulance services.	Structural + Wildland/ Rural Fire	LOW/ $	Mayor	City Council	City + state and fed'l grants					

Table 8.4-7 City of Riverdale MITIGATION ACTION ITEMS											
#	**Note:** Mitigation Action Items C through I are carried over from the 2016 Plan. Others are new and use the same # system as in Table 8.3-1 for McLean County.	**HAZARDS** Further details in Appendix J	**PRIORITY/ Cost**	**CHAMPION**	**PARTNERS**	**POTENTIAL FUNDING**	**TIMEFRAME**				
							2022	2023	2024	2025	2026
13	In wildland-urban interface areas, consider providing vegetation management services to elderly or disabled residents who need help to remove flammable materials near their homes.	Structural + Wildland/ Rural Fire	LOW/ $	City Council		City + state and fed'l grants					
15	Utilize a redundant and multiple methods for local warnings if primary communications are interrupted	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
16	Identify existing buildings with potential for retrofit use as tornado shelters. shelters for evacuation, or warming stations after power loss.	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City					
17	Continue to support mutual aid agreements and on-scene incident command.	Multiple Hazards	HIGH/ $	City Council		City					
18	Continue to support upgrading existing or purchase new equipment and infrastructure for emergency services including snow removal services, as needed.	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
19	Identify location and organize outreach to vulnerable populations during hazard events	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					

Table 8.4-8 City of Ruso MITIGATION ACTION ITEMS											
#	**Note:** Mitigation Action Items C through I are carried over from the 2016 Plan. Others are new and use the same # system as in Table 8.3-1 for McLean County.	**HAZARDS** Further details in Appendix J	**PRIORITY/ Cost**	**CHAMPION**	**PARTNERS**	**POTENTIAL FUNDING**	**TIMEFRAME**				
							2022	2023	2024	2025	2026
H	Participate in Firewise program for homeowners and implement best practices during wildfire season	Wildland/ Rural Fire	MID LEVEL/ $	Mayor	City Council	City					
I	Distribute hazard Information. Topics could include preparing for winter and summer weather, water conservation, sheltering in place, flooding, generator use, wildfire protection, drought and water use, cyber security, shelter locations, ND One Call (811).	Multiple Hazards	HIGH/ $	Mayor	City Council	City					
9	Conduct an annual review of snow plowing priorities which include consideration of the local vulnerable population.	Severe Winter Weather	MID LEVEL/ $	Mayor		City					
11	Continue to support the recruitment and training of volunteers to address wildland/rural fire, urban fire, and ambulance services.	Structural + Wildland/ Rural Fire	LOW/ $	Mayor	City Council	City + state and fed'l grants					
13	In wildland-urban interface areas, consider providing vegetation management services to elderly or disabled residents who need help to remove flammable materials near their homes.	Structural + Wildland/ Rural Fire	LOW/ $	Mayor		City + state and fed'l grants					
19	Identify location and organize outreach to vulnerable populations during hazard events	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
24	Develop a pest management plan and begin implementation,	Public Health	MID LEVEL/ $	Mayor		City					

Table 8.4-9 City of Turtle Lake MITIGATION ACTION ITEMS											
#	**Note:** Mitigation Action Items D through J are carried over from the 2016 Plan. Others are new and use the same # system as in Table 8.3-1 for McLean County.	**HAZARDS** Further details in Appendix J	**PRIORITY/ Cost**	**CHAMPION**	**PARTNERS**	**POTENTIAL FUNDING**	**TIMEFRAME**				
							2022	2023	2024	2025	2026
D	Improve inter-departmental radio communication and prepare for the rollout of Statewide Interoperability Radio Network (SIRN 2020).	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
H	Participate in Firewise program for homeowners and implement best practices during wildfire season	Wildland/ Rural Fire	MID LEVEL/ $	Mayor	City Council	City					
I	Distribute hazard Information. Topics could include preparing for winter and summer weather, water conservation, sheltering in place, flooding, generator use, wildfire protection, drought and water use, cyber security, shelter locations, ND One Call (811).	Multiple Hazards	HIGH/ $	Mayor	City Council, Local Newspapers and Social Media	City					
L	Install signage to identify emergency shelters	Multiple Hazards	LOW/ $	Mayor	City Council	City					
5	Continue supporting hazardous materials training for first responders	HAZMAT Incident (All types)	MID LEVEL/ $	Mayor	City Council	City					
7	Install and maintain surge protection on critical equipment	Severe Summer Weather	LOW/ $	City Council		City					
9	Conduct an annual review of snow plowing priorities which include consideration of the local vulnerable population.	Severe Winter Weather	MID LEVEL/ $	City Council		City					
11	Continue to support the recruitment and training of volunteers to address wildland/rural fire, urban fire, and ambulance services.	Structural + Wildland/ Rural Fire	LOW/ $	Mayor	City Council	City + state and fed'l grants					
15	Utilize a redundant and multiple methods for local warnings if primary communications are interrupted	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
16	Identify existing buildings with potential for retrofit use as	Multiple	MID LEVEL/	Mayor	City Council	City + state					

Table 8.4-9 City of Turtle Lake MITIGATION ACTION ITEMS											
#	**Note:** Mitigation Action Items D through J are carried over from the 2016 Plan. Others are new and use the same # system as in Table 8.3-1 for McLean County.	**HAZARDS** Further details in Appendix J	**PRIORITY/ Cost**	**CHAMPION**	**PARTNERS**	**POTENTIAL FUNDING**	**TIMEFRAME**				
							2022	2023	2024	2025	2026
	tornado shelters. shelters for evacuation, or warming stations after power loss.	Hazards	$			and fed'l grants					
17	Continue to support mutual aid agreements and on-scene incident command.	Multiple Hazards	HIGH/ $	Mayor	City Council	City					
18	Continue to support upgrading existing or purchase new equipment and infrastructure for emergency services including snow removal services, as needed.	Multiple Hazards	MID LEVEL/ $	City Council		City					
19	Identify location and organize outreach to vulnerable populations during hazard events	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					

Table 8.4-10 City of Underwood MITIGATION ACTION ITEMS											
#	**Note:** Mitigation Action Items A through V are carried over from the 2016 Plan. Others are new and use the same # system as in Table 8.3-1 for McLean County.	**HAZARDS** Further details in Appendix J	**PRIORITY/ Cost**	**CHAMPION**	**PARTNERS**	**POTENTIAL FUNDING**	**TIMEFRAME**				
							2022	2023	2024	2025	2026
A	Participate in a floodplain management workshop to be presented by the ND NFIP Coordinator for all NFIP participating community floodplain managers	Flood	MID LEVEL/ $	Floodplain Admin.	County Floodplain Admin.	City					
C	Install generator at city hall/shelter and install a generator for the city's water and sewer system.[67]	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
D	Improve inter-departmental radio communication and prepare for the rollout of Statewide Interoperability Radio Network (SIRN 2020).	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	County					
H	Participate in Firewise education for homeowners and implement best practices during wildfire season	Wildland/ Rural Fire	MID LEVEL/ $	City Council		City + state and fed'l grants					
I	Distribute hazard Information. Topics could include preparing for winter and summer weather, water conservation, sheltering in place, flooding, generator use, wildfire protection, drought and water use, cyber security, shelter locations, ND One Call (811)	Multiple Hazards	HIGH/ $	Mayor	City Council, Local Newspapers and Social Media	City					
L	Install signage to identify emergency shelters	Multiple Hazards	HIGH/ $	Mayor	City Council	City					
T	Require hazardous materials facilities to provide status reports to the fire dept.	HAZMAT Incident	HIGH/ $	Mayor	City Council	City					
U	Address overflow flooding issues from pond north of the city	Flood	MID LEVEL/ $ -$$	Mayor	City Council	City + state and fed'l grants					

[67] A generator for the city's water and sewer system is a new mitigation action item in the 2022 update

Table 8.4-10 City of Underwood MITIGATION ACTION ITEMS											
#	**Note:** Mitigation Action Items A through V are carried over from the 2016 Plan. Others are new and use the same # system as in Table 8.3-1 for McLean County.	**HAZARDS** Further details in Appendix J	**PRIORITY/ Cost**	**CHAMPION**	**PARTNERS**	**POTENTIAL FUNDING**	**TIMEFRAME**				
							2022	2023	2024	2025	2026
V	Conduct engineering study to identify solutions for flooding issues on the city's west side	Flood	MID LEVEL/ $ -$$	Mayor	City Council	City + state and fed'l grants					
2	Review adopted floodplain ordinances	Flood	MID LEVEL/ $	Floodplain Admin.	County Floodplain Admin.	City					
5	Continue supporting hazardous materials training for first responders	HAZMAT Incident (All types)	MID LEVEL/ $	Mayor	City Council	City					
7	Install and maintain surge protection on critical equipment	Severe Summer Weather	LOW/ $	City Council		City					
9	Conduct an annual review of snow plowing priorities which include consideration of the local vulnerable population.	Severe Winter Weather	MID LEVEL/ $	City Council		City					
11	Continue to support the recruitment and training of volunteers to address wildland/rural fire, urban fire, and ambulance services.	Structural + Wildland/ Rural Fire	LOW/ $	Mayor	City Council	City + state and fed'l grants					
15	Utilize a redundant and multiple methods for local warnings if primary communications are interrupted	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
16	Identify existing buildings with potential for retrofit use as tornado shelters. shelters for evacuation, or warming stations after power loss.	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
17	Continue to support mutual aid agreements and on-scene incident command.	Multiple Hazards	HIGH/ $	Mayor	City Council	City					
18	Continue to support upgrading existing or purchase new equipment and infrastructure for emergency services including snow removal services, as needed.	Multiple Hazards	MID LEVEL/ $	City Council		City					

Table 8.4-10 City of Underwood MITIGATION ACTION ITEMS											
#	**Note:** Mitigation Action Items A through V are carried over from the 2016 Plan. Others are new and use the same # system as in Table 8.3-1 for McLean County.	**HAZARDS** Further details in Appendix J	**PRIORITY/ Cost**	**CHAMPION**	**PARTNERS**	**POTENTIAL FUNDING**	**TIMEFRAME**				
							2022	2023	2024	2025	2026
19	Identify location and organize outreach to vulnerable populations during hazard events	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					

Table 8.4-11 City of Washburn MITIGATION ACTION ITEMS												
#	**Note:** Mitigation Action Items A through Y are carried over from the 2016 Plan. Others are new and use the same # system as in Table 8.3-1 for McLean County.	**HAZARDS** Further details in Appendix J	**PRIORITY/ Cost**	**CHAMPION**	**PARTNERS**	**POTENTIAL FUNDING**	**TIMEFRAME**				
							2022	2023	2024	2025	2026
A	Participate in a floodplain management workshop to be presented by the ND NFIP Coordinator for all NFIP participating community floodplain managers	Flood	MID LEVEL/ $	Floodplain Admin.	County Floodplain Admin.	City					
C	Install generators at Memorial Building/shelter and water treatment plant	Multiple Hazards	HIGH/ $	Mayor	City Council	City					
D	Improve inter-departmental radio communication and prepare for the rollout of Statewide Interoperability Radio Network (SIRN 2020).	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	County					
H	Participate in Firewise education for homeowners and implement best practices during wildfire season	Wildland/ Rural Fire	MID LEVEL/ $	City Council		City + state and fed'l grants					
I	Distribute hazard Information. Topics could include preparing for winter and summer weather, water conservation, sheltering in place, flooding, generator use, wildfire protection, drought and water use, cyber security, shelter locations, ND One Call (811)	Multiple Hazards	HIGH/ $	Mayor	City Council, Local Newspapers and Social Media	City					
L	Install signage to identify emergency shelters	Multiple Hazards	LOW/ $	Mayor	City Council	City					
W	Replace culverts that pass-through coulee on east side of town	Flood	HIGH/ $ -$$	Mayor	City Council	City + state and fed'l grants					
X	Replace drinking water intake along Missouri River	Drought	MID LEVEL/ $ -$$	Mayor	City Council	City + state and fed'l grants					
Y	Upgrade storm water system along Custer Drive	Flood	MID LEVEL/ $ -$$	Mayor	City Council	City + state and fed'l grants					

Table 8.4-11 City of Washburn MITIGATION ACTION ITEMS											
#	**Note:** Mitigation Action Items A through Y are carried over from the 2016 Plan. Others are new and use the same # system as in Table 8.3-1 for McLean County.	**HAZARDS** Further details in Appendix J	**PRIORITY/ Cost**	**CHAMPION**	**PARTNERS**	**POTENTIAL FUNDING**	**TIMEFRAME**				
							2022	2023	2024	2025	2026
2	Review adopted floodplain ordinances	Flood	MID LEVEL/ $	Floodplain Admin.	County Floodplain Admin.	City					
5	Continue supporting hazardous materials training for first responders	HAZMAT Incident (All types)	MID LEVEL/ $	Mayor	City Council	City					
7	Install and maintain surge protection on critical equipment	Severe Summer Weather	LOW/ $	City Council		City					
9	Conduct an annual review of snow plowing priorities which include consideration of the local vulnerable population.	Severe Winter Weather	MID LEVEL/ $	City Council		City					
11	Continue to support the recruitment and training of volunteers to address wildland/rural fire, urban fire, and ambulance services.	Structural + Wildland/ Rural Fire	LOW/ $	Mayor	City Council	City + state and fed'l grants					
13	In wildland-urban interface areas, consider providing vegetation management services to elderly or disabled residents who need help to remove flammable materials near their homes.	Structural + Wildland/ Rural Fire	LOW/ $	City Council		City + state and fed'l grants					
15	Utilize a redundant and multiple methods for local warnings if primary communications are interrupted	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
16	Identify existing buildings with potential for retrofit use as tornado shelters. shelters for evacuation, or warming stations after power loss.	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City					
17	Continue to support mutual aid agreements and on-scene incident command.	Multiple Hazards	HIGH/ $	City Council		City					

Table 8.4-11 City of Washburn MITIGATION ACTION ITEMS											
#	**Note:** Mitigation Action Items A through Y are carried over from the 2016 Plan. Others are new and use the same # system as in Table 8.3-1 for McLean County.	**HAZARDS** Further details in Appendix J	**PRIORITY/ Cost**	**CHAMPION**	**PARTNERS**	**POTENTIAL FUNDING**	**TIMEFRAME**				
							2022	2023	2024	2025	2026
18	Continue to support upgrading existing or purchase new equipment and infrastructure for emergency services including snow removal services, as needed.	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
19	Identify location and organize outreach to vulnerable populations during hazard events	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					

Table 8.4-12 City of Wilton MITIGATION ACTION ITEMS											
#	**Note:** Mitigation Action Items A through J are carried over from the 2016 Plan. Others are new and use the same # system as in Table 8.3-1 for McLean County.	**HAZARDS** Further details in Appendix J	**PRIORITY/ Cost**	**CHAMPION**	**PARTNERS**	**POTENTIAL FUNDING**	**TIMEFRAME**				
							2022	2023	2024	2025	2026
A	Participate in a floodplain management workshop to be presented by the ND NFIP Coordinator for all NFIP participating community floodplain managers	Flood	MID LEVEL/ $	Floodplain Admin.	County Floodplain Admin.	City					
C	Install generators at the city's Memorial Building/shelter, the water treatment plant, the water tower, and the ambulance building.	Multiple Hazards	HIGH/ $$	Mayor	City Council	City					
D	Improve inter-departmental radio communication and prepare for the rollout of Statewide Interoperability Radio Network (SIRN 2020).	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	County					
H	Participate in Firewise education for homeowners and implement best practices during wildfire season	Wildland/ Rural Fire	MID LEVEL/ $	City Council		City + state and fed'l grants					
I	Distribute hazard Information. Topics could include preparing for winter and summer weather, water conservation, sheltering in place, flooding, generator use, wildfire protection, drought and water use, cyber security, shelter locations, ND One Call (811)	Multiple Hazards	HIGH/ $	Mayor	City Council, Local Newspapers and Social Media	City					
L	Install signage to identify emergency shelters	Multiple Hazards	LOW/ $	Mayor	City Council	City					
3	Review adopted floodplain ordinances	Flood	MID LEVEL/ $	Floodplain Admin.	County Floodplain Admin.	City					
5	Continue supporting hazardous materials training for first responders	HAZMAT Incident (All types)	MID LEVEL/ $	Mayor	City Council	City					
7	Install and maintain surge protection on critical equipment	Severe Summer Weather	LOW/ $	City Council		City					

Table 8.4-12 City of Wilton MITIGATION ACTION ITEMS											
#	**Note:** Mitigation Action Items A through J are carried over from the 2016 Plan. Others are new and use the same # system as in Table 8.3-1 for McLean County.	**HAZARDS** Further details in Appendix J	**PRIORITY/ Cost**	**CHAMPION**	**PARTNERS**	**POTENTIAL FUNDING**	**TIMEFRAME**				
							2022	2023	2024	2025	2026
9	Conduct an annual review of snow plowing priorities which include consideration of the local vulnerable population.	Severe Winter Weather	MID LEVEL/ $	City Council		City					
11	Continue to support the recruitment and training of volunteers to address wildland/rural fire, urban fire, and ambulance services.	Structural + Wildland/ Rural Fire	LOW/ $	Mayor	City Council	City + state and fed'l grants					
13	In wildland-urban interface areas, consider providing vegetation management services to elderly or disabled residents who need help to remove flammable materials near their homes.	Structural + Wildland/ Rural Fire	LOW/ $	City Council		City + state and fed'l grants					
15	Utilize a redundant and multiple methods for local warnings if primary communications are interrupted	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
16	Identify existing buildings with potential for retrofit use as tornado shelters. shelters for evacuation, or warming stations after power loss.	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City					
17	Continue to support mutual aid agreements and on-scene incident command.	Multiple Hazards	HIGH/ $	City Council		City					
18	Continue to support upgrading existing or purchase new equipment and infrastructure for emergency services including snow removal services, as needed.	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
19	Identify location and organize outreach to vulnerable populations during hazard events	Multiple Hazards	MID LEVEL/ $	Mayor	City Council	City + state and fed'l grants					
23	Wilton Ambulance ICS training - 100 and 200	Multiple Hazards	HIGH/ $$	Mayor	City Council	City + state and fed'l grants					

9 Plan Maintenance

Since the 2016 Plan was adopted, the county and participating jurisdictions have addressed many of the plan's adopted mitigation actions worked toward ensuring that hazard mitigation is integrated into local activities. This chapter details the plan maintenance process to make sure that the McLean County Multi-Hazard Mitigation Plan will remain an active and relevant document. The plan maintenance process includes monitoringthe implementation of mitigation actions, evaluating the effectiveness of the plan at achieving its goals and updating the plan. This chapter also includes information regarding how the plan will be integrated into existing planning mechanisms.

9.1 PLAN MONITORING AND EVALUATION

The Local Emergency Planning Committee (LEPC) will monitor and evaluate the plan once per year. A basic agenda for each meeting should include:

- Discussion of project progress for the current period (and uncompleted projects from previous periods)
- Local champion reports on project status
- Discussion of upcoming projects and grant/funding opportunities
- Any changes to risks since plan adoption
- Any additions or deletions to the critical facilities list since plan adoption. Are any additions or deletions needed?

The Emergency Manager should maintain a folder with a Mitigation Action Progress Forms and meeting notes. The risk and vulnerability assessment should be evaluated during a LEPC meeting approximately two years after plan adoption.

LEPC meetings that are scheduled for discussion of the plan should be open to the public and advertised.

9.2 IMPLEMENTING THE PLAN

It is hoped that each responsible party identified in Table 8.3-1 and the following city tables will provide input to their jurisdiction's annual budget and capital improvement meetings and advocate for consideration of mitigation actions.

Each participating jurisdiction should provide the following basic information about projects to the LEPC in the reporting period:

- What was accomplished for the Mitigation Action since the last meeting
- What obstacles, problems or delays the project encountered
- If the project needs to be changed or revised.

Project progress should be recorded on the Mitigation Action Progress Form found in Appendix. G. The form should be completed for each project during the reporting period (and projects from previous reporting periods that

have not been completed). If time constraints are an issue, the LEPC may decide to only discuss the high-priority projects;

Due to the limited resources of each jurisdiction, few planning mechanisms exist within the county. Despite recent population gains in some parts of the county, the county's population is projected to remain generally unchanged through the next few years. This suggests that resources will continue to remain scarce in the near future.

9.3 CONTINUED PUBLIC INVOLVEMENT

To promote continued involvement, the Plan will remain available online through the McLean County website giving people 24-hour access. The website will include a place for people to comment. Any media reports and public meeting notices will be posted online, as well as any progress reports and updates of the Plan. Annual progress reports or any proposed updates to the Plan will be open for public review online and during at least one public meeting each year.

9.4 UPDATING THE PLAN

The McLean County Emergency Manager is responsible for overseeing the five-year update process. The Emergency Manager should begin the plan update process approximately one year prior to the expiration of the current plan. The first step is to develop the project scope by utilizing the Mitigation Action Progress Form in Appendix G. Funding opportunities from NDDES/FEMA may also be evaluated when determining project scope.

The Emergency Manager should maintain any documents gathered during the five-year period that will be useful when developing the update. This will help to greatly reduce the research collection phase of the McLean County Multi-Hazard Mitigation Plan update, which will reduce the time and cost considerations. It will also ensure that any priority projects identified during LEPC monitoring meetings will be included.

APPENDICES

Appendix A	Planning Process Overview and Community Outreach
Appendix B	Status of 2016 Plan Mitigation Action Items
Appendix C	Community Survey
Appendix D	FEMA Risk Study
Appendix E	North Dakota Department of Health - Reportable Diseases
Appendix F	McLean County Developers' Handout
Appendix G	Mitigation Action Progress Form
Appendix H	Garrison Dam 150,000 cfs Projected Inundation - 2011
Appendix I	Reviewed Documents
Appendix J	New Mitigation Action Items and the Related Hazard(s)
Appendix K	Recorded Weather Events

Appendix A-1

PLANNING PROCESS OVERVIEW

OVERVIEW

In-person collaboration with community leaders, stakeholders and adjoining jurisdictions is always challenging in McLean County because of the size of the county, the number and size of the cities. Kickoff for the McLean County Multi-Hazard Mitigation Plan was held prior to imposition of meeting restrictions due to the COVID-19 pandemic but the plan was developed during a time of meeting restrictions. An alternative approach to collaboration was developed. Community outreach is discussed in Appendix A-2.

PARTICIPATING JURISDICTIONS

In addition to McLean County, the City of Benedict, City of Butte, City of Coleharbor, City of Garrison, City of Max, City of Mercer, City of Riverdale, City of Ruso, City of Turtle Lake, City of Underwood, City of Washburn, and the City of Wilton participated in developing the McLean County Multi-Hazard Mitigation Plan. A list of participants from each participating jurisdiction is included at the end of Appendix A-2.

INFORMATION GATHERING

Appendix H lists many of the existing plans, studies, reports, and technical information utilized to develop the McLean Multi-Hazard Mitigation Plan. As the lead planner for this work also led the 2016 Plan, much of the background information was readily available. Footnotes, linking to the documents, websites, and other materials ,are used whenever clarification is needed. Additional information was gathered from community leaders and residents.

REVIEW AND COMMENT REQUESTS

Initial requests for information were sent by email to leaders and staff of the county and cities as well as the regional water districts and other agencies and state departments. Follow up emails and phone calls pursued responses when needed.

The county emergency managers, city auditors, elected officials, and the leaders of local response agencies were primary contacts and sources of local data from each jurisdiction. As some of the auditors are new in the position, they went to other staff members and elected officials for the requested information.

February 2022 Requests – Participating Jurisdictions

Early in February 2022, a letter was emailed to each city with a copy of the 2016 Mitigation Action Items attached. Each was asked:

What is the status of the action items listed in the table on the next page? (This was not included in the Mercer request as they did not participate in the previous plan.)

Will these continue action items continue to work for the city in the next five years or are there changes or other mitigation items you might want to add, such as:

- *A generator for a key city facility*
- *An emergency siren or repairs to an existing one*
- *Repairs to roads that have been impacted by flooding*
- *Training or equipment needed for emergency response*

A few other questions:

- *Does the city have any evacuation shelter?*
- *How does the city reach residents to share information?*
- *What is your meeting schedule?*
- *When we send you the draft McLean County Multi-Hazard*

Mitigation Plan for your review,, would you prefer that we email a pdf or mail you a flash drive?

February 2022 Requests – Neighboring Jurisdictions

In another element of data gathering, sections of the draft plan were sent to the emergency managers of the neighboring counties (Ward, McHenry, Sheridan, Burleigh, Oliver, Mercer, Dunn, and Mountrail Counties as well as the emergency manager for the Fort Berthold Reservation). The transmittal asked for clarification of specific issues and a review of draft tables as well as advise "lessons-learned" from their plan development. The only response came from Ward County information about the hazards addressed in their plan and the timing of some hazard events. The City of Wilton is split between McLean County and Burleigh County. Coordination with that city has included county and city officials in both counties.

DRAFT REVIEW BY PARTICIPATING JURISDICTIONS

During the first review and comment round, the cities along the Missouri River were asked to review the critical and strategic facilities shown on draft maps. Emails were followed by telephone conversations and map adjustments.

On April 4, 2022, a draft of most chapters of the Multi-Hazard Mitigation Plan was published on the project website and an email blast to all who had submitted a survey, submitted a comment through the project website, attended a meeting, or were on our county and city mailing lists, The email let all know that:

- The McLean County Commissioners would address the project at their next meeting, which could be seen on the county website
- The draft plan was available through the project website
- Comments on the draft were requested.

On the same day, the County Emergency Manager sent a letter by email to all participating jurisdictions requesting their review and comment. It read in part:

"Just wanted to let you all know that the Multi Hazard Mitigation draft plan is now available for you to review on the McLean County website at www.mcleancountynd.gov/county-news/multi-hazard-mitigation-plan-review/ or www.mcleanhazardplan.com/ or take a look at the attachment.

Please double and triple check the information listed for your city. This is your plan too. This will be open for comment for a minimum of 30 (thirty) days."

A copy of the plan was attached as well as a unique attachment for each city. The one for Underwood is included at the end of this Appendix. Each city attachments included the five or six pages where confirmation of specific information was needed with a note in red indicating the request. Review of the list of Mitigation Action Items for each city was an important element of this review.

In mid-April 2022, a follow up email was sent to each city asking:

- Do you have any corrections, changes, or additions to the draft Hazard Mitigation Plan?
- Is your city okay with the Mitigation Action Items suggested for the city?
- If all looks good to you, could you please let us know.

Telephone conversations followed addressing questions and requested changes.

CONSULTATION

Consultation with local and regional specialists was included in plan preparation. For some, the exchanges were by email; for others it was a conference call. Topics addressed included:

- Drought forecasts for the counties of North Dakota
- Services available from the Red Cross and Salvation Army after a serious hazard event and staffing needs for shelters.
- Response times
- Evaluation of structures for use as a tornado shelter
- Liability for a tornado shelter
- Local need for volunteers for fire departments and EMS
- Wildland fires, programs addressing the wildland/urban interface
- North Dakota earthquakes and landslides
- COVID-19 experience in the area
- 2020 U.S. Census and its data release timetable,
- Hazardous materials and their transportation routes and loading protocols
- North Dakota and local consumptive water use and priorities
- Air Force installations
- McLean County, McLean-Sheridan Water District, Garrison and Max Rural Water District, and the North Prairie Regional Water District provided data on water use, including during the drought as well as reviews on their performance during recent drought events and information on future plans.
- Agricultural-related business located in each city from local and state chambers, mapping, and city directories.

HAZARDS

Both natural (Chapter 4) and technology/human-caused hazards (Chapter 5) are presented in the McLean County Hazard Plan.

Information that is included in FEMA's Natural Risk Index that specifically addresses McLean County has been included and FEMA's terminology adopted. For example, the FEMA document refers to "Heat Wave" and not the typically used term of "Extreme Heat." FEMA's national maps are also included, where applicable, to put McLean County's experience in perspective.

For clarity, hazards are discussed in more detail than is typical. For example, Severe Summer Weather includes a separate discussion of Hailstorm, Heat Wave, Strong Wind, Thunderstorm + Lightning, and Tornado including local experience, impact, vulnerability, and risk assessment.

RISK ASSESSMENT

Identifying hazard characteristics and potential consequences, including effects on key facilities. Chapter 4 describes the characteristics, past occurrences, potential impact and probability and the effects on key facilities of natural hazards and Chapter 5 presents the same content for technology/human-caused hazards.

Chapter 6 addresses risk assessment and presents the Priority Risk Index (PRI). For some hazards, including the weather-related hazards, the level of risk is the same countywide but for other hazards the level of risk varies depending on location. For example, not all cities are located on roadways or rail lines with potential of carrying hazardous materials.

Whenever there are differences in the level of risk between the cities, a separate risk assessment was completed for each jurisdiction. Because of the importance of the risk assessment, the sections describing

each hazard begins with a chart showing the PRI scores.

DEVELOPMENT OF MITIGATION ACTION ITEMS

Developing the mitigation action items included in the McLean County Hazard Mitigation Plan began with those included in the 2016 Plan. Each local jurisdiction confirmed the progress on each action item since the 2016 plan was adopted. Those that were completed or no longer applicable were dropped (Table B-1) and the remainder are presented first in the 2022 list using the previous identifiers.

The new Mitigation Action Items are based on the identified key issues for the county and each individual city plus a review of local capabilities and the risk related to each hazard for each individual city. The draft was reviewed by all jurisdictions, their input incorporated, and the updated drafts sent back for confirmation. Each action item was related to one or more of the key issues and that link was included in the plan text.

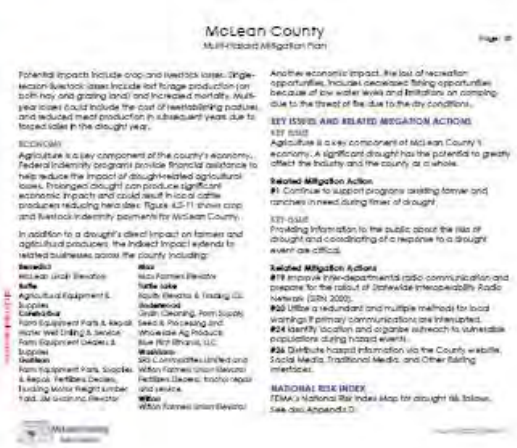
PLAN IMPLEMENTATION AND PROGRESS MONITORING

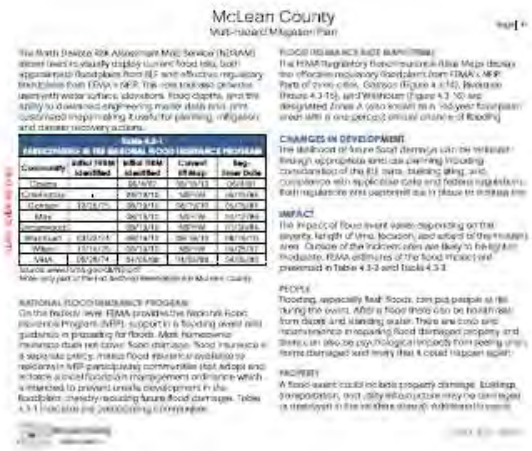
Implementing this Hazard Plan brings it to life and periodic monitoring ensures that the Hazard Plan remains relevant as conditions change.

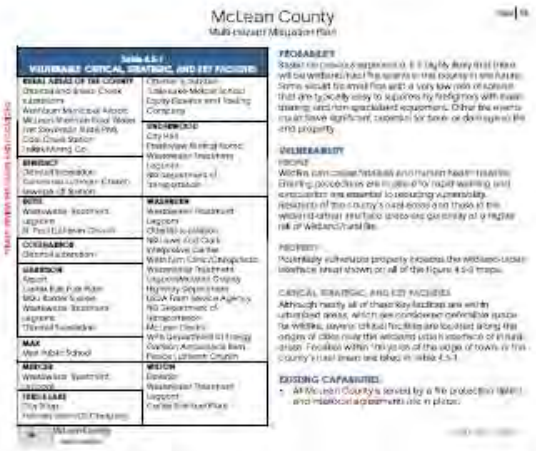
The county and the cities were successful in implementing the 2016 Hazard Plan. Continued success is expected. Progress on implementing the Mitigation Strategies will be monitored by the LEPC. Chapter 9 describes this process.

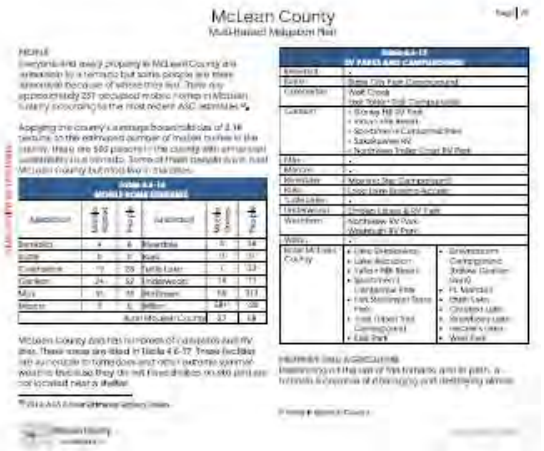
APPENDIX A-1 ATTACHMENT

Example – Request to Underwood









Appendix A-2

COMMUNITY OUTREACH

Holding public meetings is challenging in a county as big and spread out as McLean County, particularly one with many small cities with very limited or no staff. That challenge grew during the height of the COVID-19 pandemic.

The 2016 Plan included multiple public meetings and a community survey which focused on community leaders. This update always planned to:

- Coordinate with leaders of participating communities in gathering information, reviewing the 2016 policies and their ideas for continued or new policies to address the current and future needs.
- Expand the community survey results from opinions informing policy development to input to the hazard risk analysis' mathematical formulas. This would require more responses than possible using the 2016 approach in a time when public meetings would be very limited.

Outreach was undertaken in two phases, before and after the COVID-19 meeting limitations. The first community outreach phase included the launch of the project website and the kickoff meeting. The community survey was also initiated in this phase.

PROJECT WEBSITE LAUNCH - August 23, 2021

The project website, www.mcleanhazardplan.com, was live in early on August 23, 2021 and remains active today. It was also accessed through the county website. Content has been added to the website as the project developed. Much of the community outreach, especially after the COVID-19 meeting limitations were imposed, focused on driving people to the website's content.

Office of
Noelle Kroll
Emergency Manager

McLean County
STATE OF NORTH DAKOTA
www.mcleancountynd.gov
"A Proud Past – A Promising Future"

712 5th Avenue
P.O. Box 1108
Washburn, ND 58577-1108
(701) 462-8541
Fax (701) 462-3542
nkroll@nd.gov

August 19, 2021

Dear Valued Member of McLean County,

McLean County Emergency Management is preparing an update to the county's Multi-Hazard Mitigation Plan. Carron Day, a multi-disciplinary planner, was selected to assist the county develop the plan update.

For this effort to succeed, it is essential that we obtain input from all parties who have knowledge of hazards in the county. You have been selected as a key stakeholder to provide information and guidance on this planning project.

You are invited to attend a kickoff stakeholder meeting on Thursday, September 9th 2021 at the McLean County Courthouse in the Commission Room located on the ground floor at 712 5th Ave Washburn at 7:00 PM. The meeting will include a brief overview of the planning process and a discussion about hazard risk within the county. We would greatly appreciate your involvement in this important project for McLean County.

More information about the project can be found at www.McLeanHazardPlan.com. Please feel free to contact me if you have any questions.

Sincerely,

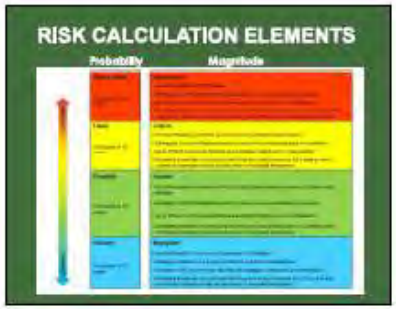
Noelle Kroll
McLean County Director of Disaster Emergency Services
701-462-8541
nkroll@nd.gov

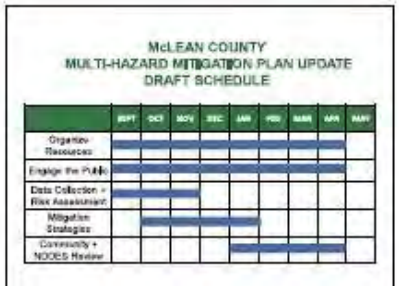
KICKOFF MEETING September 16, 2021

The invitation below was mailed or delivered in person to 108 people/organizations and emailed to 82 more. See Table A-2 Community Outreach for specifics.

The presentation provided an overview of the hazard mitigation planning process for natural and technology/ human-caused hazards,. A copy of the slides follows.

McLean County
NORTH DAKOTA





McLean County
NORTH DAKOTA

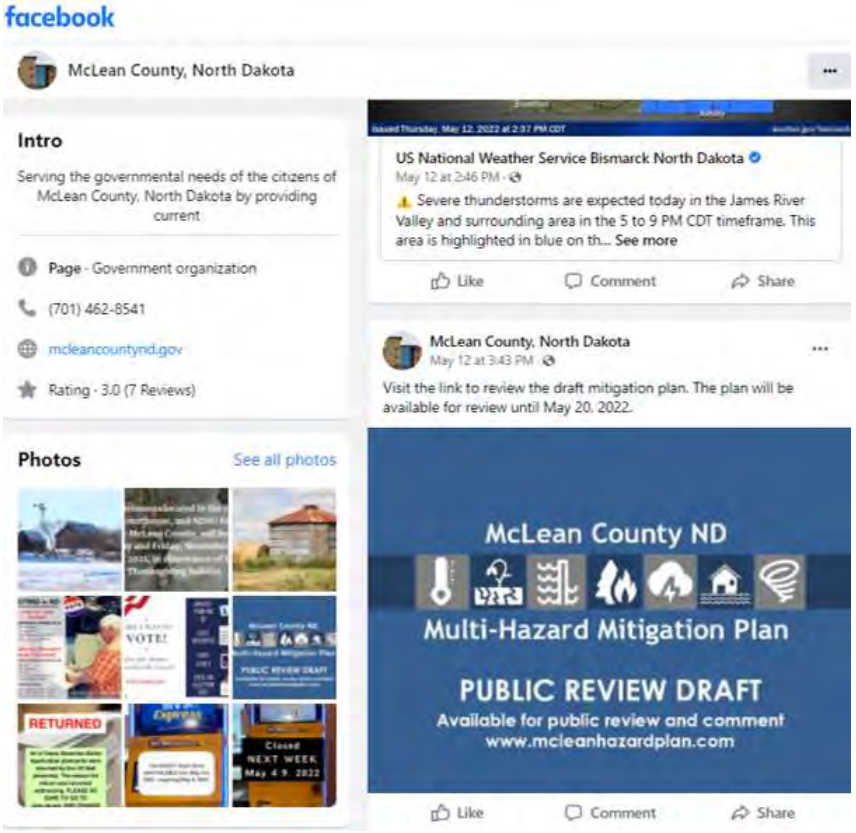
McLEAN COUNTY MULTI-HAZARD MITIGATION PLAN

UPDATE KICKOFF MEETING September 16, 2021

Name	Email address	Address	Notify of Future Meetings (yes or no)
Carron Day	carronday@gmail.com	Bismarck ND 58501	yes
Noelle Kroll	nkroll@nd.gov	Washburn, ND 58577	yes
Al HANSON	alkuhanson@nd.gov	1600 2ND AVE SW #4 MINOT	yes
Shelby Pudwill	Shelby.Pudwill@redcross-	BISMARCK	y
Curt Olson	curt.olson@ndsu.edu	MINOT	y
Paul Schlosser	[illegible]	Garrison	y
Greg Sprenger	[illegible]	Garrison	x
Jesse Carr	Jesse.carr@[illegible]	Underwood	y
Corey King	corey.king@[illegible]	Bismarck	y
Dale Klemp	dale.klemp@[illegible].nd.us	Garrison	y
Don Simon	Simon@[illegible]	Washburn ND	y
Clayton Yerke	napa116washe@yahoo.com	Washburn ND	y
Darrell Scherecky	Darrell.scherecky@[illegible]	Washburn	y
[illegible] Wagner	jwagner@[illegible]	[illegible] Turtle Lake	x
Nadine Doe	ndoe@northwoodche.org	Turtle Lake, ND	x
Dwight Johnson	dwight.johnson@[illegible]	Roseglen	y
Ralph Mancini	[illegible]	Wilton	y
Randy Ehli	rehlis@usbr.gov	304 E Broadway, Bismarck ND	Yes
Christa Komrik	ckomrik@nd.gov	4 W Acres Garrison, ND	yes
Beth Knutson	Baknutson@nd.gov	712 5th Ave Wash	Yes

FACEBOOK

McLean County Facebook Page



COMMUNITY SURVEY

After the in-person kickoff meeting, community outreach focused on reaching people through other means. To address the COVID-19 meeting limitations and meet the needs for more community input, the county took the extraordinary step of developing an insert for the local newspapers. The insert provided an opportunity for many more people to learn about hazard mitigation planning and to express their ideas in the community survey. A link to the Community Survey was live from launch to the end of April 2022 through the project website and the McLean County website's home page.

In addition, the survey was included in a four-page insert delivered to approximately 2,800 subscribers in the December 2nd edition of three McLean County newspapers. The insert described the project and introduced the survey. Another 100 paper copies were available at meetings.

WEBSITE UPDATES

November 29, 2021

A draft of Chapters 1-3 plus 9 were uploaded to the website on November 29, 2021. Emails informed those on the outreach list that the draft was available for review

April 6, 2022

On April 6, 2022, a draft of most chapters of the Multi-Hazard Mitigation Plan was published on the project website and an email blast sent to the outreach list about its availability.

April 6 through May 20, 2022

Public Review Period was extended beyond the 30-day period to accommodate requests for additional time.

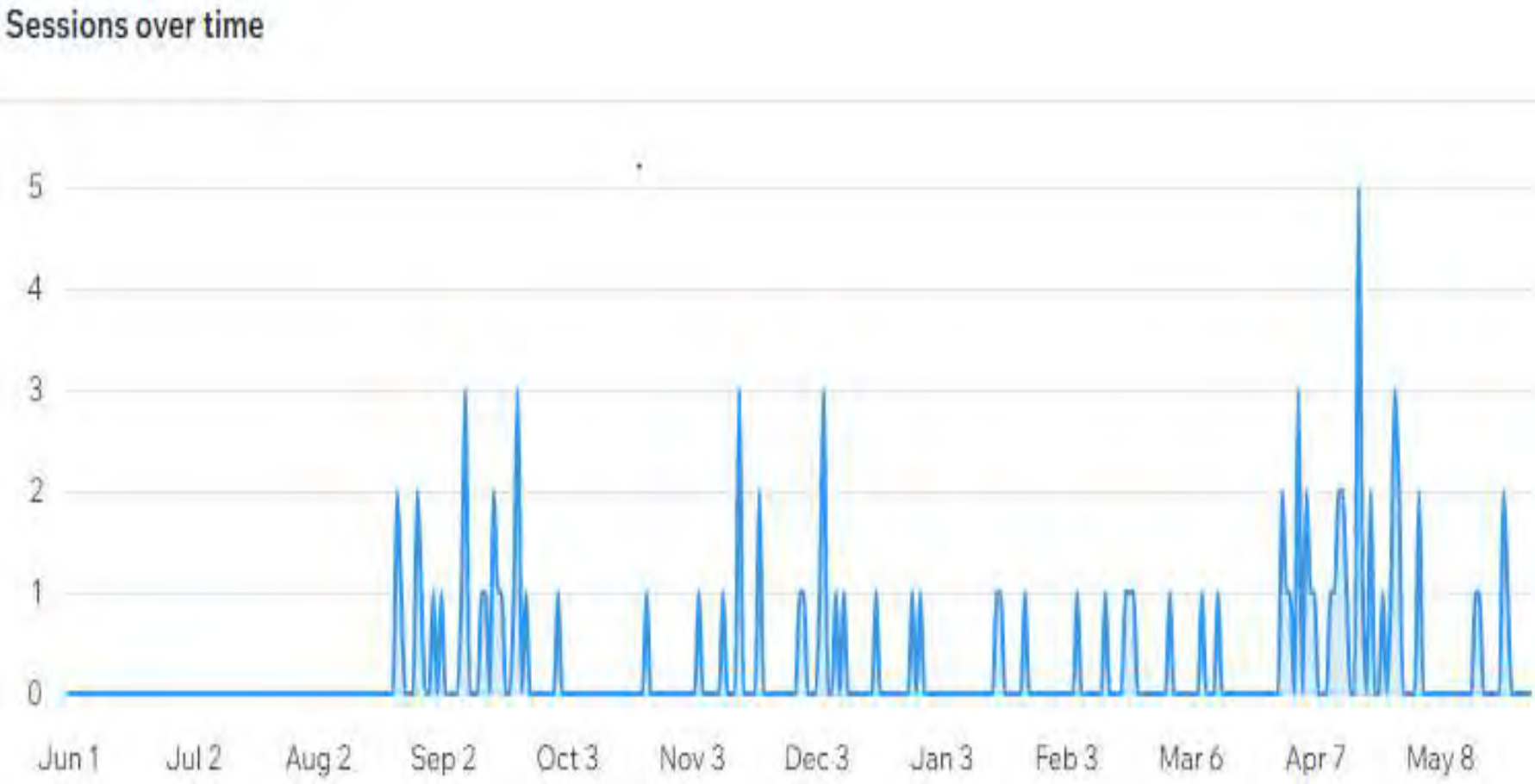
May 23, 2022

Updated Multi-Hazard Mitigation Plan incorporating all community input was posted on the project website and an email blast sent to the outreach list about its availability.

May 31, 2022

The latest version of the plan, the one that was sent to NDDES for review, was posted on the project website.

PROJECT WEBSITE ACTIVITY



The figure above tracts website activity from launch through the end of May 2022. Of the 94 visitors, 63% accessed the website directly and 37% came through the county website. Most of the visitors, 78%, used their desktop to reach the website and the remaining 21% accessed the website through a mobile device.

MAY 2022 NEWSPAPER ARTICLE

The following article was included in 1,447 issues of the McLean County Independent newspaper mailed out to subscribers, in the 522 copies sent to stores in McLean County and in the newspaper's 464 online subscriptions.

Putting a plan in place

County multi-hazard mitigation plan updated

BY JAMES C. FALCON
james@nordaknorth.com
Drought has been deemed as the most probable risk in McLean County, according to a survey of McLean County residents.
The survey was part of an update of the county's multi-hazard mitigation plan, which addresses multiple natural and other hazards, as well as identifying resources, information, and mitigation activities for reducing risk from these hazards.

Updating the plan included a survey of McLean County residents in December of last year.
The survey got a good response, said Carron Day, a FEMA consultant working with McLean County on formulating the mitigation plan. From the results, she was able to understand what the community was concerned about, and which hazards were important to the community.
In addition to drought, extreme weather conditions – summer and winter – were also categorized as being a hazard in a survey gauged to identify chief hazards in the county. The survey also identified dam failure, urban fire, and some hazardous material incidents as the least probable hazards.

Of the hazards likely to impact McLean County, drought and severe winter weather were more "very likely," severe summer weather and agricultural public health were "somewhat likely," tornado and Hazmat incidents with Air Force facilities were "somewhat unlikely" and dam failure and a major urban fire were "very unlikely.." Also, of the residents surveyed, many of the hazards listed would have a limited impact on the part of the county where they live. Dam failure had the most response when it came to catastrophic impacts. The majority of the respondents live in Garrison, Washburn, and rural parts of the county.

"The local community has to have a plan and the plan needs to address the hazards that are expected in that community," Day explained. "This plan does address a lot of hazards: drought, flood, tornados, windstorms, hailstorms … both natural events and manmade things."

The plan also addresses hazardous material incidents, should there be a spill, and urban fires.
"The bottom line is: if any significant hazard event happens in McLean County and they would be looking for FEMA to help some, they would need these plans in place," Day said.

The plan will then be submitted to the state, mainly to the North Dakota Department of Emergency Services, which is authorized by FEMA to go through these reviews, Day said.
"The last time this plan went through – and I worked on that plan, too – it had to go to FEMA's office in Denver for review," Day said, noting that bypassing that by sending it to a more regional entity can save time. They will make sure the plan conforms to all of FEMA's guidelines. They will notify the county if this plan does or does not do that or recommend changes."

In the latter case, the county would go back to the drawing board, make any necessary changes, and re-submit it, she added.
Once the plan receives approval, the cities would need to adopt it by resolution, Day said. "Then, they package it up and it can go to the county and the county will then adopt it."
The process will take a couple of months with Day noting "there is no hard deadline." As city governments tend to meet monthly, the timing of getting all of the cities to file resolutions could take some time. Day, however, said that she anticipates the process to be finished "before the end of the year, for sure. … It should be adopted in the fall."

The draft is available online at mcleanhazardplan.com. Day said that submitting comments are encouraged and that residents can also request to be notified of the final adoption hearing.

COUNTY COMMISSION/LEPC MEETINGS

All County Meetings are advertised and available for viewing in real time on the county's Facebook page. Meeting recordings are available on-line after the meetings through the county website.

McLean County Public Meeting - December 07, 2021

- The McLean County Multi-Hazard Mitigation Plan was discussed at public meetings in the County Courthouse.
- Noelle Kroll , the McLean County Director of Disaster Emergency Services/Risk Manager Carron Day and Stuart Merry, Mayor of Garrison, joined the meeting via phone. Noelle Kroll and Carron Day, Consultant to the County, displayed a PowerPoint presentation updating the commissioners on the current status of the Multi-Hazard Mitigation Plan. Discussion followed.
- Attending the meeting were Chairperson Barry Suydam. Present were Commissioners Suydam, Steve Cottingham, and Steve Lee. Also present were Auditor Beth A. Knutson, Deputy Auditor Diane L. Blumhagen, Highway Superintendent Jim Grey, Wold Engineering representative Mike Rivinius, and James C. Falcon, McLean County Independent Editor. Carron Day, Consultant to McLean County for this plan, and Stuart Merry, Mayor of Garrison watched the meeting on the county's Facebook page and joined the meeting via phone.

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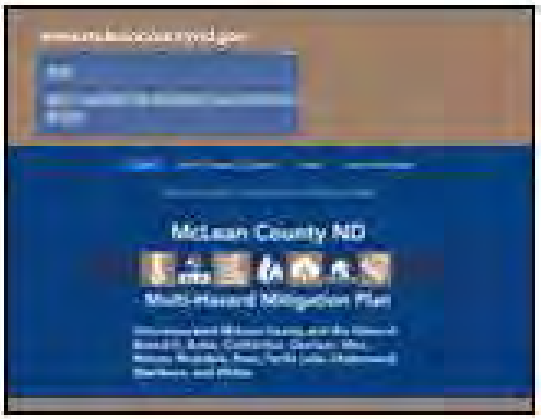

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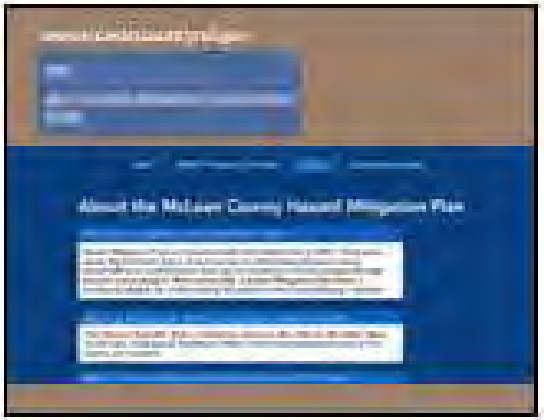
About the McLean County Hazard Mitigation Plan

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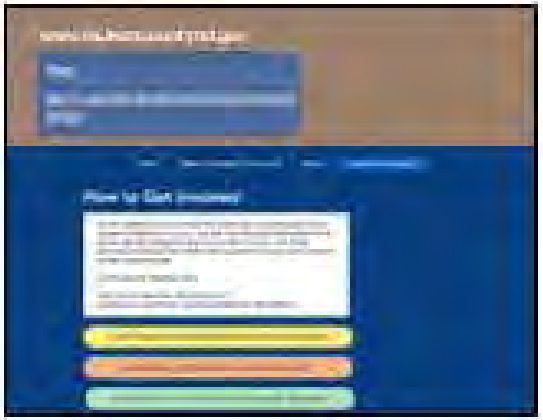

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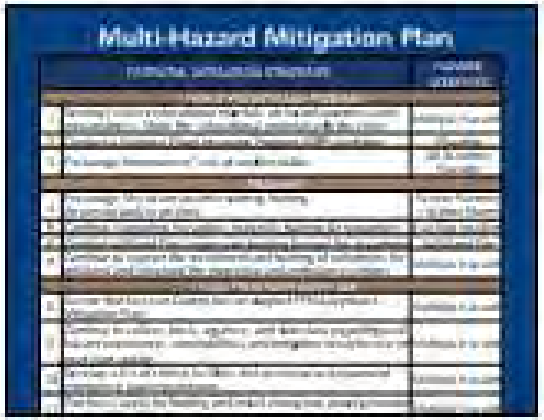
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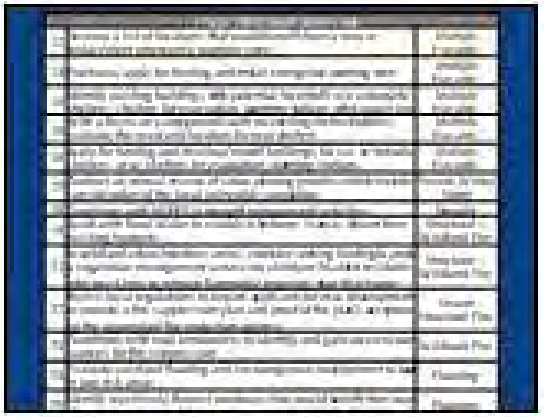

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McLean County ND
Multi-Hazard Mitigation Plan

8


QUESTIONS?

9

McLean County Commission Public Meeting - April 5, 2022

- The McLean County Multi-Hazard Mitigation Plan was discussed at public meetings in the County Courthouse.
- Noelle Kroll , the McLean County Director of Disaster Emergency Services/Risk Manager informed the commissioners that the draft copy of the multi-hazard mitigation plan is available on the county thru a link website for public review and public comment. She also discussed two upcoming full-scale exercises scheduled in Underwood and Turtle Lake as well as a burn ban.
- Attending the meeting were Chairperson Steve Lee. Commissioners Lee, Steve Cottingham, and Barry Suydam. Also present were Auditor Beth Knutson, Road Superintendent Jim Grey, Assistant Road Superintendent Travis Verke, Wold Engineering Representative Mike Rivinius, Deputy Auditor Diane L. Blumhagen, Wade and Amanda Haseleu, and Ralph Mancini of NorDak North Publishing.

McLean County Commission Public Meeting - May 24, 2022

- The McLean County Commission met on this day and after a presentation by Noelle Kroll , the McLean County Director of Disaster Emergency Services/Risk Manager, voted unanimously to transmit the McLean County Mufti-Hazard Mitigation Plan to NDDES for review.
- Attending the meeting were Chairperson Steve Lee. Commissioners Lee, Steve Cottingham, and Barry Suydam. Also present were Auditor Beth A. Knutson, Road Superintendent Jim Grey, Assistant Road Superintendent Travis Verke, Wold Engineering Representative Mike Rivinius, Deputy Auditor Diane L. Blumhagen, Wade and Amanda Haseleu, and Ralph Mancini of NorDak North Publishing.

CITY MEETINGS

The public meetings held in some McLean County cities to discuss the McLean County Multi-Hazard Mitigation Plan include the following:

- **City of Max**
  May 4, 2022
  Public Meeting to discuss the draft plan and the proposed city mitigation action items.
- **City of Benedict**
  May 10, 2022
  Public Meeting with the Multi-Hazard Mitigation Plan discussed. The city suggested changes to the number of mobile homes, the vulnerable population and older housing units. These changes were incorporated into the text.

In the other cities, the city auditors discussed the overall draft plan with other staff members and elected officials in order to provide input on the questions noted in the draft pages they received. Follow up phone conversations with the auditors clarified any questions.

PARTICIPATING JURISDICTIONS

Representatives from participating jurisdictions include the lead community contacts listed below. Many attended meetings. In addition, some provided information, documents, statistics, maps, etc. and/or reviewed and commented on draft material. See Table A-2 for specifics on how each jurisdiction participated..

McLean County
Steve Lee, Commissioner
Barry Suydam, Commissioner
Steve Cunningham, Commissioner
Noelle Kroll, Emergency Manager
Beth A. Knutson, Auditor
Jim Grey, Road Superintendent
Todd Schreiner, Director of Tax Equalization and Land Use Administrator + Mapping and GIS
Richard Johnson, Director County 911
Ladd Erickson, State's Attorney
Lori Foss, County Computer Operations Director
Pam Fischer, Public Health Nurse - Washburn.
Rick Richard, Sheriff's Office Training officer and patrol supervisor.
JR Kerzmann, County Sheriff

City of Benedict
Theresa Barrett, Mayor Pro Tem
Lisa Tomlinson, Auditor

City of Butte
Amy Nechiporencho, Mayor
Kristen Striha, Auditor

City of Coleharbor
Heith Pochant, Mayor
Sunshyne Cleveland, Auditor

City of Garrison
Stuart Merry, Mayor
Diane Affeldt, Auditor
Dustin Offerdah, Garrison Diversion Conservancy District

City of Max
Robert Boedicker, Mayor
Sam Adams, City Council
Roger Westman, City Council
Nathan Schneider, City Council
Nancy Gullickson, City Council
Anita Porter, Auditor

City of Mercer
Jim Privratsky, Mayor
Tonya Wellington, Auditor

City of Riverdale
Ken Skuza, Mayor
Del Kolke, Auditor

City of Ruso
Greg Schmaltz, Mayor

City of Turtle Lake
Richard Britton, Commission President
Darwin Saari, Auditor

City of Underwood
Leon Weisenberger, Commission President
Courtney Blotske, Auditor

City of Washburn
Larry Thomas, Commission President
Chelsey Lazier, Auditor
Kollin Syverson, Commissioner
Christa Kovarik, Washburn Volunteer Ambulance Service

City of Wilton
LeeAnn Domonoske-Keller, Commission President
Pattie Solberg, Auditor

The list of stakeholders (county, city, and township representatives, water boards, and schools, plus health-related entities, airports, railroads, utilities, and other entities serving McLean County and neighboring areas) and who were invited to be involved in the planning process and how each was involved is provided in Table A-2.

Table A-2 COMMUNITY PARTICIPATION							
MCLEAN COUNTY	**Invitation to September 2021 Meeting**			**Attended Meeting(s)**		**Provided Information**	**Reviewed Draft Materials**[66]
	by Mail	**by Email**	**Delivered**				
Steve Lee, Commissioner McLean County	x			12/7/2021	4/5/2022 5/24/2022		x
Barry Suydam, Commissioner McLean County	x						x
Steve Cunningham, Commissioner McLean County	x						x
Noelle Kroll Director of Disaster Emergency Services McLean County				9/16/2021 12/7/2021	4/5/2022 5/24/2022	x	x
Todd Schreiner, Director of Tax Equalization and Land Use Administrator + Mapping and GIS McLean County			x				
Beth Knutson, County Auditor McLean County			x	9/16/2021 12/7/2021	4/5/2022 5/24/2022		
Diane L. Blumhagen, Deputy Auditor McLean County			x	12/7/2021 4/5/2022	5/24/2022		
Richard Johnson, Director County 911 McLean County			x			x	
Jim Grey, Road Superintendent McLean County			x	9/15/2021 12/7/2021	4/5/2022 5/24/2022	x	
Travis Verke , Assistant Road Superintendent McLean County			x	4/5/2022	5/24/2022	x	
Ladd Erickson, State's Attorney McLean County			x			x	
Lori Foss, County Computer Operations Director McLean County			x			x	
Pam Fischer, Public Health Nurse - Washburn. McLean County			x			x	
Rick Richard, Sheriff's Office Training officer and patrol supervisor. McLean County			x			x	x
JR Kerzmann, County Sheriff McLean County			x			x	

CITIES IN MCLEAN COUNTY	Invitation to September 2021 Meeting			Attended Meeting(s)	Provided Information	Reviewed Draft Materials[66]
	by Mail	by Email	Delivered			
Theresa Barrett, Mayor Pro Tem City of Benedict PO Box 291 Benedict, ND 58716	x			5/5/2022	x	
Lisa Tomlinson Auditor, City of Benedict PO Box 157 Benedict ND 58716	x			5/5/2022	x	x
Amy Nechiporencho, Mayor City of Butte PO Box 137 Butte, ND 58723	x					x
Kristin Striha Auditor, City of Butte PO Box 305 Butte ND 58723	x				x	x
Heith Pochant, Mayor City of Coleharbor PO Box 65 Coleharbor, ND 58531	x					x
Sunshyne Cleveland Auditor, City of Coleharbor PO Box 65 Coleharbor ND 58531	x				x	x
Stuart Merry, Mayor City of Garrison PO Box 459 Garrison, ND 58540	x			12/7/2021		
Diane Affeldt Auditor, City of Garrison PO Box 459 Garrison ND 58540	x				x	x

CITIES IN MCLEAN COUNTY (continued)	**Invitation to September 2021 Meeting**			**Attended Meeting(s)**	**Provided Information**	**Reviewed Draft Materials**[66]
	by Mail	**by Email**	**Delivered**			
Robert Boedicker, Mayor City of Max PO Box 116 Max, ND 58759	x			5/4/2022		
Sam Adams, City Council City of Max				5/4/2022		
Roger Westman, City Council City of Max				5/4/2022		
Nathan Schneider, City Council City of Max				5/4/2022		
Nathan Schneider, City Council City of Max				5/4/2022		
Nancy Gullickson, City Council City of Max				5/4/2022		
Anita Porter. Auditor, City of Max PO Box 116 Max ND 58759	x			5/4/2022	x	x
Jim Privratsky, Mayor City of Mercer PO Box 119 Mercer, ND 58559	x				x	x
Tonya Wellington, Auditor, City of Mercer PO Box 116 Mercer ND 58559	x				x	x
City of Riverdale PO Box 507 Riverdale, ND 58565	x					
Del Kolke, Auditor, City of Riverdale PO Box 507 Riverdale ND 59565	x				x	x
Greg Schmaltz, Mayor City of Ruso 350 Helland Street N Ruso, ND 58778	x				x	x

CITIES IN MCLEAN COUNTY (continued)	**Invitation to September 2021 Meeting**			**Attended Meeting(s)**	**Provided Information**	**Reviewed Draft Materials**[66]
	by Mail	**by Email**	**Delivered**			
Richard Britton, Commission President City of Turtle Lake PO Box 338 Turtle Lake, ND 58575	x					
Darwin Saari, Auditor, City of Turtle Lake PO Box 338 Turtle Lake ND 58575	x				x	x
Leon Weisenberger, Commission President City of Underwood PO Box 168 Underwood, ND 58576	x					
Courtney Blotske Auditor, City of Underwood PO Box 168 Underwood ND 58576	x				x	x
Chelsey Lazier Auditor, City of Washburn PO Box 467 Washburn ND 58577	x				X	X
Richard Britton, Mayor City of Washburn PO Box 467 Washburn, ND 58577	x					
Kollin Syverson, Commissioner City of Washburn					X	X
LeeAnn Domonoske-Keller, Commission President City of Wilton, PO Box 278 Wilton, ND 58579	x				x	
Pattie Solberg Auditor, City of Wilton PO Box 162 Wilton, ND 58579	x				x	x

WATER BOARDS Representatives of the water boards were also contacted by phone and confirmed their activity in McLean County, confirmed their water sources and their experience during the recent drought.						
McLean County Water Board 980 26th Ave NE Coleharbor, ND 58531	x				x	x
McLean Sheridan Rural Water 987 17th Ave NW Turtle Lake, ND 58575	x				x	x
Garrison and Max Rural Water District	x				x	x
North Prairie Rural Water District	x				x	x
Dustin Offerdah, Garrison Diversion Conservancy District	x					
SCHOOLS IN MCLEAN COUNTY	**Invitation to September 2021 Meeting**			**Attended Meeting(s)**	**Provided Information**	**Reviewed Draft Material**
	by Mail	**by Email**	**Delivered**			
Turtle Lake-Mercer Public Schools PO Box 160 Turtle Lake, ND 58575	x					
Garrison High School PO Box 249 Garrison, ND 58540	x					
Bob Callies Elementary PO Box 369 Garrison, ND 58540	x					
Max Public Schools PO Box 297 Max, ND 58759	x					
Underwood Public Schools PO Box 100 Underwood, ND 58576	x					
Washburn Public Schools PO Box 280 Washburn, ND 58577	x					
Wilton Schools PO Box 249 Wilton, ND 58579	x					
White Shield Schools 2 2nd Ave. W Roseglen, ND 58775	x					

HEALTH-RELATED AGENCIES IN MCLEAN COUNTY	Invitation to September 2021 Meeting			Attended Meeting(s)	Provided Information	Reviewed Draft Material
	by Mail	by Email	Delivered			
First District Health Unit 703 2nd Ave, PO Box 6 Washburn, ND 58577	x				x	x
Tod Graeber Garrison Memorial Hospital 407 3rd Ave SE Garrison, ND 58540	x				x	
Community Memorial Hospital PO Box 280 Turtle Lake, ND 58575	x				x	
Garrison Community Clinic 131 N Main St Garrison, ND 58540	x					
Garrison Family Clinic 437 3rd Ave SE Garrison, ND 58540	x					
Nadine Boe, CEO Julia Wagner Northland Community Health Center PO Box 535 Turtle Lake, ND 58575	x			9/16/2021		
Underwood Clinic 87 Lincoln Ave Underwood, ND 58576	x					
Washburn Clinic 1167 Border Lane Washburn, ND 58577	x				x	
Washburn Family Clinic 1177 Border Lane Washburn, ND 58577	**x**				x	
Redwood Village Assisted Living PO Box 339 Wilton, ND 58579	**x**					
Benedictine Living Center PO Box 219 Garrison, ND 58540	x					

	Invitation to September 2021 Meeting			Attended Meeting(s)	Provided Information	Reviewed Draft Material
	by Mail	by Email	Delivered			
McLean Manor PO Box 99 Garrison, ND 58540						
AIRPORTS IN MCLEAN COUNTY						
Turtle Lake Municipal Airport Turtle Lake, ND 58575	x					
Washburn Municipal Airport 23rd Ave SW, PO Box 403 Washburn, ND 58577	x					
Garrison Municipal Airport W Aero Dr. Garrison, ND 58540	x					
RAILROADS OPERATING IN MCLEAN COUNTY						
Bill Reilly Dakota Missouri Valley Western Railroad PO Box 446 Washburn, ND 58577	x					
CP Railway 1345 Valley St. Minot, ND 58701	x				x	x
UTILITIES SERVING MCLEAN COUNTY Representatives of utilities were contacted by phone and confirmed their activity in McLean County.						
Otter Tail Power 171 N Main St PO Box 279 Garrison, ND 58540	x				x	
McLean Electric Cooperative, Inc PO Box 399 Garrison, ND 58540	x				x	
Curt Olsen, District Manager Montana-Dakota Utilities Co.	x			9/16/2021		
MDU Electric and Natural Gas PO Box 5600 Bismarck, ND 58506	x				x	
Central Power Electric Cooperative Benedict, ND	x					

OTHER ENTITIES IN MCLEAN COUNTY	Invitation to September 2021 Meeting			Attended Meeting(s)	Provided Information	Reviewed Drafts
	by Mail	by Email	Delivered			
Great River Energy 2875 3rd St. SW Underwood, ND 58576	x					
Farmers Union Oil Co PO Box 126 Wilton, ND 58579	x					
Farmers Union Oil Co 24 Railroad Ave E Turtle Lake, ND 58575	x					
Farmers Union Oil Co PO Box 260 Butte, ND 58723	x					
Paul Schlichting. GM Farmers Union Oil PO Box 429 Garrison, ND 58540	x			9/16/2021		
Roseglen Anhydrous Plant 151 N Main St Raub, ND 58779	x					
Enerbase Agronomy HWY 83 Bypass Washburn, ND 58577	x					
Farmers Union Elevator Co PO Box 97 Garrison, ND 58540	x					
McLean Elevator Co PO Box 217 Benedict, ND 58716	x					
Farmers Union Elevator 15 Dakota Ave PO Box 188 Wilton, ND 58579	x					
Max Farmers Elevator 202 Carvel St. Max, ND 58759	x					

Equity Elevator 57 Railroad Ave W Turtle Lake, ND 58575	x					
Max Farm Services PO Box 8 Max, ND 58759	x					
Jesse Carr Falkirk Mining Company 2801 1st St. SW Underwood, ND 58576	x			9/16/2021		
Darrell Scheresky, Manager Dakota Agronomy Partners Washburn ND	x			9/16/2021		
McLean County Resource Center 718 Main Ave Washburn, ND 58577	x					
Blue Flint Ethanol 2841 3rd St. SW Underwood, ND 58576	x					
MCLEAN COUNTY TOWNSHIPS	**Invitation to September 2021 Meeting**			**Attended**	**Provided**	**Reviewed**
	by Mail	**by Email**	**Delivered**	**Meeting(s)**	**Information**	**Drafts**
Jeff Myers Chair, Amundsville Township 6361 24th ST NW Ryder, ND 58779	x					
Greg Gullickson Chair, Andrews Township 2848 22nd Ave NW Benedict, ND 58716	x					
Ronald Lagge Chair, Blackwater Township 1607 59th AVE NW Garrison, ND 58540	x					
Christopher Haugen Chair, Byersville Township PO Box 212 Butte, ND 58723	x					

MCLEAN COUNTY TOWNSHIPS (continued)	**Invitation to September 2021 Meeting**			**Attended Meeting(s)**	**Provided Information**	**Reviewed Drafts**
	by Mail	**by Email**	**Delivered**			
Calvin Myers Chair, Cremerville Township 7036 25th St. NW Parshall, ND 58770	x					
Orvin Ravnaas Chair, Horseshoe Valley Township 1919 16th Avenue NW Turtle Lake, ND 58575	x					
Paul Hardy Chair, Longfellow Township 3451 1st St NW Underwood, ND 58576	x					
David Stumvoll Chair, Malcolm Township 2919 15th St NW Coleharbor, ND 58531	x					
Eric Schon Chair, Medicine Hill Township 1332 10th Ave NW Turtle Lake, ND 58575	x					
John Ganie Chair, Otis Township 2987 16th Ave NW Ruso, ND 58778	x					
Daniel Lies Chair, Rosemont Township 4043 29th St NW Douglas, ND 58735	x					
Jeff Presser Chair, Lake Williams Township 651 14th Ave NW Turtle Lake, ND 58575	x					
Stanley Myers Chair, Loquemont Township 6968 20th Street NW Ryder, ND 58779-9233	x					

MCLEAN COUNTY TOWNSHIPS (continued)	**Invitation to September 2021 Meeting**			**Attended Meeting(s)**	**Provided Information**	**Reviewed Drafts**
	by Mail	**by Email**	**Delivered**			
Roger Benedickson Chair, McGinnis Township 1951 39th Avenue NW Garrison, ND 58540-9287	x					
Steve Lee Chair, Mercer Township 367 11th Avenue NW Mercer, ND 58559	x					
Todd Suydam Chair, Roseglen Township 2267 57th Ave NW Roseglen, ND 58775	x					
Clair Esliinger Chair, Snow Township 1707 32nd Ave NW Coleharbor, ND 58531	x					
Ken Rustad Chair, Deepwater Township 1988 65th Ave NW Roseglen, ND 58775	x					
Ryan Plesuk Chair, Dogden Township 224A 29th Street NW Butte, ND 58723	x					
Alan Brickner Chair, Douglas Township 4328 25th St. NW Douglas, ND 58735	x					
Travis Kolden Chair, Gate Township 2743 59th Ave NW Ryder, ND 58779	x					
Myron Lick Chair, Greatstone Township 1919 21st St. NW Ruso, ND 58778	x					

	Invitation to September 2021 Meeting			Attended Meeting(S)	Provided Information	Reviewed Drafts
	by Mail	by Email	Delivered			
Glenn Seidler Chair, St Mary Township 1271 43rd Avenue NW Garrison, ND 58540	x					
Bryan Fiedler Chair, Wise Township 968 8th Ave NW Mercer, ND 58559	x					
Tim Hanson Chair, Turtle Lake Township 2043 9th St NW Turtle Lake, ND 58575	x					
John Fransen Chair, Victoria Township 1083 32nd Ave NW Coleharbor, ND 58531	x					
EMERGENCY MANAGERS OF ADJACENT COMMUNITIES		**Email with sections of the plan and a link to the draft (See page 203)**		**Attended Meeting(s)**	**Provided Information**	**Reviewed Drafts**
Jennifer Wiechmann Ward County jennifer.wiechmann@wardnd.com		x			x	x
Kelsey Siegler McHenry County pierceem@nd.gov		x				
Wayne Houston Sheridan County whouston@nd.gov		x				
Mary Senger Burleigh County msenger@nd.gov		x				
Carmen Reed Oliver County creed@nd.gov		x				
Carmen Reed Mercer County creed@nd.gov		x				

Sarah Duttenhefner Dunn County Sarah.duttenhefner@dunncountynd.org		x				
Warren Bogert Mountrail County wlbogert@nd.gov		x			x	
Cliff Whitman Emergency Manager, MHA 404 Frontage Road New Town, ND 58763	x	x			x	
US, ND + REGIONAL AGENCIES	**Invitation to September 2021 Meeting**			**Attended**	**Provided**	**Reviewed**
	by Mail	**by Email**	**Delivered**	**Meeting(s)**	**Information**	**Drafts**
Randy Ehlis, Program Management Specialist US Bureau of Reclamation 304 E. Broadway #110 Bismarck, ND 58501	x			9/16/2021		
Dept. of Interior Bureau of Reclamation 1401 HWY 83 NW Coleharbor, ND 58531	x					
Rodney Onstott Minot AFB		x			x	x
ND Game & Fish 100 N Bismarck Expressway Bismarck, ND 58501	x					
ND Department of Transportation 337 Old HWY 83 Underwood, ND 58576	x				x	
Eric Delzer ND Dept. of Agriculture 600 E. Boulevard Ave., Dept 602 Bismarck, ND 58505-0020	x				x	
Christa Kovarik ND Highway Patrol				9/16/2021		
Allan Hanson, Regional Coordinator, NDDES 1600 2nd Ave SW Suite 4 Minot, ND 58701	x			9/16/2021		
Rob Stotz Executive Director, American Red Cross 2021 4th Ave NW Minot, ND 58702	x					

	Invitation to September 2021 Meeting			Attended Meeting(s)	Provided Information	Reviewed Drafts
	by Mail	by Email	Delivered			
Shelby Pudwill. Disaster Program Manager American Red Cross				9/16/2021		
OTHER PERSONS						
Amanda Schooling, ER Response Coord, Enbridge Pipeline (ND) LLC		x			x	
Clayton Yerke Washburn ND				9/16/2021		
Ralph Mancini, BHG News Washburn ND				9/16/2021		
Don Simon Washburn ND				9/16/2021		
Dwight Johnson Roseglen ND				9/16/2021		
Graling Steinwand Garrison ND				9/16/2021		

4/4/2022 2:35 PM

To: msenger@nd.gov; denise.brew@dunncountynd.org; pierceem@nd.gov; creed@nd.gov; Bogert Jr, Warren; whouston@nd.gov; jennifer.wiechmann@wardnd.com; cwhitman@mhanation.com Cc: Kroll, Noelle

McLean County draft MHMP...
15.83 MB

Hello
I am working with Noelle Kroll, the McLean County Emergency Manager, who most of you know well, to update the McLean County Multi-Hazard Mitigation Plan. Input from the "neighbors" would be really helpful. Please review Table 3.2-1 and let me know if we need to make any changes regarding the elements included in your plan.

The draft plan has just been uploaded to the county website for public review. I've attached a copy. Any and all comments, suggestions, corrections from you would be greatly appreciated.
Just let me or Noelle know if you have any questions.

Thank you

Carron Day, Community Planner
Consultant to McLean County

McLean County
NORTH DAKOTA

Appendix B

STATUS OF THE 2016 MITIGATION ACTION ITEMS

Many of the 2016 mitigation action items are ongoing. Some have been completed. Progress has been made on others and most of those have been carried forward in the McLean County Multi-Hazard Mitigation Plan, some with minor adjustments. The ID numbers are those used in the 2016 Plan. The current status of each of the 2016 Action Items is identified as one of the following:

- **Complete:** The requirements of the Mitigation Action Item were satisfied
- **Ongoing and Continue:** The Action Item is a continuous effort by the county or city and is in the McLean County Multi-Hazard Mitigation Plan.
- **Cancel:** Either the Action Item is no longer needed, and the reason is identified, or the Action Item does not meet FEMA's definition of" mitigation" and should be pursued through an alternative funding source or grant program.

Table B-1
2016 MITIGATION ACTION ITEMS AND CURRENT STATUS

ID	Location	Mitigation Action Items	Hazard	2022 Status		
				Complete	Ongoing + Continue	Cancel
A	McLean County, Coleharbor, Garrison. Max, Underwood, Washburn, Wilton	Participate in NFIP workshop	Flood			
B	McLean County	Coordinate with landowners to identify water sources for fire suppression	Wildland/Rural Fire			
C	McLean County, Benedict, Butte, Garrison. Max, Mercer, Riverdale, Turtle Lake, Underwood, Washburn, Wilton	Install generators for the listed facility • McLean County - McLean-Sheridan water plant and well field • Benedict - lift station and water system pump • Butte - emergency shelter • Garrison - City Hall/emergency shelter and schoolauditorium/emergency shelter • Max - City Hall/civic center/shelter	Multiple			

Table B-1 2016 MITIGATION ACTION ITEMS AND CURRENT STATUS						
ID	**Location**	**Mitigation Action Items**	**Hazard**	**2022 Status**		
				Complete	**Ongoing + Continue**	**Cancel**
		• Riverdale - Water treatment plant • Underwood – City Hall/shelter • Washburn - Memorial Building/shelter and water treatment plant • Wilton – Memorial Hall				
C	Garrison and Turtle Lake	Install generators for the McLean Electric service offices	Multiple			
D	McLean County	Improve inter-department radio communication	Multiple			
E	McLean County	Acquire and remove repetitive loss properties from the floodplain	Flood			
F	McLean County	Drainage improvements and/or elevation for rural roads throughout the county	Flood			
G	McLean County, Coleharbor, Underwood, Washburn, Wilton	NFIP training for staff	Flood			
H	McLean County. Benedict, Coleharbor, Riverdale, Ruso, Turtle Lake, Underwood, Washburn. Wilton	Participate in Firewise education program for homeowners and implement best practices during wildfire season	Wildland/Rural Fire			
I	McLean County. Benedict, Coleharbor, Riverdale, Ruso,	Public education[68]	Multiple			

[68] Description expanded with specific focus for each city in Mitigation Action #25

Table B-1 2016 MITIGATION ACTION ITEMS AND CURRENT STATUS						
ID	**Location**	**Mitigation Action Items**	**Hazard**	**2022 Status**		
				Complete	**Ongoing + Continue**	**Cancel**
	Turtle Lake, Underwood, Washburn. Wilton					
j	Butte	Warning Siren • Butte - Replace warning siren • Garrison - Install additional warning siren • Benedict - Install remote-activated warning siren	Severe Summer Weather			
	Garrison					
	Benedict					
K	Benedict	Debris removal within natural drainage way through town	Flood			
L	Max, Butte, Garrison, Riverdale, Turtle Lake, Underwood, Washburn, and Wilton	Install signage to identify emergency shelters	Multiple			
M	Garrison	Expand municipal storm water system into southern area of town	Flood			
N	Garrison	Develop insect control system during periods of standing water	Communicable Disease			
O	Max	Install railroad crossing arms on 3rd Avenue SE	Multiple			
P	Ruso	Distribute weather radios to homeowners	Multiple			
Q	Turtle Lake	Remove culvert beneath old railroad tracks	Flood			
R	Turtle Lake	Elevate County Road 27 near Turtle Lake	Flood			See Note
S	Turtle Lake	Upgrade municipal storm water system	Flood			

Table B-1 2016 MITIGATION ACTION ITEMS AND CURRENT STATUS						
ID	Location	Mitigation Action Items	Hazard	2022 Status		
				Complete	Ongoing + Continue	Cancel
T	Underwood	Require HAZMAT facilities to provide status reports to the fire department	HAZMAT			
U	Underwood	Address overflow flooding issues from pond north of the city	Flood			
V	Underwood	Conduct engineering study to identify solutions for flooding issues on the city's west side	Flood			
W	Washburn	Replace culverts that pass-through coulee on east side of town	Flood			
X	Washburn	Replace drinking water intake along Missouri River	Flood			
Y	Washburn	Upgrade storm water system along Custer Drive	Flood			

Note: County Road 27 near Turtle Lake is outside of the city and flooding has not been an issue in recent years.

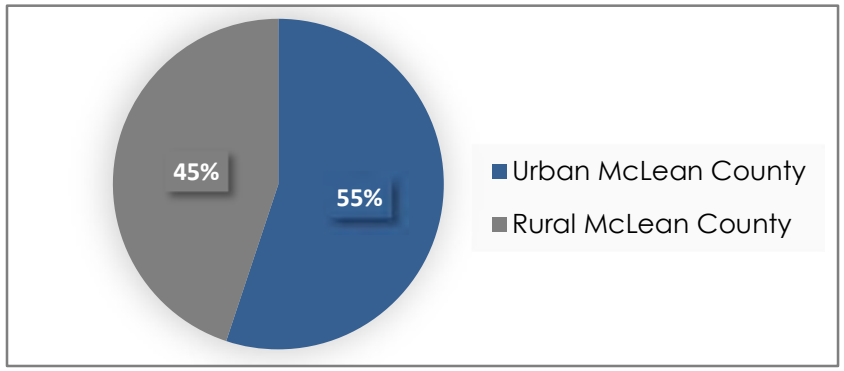
Appendix C

COMMUNITY SURVEY SUMMARY

A community survey was developed for residents and business owners to share their experience with hazard events, what concern them the most about potential disasters and what they are doing to prepare their homes and their families for a future hazard event.

The survey was delivered on the project website and as a four-page insert to approximately 2,800 subscribers in the December 2nd edition of three McLean County newspapers. Paper copies were also available at the county courthouse. In total, 84 responses were received from the paper survey and 26 online. A copy of the survey is included at the end of this Appendix.

The majority of responses came from individuals living in Garrison, Washburn, and rural McLean County (Figure 3.3-1). Most cities had at least a response to the survey.



RESPONDENTS - PROBABILITY

- Respondents ranked drought as the most probable risk, followed by extreme summer weather and extreme winter weather. (Figure 3.3-4).
- Dam failure, urban fire, and some hazardous materials (HAZMAT) incidents were rated the least probable hazards. Extreme winter weather, heat waves, and HAZMAT incidents received moderate risk ratings.

RESPONDENTS - EXPERIENCE

Many responses to an open-ended question: "Have you ever been impacted by any of the hazard events listed above?" mentioned drought and one respondent wrote that drought was

DROUGHT

"Crop dried out"
"Drought and loss of crop income"
"Getting to be a yearly event". Ten others wrote that they had experience with drought.

LOSS OF POWER

Loss of power due to blizzards and ice storms was mentioned by residents of both cities and rural McLean County.
"No power for three days"

"Have had power out for multiple days, downed power lines and trees. Now have a generator"
""No power for three days"
"Blizzards causing loss of utilities, cattle, property and income."
"Extended power outage due to ice storm when I lived in rural McLean County. We were fortunate to have a generator"
One respondent wrote" The greatest hazard facing this county …the national power shortage due to cold weather/hot weather is an increasing danger. The grid has less flexibility due to less reliable sourcing, less reliance on coal nationwide. Loss of power in winter would be catastrophic."

HAILSTORMS

Even though hailstorms are not often recorded, many of the respondents indicated that they had experience with hailstorm events>
"Multiple hailstorms . . . trailer had hail damage"
"Hailstorm – had to replace roofs, windows, doors and siding "
"Hailstorm causing a complete loss of crops."
"Hailstorm damaged siding and shingles"

FLOODING

"Major flooding in 2011 in rural area along the Missouri River"
"Flash flood – damage to basement and yard" "Flooding of roads and fields for crops. Flooding in basement of my home."
"Flooding from excess rain"
"Flooding caused by runoff towards lake lowlands"

WINDSTORM

"Building damage. Many trees broke off, roof off building"
"Windstorm broke a window"

HAZMAT INCIDENTS

Four respondents shared their concerns about anhydrous ammonia tanks being close to residential neighborhoods. One asked that the county research location criteria and another attached information on "Anhydrous ammonia tanks should be out in the country and not located upwind from housing."

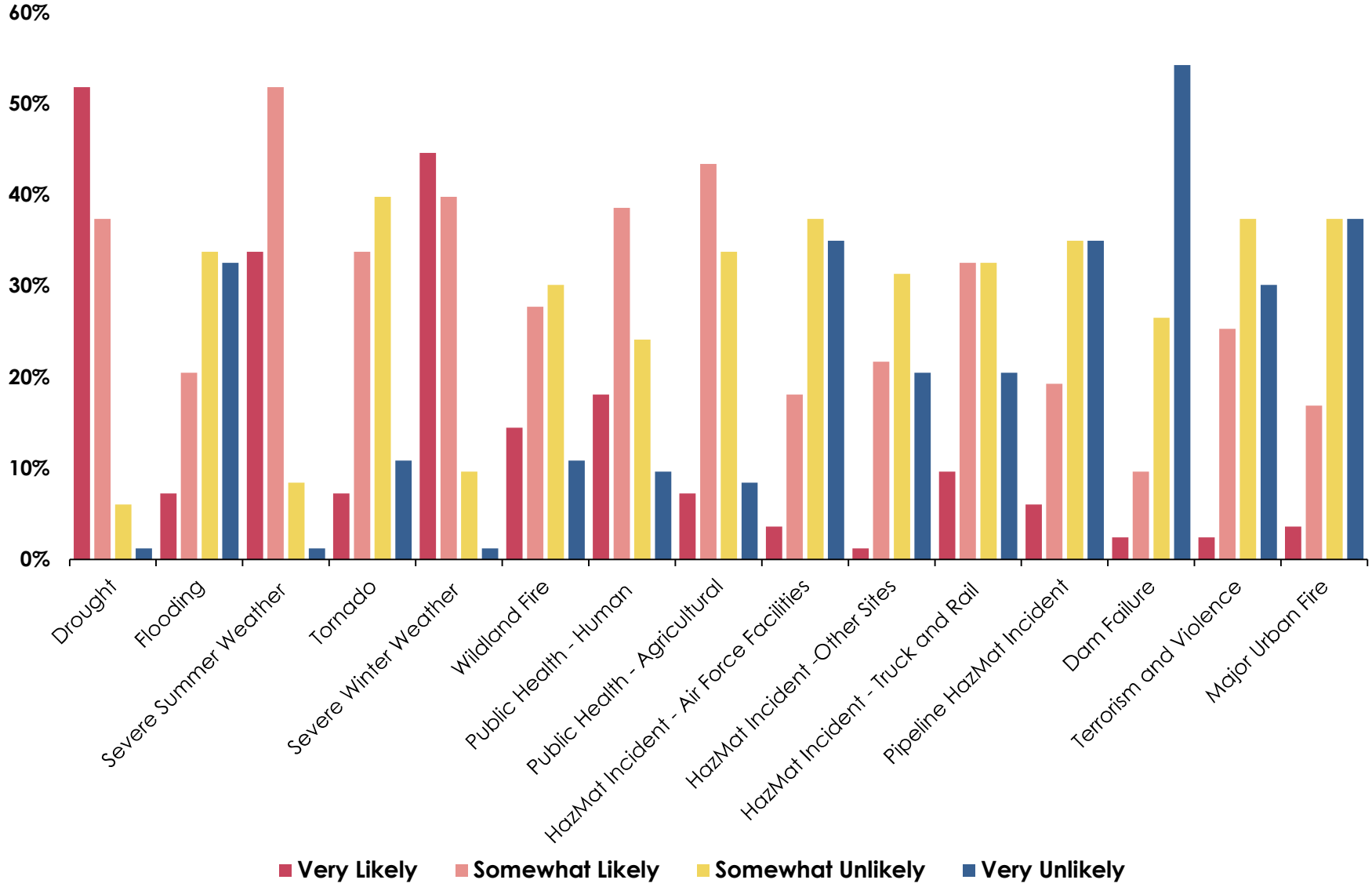
One resident of rural McLean County shared:
"Severe heat, cold, snow and blizzards are a part of life here in McLean County. A little personal preparation will get people safely through these."

SURVEY CHARTS

- Over 50% of respondents scored "highly unlikely" for dam failure and about a third considered flooding, major urban fire, pipeline incident, or a HAZMAT incident with the Air Force facilities as highly unlikely.
- About a third expected dam failure to cause a catastrophic impact. Less than 15% rated tornado, terrorism and violence, drought, and urban fire or wildfire) as catastrophic. (Figure 3.3-5)

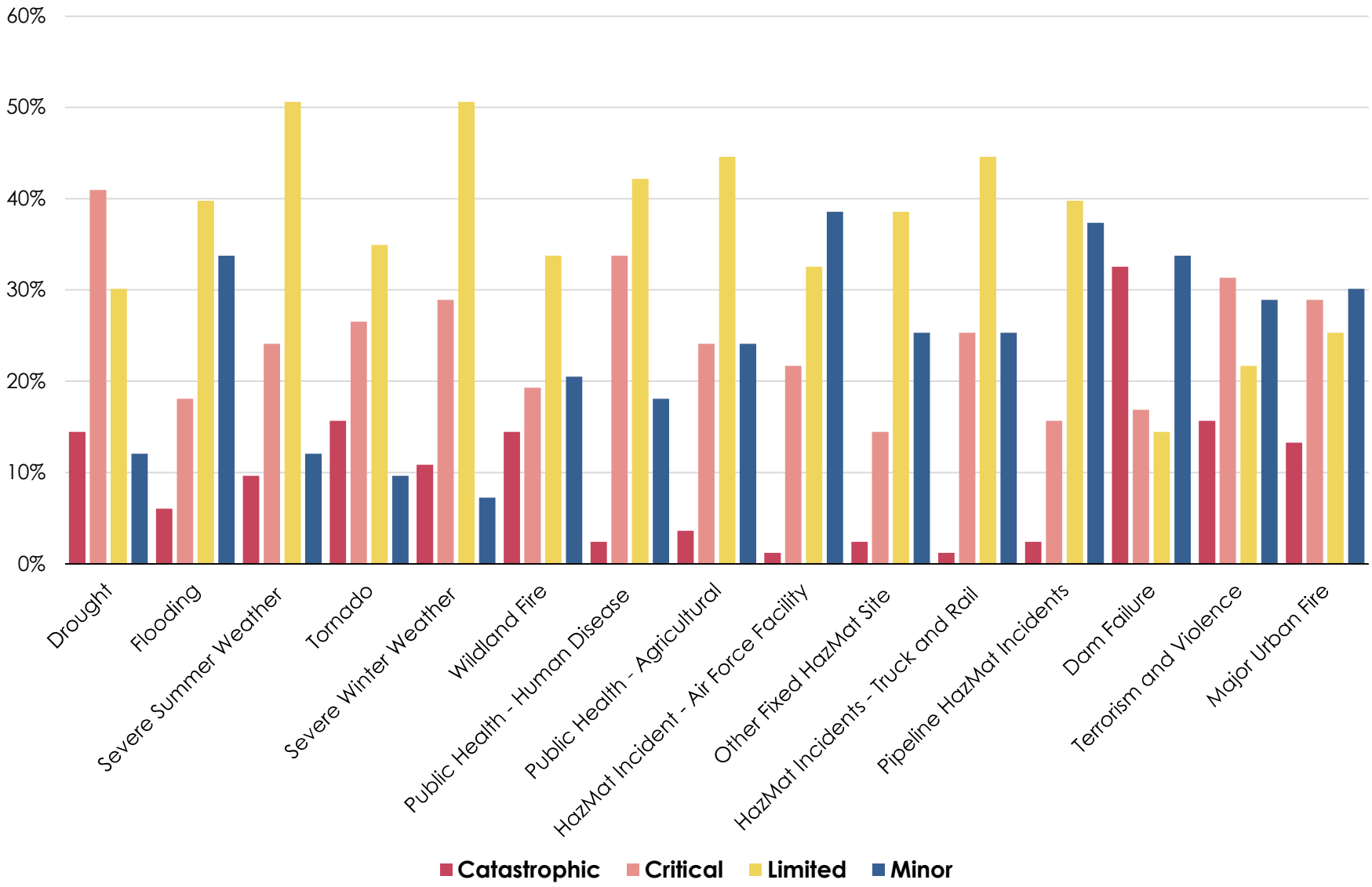
QUESTION 1

In your opinion, how likely is it that each of these hazards will impact McLean County?



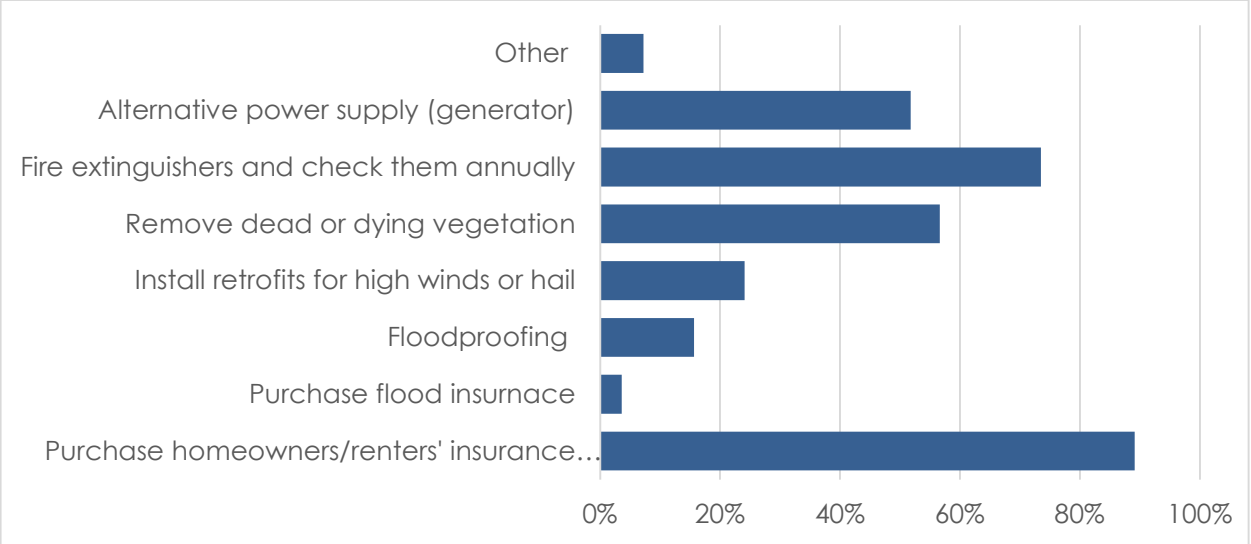
QUESTION 2

How much impact would each of these hazards have on the part of McLean County where you live?



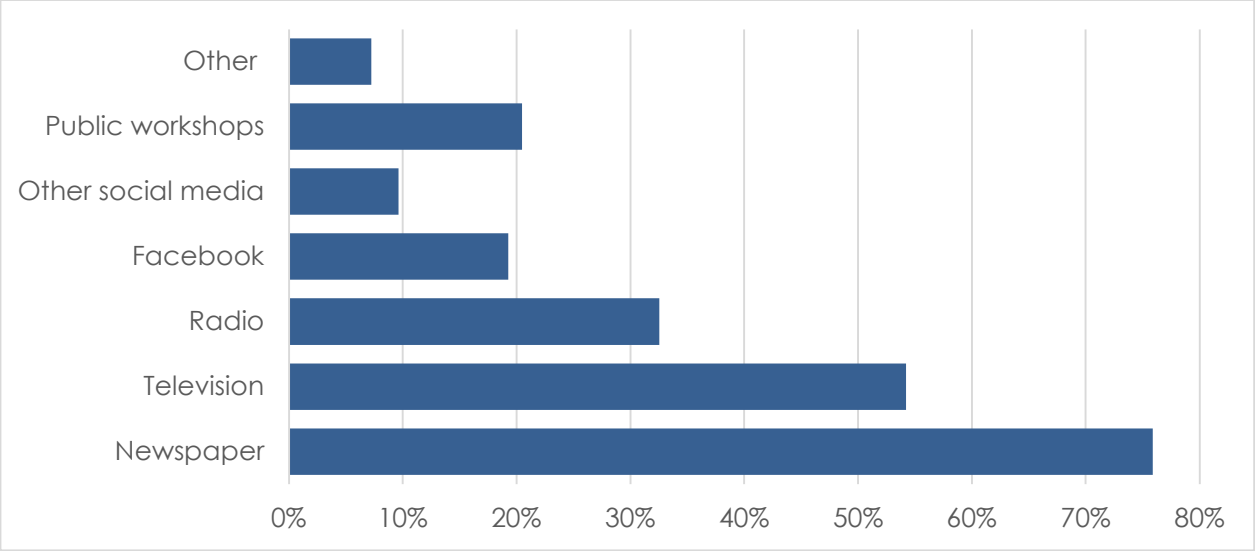
QUESTION 3

What actions have you taken to reduce risks to your home and property to prepare for potential hazard incidents?



QUESTION 3

What is the best way for you to receive information about how to make your home and your neighborhood more resistant to hazards?



INCORPORATING SURVEY RESULTS

Survey results were also used as an important element in prioritizing mitigation strategies. When draft mitigation strategies were scored, these results contributed to calculating the "probability" element of the risk analysis.

McLean County Hazard Mitigation Plan Update
Community Survey

McLean County, in cooperation with the Cities of Benedict, Butte, Coleharbor, Garrison, Max, Riverdale, Ruso, Turtle Lake, Underwood, Washburn, Wilton, Fort Berthold Reservation and other stakeholders, is now preparing a five-year update of the local hazard mitigation plan. The purpose of this plan is to identify and assess natural other hazards to determine how to best minimize or manage associated risks. Upon completion, the plan will provide McLean County with a comprehensive hazard mitigation strategy.

Your participation is important to us! The information you provide will help us better understand your hazard concerns and can lead to mitigation activities that lessen the impact of future hazard events. Please help us by completing this survey and returning it to the McLean County Courthouse no later than December 15, 2021.

1. The Hazard Mitigation Plan Team has statistics on the past impacts of these hazards, but predictions are more than that. Your opinion is very important to us and will be included in the planning team's calculations. In your opinion, how likely is it in the next five years that these hazard events will impact the part of McLean County where you live?

Very Likely = Greater than 90% annual probability
Somewhat Likely = Between 50% and 90% annual probability
Somewhat Unlikely = Between 1% and 49.9% annual probability
Very Unlikely = Less than 1% annual probability

	IN YOUR OPINION – HOW LIKELY IS IT THAT EACH OF THE HAZARDS WILL IMPACT MCLEAN COUNTY? (Please check one box for each hazard)			
	Very Likely	**Somewhat Likely**	**Somewhat Unlikely**	**Very Unlikely**
NATURAL HAZARDS				
DROUGHT				
FLOODING				
SEVERE SUMMER WEATHER (Extreme Heat, Thunderstorm, Hailstorm or Severe Windstorm)				
Tornado				
SEVERE WINTER WEATHER (Extreme Cold, Blizzards, Heavy Snow, and Ice Storms)				
WILDLAND FIRE				
TECHNOLOGOCAL/HUMAN-CAUSED HAZARDS				
Public Health Human Disease Incident				
Public Health Animal/Crop/Plant Disease				
HAZARDOUS MATERIAL RELEASE INCIDENTS				
Potential Fixed HazMat Incident - Minot Air Force Base Facilities in McLean County				
Other Fixed HazMat Site Releases				
Truck and Rail Transportation HazMat Incidents				
Pipeline HazMat Incidents				
DAM FAILURE				
TERRORISM AND VIOLENCE				
MAJOR URBAN FIRE				

2. In your opinion, if any of these hazard events happen, how much impact would they have on the people and businesses in the part of the county where you live? (check the boxes that apply)

Minor = Very few injuries, minor property damage, minimal disruption of quality of life. Could include temporary shutdown of critical facilities.
Limited = Minor injuries only but more than 10% loss of property in affected area. Complete shutdown of critical facilities for more than one day.
Critical = Multiple deaths/injuries possible and more than 25% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for more than a week.
Catastrophic = High number of deaths/injuries possible and more than 50% loss of property in affected area damaged or destroyed.

	HOW MUCH IMPACT WOULD EACH OF THESE HAZARDS HAVE ON YOUR PART OF THE COUNTY? (Please check one box for each hazard)			
	Minor	**Limited**	**Critical**	**Catastrophic**
NATURAL HAZARDS				
DROUGHT				
FLOODING				
SEVERE SUMMER WEATHER (Extreme Heat, Thunderstorm, Hailstorm or Severe Windstorm)				
Tornado				
SEVERE WINTER WEATHER (Extreme Cold, Blizzards, Heavy Snow, and Ice Storms)				
WILDLAND FIRE				
TECHNOLOGOCAL/HUMAN-CAUSED HAZARDS				
Public Health - Human Disease Incident				
Public Health - Animal/Crop/Plant Disease				
HAZARDOUS MATERIAL RELEASE INCIDENTS				
Potential Fixed HazMat Incident - Minot Air Force Base Facilities in McLean County				
Other Fixed HazMat Site Releases				
Truck and Rail Transportation HazMat Incidents				
Pipeline HazMat Incidents				
DAM FAILURE				
TERRORISM AND VIOLENCE				
MAJOR URBAN FIRE				

3. Have you ever been impacted by any of the hazard events listed above?

☐ Yes ☐ No

If "Yes", please describe your experience.

4. What actions have you taken to reduce risks to your home/apartment/property to prepare for potential hazard incidents?
(Please check all that apply)
- ☐ Purchase homeowners/renters' insurance policy
- ☐ Purchase flood insurance
- ☐ Floodproofing (elevating furnace, water heaters, air conditioning units, electric panels)
- ☐ Install retrofits such as high impact windows, doors or siding to withstand high winds or hail
- ☐ Remove dead or dying vegetation
- ☐ Fire extinguishers and check them annually
- ☐ Alternative power supply (generator)
- ☐ Other (please specify) _____

5. What is the best way for you to receive information about how to make your home and neighborhood more resistant to hazards?
- ☐ Newspaper
- ☐ Television
- ☐ Radio
- ☐ Facebook
- ☐ Other social media
- ☐ Public Workshop/meetings
- ☐ Other (please specify)

6. Please indicate where you live (check one)
- ☐ City of Benedict
- ☐ City of Butte
- ☐ City of Coleharbor
- ☐ City of Garrison
- ☐ City of Max
- ☐ City of Riverdale
- ☐ City of Ruso
- ☐ City of Turtle Lake
- ☐ City of Underwood
- ☐ City of Washburn
- ☐ City of Wilton
- ☐ Fort Berthold Reservation
- ☐ In McLean County but outside the Cities and the Reservation
- ☐ Outside McLean County

THANK YOU FOR YOUR PARTICIPATION!

The McLean County Hazard Mitigation Plan Team will review and considered all comments.

You may submit this survey anonymously, but if you provide us with your name and contact information below (optional), we will send you draft updates and meeting dates.

Name _____

Zip Code _____

Email address _____

RETURN THE SURVEY

Please help us by completing this survey and returning it to the McLean County Courthouse no later than December 15, 2021. You can either drop it off, email it or mail it.

DROP IT OFF You can drop it off at the McLean County Courthouse

FAX 701-462-3523

MAIL Mail it by folding these pages in third.

McLean County Courthouse
712 5th Avenue
PO Box 1108
Washburn, ND 58577

Emergency Manager
McLean County Courthouse
712 5th Avenue
PO Box 1108
Washburn, ND 58577

McLean County Hazard Mitigation Plan Update

National Risk Index

McLean County, North Dakota

Summary

Risk Index is **Very Low**

Score **7.08**

Expected Annual Loss is **Very Low**

Score **8.80**

Social Vulnerability is **Relatively Moderate**

Score **39.14**

Community Resilience is **Relatively High**

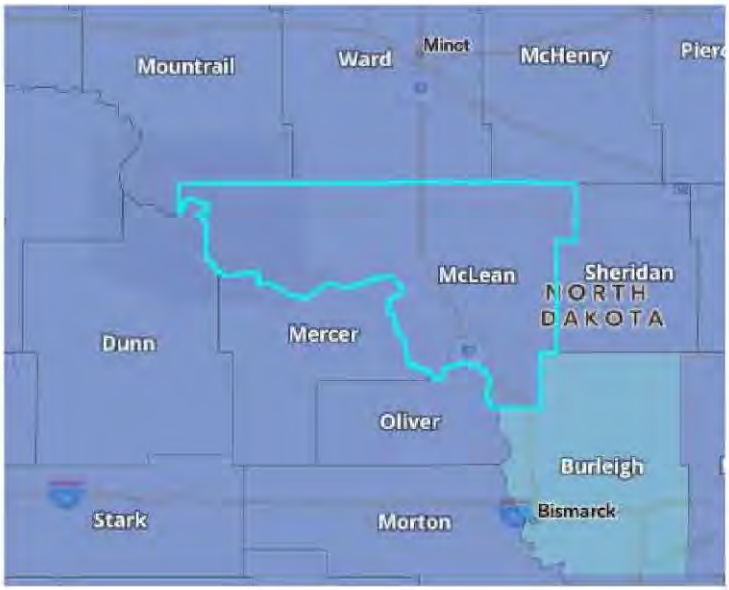
Score **56.18**

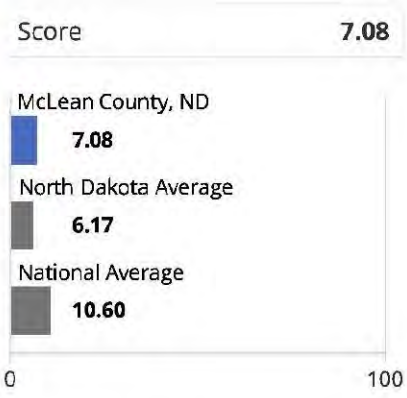
While reviewing this report, keep in mind that low risk is driven by lower loss due to natural hazards, lower social vulnerability, and higher community resilience.

For more information about the National Risk Index, its data, and how to interpret the information it provides, please review the **About the National Risk Index** and **How to Take Action** sections at the end of this report. Or, visit the National Risk Index website at **hazards.fema.gov/nri/learn-more** to access supporting documentation and links.

Risk Index

The Risk Index rating is **Very Low** for **McLean County, ND** when compared to the rest of the U.S.





29.5% of U.S. counties have a lower Risk Index

67.9% of counties in North Dakota have a lower Risk Index

Hazard Type Risk Index

Hazard type Risk Index scores are calculated using data for only a single hazard type, and reflect a community's relative risk for only that hazard type.

Hazard Type	Risk Index Rating	Risk Index Score	
Avalanche	Not Applicable	--	
Coastal Flooding	Not Applicable	--	
Cold Wave	Relatively Moderate	29.00	0 100
Drought	Relatively Low	7.72	0 100
Earthquake	Very Low	0.34	0 100
Hail	Relatively Low	8.10	0 100
Heat Wave	Relatively Low	9.02	0 100
Hurricane	Not Applicable	--	
Ice Storm	Relatively Moderate	20.08	0 100
Landslide	Relatively Low	8.41	0 100
Lightning	Very Low	8.25	0 100
Riverine Flooding	Very Low	4.70	0 100
Strong Wind	Relatively Low	13.41	0 100
Tornado	Relatively Low	10.24	0 100
Tsunami	Not Applicable	--	
Volcanic Activity	Not Applicable	--	
Wildfire	Very Low	5.14	0 100
Winter Weather	Relatively High	27.53	0 100

Expected Annual Loss

In **McLean County, ND**, expected loss each year due to natural hazards is **Very Low** when compared to the rest of the U.S.

Score **8.8**

McLean County, ND **8.80**

North Dakota Average **9.19**

National Average **13.33**

0 100

25.0% of U.S. counties have a lower Expected Annual Loss

58.4% of counties in North Dakota have a lower Expected Annual Loss

Expected Annual Loss Legend

Very High | Relatively High | Relatively Moderate | Relatively Low | Very Low

No Expected Annual Losses | Not Applicable | Insufficient Data

Composite Expected Annual Loss	**$1,625,056.42**

Building Value	**$762,863.70**	Population	**0.09** fatalities
Population Equivalence	**$667,712.07**	Agriculture Value	**$194,480.65**

Expected Annual Loss for Hazard Types

Expected Annual Loss scores for hazard types are calculated using data for only a single hazard type, and reflect a community's relative expected annual loss for only that hazard type. **13 of 18** hazard types contribute to the expected annual loss for **McLean County, ND**.

Hazard Type	Expected Annual Loss Rating	Expected Annual Loss Score
Avalanche	Not Applicable	–
Coastal Flooding	Not Applicable	–
Cold Wave	Relatively Moderate	32.37
Drought	Relatively Low	7.89
Earthquake	Very Low	0.42
Hail	Relatively Low	9.42
Heat Wave	Relatively Low	10.70
Hurricane	Not Applicable	–
Ice Storm	Relatively Moderate	27.79
Landslide	Relatively Low	11.46
Lightning	Relatively Low	13.20
Riverine Flooding	Very Low	5.03
Strong Wind	Relatively Moderate	24.74
Tornado	Relatively Low	10.95
Tsunami	Not Applicable	–
Volcanic Activity	Not Applicable	–
Wildfire	Very Low	5.49
Winter Weather	Relatively High	36.64

Expected Annual Loss Values

Hazard Type	Total	Building Value	Population Equivalence	Population	Agriculture Value
Avalanche	--	--	--	--	--
Coastal Flooding	--	--	--	--	--
Cold Wave	$220,674	$877	$218,686	0.03	$1,111
Drought	$119,764	n/a	n/a	n/a	$119,764
Earthquake	$454	$434	$20	0.00	n/a
Hail	$56,106	$13,538	$20,424	0.00	$22,145
Heat Wave	$85,990	$771	$79,586	0.01	$5,633
Hurricane	--	--	--	--	--
Ice Storm	$235,854	$197,148	$38,706	0.01	n/a
Landslide	$13,074	$656	$12,417	0.00	n/a
Lightning	$27,614	$6,443	$21,171	0.00	n/a
Riverine Flooding	$63,662	$39,293	$4,392	0.00	$19,977
Strong Wind	$271,557	$163,212	$84,485	0.01	$23,860
Tornado	$187,439	$92,357	$93,420	0.01	$1,663
Tsunami	--	--	--	--	--
Volcanic Activity	--	--	--	--	--
Wildfire	$26,269	$24,531	$1,557	0.00	$181
Winter Weather	$316,598	$223,604	$92,848	0.01	$147

Exposure Values

Hazard Type	Total	Building Value	Population Equivalence	Population	Agriculture Value
Avalanche	--	--	--	--	--
Coastal Flooding	--	--	--	--	--
Cold Wave	$69,622,847,718	$1,334,756,500	$68,111,170,218	8,962.00	$176,921,000
Drought	$150,695,137	n/a	n/a	n/a	$150,695,137
Earthquake	$69,445,957,000	$1,334,757,000	$68,111,200,000	8,962.00	n/a
Hail	$69,622,878,000	$1,334,757,000	$68,111,200,000	8,962.00	$176,921,000
Heat Wave	$69,622,847,718	$1,334,756,500	$68,111,170,218	8,962.00	$176,921,000
Hurricane	--	--	--	--	--
Ice Storm	$69,445,926,718	$1,334,756,500	$68,111,170,218	8,962.00	n/a
Landslide	$11,426,081,148	$292,218,350	$11,133,862,798	1,464.98	n/a
Lightning	$69,445,957,000	$1,334,757,000	$68,111,200,000	8,962.00	n/a
Riverine Flooding	$312,702,447	$8,539,769	$303,111,387	39.88	$1,051,292
Strong Wind	$69,622,878,000	$1,334,757,000	$68,111,200,000	8,962.00	$176,921,000
Tornado	$69,622,878,000	$1,334,757,000	$68,111,200,000	8,962.00	$176,921,000
Tsunami	--	--	--	--	--
Volcanic Activity	--	--	--	--	--
Wildfire	$7,991,680,257	$164,311,997	$7,792,379,620	1,025.31	$34,988,640
Winter Weather	$69,622,847,718	$1,334,756,500	$68,111,170,218	8,962.00	$176,921,000

Annualized Frequency Values

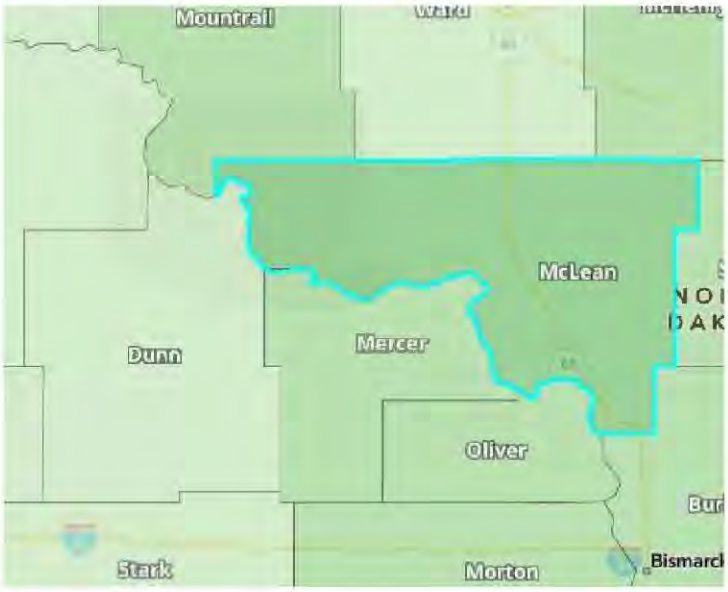
Hazard Type	Annualized Frequency	Events on Record	Period of Record
Avalanche	--	--	--
Coastal Flooding	--	--	--
Cold Wave	2.7 events per year	32	2005-2017 (12 years)
Drought	8.3 events per year	175	2000-2017 (18 years)
Earthquake	0.005% chance per year	n/a	2017 dataset
Hail	2.3 events per year	76	1986-2017 (32 years)
Heat Wave	0.6 events per year	7	2005-2017 (12 years)
Hurricane	--	--	--
Ice Storm	0.5 events per year	36	1946-2014 (67 years)
Landslide	0 events per year	0	2010-2019 (10 years)
Lightning	23.5 events per year	518	1991-2012 (22 years)
Riverine Flooding	0.5 events per year	12	1996-2019 (24 years)
Strong Wind	1.3 events per year	43	1986-2017 (32 years)
Tornado	0.8 events per year	32	1986-2019 (34 years)
Tsunami	--	--	--
Volcanic Activity	--	--	--
Wildfire	0.020% chance per year	n/a	2016 dataset
Winter Weather	5.8 events per year	71	2005-2017 (12 years)

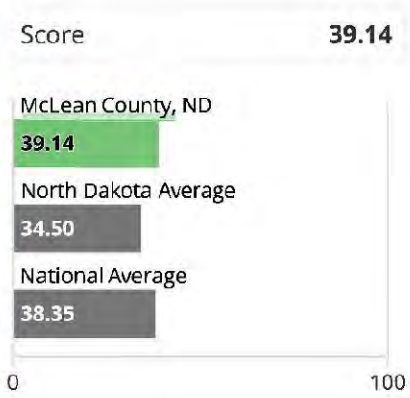
Historic Loss Ratios

Hazard Type	Overall Rating	Building Value	Population	Agriculture Value
Avalanche	--	--	--	--
Coastal Flooding	--	--	--	--
Cold Wave	Very Low	$2.42 per $10M	1.18 per 1M	$2.31 per $1M
Drought	Very Low	n/a	n/a	$9.86 per $100K
Earthquake	Very Low	$1.68 per $100	1.40 per 10K	n/a
Hail	Very Low	$4.26 per $1M	1.27 per 10M	$5.32 per $100K
Heat Wave	Very Low	$1.00 per $1M	2.03 per 1M	$5.52 per $100K
Hurricane	--	--	--	--
Ice Storm	Relatively High	$2.60 per $10K	1.03 per 1M	n/a
Landslide	Very Low	$2.25 per $10K	1.12 per 10K	n/a
Lightning	Relatively Low	$1.93 per $10M	1.24 per 100M	n/a
Riverine Flooding	Very Low	$9.20 per $1K	2.90 per 100K	$3.80 per $100
Strong Wind	Relatively High	$8.92 per $100K	9.02 per 10M	$1.01 per $10K
Tornado	Very Low	$9.04 per $100K	1.79 per 1M	$1.23 per $100K
Tsunami	--	--	--	--
Volcanic Activity	--	--	--	--
Wildfire	Very Low	$4.00 per $10	6.04 per 10K	$1.25 per $100
Winter Weather	Relatively Low	$2.86 per $100K	2.33 per 10M	$1.42 per $10M

Social Vulnerability

Social groups in **McLean County, ND** have a **Relatively Moderate** susceptibility to the adverse impacts of natural hazards when compared to the rest of the U.S.



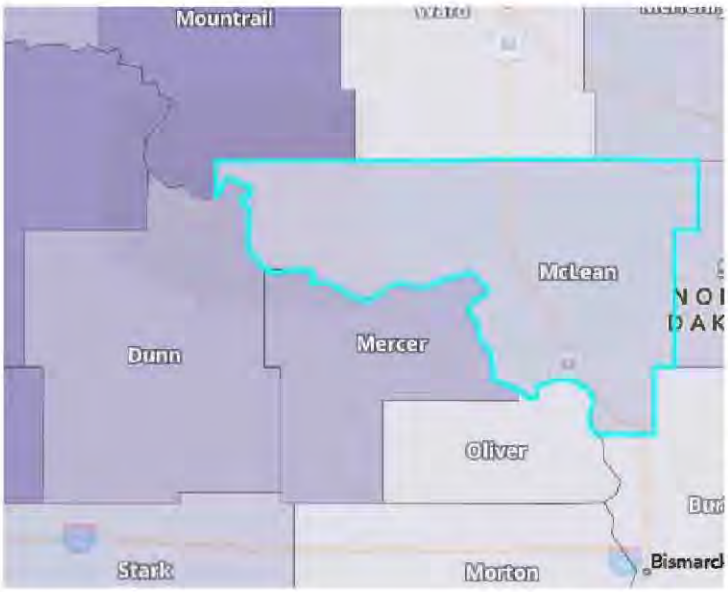


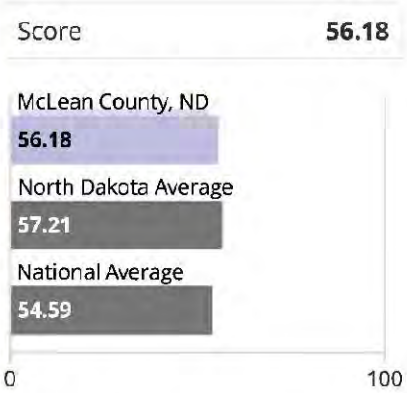
53.8% of U.S. counties have a lower Social Vulnerability

66.0% of counties in North Dakota have a lower Social Vulnerability

Community Resilience

Communities in **McLean County, ND** have a **Relatively High** ability to prepare for anticipated natural hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions when compared to the rest of the U.S.





31.1% of U.S. counties have a higher Community Resilience

73.6% of counties in North Dakota have a higher Community Resilience

About the National Risk Index

The National Risk Index is a dataset and online tool to help illustrate the United States communities most at risk for 18 natural hazards: Avalanche, Coastal Flooding, Cold Wave, Drought, Earthquake, Hail, Heat Wave, Hurricane, Ice Storm, Landslide, Lightning, Riverine Flooding, Strong Wind, Tornado, Tsunami, Volcanic Activity, Wildfire, and Winter Weather.

The National Risk Index leverages available source data for Expected Annual Loss due to these 18 hazard types, Social Vulnerability, and Community Resilience to develop a baseline relative risk measurement for each United States county and Census tract. These measurements are calculated using average past conditions, but they cannot be used to predict future outcomes for a community. The National Risk Index is intended to fill gaps in available data and analyses to better inform federal, state, local, tribal, and territorial decision makers as they develop risk reduction strategies.

Explore the National Risk Index Map at **hazards.fema.gov/nri/map**.

Visit the National Risk Index website at **hazards.fema.gov/nri/learn-more** to access supporting documentation and links.

Calculating the Risk Index

Risk Index scores are calculated using an equation that combines scores for Expected Annual Loss due to natural hazards, Social Vulnerability and Community Resilience:

$$\text{Risk Index} = \text{Expected Annual Loss} \times \text{Social Vulnerability} \div \text{Community Resilience}$$

Risk Index scores are presented as a composite score for all 18 hazard types, as well as individual scores for each hazard type.

For more information, visit **hazards.fema.gov/nri/determining-risk**.

Calculating Expected Annual Loss

Expected Annual Loss scores are calculated using an equation that combines values for exposure, annualized frequency, and historic loss ratios for 18 hazard types:

Expected Annual Loss = Exposure × Annualized Frequency × Historic Loss Ratio

Expected Annual Loss scores are presented as a composite score for all 18 hazard types, as well as individual scores for each hazard type.

For more information, visit **hazards.fema.gov/nri/expected-annual-loss**.

Calculating Social Vulnerability

Social Vulnerability is measured using the Social Vulnerability Index (SoVI) published by the University of South Carolina's Hazards and Vulnerability Research Institute (HVRI).

For more information, visit **hazards.fema.gov/nri/social-vulnerability**.

Calculating Community Resilience

Community Resilience is measured using the Baseline Resilience Indicators for Communities (HVRI BRIC) published by the University of South Carolina's Hazards and Vulnerability Research Institute (HVRI).

For more information, visit **hazards.fema.gov/nri/community-resilience**.

Appendix E

NORTH Dakota | Health
Be Legendary.

Mandatory Reportable Infectious Conditions

If highlighted red, report immediately: 800-472-2180 or 701-328-2378
Report all other conditions within one business day

Acute Flaccid Myelitis
Anaplasmosis
Anthrax◆♆
Arboviral infection (other)
Babesiosis
Botulism ◆♆
Brucellosis ◆♆
Campylobacteriosis
Candida auris ◆
Carbapenem-resistant organisms
- *Enterobacteriaceae* ◆
- *Pseudomonas aeruginosa* ◆

Chickenpox (varicella)
Chikungunya virus disease
Chlamydial infection
Cholera ◆
Cluster of severe or unexplained illnesses and deaths
Coccidioidomycosis
Creutzfeldt-Jakob disease
Cryptosporidiosis
Cyclosporiasis
Dengue
Diphtheria ◆
Eastern equine encephalitis ♆
E. coli (Shiga toxin-producing) ◆
Ehrlichiosis
Foodborne/waterborne outbreaks
Giardiasis
Glanders ◆♆
Gonorrhea
Haemophilus influenzae (invasive)◆
Hantavirus ◆
Hemolytic uremic syndrome
Hepatitis A ◆
Hepatitis B
Hepatitis C*
Hepatitis D
Hepatitis E
HIV/AIDS infection**
Influenza
- Pediatric deaths
- Seasonal
- Suspect novel, PCR influenza A unsubtypable ◆

Jamestown Canyon virus disease
Laboratory incidents with possible release of category A agents or novel influenza virus ♆
La Crosse encephalitis
Legionellosis
Leptospirosis
Listeriosis ◆
Lyme disease
Malaria ◆
Measles (rubeola) ◆
Melioidosis ◆♆
Meningococcal disease (invasive)◆
Mumps ◆
Nipah virus infections ◆♆
Nosocomial outbreaks
Novel severe acute respiratory illness ◆♆
Pertussis
Plague ◆♆
Poliomyelitis ◆
Powassan virus disease
Pregnancy in person infected with:
- Hepatitis B
- HIV

Q fever ◆♆
Rabies
- Animal
- Human ◆

Rocky Mountain spotted fever
Rubella ◆
Salmonellosis ◆
Scabies outbreaks in institutions
Shigellosis ◆
Smallpox ◆♆
Staphylococcus aureus
- Vancomycin-resistant and intermediate resistant (VRSA and VISA) – any site ◆

Staphylococcus enterotoxin B intoxication ◆♆
St. Louis encephalitis
Streptococcus pneumoniae infection (invasive) ◆
Syphilis
Tetanus
Tickborne disease (other)
Trichinosis
Tuberculosis***
- Disease ◆
- Infection

Tularemia ◆♆
Typhoid fever ◆
Unexplained or emerging critical illness/death
Vibriosis ◆
Viral hemorrhagic fevers ◆♆
Weapons of Mass Destruction suspected event ♆
Western equine encephalitis
West Nile virus
Yellow fever ◆
Zika virus

◆ Send isolate or sample to North Dakota Department of Health Division of Microbiology.
♆ This is a Select Agent when confirmed. Notify the Division of Microbiology at 701-328-6272. Report any possible lab exposures.
*Hepatitis C: All positive/reactive test results, hepatitis C genotypes, all hepatitis C nucleic acid test results (including nondetectable)
**HIV/AIDS: Any positive/reactive test results, gene sequencing and drug resistance patterns, all HIV nucleic acid test results (including nondetectable), all CD4 test results
***TB: All positive PPD & IGRA results. All results for AFB Smears, cultures and rapid methodologies performed when *M. tuberculosis* complex is suspected

How to Report: • Secure website: www.ndhealth.gov/disease/reportcard/ • Telephone: 701-328-2378 or 800-472-2180 • Secure Fax: 701-328-0355 • Electronic laboratory reporting: www.ndhealth.gov/disease/ELR/

North Dakota Administrative Code 33-06-01, North Dakota Century Code 23-07-01 Updated 10/2019

NORTH Dakota | Health
Be Legendary.

Other Mandatory Reportable Conditions

If highlighted red, report immediately: 701-328-2372
Report all other conditions within seven days

- Autism*
- Cancer+
- Cluster of severe or unexplained illnesses or deaths
- Critical congenital heart disease (CCHD)
- Fetal alcohol syndrome (FAS)
- Lead level results (all)
- Neonatal abstinence syndrome (NAS)
- Overdoses
- Suicide and suicide attempts
- Tumors of the central nervous system+
- Violent deaths^
- Visible congenital deformity

^ Homicides, legal intervention, unintentional fire-arm related injury death, deaths of unknown intent and terrorism.

How to Report:
+ Submit report to the North Dakota Cancer Registry. Call 800-280-5512 for assistance.
* Autism report form: www.nd.gov/eforms/Doc/sfn60804.pdf
- Telephone: 701-328-2372
- Secure Fax: 701-328-2785
- Secure website: www.ndhealth.gov/disease/reportcard/
- Electronic reporting may be available. Email dohstateepi@nd.gov for more information.

North Dakota Administrative Code 33-06-01, North Dakota Century Code 23-07-01
North Dakota Century Code 23-01-41 (Autism)
North Dakota Century Code 23-41-04 and 23-41-05 (Visible congenital deformity)

Updated 10/2019

Appendix F

MCLEAN COUNTY DOCUMENT FOR DEVELOPERS

"HOW TO AVOID SURPRISES AND BE A GOOD NEIGHBOR WHEN YOU ARE BUYING, BUILDING AND DEVELOPING IN MCLEAN COUNTY"

What kind of ACCESS is available outside of town?

The fact that you can drive to your property does not necessarily guarantee that you, your quests, or an emergency service vehicle (ambulance, fire truck) can get there easily, or during all seasons. Please consider:

- Arrival/Response times for emergency services cannot be guaranteed.
- There can be problems with the legal aspects of access especially if you have access across someone else's property. Make sure you have legal easements if you need them (deeded, not just verbal). You may want to get legal advice if you have questions regarding your own access to a Township, County, State or Federal road or highway. McLean County maintains hundreds of miles of roads, but many private properties are served by township or private roads, which are not County maintained. Some roads that have been used for many years by the public are not maintained by the County; that means the County will not plow snow, grade or repair damage resulting from natural disasters. Make sure you know what kind of maintenance is available and who pays for it.
- Many large construction vehicles cannot navigate small, narrow, and primitive roads. If you plan to build, check out construction access. Private driveways should be wide and sturdy enough to support either emergency or construction vehicles in all weather conditions.
- If your driveway or private road accesses a County road, you will need approval from the county highway department. If you access is directly onto a State or Federal highway, you will need to check with the North Dakota Department of Transportation about getting access approval.
- In some areas, school bus transportation may not be provided. Call the school district in which your children will be attending to find out when and where the school bus will pick up your children.

- In extreme weather, some roads may become impassable. You may need a four-wheel drive vehicle and also some method for snow removal
- during winters. Snow removal from the County maybe several days after the snowstorm.
- Gravel roads generate dust when it is dry and mud when it is wet. Paving may not be planned for you area.
- Check with the local telephone and electrical utilities to see if services are available in the area you want to build. This goes for water, garbage pickup, mail propane supplies also.
- You will need to contact First District Health Unit in Minot for septic system approval and to have your water checked if you are drilling a well.
- Remember before starting construction or digging to call 811 to have any buried utility lines or pipelines located.
- Please visit with the McLean County Planning and Zoning Department to make sure the area is zoned for the usage you want and to also obtain a building permit. You may also need to visit with the McLean County Recorder's office to see if there are any restrictions or covenants recorded in the area. It is possible that you may need to plat the property in the Recorder's Office which will require the services of a land surveyor. Depending on where you build your property will be assessed for tax purposes by the local township assessor or the county assessor.
- Remember you are building in a rural area that is dominated by agriculture. Please be aware that modern farm machinery is very large and can take up the entire roadway especially on the narrower township roads. Keep your speed down especially when going over hills or areas where your vision is limited. Also be aware of the wildlife that maybe roaming the area. Wildlife can be very interesting to look at but can also be very destructive and dangerous.

Appendix G

MITIGATION ACTION PROGRESS FORM

Progress Report Period	From Date:	To Date:
Action Project Title		
Responsible Agency		
Contact Name		
Contact Phone/Email		
Project Status	☐ Project Complete ☐ Project Cancelled ☐ Project on schedule ☐ Anticipated completion date: _____ ☐ Project delayed Explain:_____	

SUMMARY OF PROJECT PROGRESS FOR THIS REPORT PERIOD

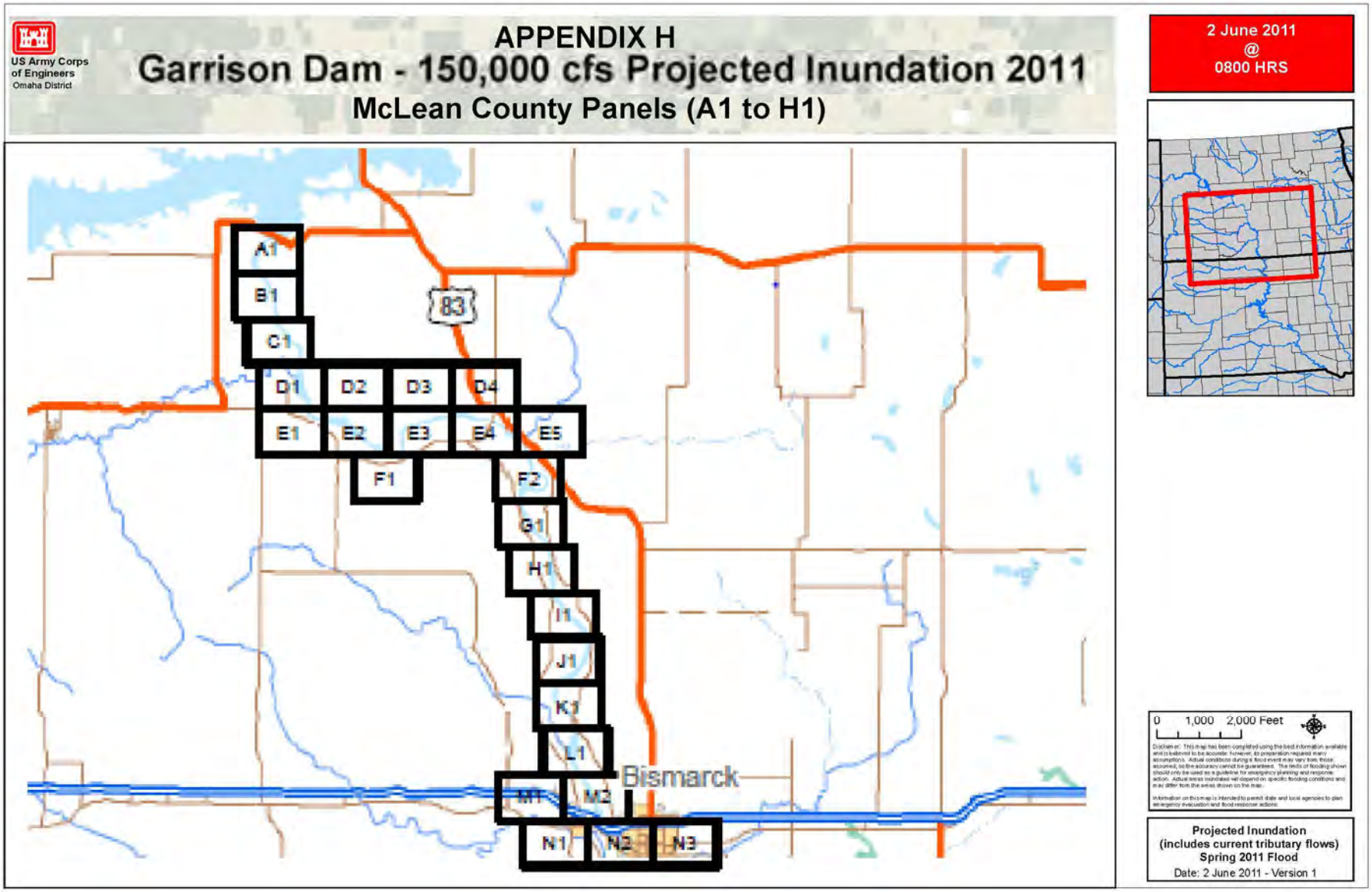
1. **What was accomplished for this project during this reporting period?**_____
   _____
   _____

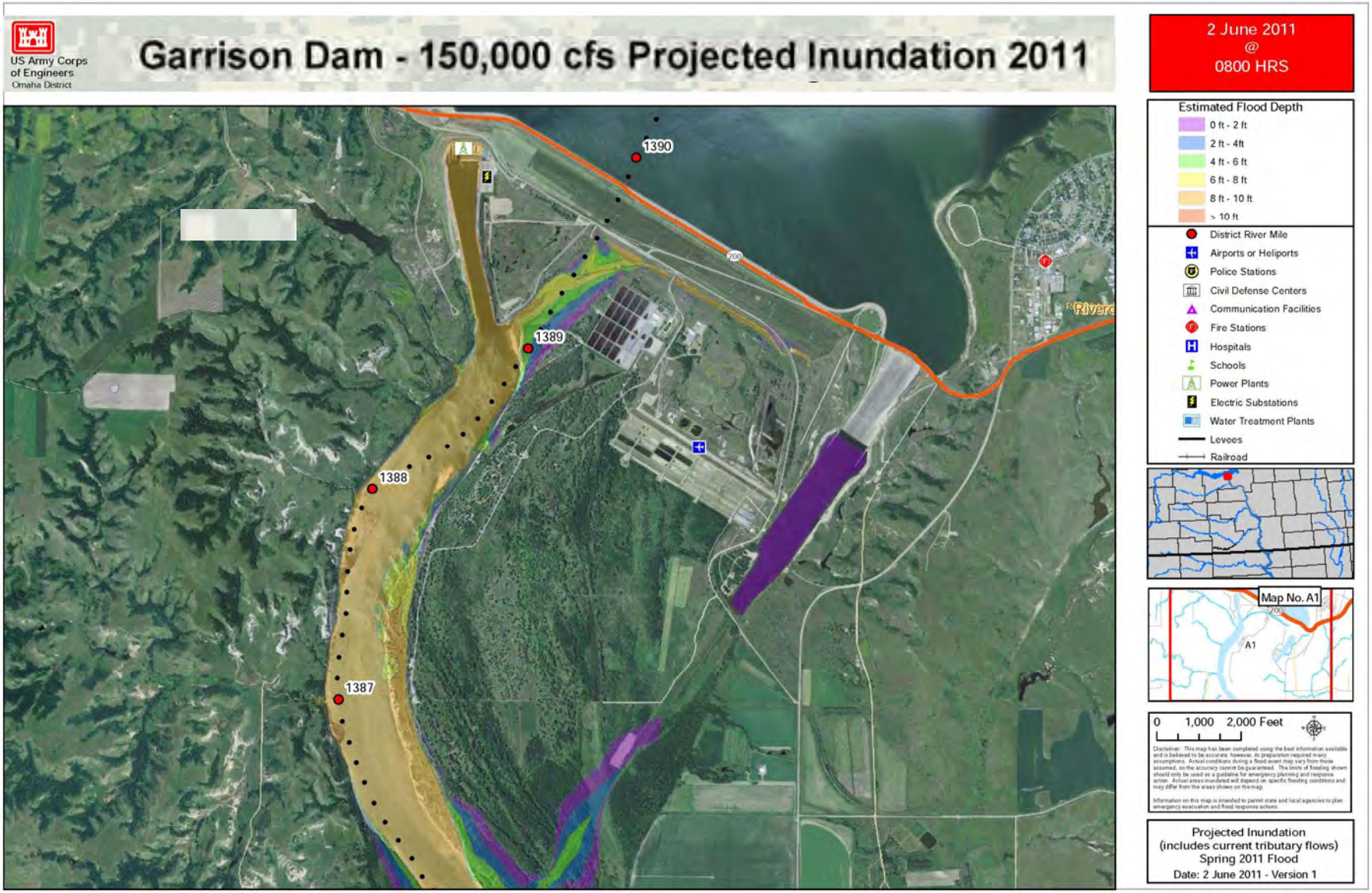
2. **What obstacles, problems, or delays did the project encounter?**_____
   _____
   _____

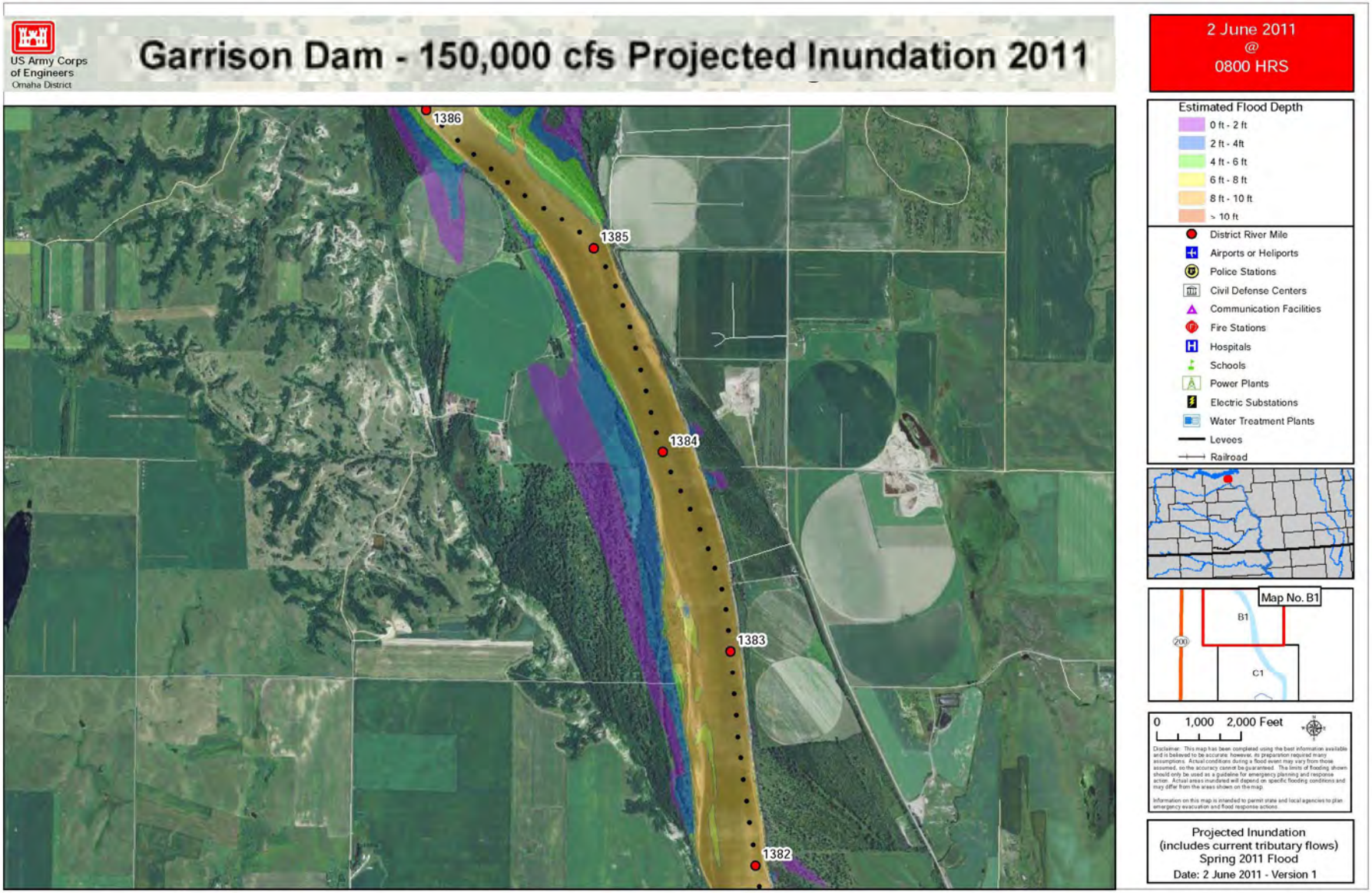
3. **If uncompleted, is the project still relevant? Should the project be changed or revised?**
   _____
   _____

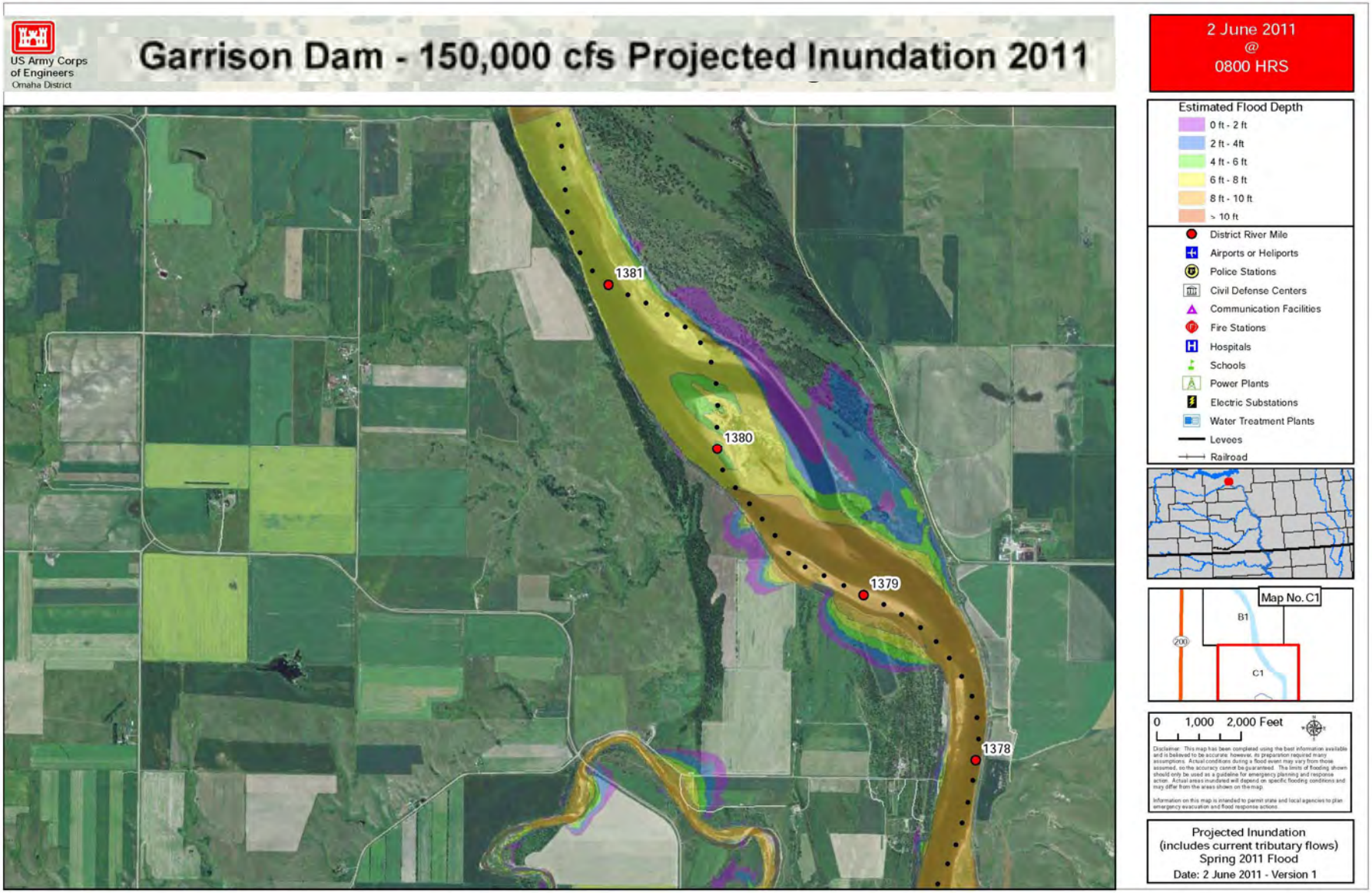
4. **Comments?**_____
   _____

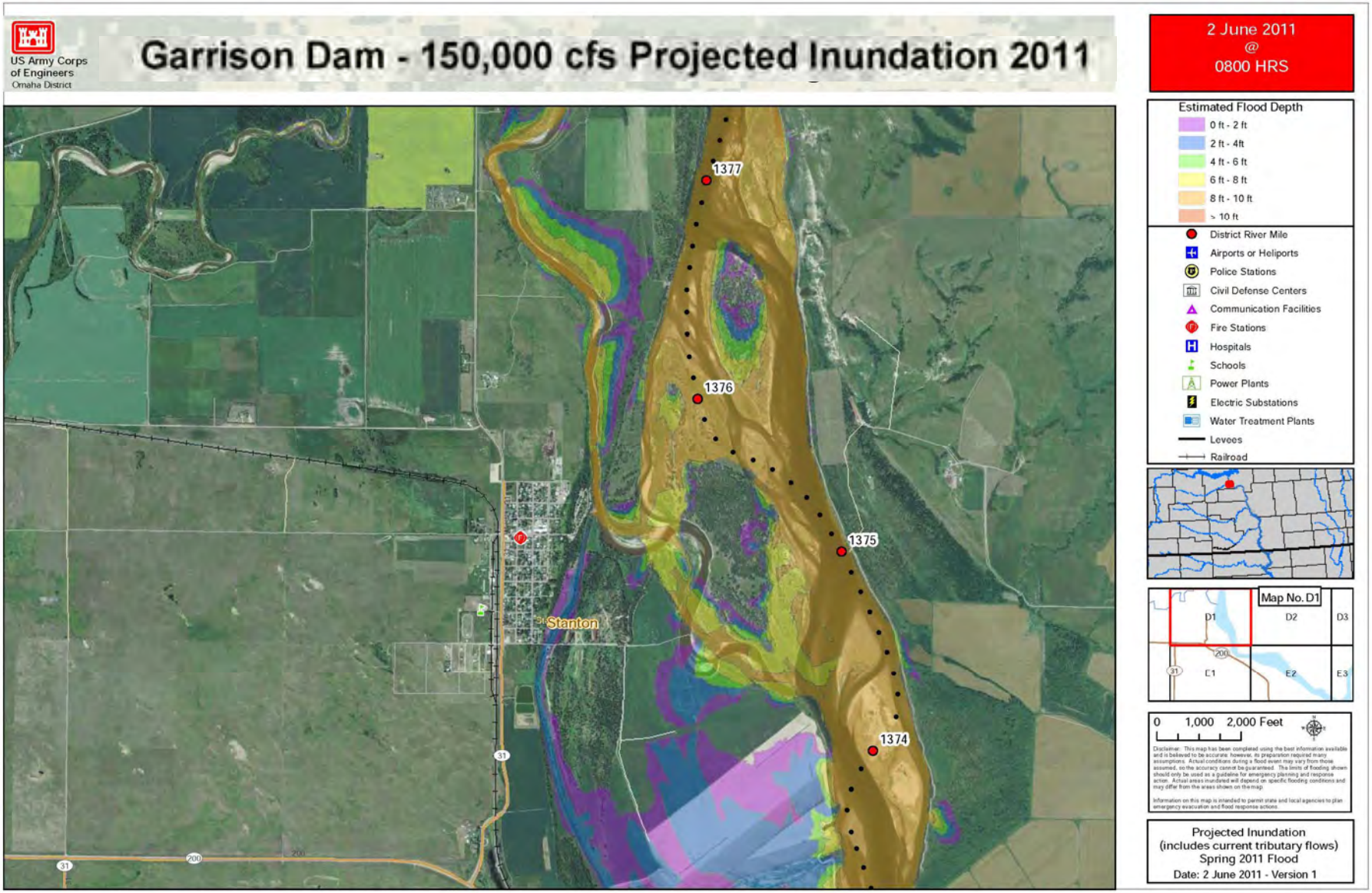
Appendix H

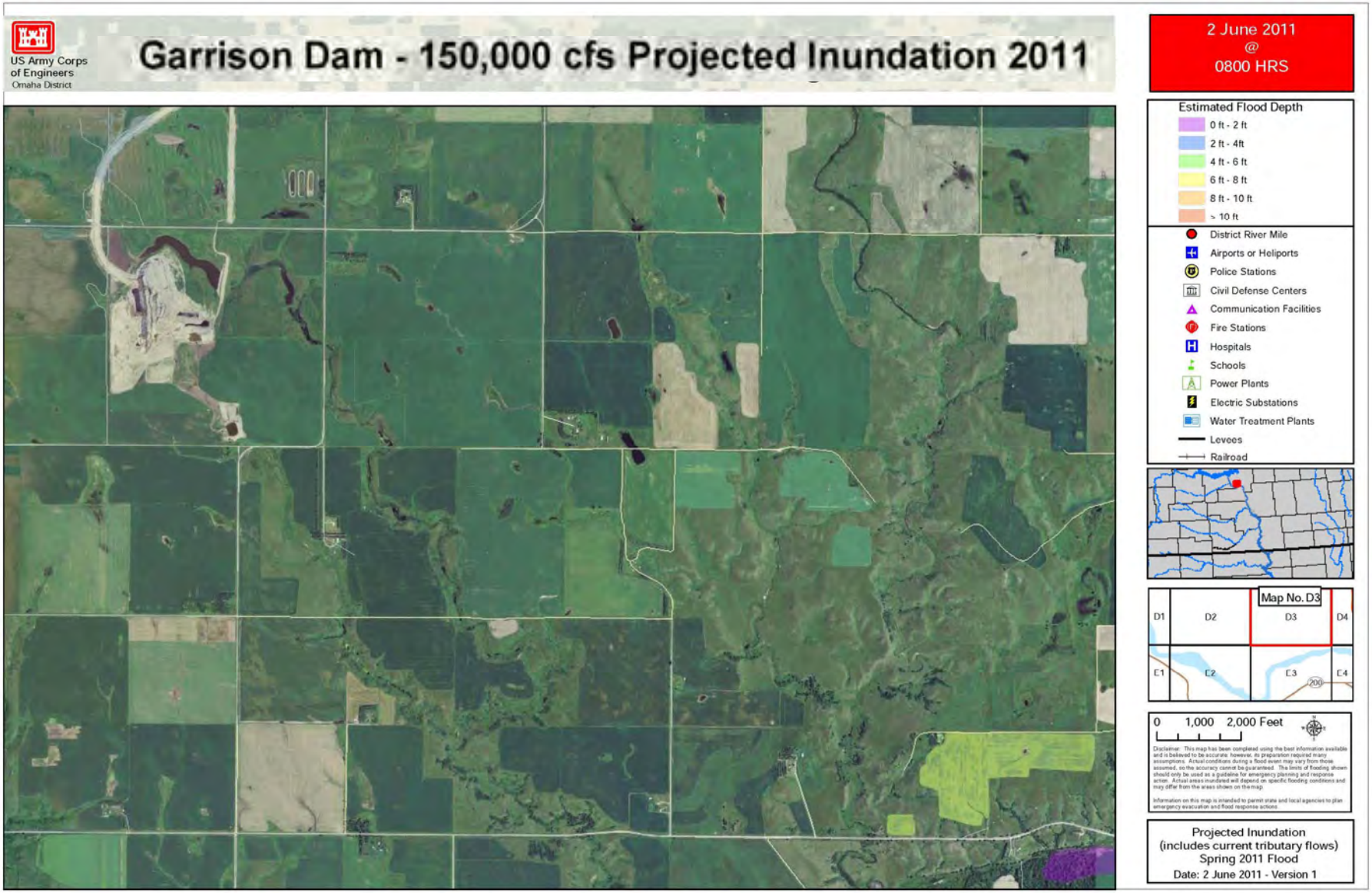

US Army Corps of Engineers
Omaha District
APPENDIX H
Garrison Dam - 150,000 cfs Projected Inundation 2011
McLean County Panels (A1 to H1)
2 June 2011
@
0800 HRS
A1
B1
C1
D1
D2
D3
D4
E1
E2
E3
E4
E5
F1
F2
G1
H1
I1
J1
K1
L1
M1
M2
N1
N2
N3
83
Bismarck
0 1,000 2,000 Feet
Projected Inundation
(includes current tributary flows)
Spring 2011 Flood
Date: 2 June 2011 - Version 1

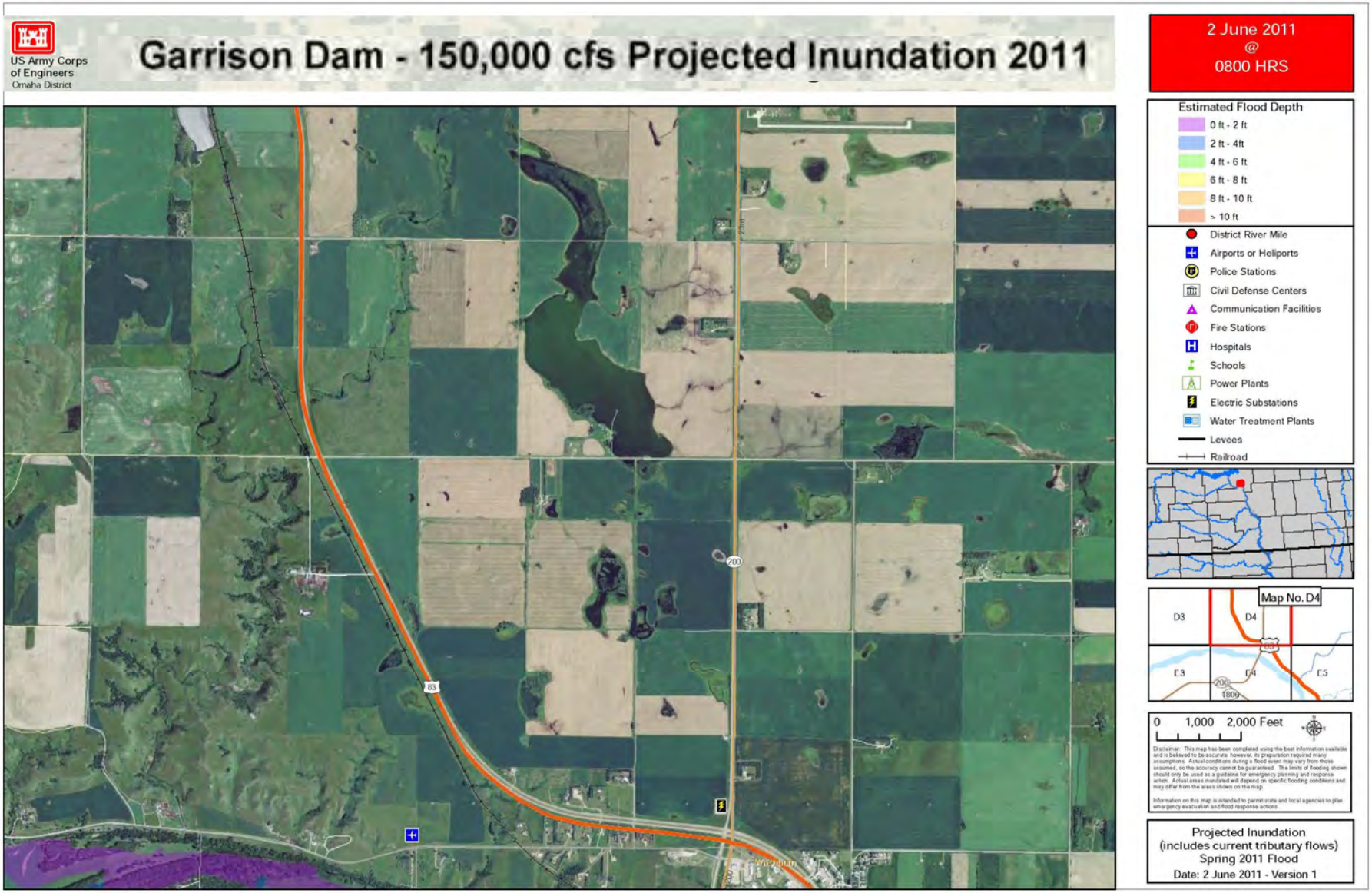

US Army Corps of Engineers
Omaha District
Garrison Dam - 150,000 cfs Projected Inundation 2011
2 June 2011
@
0800 HRS
Estimated Flood Depth
0 ft - 2 ft
2 ft - 4ft
4 ft - 6 ft
6 ft - 8 ft
8 ft - 10 ft
> 10 ft
District River Mile
Airports or Heliports
Police Stations
Civil Defense Centers
Communication Facilities
Fire Stations
Hospitals
Schools
Power Plants
Electric Substations
Water Treatment Plants
Levees
Railroad
Map No. A1
A1
0 1,000 2,000 Feet
Projected Inundation
(includes current tributary flows)
Spring 2011 Flood
Date: 2 June 2011 - Version 1
1390
1389
1388
1387

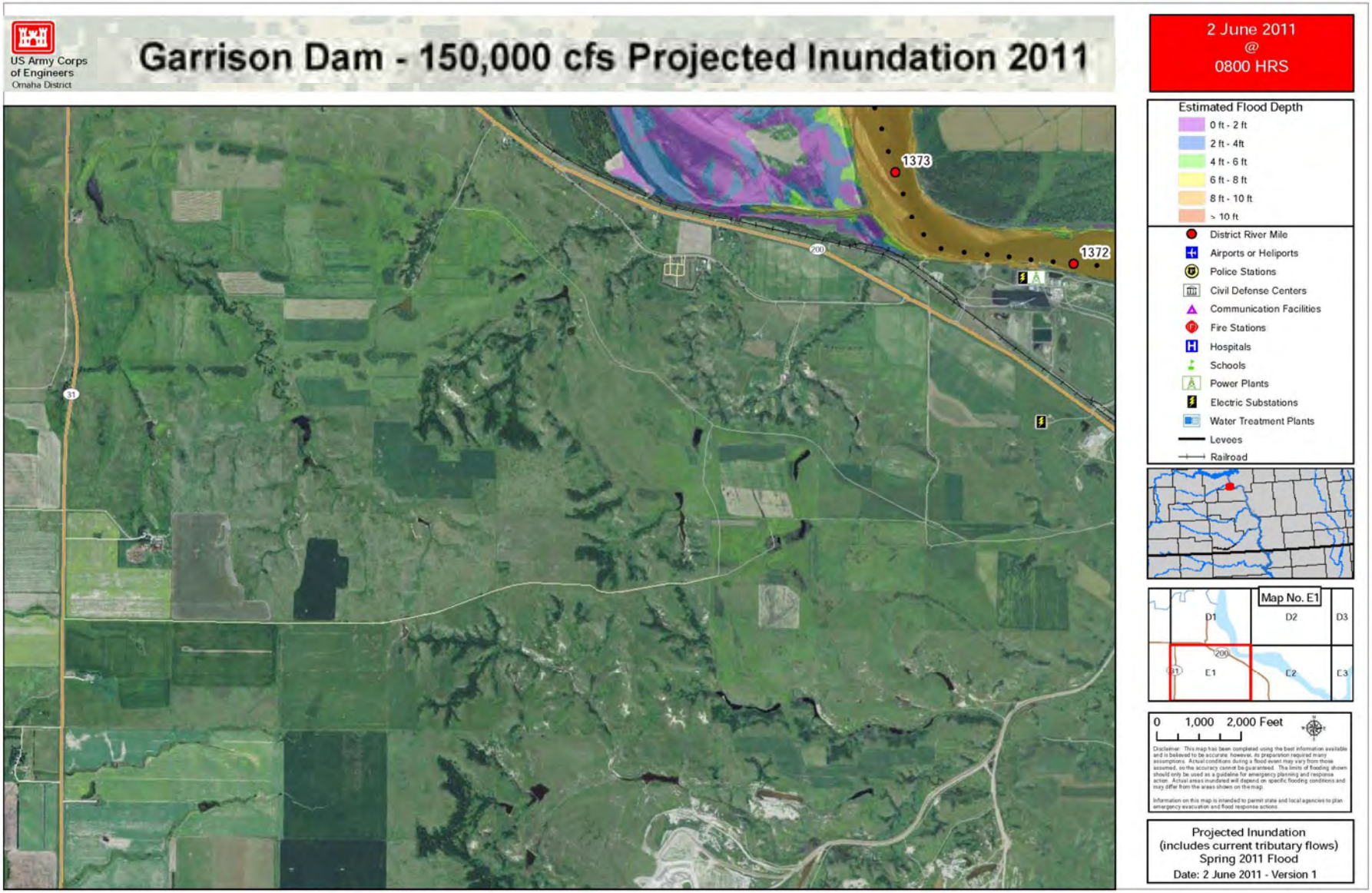

US Army Corps of Engineers
Omaha District
Garrison Dam - 150,000 cfs Projected Inundation 2011
2 June 2011
@
0800 HRS
Estimated Flood Depth
0 ft - 2 ft
2 ft - 4ft
4 ft - 6 ft
6 ft - 8 ft
8 ft - 10 ft
> 10 ft
District River Mile
Airports or Heliports
Police Stations
Civil Defense Centers
Communication Facilities
Fire Stations
Hospitals
Schools
Power Plants
Electric Substations
Water Treatment Plants
Levees
Railroad
1386
1385
1384
1383
1382
Map No. B1
B1
C1
200
0 1,000 2,000 Feet
Disclaimer: This map has been completed using the best information available and is believed to be accurate, however, its preparation required many assumptions. Actual conditions during a flood event may vary from those assumed, so the accuracy cannot be guaranteed. The limits of flooding shown should only be used as a guideline for emergency planning and response action. Actual areas inundated will depend on specific flooding conditions and may differ from the areas shown on the map.
Information on this map is intended to permit state and local agencies to plan emergency evacuation and flood response actions.
Projected Inundation
(includes current tributary flows)
Spring 2011 Flood
Date: 2 June 2011 - Version 1


US Army Corps of Engineers
Omaha District
Garrison Dam - 150,000 cfs Projected Inundation 2011
2 June 2011
@
0800 HRS
Estimated Flood Depth
0 ft - 2 ft
2 ft - 4ft
4 ft - 6 ft
6 ft - 8 ft
8 ft - 10 ft
> 10 ft
District River Mile
Airports or Heliports
Police Stations
Civil Defense Centers
Communication Facilities
Fire Stations
Hospitals
Schools
Power Plants
Electric Substations
Water Treatment Plants
Levees
Railroad
1381
1380
1379
1378
Map No. C1
B1
C1
200
0 1,000 2,000 Feet
Projected Inundation
(includes current tributary flows)
Spring 2011 Flood
Date: 2 June 2011 - Version 1


US Army Corps of Engineers
Omaha District
Garrison Dam - 150,000 cfs Projected Inundation 2011
2 June 2011
@
0800 HRS
Estimated Flood Depth
0 ft - 2 ft
2 ft - 4ft
4 ft - 6 ft
6 ft - 8 ft
8 ft - 10 ft
> 10 ft
District River Mile
Airports or Heliports
Police Stations
Civil Defense Centers
Communication Facilities
Fire Stations
Hospitals
Schools
Power Plants
Electric Substations
Water Treatment Plants
Levees
Railroad
1377
1376
1375
1374
Stanton
Map No. D1
D1
D2
D3
E1
E2
E3
0 1,000 2,000 Feet
Projected Inundation
(includes current tributary flows)
Spring 2011 Flood
Date: 2 June 2011 - Version 1


US Army Corps of Engineers
Omaha District
Garrison Dam - 150,000 cfs Projected Inundation 2011
2 June 2011
@
0800 HRS
Estimated Flood Depth
0 ft - 2 ft
2 ft - 4ft
4 ft - 6 ft
6 ft - 8 ft
8 ft - 10 ft
> 10 ft
District River Mile
Airports or Heliports
Police Stations
Civil Defense Centers
Communication Facilities
Fire Stations
Hospitals
Schools
Power Plants
Electric Substations
Water Treatment Plants
Levees
Railroad
Map No. D3
D1
D2
D3
D4
E1
E2
E3
E4
0 1,000 2,000 Feet
Projected Inundation
(includes current tributary flows)
Spring 2011 Flood
Date: 2 June 2011 - Version 1


US Army Corps of Engineers
Omaha District
Garrison Dam - 150,000 cfs Projected Inundation 2011
2 June 2011
@
0800 HRS
Estimated Flood Depth
0 ft - 2 ft
2 ft - 4ft
4 ft - 6 ft
6 ft - 8 ft
8 ft - 10 ft
> 10 ft
District River Mile
Airports or Heliports
Police Stations
Civil Defense Centers
Communication Facilities
Fire Stations
Hospitals
Schools
Power Plants
Electric Substations
Water Treatment Plants
Levees
Railroad
Map No. D4
D3
D4
E3
E4
E5
0 1,000 2,000 Feet
Projected Inundation
(includes current tributary flows)
Spring 2011 Flood
Date: 2 June 2011 - Version 1


US Army Corps of Engineers
Omaha District
Garrison Dam - 150,000 cfs Projected Inundation 2011
2 June 2011
@
0800 HRS
Estimated Flood Depth
0 ft - 2 ft
2 ft - 4ft
4 ft - 6 ft
6 ft - 8 ft
8 ft - 10 ft
> 10 ft
District River Mile
Airports or Heliports
Police Stations
Civil Defense Centers
Communication Facilities
Fire Stations
Hospitals
Schools
Power Plants
Electric Substations
Water Treatment Plants
Levees
Railroad
1373
1372
200
31
Map No. E1
D1
D2
D3
E1
E2
E3
0 1,000 2,000 Feet
Disclaimer: This map has been completed using the best information available and is believed to be accurate, however, no preparation required many assumptions. Actual conditions during a flood event may vary from those assumed, so the accuracy cannot be guaranteed. The limits of flooding shown should only be used as a guideline for emergency planning and response action. Actual areas inundated will depend on specific flooding conditions and may differ from the areas shown on the map.
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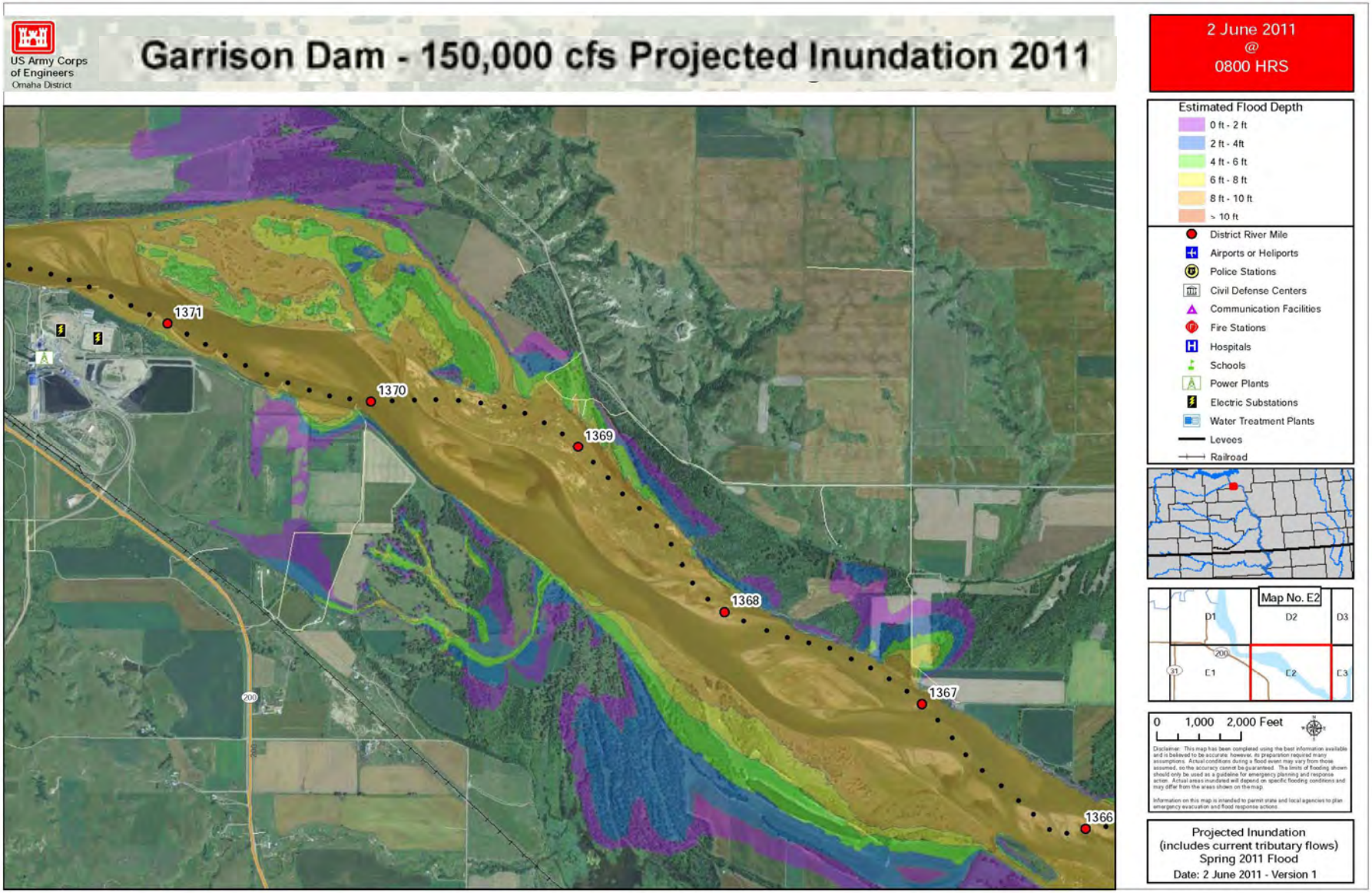
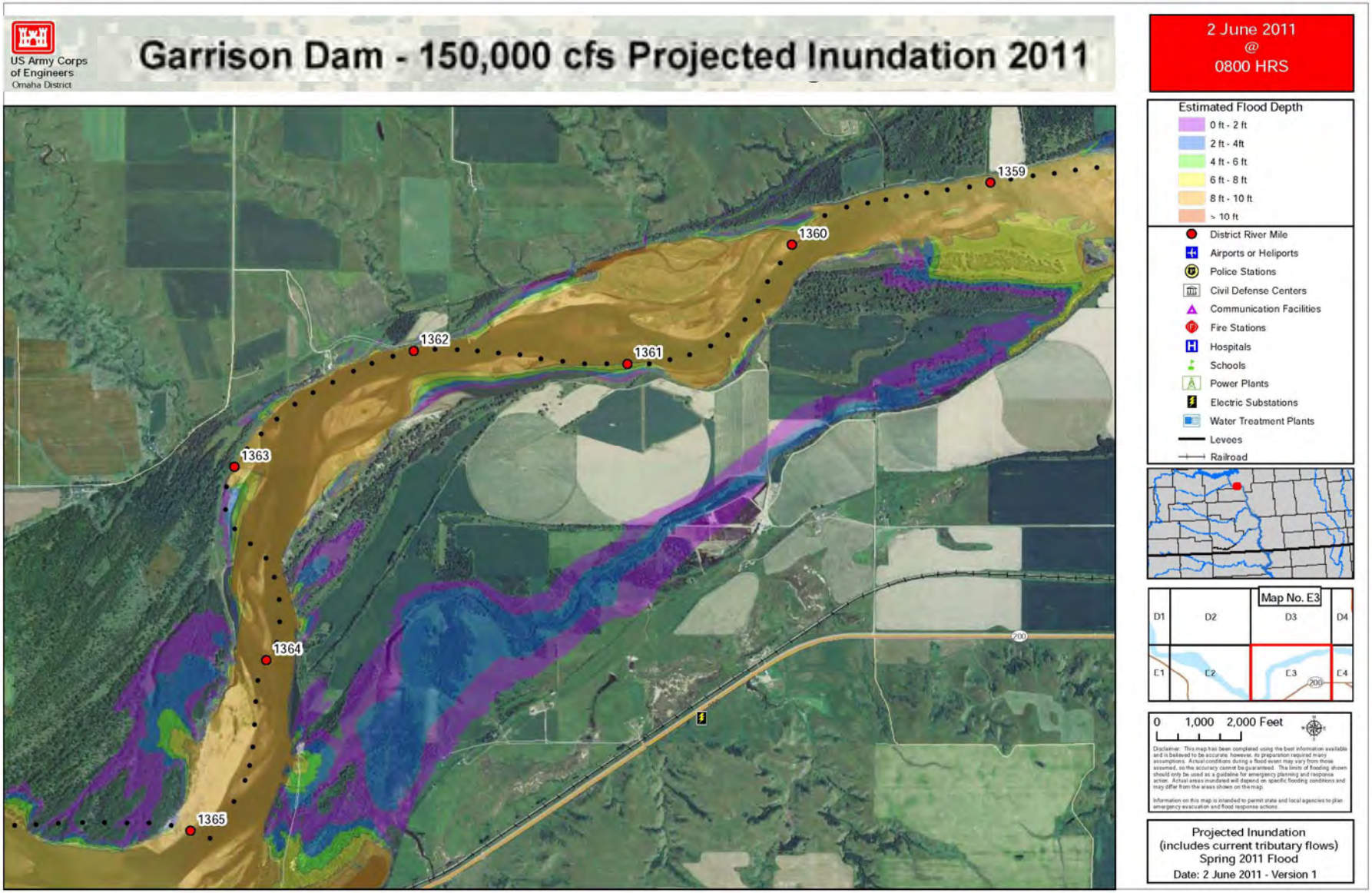
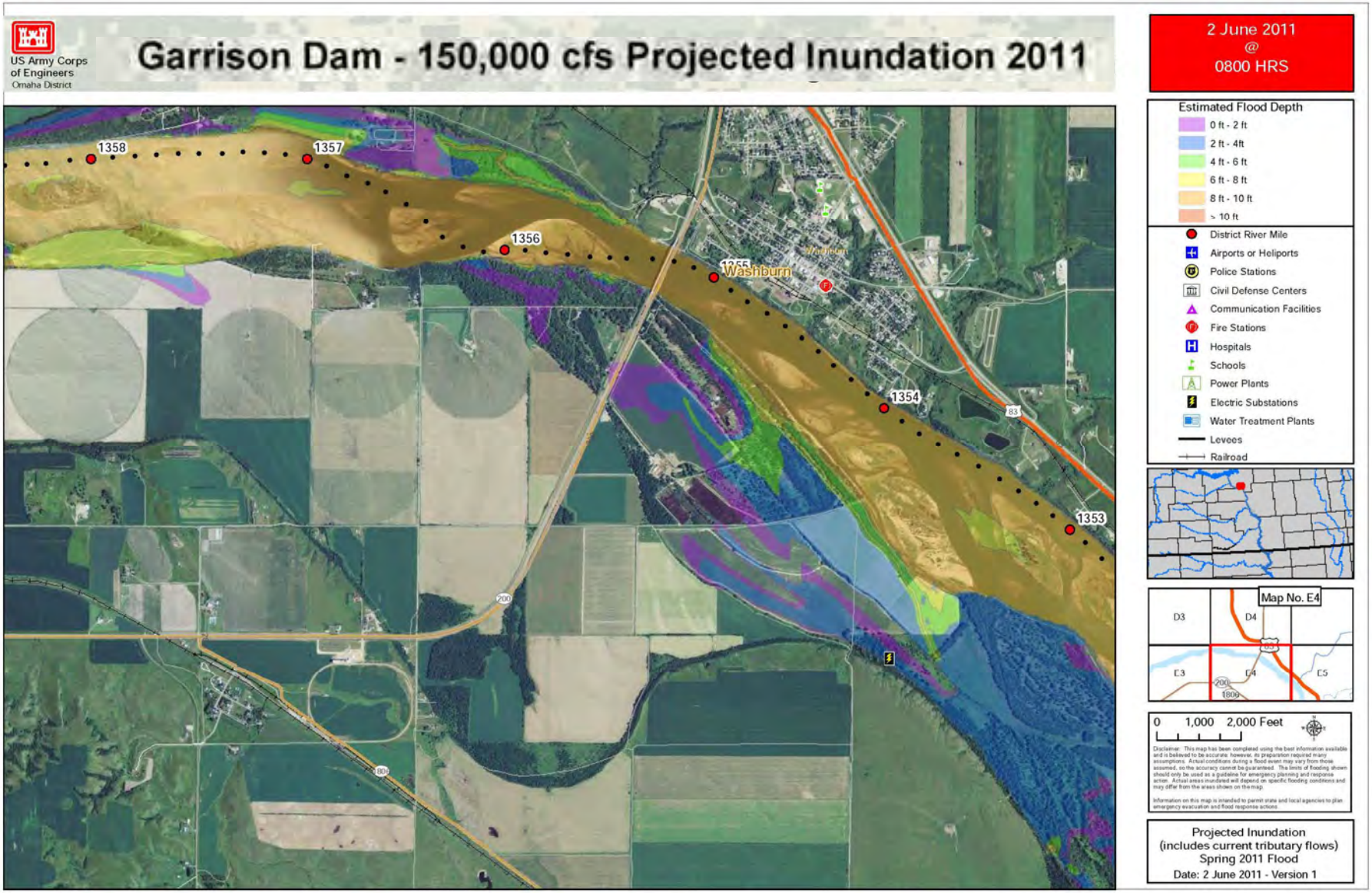
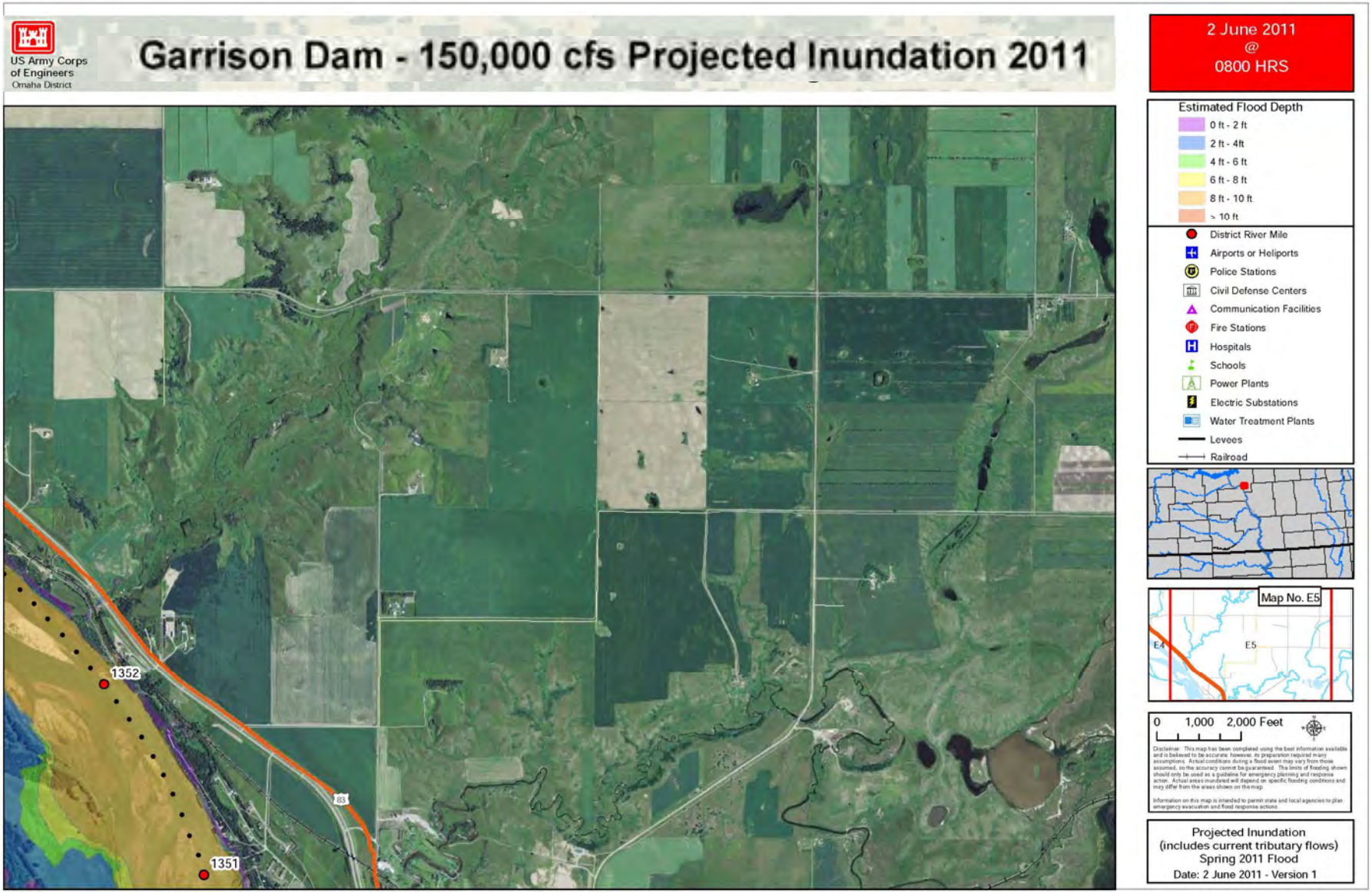
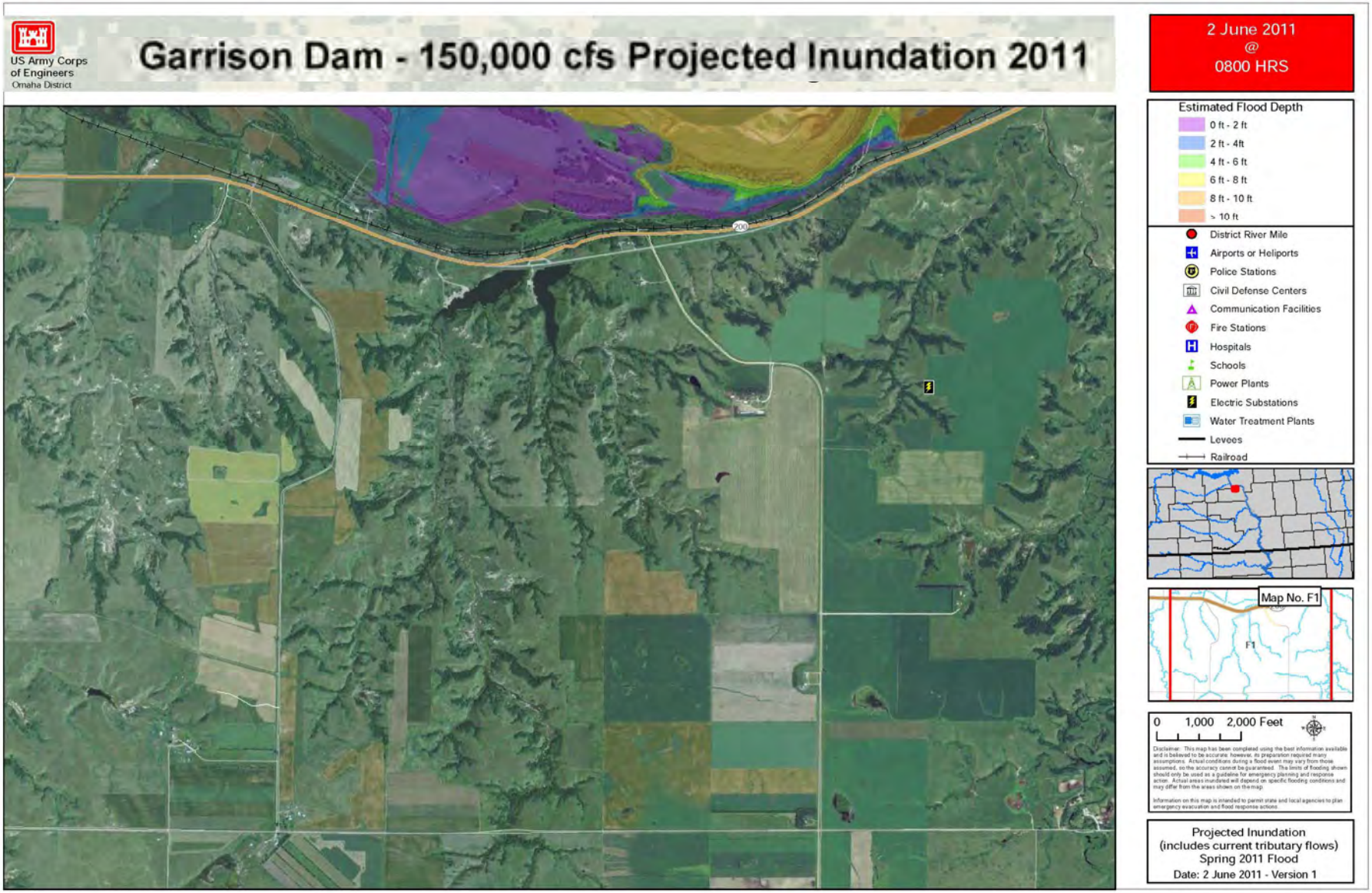
Projected Inundation
(includes current tributary flows)
Spring 2011 Flood
Date: 2 June 2011 - Version 1

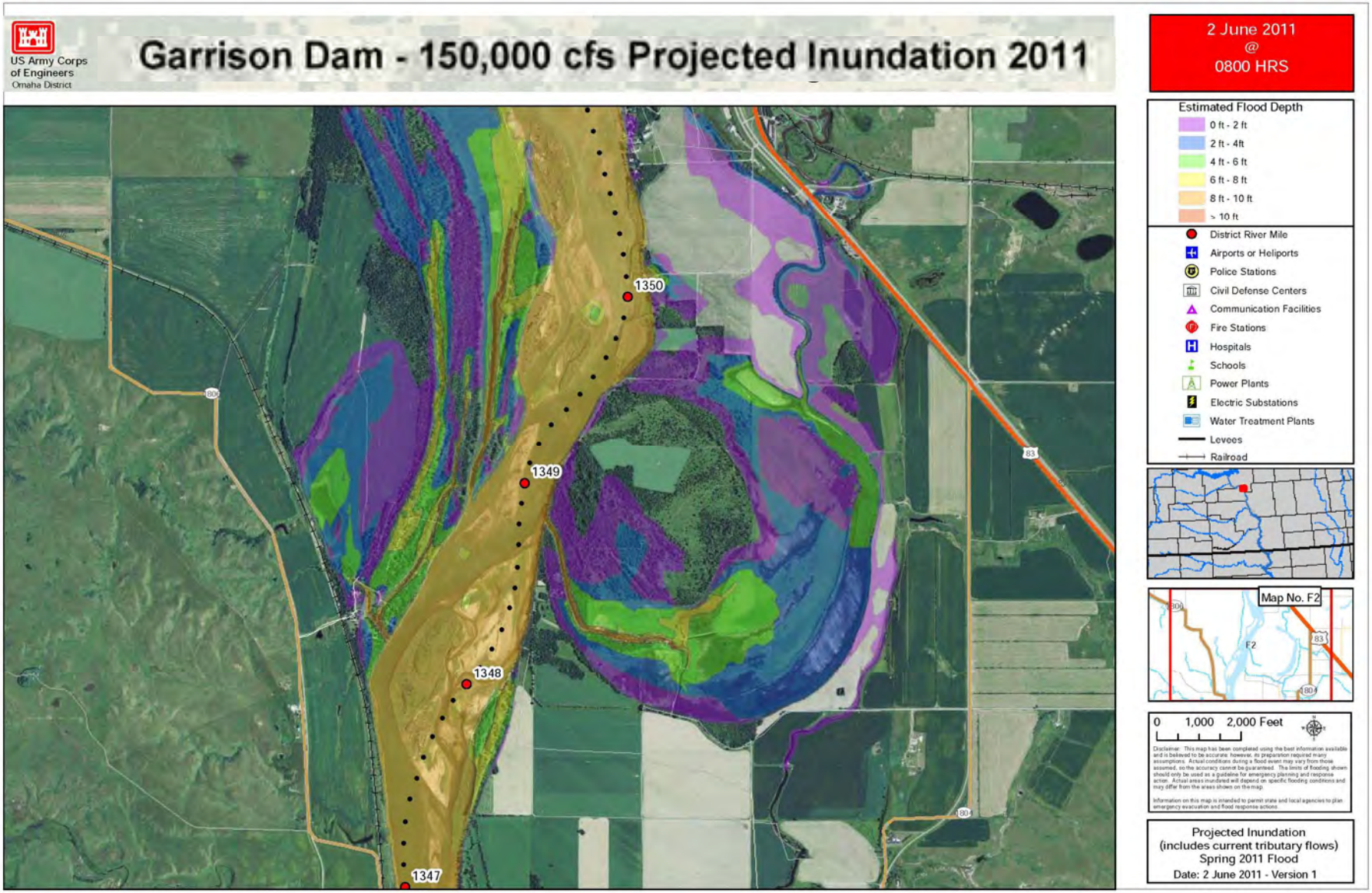

US Army Corps of Engineers
Omaha District
Garrison Dam - 150,000 cfs Projected Inundation 2011
2 June 2011
@
0800 HRS
Estimated Flood Depth
0 ft - 2 ft
2 ft - 4ft
4 ft - 6 ft
6 ft - 8 ft
8 ft - 10 ft
> 10 ft
District River Mile
Airports or Heliports
Police Stations
Civil Defense Centers
Communication Facilities
Fire Stations
Hospitals
Schools
Power Plants
Electric Substations
Water Treatment Plants
Levees
Railroad
1371
1370
1369
1368
1367
1366
Map No. E2
D1
D2
D3
E1
E2
E3
0 1,000 2,000 Feet
Projected Inundation
(includes current tributary flows)
Spring 2011 Flood
Date: 2 June 2011 - Version 1

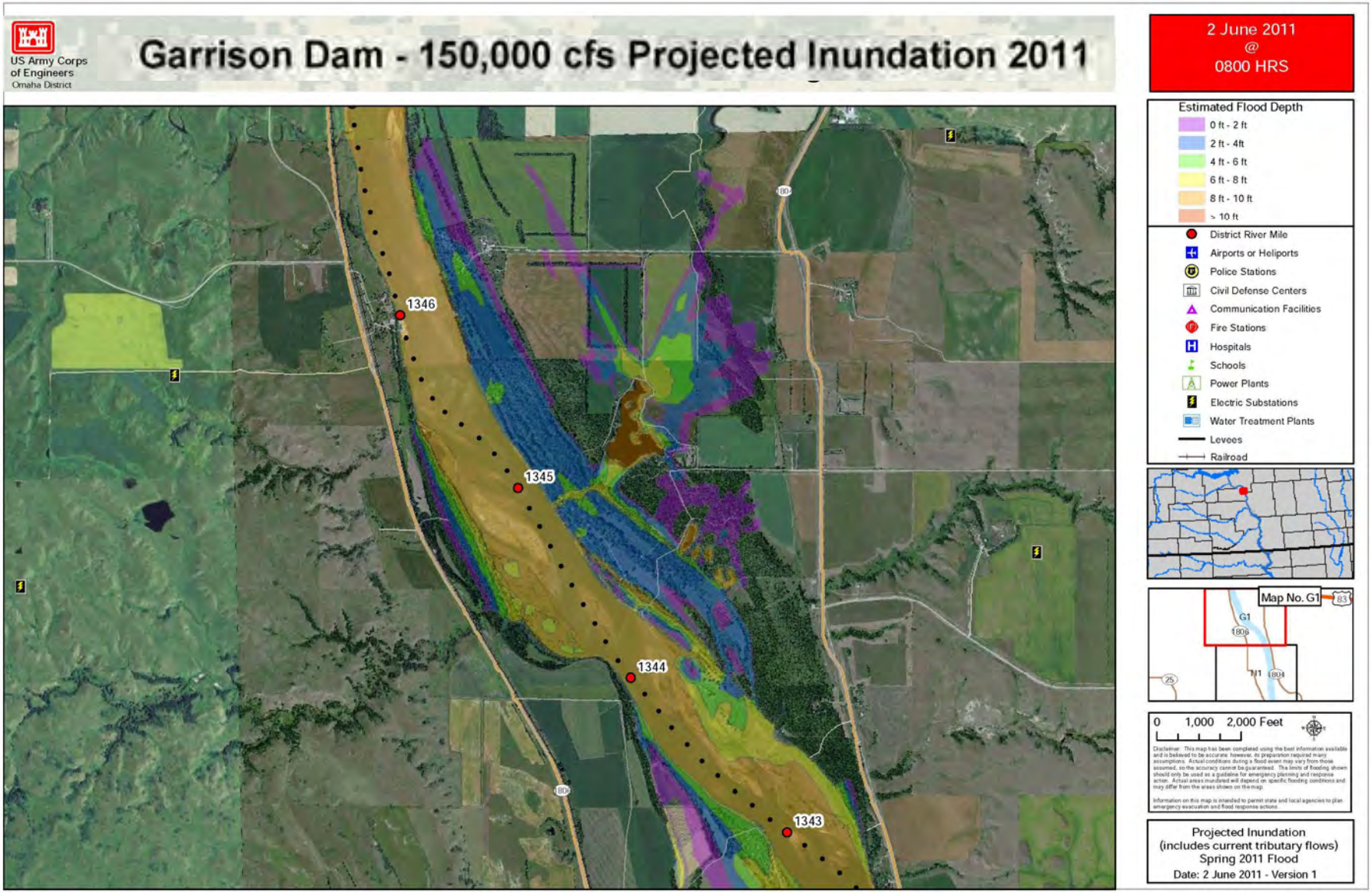

US Army Corps of Engineers
Omaha District
Garrison Dam - 150,000 cfs Projected Inundation 2011
2 June 2011
@
0800 HRS
Estimated Flood Depth
0 ft - 2 ft
2 ft - 4ft
4 ft - 6 ft
6 ft - 8 ft
8 ft - 10 ft
> 10 ft
District River Mile
Airports or Heliports
Police Stations
Civil Defense Centers
Communication Facilities
Fire Stations
Hospitals
Schools
Power Plants
Electric Substations
Water Treatment Plants
Levees
Railroad
1359
1360
1361
1362
1363
1364
1365
Map No. E3
D1
D2
D3
D4
E1
E2
E3
E4
0 1,000 2,000 Feet
Projected Inundation
(includes current tributary flows)
Spring 2011 Flood
Date: 2 June 2011 - Version 1

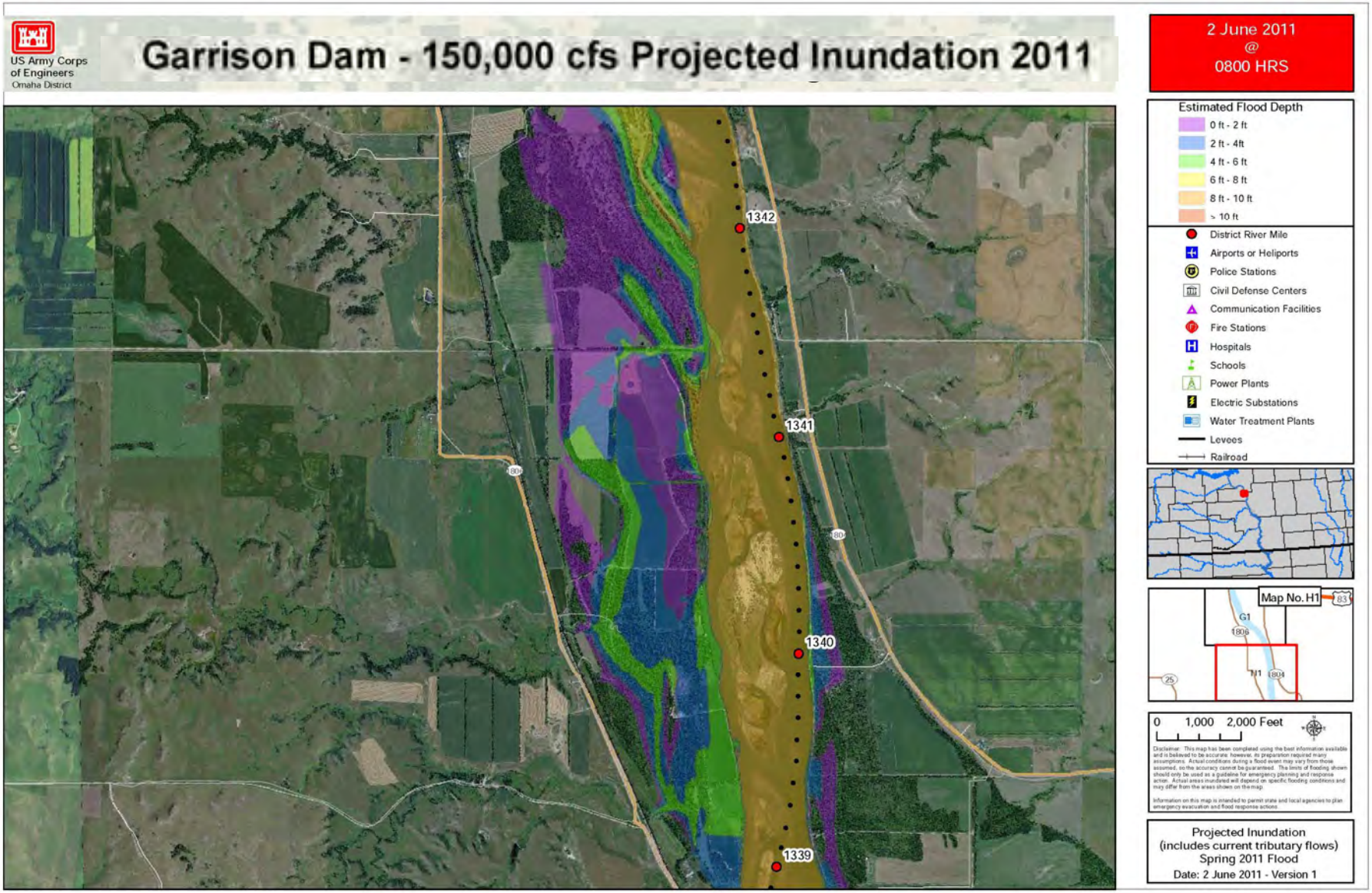

US Army Corps of Engineers
Omaha District
Garrison Dam - 150,000 cfs Projected Inundation 2011
2 June 2011
@
0800 HRS
Estimated Flood Depth
0 ft - 2 ft
2 ft - 4ft
4 ft - 6 ft
6 ft - 8 ft
8 ft - 10 ft
> 10 ft
District River Mile
Airports or Heliports
Police Stations
Civil Defense Centers
Communication Facilities
Fire Stations
Hospitals
Schools
Power Plants
Electric Substations
Water Treatment Plants
Levees
Railroad
1358
1357
1356
1355
Washburn
1354
1353
Map No. E4
D3
D4
E3
E4
E5
0 1,000 2,000 Feet
Projected Inundation
(includes current tributary flows)
Spring 2011 Flood
Date: 2 June 2011 - Version 1


US Army Corps of Engineers
Omaha District
Garrison Dam - 150,000 cfs Projected Inundation 2011
2 June 2011
@
0800 HRS
Estimated Flood Depth
0 ft - 2 ft
2 ft - 4ft
4 ft - 6 ft
6 ft - 8 ft
8 ft - 10 ft
> 10 ft
District River Mile
Airports or Heliports
Police Stations
Civil Defense Centers
Communication Facilities
Fire Stations
Hospitals
Schools
Power Plants
Electric Substations
Water Treatment Plants
Levees
Railroad
Map No. E5
E4
E5
1352
1351
183
0 1,000 2,000 Feet
Projected Inundation
(includes current tributary flows)
Spring 2011 Flood
Date: 2 June 2011 - Version 1


US Army Corps of Engineers
Omaha District
Garrison Dam - 150,000 cfs Projected Inundation 2011
2 June 2011
@
0800 HRS
Estimated Flood Depth
0 ft - 2 ft
2 ft - 4ft
4 ft - 6 ft
6 ft - 8 ft
8 ft - 10 ft
> 10 ft
District River Mile
Airports or Heliports
Police Stations
Civil Defense Centers
Communication Facilities
Fire Stations
Hospitals
Schools
Power Plants
Electric Substations
Water Treatment Plants
Levees
Railroad
Map No. F1
F1
0 1,000 2,000 Feet
Projected Inundation
(includes current tributary flows)
Spring 2011 Flood
Date: 2 June 2011 - Version 1


US Army Corps of Engineers
Omaha District
Garrison Dam - 150,000 cfs Projected Inundation 2011
2 June 2011
@
0800 HRS
Estimated Flood Depth
0 ft - 2 ft
2 ft - 4ft
4 ft - 6 ft
6 ft - 8 ft
8 ft - 10 ft
> 10 ft
District River Mile
Airports or Heliports
Police Stations
Civil Defense Centers
Communication Facilities
Fire Stations
Hospitals
Schools
Power Plants
Electric Substations
Water Treatment Plants
Levees
Railroad
1350
1349
1348
1347
Map No. F2
F2
0 1,000 2,000 Feet
Projected Inundation
(includes current tributary flows)
Spring 2011 Flood
Date: 2 June 2011 - Version 1


US Army Corps of Engineers
Omaha District
Garrison Dam - 150,000 cfs Projected Inundation 2011
2 June 2011
@
0800 HRS
Estimated Flood Depth
0 ft - 2 ft
2 ft - 4ft
4 ft - 6 ft
6 ft - 8 ft
8 ft - 10 ft
> 10 ft
District River Mile
Airports or Heliports
Police Stations
Civil Defense Centers
Communication Facilities
Fire Stations
Hospitals
Schools
Power Plants
Electric Substations
Water Treatment Plants
Levees
Railroad
1346
1345
1344
1343
Map No. G1
0 1,000 2,000 Feet
Projected Inundation
(includes current tributary flows)
Spring 2011 Flood
Date: 2 June 2011 - Version 1


US Army Corps of Engineers
Omaha District
Garrison Dam - 150,000 cfs Projected Inundation 2011
2 June 2011
@
0800 HRS
Estimated Flood Depth
0 ft - 2 ft
2 ft - 4ft
4 ft - 6 ft
6 ft - 8 ft
8 ft - 10 ft
> 10 ft
District River Mile
Airports or Heliports
Police Stations
Civil Defense Centers
Communication Facilities
Fire Stations
Hospitals
Schools
Power Plants
Electric Substations
Water Treatment Plants
Levees
Railroad
1342
1341
1340
1339
Map No. H1
0 1,000 2,000 Feet
Projected Inundation
(includes current tributary flows)
Spring 2011 Flood
Date: 2 June 2011 - Version 1

Appendix I

REVIEWED DOCUMENTS

In preparing this Hazard Plan, hundreds of documents were reviewed. Some are cited within this Hazard Plan and others were used as resource material. The list below represents much of that material. Document review started even before project kick-off and continued through completion of the draft document. Reports and studies can be grouped into a few categories:

- Local and state adopted plans, regulations, and studies
- Data, including historical records on a wide variety of subjects including weather events, land use, water use, automobile and railroad accidents, socio-economic data, available funding, etc.
- FEMA guidance and reports
- Mapping including FEMA flood maps, land use, groundcover, roadway, geological surveys
- Academic studies
- Newspaper and online reports, generally reflecting incidents in Mountrail County.

The list below is grouped according to document source. Chapters 4 and 5of the Hazard Plan text incorporate more of the reviewed material than any other part of this Hazard Plan.

MCLEAN COUNTY

- 2016 McLean County Multi-Hazard Mitigation Plan
- McLean County Zoning Ordinance, Amended and Updated: March 26, 2020
- McLean County mapping
- x

STATE OF NORTH DAKOTA AGENCIES

- North Dakota Executive Orders
  - August 9, 2021 - Burgum Declares Statewide Severe Summer Storm Disaster
  - April 30, 2021 - Burgum Rescinds COVID-19 Emergency
  - April 8, 2021 - Burgum Declares Statewide Drought Disaster
  - April 1, 2021 - Burgum Declares Statewide Wildfire Emergency
  - February 22, 2021 - Burgum Terminates Several Executive Orders Related to COVID-19 Pandemic
  - August 31, 2020 - Burgum Activates State Emergency Operations Plan for March 13, 2020 - Burgum Declares State of Emergency in Response to Public Health Crisis of COVID-19
  - October 21, 2019 - Burgum Declares Statewide Flood Emergency
  - October 11, 2019 - Burgum Activates State Emergency Operations Plan for Severe Snowstorm
  - March 27, 2019 - Burgum Declares Statewide Flood Emergency
  - March 26, 2019 - Burgum Declares Winter Storm Emergency
  - June 26, 2017 - Burgum Proclaims Statewide Fire and Drought Emergency
  - June 22, 2017 - Burgum Declares Drought Emergency

- April 13, 2015 - Dalrymple Extends the Statewide Burn Ban
- April 1, 2015 - Dalrymple Declares a Fire Emergency Exists

- 2019 North Dakota Draft Enhanced Multi-Hazard Mitigation Plan
- Earthquake Hazards and Probabilities in North Dakota
- North Dakota Department of Environment Quality, Compliance Alert, L. David Glatt, Director 10/5/2020
- North Dakota Geological Survey mapping (Scale 1:24,000)
- State Water Commission Flood Maps
- Swc.org newsletters and plan
- North Dakota Rail Study
- State Water Commission Report March 2021
- Climatic and Hydrologic Aspects of the 1988-1992 Drought and the Effect on People and Resources of North Dakota, North Dakota State Water Commission, 1994.
- North Dakota Department of Emergency Services, Hazardous Chemicals Preparedness and Response Program
- https://ndram.dwr.nd.gov
- Land Use Land Cover www.nd.gov/gis/apps/HubExplorerV2/
- N.D. Geological Survey maps,
- Game and fish reservoir maps Stanley Reservoir2003.pdf (nd.gov)
- North Dakota Department of Environmental Quality – air quality mapping
- North Dakota Department of Agriculture North Dakota Department of Agriculture
- www.stanleyhealth.org/reopening-of-services-at-the-mountrail-county-medical-center/
- North Dakota Influenza Season Final Reports
- https://www.dmr.nd.gov/ndgs/ndnotes/Earthquakes/
- North Dakota Water Commission Biennial Reports
- Department of Water Resources (nd.gov) newsletters and mapping

OTHER NORTH DAKOTA DOCUMENTS

- Multi-Hazard Mitigation Plans for McKenzie, McLean, Ward, and Williams Counties and for the Fort Berthold Reservation
- www.stanleyhealth.org/reopening-of-services-at-the-mountrail-county-medical-center/
- Unstable Ground in Western North Dakota by Donald E. Trimble, USGS 1979
- Western Water Study: North Dakota | Western Energy Alliance
- Energy–Water | Research & Expertise | EERC | University of North Dakota (undeerc.org)
- Land Use Land Cover Map 2017 N Hub Explorer

FEDERAL AGENCIES

- USDA Wildfire Risk to Communities wildfirerisk.org
- USDA 2019 Crop Disaster Loss Designations
- US Census 2010 and 2020
- US Census 2019: ACS 5-Year Estimates Subject Tables
- NOAA's National Center for Environmental Information
- NOAA Climate Prediction Center
- USACE National Directory of Dams - https://nid.sec.usace.army.mil

- USACE Missouri River Inundation Hydraulic Modeling and Mapping, 2012
- USGS 2019 Earthquake Risk Map (usgs.gov/media/images/2018-nshm-chance-shaking-image)
- DOT Crossing Inventory Data https://safetydata.fra.dot.gov/officeofsafety
- FEMA fema.gov/emergency-managers/risk-management/safe-rooms
- FEMA Emergency Action Planning (FEMA National Dam Safety Program)
- FEMA www.fema.gov/cis/ND.pdf
- FEMA - Best Available Refuge Assessment
- FEMA – Presidential Disaster Declarations 2015-2021
- FEMA - Hazard Mitigation For Natural Disasters, A Starter Guide for Water and Wastewater Utilities
- FEMA - www.fema.gov/sites/default/files/2020-11/fema_protect-your-property_severe-wind.pdf
- FEMA - Guidance for Flood Risk Analysis and Mapping, Base Level Engineering (BLE) Analysis and Mapping
- FEMA https://hazards.fema.gov/nri/report
- Federal Motor Carrier Safety Administration
- National Climatic Data Center
- www.cdc.gov/disasters/rodents.html
- www.minot.af.mil/News/Article-Display/Article/1919329/ten-thousand-rodent-intruders/

OTHER RESOURCES

- McLean County Conditions | Drought.gov
- Geology of McLean County, North Dakota, John P. Bluemle, University of North Dakota, 1971
- Garrison Dam Spillway photo, The Dickinson Press
- COVID-19 Positive Cases - New York Times graphic
- Fire Loss in the United States During 2019, September 2020. Ahrens and Evarts. National Fire Protection Association.
- National Drought Mitigation Center' https://drought.unl.edu
- silvis.forest.wisc.edu
- NFPA Standard on Mass Evacuation, Sheltering, and Re-entry Programs, 2017
- www.weatherbase.com/weather/weather.php
- www.interactivehailmaps.com
- www.wunderground.com
- www.govtech.com
- https://interactive-lightning-map.vaisala.com
- https://crops.extension,iastate.edu
- ClimateEngine.org
- www.grandforksherald.com article - In North Dakota, the Department of Information Technology (NDIT)
- www.ncdc.noaa.gov/stormeventsdriest
- www.nps.gov/subjects/nationalregister
- https://damsafety.org/dam-owners
- https://bismarcknd.gov/DocumentCenter/View/38351/urban-rodent

Appendix J

NEW MITIGATION ACTION ITEMS AND THE RELATED HAZARD(S)

NEW MITIGATION ACTION ITEMS AND THE RELATED HAZARD(S)
Information applicable to the Mitigation Actions for the county (Table 8.3-1) and those for the cities (Table 8.4-1 thru Table 8.4-11)

#	Mitigation Action	Drought	Flood		Geo-logic		Severe Summer Weather					Extreme Winter Weather				Wildland/Rural Fire	Dam Failure	Public Health		Hazardous Materials				Security		Major Urban Fire	Road/ Rail	
			Flood - Riverine	Flood - Other	Earthquake	Landslide	Hail	Heat Wave	Strong Wind	Thunder and Lightning	Tornado	Cold Wave	Ice Storm	Blizzard, Heavy Snow				Outbreak- Human	Outbreak - Agricultural	In Transit (Truck or Rail)	Pipeline	Air Force Facilities	Other Fixed Site	Active Attacker	Cyber threat		Major Road Incident	Major Rail Incident
1	Continue to support programs assisting farmer and ranchers in need during times of drought,																											
2	Review adopted floodplain ordinances																											
3	Acquire and remove repetitive loss properties from the floodplain, as needed																											
4	Drainage improvements and/or elevation for rural roads throughout the county, as needed																											
5	Continue supporting hazardous materials training for first responders																											
6	Evaluate zoning and building code tiedown requirements																											
7	Install and maintain surge protection on critical equipment																											
8	Study and support pre-arranged shelters for stranded motorists/travelers, and others.																											

NEW MITIGATION ACTION ITEMS AND THE RELATED HAZARD(S)
Information applicable to the Mitigation Actions for the county (Table 8.3-1) and those for the cities (Table 8.4-1 thru Table 8.4-11)

#	Mitigation Action	Drought	Flood		Geo-logic		Severe Summer Weather					Extreme winter weather				Dam Failure	Public Health		Hazardous Materials				Security		Major Urban Fire	Road/ Rail	
			Flood - Riverine	Flood - Other	Earthquake	Landslide	Hail	Heat Wave	Strong Wind	Thunder and Lightning	Tornado	Cold Wave	Ice Storm	Blizzard, Heavy Snow	Wildland/Rural Fire		Outbreak- Human	Outbreak - Agricultural	In Transit (Truck or Rail)	Pipeline	Air Force Facilities	Other Fixed Site	Active Attacker	Cyber threat		Major Road Incident	Major Rail Incident
9	Conduct an annual review of snow plowing priorities which include consideration of the local vulnerable population.																										
10	Continue to review construction under the North Dakota State Building Code and consider adopting fire codes and fire suppression requirements in new construction.																										
11	Continue to support the recruitment and training of volunteers to address wildland/rural fire, urban fire, and ambulance services.																										
12	Work with Rural Water to establish hydrants in areas distant from existing hydrants for fire suppression use.																										
13	In wildland-urban interface areas, consider providing vegetation management services to elderly or disabled residents who need help to remove flammable materials near their homes.																										
14	Coordinate with rural landowners to identify and gain access to water sources for fire suppression Improve inter-departmental radio communication and prepare for the rollout of Statewide Interoperability Radio Network (SIRN 2020).																										

NEW MITIGATION ACTION ITEMS AND THE RELATED HAZARD(S)
Information applicable to the Mitigation Actions for the county (Table 8.3-1) and those for the cities (Table 8.4-1 thru Table 8.4-11)

#	Mitigation Action	Drought	Flood		Geo-logic		Severe Summer Weather					Extreme winter weather				Wildland/Rural Fire	Dam Failure	Public Health		Hazardous Materials				Security		Major Urban Fire	Road/ Rail	
			Flood - Riverine	Flood - Other	Earthquake	Landslide	Hail	Heat Wave	Strong Wind	Thunder and Lightning	Tornado	Cold Wave	Ice Storm	Blizzard, Heavy Snow				Outbreak- Human	Outbreak - Agricultural	In Transit (Truck or Rail)	Pipeline	Air Force Facilities	Other Fixed Site	Active Attacker	Cyber threat		Major Road Incident	Major Rail Incident
15	Utilize a redundant and multiple methods for local warnings if primary communications are interrupted																											
16	Identify existing buildings with potential for retrofit use as tornado shelters. shelters for evacuation, or warming stations after power loss.																											
17	Continue to support mutual aid agreements and on-scene incident command.																											
18	Continue to support upgrading existing or purchase new equipment and infrastructure for emergency services including snow removal services, as needed.																											
19	Identify location and organize outreach to vulnerable populations during hazard events																											
20	Maintain an inventory of emergency generators.																											
21	To prepare for consideration of space weather in the next Plan update, include space weather in any hazard-related community survey. process																											
22	Update municipal raw water intake at Lake Sakakawea																											
23	ICS training 100 and 200 for Wilton Ambulance staff																											

Appendix K

RECORDED WEATHER EVENTS SINCE THE 2016 PLAN

McLean County Recorded Weather Events																		
	DATE	Heavy Snow/ Blizzard	Extreme Cold	High Wind	Thunder-storm	Hail	Funnel Cloud/ Tornado	Drought		DATE	Heavy Snow/ Blizzard	Extreme Cold	High Wind	Thunder-storm	Hail	Funnel Cloud/ Tornado	Drought
COLEHARBOR	7/28/2015			1					UNDERWOOD	9/6/2015			1	1			
COLEHARBOR	4/6/2016			1	1				UNDERWOOD	11/28/2016	1						
COLEHARBOR	5/25/2016						1		UNDERWOOD	1/2/2017	1						
COLEHARBOR	8/5/2019					1			UNDERWOOD	6/28/2018			1	1			
COLEHARBOR	8/5/2019			1	1				UNDERWOOD	12/26/2018	1						
COLEHARBOR	8/25/2019					1			UNDERWOOD	7/8/2019					1		
GARRIS. AIR	6/1/2015			1	1				UNDERWOOD	7/7/2020			1	1			
GARRIS. AIR	7/15/2015					1			WASHBURN	7/11/2015					1		
GARRIS. AIR	7/23/2015					1			WASHBURN	4/6/2016			1	1			
GARRIS. AIR	6/21/2016					1			WASHBURN	7/16/2016			1	1			
GARRIS. AIR	6/6/2020					1			WASHBURN	7/16/2016					1		
GARRIS. AIR	7/7/2020			1	1				WASHBURN	7/16/2016					1		
GARRISON	8/22/2015			1					WASHBURN	6/10/2017			1	1			
GARRISON	10/11/2015			1					WASHBURN	7/14/2017			1	1			
GARRISON	11/18/2015			1					WASHBURN	7/21/2017					1		
GARRISON	2/6/2016			1					WASHBURN	6/29/2018			1	1			
GARRISON	4/6/2016			1	1				WASHBURN	7/7/2020			1	1			

McLean County Recorded Weather Events																		
	DATE	Heavy Snow/ Blizzard	Extreme Cold	High Wind	Thunder-storm	Hail	Funnel Cloud/ Tornado	Drought		DATE	Heavy Snow/ Blizzard	Extreme Cold	High Wind	Thunder-storm	Hail	Funnel Cloud/ Tornado	Drought
GARRISON	6/9/2016			1	1				WILTON	7/11/2015					1		
GARRISON	6/11/2016			1					WILTON	7/11/2015					1		
GARRISON	1/30/2017			1					WILTON	7/23/2015			1	1			
GARRISON	3/7/2017			1					WILTON	7/3/2018			1	1			
GARRISON	7/16/2017			1	1				WILTON	9/2/2020			1				
GARRISON	3/5/2018	1															
GARRISON	5/27/2018			1	1				COUNTY	2/22/2015		1					
GARRISON	6/1/2018			1	1				COUNTY	12/5/2016	1						
GARRISON	7/10/2018			1					COUNTY	12/25/2016	1						
GARRISON	1/27/2019			1	1				COUNTY	3/23/2018	1						
GARRISON	7/7/2020			1					COUNTY	1/29/2019		1					
GARRISON	10/31/2020			1					COUNTY	10/9/2019	1						
GARRISON	1/20/2021			1					COUNTY	10/10/2019	1						
GARRISON	2/22/2021			1					COUNTY	11/30/2019	1						
GARRISON	3/29/2021			1					COUNTY	3/1/2020			1				
GARRISON	8/12/2019					1			COUNTY	12/22/2020			1				
GARRISON	6/5/2021			1	1				COUNTY	1/13/2021			1				
MAX	7/20/2020						1		COUNTY	2/5/2021		1					
MAX	6/12/2016					1			COUNTY	3/16/2021							1
MAX	7/21/2017					1			COUNTY	4/1/2021							1
MAX	12/20/2017	1							COUNTY	5/1/2021							1

McLean County Recorded Weather Events																		
	DATE	Heavy Snow/ Blizzard	Extreme Cold	High Wind	Thunder-storm	Hail	Funnel Cloud/ Tornado	Drought		DATE	Heavy Snow/ Blizzard	Extreme Cold	High Wind	Thunder-storm	Hail	Funnel Cloud/ Tornado	Drought
MAX	2/3/2019	1							COUNTY	6/1/2021							1
MAX	8/12/2019						1		COUNTY	7/1/2021							1
MERCER	6/28/2018			1	1				EMMET	7/23/2015					1		
MERCER	6/29/2018			1	1				EMMET	6/11/2016			1	1			
MERCER	7/17/2020					1			EMMET	6/11/2021			1	1			
RIVERDALE	7/23/2015			1	1				FALKIRK	6/28/2018			1	1			
RIVERDALE	6/28/2020					1			FALKIRK	9/2/2019					1		
TURTLE LAKE	7/25/2015					1			RAUB	6/1/2015					1		
TURTLE LAKE	6/9/2017					1			RAUB	9/2/2019			1	1			
TURTLE LAKE	6/9/2017					1			RAUB	7/20/2020						1	
TURTLE LAKE	6/28/2018			1	1				ROSEGLEN	6/11/2016			1	1			
TURTLE LAKE	7/8/2019					1			ROSEGLEN	6/1/2018					1		
TURTLE LAKE	8/5/2019			1	1				ROSEGLEN	6/28/2018							
TURTLE LAKE	8/5/2019					1			ROSEGLEN	7/20/2020						1	
TURTLE LAKE	6/30/2020			1	1				ROSEGLEN	6/1/2015						1	5
TURTLE LAKE	7/7/2020			1	1				RUSO	7/10/2016					1		
UNDERWOOD	7/23/2015			1	1				RUSO	7/17/2020					1		
UNDERWOOD	7/23/2015			1	1												

Adoption Resolutions

COUNTY

Adopted November 15, 2022

Office of
Noelle Kroll
Director of Disaster
Emergency Services
nkroll@nd.gov

McLean County
STATE OF NORTH DAKOTA

712 5th Ave
P.O. Box 1108
Washburn, ND 58577-1108
Phone (701) 462-8541
Fax (701) 462-3523
www.mcleancountynd.gov

McLean County Multi-Hazard Mitigation Plan

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

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

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

Signed this 15th day of November, 2022.

Attested: Beth A. Knutson
Beth A. Knutson, Auditor

Signed:
Steve Lee, Chairperson
McLean County Commission

CITY OF BENEDICT

Adopted September 13, 2022

McLean County Multi-Hazard Mitigation Plan

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

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

Now, therefore, be it resolved, that the City of Benedict adopts the McLean County Multi-Hazard Mitigation Plan.

Signed this 13th day of September, 2022.

Attested: Lisa Tomlinson
Name: Lisa Tomlinson (print)
Benedict City Auditor

Signed:
Name: Becky Tebby (print)
Benedict City Mayor

CITY OF BUTTE
Adopted November 7, 2022

McLean County Multi-Hazard Mitigation Plan

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

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

Now, therefore, be it resolved, that the City of Butte adopts the McLean County Multi-Hazard Mitigation Plan as approved by the Federal Emergency Management Agency.

Signed this 7th day of November 2022.

Attested: _____ Signed: _____

Auditor Mayor

CITY OF COLEHARBOR
Adopted September 13, 2022

McLean County Multi-Hazard Mitigation Plan

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

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

Now, therefore, be it resolved, that the City of Coleharbor adopts the McLean County Multi-Hazard Mitigation Plan.

Signed this 12 day of September, 2022.

Attested: _____ Signed: _____

Name: Sunshine Cleveland Name: _____

(print)

Coleharbor City Auditor Coleharbor City Mayor

CITY OF GAR RISON
Adopted September 7, 2022

McLean County Multi-Hazard Mitigation Plan

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

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

Now, therefore, be it resolved, that the City of Garrison adopts the McLean County Multi-Hazard Mitigation Plan.

Signed this 7 day of September, 2022.

Attested: Diane Affeldt Signed Stu Merry

Name: Diane Affeldt (print) Name: Stu Merry
Garrison City Auditor Garrison City Mayor

CITY OF MAX
Adopted September 8, 2022

McLean County Multi-Hazard Mitigation Plan

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

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

Now, therefore, be it resolved, that the City of Max adopts the McLean County Multi-Hazard Mitigation Plan.

Signed this 8th day of September, 2022.

Attested: Anita Porter Signed:

Name: ANITA PORTER (print) Name: Aaron Zahg (print)
Max City Auditor Max City Mayor

CITY OF MERCER
Adopted November 8, 2022

McLean County Multi-Hazard Mitigation Plan

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

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

Now, therefore, be it resolved, that the City of Mercer adopts the McLean County Multi-Hazard Mitigation Plan as approved by the Federal Emergency Management Agency.

Signed this 8 day of Nov., 2022.

Attested: Tonya Wellington Signed: Jim Pruitsky
Auditor Mayor

CITY OF RIVERDALE
Adopted September 12, 2022

McLean County Multi-Hazard Mitigation Plan

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

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

Now, therefore, be it resolved, that he City of Riverdale adopts the McLean County Multi-Hazard Mitigation Plan.

Signed this 12 day of September, 2022.

Attested: Del Kolke Signed:

Name: Del Kolke (print) Name: Alex Taylor (print)
Riverdale City Auditor Riverdale City Mayor

CITY OF RUSO

Adopted August 18, 2022

McLean County Multi-Hazard Mitigation Plan

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

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

Now, therefore, be it resolved, that the city of Ruso adopts the McLean County Multi-Hazard Mitigation Plan.

Signed this 18 day of ~~September~~ August, 2022. Mayor Ruso ND Greg Schmeltz

CITY OF TURTLE LAKE

Adopted September 12, 2022

McLean County Multi-Hazard Mitigation Plan

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

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

Now, therefore, be it resolved, that the City of Turtle Lake adopts the McLean County Multi-Hazard Mitigation Plan.

Signed this 12th day of September, 2022.

Attested: Dawn Jason — Signed: Dianne Zenker

Name: Dawn Jason (print) — Turtle Lake City Auditor

Name: Dianne Zenker (print) — Turtle Lake City Mayor

CITY OF UNDERWOOD
Adopted August 22, 2022

McLean County Multi-Hazard Mitigation Plan

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

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

Now, therefore, be it resolved, that the City of Underwood adopts the McLean County Multi-Hazard Mitigation Plan.

Signed this 22 day of ~~September~~ August, 2022.

Attested: _____ Signed: _____

Name: _____ (print) Name: Leon Weisenburger (print)
Underwood City Auditor Underwood City Mayor

CITY OF WASHBURN
Adopted September 12, 2022

McLean County Multi-Hazard Mitigation Plan

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

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

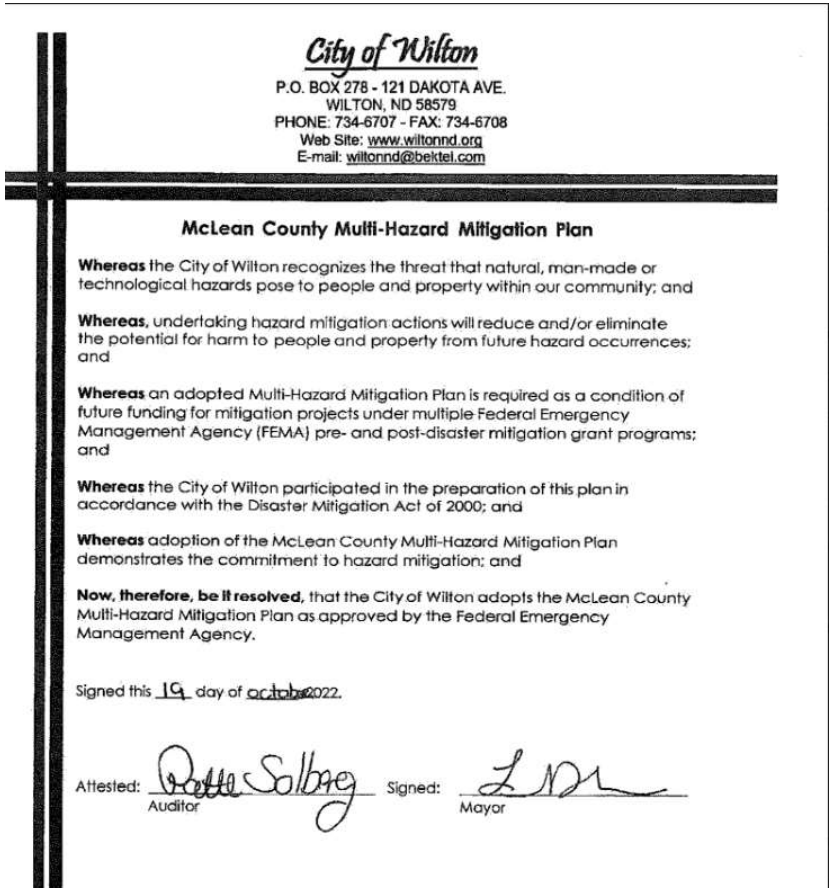
Now, therefore, be it resolved, that the City of Washburn adopts the McLean County Multi-Hazard Mitigation Plan.

Signed this 12th day of September, 2022.

Attested: _____ Signed: _____

Name: Chelsey Brandt (print) Name: Larry Thomas (print)
Washburn City Auditor Washburn City Mayor

CITY OF WILTON
Adopted October 19, 2022



City of Wilton

P.O. BOX 278 - 121 DAKOTA AVE.
WILTON, ND 58579
PHONE: 734-6707 - FAX: 734-6708
Web Site: www.wiltonnd.org
E-mail: wiltonnd@bektel.com

McLean 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 McLean County Multi-Hazard Mitigation Plan demonstrates the commitment to hazard mitigation; and

Now, therefore, be it resolved, that the City of Wilton adopts the McLean County Multi-Hazard Mitigation Plan as approved by the Federal Emergency Management Agency.

Signed this 19 day of October 2022.

Attested: Bette Solberg Auditor Signed: L N Mayor

McLean County, North Dakota
MULTI-HAZARD MITIGATION PLAN
November 2022 Update