

CHAPTER 1: Introduction

Hazard Mitigation Planning

Natural, human-caused, and technological hazards have a direct impact on residents and property in Mercer 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. Mitigation actions may be implemented before, during or after an event; however, they are most successful when based on a long-term plan developed before a disaster occurs. Successful mitigation actions must be practical, cost-effective, politically acceptable and supported by a sound planning process.

This plan is organized into five chapters:

CHAPTER 1: INTRODUCTION

- General plan overview

CHAPTER 2: STUDY AREA BACKGROUND

- Background information about the demographics, economy, geography, weather and climate of the County and each jurisdiction

CHAPTER 3: HAZARD RISKS AND VULNERABILITIES

- Hazard profiles including their historical frequency, assessment of risks and vulnerabilities, identification of key issues and potential action items

CHAPTER 4: MITIGATION STRATEGY

- Identification of goals and action items to mitigate risks of hazards for each jurisdiction

CHAPTER 5: PLAN MAINTENANCE

- Procedures for monitoring, evaluating and updating the plan

Purpose

The purpose of the plan is to promote sound public policy designed to protect citizens, critical facilities, infrastructure, private property and the environment from natural and 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 and businesses.
- Increasing education and awareness of threats and hazards, as well as their risks.
- Communication priorities to state and federal officials.
- Aligning risk reduction with other community objectives.

The plan includes a risk and vulnerability assessment that residents, organizations, local governments and other interested participants can utilize when planning for hazards. The plan also includes a description of mitigation projects 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 Assistance Program (HMA). HMA offers three programs to help fund implementation of mitigation projects: the Hazard Mitigation Grant Program (HMGP), Building Resilient Infrastructure and Communities (BRIC), and Flood Mitigation Assistance (FMA) programs.

Authority

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 Multi-Hazard Mitigation Plan to receive funding for certain types of non-emergency disaster assistance, including mitigation projects.

This plan is an update of Mercer County's 2016 Multi-Hazard Mitigation Plan. Hazard mitigation plans are required by FEMA to be updated every five years to maintain the jurisdiction's eligibility for grant funding.

Jurisdictions that participated in the planning process and are adopting the plan by the official method of approval based on legal authority are listed in Table 1.1. To be eligible for future funds through the Hazard Mitigation Grant Program (HMGP), Building Resilient Infrastructure and Communities (BRIC) and Flood Mitigation Assistance program, jurisdictions must either adopt the plan and participate in the planning process or be sponsored by a

jurisdiction that has done so. Approval and adoption documentation can be found in Appendix A.

Table 1.1 – Adopting Jurisdictions	
Jurisdiction	Adoption Date
Mercer County	
City of Beulah	
City of Golden Valley	
City of Hazen	
City of Pick City	
City of Stanton	
City of Zap	

The 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 potential consequences, including effects on critical facilities.
- **Development of mitigation strategies:** Determining priorities and ways to minimize effects of identified hazards.
- **Plan implementation and progress monitoring:** Implementing the plan brings it to life and periodic monitoring ensures the plan remains relevant as conditions change.

The overall planning process for the development of the Mercer County MHMP included the following activities:

- Consultant and emergency manager discussed approach to public engagement and planning team role.
- Emergency manager held a kickoff meeting with the Planning Team to review the process and discuss hazards documented in the last MHMP.
- Emergency manager conducted Community meetings to explain objectives and process, and to obtain feedback on hazard concerns and priorities, and potential mitigation actions.
- Consultant and emergency manager develop community questionnaire. Emergency manager publicizes the survey.

- Emergency manager conducted Planning Team meeting to review and confirm goals, assess past mitigation action status, and discuss priority hazards.
- Consultant develops initial risk assessment based on secondary sources and early input from emergency manager and Planning Team and Community meetings.
- Consultant works with emergency manager to obtain additional information pertaining to past hazard events.
- Consultant completes additional outreach and research to complete risk assessment and analysis.
- Emergency manager and consultant review past action item status, community survey results and develop draft mitigation action items.
- Draft mitigation actions were discussed with the Planning Team to obtain feedback and additional potential mitigation actions.
- Consultant works with emergency manager to finalize mitigation action item details.
- Emergency manager and consultant review and revise draft implementation and progress monitoring plan.
- Draft plan was presented to Planning Team for review and comment.
- Draft plan was presented for review and comment to communities at a public meeting.

Public involvement for the plan included community meetings, consultations with representatives of each jurisdiction, and three Planning Team meetings. Local planning documents were also reviewed and incorporated into the document when applicable. Additional details about the planning process can be found in Appendix B.

Acknowledgements

Numerous elected officials, City and County staff, and stakeholders participated in the planning process. The project would not have been possible without the assistance of Planning Team members (identified in Appendix B) and stakeholders who provided comments. The project was primarily funded with a grant awarded through the FEMA Pre-Disaster Mitigation Program, administered by the North Dakota Department of Emergency Services (DES). Guidance from state and FEMA staff was instrumental in completing the project.

Chapter 2: Study Area Background

Jurisdictional Information

Mercer County is located in west central North Dakota, directly south of Lake Sakakawea. The total county land area is 667,494 acres, making it the state's 35th largest county, slightly smaller than the median county size of 739,000 acres. The county includes six incorporated cities: Beulah, Golden Valley, Hazen, Pick City, Stanton, and Zap. Stanton is the county seat and Beulah has the largest population. A portion of the Fort Berthold Reservation is located in the northwest corner of the county.

A general map of the county, including major features and neighboring jurisdictions, is shown in Figure 2.2 on the following page. Major roadways include US Highway 200, and State Highways 31 and 49. The BNSF railroad from Stanton westward through Hazen and Beulah with branch lines running northward and southward from Beulah. Major waterways include the Missouri River on the east, Lake Sakakawea on the north, and the Knife River which traverses from west to east through central part of the county before emptying into the Missouri River. Lake Sakakawea was created by the 1956 completion of the Garrison Dam which impounds waters from the Missouri River. There are 75 recreation areas established around Lake Sakakawea including Lake Sakakawea State Park located near Pick City in the county's northeastern corner.

Population and Demographics

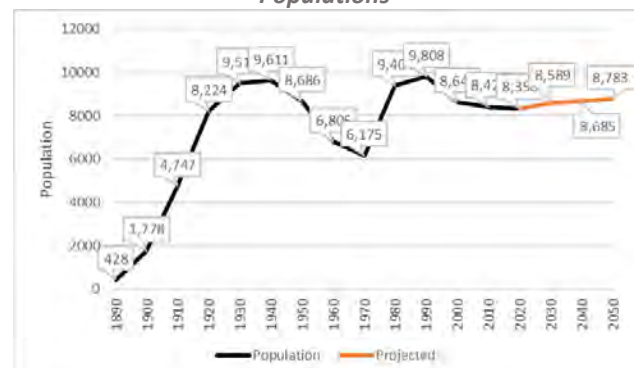
Summarized demographic information for Mercer County and North Dakota is shown in Table 2.1. The county is generally older than the state overall, with a median age of 43.4 and 21.0 percent of residents at least 65 years of age. The county's population density of 8.1 persons per square mile is approximately 75% of the statewide density. The county's median income is significantly greater than the state's while the poverty level is slightly less than the state's.

Historic population for the county is shown in Figure 2.1. The county had an early peak in population in 1940 and then declined until the 1970's. A surging energy industry resulted in a higher peak in 1990. The most recent Census population figure is 8,350 from the 2020 decennial census. Woods and Poole project that the County will gradually grow over the next 30 years. Recent population trends for each city are summarized in Table 2.2. Four of the six cities lost population from 2000 to 2010, and three cities lost population from 2010 to 2020.

	Mercer County	North Dakota
<i>Population</i>	8,350	779,094
<i>Persons under 5 years</i>	5.9%	7.1%
<i>Persons under 18 years</i>	23.2%	23.6%
<i>Persons 65 years and over</i>	21.0%	15.7%
<i>Median Age</i>	43.4	35.3
<i>Persons per square mile</i>	8.1	11.0
<i>White</i>	94.2%	83.7%
<i>Hispanic or Latino</i>	3.0%	4.1%
<i>American Indian or Alaska Native</i>	2.9%	5.6%
<i>Black or African American</i>	0.7%	3.4%
<i>Asian</i>	0.5%	1.7%
<i>Two or More Races</i>	1.7 %	2.3%
<i>Foreign born</i>	1.2%	4.1%
<i>Language other than English spoken at home</i>	6.7%	6.0%
<i>High school graduates, age 25+</i>	91.4%	92.6%
<i>Median household income</i>	\$82,181	\$64,894
<i>Persons in poverty</i>	8.0%	10.6%
<i>Average household size (persons)</i>	2.24	2.3

Source: US Census Bureau; 2020 Decennial Census used for population; 2020 Population Estimates Program used for age; 2015-2019 American Community Survey used for other demographic information

Figure 2.1 – Mercer County Historical and Projected Populations



Source: US Census Bureau (Historical and 2020); Woods and Poole (2030-2050 Projected)

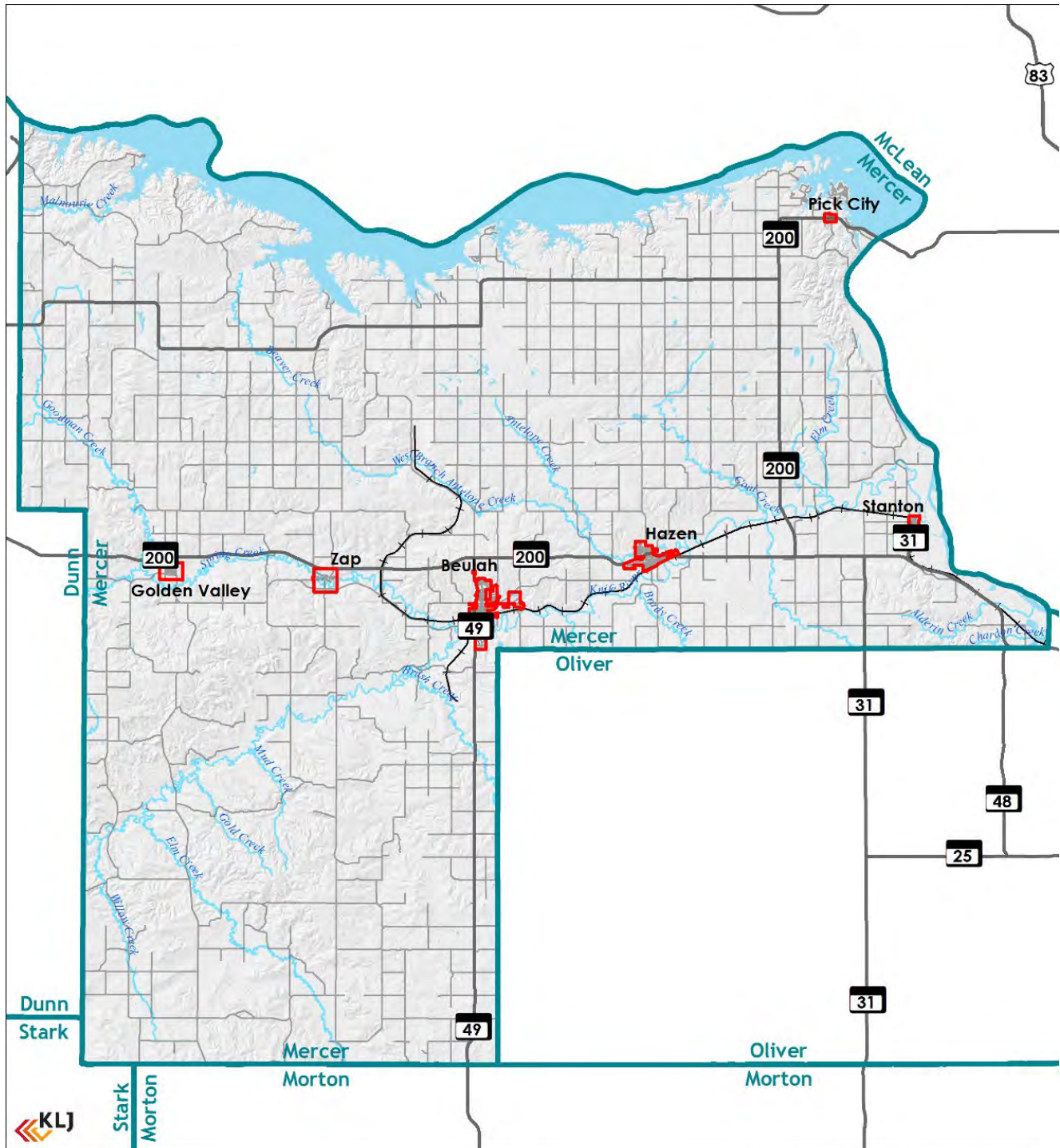


Figure 2.2
Study Area

- ▬ County Boundaries
- ▬ Incorporated City Boundaries
- ▬ State & Federal Roads
- ▬ Other Roads
- +— Railroads

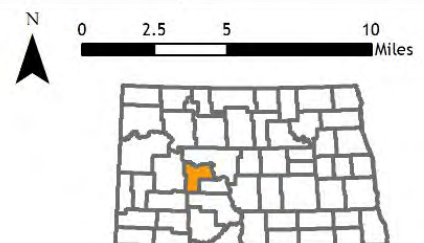


Table 2.2 – Incorporated City Population Trends

City	2000	2010	% Change 2000-2010	2020	% Change 2010-2020
Beulah	3,152	3,121	-1.0%	3,058	-2.1%
Golden Valley	183	182	-0.5%	191	4.7%
Hazen	2,457	2,411	-1.9%	2,281	-5.7%
Pick City	166	123	-25.9%	123	0.0%
Stanton	345	366	6.1%	368	0.5%
Zap	231	237	2.6%	221	-7.2%

Source: US Census Bureau Decennial Census: 2000, 2010 & 2020

Climate and Weather

Aggregated weather statistics for the county are shown in Table 2.3. Weather extremes in the county are shown in Table 2.4. The NWS Cooperative Network Weather Station in Beulah is used for aggregate data because it has the longest available period of record in the county. Additional weather statistics can be found in Appendix C.

Table 2.3 – Mercer County Aggregated Weather Statistics

	Temperature (°F)		Precipitation (In.)	Snow Fall (In.)
	Avg Daily Max	Avg Daily Min	Avg Monthly	Avg Monthly
Jan	21.0	-1.0	0.37	5.3
Feb	27.2	5.0	0.40	4.8
Mar	39.6	16.5	0.68	5.2
Apr	56.4	29.0	1.56	3.0
May	69.2	40.5	2.39	0.3
Jun	77.7	50.3	3.58	0.0
Jul	85.0	55.0	2.43	0.0
Aug	84.3	52.8	1.76	0.0
Sep	72.5	41.9	1.46	0.0
Oct	59.5	30.9	1.00	1.4
Nov	39.2	16.8	0.62	4.5
Dec	26.6	5.4	0.35	4.8
Ann	54.9	28.6	16.58	29.3

Note: Aggregated Monthly Statistics 1/1/1954-12/31/2021

Source: NWS Cooperative Network Weather Station, Beulah 1 W (High Plains Regional Climate Center)

Table 2.4 – Towner County Weather Extremes

Highest Max Temperature	109° F	7/15/2002
Lowest Min Temperature	-50° F	1/13/1916
Highest Daily Precipitation	5.0"	6/17/1939
Greatest Daily Snowfall	15.0"	10/28/1991
Lowest Annual Precipitation	6.53"	1934

Economy

The energy industry is the largest production sector of the Mercer County economy. The Utilities and Extraction industries combine to make up nearly 62% of the total wages in the county. Countywide workforce data is compiled by the Job Service North Dakota Labor Market Information Center. Table 2.5 identifies major employers in the region based on available LMI data and community estimates.

Table 2.5 Major Employers

Dakota Gasification	Utilities
The Coteau Properties Company	Mining
Basin Electric Power Coop	Utilities
Sakakawea Medical Center	Healthcare & Social Assist
Beulah Public School District	Education
Knife River Care Center	Healthcare & Social Assist
Coal Country Community Health Center	Healthcare & Social Assist
Hazen Public School District	Education
Mercer County	Executive, Legislative and General Government

Note: Suppressed Employers Omitted

Source: ND LMI 2020, Mercer County Economic Development

The agriculture industry is tracked by annual survey and a 5-year census through the National Agricultural Statistics Service. Spring wheat was the most common crop, accounting for about 40 percent of the county's harvested acreage in 2017. Cattle and calves make up the county's livestock industry. The USDA Census of Agriculture indicates that in 2017 the total value of crops sold in the county was \$25,030,000 and the total value of livestock was \$32,238,000. Summarized 2017 Census of Agriculture information is shown in Table 2.6.

Table 2.6 – Mercer County Agriculture Summary

Crop	Acres Harvested	Production
<i>Spring Wheat (excl Durum)</i>	34,406	973,646 bu
<i>Soybeans</i>	7,989	222,714 bu
<i>Hay, Haylage, Silage</i>	63,307	55,721 tons
<i>Corn, Grain</i>	15,788	1,183,853 bu
<i>Other Wheat</i>	8,016	217,738 bu
<i>Barley</i>	6,977	298,248 bu
<i>Sunflowers</i>	10,531	19,295,997 lbs
<i>Oats</i>	3,553	163,182 bu
Livestock	Inventory	
<i>Cattle and Calves</i>	45,225	
<i>Horses</i>	770	

Source: USDA National Agricultural Statistics Service 2017 Census of Agriculture

CHAPTER 3: Hazard Risks and Vulnerabilities

Hazards Overview

DISASTER DECLARATIONS

Mercer County is subject to several natural and human-caused or technological hazards. Many hazards are capable of creating significant levels of damage and having a negative effect on the local economy.

Table 3.1 lists Presidential Disaster Declarations for Mercer County from 1953 to 2021. There were 64 unique Presidential Disaster Declarations in North Dakota during the period, and Mercer County was designated for 21 of them. The most recent declared disasters pertained to the COVID-19 pandemic in 2020.

PROFILED HAZARDS

The 2019 State of North Dakota Enhanced Mission Area Operations Plan served as the basis for selecting the hazards profiled in this chapter. Homeland Security, identified in the 2014 statewide Multi-Hazard Mitigation Plan, was replaced by Civil Disturbance, Cyber Attack, and Criminal Terrorist National Attack which are profiled as separate hazards in the 2019 Enhanced Plan. Space Weather was also new in the 2019 Enhanced Plan. In this plan these hazards are profiled in a limited manner due to the low perceived level of impact or the perceived low potential to mitigate impacts. Wildland Fire and Urban Fire (including structural collapse) were combined into a single Fire hazard in the 2019 Enhanced Plan; but they are retained as separate hazards in this very rural region due to the very different impacts and responses needed for each. References to shortages and outage of critical materials from the 2014 Plan were eliminated because they are more impacts of hazards than actual hazards. Finally, Communicable Diseases from the 2014 Plan has been renamed Infectious Diseases.

Profiled natural hazards:

- Drought
- Flood
- Geologic Hazards
- Severe Summer Weather
- Severe Winter Weather
- Wildland Fire
- Space Weather

Profiled human-caused/technological hazards:

- Dam Failure
- Hazardous Materials Release
- Infectious Disease/Pest Infestation
- Transportation Incident
- Urban Fire
- Cyber Attack
- Civil Disturbance
- Criminal Terrorist Nation Attack

Table 3.1 – Mercer County Presidential Disaster Declarations, 1953-2021

Year	Declaration	Hazard(s)
2020	DR 4509	Pandemic
2020	EM 3477	COVID-19
2011	DR 1981	Flooding
2011	EM 3318	Flooding
2010	DR 1907	Flooding
2010	DR 1901	Severe Winter Storm
2010	EM 3309	Flooding
2010	DR 1879	Severe Winter Storm
2009	DR 1829	Severe Storms & Flooding
2005	DR 1616	Severe Winter Storm & Snow
2004	EM 3196	Snow
1999	DR 1279	Severe Storms & Flooding
1997	DR 1174	Severe Storms & Flooding
1997	DR 1157	Severe Winter Storms
1993	DR 1001	Severe Summer Storms & Flooding
1979	DR 581	Severe Winter Storm & Flooding
1978	DR 554	Severe Summer Storm & Flooding
1976	EM 3016	Drought
1970	DR 287	Severe Summer Storm & Flooding
1969	DR 256	Flooding
1966	DR 220	Severe Summer Storm & Flooding

Source: FEMA

HAZARD ANALYSIS

Natural hazards are listed first, followed by human-caused/technological hazards. Each profiled hazard includes the following information:

- **Hazard Profile:** Definition and general explanation of the hazard.
- **History:** Previous occurrences of the hazard.
- **Probability:** Estimated frequency of occurrence.
- **Location:** Identification of hazard location to specific parts of the county or as county-wide.
- **Extent:** The magnitude of the hazard.
- **Vulnerability:** Specific risk for the jurisdiction, including impacts to population, property, critical facilities, and economy.
- **Existing Capabilities:** Current actions taken by the jurisdiction to address the hazard.
- **Key Issues:** The primary issues that affect the jurisdiction and the basis for determining action items.
- **Potential Action Items:** A preliminary list of action items to address key issues. These items are refined and prioritized in Chapter 4.

The profiles include an analysis of the probability and impact of each event to determine overall hazard risk. These terms are defined similarly to their use in the 2019 Enhanced Plan. Probability is the likelihood that the hazard event will occur within the county in future years. Impact, and the extent to which critical facilities that could be significantly affected by the hazard event in a worst-case scenario. Criteria used to determine probability, impact, and overall risk class are shown below. Historical data from previous events was utilized to determine probability and magnitude when possible. Risk class is determined for the rural county (unincorporated areas) and each incorporated city. Table 3.2 illustrates the relationship between probability, impact, and risk class.

Probability

Low: less than 10 percent probability in the next year
 Moderate: 10-100 percent probability in the next year
 High: more than 100 percent probability in the next year

Impact

Low: less than 5 percent of jurisdiction exposed
 Moderate: 5-10 percent of jurisdiction exposed
 High: more than 10 percent of jurisdiction exposed

Risk Class

Low: at most either impact or probability are considered moderate, but not both

Moderate: above the low risk class, while at most either impact or probability are considered high, but not both

High: above the moderate risk class, while at least either impact or probability are considered high

Table 3.2 - Risk Class Determination Criteria

		Impact		
		Low	Moderate	High
Probability	Low	Low	Low	Moderate
	Moderate	Low	Moderate	High
	High	Moderate	High	High

Hazard statistics for recent years are provided from the National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center's Storm Data and Unusual Weather Phenomena database. The Storm Data and Unusual Weather Phenomenon database provides a comprehensive list of weather events along with vital information about each event. Information from the database is provided in the corresponding hazard profiles and Appendix C. For Mercer County, the database includes information about flooding, severe summer weather and severe winter weather. Statistics for other hazards are provided by a variety of sources, as noted in each corresponding profile.

Drought

All Jurisdictions

Overall Risk: Moderate

Probability: Moderate (once per decade, approximately 10% to 20% annual probability)

Impact: Moderate (economic impact on entire county)

Seasonal Pattern

None, but impacts may be greater during Spring and Summer

Duration

Months/Years

Primary Impacts

Agricultural loss (crops, livestock)

Economic loss

Increased fire potential

Loss of potable water

Pest infestation

HAZARD PROFILE

Drought is generally defined as a deficiency of precipitation over an extended 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. It is a normal, recurrent phenomenon that takes place in nearly all climate zones. Droughts appear gradually, and it is often difficult to pinpoint their beginning and end. Droughts can last multiple years, and even persist over decades. Significant droughts in North Dakota occur approximately once per decade. Previous significant droughts covering more than 50% of the state occurred in the late 1910's, 1930s, 1950s, 1960s, mid-late 1970s, early 1980s, 1988-1991, 2007-2008, 2017-2018 and 2020-2021.

Droughts are often measured by impacts; most notably agricultural damage and municipal water supply shortage.

The impacts are highly variable based on time of year, 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.

HISTORY AND EXTENT

Mercer County was included in one drought-related Presidential Disaster Declaration between 1953 and 2021.

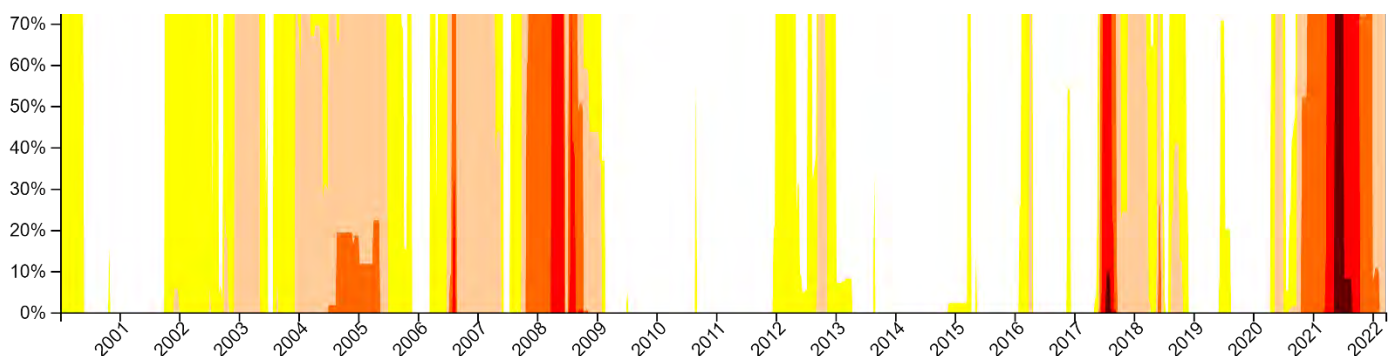
Historic trends show that wetter-than-normal periods tend to alternate with drier-than-normal periods. The average annual precipitation in Mercer County is 16.6 inches as recorded at the National Weather Service Cooperative Network weather station. The county's lowest annual precipitation is 6.53 inches which was recorded in 1934.

Figure 3.1 illustrates the percent of area and intensity of drought conditions since 2000 in Mercer County. Yellow indicates abnormally dry conditions. The red and brown colors indicate extreme and exceptional drought conditions, respectively. The chart shows that widespread extreme drought occurred four times during that time period.

The most recent severe drought began in the fall of 2020 and became an extreme and exceptional drought through most of 2021. This is the first time in the last 20 years when parts of Mercer County experienced "exceptional drought" status. This level on the drought scale is a very rare occurrence, happening less than 2% of the time. Impacts of this exceptional drought included widespread crop and pasture losses, and shortages of water in reservoirs, streams, and wells. The County was designated as a Primary Natural Disaster Area due to the drought that began in April 2020.

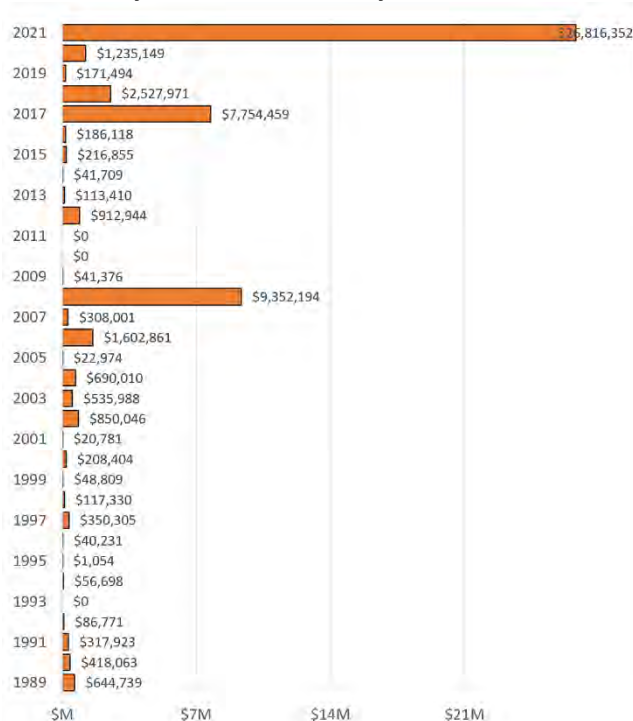
Historical drought occurrences can also be measured by looking at impacts. Federal indemnity programs provide financial assistance to help reduce the impact of drought-related agricultural losses. Figure 3.2 shows indemnity

Figure 3.1 – Mercer County Drought Percent of Area and Intensity of Conditions (2000-2021)



payments for Mercer County from 1989-2021. The figure shows that 2021 had the largest drought indemnity payments during the time period with over \$26,000,000. The years 2008 and 2017 also had drought related payments in excess of \$7,000,000.

Figure 3.2 – Drought-Related Federal Indemnity Payments, Mercer County, 1989-2021



Source: National Drought Mitigation Center

PROBABILITY

It is difficult to predict when a drought will appear. Historic trends show that wetter-than-normal periods tend to alternate with drier-than-normal periods. It is important to note, however, that numerous factors beyond rainfall contribute to drought status, which can make it difficult to predict and classify droughts. Based on previous regional trends, a severe drought can be expected approximately once or twice per decade.

LOCATION

Drought occurs at a regional level and is not a micro-climatic event. It generally occurs across the entire geographical area encompassed by a county. All parts of Mercer County are at equal risk from drought.

VULNERABILITY

Population

- Drought has no direct impact on human life, but it greatly increases the risk of wildfire, which is a potentially life-threatening hazard. Drought accompanied by high temperatures can increase the threat of heat-related illness for persons who spend a significant amount of time outdoors or do not have adequately-cooled homes. The highest recorded temperature in the county (at the Zap monitoring station) was 109 degrees Fahrenheit recorded in July 2002. Elderly persons are at increased risk of heat-related illness. Approximately 1,754 residents in the county are 65 years of age or older. The estimated number of residents age 65 or older for each jurisdiction are summarized below.

- Beulah: 428 residents
- Golden Valley: 46 residents
- Hazen: 297 residents
- Pick City: 54 residents
- Stanton: 85 residents
- Zap: 53 residents
- Rural Mercer County: 791 residents

- Prolonged drought could affect water supplies. Bottled water could be brought in as an emergency measure, but a lack of household water could create health and sanitation issues for residents. Beulah has its own municipal water system with the means to deliver it to Zap in the event of an emergency. Pick City is part of the Northwest Consortium water supply district. The remaining cities and many rural residents are connected to Southwest Water Authority. Some rural residents have their own wells.

Property

- Drought can result in significant loss of land and non-land property value for farmers and ranchers. During 2008 drought, many rural wells experienced water shortage issues. Beyond agricultural impacts, there is also a greater threat of structure damage in drought-affected areas, as drought increases the risk of wildfire and may create water shortages that inhibit adequate fire response. Structure vulnerability from wildfire is discussed in more detail in the wildland fire section of this chapter.

Critical Facilities

- No critical facility in the county is physically impacted by drought.

Economy

- Agriculture is a significant economic driver in the county, and the economic success of each city ultimately relies on a healthy agriculture industry. Drought can have a significant economic impact on agriculture and related industries. Federal indemnity payments, previously shown in Figure 3.2, are an indicator of drought-related agricultural losses. Since 1989, the years with the greatest payments was 2008, 2017, and 2021 with an average of over \$1.7 million paid annually by the USDA to reduce the economic impact of drought.
- The drought-related crop insurance payments in Mercer County from 1989 to 2021 totaled \$55,691,018. Based on a statewide rate of 89 percent of crops being insured, total estimated damages for the County were \$62,574,178 over the time period.
- The direct economic loss of drought for livestock producers is difficult to measure. Cattle and calve numbers regularly fluctuate based on a wide number of factors. Impacts on livestock producers include reduced rangeland productivity, high cost/unavailability of water for livestock, disruption of reproductive cycles and the cost of finding supplemental feed or pasture.
- *Potential Action Item:* Develop emergency response plan that includes coordination with local livestock producers.

Future Development

- Public water systems are monitored by the North Dakota Department of Health, and water permit applications are maintained by the North Dakota Department of Water Resources and US Army Corps of Engineers.

EXISTING CAPABILITIES

The USDA Farm Service Agency and North Dakota State University Extension both have field offices located in Beulah. Both offices offer general education relating to drought management best practices. The USDA Farm Service Agency field office assists with the distribution of drought indemnity payments to agricultural producers. No jurisdiction has emergency drought procedures in place.

KEY ISSUES AND POTENTIAL ACTION ITEMS

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

- *Potential Action Item:* Continue supporting the USDA Farm Service Agency and North Dakota State University Extension and provide assistance as needed to local farmers and ranchers.

Flood

Rural County

Overall Risk: High

Probability: Moderate. 56% Chance Per Year County-Wide

Impact: High

Beulah

Overall Risk: High

Probability: Moderate

Impact: High

Golden Valley

Overall Risk: Low

Probability: Moderate

Impact: Moderate

Hazen

Overall Risk: Moderate

Probability: Moderate

Impact: Moderate

Pick City

Overall Risk: Low

Probability: Moderate

Impact: Low

Stanton

Overall Risk: Low

Probability: Moderate

Impact: Low

Zap

Overall Risk: High

Probability: Moderate

Impact: High

Seasonal Pattern

March – October

Duration

One week

Primary Impacts

Agricultural loss (crops, livestock)

Blocked roads

Economic loss

Human loss and injuries

Localized evacuation

Property damage or loss

Release of hazardous materials

HAZARD PROFILE

Primary causes of flooding in North Dakota include heavy rain/flash flooding, rapid snowmelt/ice jams and increased seasonal moisture. Flooding can occur in riverine zones or flat areas that lack adequate drainage.

Typical insurance policies do not cover flood damages, so FEMA created the National Flood Insurance Program (NFIP) to provide flood insurance for property owners. The NFIP makes flood insurance available to residents in NFIP-participating communities that adopt and enforce floodplain management ordinances and follow other basic requirements.

A Flood Insurance Rate Map (FIRM) is created to determine flood insurance rates for each participating community. The FIRM identifies Special Flood Hazard Areas (SFHA) that have a one percent annual chance of flooding, commonly referred to as the 100-year floodplain. Areas outside the SFHA are considered to be in the Non-Special Flood Hazard Area (NSFHA). Structures in the NSFHA may still be at risk from flooding; according to FEMA, one in every four floods occurs in an NSFHA. Flood insurance is required for all property owners who acquire a loan from a federally regulated, supervised or insured financial institution for the acquisition or improvement of land, facilities or structures located within an SFHA.

HISTORY

Mercer County was included in thirteen flood-related Presidential Disaster Declarations between 1957 and 2021.

Localized road and culvert washouts are the most common identified impacts of flood events in the county, although some events resulted in more significant impacts. The National Climatic Data Center Storm Events Database includes brief summaries of significant storm events. A selection of recent flood events within Mercer County are summarized below.

- **March 21, 1997.** Heavy snowfall in the winter of 1996-1997 was followed by a rapid snowmelt in the middle of March. This led to water overflowing the drainage system and flooding many local roads.
- **March 6, 2009.** Spring Creek and the Knife River flooded due to snow melt and ice jams. Overland flooding damaged county and township roads. Fifty-five homes were flooded. Flooding continued into April.
- **September 9, 2010.** Torrential rain resulted in a flash flood around Zap. Two feet of water covered county roads and Highway 200. Water was reported in the basement of one home. Spring Creek near Zap rose ten feet in response to the rain, and crested one foot over flood stage. Total property damages were estimated at \$45,000.
- **June 2, 2011.** This was part of historic flooding in North Dakota with statewide costs estimated around 1.5 billion dollars. Flooding was the result of

significant winter snows and significant spring rains, not only in North Dakota but in Montana as well. Rocky Mountain snowpack was four to six times normal. Flooding was along the Missouri River from the Garrison Dam to the South Dakota border. Dams were overwhelmed by the amount of water. Flooding included river, ground, and overland types.

- **August 15, 2014.** Upwards of nine inches of rain in parts of western Mercer County led to very significant overland flooding. There was also flooding along the Knife River, Spring Creek, and their tributaries. There was significant damage to roads and crops. Officials estimated damage to at least 90 residences. Damage occurred to storm sewer and sanitary sewer systems. A county emergency declaration was issued.
- **June 28, 2018.** A slow-moving thunderstorm produced heavy rain over western Mercer County. Over five inches of rain fell over some locations causing creeks to come out of their banks and overland flooding to develop. Water was running across North Dakota Highway 1806 in Mercer County. Crops were damaged by the water.

The US Army Corps of Engineers Cold Regions Research and Engineering Laboratory (CRREL) tracks ice jams in Mercer County. CRREL has recorded 7 ice jams in the county since 1950. Five of the ice jams were along the along the Knife River and the other 2 were along Spring Creek. The most recent ones were recorded in 2004 near Golden Valley and Hazen. No ice jams in the County have resulted in reported damages. See Figure 3.3.

PROBABILITY

Recent flood events in Mercer County are summarized in Table 3.3. The county averages less than one flood event per year. Flood event classification criteria and a detailed listing of events can be found in Appendix C. There is a 56% annual probability of flooding in Mercer County.

Table 3.3 - Flood Events in Mercer County, 1996-2021			
Flood Events	Event Days*	Annual Probability	Event Days per Year
Flood	14	56%	0.6

*Number of days with a reported event

Source: National Climatic Data Center Storm Events Database

LOCATION

A county wide Flood Insurance Study was completed in 2015. Flood Insurance Rate Maps effective October 16, 2015 were established for the Cities of Beulah, Hazen, Zap and Mercer County. The flood insurance study for these jurisdictions shows the main flooding sources are the

Knife River, Spring Creek and Antelope Creek. A very small part of flooding results from tributaries to these main sources. A small part of the developed part of Beulah (south of the railroad tracks) is in the 100 year floodplain. Nearly all of Hazen is in an area defined as flood risk reduced by a levee. Zap has a small developed area which is designated in the 100 year floodplain.

Flood Insurance Rate Map information for Mercer County is shown in Figures 3.4 through 3.10. Zones A and AE (also known as a 100-year floodplain or Special Flood Hazard Area) identify areas with a one percent annual chance of flooding. Floodways are established for all three cities with FIRMs. Zone X areas shown on the maps (also known as a 500-year floodplain or Non-Special Flood Hazard Area) present a 0.2 percent annual chance of flooding.

Flood insurance is required for all property owners who acquire a loan from a federally regulated, supervised or insured financial institution for the acquisition or improvement of land, facilities or structures located within an SFHA. NFIP participation is summarized in Table 3.4.

Table 3.4 – NFIP Participation in Mercer County				
	Mercer County	Beulah	Hazen	Zap
Enforced Floodplain Ordinance	yes	yes	yes	yes
Policies in Force	5	43	10	1
Total Coverage	\$1.155M	\$5.016M	\$2.215M	\$0.600M
Total Written Premium + FPF	\$5,865	\$50,141	\$11,727	\$629

Source: FEMA-NFIP Policy Data as of April 30, 2022

Additional floodplain modeling for the County was completed in 2019 with a Risk MAP program undertaken jointly by FEMA and the North Dakota State Water Commission. The resulting RAM maps are based on topography and modeled water volumes to determine estimated floodplain areas. Figures 3.11 through 3.17 show areas identified by the Risk MAP study as being located in an area with significant risk of flooding.

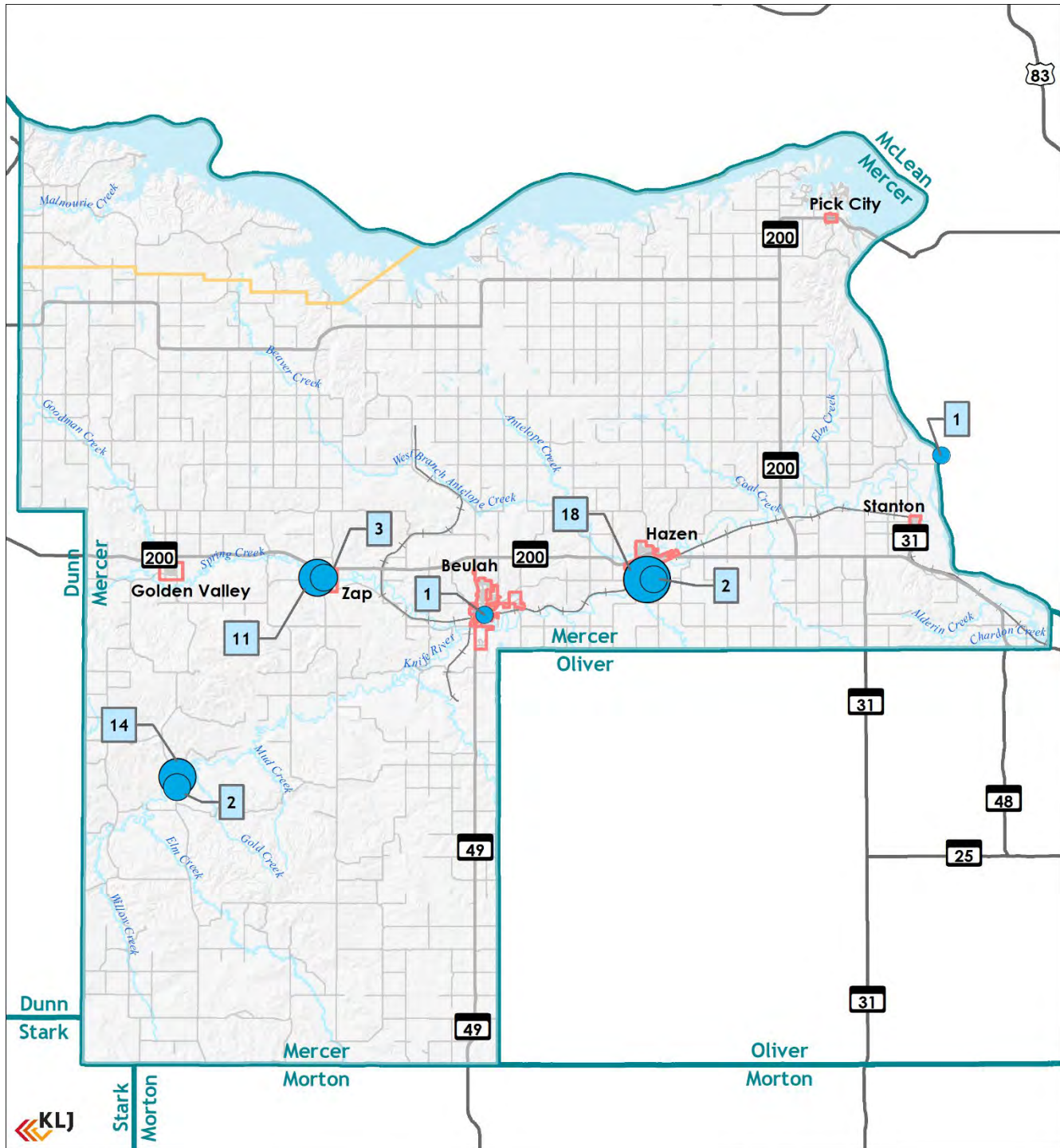
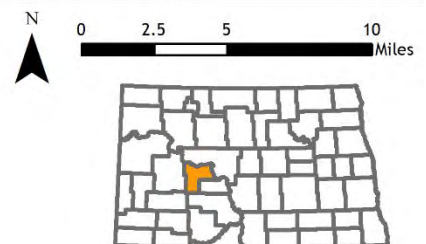


Figure 3.3
Ice Jams

- County Boundaries
- Fort Berthold Reservation
- Incorporated City Boundaries
- State & Federal Roads
- Other Roads
- Railroads
- Ice Jam Locations since 1881
Larger Circle indicates more Ice Jams



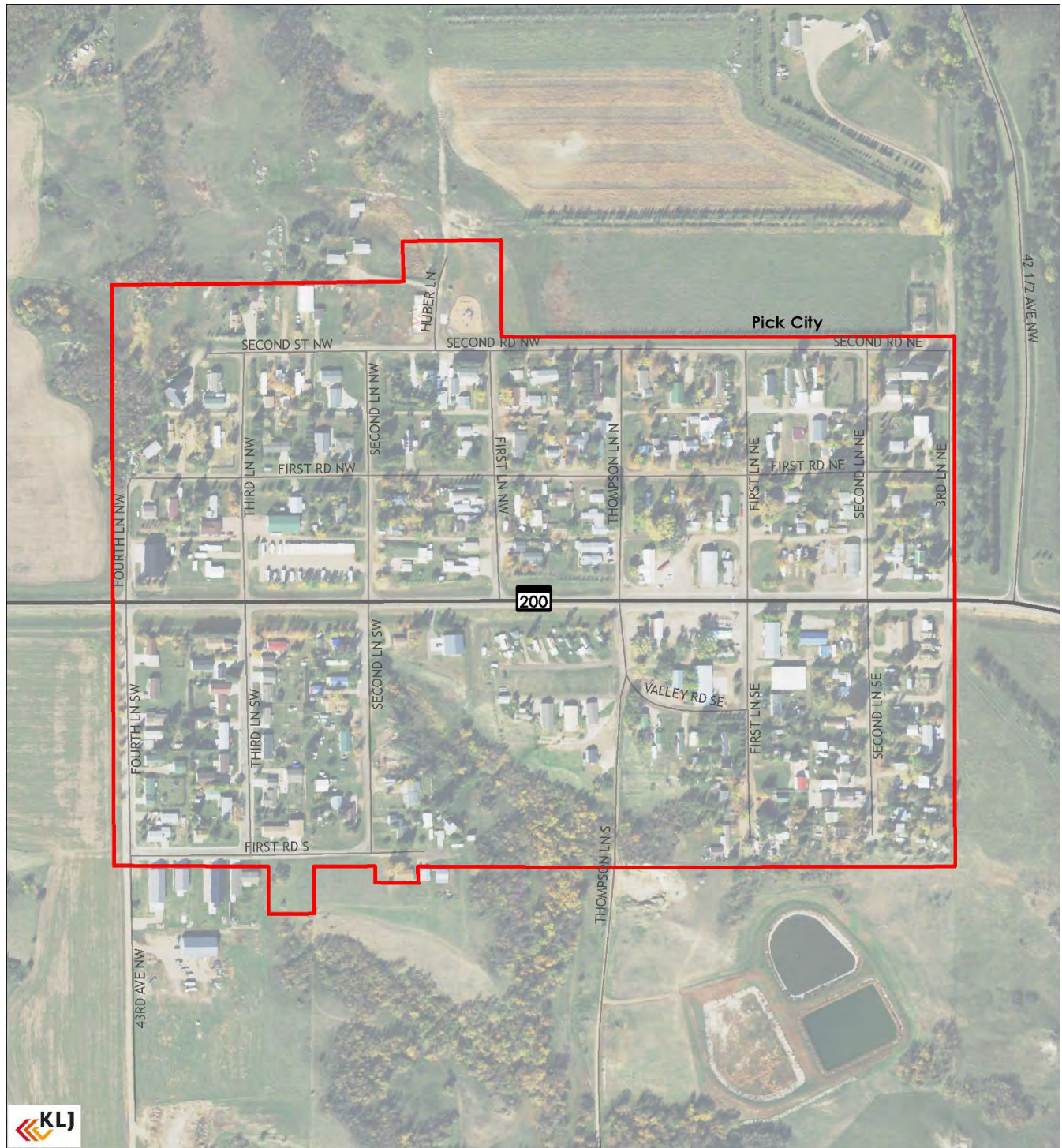


Figure 3.4
FEMA Flood Hazards Pick City

- | | |
|------------------------------|-------------------------------------|
| County Boundaries | Flood Hazard Zones |
| Fort Berthold Reservation | Area with Reduced Risk Due to Levee |
| Incorporated City Boundaries | 1% Annual Chance Flood Hazard |
| State & Federal Roads | 0.2% Annual Chance Flood Hazard |
| Other Roads | Regulatory Floodway |
| Railroads | |

0 500 1,000 Feet



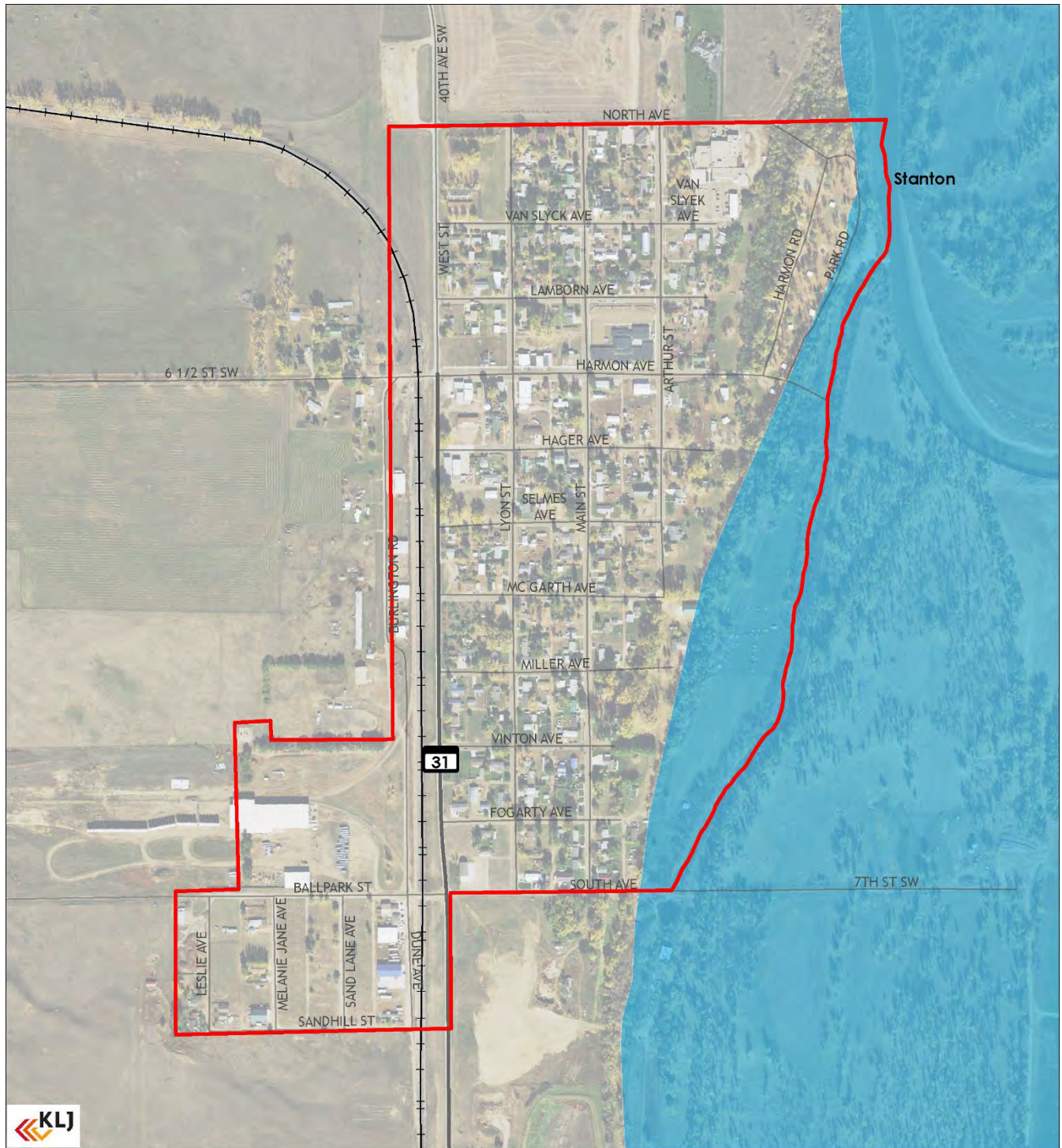


Figure 3.5
FEMA Flood Hazards Stanton

- | | |
|------------------------------|-------------------------------------|
| County Boundaries | Area with Reduced Risk Due to Levee |
| Fort Berthold Reservation | 1% Annual Chance Flood Hazard |
| Incorporated City Boundaries | 0.2% Annual Chance Flood Hazard |
| State & Federal Roads | Regulatory Floodway |
| Other Roads | |
| Railroads | |

0 500 1,000
Feet



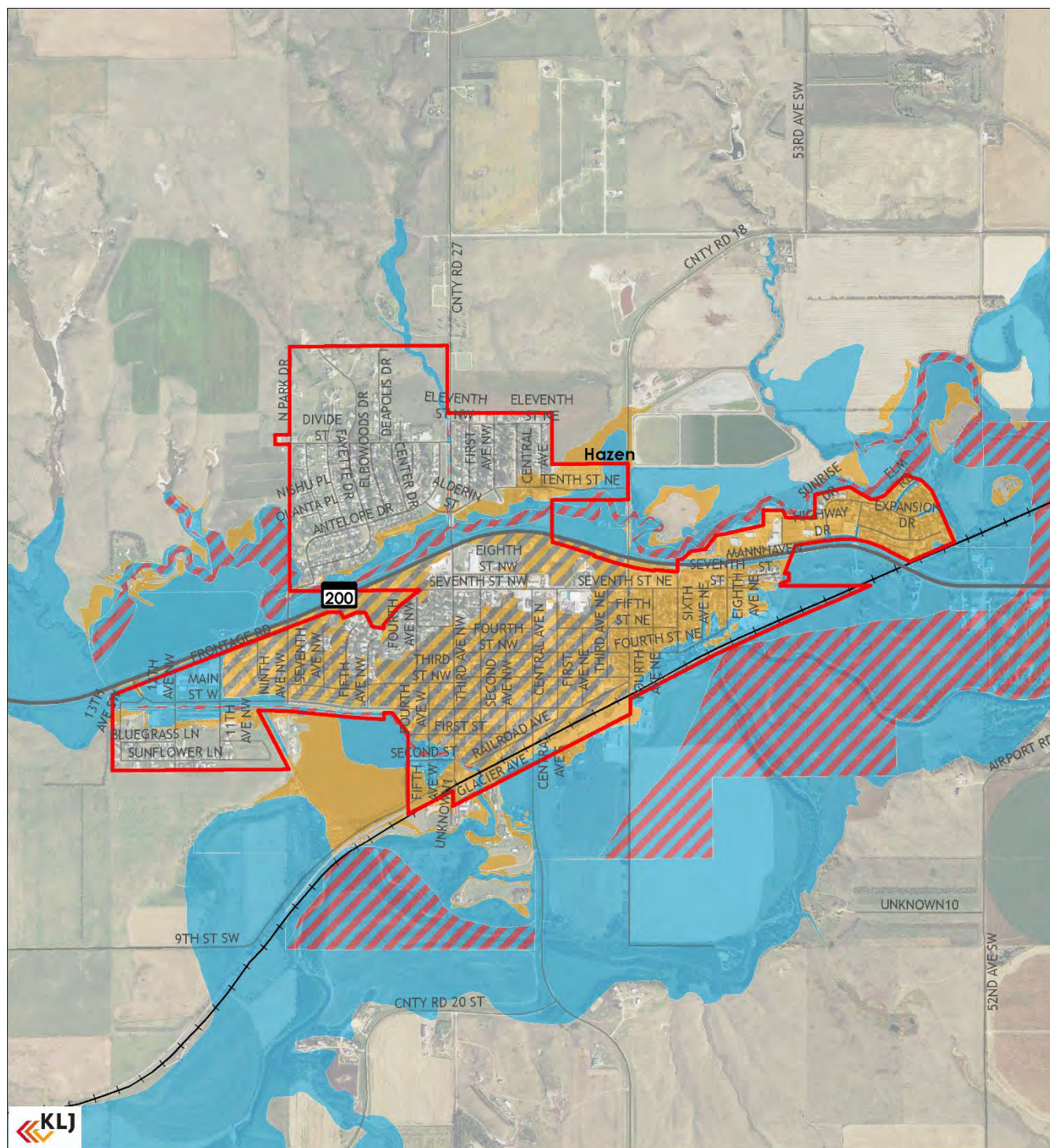


Figure 3.6
FEMA Flood Hazards Hazen

- | | |
|------------------------------|-------------------------------------|
| County Boundaries | Area with Reduced Risk Due to Levee |
| Fort Berthold Reservation | 1% Annual Chance Flood Hazard |
| Incorporated City Boundaries | 0.2% Annual Chance Flood Hazard |
| State & Federal Roads | Regulatory Floodway |
| Other Roads | |
| Railroads | |

0 500 1,000 2,000 3,000 4,000 5,000 Feet



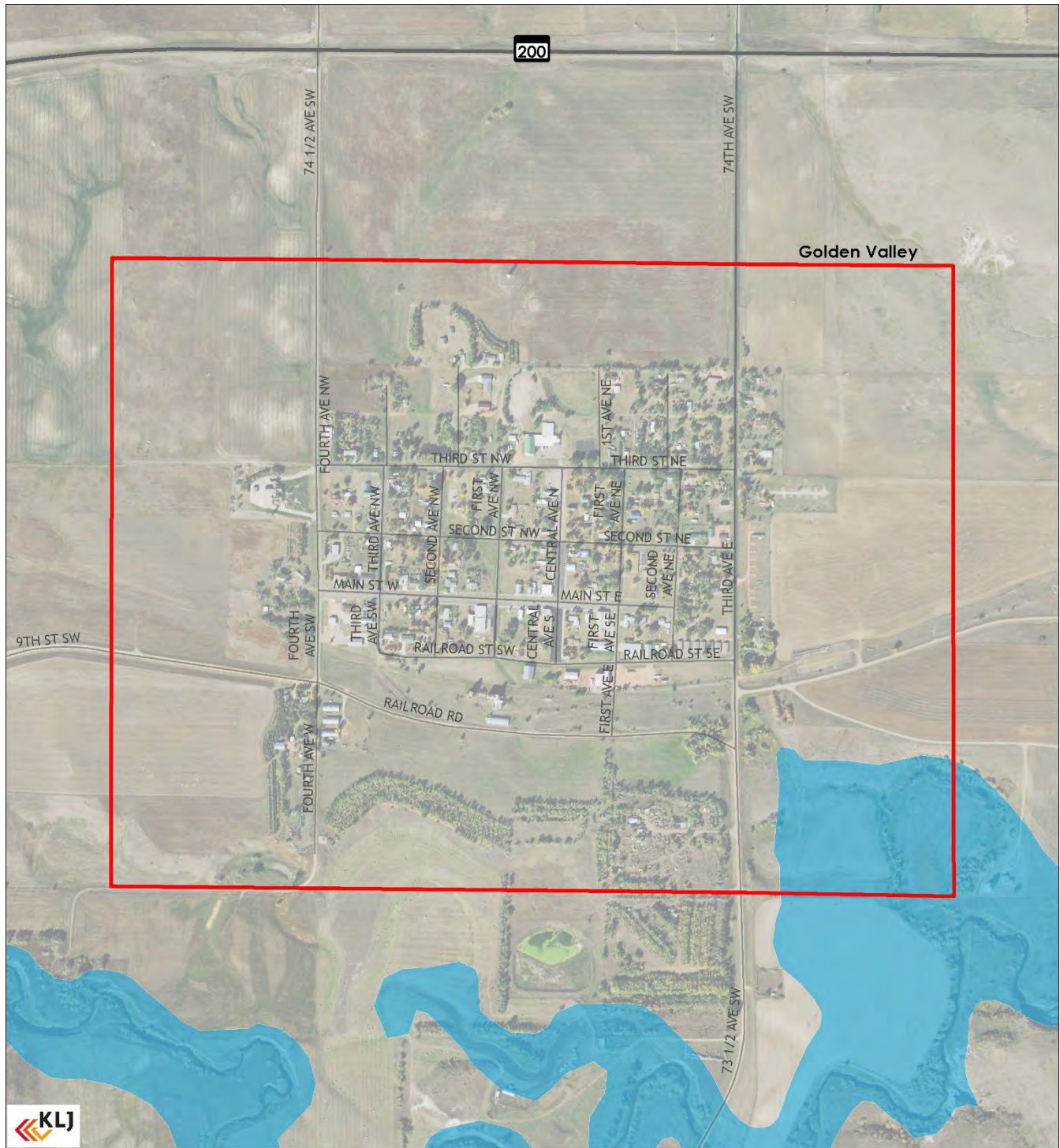


Figure 3.7
FEMA Flood Hazards Golden Valley

- | | |
|------------------------------|-------------------------------------|
| County Boundaries | Flood Hazard Zones |
| Fort Berthold Reservation | Area with Reduced Risk Due to Levee |
| Incorporated City Boundaries | 1% Annual Chance Flood Hazard |
| State & Federal Roads | 0.2% Annual Chance Flood Hazard |
| Other Roads | Regulatory Floodway |
| Railroads | |

0 500 1,000 2,000 Feet



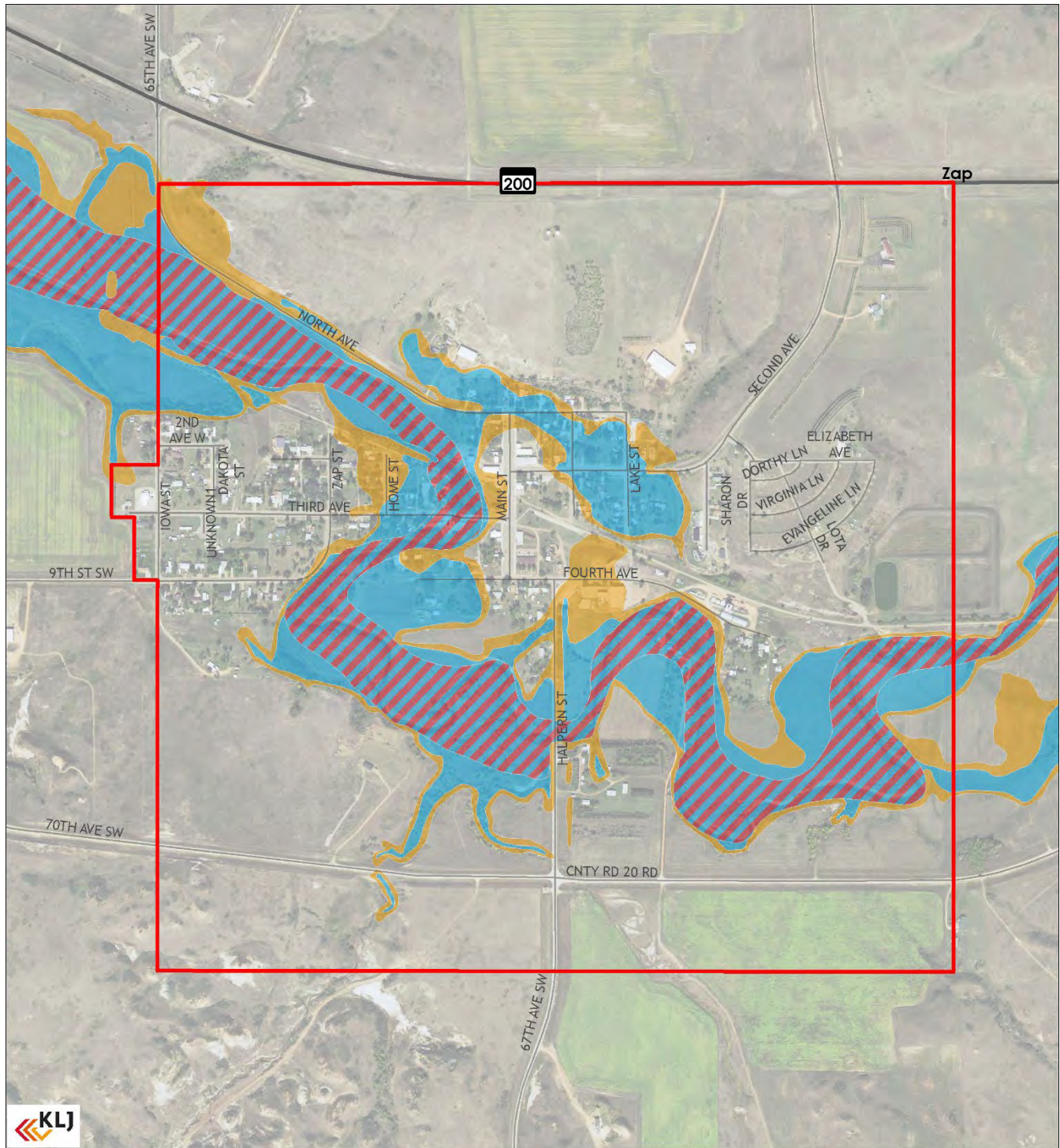
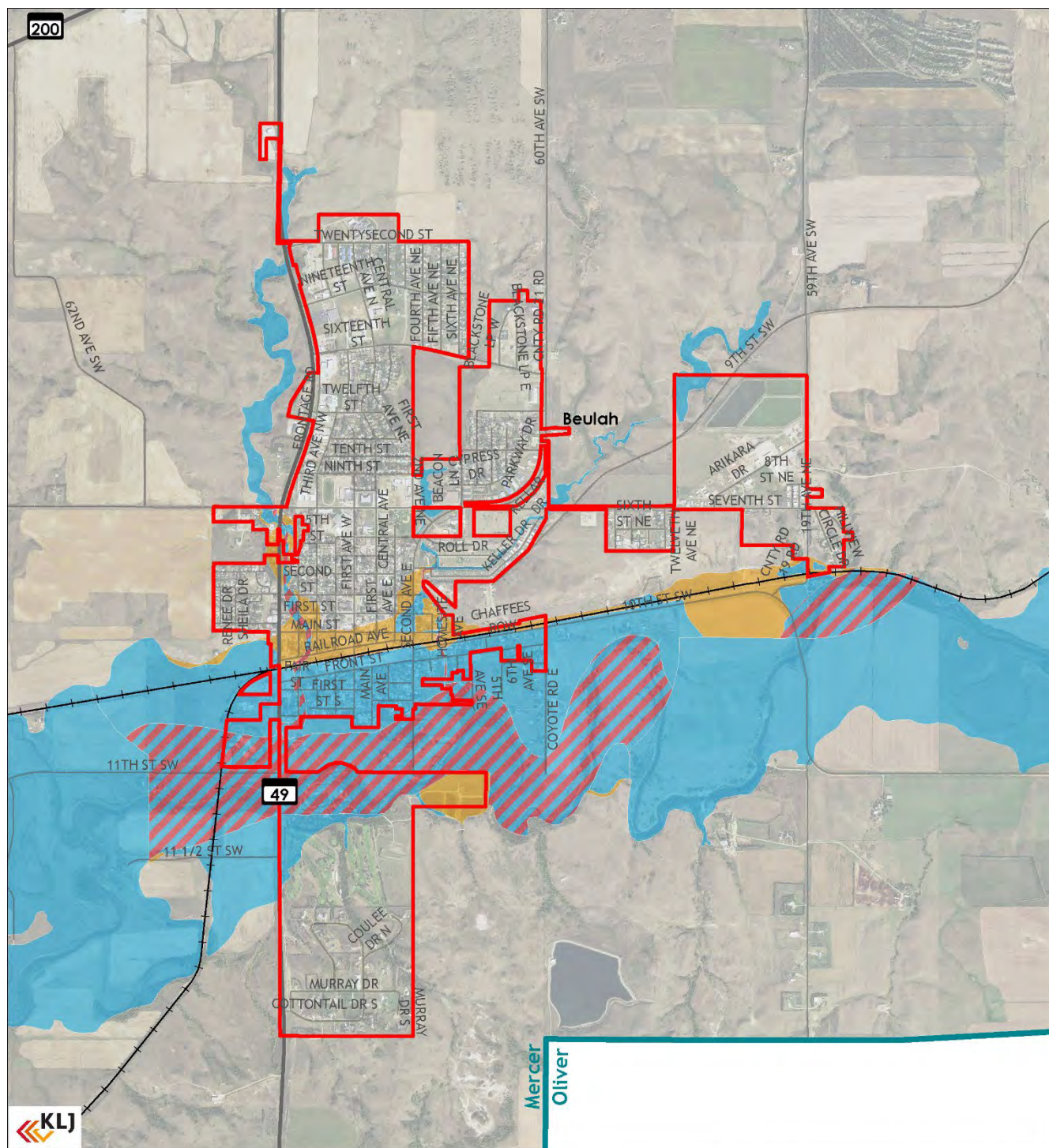


Figure 3.8
FEMA Flood Hazards Zap

- | | |
|------------------------------|-------------------------------------|
| County Boundaries | Area with Reduced Risk Due to Levee |
| Fort Berthold Reservation | 1% Annual Chance Flood Hazard |
| Incorporated City Boundaries | 0.2% Annual Chance Flood Hazard |
| State & Federal Roads | Regulatory Floodway |
| Other Roads | |
| Railroads | |

0 500 1,000 2,000 Feet





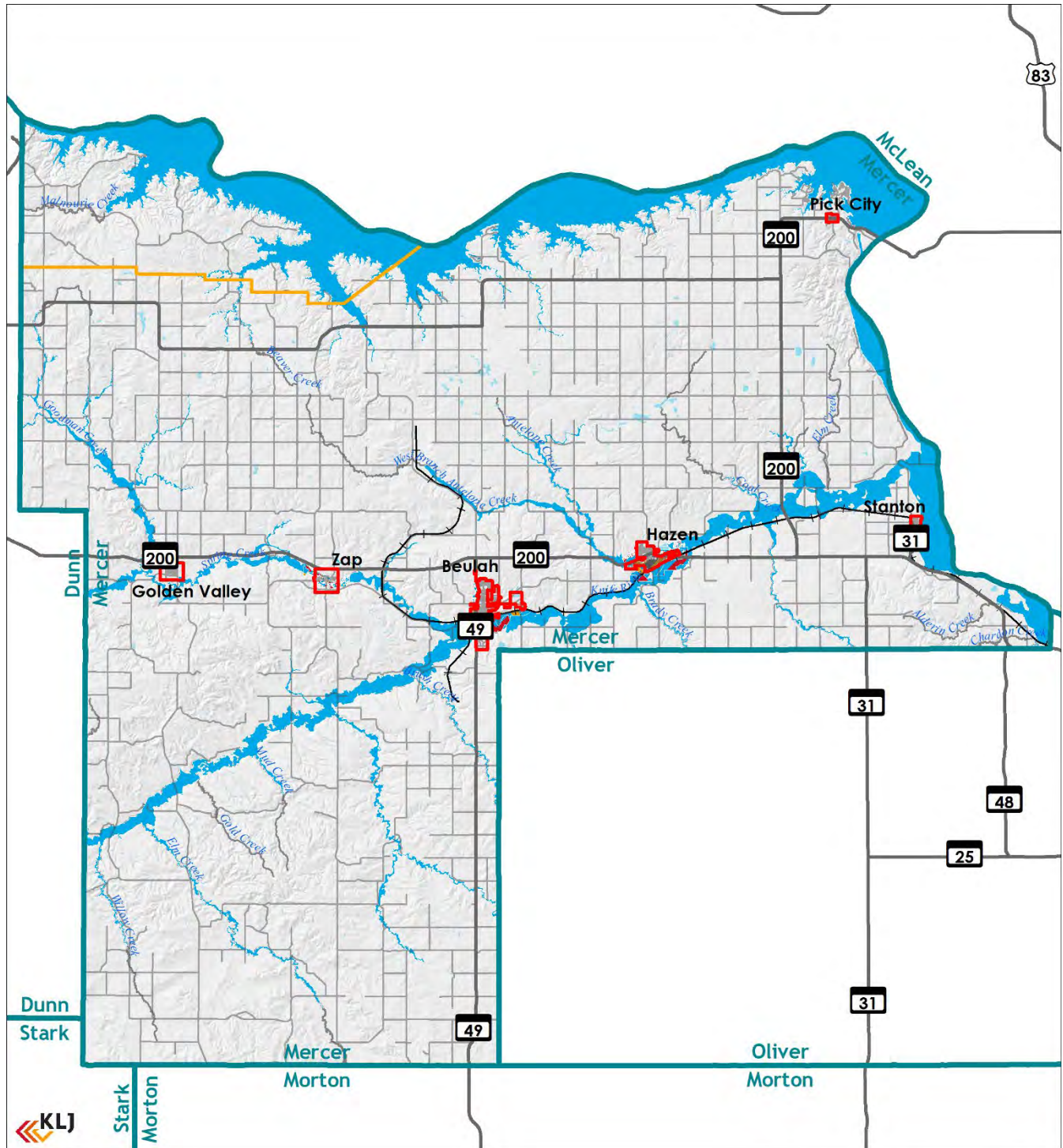


Figure 3.10
FEMA Flood Hazards

- | | |
|------------------------------|-------------------------------------|
| County Boundaries | Area with Reduced Risk Due to Levee |
| Fort Berthold Reservation | 1% Annual Chance Flood Hazard |
| Incorporated City Boundaries | 0.2% Annual Chance Flood Hazard |
| State & Federal Roads | Regulatory Floodway |
| Other Roads | |
| Railroads | |



0 2.5 5 10
Miles



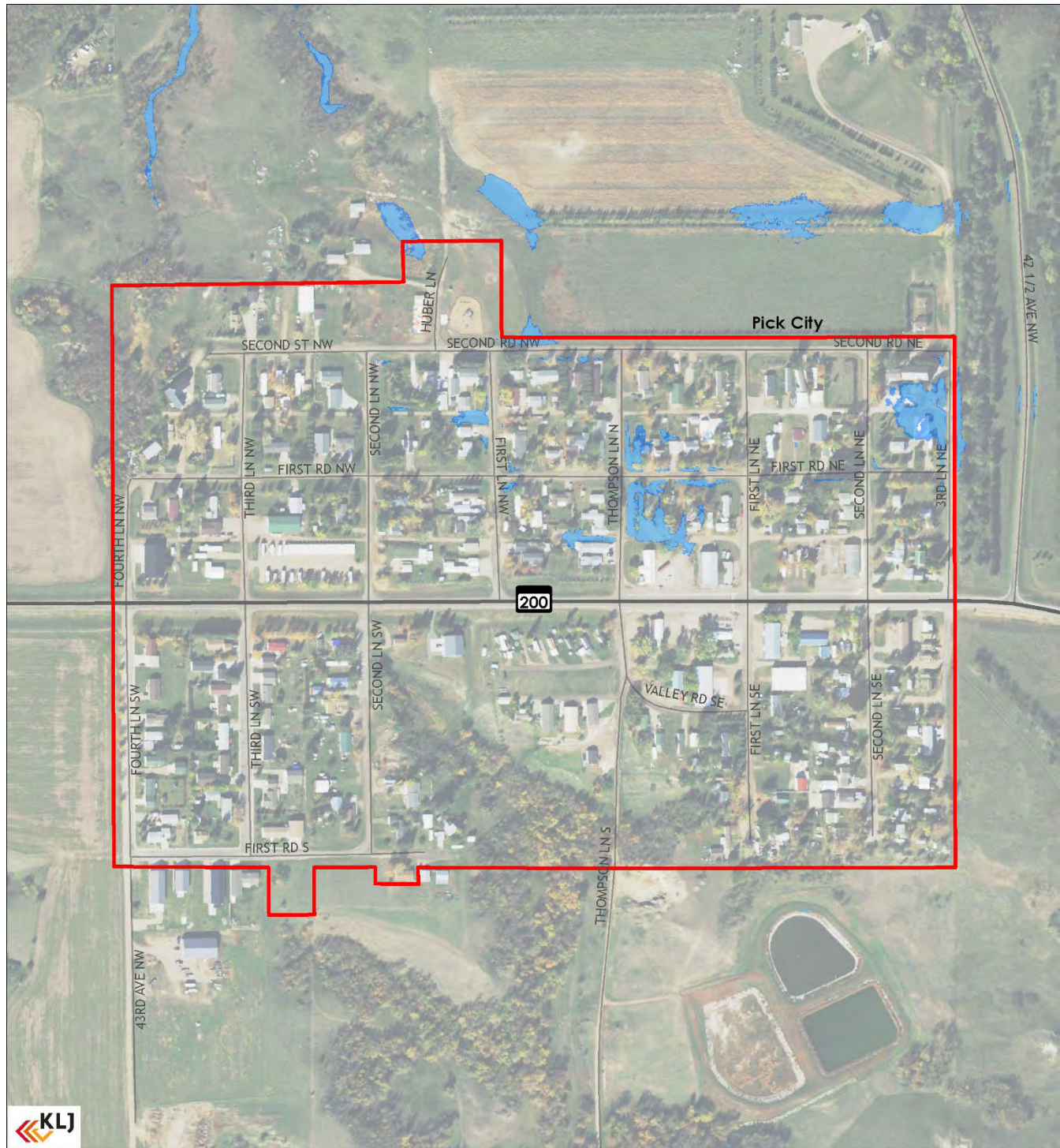


Figure 3.11
NDRAM Flood Hazards Pick City

- | | |
|------------------------------|---------------------------------|
| County Boundaries | ND RAM Flood Hazard |
| Fort Berthold Reservation | 1% Annual Chance Flood Hazard |
| Incorporated City Boundaries | 0.2% Annual Chance Flood Hazard |
| State & Federal Roads | |
| Other Roads | |
| Railroads | |

0 500 1,000 Feet



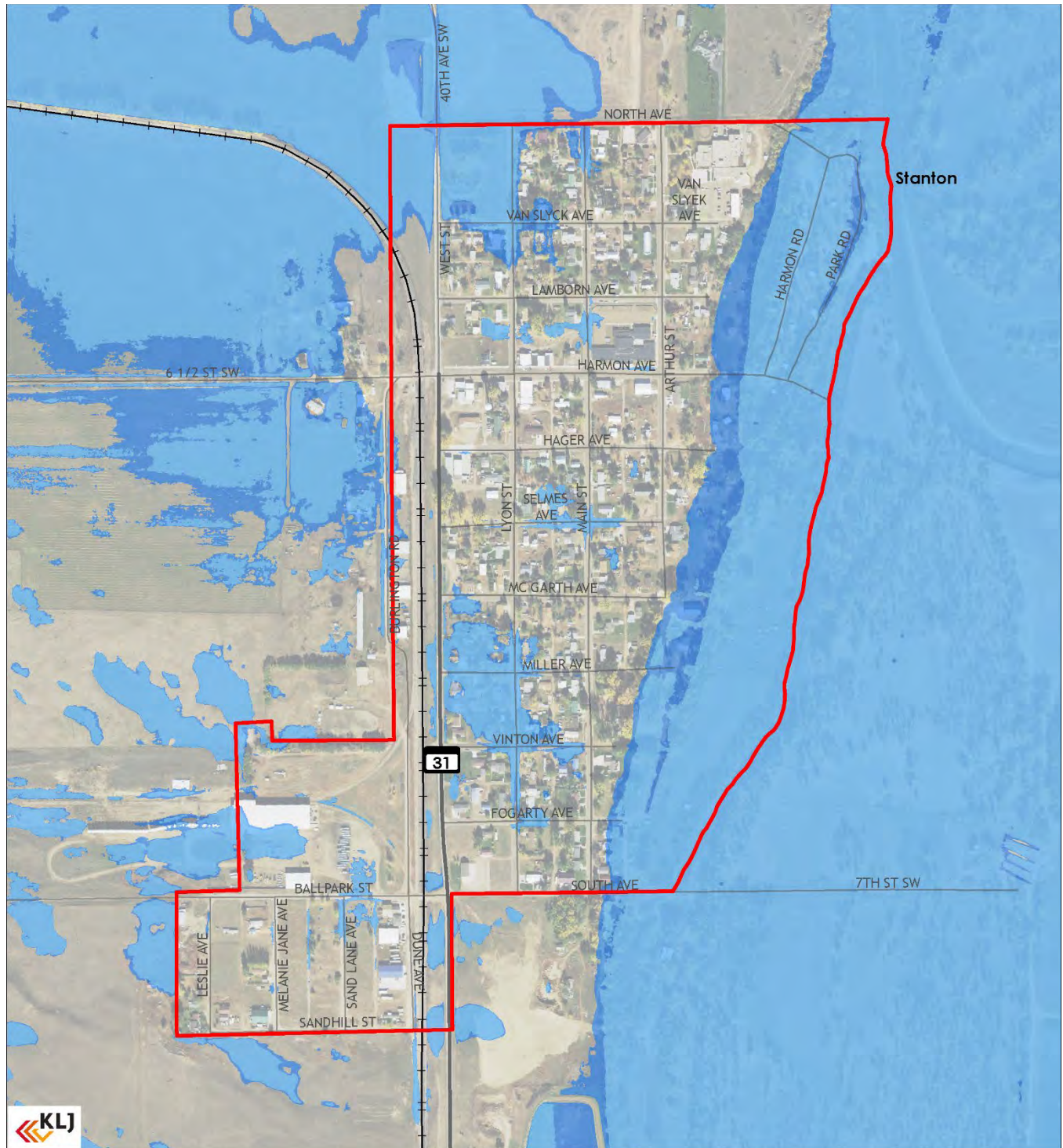


Figure 3.12
NDRAM Flood Hazards Stanton

- | | |
|------------------------------|---------------------------------|
| County Boundaries | ND RAM Flood Hazard |
| Fort Berthold Reservation | 1% Annual Chance Flood Hazard |
| Incorporated City Boundaries | 0.2% Annual Chance Flood Hazard |
| State & Federal Roads | |
| Other Roads | |
| Railroads | |

0 500 1,000
Feet



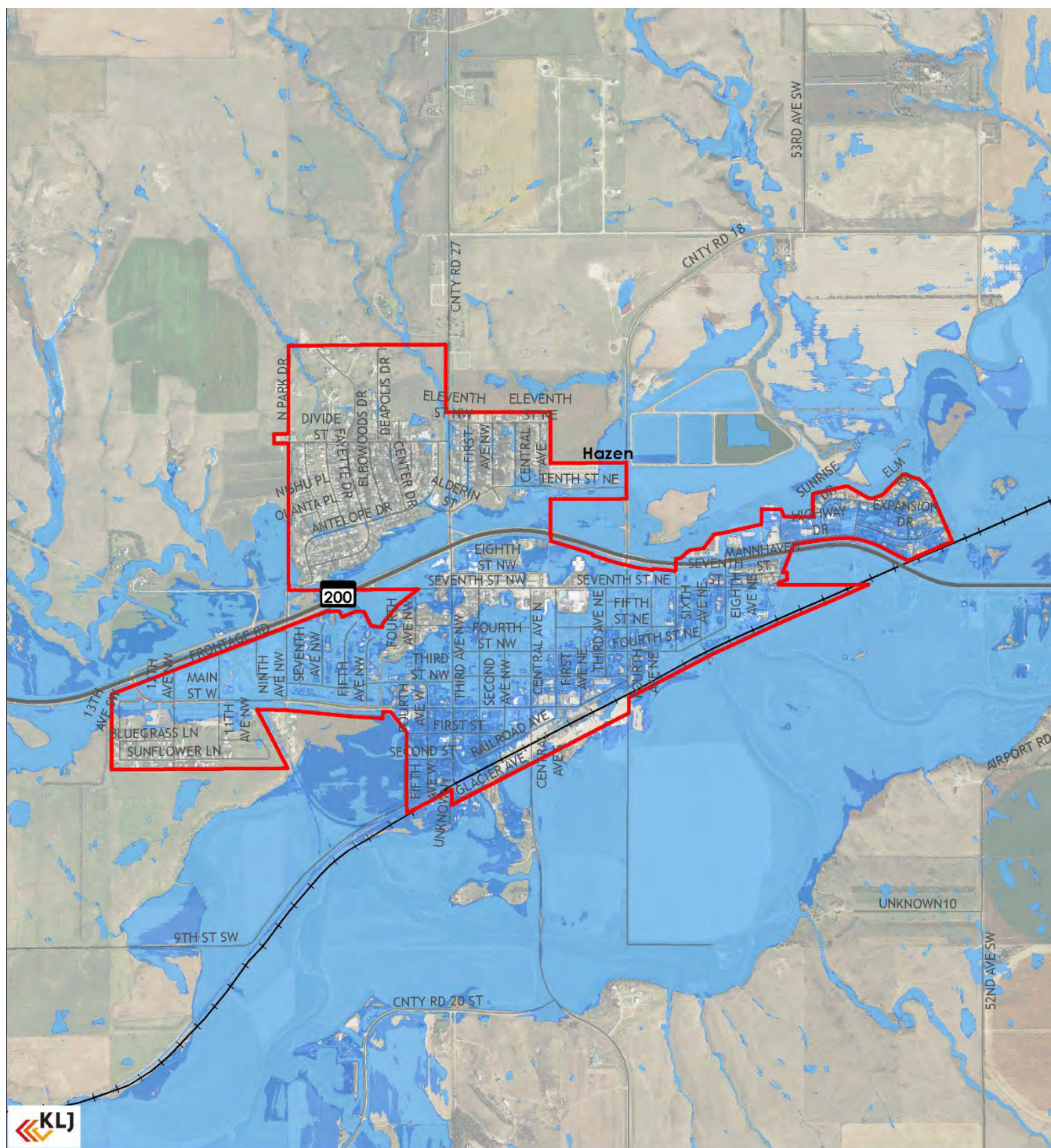
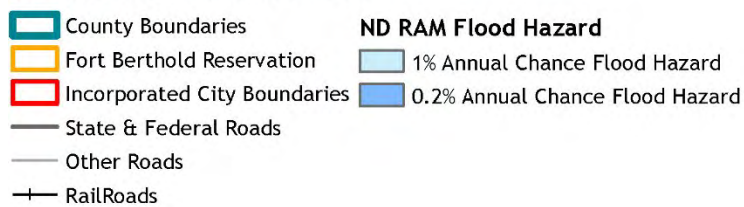


Figure 3.13
NDRAM Flood Hazards Hazen



0 500 1,000 2,000 3,000 4,000 5,000
Feet



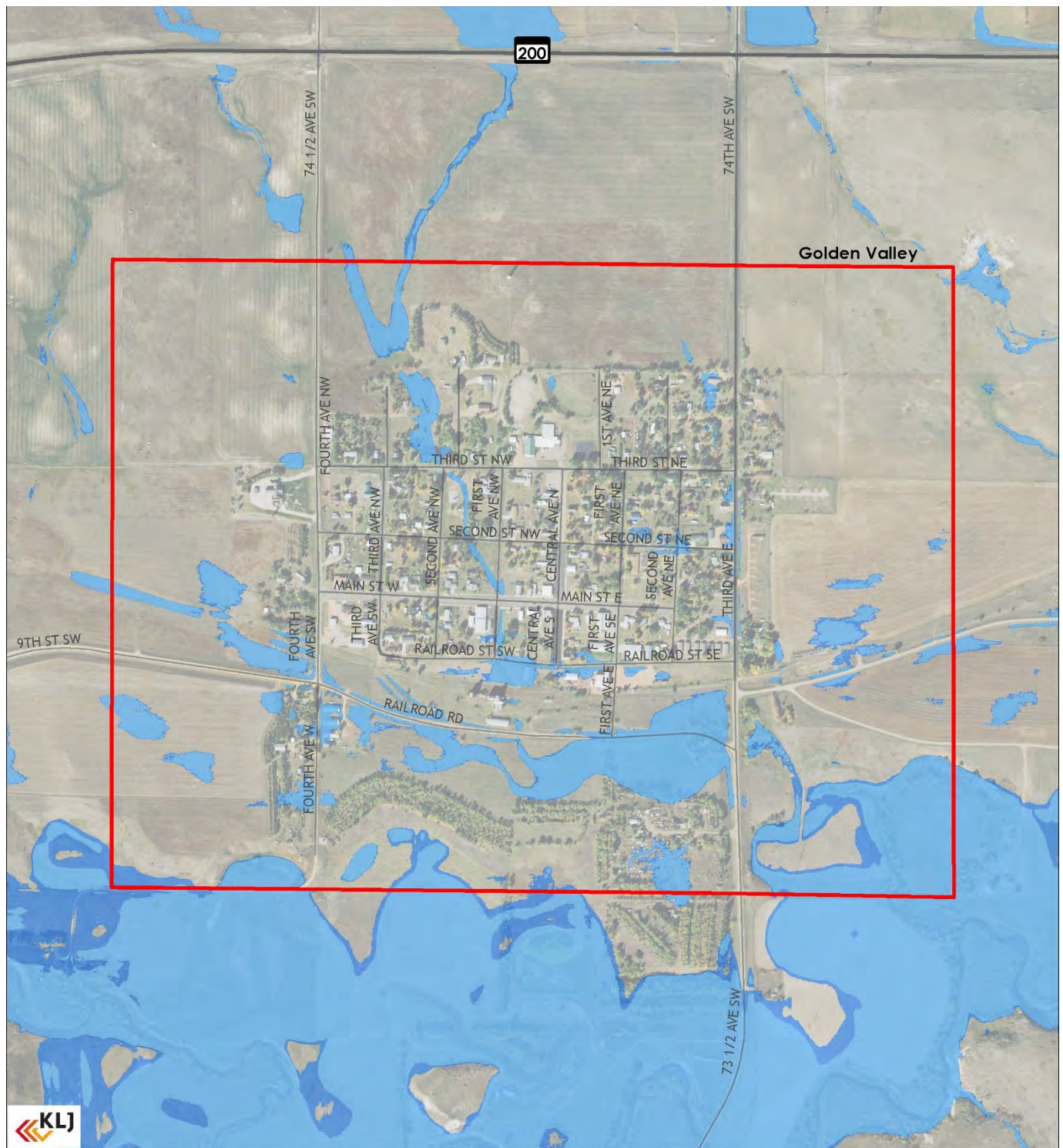
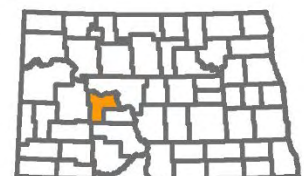


Figure 3.14
NDRAM Flood Hazards Golden Valley

- | | |
|------------------------------|---------------------------------|
| County Boundaries | ND RAM Flood Hazard |
| Fort Berthold Reservation | 1% Annual Chance Flood Hazard |
| Incorporated City Boundaries | 0.2% Annual Chance Flood Hazard |
| State & Federal Roads | |
| Other Roads | |
| Railroads | |

0 500 1,000 2,000
Feet



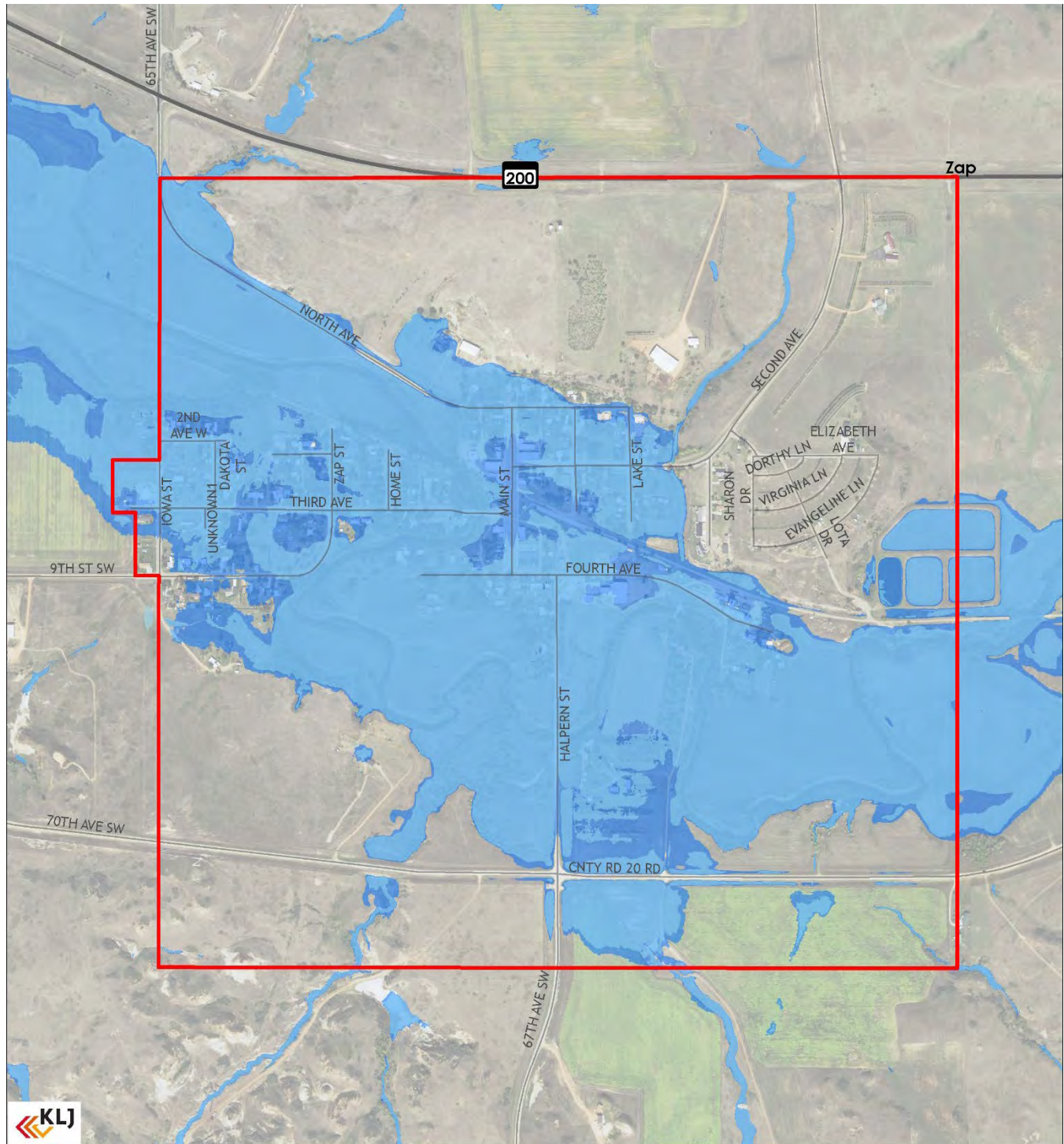


Figure 3.15
NDRAM Flood Hazards Zap

- | | |
|------------------------------|---------------------------------|
| County Boundaries | ND RAM Flood Hazard |
| Fort Berthold Reservation | 1% Annual Chance Flood Hazard |
| Incorporated City Boundaries | 0.2% Annual Chance Flood Hazard |
| State & Federal Roads | |
| Other Roads | |
| Railroads | |

0 500 1,000 2,000
Feet



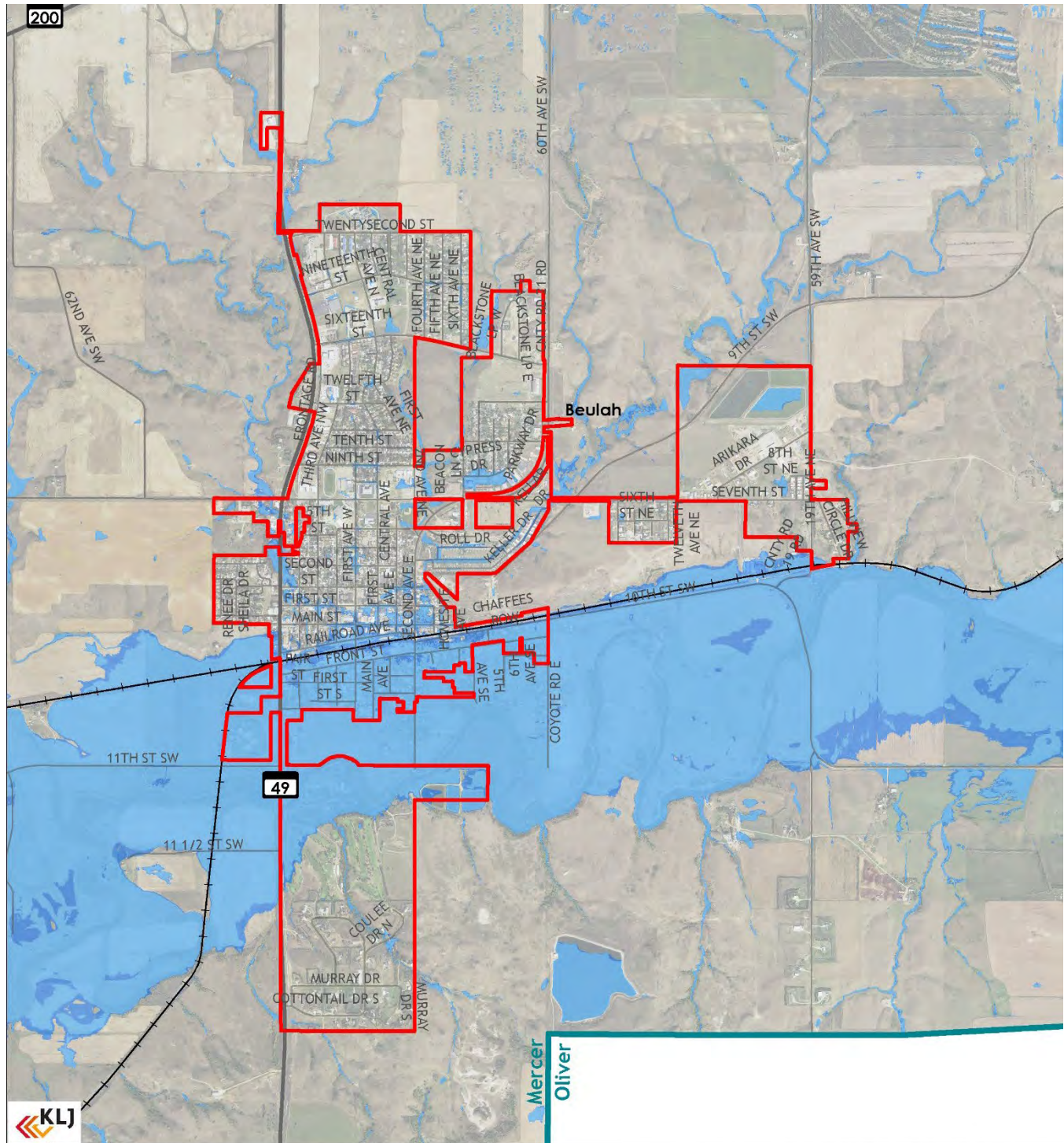


Figure 3.16
NDRAM Flood Hazards Beulah

0 500 000 2,000 3,000 4,000 5,000 6,000
Feet

- | | |
|------------------------------|---------------------------------|
| County Boundaries | ND RAM Flood Hazard |
| Fort Berthold Reservation | 1% Annual Chance Flood Hazard |
| Incorporated City Boundaries | 0.2% Annual Chance Flood Hazard |
| State & Federal Roads | |
| Other Roads | |
| Railroads | |



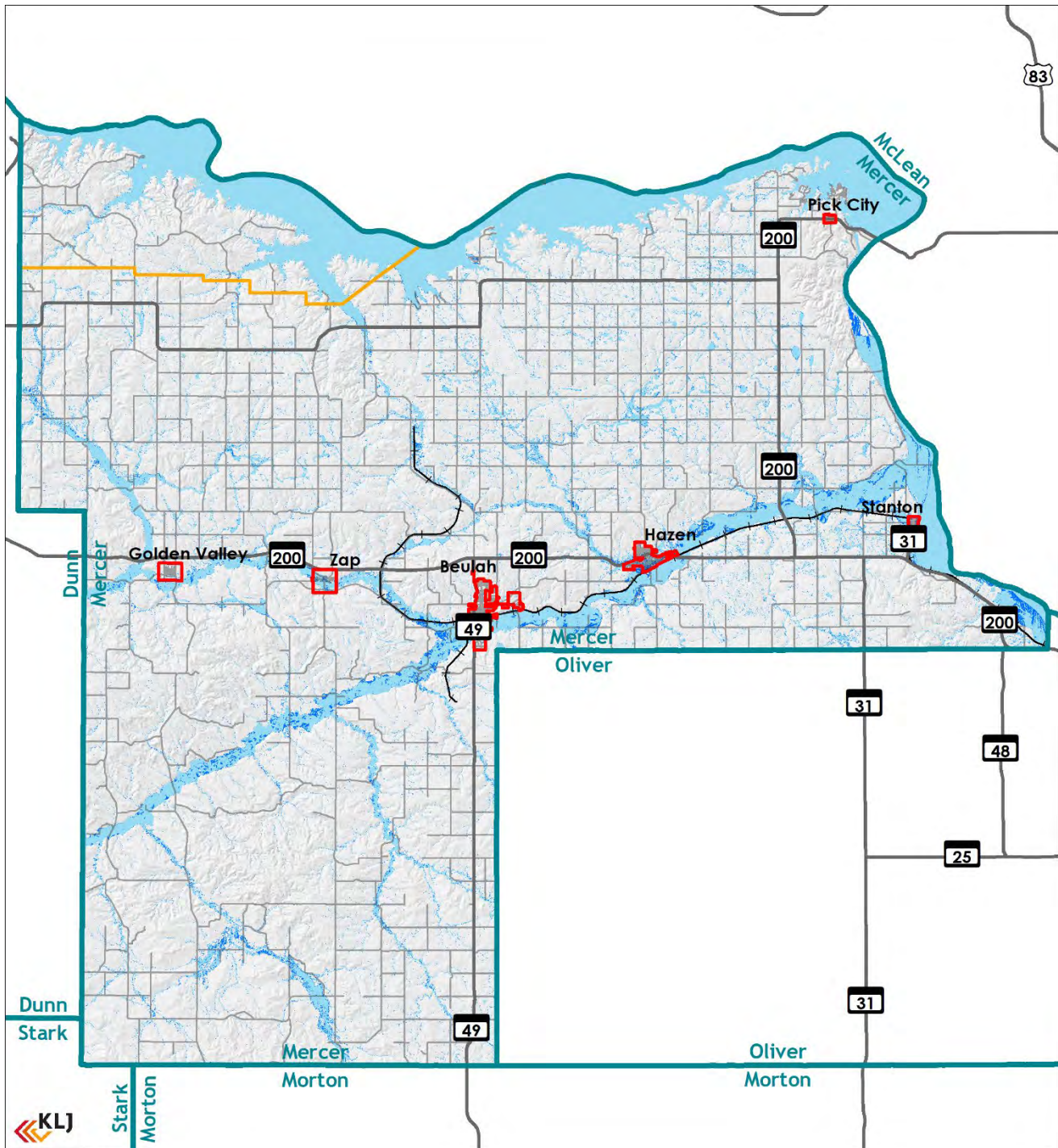
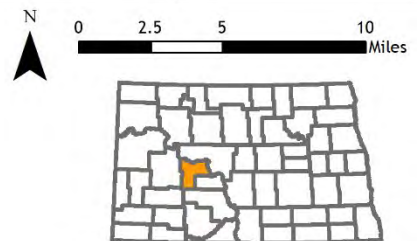


Figure 3.17
ND RAM Flood Hazard Areas

- | | |
|------------------------------|---------------------------------|
| County Boundaries | ND RAM Flood Hazard |
| Fort Berthold Reservation | 1% Annual Chance Flood Hazard |
| Incorporated City Boundaries | 0.2% Annual Chance Flood Hazard |
| State & Federal Roads | |
| Other Roads | |
| Railroads | |



RAM floodplains are not regulatory and are intended for planning purposes only. However, it should be noted that any jurisdiction participating in the NFIP has the authority to use “best available information” when administering floodplain regulations.

VULNERABILITY

Population

- Vulnerable population can be estimated by identifying the intersection of structures from aerial photography with FEMA identified floodplains. Table 3.5 summarizes the estimated vulnerable population by jurisdiction.

Table 3.5 – Mercer County Estimated Vulnerable Population

	Residential Structures in Floodplain	Estimated Population	% of Total Population
Rural County	10	22	1.1%
Beulah	210	470	15.3%
Hazen	25	56	2.4%
Zap	23	52	23.5%
Total	268	600	7.2%

Note: Floodplain area from FEMA FIRM (Zones A & AE)

Property

- The statewide Multi-Hazard Mitigation Plan includes information about crop insurance payments from the USDA Risk Management Agency. Flood-related crop insurance payments in Mercer County from 1989 to 2021 were approximately \$17,000. Based on a statewide rate of 89 percent of crops being insured, total estimated damages for the County were \$19,101. Over a 30-year period this results in an annualized loss of approximately \$600. Statistics can be seen in Figure 3.18.
- Since 1971 there have been 81 total NFIP claims resulting in damage payments totaling \$666,739 as of September 30, 2019.
- Repetitive loss properties are tracked for communities that participate in the NFIP. There are no known repetitive loss properties in the County.
- An estimate of major structures at risk from flooding was created by intersecting the FIRM floodplain data with aerial photography. A total of 268 residences are estimated to be at risk throughout the County (including within cities) according to the FIRM data. As summarized in Table 3.6 an additional 39 non-

residential properties also appear to be vulnerable to flooding.

Figure 3.18 – Flood-Related Federal Indemnity Payments, Mercer County, 1989-2021

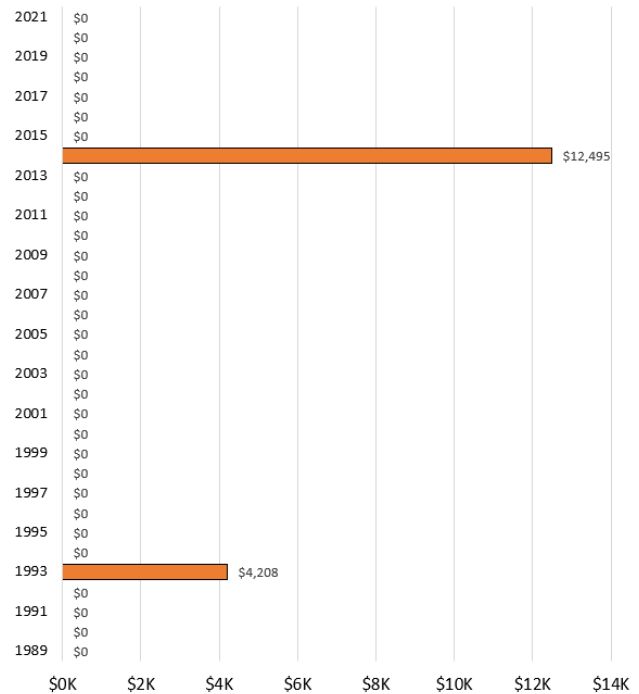


Table 3.6 – Mercer County Estimated Properties within Identified Floodplain

	Residential Properties	Non-residential Properties
Rural County	10	4
Beulah	210	19
Hazen	25	11
Zap	23	5
Total	268	39

Note: Floodplain area from FEMA FIRM (Zones A & AE)

Critical Facilities

- Rural facilities within floodplain:
 - Segments of several major roadways including Highways 49, 200, and 1806
 - Segments of the BNSF railroad
- Beulah facilities within floodplain:
 - Airport
 - Downtown Conoco

- Segments of Highway 49
- Segments of the BNSF railroad
- Valley Grain Milling Elevator
- Water Treatment Plant
- Hazen facilities within floodplain:
 - Lift Station #1
 - Segments of Highway 200
 - Segments of the BNSF railroad
- Zap facilities within floodplain:
 - Segments of the BNSF railroad

Economy

- The highest annual agricultural crop loss impacts are estimated at \$12,495, but annual crop losses from flooding are seldom significant. Other impacts are unknown.

Future Development

- Beulah, Hazen, Zap and Mercer County are all participants in the NFIP and have floodplain regulations that limit future growth into high-risk areas. Beulah and Hazen have future land use plans that generally limit the scale of development and therefore potential flooding impacts. The remaining cities do not have future land use plans.

- *Potential Action Item:* Conduct NFIP workshop to educate public about benefits of flood insurance.
- *Potential Action Item:* Develop educational strategy to highlight the benefits of participation in the NFIP
- *Potential Action Item:* Identify, acquire and remove high risk properties in the floodplain.
- *Potential Action Item:* Consider joining the NFIP and its Community Rating System (CRS) program.

Key Issue: Roads in the county are sometimes washed out or inundated during flooding events.

Potential Action Item: Identify areas that could use enlarged culverts or road raises.

- *Potential Action Item:* Elevate commonly impacted roads or bridges.
- *Potential Action Item:* Identify areas that could use enlarged culverts or road raises.
- *Potential Action Item:* Replace damaged bridge(s) with box culverts.

EXISTING CAPABILITIES

Beulah, Hazen, Zap and Mercer County each have floodplain administrators and floodplain ordinances that are actively enforced. NFIP participation is summarized in Table 3.7. Participation is lower than it was in 2015. Each jurisdiction has Flood Insurance Rate Maps that were adopted in 2015.

Table 3.7 - NFIP Participation in Mercer County		
Jurisdiction	Policies in Force	Insured Value of Participating Properties
Beulah	43	\$5.016M
Hazen	10	\$2.215M
Zap	1	\$0.600M
Rural County	5	\$1.155M

Note: Policy information as of 9/30/2021

KEY ISSUES AND POTENTIAL ACTION ITEMS

Key Issue: Mercer County experiences a flood event approximately once every two years. Flood events in the county are primarily localized drainage system flooding.

Geologic Hazards

All Jurisdictions

Overall Risk: Low

Probability: Low

Impact: Low

Primary Impacts

Not Applicable (the potential impact of earthquakes, landslides or sinkholes to property or infrastructure is low)

HAZARD PROFILE

Geologic hazards include landslides, earthquakes and sinkholes related to underground mining.

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.

An earthquake is defined by USGS as a sudden movement of the earth, caused by the abrupt release of strain that has accumulated over a long time. North Dakota is not an area known for earthquake activity; however, many small earthquakes may occur throughout the state. Earthquake severity can be measured by looking at magnitude and intensity. Magnitude is based on the area of the fault plane and amount of slip, and it can be measured using the Richter scale. An earthquake below Richter magnitude 5.0 rarely causes damage. Intensity is based on how strong the shock is felt and the degree of damage at a given location. It can be measured using the modified Mercalli scale. Damage usually occurs with earthquakes of intensity level V or higher.

The USGS defines a sinkhole as a depression in the ground that has no natural external surface drainage. The primary cause of sinkholes is typically the dissolution of soluble rock by groundwater. This creates underground spaces. If there is not enough support for the land above the spaces, sudden collapse of the land surface can occur.

HISTORY

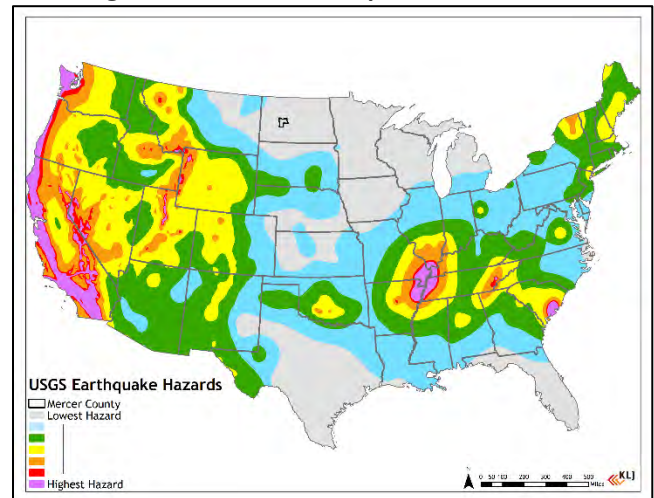
There is no record of earthquakes in Mercer County. Figure 3.20 on the following page illustrates the location of many landslides documented by the ND Geological Survey in the County. Sinkholes have been documented in the County as follows:

- T144N-R87W, Sections 6,7,18, & 13
- T144N-R88W, Sections 4, 12, 13, 15 & 25
- T144-R89W, Sections 17, 20, 22-26

LOCATION, EXTENT AND PROBABILITY

Figure 3.19 shows that Mercer County, and practically all of North Dakota, has the lowest earthquake hazard level according to the USGS.

Figure 3.19 – USGS Earthquake Risk Levels



The Geologic Hazard risk in Mercer County is primarily from landslides. Figure 3.20 shows landslide incidence areas mapped by the ND Geologic Survey. They are primarily near Lake Sakakawea, the Missouri River, and in the southwestern part of the County. Figure 3.21 shows the entire County is a moderate susceptibility, low incidence hazard area. It also shows mining activity sites that could lead to sinkholes.

VULNERABILITY

Population, Property, Critical Facilities, Economy, Future Development

- There is no known vulnerability to Mercer County's population, property, critical facilities, economy, or potential future development from geologic hazards.

EXISTING CAPABILITIES

The State Building Code prohibits construction on steep slopes and provides general standards that contribute to earthquake resiliency. Beulah, Golden Valley, Hazen, Stanton and Zap have adopted the State Building Code.

KEY ISSUES AND POTENTIAL ACTION ITEMS

Key Issue: There are no key issues related to geologic hazards in Mercer County

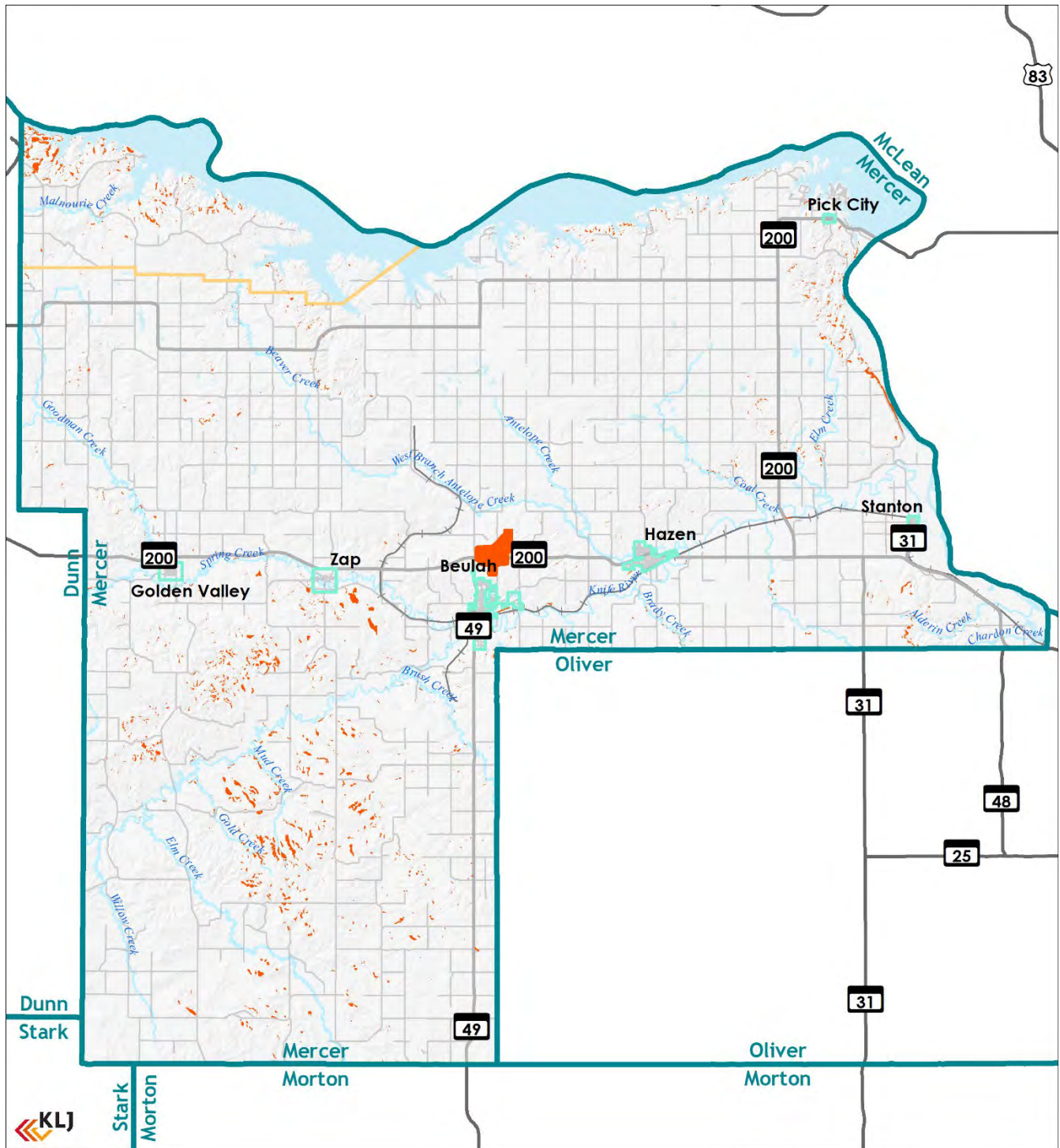
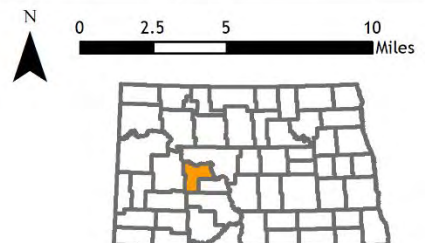
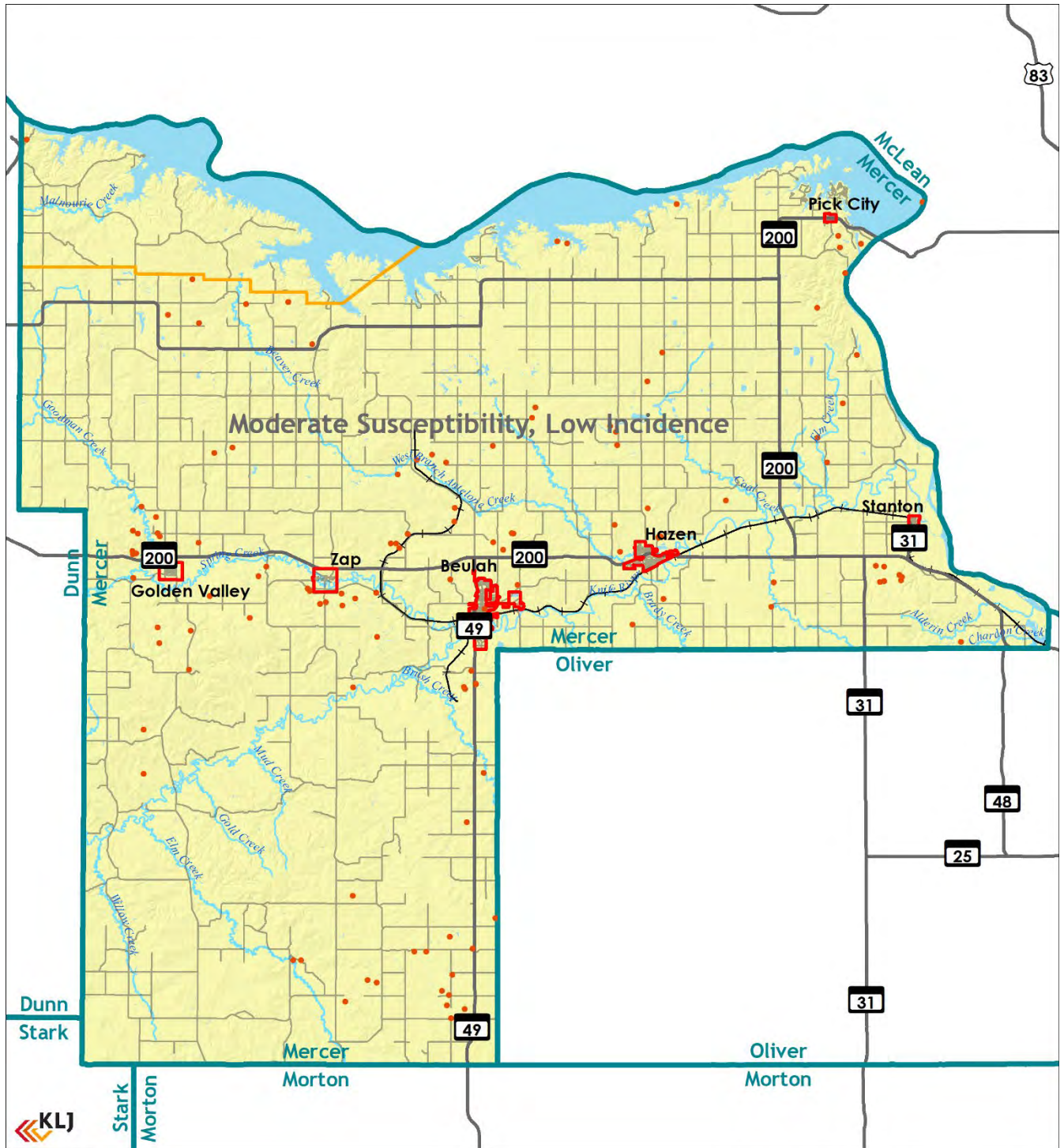


Figure 3.20
Landslide Deposit Areas

- | | |
|---|--|
| County Boundaries | State & Federal Roads |
| Landslide Deposit Areas | Other Roads |
| Fort Berthold Reservation | Railroads |
| Incorporated City Boundaries | |





Severe Summer Weather

All Jurisdictions

Overall Risk: High

Probability: High

Magnitude: High

Seasonal Pattern

May - October

Duration

A few minutes to six hours

Primary Impacts

Agricultural loss (crops, livestock)

Economic loss

Human loss and injuries

Increased stress on medical services

Permanent loss of businesses

Power loss

Property damage or loss

Release of hazardous materials

HAZARD PROFILE

The elements of severe summer weather include tornadoes, wind, hail and lightning.

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 travel from southwest to northeast at a speed between 30 and 70 MPH and are generally on the ground for less than 10 minutes; however, tornado characteristics are highly unpredictable and can change rapidly. Tornado severity is recorded with the Enhanced Fujita (EF) Scale, which replaced the Fujita (F) Scale in 2007. Wind speed estimates are determined by the damage created by a tornado. The EF Scale is shown below.

EF 0: 65-85 MPH EF 3: 136-165 MPH

EF 1: 86-110 MPH EF 4: 166-200 MPH

EF 2: 111-135 MPH EF 5: Over 200 MPH

Most tornado fatalities are caused by flying debris. Wind, hail and scud clouds may mask the presence of a tornado and associated debris, which makes a public warning system critical for preventing loss of life and injuries.

Straight-line winds are a common element of severe summer storms, and typically responsible for most damage associated with the storms. Strong winds often

form on the leading edge of severe storms, and gusts more than 100 MPH are possible.

Hail presents a hazard for property, crops, livestock and occasionally human life. Hail events range from an area of a few acres up to hundreds of square miles, although small events are most common. Hailstones can fall to the surface at more than 100 MPH and reach more than seven inches in diameter; however, most hailstones do not exceed two inches in diameter.

Lightning strikes pose multiple threats to life and property. A lightning strike can electrocute humans and animals, vaporize materials, cause fire and cause an electrical surge that may damage equipment. Human deaths from lightning strikes are somewhat uncommon. According to the National Oceanic and Atmospheric Administration, there were 12 recorded lightning fatalities in North Dakota from 1959-2013. Florida led the nation during that time period with 471 lightning fatalities. Livestock deaths and property damage are the most common lightning-related threats in North Dakota.

HISTORY

Mercer County was included in seven severe summer weather-related Presidential Disaster Declarations between 1953 and 2021.

Table 3.8 - Severe Summer Weather Events in Mercer County, 1996-2021

Summer Storm Events	Event Days*	Annual Probability	Event Days per Year
Total	207	828.0%	8.3
Hail	104	416.0%	4.2
High/Thunders torm Wind	90	360.0%	3.6
Tornado/ Funnel Cloud	12	48.0%	0.5
Excessive Heat	1	4.0%	0.0

*Number of days with a reported event

Source: National Climatic Data Center Storm Events Database

Severe summer weather events in Mercer County are summarized in Table 3.8. Hail and wind events occur approximately 4 times each per year on average. Summer weather classification criteria and a detailed listing of events can be found in Appendix C.

A severe hail event is defined as a storm producing hailstones greater than 0.75 inches in diameter. According to the National Weather Service, the largest hailstone recorded in Mercer County from 1996 to 2019 is 4.25 inches in diameter, which occurred in June 2008. June and

July are the most common months for severe hail in the county, accounting for 70 percent of all reported hail events between 1996 and 2019. Common impacts from hail include broken windows, damaged shingles, dented or broken gutters, and damaged vehicles. Heavy hail events can also injure livestock and destroy crops.

A severe wind event is defined as gusts of at least 50 kts or 58 MPH. According to the National Climatic Data Center the greatest straight-line wind gust recorded in Mercer County from 1996 to 2019 is 113 kts (130 MPH), which occurred in June 2018. July is the most common month for high wind in the county, accounting for 52 percent of all reported wind events between 1996 and 2019. Common impacts from severe winds include broken trees and limbs, damaged agricultural structures and damaged power poles.

Tornadoes are rare in the county, as shown in Figure 3.22. There were 12 tornadoes/funnel clouds reported in the county between 1996 and 2019; however, a majority were rated at EF0 or EF1 meaning they caused minimal damage to property. The impact would be devastating if a large tornado were to directly strike a city. An EF3 tornado is listed to have occurred in Mercer County in 1956, causing an estimated \$250,000 in property damages.

Anecdotal evidence suggests that lightning presents an ongoing risk to people and property in the county. Mercer County has one example that occurred in Hazen during July 2005. Lightning struck the home and knocked plaster of the bathrooms wall and blew the electronics, causing \$5,000 in property damages.

The National Climatic Data Center Storm Events Database includes brief summaries of significant storm events. A selection of recent summer storm events within Mercer County are summarized below.

- **June 1999.** An EF1 tornado touched down in the Beulah area. Damages to property included \$150,000 and destroyed most of a farmstead.
- **August 2006.** A strong summer storm brought 2.5 and 3.25 in. hail to the Stanton area. The result was over 40 damaged vehicles and damage to roofs and windows. A total of \$650,000 of property damage occurred.
- **June 2016.** High winds destroyed a DGC Urea Plant. Tornadoes were spotted in western Mercer County.
- **July 2016.** A very strong thunderstorm came through, with estimated gusts of up to 65 mph. The storm knocked over numerous trees and houses had siding torn off. A camper turned was knocked over as well. In total, \$200,000 of property damage occurred, along with \$45,000 in crop damage.

- **June 2018.** A strong storm developed a microburst, causing 130 mph winds and very large hail. The worst damage was northwest of Stanton with property damage at approximately \$400,000, along with \$75,000 in crop damage. Additional property damage elsewhere in the county totaled \$485,000.

PROBABILITY

Recent severe summer weather events in Mercer County are summarized in Table 3.7. The county averages over eight event days per year. Summer weather event classification criteria and a detailed listing of events can be found in Appendix C. There is essentially a 100% annual probability of severe summer storms in Mercer County.

LOCATION

Severe summer weather occurs at a regional level and is not a micro-climatic event. It generally occurs across the entire geographical area of the county. As noted in the Hazard Profile, the scale of its elements can vary widely, and the location of its occurrence is unpredictable.

VULNERABILITY

Population

- The entire population is vulnerable to a severe summer storm event. Residents living in mobile homes or recreational vehicles are particularly vulnerable to tornado and wind events.
- There are an estimated 322 mobile homes in Mercer County. Assuming 2.25 persons per mobile home, the vulnerable population would be:
 - 349 residents in rural areas of the county (155 mobile homes)
 - 101 residents in Beulah (45 mobile homes)
 - 2 residents in Golden Valley (1 mobile homes)
 - 171 residents in Hazen (76 mobile homes)
 - 63 residents in Pick City (28 mobile homes)
 - 11 residents in Stanton (5 mobile homes)
 - 27 residents in Zap (12 mobile homes)
- If a tornado were to hit a city in Mercer County, the potential number of residents affected could be more than those living in mobile homes.

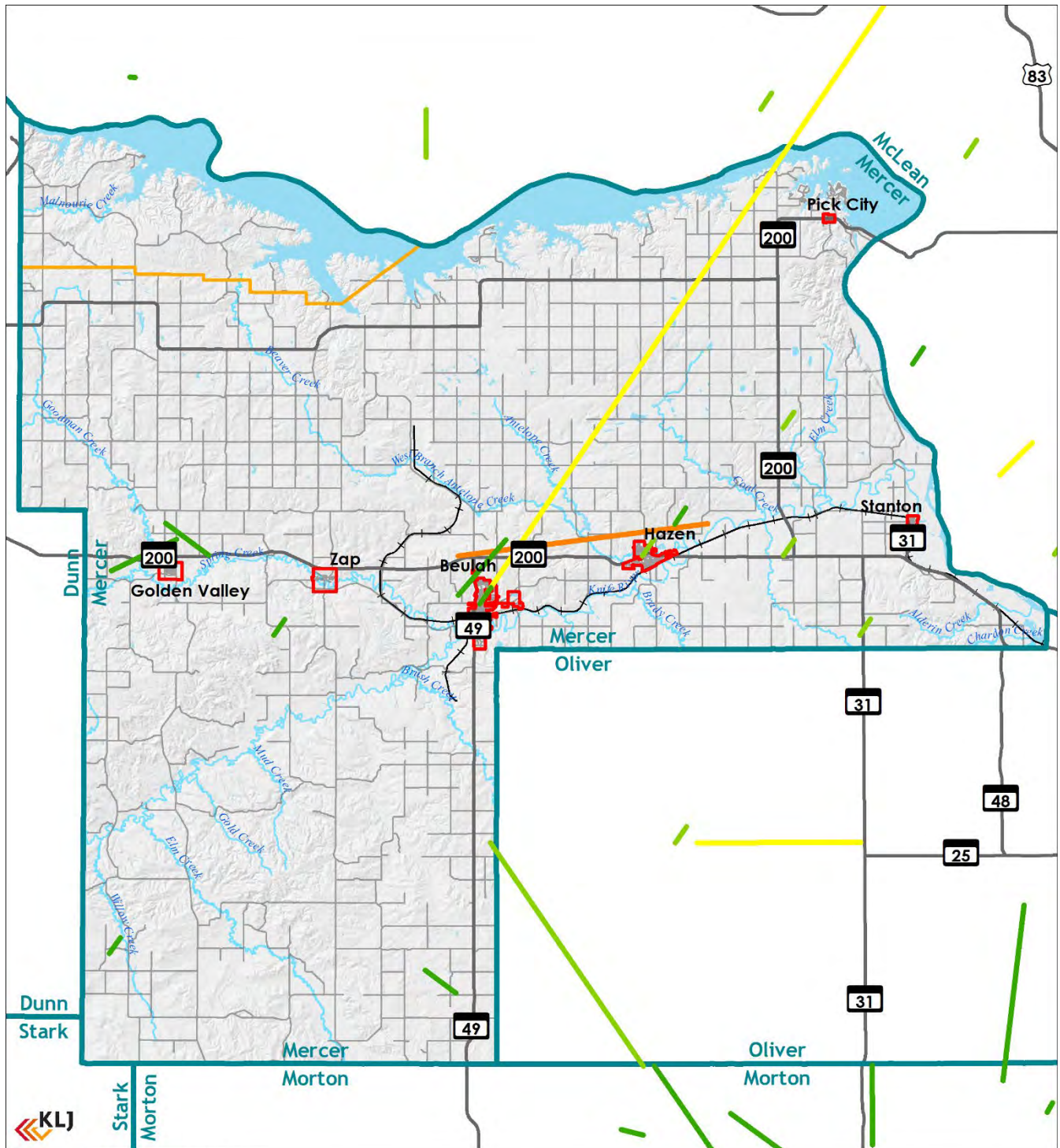
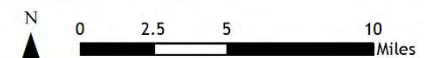
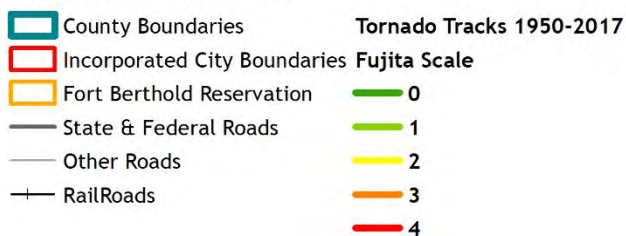


Figure 3.22 - Tornadoes



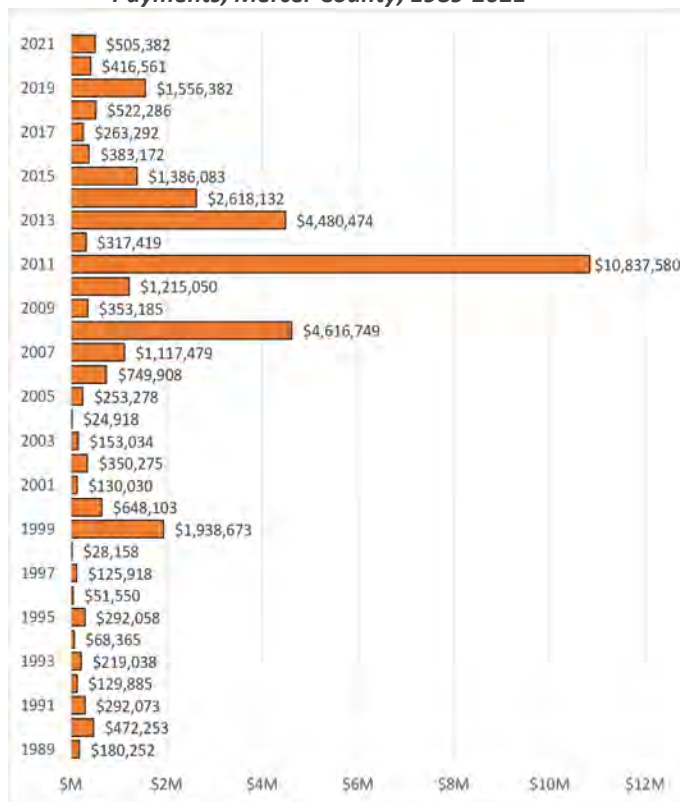
Property

- One of the most damaging summer storm events recorded by the National Climatic Data Center since 1996 is a severe summer storm which large sized hail in August 2006 and caused an estimated to have caused \$0.65 Million in damages.
- 2011 had severe summer weather impacts on crops in Mercer County resulting in over \$10 million of federal indemnity payments.
- Agricultural indemnity payments in Mercer County for severe summer weather from 1989 through 2021 totaled almost \$36,697,000. Assuming a participation rate of 89% in the County, this suggests total damages on an annualized basis of approximately \$1,250,000. Statistics can be seen in Figure 3.23.

Critical Facilities

- All critical facilities are vulnerable to a severe summer storm event. Facilities with an increased vulnerability include schools, special care centers, tall buildings or structures, electrical infrastructure and outdoor recreation or event facilities.

Figure 3.23 –Severe Summer-Related Federal Indemnity Payments, Mercer County, 1989-2021



Economy

- The economic impact of severe summer weather may be greatest on the agricultural industry since crop damage due to hail or other severe weather can ruin large swaths of growing products. Annualized crop loss is estimated at \$1,250,000. Other economic impacts from severe summer weather are unknown.

Future Development

- Beulah, Golden Valley, Hazen, Stanton and Zap have adopted the State Building Code which consists of the 2018 International Building Code, International Residential Code, International Mechanical Code, International Energy Conservation Code and International Fuel Gas Code published by the International Code Council. The code includes a provision that buildings must be constructed to withstand a wind load of 76 MPH constant velocity and three-second gusts of 115 MPH. Construction to State Building Code standards reduces the potential impacts from severe summer weather.

EXISTING CAPABILITIES

As noted previously, all jurisdictions but Pick City and Mercer County require construction to State Building Code standards. Additionally, all the cities have at least one warning siren. Each city, except Pick City, has a designated emergency shelter. There are no emergency shelters at any of the regional outdoor recreational sites.

KEY ISSUES AND POTENTIAL ACTION ITEMS

Key Issue: Mercer County averages about eight severe summer storm event days per year. Severe wind and hail are the most common summer storm events in the county, and tornadoes are also a possibility in the region. Lightning strikes have the possibility to cause significant property damage. There is need to reduce impacts.

- Potential Action Item:** Install and maintain surge protection on critical equipment.
- Potential Action Item:** Upgrade warning sirens for all cities in Mercer County.
- Potential Action Item:** Construct an emergency shelter at Pick City
- Potential Action Item:** Construct emergency shelters at outdoor recreational sites.
- Potential Action Item:** Pick City and Mercer County could adopt the State Building Code and require building permitting to ensure construction happens to code.

Severe Winter Weather

All Jurisdictions

Overall Risk: High

Probability: High

Magnitude: High

Seasonal Pattern

October - April

Duration

One to three days

Primary Impacts

Agricultural loss (crops, livestock)

Blocked roads

Economic loss

Exposure risks to people, pets, livestock and wildlife

Freezing pipes

Human loss and injuries

Increased stress on medical services

Power loss

Property damage or loss

School closure

Vehicle accidents

HAZARD PROFILE

Elements of severe winter weather include blizzards, heavy snow, ice storms and extreme cold. These elements can produce life-threatening situations and are a threat to people and property.

A blizzard is defined by the National Weather Service 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.

An ice storm produces heavy and damaging accumulations of ice due to a combination of rain and below freezing surface temperatures. Accumulated ice can bring down trees and power lines and poses a threat to motorists, pedestrians and livestock.

Extreme cold is a common occurrence in North Dakota during the winter months. Cold temperatures are

amplified when combined with wind, creating dangerous wind chills. Exposure to extreme cold temperatures and wind chill can damage tissue (frostbite) and lower the body's core temperature (hypothermia), presenting a risk to both humans and livestock.

HISTORY

Mercer County was included in 9 severe winter weather-related Presidential Disaster Declarations between 1953 and 2021.

A summary of the severe winter weather events in Mercer County is shown in Table 3.9. On average, a severe winter weather event occurs in the county approximately five days per year.

Winter Storm Events	Event Days*	Annual Probability	Event Days per Year
Total	121	504.2%	5.0
Extreme Cold/Wind Chill	25	104.2%	1.0
Blizzard	30	125.0%	1.3
Winter Storm	28	116.7%	1.2
High Wind	24	100.0%	1.0
Heavy Snow	14	58.3%	0.6
Other winter Weather	0	0.0%	0.0

*Number of days with a reported event

Source: National Climatic Data Center Storm Events Database

Winter storm and blizzard events are most common. The most common impacts are ice covered roads and blowing snow limiting visibility. Power loss happens occasionally throughout the county during severe winter storms, but electricity is generally restored quickly.

Significant past severe winter weather events include:

- **July 1997.** High winds of 45 knots caused water to wash over the main spillway of the Garrison Dam, the first time since 1975.
- **January 2010.** A winter storm transitioned from rain to ice and damaged power lines. Damages were estimated at \$93,000.
- **April 2010.** A strong spring storm system brought several inches of wet snow to mainly eastern portions of Mercer County. The combination of strong winds and the wet snow resulted in damages to electrical

utilities, causing scattered power outages across the county. Damages were reported at \$30,000.

- **December 2016.** Mercer County experienced two blizzards with nearly 30 inches of snow, and frigid temperatures.
- **January 2021.** A powerful system came through the area with very high winds, with gusts up to 65 mph according to the Golden Valley NDDOT site. A newly constructed building was blown over. Damages were reported at \$50,000.

PROBABILITY

Recent severe winter weather events in Mercer County are summarized in Table 3.8. The county experience around 5 event days per year. Winter storm event classification criteria and a detailed listing of events can be found in Appendix C. There is essentially a 100% annual probability of severe winter weather in Mercer County.

LOCATION

Severe winter weather occurs at a regional level and is not a micro-climatic event. It generally occurs across the entire geographical area of the county. As noted in the Hazard Profile, the scale of its elements can vary widely, and the location of their occurrences are unpredictable.

VULNERABILITY

Population

- Residents living in mobile homes, recreational vehicles, or poorly insulated homes may find it difficult to adequately heat their homes during cold temperature events. Estimated number of residents and mobile homes in Mercer County include:
 - 349 residents in rural areas of the county (155 mobile homes)
 - 101 residents in Beulah (45 mobile homes)
 - 2 residents in Golden Valley (1 mobile homes)
 - 171 residents in Hazen (76 mobile homes)
 - 63 residents in Pick City (28 mobile homes)
 - 11 residents in Stanton (5 mobile homes)
 - 27 residents in Zap (12 mobile homes)
- Wind, ice, heavy snow and cold temperatures can combine to create hazardous conditions and “trap” residents in their homes without heat or electricity. Elderly residents may be especially vulnerable to this hazard as they are more likely to have limited mobility, especially in the event of hazardous road conditions. The estimated number of permanent

residents age 65 or older for each jurisdiction are summarized below.

- Beulah: 428 residents
- Golden Valley: 46 residents
- Hazen: 297 residents
- Pick City: 54 residents
- Stanton: 85 residents
- Zap: 53 residents
- Rural Mercer County: 791 residents

- People required to travel on a daily basis face increased road hazards. According to the St. Louis Federal Reserve, the 2021 labor force in Mercer County was approximately 3,670 people. The mean commute time to work for residents in the county as recorded in the latest American Community Survey is approximately 18 minutes.

Property

- It is difficult to estimate the impact of winter storms on property in the County. The most likely damages involve vehicle accidents and roof collapse due to heavy snow loads. A winter storm 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.
- Losses vary based on storm severity and duration, but losses to unprotected livestock can be significant during a major storm event. Winter storms in the spring season have the potential to affect calving operations.

Critical Facilities

- A winter storm event that “traps” fire and ambulance responders within the facility would severely limit the emergency response capability of the County.
- A severe winter storm event would most likely require closure of schools. A winter storm event that begins mid-day could present issues for students leaving school.
- Some critical facilities lack emergency generators and their operations would be hampered in the event of a power outage.

Economy

- The most significant economic impact may be livestock fatalities caused by extreme blizzards with resulting economic losses for farmers and ranchers.
- Severe winter weather may prevent businesses or services from opening and result in lost wages for workers.

- Structures (especially agricultural storage buildings) may suffer roof collapse and damage to contents inside.

Future Development

- The potential vulnerability to winter weather in the county is not expected to change in the foreseeable future. There is no identified impact on future development.

EXISTING CAPABILITIES

While many facilities in the County do have emergency generators, there are several critical facilities in each jurisdiction that do not. Snow removal is generally timely. Electricity is generally restored quickly in the event of power loss.

KEY ISSUES AND POTENTIAL ACTION ITEMS

Key Issue: Mercer County averages approximately 5 days per year with a winter storm event. Severe winter weather events in the county include winter storm, high wind, heavy snow, blizzard, extreme cold/wind chill and ice storm. These events may lead to road closures.

- *Potential Action Item:* Coordinate with landowners to identify strategic locations for constructing snow fences.
- *Potential Action Item:* Continue educating residents about winter storm safety.

Key Issue: A winter storm 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 extreme cold temperatures.

- *Potential Action Item:* Identify emergency warming shelter(s) and acquire back-up generator(s) to heat shelters and provide electricity during a winter storm event. Promote shelters so residents are aware of their availability.
- *Potential Action Item:* Encourage utility provider to bury electric power lines when undergoing upgrades or repair.
- *Potential Action Item:* Obtain backup power generators for critical facilities.

Space Weather

All Jurisdictions

Overall Risk: Moderate

Probability: Possible

Impact: Limited (impact could vary widely)

Seasonal Pattern

None

Primary Impacts

Agricultural loss (crops, livestock)

Economic loss

Explosion

Hazardous materials release

Human loss and injuries

Increased stress on medical services

Localized evacuation

Property damage or loss

HAZARD PROFILE

Space Weather is a direct threat to most communities because of the widespread reliance on technological systems. NASA describes space weather as any and all conditions and events on the sun, in the solar wind, in near-Earth space, and in Earth's upper atmosphere that can affect space-borne and ground based technological systems. Generally, it takes the form of particles, electromagnetic energy, and magnetic fields. Space weather events which occur in space near the earth or its atmosphere can be classified as one of three types.

- A geomagnetic storm is a major disturbance of Earth's magnetosphere that occurs when there is a very efficient exchange of energy from the solar wind into the space environment surrounding Earth.
- Solar flares are large eruptions of electromagnetic radiation from the sun lasting from minutes to hours. The sudden outburst of electromagnetic energy travels at the speed of light, therefore any effect upon the sunlit side of Earth's exposed outer atmosphere occurs at the same time the event is observed. Solar radiation storms occur when a large-scale magnetic eruption, often causing a coronal mass ejection (CME) and associated solar flare, accelerates charged particles in the solar atmosphere to very high velocities.

These events can affect critical facility infrastructure and technology in various ways. Generally, they can disrupt surface-to-surface and surface-to-orbit communications. Additionally:

- Strong electrical currents driven along Earth's surface during auroral events disrupt electric power grids and contribute to the corrosion of oil and gas pipelines.
- Changes in the ionosphere during geomagnetic storms interfere with high-frequency radio communications and Global Positioning System navigation.
- During polar cap absorption events caused by solar protons, radio communications can be compromised for commercial airliners on transpolar crossing routes.

As a reference for impact, a space weather event occurred in July 2012 that was not directed toward Earth. If it had been, the effects would have more severe than any since the September 1859 "Carrington Event." The Carrington Event impacted telegraph systems all over Europe and North America. Auroras were seen as far south as the Caribbean in the northern hemisphere. If such an event were to take place now, the effects would be far more devastating. Testimony before Congress as to the level of impact suggests the entire electrical transmission grid could be affected and power plants, substations and transformers that keep the grid operational could be destroyed. Experts disagree about the potential level of impact. Opinions range from disrupting electrical power supply for a few weeks all the way to loss of 90 percent of human lives due to failure of nearly all computer and electrical systems, and ancillary effects.

HISTORY

There are no recorded catastrophic space weather effects in Mercer County or all of North Dakota. The nearest recorded storm affected Montreal, Canada on March 13, 1989, when a geomagnetic storm took out their commercial electric power for nine hours, affecting six million people. Other recorded space weather events occurred in September 1859, May 1921, May 1967, and November 2003.

PROBABILITY

The capacity to forecast space weather events is limited. NOAA's Space Weather Prediction Center is the United State's official source of space weather alerts, watches, and warnings. Using modeling similar to that used for weather forecasting, the agency is able to predict space weather on time scales of hours to weeks. However, the degree of certainty and the magnitude of potential events leaves much to be desired, especially with respect to catastrophic events. Although no specific probability estimate has been provided by NOAA, the Royal Academy of Engineering in London, England published a report in 2013 that indicated for planning purposes an event similar

to the Carrington Event is considered to be a 1-in-100 year event. One researcher published a research study in 2012 suggesting there is approximately a 12% chance of such an event happening in the next ten years. Source: Pete Riley. (2012) On the probability of occurrence of extreme space weather events, *Space Weather*.

LOCATION

All parts of Mercer County are at equal risk from a space weather event.

VULNERABILITY

Population

- Except in the case of a high intensity solar radiation storm, the direct impacts of a space weather event on people is limited. However, nearly all of the County's population relies directly or indirectly on electricity for normal, essential functions such as heating and cooling, obtaining water, waste disposal, food refrigeration, communications, and transportation. If a space weather event caused the loss of power, the impact for a short time would be an inconvenience for most, but critical to life support for a few. Loss of power for an extended period of time could result in significant challenges to sustain life as we know it in Mercer County.

Property

- The loss of electricity for a short time would primarily impact structures that are heated with electricity or protected from seepage by sump pumps in areas with high water tables. Buildings directly or indirectly dependent on electricity will likely be uninhabitable during winter months.

Critical Facilities

- All critical facilities in the region rely on electrical power to function properly. Most of these critical facilities do not have a backup power source. Therefore, short term and long-term functionality of most critical facilities in the region could be reduced or destroyed. The majority of electrical power in Mercer County is sourced from the Basin Electric Power and Western Area Power Administration and distributed by the Roughrider Electric Cooperative. Beulah, Zap, and Golden Valley are all served by MDU. Although local power cooperatives have plans to get local power infrastructure up and running after such disasters, the minimum timeframe to do so is a matter of weeks or months. A major space weather event could make fixing damaged substations moot in

view of other electrical grid damage and system failure. Therefore, the time to get power back could be much greater.

- One of the most significant and immediate potential impacts of a space weather event would be disruption or destruction of electronic systems used for healthcare in the region. Mitigation measures to protect or replace these electronic systems are not in place. The electronic systems of the Sakakawea Medical Center facilities in Hazen are not hardened to withstand such an event.
- Emergency communications systems and all other communications systems are critical to emergency notification and response functions in the region, and could be disrupted or destroyed by a major space weather event. Mitigation measures to protect or replace these communications systems are not in place.

Economy

- To the degree that the systems of production are dependent on electrical power, their capacity to generate income would be limited.
- However, the larger impact may well be on the medium of exchange. Since almost all transactions now involve electronic transfers of monetary value, if electronic systems were damaged or destroyed, the normal means of completing transactions would be lost. In fact, actual access to wealth would largely be lost.

Future Development

- There are no direct impacts of space weather events on future development. Traditional development patterns would be subject to the same impacts anticipated for existing property, critical facilities, and populations.

EXISTING CAPABILITIES

There are no known capabilities in place in the County to mitigate the impacts of space weather events. However, the very rural locale of many residents of the region has necessarily required a more independent lifestyle than more heavily populated areas. These very rural locales are more likely to have redundant systems that will allow them to sustain life for extended periods of time.

KEY ISSUES AND POTENTIAL ACTION ITEMS

Key Issue: Widespread, long-term loss of electrical power will lead to loss of life and disruption of life as we know it in Mercer County.

- *Potential Action Item:* Encourage household level preparations to mitigate the impacts of a sustained widespread power loss.
- *Potential Action Item:* Harden electrical components and systems for critical facilities (especially emergency response services) against the anticipated impacts of a space weather event.
- *Potential Action Item:* Develop a strategic action plan to harden medical facilities and electronic systems against the anticipated impacts of a space weather event.
- *Potential Action Item:* Appoint a strategic planning team to consider the long-term impacts of a major space weather event and develop a strategic plan to mitigate the impacts on the region.

Wildland Fire

Rural County

Overall Risk: Moderate

Probability: Moderate

Impact: Moderate

Beulah

Overall Risk: Moderate

Probability: Low

Impact: High

Golden Valley

Overall Risk: Moderate

Probability: Low

Impact: High

Hazen

Overall Risk: Moderate

Probability: Low

Impact: High

Pick City

Overall Risk: Moderate

Probability: Low

Impact: High

Stanton

Overall Risk: Moderate

Probability: Low

Impact: High

Zap

Overall Risk: Moderate

Probability: Low

Impact: High

Seasonal Pattern

March – November

Duration

Hours to weeks

Primary Impacts

Agricultural loss (crops, livestock)

Blocked roads

Economic loss

Explosion

Hazardous materials release

Human loss and injuries

Increased stress on medical services

Localized evacuation

Property damage or loss

Reduced air quality

HAZARD PROFILE

A wildfire is an unplanned fire, a term which includes grass fires, forest fires and scrub fires either human-caused or natural in origin.

Wildfires pose increasing threats to people and their property as communities develop in the wildland-urban interface. The wildland-urban interface refers to areas where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. The threat exists anywhere that structures are located close to natural vegetation and where fire can spread from vegetation to structures, or from structures to vegetation.

The three major factors that affect 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. These factors affect and increase the likelihood of a fire starting, the speed and direction in which a fire will travel, the intensity at which it burns, and the ability to control and extinguish it. At the landscape level, both topography and weather are beyond our control. Fuel is the only factor influencing fire behavior that humans have the ability to manage.

HISTORY

The Interagency Fire Program Analysis fire-occurrence database, compiled by Karen C. Short of the USDA Forest Service, Rocky Mountain Research Station is sourced from multiple reporting agencies; however, due to reporting limitations, it should not be considered an all-inclusive list. According to the database, there were 100 wildfires between 1992 and 2018 in Mercer County. Seven fires in the last ten years were over 100 acres.

The North Dakota Forest Service also tracks reported wildland fires. However, the Forest Service data is only a partial summation of overall wildland fire events in the County. For the reporting districts, there were 74 reported wildland fires from the years 2017 through 2021. The typical size of reported fires was approximately 1 acre. The maximum size reported fire was 1000 acres in 2017.

Agricultural operations are the most likely source of these wildland fires. Burn pits and lightning strikes are also common sources.

PROBABILITY

In 2009 the North Dakota Forest Service developed a wildfire risk assessment for every county in the state based on wildfire occurrence, fire department response capabilities and weather. The assessment ranked Mercer County as having a moderate risk for wildfire.

Figure 3.25 on the following page shows fuel types in Mercer County. Predominate fuel types are classified using the 13 standard fuel models for fire behavior by Anderson. Much of the county is agricultural land, which the Anderson models do not consider to be a significant fuel; however, in times of drought or during harvest season agricultural fields may present a wildfire risk. The most prevalent fuels in the county are grass and shrub groups. Timber fuels can be found along the Missouri River and Lake Sakakawea. Grassland fires generally burn with a low intensity but can spread quickly. Based on aggregate data from USDA from 2017-2021, an average of 15 wildland fires occurred annually in Mercer County, and the probability of a wildland fire of 100+ acres occurring is approximately a 70% chance per year. Given the information on wildland fires from the Fire Occurrence Database, the actual incidence of wildland fires and average size of wildland fires may be significantly higher.

LOCATION

Based on data from the Fire Occurrence Database, the greatest incidence of wildland fires has been clustered in the southeastern part of the county in the vicinity of US 200 and the BNSF railroad that roughly parallels the highway. Additional clusters are located in the northwestern corner of the county. See Figure 3.25. The wildland-urban interface identifies risk areas where fire can spread from vegetation to structures, or from structures to vegetation. Any areas where structures are located within or adjacent to wildland environments can be included within the wildland-urban interface. This includes all rural structures in Mercer County and structures along the edges of each city.

VULNERABILITY

Population

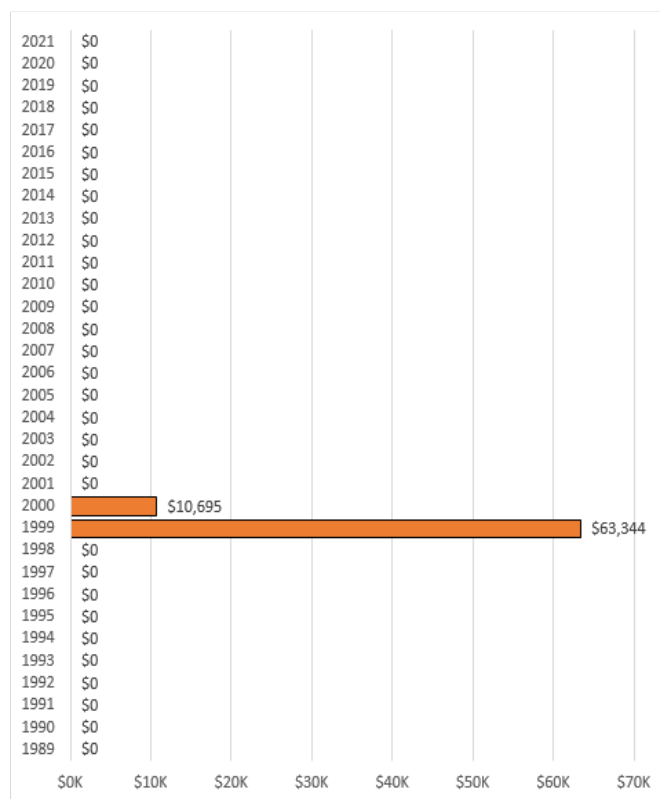
- Residents of non-urbanized areas (in the wildland-urban interface) are generally at a higher risk of wildfire. According to Census Bureau counts, there are 8,350 residents in the county; of these, an estimated 2,108 live outside of an incorporated city and are at increased vulnerability to wildfire. Assuming approximately 10 percent of residents in incorporated cities live along or near the wildland-urban interface, 624 additional residents are vulnerable to wildfire. Using these estimates, approximately 2,732 residents (33 percent of total population) in the county are vulnerable to wildfire. The estimated at-risk population in each city is as follows:

- Beulah: 306 residents
- Golden Valley: 19 residents
- Hazen: 228 residents
- Pick City: 12 residents
- Stanton: 37 residents
- Zap: 22 residents

Property

- The statewide Multi-Hazard Mitigation Plan includes information about crop indemnity payments from the USDA Risk Management Agency. Figure 3.24 lists wildfire-related crop indemnity payments in Mercer County between 1989 and 2021 payments in 1999 and 2000. The 1999 payments totaled over \$63,000.

Figure 3.24 – Fire-Related Federal Indemnity Payments, Mercer County, 1989-2021



- There is no instance of recorded widespread property loss in Mercer County due to wildfire. The largest wildfire in North Dakota between 1992 and 2012 is 53,708 acres according to the National Interagency Fire Occurrence Database. The wildfire originated in Richland County MT in 1999.

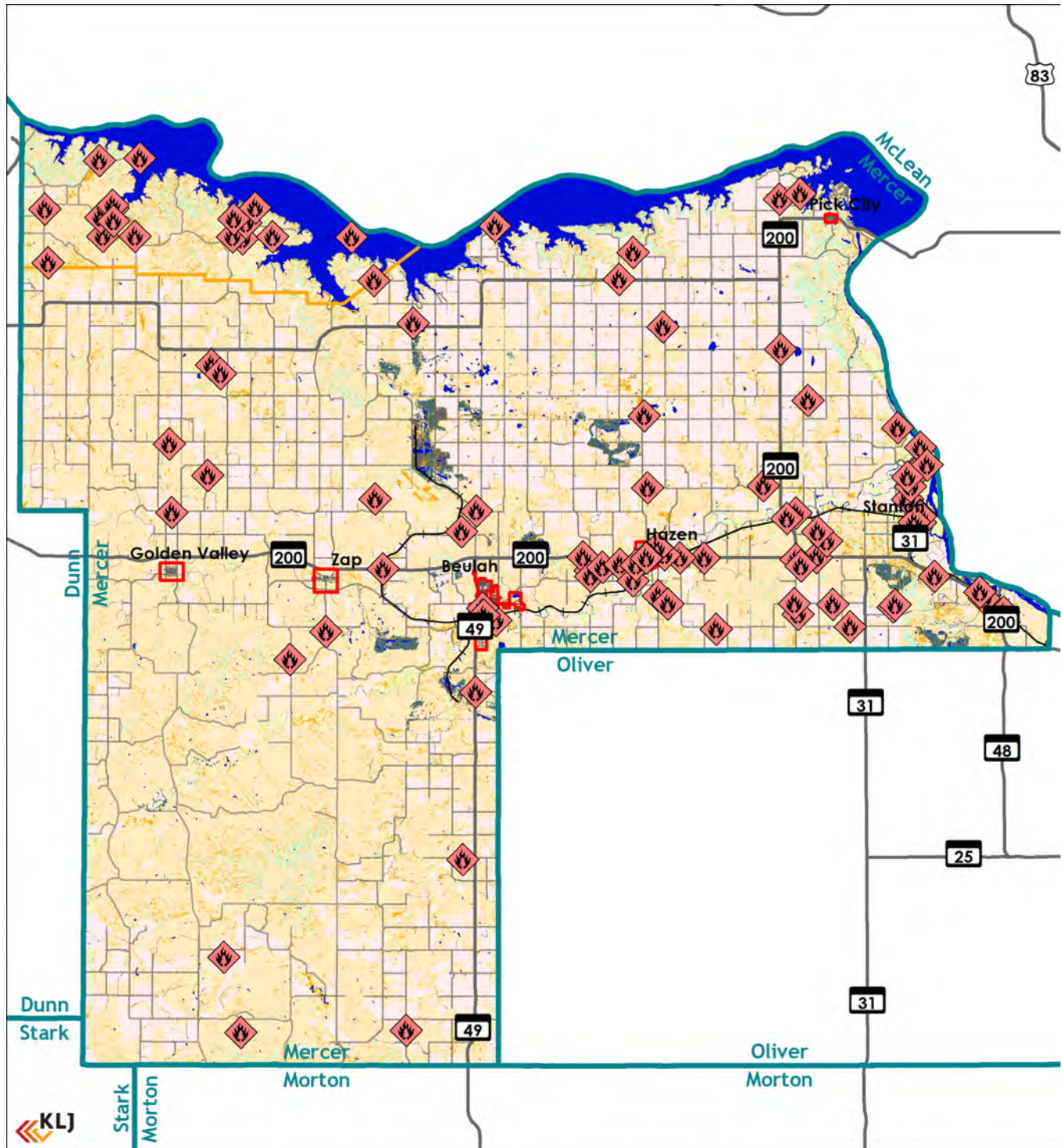


Figure 3.25
Wildfires and Fire Fuel

- County Boundaries
- Fort Berthold Reservation
- Incorporated City Boundaries
- State & Federal Roads
- Other Roads
- Railroads

◆ Fire History 1992-2018 (All Sizes)

Burnable Fuels

- Grass
- Grass and Shrub
- Shrubs
- Timber Litter
- Grass/Shrubs with Canopy Litter

Nonburnable Areas

- Urban Areas
- Agriculture
- Open Water
- Bare Ground



0 2.5 5 10 Miles



From 1992-2021, the largest fire reported in Mercer County was 1000 acres in 2017.

Critical Facilities

- Although nearly all of the county's critical 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. These, and other facilities within 100 yards of the edge of cities or the unincorporated communities include:
 - Rural areas of the county:
 - All key facilities in rural areas of the county are considered vulnerable to wildfire
 - Beulah:
 - Beulah High School
 - Church of the Nazarene
 - Knife River Care Center Nursing Home
 - Mercer County Ambulance
 - Water Treatment Plant
 - Hazen:
 - Christian Fellowship Church
 - Cinema Twin Theaters
 - Hazen Fire Department
 - Hazen Middle School
 - Farmers Union Bulk Plant
 - Mercer County Ambulance
 - New Bethel Congregational Church
 - Water Tower
 - Pick City:
 - Sakakawea Motel
 - Stanton:
 - Dakota Transload Facility
 - Lighthouse Assembly of God
 - Mercer County Courthouse
 - Zap:
 - Lift Station

Economy

- There are no overall estimates for the level of impact of wildland fires on the Towner County economy. However, it should be noted that wildland fires can burn through large swaths of cattle grazing land and essentially eliminate pastureland for those farmers and ranchers using the grazing land for more than a year.

Future Development

- The Mercer County zoning regulations do not include any provisions that specifically address wildfire. Such regulations could include defensible space standards, road access and adequate water supply.

EXISTING CAPABILITIES

The Mercer County Emergency Manager oversees the burn ban and fire danger level alert systems. Wildfire response in the county is coordinated by several fire districts. District boundaries are shown in Figure 3.26.

- Beulah Fire Protection District
- Glen Ullin Fire Protection District
- Golden Valley Fire Protection District
- Halliday Fire Protection District
- Hazen Fire Protection District
- Hebron Fire Protection District
- Stanton Fire Protection District
- Twin Buttes Fire Protection District

KEY ISSUES AND POTENTIAL ACTION ITEMS

Key Issue: Mercer County experienced 7 fires that covered at least 100 acres over the last ten years. Most large wildfires in the county cause minimal property damage.

- *Potential Action Item:* Perform fuel reduction activities in high-risk rural areas.
- *Potential Action Item:* Educate residents about defensible space best practices.
- *Potential Action Item:* Encourage the use of non-combustible materials (stone, brick, stucco, etc.) for new construction in wildfire hazard areas.
- *Potential Action Item:* Incorporate wildland-urban interface guidelines into the county's zoning and subdivision regulations.

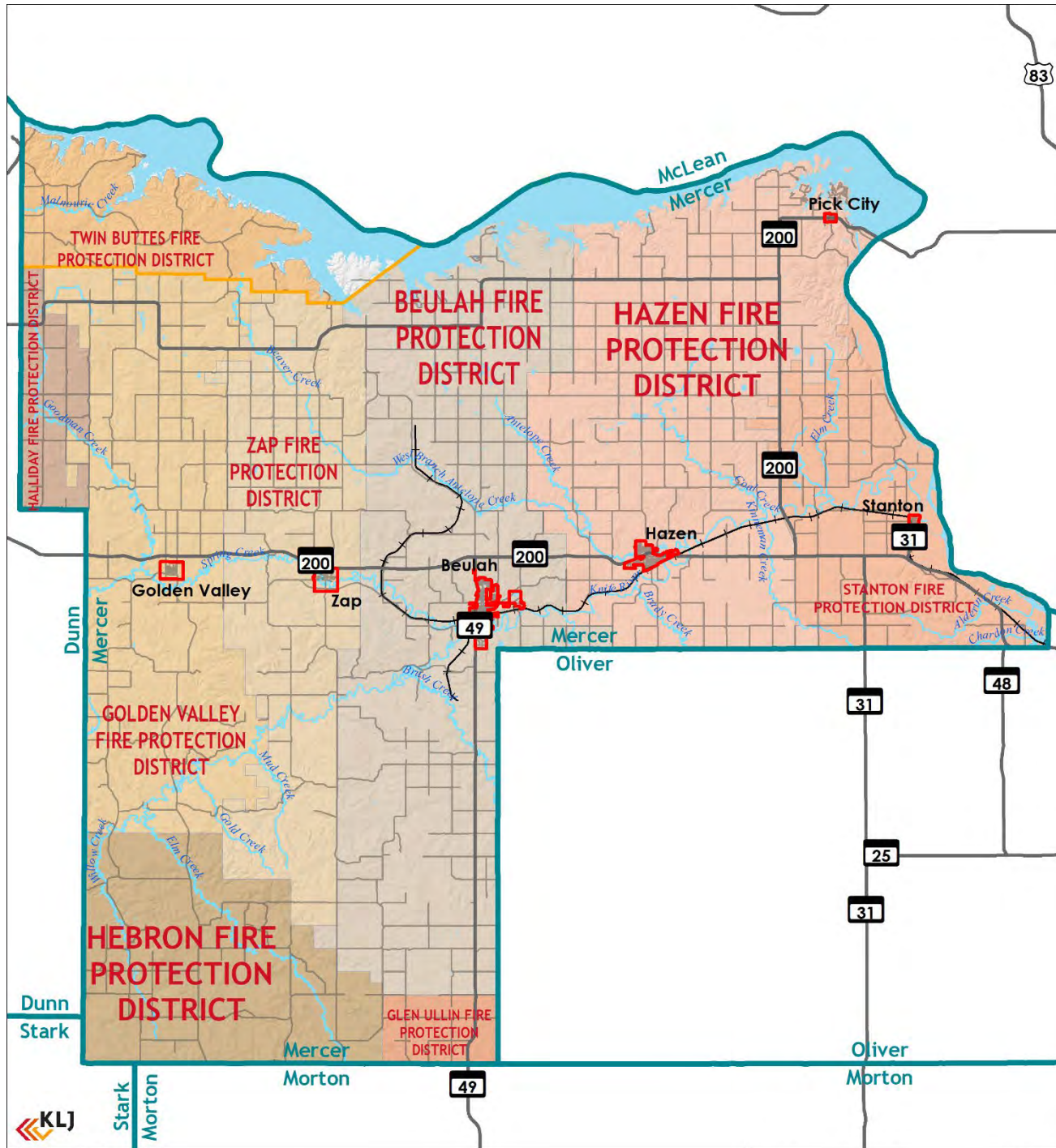
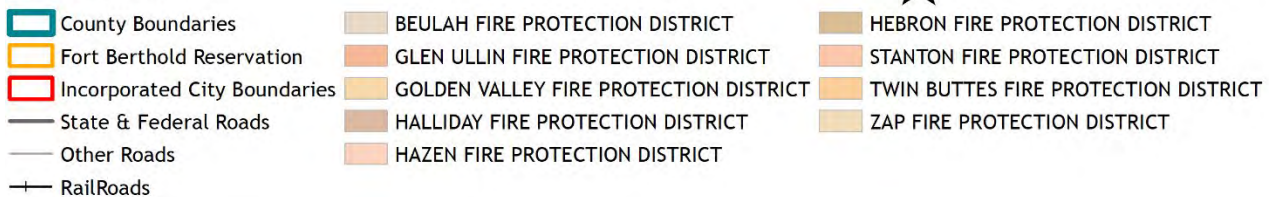


Figure 3.26
Fire Districts



Infectious Disease

All Jurisdictions

Overall Risk: Moderate

Probability: Moderate

Impact: Moderate

Seasonal Pattern

None

Duration

Varies

Primary Impacts

Agricultural loss (crops, livestock)

Economic loss

Human loss and injuries

Increased stress on medical services

Localized evacuation

School closure

HAZARD PROFILE

Communicable disease is an illness caused by an infectious agent such as bacteria, virus, fungi, parasites or toxin. Communicable diseases of particular concern are those that can lead to the loss of human life or widespread loss of crops and livestock. A severe communicable disease incident has potential for catastrophic effects on human populations and the economy.

There are numerous ways for communicable disease to spread among humans: physical contact with an infected person, contact with contaminated object, bites from animals or insects carrying the disease, or air travel. A widespread occurrence of infection in a community is called an epidemic. Epidemics may lead to quarantines, school and business closures, and stress on medical facilities. A widespread epidemic (often countrywide or worldwide in scope) is referred to as a pandemic. Perhaps the most notable pandemic in the modern era was the Spanish Influenza in 1918. The disease killed an estimated 20 to 40 million people worldwide, including 675,000 Americans. In North Dakota, about 2,700 people died and 6,000 were infected. As of December 13, 2021 there were 1,625 deaths attributed to COVID-19 in North Dakota.

Animal and plant diseases can harm the economy through the loss of livestock and crops. Widespread plant and animal diseases can lead to food shortages. Some animal diseases may cause sickness in humans if proper precautions are not taken with infected animals. Diseases that are a threat to cattle include tuberculosis and anthrax. According to the North Dakota Department of

Health, there has been one report of tuberculosis in cattle in recent years. Anthrax is much more common, with 185 cases between 1989 and 2010; a majority of those cases occurred in 2005 when there were 109 reports. Plant diseases in North Dakota include karnal bunt disease, black stem rust race Ug99, and emerald ash borer.

HISTORY

Mercer County was included in two infectious disease-related Presidential Disaster Declarations between 1953 and 2021.

Prior to the COVID-19 pandemic of 2020, there has been no recent history of major crop, animal or human epidemic disease or contamination in the county. As of September 24, 2022 the cumulative number of identified coronavirus cases in Mercer County was 2,834 and there had been 24 lives lost to the pandemic.

PROBABILITY

Populations throughout the world are susceptible to epidemics and national pandemics, and Mercer County residents are no exception, although the generally low population density of the area makes rapid transmission of communicable disease less likely.

Based on historical data, it is highly likely that one or more infectious diseases will occur in Mercer County every year.

Based on historical data, it is likely that plant or animal diseases will occur in Mercer County within a ten-year period.

LOCATION

Infectious disease and pest infestations are not controlled by geographic boundaries and can happen throughout the entire area of Mercer County.

VULNERABILITY

Population

- Elderly and young persons are most at risk for communicable disease. Approximately 1,754 of the county's permanent residents are 65 years of age or older. The estimated number of permanent residents age 65 or older for each jurisdiction are summarized below.
 - Beulah: 428 residents
 - Golden Valley: 46 residents
 - Hazen: 297 residents
 - Pick City: 54 residents
 - Stanton: 85 residents
 - Zap: 53 residents
 - Rural Mercer County: 791 residents

- Approximately 5.9 percent, or 493, of the county's permanent residents, are under five years of age. The estimated number of permanent residents under age five for each jurisdiction are summarized below.
 - Beulah: 122 residents
 - Golden Valley: 19 residents
 - Hazen: 137 residents
 - Pick City: 0 residents
 - Stanton: 29 residents
 - Zap: 18 residents
 - Rural County: 168 residents
- The most commonly occurring infectious disease in recent decades has been influenza. While details about influenza cases in Mercer County are not readily available, the North Dakota Department of Health has published the number of cases at a county level from 2010 through 2021. The season with the highest number of cases in Mercer County was 2019-2020. There were 189 cases that season.
- The Centers for Disease Control and Prevention (CDC) estimates that a medium level influenza pandemic would result in 30 percent ill, 0.8 percent of ill requiring hospitalization and 0.2 percent of ill dying from the disease. In Mercer County this would equate to 2505 ill, 20 requiring hospitalization and 0 deaths from a medium level influenza pandemic.

Property

- The 2019 North Dakota Enhanced Mitigation Mission Area Operations Plan estimated that infectious disease could impact 20 percent of crop and livestock values. According to the 2017 Census of Agriculture the market value of crops in Mercer County was \$25 million and the market value of livestock was \$32 million. Estimating 20 percent loss for each sector results in \$5 million in communicable disease-related crop loss and \$6.4 million livestock loss.

Critical Facilities

- Gathering places and facilities that have a high density of occupants have the greatest vulnerability to infectious disease. These include:
 - Beulah School District (K12) 724 students
 - Hazen School District (K12) 568 students
 - Knife River Care Center -- 86 residents
 - Sakakawea Medical Center – 13 bed critical access hospital with 5 emergency rooms
 - Senior Suites at Sakakawea – 18 residents with capacity for 30

Economy

- No estimates of the overall economic impact from infectious disease have been calculated for Mercer County.

Future Development

- The growth of the energy industry has resulted in an influx of young workers who are generally less susceptible to disease given their age; however, the high-density living conditions experienced by many of these workers, especially those in workforce housing facilities, could make rapid disease transmission more likely. As the population stabilizes this is unlikely to stay a significant factor, and the long-term impact of infectious disease on future development is likely to be negligible.

EXISTING CAPABILITIES

Sakakawea Medical Center is a critical access hospital in Hazen, but it does not have any ICU rooms.

The USDA Farm Service Agency and North Dakota State University Extension both have field offices located in Beulah and offer technical assistance to farmers and ranchers for the prevention and treatment of agricultural diseases.

KEY ISSUES AND POTENTIAL ACTION ITEMS

Key Issue: Human and agricultural disease have the potential to greatly impact the health and economy of the county.

- *Potential Action Item:* Continue supporting the efforts of the USDA Farm Service Agency and NDSU Extension.

Dam Failure

Rural County

Overall Risk: Low

Probability: Low

Impact: Moderate

Beulah

Overall Risk: Moderate

Probability: Low

Impact: High

Golden Valley

Overall Risk: Low

Probability: Low

Impact: Low

Hazen

Overall Risk: Moderate

Probability: Low

Impact: High

Pick City

Overall Risk: Low

Probability: Low

Impact: Low

Stanton

Overall Risk: Moderate

Probability: Low

Impact: High

Zap

Overall Risk: Low

Probability: Low

Impact: Low

Seasonal Pattern

More likely during flooding season, March-October

Duration

24 hours

Identified Risks

Agricultural loss (crops, livestock)

Economic loss

Human loss and injuries

Increased stress on medical services

Localized evacuation

Loss of power

Release of hazardous materials

Shortage of critical materials

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. Dam failure is a sudden, uncontrolled release of impounded water, and can have a devastating effect on people and property downstream.

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. Approximately 34 percent of all dam failures in the United States are due to overtopping.
- Foundation defects, including settlement and slope instability, cause about 30 percent of all dam failures.
- Piping is a term used to describe the process that occurs as seepage pathways create eroded pipes through a structure. Seepage often occurs around hydraulic structures and earthen features, and if left unchecked can gradually reduce the dam structure's stability. About 20 percent of all dam failures in the United States are caused by piping.
- Structural failure of materials used to construct the dam.
- Inadequate maintenance.

HISTORY

According to the Stanford National Performance of Dams Program, no dams in Mercer County have failed.

PROBABILITY

The Association of State Dam Officials and the US Army Corps of Engineers 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.
- **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 serious 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.

- The North Dakota Century Code requires that all dams with greater than 1,000 acre-feet of storage have emergency procedures and safety plans. Safety plans must include a map of the evacuation area, notification directory, name of the dam owner or responsible entity, availability of materials for emergency repairs, and a list of contractors that could provide emergency assistance.

LOCATION

The North Dakota Department of Water Resources maintains a database of all dams in the county. There are 119 dams in Mercer County; two are classified as high hazard. The high hazard dams in the county are described in Table 3.10 and shown in Figure 3.27. Although there are several small dams in Mercer County, related dam failures would likely only impact agricultural areas, and not the municipalities.

Dam Name	Action Plan	Owner	Type	Year Built	Max Storage (acre-feet)
Garrison Dam	Yes	USACE	Roller Earth	1953	24,200,000
Beulah Flood Control Dam	Yes	City of Beulah	Roller Earth	1982	1,388

Source: ND State Water Commission

Garrison Dam is technically located in McLean County and is just east of Pick City. Its impoundment area is approximately 315,000 acres. The dam is a fishing and recreational amenity for the surrounding region and state, and also serves as an irrigation source.

Beulah Flood Control Dam is located north and east of the City of Beulah. Its maximum impoundment area is approximately 68 acres. The dam has no normal pool. The dam's purpose is flood control.

VULNERABILITY

Population

- Garrison Dam is located just east of Pick City. Potential impacts from a Garrison Dam failure would include inundating Stanton and extreme flooding of Hazen and all lands between these towns and south of Stanton. All 368 residents of Stanton would be impacted. Almost all the 2281 residents of Hazen would be impacted. An estimated 135 rural residents living between these cities and south of Stanton that would be affected. Approximately 35 square miles of in Mercer County would be flooded by a Garrison Dam failure.
- Beulah Flood Control Dam is located north and east of the City of Beulah. Approximately 700 residents within Beulah would be affected by dam failure.

Property

- Garrison Dam is located just east of Pick City. Potential impacts from a Garrison Dam failure would include inundating Stanton and extreme flooding of Hazen and all lands between these towns and south of Stanton. Approximately 297 structures in Stanton and 1,349 structures in Hazen would be impacted. There are about 127 structures in between these cities and south of Stanton that would be affected. Approximately 35 square miles of in Mercer County would be flooded by a Garrison Dam failure.
- Beulah Flood Control Dam is located north and east of the City of Beulah. There are 471 structures within Beulah would be impacted by dam failure.
- Agricultural land would be at risk if a low hazard dam failed in a rural part of the County.

Critical Facilities

- Critical facilities in Beulah that may be affected by the failure of the Flood Control Dam include:
 - Beulah Beacon
 - Beulah City Hall
 - Beulah Post Office
 - FUOC Fertilizer Plant
 - Job Service ND
 - Valley Grain Milling Elevator

Economy

- The economic impact from dam failures in Mercer County is not available.

Future Development

- New development within the inundation area of the Garrison Dam is not expected.

- Development is likely downstream of the Beulah Flood Protection Dam, as it impounds a relatively small creek that runs directly through the city.

EXISTING CAPABILITIES

There are emergency action plans for both Garrison Dam and Beulah Flood Control Dam.

KEY ISSUES AND POTENTIAL ACTION ITEMS

Key Issue: Garrison Dam would have a large regional impact in the event of failure, and Beulah Dam would impact dozens of properties. There is no history of significant dam failure in the county and a future incident is considered very unlikely.

Potential Action Item: Restrict future development in the flood-stage dam failure inundation areas identified in the Garrison Dam and Beulah Dam emergency action plans.

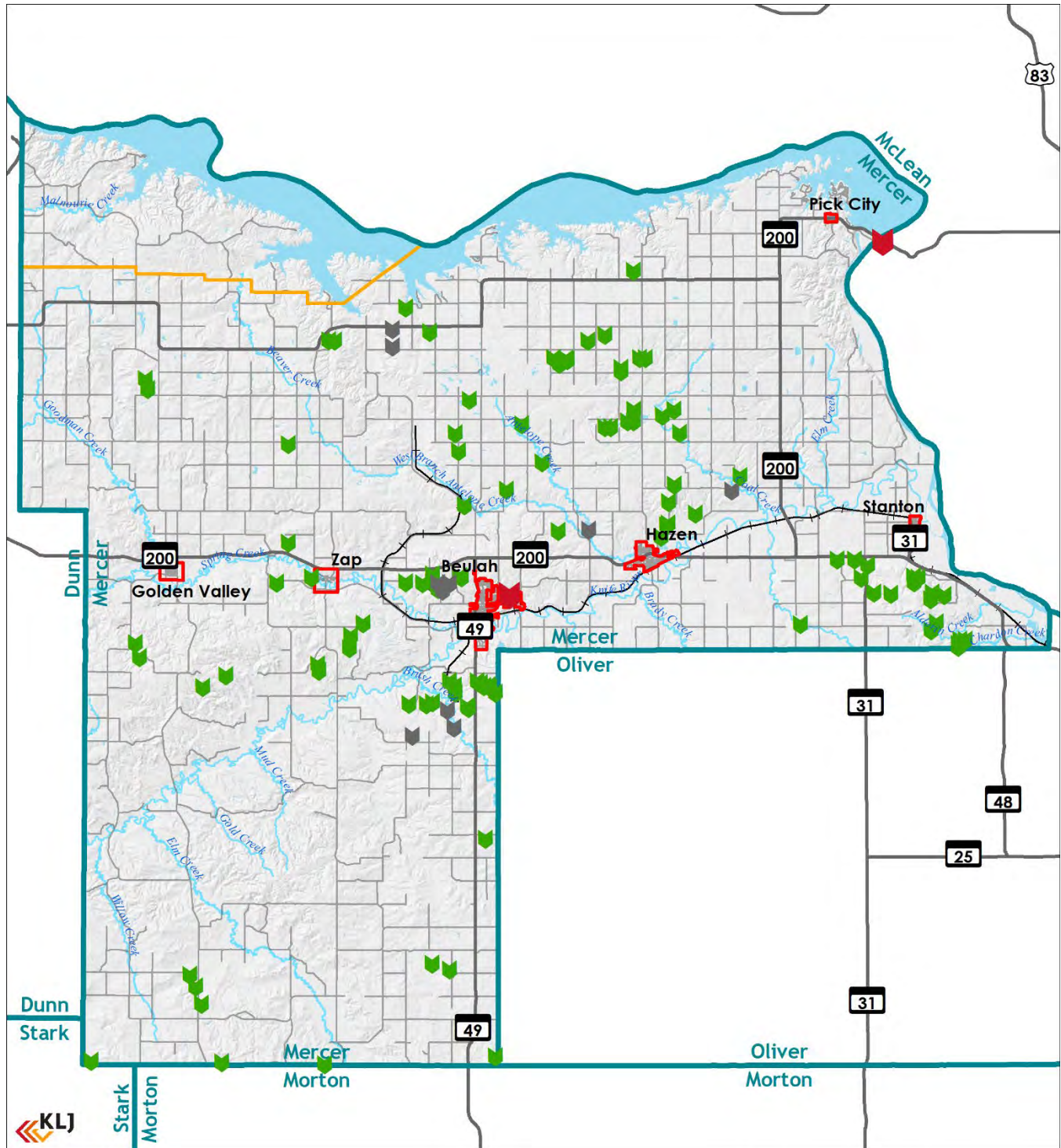
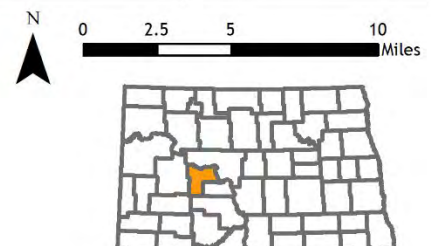


Figure 3.27
Dams



Hazardous Materials Release

Rural County

Overall Risk: Moderate

Probability: Low

Impact: High

Beulah

Overall Risk: Moderate

Probability: Low

Impact: High

Golden Valley

Overall Risk: Moderate

Probability: Low

Impact: High

Hazen

Overall Risk: Moderate

Probability: Low

Impact: High

Pick City

Overall Risk: Moderate

Probability: Low

Impact: High

Stanton

Overall Risk: Moderate

Probability: Low

Impact: High

Zap

Overall Risk: Moderate

Probability: Low

Impact: High

Seasonal Pattern

None

Duration

1-10 hours

Primary Impacts

Agricultural loss (crops, livestock)

Economic loss

Human loss and injuries

Increased stress on medical services

Localized evacuation

Loss of income for displaced workers

Loss of power

Permanent loss of business

HAZARD PROFILE

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.

Hazardous materials incidents can occur at a fixed facility or while a material is transported. Common hazardous materials incidents at fixed sites include the improper storage, treatment and disposal of hazardous waste at manufacturing and processing facilities. Transportation-related hazardous materials incidents generally occur along major transportation routes such as highways, interstates, pipelines and railroads.

Common hazardous materials found in North Dakota include natural gas, anhydrous ammonia and crude oil.

Natural gas is commonly used in North Dakota, often in its refined form of propane or butane. Propane and butane are generally transported as a liquid but will vaporize in the event of an unintended release (butane only vaporizes at temperatures above 32 degrees Fahrenheit). In their gaseous form they are both heavier than air, and generally remain close to the ground. Propane and butane are both highly flammable and present the risk of explosion. Exposure to propane and butane can also be a health hazard. Acute exposure can cause asphyxiation, respiratory irritation and physiological damage; however, these effects are most likely to occur in enclosed spaces or areas with poor ventilation.

Anhydrous ammonia is used in manufacturing, refrigeration and fertilizer. It is often stored and transported as a pressurized liquid, but it will vaporize under normal pressure. Anhydrous ammonia has explosive potential, but it requires extremely high temperatures to ignite. It generally only produces a significant health hazard when released in poorly ventilated areas, but when exposed to moisture it can cause a low-lying ammonia fog. Effects of acute anhydrous ammonia exposure include severe irritation to the eyes, respiratory tract, gastrointestinal tract and skin; severe repetitive exposure can cause permanent damage to these tissues. Anhydrous ammonia is not known to be carcinogenic.

Crude oil poses a significant risk due to its high flammability. It may release flammable vapors that increase the risk of explosion. Crude oil also poses several health risks. Exposure to crude oil can come from direct contact, inhalation or ingestion. Acute exposure to crude oil can cause direct effects such as skin irritation, breathing difficulty, headaches and nausea. Acute

exposure may also lead to long-term complications such as lung, liver or kidney damage, and increased cancer risk.

HISTORY

Primary sources of information about hazardous materials releases include the ND Department of Emergency Services, the ND Department of Environmental Quality, and the Division of Mineral Resources. The most notable hazardous material release incidents in Mercer County according to the ND DEQ data source were an ether/benzene spill in 2022 and an arsenic spill in 2022. A total of 119 incidents occurred in the county from 1975 to the present.

- **February 24, 2022.** A leak at fertilizer plant caused a spill of ether and benzene. The spill was diked to prevent spread.
- **August 11, 2022.** A damaged pipe started to leak at the Dakota Gasification plant, causing arsenic-containing coal ash leachate to spill.

National data collection of hazardous materials releases includes the National Response Center and the Pipeline and Hazardous Materials Safety Administration.

The National Response Center is an interagency effort managed by the US Coast Guard that catalogs “all” reported hazardous materials incidents in the United States. There were 120 hazardous materials incidents in Mercer County reported to the National Response Center from 2010 to 2020.

The Pipeline and Hazardous Materials Safety Administration (PHMSA) is part of the US Department of Transportation and monitors “all” transportation-related hazardous materials incidents in the United States. There were three incidents reported to the PHMSA during the time period 2010-2020.

PROBABILITY

In general, as evidenced by the statistics above, hazardous materials releases happen frequently. According to ND DEQ data, on average, there are approximately 2.5 hazardous material releases in Mercer County per year. Many of these releases occur at coal-related industries in the county, which are located outside of city limits, limiting the threat of potential hazardous materials release on residents.

LOCATION

Transportation routes throughout the county are primary locations at risk of hazardous materials releases. Highways

and pipelines are the major transportation routes through the county. Materials transported through the county on truck include fuel, anhydrous ammonia, and saltwater.

The Emergency Planning and Community Right-to-Know Act (EPCRA) requires that operators of facilities containing hazardous materials and chemicals must identify themselves to appropriate state and local agencies. North Dakota requires that all hazardous materials operators submit Tier II Chemical Inventory Reports to the county’s Local Emergency Planning Committee (LEPC) on an annual basis. Typical Tier II facilities include bulk fuel plants, anhydrous ammonia plants, propane plants, agricultural processing plants and energy producing sites. There were 30 Tier II-reporting facilities in the county in 2021. Typical Tier II facilities include bulk fuel plants, anhydrous ammonia plants, propane plants, agricultural processing plants and energy producing sites.

Figure 3.28 shows major transportation corridors in Mercer County, with evacuation areas of 1/2 mile and 1 mile. Hazard distances are from the 2012 Emergency Response Guidebook. Recommendations for initial evacuation in the case of fire for common hazardous materials are as follows:

- Crude oil, petroleum and diesel fuel: 1/2 mile
- Propane, natural gas: 1 mile
- Anhydrous ammonia: 1 mile
- Chlorine: 1/2 mile
- Ammonium nitrate fertilizers: 1/2 mile

Occupational Safety and Health Administration (OSHA) regulations require hazardous materials producers to maintain material safety data sheets and report chemical quantities that equal or exceed 500 pounds (or a different specified threshold quantity). According to these reports there are 18 facilities in Mercer County housing “extremely hazardous” materials.

VULNERABILITY

Population

- Vulnerable population to transportation incidents can be estimated by identifying the intersection of 2020 US Census Blocks and the identified hazard areas in Figure 3.28. Census blocks in rural areas are generally large, which makes detailed estimates difficult. For purposes of this analysis, only census blocks that have their centroid within the hazard area are included; however, it is important to note

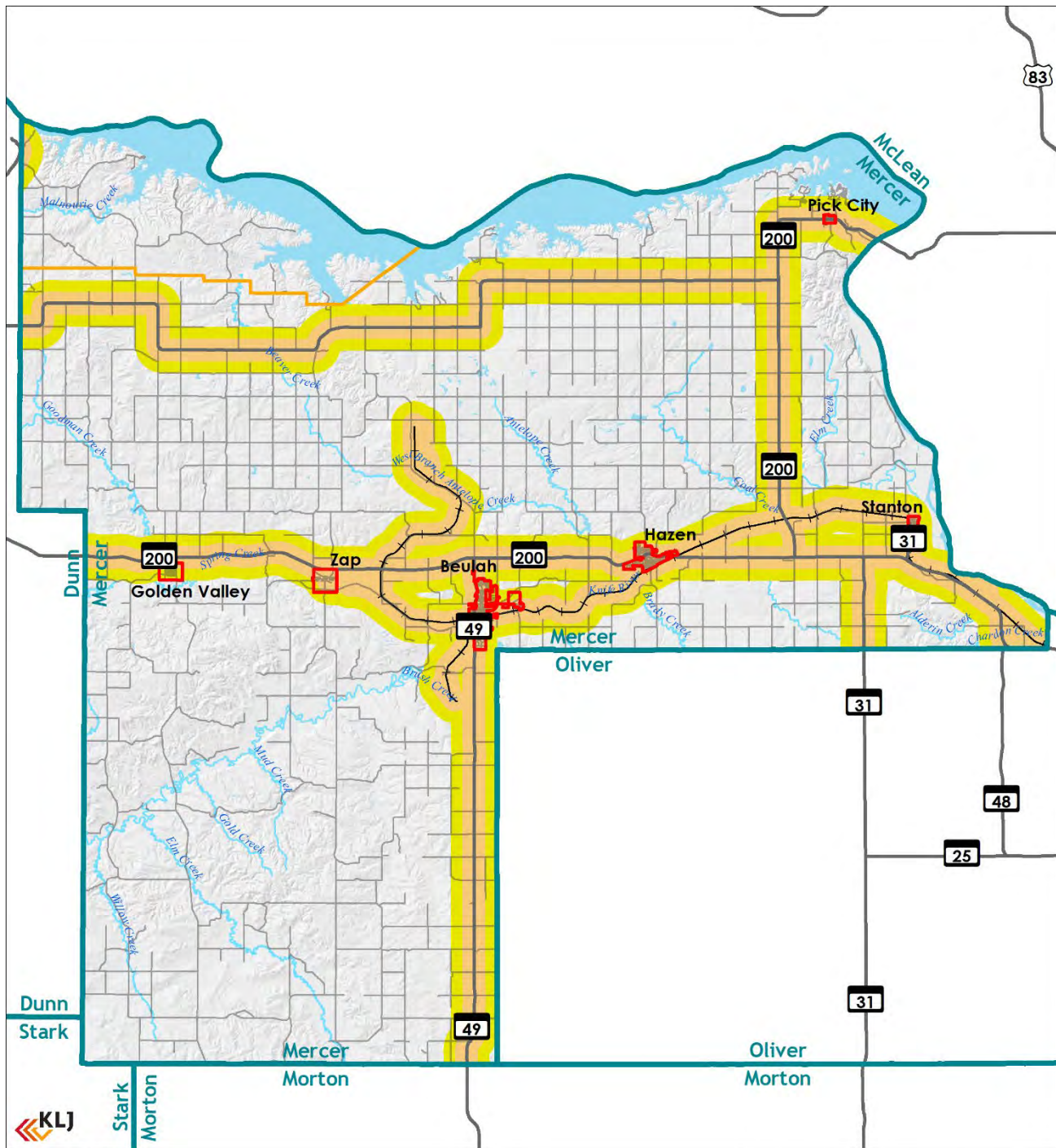
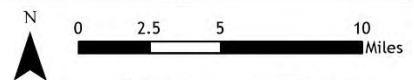


Figure 3.28
Hazmat Areas

- | | |
|------------------------------|---|
| County Boundaries | Major Road & Rail Half Mile Hazard Area |
| Fort Berthold Reservation | Major Road & Rail 1 Mile Hazard Area |
| Incorporated City Boundaries | |
| State & Federal Roads | |
| Other Roads | |
| Railroads | |



	Population in 1/2 Mile Hazard Area	% of Total Population	Population in 1 Mile Hazard Area	% of Total Population	Population
Rural County	1182	55.9%	1366	64.6%	2114
Beulah	2747	90.0%	3052	100.0%	3052
Golden Valley	30	15.7%	191	100.0%	191
Hazen	2281	100.0%	2281	100.0%	2281
Pick City	123	100.0%	123	100.0%	123
Stanton	368	100.0%	368	100.0%	368
Zap	221	100.0%	221	100.0%	221
Total	1711	20.5%	1740	20.8%	8350

that this analysis does not consider the exact location of residential structures within each census block. Vulnerable population estimates are shown in Table 3.11. Note that this analysis does not include population vulnerable to fixed site incidents due to the difficulty in cataloging all fixed site facilities.

- According to available data, there have been no hazardous materials incidents causing severe injuries or fatalities in Mercer County in the last ten years.

Property

- Property exposure to hazardous materials releases can be estimated by analyzing the intersection of structure points and hazardous areas. The following list shows the estimated percent of properties at risk of exposure:
 - Rural County – 30%
 - Beulah – 100%
 - Golden Valley – 100%
 - Hazen – 100%
 - Pick City – 100%
 - Stanton – 100%
 - Zap – 100%

Future Development

- The region's vulnerability to hazardous materials is not expected to change in the foreseeable future. Development is likely limited in the vicinity of the coal

gasification plant due to its relative frequency of hazardous materials spills.

- Local jurisdiction zoning ordinances can restrict the future development from locating near certain high-risk hazardous materials facilities but are powerless to prevent the Department of Mineral Resources or the Industrial Commission from allowing new high-risk hazardous materials facilities from being located close to that development after it is constructed.

EXISTING CAPABILITIES

The Hazen Fire Department has a Fire and Rescue truck that responds to the entire county.

Many first responders in the county are hazardous materials trained at the awareness level.

Hazardous materials operators are responsible for clean-up and reclamation of incident sites.

Local jurisdiction zoning ordinances can restrict the future development from locating near certain high-risk hazardous materials facilities but are powerless to prevent the Department of Mineral Resources from allowing new high-risk hazardous materials facilities from being located close to that development after it is constructed.

KEY ISSUES AND POTENTIAL ACTION ITEMS

Key Issue: There are an average of 2.5 hazardous materials incidents per year in Mercer County, and at least 75% of county residents live, work or travel within a potential hazard area.

- Potential Action Item:* Educate first responders and residents about hazardous materials safety.
- Potential Action Item:* Designate evacuation shelter facility for each city located a safe distance from potential sources of a hazardous materials incident.
- Potential Action Item:* Prohibit the construction of facilities containing hazardous materials within floodplain areas.

Transportation Incident

All Jurisdictions

Overall Risk: Low

Probability: Low

Impact: Moderate (impact could vary widely)

Seasonal Pattern

None

Duration

Varies

Primary Impacts

Economic loss

Human loss and injuries

Increased stress on medical services

Localized evacuation

Property damage or loss

Release of hazardous materials

HAZARD PROFILE

“Transportation Incident, for the purposes of this plan, is any large-scale vehicular, railroad, aircraft or watercraft accident involving mass casualties. Mass casualties can be defined as an incident resulting in a large number of deaths and/or injuries that reaches an impact that overtaxes the ability of local resources to adequately respond.” [p271, 2019 ND Enhanced Mitigation Mission Area Operations Plan] The impacts of transportation incidents are most significant because of the loss of life or major injury. In rural communities, even relatively small incidents may overtax local resources because of the limited resources available to the communities. Another significant hazard associated with these incidents may be hazardous materials release. Other hazards that may precipitate a transportation incident include severe winter weather and flooding. It should also be noted that the hazard of terrorist attacks has also been aimed at transportation infrastructure and transit systems.

These events can affect critical infrastructure systems and local economies in various ways. Generally, they can block major transportation systems for extended periods of time.

HISTORY

The most common transportation incident is a multi-vehicle crash involving injury or death. There were 398 vehicle crashes with a total of 5 fatalities during the five

year period from 2017-2021. Over the same time period 105 crashes involved injuries.

PROBABILITY

There are ____ miles of state and federal highways in the County. While the presence of these major transportation routes is a component of local risk, it is compounded because hazardous materials are transported every day along them, and along local roads in the County. Based on statistics from 2017 through 2021, the average number of crashes in Mercer County is 79.6 per year. The average number of fatalities is 1 per year.

LOCATION

Transportation incidents can happen any place, but are more likely to occur along major highways, along railroad lines, and near airports. The major highways in Mercer County are US 200, ND 49, 31 & 1806. The BNSF railroad runs through Stanton to north of Beulah. The Beulah and Hazen both have Municipal Airports.

VULNERABILITY

Population

- The County’s population is not generally vulnerable to transportation incidents. The largest potential vulnerability stems from inhabited structures located close to major roadways where a crash involving hazardous materials could impact the occupants.

Property

- Potential property damage from a transportation incident is most likely when a major transportation route is situated close to major structures. Detailed statistics about proximity of buildings to these major transportation routes are not available.

Critical Facilities

- Several critical facilities are located along state and federal highways. They could potentially have access limited because of a transportation incident. Additionally, the highways and railroads themselves are critical infrastructure that could be disrupted for a significant time period.

Economy

- Economic impact at a county-wide scale from transportation incidents is not identifiable.

Future Development

- Potential future development property damage from a transportation incident is unlikely as long as appropriate setback requirements are adhered to during development.

EXISTING CAPABILITIES

Local emergency response capabilities in Mercer County include 2 ambulance services (Beulah and Hazen) located in Mercer County, and 4 quick response units. Local fire department response capabilities include certification in extrication, jaws of life, and hazardous materials. The local Sakakawea Medical Center in Hazen has an Emergency/Trauma Center with an emergency room and a surgical center but is classified as a Level V trauma center. The nearest Level II trauma center is located in Bismarck.

KEY ISSUES AND POTENTIAL ACTION ITEMS

Key Issue: Mercer County's very rural setting results in limited resources being available to respond to transportation incidents.

- *Potential Action Item:* Obtain additional equipment for transportation related emergency response needs.

Urban Fire

All Jurisdictions

Overall Risk: Low

Probability: Low

Impact: Moderate (impact could vary widely)

Seasonal Pattern

None

Duration

Varies

Primary Impacts

Agricultural loss (crops, livestock)

Economic loss

Human loss and injuries

Increased stress on medical services

Localized evacuation

Property damage or loss

Release of hazardous materials

Structure collapse

HAZARD PROFILE

Urban fire is a threat to all communities. A small flame can begin inside a structure and rapidly turn into a major fire, creating a costly and deadly situation. The National Fire Protection Association (NFPA) reports that fires in the United States caused 3,005 civilian deaths and 17,500 civilian injuries in 2011. Eighty-four percent of civilian fire deaths were due to home structure fires. According to the National Fire Incident Reporting System (NFIRS) there are about 2,500 urban fire events each year in North Dakota.

Fires may begin intentionally (arson) or by accident. Common motives for arson are insurance fraud, vandalism and murder. Common causes of accidental fires are cooking equipment, heating equipment, electrical distribution and lighting equipment, cigarettes, clothes dryer or washer, candles, and spontaneous combustion. According to the NFPA, unattended cooking is the leading cause of structure fires, with frying as the leading type of cooking activity. Heating equipment is the second leading cause of structure fire.

HISTORY

Although the cities of Towner County have experienced multiple individual building fires, there have not been any multi-building fires or fires which have threatened whole blocks of the cities.

PROBABILITY

Detailed statistics on incidence of fires in North Dakota are not readily available. A key statistic from the National Fire Protection Association based on available data across the United States suggests that in communities with 2,500 people the annual rate of fires is 10.2 fires per 1,000 population. Source: Ahrens and Evarts. Fire Loss in the United States During 2019 (2020), NFPA.

LOCATION

Most structure fires are individual disasters and not community-wide, but the potential exists for widespread urban fires that displace several businesses or residences. The greatest risk of a multiple-structure urban fire is in historic downtowns. There is no history of multi-structure fire in Mercer County. Agricultural facilities, such as grain elevators and dryers, and energy production and transport facilities are also at risk for significant fire.

VULNERABILITY

Population

- All residents in urban areas of the county are vulnerable to an urban fire event. The county's cities contain approximately 6,242 residents (75 percent of the county's total population).
- Mobile homes may be more vulnerable to fire than other residential structures. Collectively, estimated population in these facilities includes:
 - 349 residents in rural areas of the county (155 mobile homes)
 - 101 residents in Beulah (45 mobile homes)
 - 2 residents in Golden Valley (1 mobile homes)
 - 171 residents in Hazen (76 mobile homes)
 - 63 residents in Pick City (28 mobile homes)
 - 11 residents in Stanton (5 mobile homes)
 - 27 residents in Zap (12 mobile homes)

Property

- Property value data for individual structures is not available but is assumed that a large multi-structure fire could cause damages over \$1 million.
- Mobile homes may be more vulnerable to fire than other residential structures. The estimated number of such housing units includes:
 - rural areas of the county: 155 mobile homes
 - Beulah: 45 mobile homes
 - Golden Valley: 1 mobile home
 - Hazen: 76 mobile homes

- Pick City: 28 mobile homes
- Stanton: 5 mobile homes
- Zap: 12 mobile homes

Critical Facilities

- Critical facilities in historic downtowns generally have a greater vulnerability to urban fire because of close building proximity. Other large facilities, such as grain elevators, electric substations and energy production facilities, may also be vulnerable to fire.

- Critical Facilities within communities are as follows:

Rural area critical facilities:

- Antelope Valley Station
- Coyote Station
- Great Plains Synfuels Plant
- Leland Olds Station
- Lake Sakakawea recreation areas

Beulah critical facilities:

- Basin Transload Facility
- Knife River Care Center
- Sunset Manor
- 3 schools
- City Hall
- Conoco
- Ferrell Gas
- Neuberger Oil Co
- Valley Grain Milling Elevator
- 12 churches
- Beulah Clinic
- Custer County Nurse

Golden Valley critical facilities:

- Community Center
- 3 churches
- Water Tower
- Fire Department

Hazen critical facilities:

- Cinema Twin Theaters
- Crescent Manor
- Hazen Public School
- Post Office
- City Hall
- Fire Department
- Sakakawea Medical Center
- Senior Citizens Center
- Water Tower
- Senior Suites
- Oliver-Mercer Special Ed
- North Star 1&2 Mobile Homes

Pick City critical facilities:

- Sakakawea Motel

Stanton critical facilities:

- Civic Center
- Sand Dune Mobile Homes

- 2 churches

Zap critical facilities:

- Community Hall
- 1 church

Economy

- Detailed statistics on Mercer County's economic impact from urban fire is not available.

Future Development

- Beulah, Golden Valley, Hazen, Stanton and Zap have adopted the State Building Code. The State Building Code consists of the 2018 International Building Code, International Residential Code, International Mechanical Code, International Energy Conservation Code and International Fuel Gas Code published by the International Code Council. Future development will be protected to the extent these Codes can reduce urban fire.

EXISTING CAPABILITIES

All areas of the county are within the service area of a volunteer fire department.

KEY ISSUES AND POTENTIAL ACTION ITEMS

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

- *Potential Action Item:* Provide education about fire prevention best practices for local business owners and residents.
- *Potential Action Item:* Continue response preparation with local fire districts.
- *Potential Action Item:* Remove abandoned properties that could be a target for arson.

Civil Disturbance

All Jurisdictions

Overall Risk: Low

Probability: Low

Impact: Moderate

Seasonal Pattern

None

Duration

Varies

Primary Impacts

Economic loss

Human loss and injuries

Increased stress on medical services

Localized evacuation

Property damage or loss

HAZARD PROFILE

Civil disturbances can occur when large groups, organizations, or distraught individuals act with potentially disastrous or disruptive results. Many issues can cause civil disturbance, but most are due to political grievances, economic disputes or social discord, terrorism, or foreign agitators. Additionally, civil disturbance can result following a disaster that creates panic in the community. Civil disturbances are criminal actions and not protected by the 1st Amendment. Forms of civil disturbances may range from groups blocking sidewalks, roadways, and buildings to mobs rioting and looting to gang activity. They can be either spontaneous or planned events. [p47, 2019 ND Enhanced Mitigation Mission Area Operations Plan]

HISTORY

Events that can be classified as civil disturbances have been very limited in North Dakota. Until 2020, there had been three documented events in the last fifty years:

- 1969 – Zip to Zap event. This event was initiated as a large scale party during a college break, but turned into a riot when tensions arose between students and authorities.
- 2016 – Dakota Access Pipeline (DAPL) event. This event was initiated when protestors gathered to express their opposition to the construction of the pipeline. It turned into multiple criminal activities including rioting, vandalism, theft, criminal trespass, terroristic threats, and arson. While the event started

with a few hundred protestors it grew into a group estimated at nearly 10,000 participants.

- 2020 – Downtown Fargo Riot. The March for George Floyd protest that began in the afternoon turned into a riot with some protestors attacking occupied police cars and vandalizing property. Taxpayer costs were estimated at \$842,000.

Despite the very rural location in two of the documented events, the civil disturbances turned into large scale events requiring law enforcement capacity significantly beyond local resources. Neither event had been anticipated, and local resources were quickly overwhelmed. Communication channels are so immediate and widespread that similar events can be initiated with little to no advance warning to local law enforcement officials.

Impacts from civil disturbances can range from using up limited budgets for local law enforcement to property damage or destruction to potential injury and loss of life. The cost of responding to the DAPL event have been estimated in the neighborhood of \$38 million. Other potential impacts may include disruption of transportation systems and environmental damage.

PROBABILITY

Despite the very rural nature of Mercer County, there is a realistic potential for similar events to happen in the County as evidenced by the Zip to Zap event. No level of probability has been determined.

LOCATION

While the very rural nature of Mercer County suggests that no part of the County is safe from a potential civil disturbance, there is probably a greater likelihood of an incident happening at the site related to the topic of a gathering. These might include sites where environmental damage is a concern or sites where an historical event has occurred.

VULNERABILITY

Population

- The number of residents vulnerable to a civil disturbance is highly variable based on the site and timing of an event. A large-scale incident, similar to the DAPL event, would have the potential for hundreds of injuries or fatalities.
- The largest concentration of resident population in Mercer County would be in Beulah and Hazen.

- With the right provocation or initiative, a civil disturbance can happen anywhere. Therefore, the entire population of the County could be considered vulnerable.
- *Potential Action Item:* Enhance security measures at critical facilities.

Property

- As illustrated by the Fargo event, damage in an urban setting can result in damages in the hundreds of thousands of dollars.

Critical Facilities

- Because of the historical precedence in North Dakota, it is not safe to rule out any location or critical facility from being potentially impacted by a civil disturbance.
- Local government facilities, including the county courthouse and each city hall, may be attractive targets. Other potential targets include schools, and the energy production, processing, and transport facilities.

Economy

- Direct impacts of civil disturbances to the Mercer County economy as a whole are likely to be minor, however, the potential to severely affect individual property owners or businesses is significant. No direct costs to the local economy can be calculated.

Future Development

- Civil disturbances are not constrained by location or age of development. However, proposals for certain types of controversial uses are more likely to precipitate civil disturbances than typical development proposals.

EXISTING CAPABILITIES

The primary response capabilities in Mercer County are the Sheriff Department, and the Hazen and Beulah police departments. There are ongoing efforts to organize coordinated responses in North Dakota in the case of another DAPL type event.

KEY ISSUES AND POTENTIAL ACTION ITEMS

Key Issue: Civil disturbances are an ongoing concern, but it is unlikely that a large-scale event will occur in the County. The key issue for civil disturbance is unpredictability and the high cost of incident response.

- *Potential Action Item:* Develop a collaborative approach to assessing risk and mobilizing needed resources for civil disturbances.

Criminal Terrorist Nation Attack

All Jurisdictions

Overall Risk: Low

Probability: Low

Impact: Moderate (impact could vary widely)

Seasonal Pattern

None

Duration

Varies

Primary Impacts

Agricultural loss (crops, livestock)

Economic loss

Human loss and injuries

Increased stress on medical services

Localized evacuation

Property damage or loss

Release of hazardous materials

Structure collapse

HAZARD PROFILE

For the purposes of this profile, Criminal Terrorist Nation Attack includes chemical attacks, biological attacks, radiological attacks, nuclear attacks, explosive attacks, food/food production attacks, and armed assaults. These can broadly be defined as any intentional adversarial human-caused incident, domestic or international, that causes mass casualties, large economic losses, large infrastructure damage or widespread panic in the country. Such attacks can result in a variety of hazards. For example, terrorists might compromise a dam leading to catastrophic dam failure. Other hazards that can be intentionally initiated by human actions given the appropriate materials and motivation include infectious disease, transportation incidents, hazardous material releases, utility or communication failures, cyber attacks and wildland fires. [p54, 2019 ND Enhanced Mitigation Mission Area Operations Plan]

The impacts from such attacks can vary based on the scale of targets, the capacity and resources of the attackers, the degree of effort in preparation and instigation of the attacks, and the degree of mitigation in place to reduce impacts.

HISTORY

There are no identified incidents of Criminal Terrorist Nation attacks in Mercer County. Threats to or in North Dakota of Criminal Terrorist Nation Attacks are a reality which may not be commonly recognized. Since January 2014 there have been 43 Terrorist Screening Center hits or encounters within North Dakota. In that same time period there have been hundreds of suspicious activity reports of which 266 were passed on to the FBI for potential investigation. [p56, 2019 ND Enhanced Mitigation Mission Area Operations Plan]

Examples of these potential Criminal Terrorist Nation Attacks include bomb threats and an oil pipeline shutoff. The type and scope of such incidents can vary dramatically as illustrated by the following two examples.

- September 11, 2001 attack on the World Trade Center and the Pentagon. This attack killed 2,977 people and injured thousands more, as well as causing billions in damages, and disrupting business and government activities throughout the United States.
- January 21, 1995 attack on the underground phone cable system in Fargo. This attack caused \$1 million in damages and interrupted phone service for 20,000 people.

PROBABILITY

As documented in the previous subsection, there have been Criminal Terrorist Nation attacks in North Dakota. There is no known calculated probability for these incidents in Mercer County. However, it is instructive to consider the results of an FBI study of active shooter incidents in the United States between 2000 and 2013. Key findings of the study include:

- Over 66% of the incidents studied ended before law enforcement arrived and could engage the shooter.
- The frequency of the incidents increased over time.
- In almost every case a shooter acted alone.

LOCATION

The FBI study noted previously found that while the greatest frequency of incidents were in commercial areas or educational settings, there have been incidents that have occurred in open spaces, government facilities, houses of worship, residences and health care facilities. Additionally, these events happened in very rural and very urban settings, and both indoors and out of doors. For the purposes of this analysis, all areas of Mercer County are equally at risk.

VULNERABILITY

Population

- Terrorist and Nation/State attacks are commonly aimed at major population centers where the degree of impact may be more significant. Such attacks on Mercer County are extremely unlikely due to its low population density and lack of targets of national significance. Some types of such attacks may have nation-wide impacts that do affect the region. However, criminal attacks may result from different motivations, be less predictable, and more likely in rural areas. The active shooter type incident is completely unpredictable and could happen at any location.

Property

- As noted previously Criminal Terrorist Nation Attacks are not likely to be focused on rural places like Mercer County. If such attacks were to occur in the region, most types of these incidents would likely have limited impacts to property.

Critical Facilities

- Terrorist and Nation/State attacks are commonly aimed at targets of national significance and are extremely unlikely in the region due to a lack of such targets. Local power generation facilities are potential targets. Some types of such attacks may have nation-wide impacts that do affect the region. However, criminal attacks may result from different motivations, be less predictable, and more likely in rural areas like Mercer County. Level of security in local critical facilities is also likely to be lower than in more heavily populated parts of North Dakota or the United States.

Economy

- If a major Terrorist or Nation/State attack were to occur in Mercer County, depending on the type of attack and resulting damage, it could have devastating impacts to the local economy. If certain critical facilities were damaged or destroyed it could hamper the ability for normal civilian functions to occur for several months. Although the impacts of a criminal incident are likely to have less long-term or wide-spread impacts, even those like the Fargo phone system attack noted previously can significantly impact individual businesses or property owners.

Future Development

- The county's overall vulnerability to Criminal Terrorist Nation Attacks is not expected to change in the foreseeable future.

EXISTING CAPABILITIES

The primary response capabilities in Mercer County are the Sheriff Department and police department of Beulah and Hazen. There are ongoing efforts to organize coordinated responses in North Dakota in the case civil disturbances and Criminal Terrorist Nation attacks.

KEY ISSUES AND POTENTIAL ACTION ITEMS

Key Issue: The most likely Criminal Terrorist Nation Attack incident affecting the region is a criminal attack such as an active shooter.

- *Potential Action Item:* Develop educational materials on best practices to enhance security at locations with perceived risk of such attacks, and encourage their implementation.
- *Potential Action Item:* Assess safety/security at oil/gas facilities.
- *Potential Action Item:* Upgrade security cameras at K12 schools where needed.
- *Potential Action Item:* Assess safety/security at critical facilities throughout the County, including water treatment plants.

Cyber Attack

All Jurisdictions

Overall Risk: Moderate

Probability: Moderate

Impact: Moderate(impact could vary widely)

Seasonal Pattern

None

Duration

Varies

Primary Impacts

Economic loss

Property damage or loss (data property)

Disruption of critical services

Human loss and injuries

HAZARD PROFILE

“Cyber Attack is the attack or hijack of information technology infrastructure critical to the functions controlled by computer networks, such as operating, financial, communications, and trade systems. Any cyber attack that creates unrest, instability, or negatively impacts confidence of citizens/consumers can be considered cyber terrorism. Computer security incidents are an ongoing threat and require due diligence to address accordingly to mitigate any potential disruption to critical infrastructure. There are seven common types of cyber attacks that governments, businesses and people are at risk to, as described below.

- Socially engineered malware. A normally trusted site is compromised, and the attackers embed malware into the site. Users of the site are tricked into downloading malware onto their computers through a Trojan Horse.
- Password phishing attacks. Emails are designed to look like they are from trusted vendors and users are prompted to enter their passwords to access the content from the email. The site the user is taken to saves the password the user provides, which attackers can use to access the real site and the user’s information.
- Unpatched software. Cyber attackers can access software on users’ computers if the software patches are not up to date.
- Social media threats. Friend or application install requests are designed to mask malware or phishing attempts. Users who accept these requests are tricked into providing their email, downloading

malware, or otherwise giving cyber attackers access to their computer and data.

- Advanced persistent threats. Cyber attackers gain access to an organization’s data using phishing or Trojan Horse attacks. These attacks typically target multiple employees to trick at least one into providing their password or downloading the malware.
- Distributed denial of service. An attack in which multiple compromised computer systems attack a target, such as a server, website or other network resource and cause a denial of service for users of the targeted resource.
- Doxing. Discovery and release of personally identifiable information.

To ensure a quick and proper response to cyber attacks, systems vulnerable to cyber terrorism should have an incident response plan to minimize negative impacts.” [p66, 2019 ND Enhanced Mitigation Mission Area Operations Plan].

HISTORY

There are no documented incidents of cyber attacks in Mercer County. There were three known large-scale cyber attacks in North Dakota in recent years.

- 2016 DAPL event doxing. Unknown individual(s) discovered and released personally identifying information of law enforcement officers who were part of the response to the DAPL event.
- 2017 UND website distributed denial of service. The UND website was flooded with so many incoming queries that it became unresponsive and was no longer functional to legitimate users.
- 2018 phishing attack on a North Dakota company. Phishing emails were sent to over 150 employees and over a dozen were successfully phished. Personnel records, including personally identifiable information, were accessed.

PROBABILITY

According to a Clark School [University of Maryland] study, every 39 seconds there is a hacker attack on computers with internet access with the result of affecting one in three Americans every year. Source: <https://eng.umd.edu/news/story/study-hackers-attack-every-39-seconds>

According to an online article published on the Business2Community.com website, the cybersecurity firm BlueVoyant published a report in August 2020 finding that state and local governments have seen a 50% increase in cyberattacks since 2017. The report outlined the cyberattacks as either targeted intrusions, fraud, or damage caused by hackers. BlueVoyant noted that the 50% increase in attacks is likely a fraction of the true number of incidents because many go unreported. Source:

<https://www.business2community.com/cybersecurity/state-local-government-cyberattacks-up-50-02348278>

LOCATION

A cyber attack could occur or impact any location in the County. It could occur anywhere in the United States and potentially still have impacts to the County and its people, businesses, governments, and infrastructure. Such attacks can be small scale and localized or affect major segments of the United States.

VULNERABILITY

Population

- Cyber attacks can impact individuals by the 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

- Property, facilities and infrastructure can be damaged or destroyed by a cyber attack incident.

Critical Facilities

- A cyber attack could occur or impact any location in the County. It could occur anywhere in the United States and potentially still have impacts to the County and its businesses, governments, infrastructure and people.
- Cyber attacks can disrupt electronic operations or functions of critical facilities resulting in potentially catastrophic direct and indirect consequences. Table 3.12 summarizes critical infrastructure and key resources in Towner County. Many of these could be impacted by a cyber attack.

Economy

- Cyber attacks can impact the local economy, although known incidences of cyber attacks do not typically have a county-wide economic impact. A cyber

ransom attack is likely the most obvious way that there could be a county wide impact.

Table 3.12 – Critical Infrastructure and Key Resources in Mercer County

CIKR Resource	Description	# in Mercer County
Food/Agriculture	Major food distribution centers	2
Energy	Power generation and petrochemical facilities	4
Public Health	Hospitals and other healthcare facilities	5
Transportation	Bridges and major highways	10
Emergency Services	Police, fire, ambulance and dispatch centers	11
Communications	Major communications towers	9
Water	Treatment facilities	3

Future Development

- Cyber attacks are not anticipated to directly impact potential future development patterns.

EXISTING CAPABILITIES

Standard cyber attack protection is in place through the county's internet service provider. Existing protection for private individuals and businesses, public services, and other local government agencies is unknown.

KEY ISSUES AND POTENTIAL ACTION ITEMS

Key Issue: Critical facilities and local organizations are at risk from cyber attacks.

- *Potential Action Item:* Develop educational materials on best practices to harden electronic systems of critical facilities and local organizations and encourage their implementation.
- *Potential Action Item:* Upgrade cyber protection of local government facilities and data.

Summary

There are 15 priority hazards identified for Mercer County. The key issues for each hazard are summarized below. Hazards are summarized for the county overall. Hazard risk for each jurisdiction is summarized in Table 3.13.

	County	Beulah	Golden Valley	Hazen	Pick City	Stanton	Zap	
Criminal Terrorist Nation Attack	L	L	L	L	L	L	L	
Civil Disturbance	L	L	L	L	L	L	L	
Cyber Attack	M	M	M	M	M	M	M	
Dam Failure	L	M	L	M	L	M	L	
Drought	M	M	M	M	M	M	M	
Flood	H	H	L	M	L	L	H	
Geologic Hazards	L	L	L	L	L	L	L	
Hazardous Materials Release	M	M	M	M	M	M	M	
Infectious Disease	M	M	M	M	M	M	M	
Severe Summer Weather	H	H	H	H	H	H	H	
Severe Winter Weather	H	H	H	H	H	H	H	
Space Weather	M	M	M	M	M	M	M	
Transportation Incident	L	L	L	L	L	L	L	
Urban Fire	L	L	L	L	L	L	L	
Wildland Fire	M	M	M	M	M	M	M	

H = High, M = Moderate, L = Low

CRIMINAL TERRORIST NATION ATTACK

The potential impacts from a criminal terrorist nation attack can widely vary based on the type of attack, but the County has a small population base and limited infrastructure. The energy facilities in the County have potential to be targets.

CIVIL DISTURBANCE

Civil disturbance impacts again, could vary widely, but the likelihood of a significant disturbance is very limited.

CYBER ATTACK

Cyber attacks are a high probability event. There are important critical facilities that could be directly attacked or impacted. While impacts are generally limited, the potential impacts could vary widely.

DAM FAILURE

Although there are many dams in Mercer County, only two are considered high hazard dams. Failure of either dam would cause significant impacts. The Garrison Dam inundation area would cover 35 square miles. However, the potential for failure is considered low.

DROUGHT

Severe drought conditions have occurred in Mercer County in recent years. Agriculture is a key component of the county's economy. A significant drought has the potential to greatly affect the industry and the county as a whole. The rural water services do not foresee circumstances where there is not potable water available for household use.

FLOOD

Mercer County has approximately an 56% annual probability of flooding. Local area ponding as well as riverine flooding are both concerns. Rural roads in the county may be overtopped or washed out.

GEOLOGIC HAZARDS

The entire county is within a moderate susceptibility landslide hazard area as defined by USGS. There is historical evidence of many past slides in many parts of the county, but no identified threats to buildings or infrastructure. There are sinkholes identified in several sections of the county and more potential locations from past underground mining. These are well documented and considered when new development is proposed. There is no history and a very small likelihood of any earthquake impacting the county.

HAZARDOUS MATERIALS INCIDENT

Hazardous materials incidents happen an average of 2.5 times per year in Mercer County, but a majority of its residents live, work or travel within a potential hazard area.

INFECTIOUS DISEASE

Human and agricultural disease have the potential to greatly impact the health and economy of the county. The

COVID-19 pandemic has resulted in significantly more cases than typical influenza cases.

SEVERE SUMMER WEATHER

Mercer County averages approximately eight days per year with a summer storm event. Severe wind and hail are the most common summer storm events in the county, and tornadoes are also a possibility in the region.

SEVERE WINTER WEATHER

Mercer County averages approximately five days per year with a winter storm event. Severe winter weather events in the county include winter storm, high wind, heavy snow, blizzard, extreme cold/wind chill and ice storm.

A winter storm 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 extreme cold temperatures.

SPACE WEATHER

Mercer County like the rest of the United States is not equipped to deal with a major space weather event like the Carrington Event (geomagnetic storm) of 1859. Similar events have happened in the last few decades but have not had as widespread impacts. Due to the extreme dependence on electricity and computer systems, there is concern that such an event could have severe impacts on life in Mercer County.

TRANSPORTATION INCIDENT

Transportation incidents are not common in Mercer County and potential concerns are more about the potential of those incidents involving hazardous materials than about large-scale crashes.

URBAN FIRE

Urban fire has a very low incidence rate in Mercer County, and the probable impacts are relatively benign.

WILDLAND FIRE

Wildland fires happen several times each year in Mercer County. But wildfires greater than 100 acres have approximately a 40% annual chance of occurrence. Most large wildfires in the county cause minimal property damage.

CHAPTER 4: Mitigation Strategy

The mitigation strategy includes specific action items to reduce the impact of the priority hazards identified in Chapter 3. The process for identifying action items was as follows:

- Consultant developed initial action item suggestions based on hazard assessment.
- Goals and past mitigation actions were reviewed to help guide action item development.
- Emergency manager and consultant review of jurisdictional and citizen input on hazard concerns and potential action items.
- Emergency manager and consultant development of mitigation action items.
- Planning team member review and refinement of proposed mitigation action items.
- Jurisdictional representative review and comment on draft mitigation action items.

Capability Assessment

Before identifying goals and action items, it is important to know the capabilities of each jurisdiction to undertake different types of hazard mitigation projects. Specific capabilities are listed as part of each hazard profile in Chapter 3. Additional capabilities are summarized below.

LEGAL AND REGULATORY

- **Zoning Ordinance.** All jurisdictions have zoning ordinances.
- **Comprehensive Plan.** All jurisdictions have adopted comprehensive plans.
- **Floodplain Ordinance.** Mercer County, Beulah, Zap, and Hazen have floodplain ordinances and floodplain administrators.
- **Building Code.** All jurisdictions but Pick City and Mercer County have adopted the State Building Code.

ADMINISTRATIVE AND TECHNICAL

- **Emergency Management Department.** Mercer County has an emergency management department.
- **Building Permits.** All jurisdictions except Mercer County require building permits.
- **Building Inspections.** There are no jurisdictions that require building inspections.

FISCAL

- **Federal Grants.** Mercer County and each incorporated jurisdiction are eligible for a variety of federal grants, including Community Development Block Grants. More details are provided in the Funding subsection on page 4-2.
- **Taxing Authority.** Mercer County and each incorporated jurisdiction have authority to levy taxes.
- **Bonding.** Mercer County and each incorporated jurisdiction have capacity to issue bonds.

Goals

The goals defined below provide the general guiding principles that were used when developing mitigation activities. The goals may be used to guide the development of additional action items as the plan is evaluated in future years. The goals below are all priorities and presented in no particular order.

- **Protect life and property**
- **Enhance public awareness about mitigation activities**
- **Protect the County's environmental system**
- **Strengthen the County's emergency management network**

Previous Mitigation Actions

There were 44 mitigation actions for Mercer County and its participating jurisdictions in the last Multi-Hazard Mitigation Plan. Many of these mitigation actions applied to more than one jurisdiction. Appendix D contains a summary table of the status of past mitigation actions. Three actions were completed. Thirty-eight actions are incomplete or ongoing, and incorporated into this plan. Three other actions are being dropped as no longer needed.

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. Many of the 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.

Funding

Mercer County will need to utilize local, state and federal funding to implement the action items identified in this plan. The County and each jurisdiction have access to multiple state and federal funding opportunities. US Department of Housing and Urban Development (HUD) Community Development Block Grants (CDBG) and US Department of Agriculture (USDA) Community Facility Grants are available for a wide variety of uses. There are also other viable funding streams tailored specifically for hazard mitigation and disaster response. FEMA's Hazard Mitigation Grant Program (HMGP) could provide funding for a wide variety of mitigation projects and is only available following a North Dakota disaster declaration. Additional FEMA grant programs that provide funds for mitigation include the Building Resilient Infrastructure and Communities (BRIC) program and Flood Mitigation Assistance (FMA) program.

FEMA's Hazard Mitigation Assistance Unified Guidance, which includes eligible activities for each of FEMA's mitigation grant programs, can be found at:

<https://www.fema.gov/media-library/assets/documents/103279>

Action Items

The mitigation action items for the participating jurisdictions, identified in Tables 4.1 – 4.7 are recommendations developed through discussion with Planning Team members, community representatives, and key stakeholders from the County. A broad range of potential mitigation activities were considered; many of these potential activities are listed in Chapter 3 with the applicable hazard. These potential actions were evaluated based on community representative and emergency manager feedback, and further prioritized and refined in collaboration with key stakeholders from each jurisdiction. Further explanation of the mitigation activity selection process can be found in Appendix D.

The mitigation action items listed in Tables 4.1 – 4.7 provide a roadmap for targeting and implementing mitigation projects over the next five years. Each action item listed identifies the hazard or hazards that it is intended to mitigate. Due to space limitations the

hazard names are truncated. The following list matches the truncated name to the full hazard name.

- **Drought:** Drought
- **Fire:** Wildland Fire
- **Flood:** Flood
- **Geologic:** Geologic Hazards
- **Summer:** Severe Summer Weather
- **Winter:** Severe Winter Weather
- **Wildland:** Wildland Fire
- **CTNS:** Criminal Terrorist Nation Attack
- **Dam:** Dam Failure
- **HazMat:** Hazardous Materials Releases
- **Disease:** Infectious Disease or Pest Infestations
- **Space:** Space Weather
- **Cyber:** Cyber Attack
- **Civil:** Civil Disturbance
- **Transp:** Transportation Incident
- **Urban:** Urban Fire
- **Multiple:** two or more of the above listed hazards

Project costs are identified in terms of staff time, or a numeric cost estimate range. The numeric values are generally based on a previously identified cost, but in some cases shows order of magnitude rather than a budgetary value. The amount of staff time required may vary widely, but budgeting for direct expenses for mitigation projects labeled staff time are assumed to be extremely limited. Projects are prioritized based on urgency of need, anticipated time to develop, and a generalized benefit-cost analysis that factors in potential cost and project benefit.

The terms low, moderate, and high are aimed at increasing magnitudes of cost. Low represents projects estimated to cost less than \$1000, moderate – less than \$10,000 and high – in excess of \$10,000 (in some cases like road and bridge improvements possibly 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 project 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 needed local funds.

Table 4.1 – Mercer County Mitigation Action Items

ID	Priority	Action	Hazard	Cost	Timeframe
A	High	Participate in NFIP workshop to educate the public about benefits of flood insurance	Flood	Staff Time	Ongoing
B	Moderate	Mitigate flooding issues on Co Rd 5 near Golden Valley	Flood	Varies	2023
C	Moderate	Consider enrolling in NFIP Community Rating System	Flood	Staff Time	Ongoing
D	Moderate	Participate in NFIP training	Flood	Staff Time	Ongoing
E	Low	Participate in Firewise education program and implement best practices during fire season	Wildfire	Staff Time	2023
F	Low	Educate public about existing community shelters	Multiple	Staff Time	Ongoing

Table 4.2 – Beulah Mitigation Action Items

ID	Priority	Action	Hazard	Cost	Timeframe
G	High	Install siren on north end of town	Multiple	\$8,000 - \$15,000	2024
A	Moderate	Participate in NFIP workshop to educate the public about benefits of flood insurance	Flood	Staff Time	2024
H	High	Perform bank stabilization activities on Knife River	Flood	Varies	Ongoing
I	High	Install generators at Civic Center/shelter, lift station #1 and middle school (secondary)	Multiple	\$25,000-\$50,000 per generator	2022
J	Moderate	Install dry dams to alleviate overland flooding	Flood	\$500,000+	2023-2025
K	High	Continue channel clearance and debris removal program for Knife River	Flood	Varies	Ongoing
E	Moderate	Participate in NFIP training	Flood	Staff Time	Ongoing
F	Low	Participate in Firewise education program and implement best practices during fire season	Wildfire	Staff Time	Ongoing
G	Low	Educate public about existing community shelters	Multiple	Staff Time	Ongoing

Table 4.3 –Golden Valley Mitigation Action Items

ID	Priority	Action	Hazard	Cost	Timeframe
L	High	Acquire portable generator for use at shelter or lift station	Multiple	\$25,000-\$50,000	2023
B	High	Mitigate flooding issues on Co Rd 5 near Golden Valley	Flood	Varies	2023
M	Moderate	Implement improvements to existing community shelter or construct new shelter	Multiple	\$300,000+	2023
F	Low	Participate in Firewise education program and implement best practices during fire season	Wildfire	Staff Time	2023
G	Low	Educate public about existing community shelters	Multiple	Staff Time	Ongoing

Table 4.4 – Hazen Mitigation Action Items

ID	Priority	Action	Hazard	Cost	Timeframe
A	High	Participate in NFIP workshop to educate the public about benefits of flood insurance	Flood	Staff Time	Ongoing
D	Low	Consider enrolling in NFIP Community Rating System	Flood	Staff Time	Ongoing
N	High	Enhance the abandoned rail line west of town to divert/slow water draining from the NW	Flood	\$500,000+	2022
K	Moderate	Continue channel clearance and debris removal program for Knife River and Antelope Creek	Flood	Varies	Ongoing
E	Moderate	Participate in NFIP training	Flood	Staff Time	Ongoing
F	Low	Participate in Firewise education program and implement best practices during fire season	Wildfire	Staff Time	2023
G	Low	Educate public about existing community shelters	Multiple	Staff Time	Ongoing
O	Moderate	Obtain at least 3 generators for lift stations	Flood	\$150,000+	2023-2025
P	Moderate	Provide permanent flood protection for Lift Station #1	Flood	Varies	2023

Table 4.5 – Pick City Mitigation Action Items

ID	Priority	Action	Hazard	Cost	Timeframe
Q	High	Install siren at southwest corner of Pick City	Multiple	\$8,000 - \$15,000	2023
R	Moderate	Improve drainage along Hwy 200 in the central part of town	Flood	Varies	2023
S	Moderate	Install multi-use path on north side of Hwy 200 for pedestrian safety	Transport	\$25,000 - \$35,000	2023
T	Moderate	Complete a study about heavy truck traffic and evaluate options to mitigate safety concerns	Transport	Staff Time	2022
F	Low	Participate in Firewise education program and implement best practices during fire season	Wildfire	Staff Time	2023

Table 4.4 – Stanton Mitigation Action Items

ID	Priority	Action	Hazard	Cost	Timeframe
U	Moderate	Improve drainage on the north end of town at the intersection of North AV and West ST	Flood	Varies	2023
V	Moderate	Improve drainage on the south end of town at the intersection of South AV and Main ST	Flood	Varies	2023
F	Low	Participate in Firewise education program and implement best practices during fire season	Wildfire	Staff Time	2023
G	Low	Educate public about existing community shelter	Multiple	Staff Time	Ongoing

Table 4.4 – Zap Mitigation Action Items

ID	Priority	Action	Hazard	Cost	Timeframe
W	High	Perform bank stabilization activities on east side of Spring Creek near the Civic Center and City Shop to stop erosion	Flood/Geologic	Varies	2023
X	High	Install backup generator at the Civic Center/shelter	Multiple	\$25,000 - \$50,000	2024
Y	Moderate	Upgrade both emergency sirens	Multiple	\$15,000-\$30,000	2023
Z	High	Improve drainage at corner of 2 AV W/Iowa ST W	Multiple	Varies	2022
E	Moderate	Participate in NFIP training	Flood	Staff Time	Ongoing
F	Low	Participate in Firewise education program and implement best practices during fire season	Wildfire	Staff Time	Ongoing
G	Low	Educate public about existing community shelter	Multiple	Staff Time	Ongoing

Project Summaries for Action Items

The Mercer County 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 projects ultimately rests with each jurisdiction. The individual or agency responsible for overseeing implementation of mitigation projects for each jurisdiction is listed as part of each project summary. The actual person(s) performing the project may be different than the responsible party.

MERCER COUNTY

A: Participate in NFIP workshop to educate the public about benefits of flood insurance.

Workshops would be targeted at educating residents not required to buy flood insurance but still at risk for flooding. Technical assistance for a workshop is available from the State Water Commission. A workshop could be conducted by the County in a central location, or rotating workshops could be held in each participating NFIP community. Funds are available for public awareness or education campaigns under the HMGP Five Percent Initiative. Multiple jurisdictions could participate in this action.

Responsible party: Mercer County Emergency Management

B: Mitigate flooding issues on Co Rd 5 near Golden Valley

The road experiences ponding issues during heavy rain events. Water gets caught up in the ditch when the area receives a lot of rain and has nowhere to drain.

Requesting drainage improvement along both sides of County Road 5 on east side of Golden Valley would divert most flow on north edge of town to the east highway ditch. Possible mitigation actions include re-grading the road, elevating the road and enlarging adjacent culverts/drainage ditches. This project would be shared between the county and city. Road mitigation projects are eligible for FEMA funds through the HMGP, PDM and FMA grant programs.

Responsible party: Mercer County Road Supervisor, Golden Valley Mayor

C: Consider enrolling in NFIP Community Rating System.

The NFIP CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. Flood insurance premium rates for residents are discounted to reflect the reduced flood risk resulting from community actions that meet CRS goals. Flood insurance premium discounts can range from 5 to 45 percent within Special Flood Hazard Areas (100-year floodplains).

Communities receive “credits” for 18 different activities within the program. A larger number of credits results in a greater premium discount for residents. Activities eligible for credit include outreach projects, open space preservation, stormwater management regulations, flood protection projects and flood warning programs.

The greatest challenge with CRS participation is the time requirements of administering the program. Each activity must be documented to receive credit, and the time required to create and maintain the documentation can be significant. Additionally, significant time may be required to administer the CRS activities that the community decides to utilize for credits.

FEMA does not charge a fee to apply or participate in the program. The overall cost varies based on staff time and expenses related to implementing the CRS activities selected by the community. Multiple jurisdictions could participate in this action.

Responsible party: Mercer County Emergency Management; Mayors of Beulah, Hazen, and Zap

D: Participate in NFIP training.

Training would be targeted at floodplain administrators in NFIP-participating jurisdictions. Local on-site training can be requested from the North Dakota State Water Commission, and online education opportunities are

available from FEMA. Multiple jurisdictions could participate in this action.

Responsible party: Mercer County Emergency Management; Mayors of Beulah, Hazen, and Zap

E: Participate in Firewise education program and implement best practices during fire season.

Firewise is a nationwide program produced by the National Fire Protection Association. Within North Dakota the program is operated by the State Forest Service. Firewise focuses on education for individual homeowners to help prepare homes for wildfire resistance. Each jurisdiction’s role within this program is to educate residents about wildfire risks and mitigation activities they can do to reduce their individual risk.

In addition to public education, the county and each city should evaluate opportunities for fuel reduction activities during wildfire season.

More information about Firewise can be found at:

<http://www.firewise.org/>

<http://www.ag.ndsu.edu/ndfs/documents/firewise-standard.pdf/view>

<http://www.firewise.org/usa-recognition-program/state-liaison-list.aspx?sso=0>

Additional resources may be required to implement fuel reduction activities. Wildfire fuels reduction is eligible for funding through the FEMA HMGP and BRIC grant programs. Multiple jurisdictions could participate in this action.

Responsible party: Mercer County Emergency Management; Mayors of each city

F: Educate public about existing community shelters.

Education could come in the form of a mailer or advertisement. Identifying signage should also be posted at the entrance to each shelter facility. Multiple jurisdictions could participate in this action.

Responsible party: Mercer County Emergency Management, Mayors of Beulah, Golden Valley, Hazen and Zap

BEULAH

G: Install siren on north end of town.

Recent growth on the north side of the city is driving the need for a second siren. There are many different types of sirens, each with a different price point. Items to

consider include fixed or rotating, duty rating, decibel ratings, sound circle and source of power. Warning sirens are not eligible for FEMA mitigation funding, but funding is periodically made available from North Dakota DES.

Responsible party: Beulah Mayor

H: Perform bank stabilization activities on Knife River.

Ongoing erosion issues have become especially evident during recent years of low flow in the Knife River. Riverbank stabilization could occur through a variety of methods, including riprap and vegetative buffers. Soil stabilization is eligible for funding through the FEMA HMGP, BRIC and FMA grant programs.

Responsible party: Beulah Mayor

I: Install generators at Civic Center/shelter, lift station #1 and middle school (secondary).

Emergency shelters cannot function appropriately without power. Emergency generators are needed for both facilities in Beulah.

Responsible party: Beulah Mayor

J: Install dry dams to alleviate overland flooding.

Dry dams would address flooding from the drainage area north-northwest of Beulah. Localized flood mitigation projects are eligible for FEMA funds through the HMGP, BRIC and FMA grant programs.

Responsible party: Beulah Public Works

K: Continue channel clearance and debris removal program for Knife River.

Although maintenance activities are not eligible for FEMA hazard mitigation grant funding, this action is important to maintaining good flows and preventing dams at river crossing locations in times of high water movement and flooding.

Responsible party: Beulah Public Works

GOLDEN VALLEY

L: Acquire portable generator for use at shelter or lift station.

An emergency generator is needed at the emergency shelter located in the fire shop at 21 Main ST W. However, it could also provide emergency power if the lift station needs the power to prevent flooding in town.

Funds for public awareness or education campaigns about mitigation are available under the HMGP Five Percent Initiative.

Responsible party: Golden Valley Mayor

B: Mitigate flooding issues on Co Rd 5 near Golden Valley.

The road experiences ponding issues during heavy rain events. Water gets caught up in the ditch when the area receives a lot of rain and has nowhere to drain. Requesting drainage improvement along both sides of County Road 5 on east side of Golden Valley would divert most flow on north edge of town to the east highway ditch. Possible mitigation actions include re-grading the road, elevating the road and enlarging adjacent culverts/drainage ditches. This project would be shared between the county and city. Road mitigation projects are eligible for FEMA funds through the HMGP, BRIC and FMA grant programs.

Responsible party: Mercer County Road Supervisor, Golden Valley Mayor

M: Implement improvements to existing community shelter or construct new shelter.

The existing shelter has no electricity, limited lighting and holds approximately 20 people. Initial discussion concluded that the existing shelter is the better option. But improvements are still needed.

Responsible party: Golden Valley Mayor

HAZEN

N: Enhance the abandoned rail line west of town to divert/slow water draining from the NW.

With a few enhancements the abandoned rail line could be converted into a dry dam to slow or divert water draining from northwest of town. A study is needed to assess the appropriate approach to this ongoing problem. HMGP monies may be available to complete this flood/drainage study, which will be done in coordination with the Mercer Co Water Board. Localized flood mitigation projects are eligible for FEMA funds through the HMGP, BRIC and FMA grant programs.

Responsible party: Hazen Public Works

K: Continue channel clearance and debris removal program for Knife River and Antelope Creek.

Although maintenance activities are not eligible for FEMA hazard mitigation grant funding, this action is

important to maintaining good flows and preventing dams at river crossing locations in times of high water movement and flooding. This ongoing effort is conducted in collaboration with the Mercer County Water Board.

Responsible party: Hazen Public Works

O: Obtain at least 3 generators for lift stations.

The objective is to provide at least half the generating power needed during emergencies. Portable or permanent generators are both options.

Responsible party: Hazen Public Works

P: Provide permanent flood protection for Lift Station #1.

Lift Station # 1 is frequently at risk from flooding. It would be most cost effective to install permanent flood protection to alleviate the need for installing emergency measures.

Responsible party: Hazen Public Works

PICK CITY

Q: Install siren at southwest corner of Pick City.

The increasing number of residents in town make this previously listed project even more important. A siren is needed to provide emergency alerts for the entire city.

Responsible party: Pick City Mayor

R: Improve drainage along Hwy 200 in the central part of town.

The lack of adequate drainage in the central part of the town create big problems but there appear to be simple fixes if they can be implemented. City engineer will work with the City Council to develop a detailed action plan.

Responsible party: Pick City Mayor, Mercer County Road Supervisor

S: Install multi-use path on north side of Hwy 200 for pedestrian safety.

Pick City is a cabin site convenience town where 10,000 summer cabin site residents use the local services for food/bar/laundry and so on. The heavy traffic on the major highway going through the middle of town creates pedestrian hazards. A multi-use trail will provide the additional safety for the thousands of summer pedestrians in town.

Responsible party: Pick City Mayor

T: Complete a study about heavy truck traffic and evaluate options to mitigate safety concerns.

The heavy semi-truck traffic running through the middle of the town is very high at all times of the year. Last year there was a semi-truck with hay bales that ran off the highway 1 mile west of Pick City and literally burned for 8 hours. It would be valuable for the DOT to complete a study traffic volume and potential congestion and safety concerns. This may support the need for the proposed multi-use trail of the previous action.

Responsible party: Pick City Mayor

STANTON

U: Improve drainage on the north end of town at the intersection of North AV and West ST.

Water fills in on the east side of West Street between North Avenue and Vanslyck Avenue. The drainage to the west needs to be improved. There is no housing in the area of where this block floods, which would be the north end of the block. There is a senior housing building on the south end. Potential options include drainage ditches, culverts, re-grade of flooded area or road elevation. Localized flood mitigation projects are eligible for FEMA funds through the HMGP, BRIC and FMA grant programs.

Responsible party: Stanton Mayor

V: Improve drainage on the south end of town at the intersection of South AV and Main ST.

The south end of Stanton experiences similar water backups to that occurring in the north end of town during heavy rains. Options need to be evaluated and an action plan established to resolve this hazard.

Responsible party: Stanton Mayor

ZAP

W: Perform bank stabilization activities on east side of Spring Creek near the Civic Center and City Shop to stop erosion.

Ongoing erosion issues have become especially evident during recent years of low flow on Spring Creek. Riverbank stabilization could occur through a variety of methods, including riprap and vegetative buffers. Soil stabilization is eligible for funding through the FEMA HMGP, BRIC and FMA grant programs.

Responsible party: Zap Mayor

X: Install backup generator at the Civic Center/shelter.

Emergency shelters cannot function appropriately without power. An emergency generator is needed for the Zap designated emergency shelter.

Responsible party: Zap Mayor

Y: Upgrade both emergency sirens.

Existing emergency sirens are no longer operating appropriately. They need to be upgraded.

Responsible party: Zap Mayor

Z: Improve drainage at corner of 2 AV W/Iowa ST W.

There is a drainage problem during heavy rainfall events. Dead trees are blocking water flow in the ditch and need to be removed.

Responsible party: Zap Mayor

CHAPTER 5: Plan Maintenance

This chapter details the plan maintenance process to make sure the Mercer County Multi-Hazard Mitigation Plan will remain an active and relevant document. The plan maintenance process includes monitoring the implementation of mitigation projects, 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.

Plan Monitoring and Evaluation

The Local Emergency Planning Committee (LEPC) will monitor and evaluate the plan once per year in a workshop format. The Emergency Manager will advertise the meeting to invite public attendance and input. Community officials will be invited as well. A basic agenda for each meeting should include:

- Discussion of project progress for the current period
- Local champion reports on project status
- Discussion of upcoming projects and grant/funding opportunities
- Develop action list for upcoming reporting period

The responsible party should provide the following basic information about projects in the reporting period:

- What was accomplished since the last review meeting
- What obstacles, problems or delays the project encountered
- If the project needs to be changed or reviewed

Project progress should be recorded on the Mitigation Action Progress Report Form found in Appendix E. A 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 complete the form for high priority projects; lower-priority projects may be generally discussed without completing the form.

The County Emergency Manager should maintain a folder with all Mitigation Action Progress Report Forms and meeting notes.

The risk and vulnerability assessment should be evaluated during an LEPC meeting approximately two years after plan adoption. Any changes to risks since plan adoption, such as a major flood event that damaged areas thought to be safe from flooding, should be noted. If there are new additions or changes to critical facilities in each County, a

report detailing these changes should be made. If significant changes are required, the Emergency Manager should schedule a meeting to discuss amending the current plan. If no significant changes are required, the Emergency Manager should save the report of changes for reference during the next five-year plan update.

LEPC meetings that are reserved for discussion of the plan should be open to the public and advertised. Since weather and infectious disease impacts have been so significant in the area in recent years, there may be public interest in ongoing efforts to reduce hazard impacts. A simple Annual Emergency Management Status Report may be a reasonable product of the LEPC monitoring and evaluation process. The report could be posted on the county's website and relevant Facebook pages. A copy of the Report could be sent to newspapers serving the area.

Although Emergency Management staff time is already stretched meeting existing workload requirements, a part of the ongoing outreach effort could include distribution of infographic style posters that would remind and educate county citizens about key hazards and mitigation opportunities.

Integration into Existing County-wide Planning Mechanisms

A comprehensive plan is a valuable tool for counties and cities to evaluate needs and establish strategies for meeting these needs. All Mercer County jurisdictions have comprehensive plans. What is especially useful is the opportunity to look for synergies in addressing multiple needs in a comprehensive and coordinated manner. The best emergency management practices prevent problems from even being constructed or initiated because jurisdictional practices reduce the lack of foresight that allows such things to happen. To the extent possible, local jurisdictions should establish comprehensive plan policies, zoning and subdivision regulations that minimize potential conflict and risk from potentially negative development. As an example, this may include establishing larger setback requirements from potential hazards.

Items from the risk/vulnerability assessment and action items that involve response activities from this plan should also be integrated into the county's Local Emergency Operations Plan (LEOP).

Due to the limited resources of each jurisdiction, few planning mechanisms generally exist within the county. Some of the mitigation actions included in this plan are

infrastructure related. It would be helpful for each jurisdiction to incorporate the infrastructure projects pertaining to them, or at least have the project details available for the beginning of their annual budget process. It is the role of each responsible party identified in Chapter 4 to be present at annual budget meetings and advocate for consideration of mitigation projects.

Independent of local jurisdiction activities, the County emergency manager may be able to unilaterally educate and encourage implementation of more best practices.

Additional activities which various jurisdictions and organizations could pursue to further implement this plan are:

- Adopt the state building code
- Enact subdivision and zoning regulations
- Collaborate with the next relevant Comprehensive Economic Development Strategy (CEDS) process by sharing analyses from this document to inform the CEDS planning process, and potentially help implement mitigation strategies of this document.
- Update comprehensive plans to actively integrate with multi-hazard mitigation planning

All jurisdictions should prioritize action items applicable to them and incorporate them into their annual budget decisions.

Current economic conditions and limited population growth suggest that resources will continue to remain scarce in the near future. For the next five years, specific effort needs to be directed at maintaining interest in mitigation. Two ways to help maintain interest are.

- Develop a kiosk or small display with posters and materials for distribution to inform county residents about opportunities and methods to increase resilience. Situate the kiosk at periodic public events such as fairs, community days, etc.
- Periodically provide a news release or short article for local newspapers on some aspect of emergency management such as tips for keeping your home safe from wildland fires. Post the same material on County websites and Facebook pages.

Updating the Plan

The County Emergency Manager is responsible for overseeing the five-year update process. Twelve to fourteen months should be allowed for completion of the plan – nine to eleven months to develop a draft and three months to collect DES and FEMA comments/revisions and formally adopt the plan. The Emergency Manager should begin the plan update process approximately fifteen months prior to the expiration of the current plan. The first step is to develop the project scope by utilizing the Plan Update Evaluation Worksheet in Appendix E. Funding opportunities from DES/FEMA may also be evaluated when determining project scope.

The Emergency Manager should maintain any documentation 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 plan update, which will reduce the time and cost of the plan update. It will also ensure that any priority items identified during LEPC monitoring meetings will be included in the plan.

Appendix A: Adoption Resolutions

Appendix B: Planning Process

Project Schedule

Note: Sign-in Sheets and Meeting Notices can be found later in this Appendix. A list of representatives from participating jurisdictions is available with the sign-in sheets.

Mercer County Kickoff Meeting [Mercer LEPC/MHMP Meeting] (January 13, 2022; Virtual Meeting via Zoom)

Emergency manager explained the project process and discussed hazards documented in the last MHMP.

City Council MHMP Meetings (February 1, 2022 – March 7, 2022)

Meetings with city councils and city staff to review past projects statuses, discuss new hazards, and the need for new mitigation actions. The meetings were:

- Golden Valley City Council – February 1, 2022
- Pick City Council – February 7, 2022
- Beulah City Council – February 9, 2022
- Stanton City Council – February 16, 2022
- Zap City Council – February 21, 2022
- Hazen City Council – March 7, 2022

Mercer County LEPC/MHMP Meeting (March 24, 2022; Mercer Co Courthouse, Stanton ND)

Discussed goals and reviewed recent hazard events and potential new mitigation projects.

Mercer County LEPC/MHMP Meeting (September 22, 2022; Sakakawea Medical Center, Hazen ND)

Reviewed Draft Plan.

Mercer County MHMP Public Meeting (September 26, 2022; Beulah Civic Center, Beulah ND)

Reviewed Draft Plan with public.

Meeting Attendance

Representatives from each participating jurisdiction who attended at least one meeting are listed below. Planning Team members are denoted with an asterisk(*).

MERCER COUNTY

- Carmen Reed, Mercer-Oliver Emergency Manager*

- Kurt Milbradt, Sheriff's Office and Hazen Fire Department*
- Warren Herman, Dakota Classification Company Safety Coordinator*
- Craig Askin, NDSU Extension Agent*
- Liza Taylor, Mercer Co Commissioner*
- Monica Johner, Mercer Co Ambulance Service*
- Dennis Barclay, Dakota Gasification Company Protective Services Supervisor*
- Terrance Ternes, Sheriff's Office*
- Ashley Miller, Sheriff's Office*
- Travis Frey, Mercer Co Commissioner and City of Beulah*
- Jeff Graney, Dakota Gasification Company, Compliance, Safety, Industrial Hygiene Superintendent*
- Claude O'Berry, Dakota Gasification Company Pipeline Superintendent*
- Kurt Dutchuk, Dakota Gasification Company Pipeline Supervisor*
- Jay Volk, Summit Carbon Solutions, Director of Health, Safety & Environmental*
- Pam Pehl, Sheriff's Office

BEULAH

- Frank Senn, Chief of Beulah Police Department
- Beaver Brinkman, City of Beulah
- Heidi Hamilton, City of Beulah Assessor/Planner
- Gary Bovkoon, City of Beulah Water/Wastewater
- Scott Solem, City of Beulah
- Kenny Yeager, City of Beulah Public Works
- Amanda L. Mohl, City of Beulah City Council
- David Czywczynski, City of Beulah City Council
- David Ripplinger, City of Beulah
- Heather Ferebee, City of Beulah Auditor*
- Gary Miller, City of Beulah City Council
- Ben Lenzen, City of Beulah City Council
- Eric Hoffer, City of Beulah City Council
- Eli Schumann, Beulah Fire Chief*
- Blake Kragnes, Knife River Care Center Administrator
- Jim Wenning, Beulah Police Department

GOLDEN VALLEY

- Kenton Richau, Golden Valley City Commission & Fire Chief*
- Rod Bredt, Golden Valley City Commission
- Shannon McKay, Resident of Golden Valley
- Krista Richau, City of Golden Valley Auditor*
- Kyle Lukenbach, Golden Valley City Commission

HAZEN

- Jason Haack, Hazen City Commission
- Jerry Obenauer, Hazen City Commission
- Casey Stern, Hazen City Commission
- Dan Pillar, Hazen City Commission
- Sara Schumann, Coal Country Community Health Center, Hazen Site Coordinator*
- Troy Johnson, Harlows Bus Director – Hazen School Buses*
- Brad Beecher, Sakakawea Medical Center Safety Coordinator/Environmental Services*
- Rachel Sem, Sakakawea Medical Center Director of Nursing*
- Monte Erhardt, City of Hazen Auditor*
- Vickie Schantz, Sakakawea Medical Center
- Dan Arens, Hazen Star Editor

PICK CITY

- Joshua Feil, Moore Engineering
- Wilbert Harsch, Mayor
- Brandon Reiser, Pick City Council
- Pat Drown, Pick City Auditor*
- Jim Sailer, Pick City
- Dan Wettstein, Pick City Fire Chief*
- Arvid Anderson, Pick City Fire & City Council*

STANTON

- Ron Boyko, Mayor
- Tom Sayler, City of Stanton Council
- Marvin Ballensky, City of Stanton Council
- Ryan Vigasaa, City of Stanton Council
- Nicolas Chapman, City of Stanton Public Works
- Dallas Sailer, City of Stanton
- Jennifer Gooss, Solem Law Office
- Chonny Braithwaite, City of Stanton Auditor*

ZAP

- Mike Duttenhefer, Mayor
- Rhonda Pfenning, Zap City Council
- Roy P. Enter, Zap City Council
- Joe Grammond, Zap City Council
- Tammy Gillig, Zap City Council
- Cynthia Zahn, Zap City Auditor*
- Scott Solem, Zap City Attorney

Additional Project Consultations

A number of direct consultations with Planning Team members, regional agency or organization representatives, other key stakeholders and experts were used to supplement the input received from project meetings. People not participating directly in meetings who provided assistance included:

- Karen Short, Missoula Fire Sciences Laboratory
- Aaron Bucholz, ND Fire Marshal's Office
- Noelle Kroll, McLean County Emergency Manager
- Greg Cocoran, Sakakawea State Park Manager
- Daniel Arens, Hazen Star Reporter/Editor (While not providing technical review or input, the publicity provided by his participation was extremely valuable to the project process.)

Mercer County MHMP Public Meeting
Sign In Sheet

September 28th 2022
Sign in at the South Gate Center, 120715 ST NE, Stanton, ND

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Name	Address	Email (Optional)
Terrell Frey	120 4th Ave SW, Buhl	
Frank Hohl	415 N. Main St, Stanton	
Don Arens	418 2nd St NW, Hazen	
Frank Arens	218 Main St, Stanton	
Frank Sem	120 4th Ave N, Buhl	fsenead@cox
Jim Sailer	120 Central Ave N, Buhl	jsailer@pickcity
Arvid Anderson	4355 2nd St NW, Hazen	

[illegible]

Mercer County LEPC/MHMP Meeting Sign in Sheet

September 22nd, 2022 11:45 AM at the Stakeholders Medical Center, 530 8th Ave NE, Hazen, ND
Name: Agency: Phone: Email:

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Caroline Reed	Mercer County SW	(701) 870-0889	creed@nd.gov
Travis Frey	City of Bismarck/Mercer Co	701-871-8723	travis.frey@cityofbismarck.org
David Baecher	SWC	701-748-7257	dbaecher@swc.nd.gov
David Arms	Hazen Stn	701-748-7255	hazenstn@nd.gov
Adrian Brown	Public Configuration	701-873-6259	adrianbrown@nd.gov
Neil Johnson	ADPES	701-328-8130	
Jeff Gansner	DGE	701-870-0531	gansner@nd.gov
Chuck O'Brien	DGC	701-870-0703	chuckobrien@nd.gov
Terry Tink	MUSD		ttink@mud.nd.gov
Angie Miller	MUSD	381-0000	amiller@mud.nd.gov
Kristi Doherty	DOH	701-873-6367	kristi.doherty@nd.gov
Rachel Sen	SWC	215-230-3767	rsen@swc.nd.gov

Mercer County LEPC/MHMP Meeting Sign in Sheet

September 22nd, 2022 11:45 AM at the Stakeholders Medical Center, 530 8th Ave NE, Hazen, ND
Name: Agency: Phone: Email:

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Dan Witterau	Fire City Fire	426-6461	dawitterau@cityoffire.com
Tony Johnson	Hazards Dept Director	891-9454	johnson@nd.gov
Sean Shumann	CCHC	880-8777	sean.shumann@nd.gov
Jay NDK	SCS	400-1004	jay.ndk@nd.gov
Heidi Moore	Custer Health	701-873-4433	hmoore@custerhealth.com
Cynthia Kuntz	BSPH / SPR	701-280-5851	ckuntz@nd.gov
Lita Taylor	County Commission	701-871-9217	lita.taylor@nd.gov

Mercer County LEPC/MHMP Meeting Sign in Sheet

March 24th, 2022 11:45 AM at the Stakeholders Medical Center, 530 8th Ave NE, Hazen, ND
Name: Agency: Phone: Email:

Page 1

Caroline Reed	Mercer County SW	(701) 870-0889	creed@nd.gov
David Baecher	SWC	701-748-7257	dbaecher@swc.nd.gov
David Arms	Hazen Stn	701-748-7255	hazenstn@nd.gov
Adrian Brown	Public Configuration	701-873-6259	adrianbrown@nd.gov
Neil Johnson	ADPES	701-328-8130	
Jeff Gansner	DGE	701-870-0531	gansner@nd.gov
Chuck O'Brien	DGC	701-870-0703	chuckobrien@nd.gov
Terry Tink	MUSD		ttink@mud.nd.gov
Angie Miller	MUSD	381-0000	amiller@mud.nd.gov
Kristi Doherty	DOH	701-873-6367	kristi.doherty@nd.gov
Rachel Sen	SWC	215-230-3767	rsen@swc.nd.gov

Mercer County LEPC/MHMP Meeting Sign in Sheet

March 24th, 2022 11:45 AM at the Stakeholders Medical Center, 530 8th Ave NE, Hazen, ND
Name: Agency: Phone: Email:

Page 2

Caroline Reed	Mercer County SW	(701) 870-0889	creed@nd.gov
David Baecher	SWC	701-748-7257	dbaecher@swc.nd.gov
David Arms	Hazen Stn	701-748-7255	hazenstn@nd.gov
Adrian Brown	Public Configuration	701-873-6259	adrianbrown@nd.gov
Neil Johnson	ADPES	701-328-8130	
Jeff Gansner	DGE	701-870-0531	gansner@nd.gov
Chuck O'Brien	DGC	701-870-0703	chuckobrien@nd.gov
Terry Tink	MUSD		ttink@mud.nd.gov
Angie Miller	MUSD	381-0000	amiller@mud.nd.gov
Kristi Doherty	DOH	701-873-6367	kristi.doherty@nd.gov
Rachel Sen	SWC	215-230-3767	rsen@swc.nd.gov

Planning Team

The Planning Team consisted of members of the LEPC and additional key representatives from each city in Mercer County. Because of the difficulty of holding meetings during the pandemic individual consultations with additional key stakeholders also occurred. The following table lists Planning Team members who participated in at least one meeting or a consultation.

Planning Team Members	Jurisdiction/ Organization
Carmen Reed, Emergency Manager	Mercer Co
Dan Wettstein, Fire Chief	Pick City Fire Dept
Sara Schumann, Hazen Site Coordinator	Coal Country Community Health Ctr
Eli Schumann, Fire Chief	Beulah Fire Dept
Arvid Anderson, City Council member, Firefighter	Pick City, Pick City Fire Dept
Kevin Herrmann, Resident	Mercer Co
Kurt Milbradt, Dispatcher/Jailer, Firefighter	Mercer Co, Hazen Fire Dept
Kenton Richau, Fire Chief	Golden Valley
Warren Herman, Safety Coordinator	Dakota Gasification Company
Monica Johnner, Assistant Director	Mercer Co Ambulance
Troy Johnson, Harlows Bus Director	Hazen School Distr
Brad Beecher, Safety Coordinator/ Environmental Services Manager	Sakakawea Medical Center
Monte Erhardt, City Auditor	Hazen
Heidi Moore, County Nurse	Mercer Co
Dennis Barclay, Protective Services Supervisor	Dakota Gasification Company
Terrance Ternes, Chief Deputy	Mercer Co Sheriff Dept
Craig Askin, Extension Agent	NDSU
Ashley Miller, Dispatcher/Jailer	Mercer Co Sheriff Dept
Cynthia Zahn, Auditor	Zap
Krista Richau, Auditor	Golden Valley

Heather Ferebee, Auditor	Beulah
Chonny Braithwaite, Auditor	Stanton
Pat Drown, Auditor	Pick City
Crystallynn Kuntz, Emergency Preparedness SWC Regional Coordinator	Bismarck-Burleigh Regional Health
Travis Frey, County Commissioner	Mercer Co
Jeff Graney, Compliance, Safety, Industrial Hygiene Superintendent	Dakota Gasification Company
Claude O'Berry, Pipeline Superintendent	Dakota Gasification Company
Kurt Dutchuk, Pipeline Supervisor	Dakota Gasification Company
Rachel Sem, Director of Nursing	Sakakawea Medical Center
Jay Volk, Director of Health, Safety & Environmental	Summit Carbon Solutions
Liza Taylor, County Commissioner	Mercer Co
Rick Alexander, Coyote Plant Safety Coordinator	Otter Tail Power Company
Neil Johnson, Regional Emergency Manager	NDDes

Publicity

The project and project meetings were publicized by ads and articles in local newspapers and by local jurisdiction notices and websites. The September Public meeting had an advertisement and article promoting input. Additionally, key stakeholders were invited by phone call or email to participate in the meetings. The images on the following page document several of these publicity tools.



Photo credit of Daniel Arens

Mercer County Emergency Response Manager Carmen Reed (standing) receives the blessing of the Mercer County Commission to work with engineers in order to update the county's expired multi-hazard mitigation plan.

Setting up for new radios

By DANIEL ARENS

This year, the first real steps towards a statewide emergency radio system will take place.

For the last several years, local dispatch, law enforcement, fire departments and ambulance providers have been getting ready for the implementation of SIREN. The Statewide Interoperable Radio Network is a radio network that will be used by emergency responders throughout North Dakota, enabling a more cohesive system of response across all county lines.

These updated radios, however, come with a quite literal cost. For rural responders like Mercer County and its communities, two-thirds of which have a population under 1,000 people, finding the funds to purchase the new radios that work with SIREN can be a challenge.

Local agencies have been working towards securing funds and figuring out ways to implement SIREN for a while. But the SIREN system will actually start to come online in just a few months.

During a Zoom meeting of the Mercer County Local Emergency Planning Committee (LEPC) last Thursday, Emergency Response Manager Carmen Reed informed local leaders that the state intends to start inputting data for the SIREN system on March 14. She added there is an estimate of three months

to bring the project online.

Beulah Police Chief Frank Sonn asked whether local response agencies would need to convert over to the SIREN system in that time. Reed stressed that was not the case. The SIREN system will, by summer, be available, but local agencies can still take more time to make the transition.

Sonn's question came as he said the Beulah Police Department had started purchasing SIREN radios but was still in the process of buying the remainder.

"You still have time to make additional purchases," Reed said. "The ability will be there in July. When we're ready, then we can go live."

The LEPC committee is also hoping to pursue some training exercises for emergency response in the coming year. Those exercises could provide emergency responders a chance to train with the new radios and make sure they know how to utilize them for coordinating and collaborating response.

Reed said the county's multi-hazard mitigation plan has expired. The reason for that is that Reed had put in for grant money last year, but had not moved further while waiting for a response on that request.

In order to implement a new multi-hazard mitigation plan, Reed said the county and individual cities needed to take stock of what potential hazards they might have to deal with and compile a

list of hazards. In addition, Reed would need to speak to the county commission and the cities, as well as hold public meetings to seek additional input.

Reed began the process by informing the LEPC members during the meeting. She said she hopes to revisit the topic in a March meeting to see what additional ideas or suggestions the committee members and first responders might have. The purpose of last week's update was to get people thinking about what things they would include in the plan.

During the county commission meeting Tuesday, Reed spoke with the commissioners about the mitigation plan. The county commission unanimously passed a motion approving Reed to enter into a service agreement with the engineering firm KJJ to update the multi-hazard mitigation plan, with a large portion of the associated costs subject to refund through a grant program.

Reed plans to visit with the individual cities in February concerning updates to their hazards.

Reed also discussed Red Cross sheltering in the county, with the county courthouse and jail not an ideal location for long-term sheltering and Reed hoping to visit with the City of Stanton about making use of the Stanton Civic Center as an emergency shelter location for that town.

MERCER COUNTY MULTI-HAZARD MITIGATION PLAN YOUR INPUT IS NEEDED

What are the biggest hazards facing your community?

What should the community do to address these hazards?



HOW TO PARTICIPATE

Join Us on Monday, September 26th at 5PM
At the Beulah Civic Center for Supper & a Brief
Presentation of the Updated Mitigation Plan!

Your Input is Needed!!!

MERCER COUNTY 911/EM

THUNDER SEVERE SUMMER STORM LANDSLIDE URBAN FIRE
WILDLAND FIRE DAM FAILURE SEVERE WINTER STORM HOME/IND SECURITY INCIDENT
COMMERCIAL/INDUSTRIAL MATERIALS RELEASE FLOOD URBAN FLOOD

Emergency response seeks public input



PHOTO CREDIT OF DANIEL ARENS

Carmen Reed, Mercer County Emergency Response Manager, speaks with the Hazen City Commission Monday about that community's multi-hazard mitigation plan, and whether any updates are needed. It's one part of the process of preparing a new mitigation plan for Mercer County for the next 5 years to address any concerns about possible disasters. The public can participate in the process as well by completing an online survey.

By DANIEL ARENS

Mercer County's Multi-Hazard Mitigation Plan (MHMP) is a vital foundation for helping local emergency response prepare for potential emergencies and ensure preventative measures are in place to minimize hazardous threats. Every five years, the county's MHMP must be updated as a requirement from the Federal Emergency Management Agency (FEMA), which enables the county and cities to receive FEMA funding in the event of a major disaster. One of the primary aspects of updating the plan

involves public meetings or a public survey. Two engagements with the public are required, prior to approving a final plan.

Mercer County Emergency Response Manager Carmen Reed has sent out a survey to satisfy the first of those two requirements. The survey is available at <https://www.surveymonkey.com/r/Mercer2022> and must be completed by March 24.

"Everybody in the public has the option to have input on it," Reed said. "We're trying to make it brief and to the point, and we tried to list everything people might have comments on."

Emergency Planning Committee (LEPC) will meet to discuss the results of the survey and get feedback from emergency response leaders like police and fire chiefs. This information will all be put together by Reed, the LEPC and the engineering firm KJJ to create a draft MHMP for Mercer County.

Following this, Reed said the plan is to have a full public meeting to go over the draft plan, where any further additions or corrections to that plan can be made. The meeting will be open to anyone, and Reed said she plans to have refreshments available. That meeting will be in April,

with an exact date to be determined. After that meeting, the final MHMP will be put together for approval.

Reed has also visited with all the incorporated cities of Mercer County in preparation for the draft plan. She attended the Hazen City Commission Monday evening, which was the last of the city council meetings for her to attend.

Reed reviewed the city plans from five years ago, the last time an MHMP was approved. She wanted to see which of the priorities

See **EMERGENCY**
on page 3

Mercer County submits hazard response plan



PHOTO CREDIT OF DANIEL ARENS

Mercer County Emergency Manager Carmen Reed (standing, at left) gives an overview of the proposed Mercer County Multi-Hazard Mitigation Plan to members of the local emergency planning committee. The plan lists major possible hazards to the county and its residents, and ways to minimize the harm and the likelihood of these disasters.

BY DANIEL ARENS

When it comes to disasters, both natural and due to human activity, it is better to be proactive rather than reactive.

The Mercer County Local Emergency Planning Committee (LEPC) meets regularly to train and communicate about emergencies, and help prepare themselves for these things before they actually happen.

And, in order to help guide the LEPC and other government and emergency response leaders in how to prepare and how to respond, the county's Multi-Hazard Mitigation Plan (MHMP) is an essential document, a blueprint to help guide future decisions.

The MHMP must be renewed every five years, a process involving input from local leaders, the Mercer County public, the State and FEMA at the federal level. The renewal allows the county to see which goals set in their previous plan have been effectively met, which goals are still works in progress and what

new goals they need to set.

Throughout the past year, Mercer County Emergency Response Manager Carmen Reed has been working with the county commission and city councils to ensure that their list of priorities are gathered so they can be incorporated into the new plan. Last Thursday, she met with the LEPC to go through the finalized plan with them, and then Monday evening held a public comment meeting at the Beulah Civic Center for anyone from the public to participate in.

No changes were made by the LEPC to the presentation Reed gave them, and there were no attendees at the public hearing other than the county commission chairman and law enforcement officers from the Mercer County Sheriff's Department and the Beulah Police Department. With no changes, Reed will now send the draft on to the State for them to review.

The MHMP began by setting out the purpose, authority and planning process for the plan as a whole. This was followed by updated

demographics about Mercer County, including population, climate and economics.

From here, the plan moved into a detailed analysis of various hazards, where they are most prone to happen in the county and what steps could be taken to prevent or minimize the impacts of them. Reed listed what she saw as the primary hazard threats, most of which were natural disasters that might be expected to occur more frequently. Summer and winter storms with damaging impacts were the highest items on the list, which also included flooding, fires and hazardous waste spills.

The plan then listed the hazard mitigation priorities of Mercer County and each of its incorporated cities. Some of these are ongoing items, including public education and participation in training. But there are also more specific items, such as performing bank stabilization projects on the Knife River in Beulah and improv-

See HAZARDS on page 14

Input sought for hazard response

BY DANIEL ARENS

Emergency responders and leaders at the city and county levels have weighed in on the significant potential hazards to Mercer County. But, now, it's time for the public to have the chance to do the same.

On Monday, Sept. 26,

there will be a special public input meeting at the Beulah Civic Center regarding the county's Multi-Hazard Mitigation Plan. A plan has been drafted with input from emergency response leaders in police, fire and ambulance services, and city council members and city councilors have weighed in with their own concerns as well.

Now, with the draft in place, there's a chance for those interested in the plan, or having their own concerns they want to voice, to be heard. The meeting begins at 6 p.m., and there will be a light supper provided. Those attending will need to sign their names on a sign-in sheet. Carmen Reed,

Mercer County Emergency Response Manager, will give a brief presentation of the current plan through a PowerPoint display, after which there will be an open discussion among those present at the meeting. All input from the public will be documented.

"The public review of the Mercer County Multi-Hazard Mitigation Plan is a chance for the public to review all the hazards of the County and become more aware of what plans are in place to address them," Reed said. "This plan is to help keep all the residents safe within the community and if there are hazards that are not being addressed, we need to address them."

Reed said that, while all counties should have plans to address potential emergency situations, these plans are particularly important to place that Mercer County, which are unique based on its location due to local industries, as well as pipelines, trains and truck hauling safety. In addition, Mercer County can see emerging from industries hazards to a strong response in a given year in terms of weather, while the generally

dry conditions and strong winds can make the threat of fires more severe. Reed said that, besides getting input from the public, the meeting is a chance to better educate the public about what potential hazards and disasters the county could face, helping them stay as safe as possible in an emergency situation.

By also stepping back, the county and its officials will be able to see the big picture and how the county and its officials will handle emergencies, addressing the responsibilities of both local officials and emergency responders in a situation, the Multi-Hazard Mitigation Plan can help make actual responses to emergency situations more efficient and effective, ultimately resulting in a safer county.

"We all have to work together to really have an effective plan and in return have a safer community," Reed said. If you'd like to comment on these really important safety issues, or even directly learn more about them and how local leaders plan to respond to them, make sure you attend the public input meeting on Monday evening and let your voice be heard.

We can help you save with Lifeline.

When you participate in the Lifeline program, which is a government-sponsored program that offers a range of services and resources, a discount on your monthly service. Only eligible customers may enroll in the program.

You may be eligible for a Lifeline discount if you currently participate in a qualifying public assistance program or otherwise qualify for federal income assistance. The Lifeline discount is limited to a single line of service and is available to one household. You may not be eligible for the Lifeline discount if you are already receiving a Lifeline discount on another line of service, or if you are not a U.S. resident. Lifeline is a federal program, and its rules and regulations are subject to change. For more information, visit www.fcc.gov/lifeline or call 1-877-876-2442.

To request further information about the Lifeline program, visit www.fcc.gov/lifeline or call 1-877-876-2442. Lifeline is a federal program, and its rules and regulations are subject to change. For more information, visit www.fcc.gov/lifeline or call 1-877-876-2442.

Community Survey

A questionnaire was developed and distributed electronically to obtain input about key topics to be addressed by the MHMP. There were 73 respondents. The newspaper ad publicizing the survey is shown below, followed by responses to key questions in the survey.

MERCER COUNTY

MULTI-HAZARD MITIGATION PLAN

YOUR INPUT IS NEEDED

HOW TO PARTICIPATE PUBLIC SURVEY

Take survey at:

<https://www.surveymonkey.com/r/Mercer2022>

WHAT ARE THE BIGGEST HAZARDS FACING YOUR COMMUNITY?

WHAT SHOULD THE COMMUNITY DO TO ADDRESS THESE HAZARDS?

This brief survey will collect our input on local hazards & potential solutions!

MERCER COUNTY 911/EM

Drought | Severe Summer Storm | Landslide | Urban Fire | Wildland Fire
Dam Failure | Severe Winter Storm | Homeland Security Incident
Infectious Disease | Materials Release | Flood

Q2. Rank natural hazards from most concerning to least concerning. The top five hazards in ranked order were:

- Severe Summer Weather
- Severe Winter Weather
- Drought
- Flooding
- Wildland fires

Q4. Rank human caused or technological hazards from most concerning to least concerning. The top five hazards in ranked order were:

- Hazardous materials release
- Structure Fire
- Dam Failure
- Transportation Incidents
- Active Attack Incident

Q6. Do you feel you have adequate knowledge to prepare yourself, your home, your family, your business, etc., in the event of an emergency/disaster?

Yes: 72%

No: 8%

Not Sure: 20%

Q8. Does your community provide sheltering for severe storms?

Yes: 70%

No: 7%

Not Sure: 23%

Reviewed Documents

Documents reviewed and incorporated into this plan include:

- 2016 Mercer County Multi-Hazard Mitigation Plan
- 2019 North Dakota Enhanced Multi-Hazard Mitigation Plan (risk assessment)
- Beulah Comprehensive Plan
- Hazen Comprehensive Plan
- Earthquake Hazards and Probabilities in North Dakota
- Landslides in North Dakota. January 2017. Murphy. Geo News.
- September 2018 National Performance of Dams Program (NPDP-01 V1) from Stanford University

Appendix C: Additional Hazard Information

Storm Events Database

This section contains storm events from the NOAA National Climatic Data Center Storm Events Database. The criteria for each event type to qualify for inclusion to the database are:

- **Blizzard:** Sustained winds of 35 MPH or greater, snow reducing visibility to less than ¼ mile and lasting at least three hours.
- **Cold/Wind Chill:** Wind chill reaching -35 degrees F or lower.
- **Flash Flood:** Rapid and extreme flow of high water above pre-determined flood levels, beginning within six hours of the causative event.
- **Drought:** Deficiency of moisture resulting in a D2 classification or higher as indicated in the multi-agency Drought Monitor.
- **Flood:** Any high flow, overflow or inundation by water that causes or threatens damage, generally occurring more than six hours after the causative event.
- **Funnel Cloud:** A rotating, visible, extension of a cloud pendant from a convective cloud with circulation not reaching the ground.
- **Hail:** Hail of at least ¾ inch diameter, or hail less than ¾ inch diameter that causes injuries or fatalities.
- **Heavy Rain:** Unusually large amount of rain which does not cause a flash flood or flood, but causes damage, e.g., roof collapse or other human/economic impact. Urban ponding events would generally be classified as heavy rain.
- **Heat:** A period of heat resulting from high temperatures and relative humidity as determined by locally-established thresholds.
- **Heavy Snow:** Snow accumulation exceeding locally defined 12 and/or 24-hour criteria. Could include snow events of 6, 8 or 10 inches in 24 hours or less depending on typical regional snowfall.
- **High/Strong/Thunderstorm Wind:** Sustained winds of 40 mph or greater lasting for 1 hour or longer, or winds of 58 mph for any duration.
- **Ice Storm:** Ice accretion of ¼ or ½ inch or more (varies depending on local jurisdiction defining criteria).
- **Lightning:** Sudden electrical discharge from a storm resulting in a fatality, injury or property damage.
- **Tornado:** A funnel cloud that makes contact with the ground and creates ground-based visual effects such as dust/dirt or other disturbance.
- **Wildfire:** Wildfire that causes one or more fatalities or injuries, and/or property damage.
- **Winter Storm:** A winter weather event that has more than one significant hazard (i.e. heavy snow and blowing snow; snow and ice; snow and sleet; sleet and ice; or snow, sleet and ice). A winter storm would normally pose a threat to life and property.
- **Winter Weather:** Winter precipitation event that causes a death, injury or significant economic impact.

Note that in most instances property and crop damage was not included with storm reports in the counties.

Mercer County Hazard Events, 2000-2021					
Location	Date	Type	Magnitude	Property Damage	Crop Damage
Mercer (Zone)	1/17/1996	Blizzard		0.00K	0.00K
Mercer (Zone)	2/1/1996	Cold/Wind Chill		0.00K	0.00K
Mercer (Zone)	2/10/1996	High Wind	50 kts.	0.00K	0.00K
Mercer (Zone)	2/26/1996	Blizzard		0.00K	0.00K
Mercer (Zone)	3/23/1996	Winter Storm		0.00K	0.00K
Golden Valley	6/30/1996	Thunderstorm Wind	52 kts.	0.00K	0.00K
Beulah	7/10/1996	Hail	2.00 in.	0.00K	0.00K
Hazen	7/10/1996	Hail	0.75 in.	0.00K	0.00K
Beulah	7/10/1996	Hail	2.00 in.	0.00K	0.00K
Mercer (Zone)	10/20/1996	Winter Storm		0.00K	0.00K
Mercer (Zone)	11/19/1996	Winter Storm		0.00K	0.00K
Mercer (Zone)	11/23/1996	Winter Storm		0.00K	0.00K
Mercer (Zone)	12/16/1996	Blizzard		0.00K	0.00K
Mercer (Zone)	12/25/1996	Cold/Wind Chill		0.00K	0.00K
Mercer (Zone)	1/4/1997	Blizzard		0.00K	0.00K
Mercer (Zone)	1/4/1997	Blizzard		250.0K	0.00K
Mercer (Zone)	1/9/1997	Blizzard		1.53M	0.00K
Mercer (Zone)	3/12/1997	Winter Storm		0.00K	0.00K
Mercer (Zone)	3/21/1997	Flood		1.20M	0.00K
Mercer (Zone)	4/4/1997	Blizzard		1.52M	0.00K
Mercer (Zone)	7/2/1997	High Wind	45 kts.	0.00K	0.00K
Beulah	7/10/1997	Thunderstorm Wind	60 kts.	0.00K	0.00K
Zap	7/10/1997	Hail	0.75 in.	0.00K	0.00K
Golden Valley	7/10/1997	Tornado	F0	35.00K	0.00K
Beulah	7/10/1997	Thunderstorm Wind	75 kts.	0.00K	0.00K
Mercer (Zone)	2/25/1998	Blizzard		0.00K	0.00K
Stanton	5/27/1998	Hail	1.00 in.	0.00K	0.00K
Mercer (Zone)	11/9/1998	Heavy Snow		0.00K	0.00K
Mercer (Zone)	11/18/1998	Winter Storm		0.00K	0.00K
Mercer (Zone)	1/1/1999	Winter Storm		0.00K	0.00K
Mercer (Zone)	1/26/1999	Winter Storm		0.00K	0.00K
Mercer (Zone)	10/31/1999	High Wind	60 kts.	0.00K	0.00K
Mercer (Zone)	2/25/2000	Winter Storm		0.00K	0.00K
Mercer (Zone)	2/26/2000	Winter Storm		0.00K	0.00K
Mercer (Zone)	3/8/2000	Winter Storm		0.00K	0.00K
Mercer (Zone)	4/5/2000	High Wind	60 kts. E	0.00K	0.00K
Mercer (Zone)	4/13/2000	Winter Storm		0.00K	0.00K
Mercer (Zone)	4/14/2000	Winter Storm		0.00K	0.00K
Hazen	6/11/2000	Hail	0.75 in.	0.00K	0.00K
Golden Valley	8/2/2000	Thunderstorm Wind	61 kts. E	0.00K	0.00K

Stanton	8/20/2000	Hail	0.75 in.	0.00K	0.00K
Mercer (Zone)	11/2/2000	Winter Storm		0.00K	0.00K
Mercer (Zone)	11/7/2000	Winter Storm		0.00K	0.00K
Mercer (Zone)	12/16/2000	Blizzard		0.00K	0.00K
Zap	6/9/2001	Thunderstorm Wind	52 kts. M	0.00K	0.00K
Zap	6/9/2001	Hail	0.75 in.	0.00K	0.00K
Beulah	6/9/2001	Funnel Cloud		0.00K	0.00K
Stanton	6/9/2001	Hail	0.75 in.	0.00K	0.00K
Beulah	7/20/2001	Thunderstorm Wind	52 kts. E	0.00K	0.00K
Beulah	7/22/2001	Thunderstorm Wind	52 kts. E	0.00K	0.00K
Mercer (Zone)	11/1/2001	High Wind	38 kts. E	0.00K	0.00K
Mercer (Zone)	2/11/2002	High Wind	44 kts. M	0.00K	0.00K
Mercer (Zone)	4/18/2002	Winter Storm		0.00K	0.00K
Mercer (Zone)	5/7/2002	Winter Storm		0.00K	0.00K
Beulah	6/8/2002	Hail	0.75 in.	0.00K	0.00K
Hazen	6/14/2002	Hail	0.75 in.	0.00K	0.00K
Beulah	6/29/2002	Thunderstorm Wind	52 kts. E	0.00K	0.00K
Hazen	7/24/2002	Thunderstorm Wind	52 kts. E	0.00K	0.00K
Beulah	8/16/2002	Hail	0.75 in.	0.00K	0.00K
Hazen	8/30/2002	Flash Flood		0.00K	0.00K
Mercer (Zone)	11/29/2002	High Wind	45 kts. M	0.00K	0.00K
Mercer (Zone)	12/17/2002	Winter Storm		0.00K	0.00K
Mercer (Zone)	4/1/2003	Winter Storm		0.00K	0.00K
Beulah	7/3/2003	Thunderstorm Wind	65 kts. EG	0.00K	0.00K
Pick City	7/13/2003	Hail	1.25 in.	0.00K	0.00K
Mercer (Zone)	1/4/2004	Cold/Wind Chill		0.00K	0.00K
Mercer (Zone)	1/24/2004	Winter Storm		0.00K	0.00K
Mercer (Zone)	1/27/2004	Cold/wind Chill		0.00K	0.00K
Mercer (Zone)	2/10/2004	Winter Storm		0.00K	0.00K

Mercer (Zone)	2/10/2004	Blizzard		0.00K	0.00K
Mercer (Zone)	2/29/2004	Winter Storm		0.00K	0.00K
Mercer (Zone)	3/10/2004	Blizzard		0.00K	0.00K
Mercer (Zone)	3/13/2004	High Wind	50 kts. ES	0.00K	0.00K
Mercer (Zone)	5/15/2004	High Wind	37 kts. ES	0.00K	0.00K
Golden Valley	7/11/2004	Thunderstorm Wind	55 kts. MG	0.00K	0.00K
Hazen	7/11/2004	Thunderstorm Wind	52 kts. EG	0.00K	0.00K
Mercer (Zone)	12/11/2004	High Wind	42 kts. ES	0.00K	0.00K
Mercer (Zone)	12/20/2004	High Wind	45 kts. ES	0.00K	0.00K
Mercer (Zone)	1/13/2005	Cold/Wind Chill		0.00K	0.00K
Mercer (Zone)	3/9/2005	High Wind	49 kts. ES	0.00K	0.00K
Beulah	5/21/2005	Hail	0.88 in.	0.00K	0.00K
Hazen	6/19/2005	Hail	2.25 in.	0.00K	0.00K
Beulah	6/19/2005	Thunderstorm Wind	52 kts. EG	0.00K	0.00K
Hazen	6/19/2005	Thunderstorm Wind	52 kts. EG	0.00K	0.00K
Zap	7/2/2005	Hail	2.00 in.	0.00K	0.00K
Beulah	7/7/2005	Hail	1.75 in.	0.00K	0.00K
Hazen	7/7/2005	Hail	1.00 in.	0.00K	0.00K
Hazen	7/16/2005	Lightning		5.00K	0.00K
Hazen	8/1/2005	Hail	1.00 in.	0.00K	0.00K
Stanton	9/8/2005	Hail	1.00 in.	0.00K	0.00K
Mercer (Zone)	10/4/2005	Blizzard		110.00K	0.00K
Mercer (Zone)	2/16/2006	Cold/Wind Chill		0.00K	0.00K
Beulah	7/12/2006	Hail	1.00 in.	0.00K	0.00K
Beulah	7/12/2006	Thunderstorm Wind	70 kts. EG	20.00K	0.00K
Pick City	7/30/2006	Hail	0.75 in.	0.00K	0.00K
Zap	8/24/2006	Hail	1.00 in.	0.00K	0.00K
Golden Valley	8/24/2006	Thunderstorm Wind	52 kts. EG	0.00K	0.00K
Zap	8/24/2006	Hail	0.88 in.	0.00K	0.00K
Beulah	8/24/2006	Hail	1.75 in.	0.00K	0.00K
Hazen	8/24/2006	Hail	1.00 in.	0.00K	0.00K
Stanton	8/24/2006	Hail	2.50 in.	350.00K	0.00K
Stanton	8/24/2006	Hail	3.25 in.	300.00K	0.00K
Beulah	8/24/2006	Hail	1.00 in.	0.00K	0.00K
Zap	8/24/2006	Thunderstorm Wind	52 kts. EG	0.00K	0.00K
Beulah	8/24/2006	Flash Flood		40.00K	0.00K
Mercer (Zone)	2/28/2007	Winter Storm		0.00K	0.00K
Hazen	5/6/2007	Funnel Cloud		0.00K	0.00K
Mercer (Zone)	5/14/2007	High Wind	36 kts. ES	0.00K	0.00K

Beulah	5/21/2007	Hail	1.00 in.	0.00K	0.00K
Beulah	6/12/2007	Heavy Rain		0.00K	0.00K
Pick City	7/3/2007	Thunderstorm Wind	52 kts. EG	0.00K	0.00K
Mercer (Zone)	11/13/2007	High Wind	35 kts. ES	2.00K	0.00K
Mercer (Zone)	1/28/2008	Extreme Cold/Wind Chill		0.00K	0.00K
Mercer (Zone)	1/28/2008	Extreme Cold/Wind Chill		0.00K	0.00K
Mercer (Zone)	2/10/2008	Extreme Cold/Wind Chill		0.00K	0.00K
Mercer (Zone)	3/24/2008	High Wind	50 kts. EG	0.00K	0.00K
Stanton	6/18/2008	Hail	1.00 in.	0.00K	0.00K
Stanton	6/18/2008	Hail	2.75 in.	7.00K	0.00K
Stanton	6/18/2008	Hail	2.50 in.	0.00K	0.00K
Stanton	6/18/2008	Hail	4.25 in.	0.00K	0.00K
Golden Valley	6/24/2008	Hail	1.75 in.	0.00K	0.00K
Hazen	6/24/2008	Hail	1.50 in.	0.00K	0.00K
Golden Valley	6/26/2008	Hail	0.88 in.	0.00K	0.00K
Zap	6/26/2008	Hail	1.00 in.	0.00K	0.00K
Hazen	6/26/2008	Hail	1.00 in.	0.00K	0.00K
Stanton	6/26/2008	Hail	1.00 in.	0.00K	0.00K
Beulah	7/10/2008	Hail	0.75 in.	0.00K	0.00K
Hazen Muni Arpt	7/10/2008	Hail	1.75 in.	0.00K	0.00K
Mercer (Zone)	7/11/2008	High Wind	35 kts. ES	0.00K	0.00K
Mercer (Zone)	7/12/2008	High Wind	35 kts. ES	0.00K	0.00K
Golden Valley	7/19/2008	Thunderstorm Wind	61 kts. EG	0.00K	0.00K
Beulah	7/19/2008	Hail	0.75 in.	0.00K	0.00K
Zap	7/28/2008	Hail	1.00 in.	0.00K	0.00K
Stanton	7/28/2008	Hail	2.00 in.	0.00K	0.00K
Stanton	7/28/2008	Hail	1.75 in.	0.00K	0.00K
Republic	7/30/2008	Hail	2.50 in.	0.00K	0.00K
Beulah Arpt	7/30/2008	Hail	0.88 in.	0.00K	0.00K
Hazen	7/30/2008	Hail	1.75 in.	30.00K	0.00K
Krem	7/30/2008	Hail	0.88 in.	0.00K	0.00K
Pick City	7/30/2008	Thunderstorm Wind	52 kts. EG	0.00K	0.00K
Stanton	7/30/2008	Thunderstorm Wind	61 kts. EG	8.00K	0.00K
Stanton	7/30/2008	Thunderstorm Wind	56 kts. EG	1.00K	0.00K
Zap	8/3/2008	Thunderstorm Wind	52 kts. EG	3.00K	0.00K
Mercer (Zone)	11/6/2008	Blizzard		0.00K	0.00K
Mercer (Zone)	12/13/2008	Blizzard		0.00K	0.00K
Mercer (Zone)	12/14/2008	Extreme Cold/Wind Chill		0.00K	0.00K

Mercer (Zone)	12/20/2008	Extreme Cold/Wind Chill		0.00K	0.00K
Mercer (Zone)	12/26/2008	Heavy Snow		0.00K	0.00K
Mercer (Zone)	12/29/2008	Heavy Snow		0.00K	0.00K
Mercer (Zone)	1/8/2009	Heavy Snow		0.00K	0.00K
Mercer (Zone)	1/11/2009	Blizzard		0.00K	0.00K
Mercer (Zone)	1/16/2009	Winter Weather		0.00K	0.00K
Mercer (Zone)	1/31/2009	High Wind	35 kts. ES	0.00K	0.00K
Mercer (Zone)	2/9/2009	Heavy Snow		0.00K	0.00K
Golden Valley	3/6/2009	Flood		553.00K	0.00K
Mercer (Zone)	3/23/2009	Blizzard		0.00K	0.00K
Golden Valley	4/1/2009	Flood		255.00K	0.00K
Hazen	7/8/2009	Thunderstorm Wind	51 kts. MG	0.00K	0.00K
Beulah	7/11/2009	Thunderstorm Wind	56 kts. MG	10.00K	0.00K
Stanton	7/11/2009	Thunderstorm Wind	61 kts. EG	75.00K	0.00K
Mercer (Zone)	12/23/2009	Winter Storm		0.00K	0.00K
Mercer (Zone)	12/25/2009	Blizzard		0.00K	0.00K
Mercer (Zone)	1/5/2010	Winter Weather		0.00K	0.00K
Mercer (Zone)	1/6/2010	Extreme Cold/Wind Chill		0.00K	0.00K
Mercer (Zone)	1/18/2010	Winter Weather		0.00K	0.00K
Mercer (Zone)	1/22/2010	Winter Storm		0.00K	0.00K
Mercer (Zone)	1/25/2010	Blizzard		93.00K	0.00K
Mercer (Zone)	3/9/2010	Winter Weather		0.00K	0.00K
Mercer (Zone)	4/2/2010	Winter Weather		30.00K	0.00K
Mercer (Zone)	5/6/2010	Winter Weather		0.00K	0.00K
Mercer (Zone)	5/25/2010	High Wind	52 kts. EG	30.00K	0.00K
Beulah	6/17/2010	Thunderstorm Wind	52 kts. EG	0.00K	0.00K
Beulah	6/17/2010	Hail	0.88 in.	0.00K	0.00K
Mercer (Zone)	6/18/2010	High Wind	35 kts. ES	0.00K	0.00K
Golden Valley	7/10/2010	Hail	0.88 in.	0.00K	0.00K
Zap	7/10/2010	Hail	1.00 in.	0.00K	0.00K
Beulah	7/10/2010	Hail	0.88 in.	0.00K	0.00K
Beulah	7/29/2010	Thunderstorm Wind	52 kts. EG	70.00K	0.00K
Hazen	7/29/2010	Thunderstorm Wind	56 kts. MG	0.00K	0.00K
Beulah	8/1/2010	Tornado	EF0	50.00K	0.00K
Beulah	9/9/2010	Hail	1.00 in.	0.00K	0.00K
Beulah	9/9/2010	Thunderstorm Wind	52 kts. EG	0.00K	0.00K
Zap	9/9/2010	Thunderstorm Wind	52 kts. EG	0.00K	0.00K
Golden Valley	9/9/2010	Flash Flood		45.00K	0.00K

Mercer (Zone)	10/26/2010	High Wind	35 kts. MS	0.00K	0.00K
Mercer (Zone)	10/26/2010	Blizzard		0.00K	0.00K
Mercer (Zone)	12/10/2010	Heavy Snow		0.00K	0.00K
Mercer (Zone)	12/20/2010	Heavy Snow		0.00K	0.00K
Mercer (Zone)	1/31/2011	Extreme Cold/Wind Chill		0.00K	0.00K
Mercer (Zone)	2/1/2011	Extreme Cold/wind Chill		0.00K	0.00K
Mercer (Zone)	2/1/2011	Extreme Cold/Wind Chill		0.00K	0.00K
Mercer (Zone)	2/8/2011	Extreme Cold/Wind Chill		0.00K	0.00K
Mercer (Zone)	2/13/2011	High Wind	35 kts. MS	20.00K	0.00K
Mercer (Zone)	3/11/2011	Blizzard		0.00K	0.00K
Mercer (Zone)	3/22/2011	Blizzard		0.00K	0.00K
Mercer (Zone)	3/22/2011	Winter Storm		0.00K	0.00K
Mercer (Zone)	4/14/2011	Heavy Snow		0.00K	0.00K
Mercer (Zone)	4/30/2011	Blizzard		0.00K	0.00K
Mercer (Zone)	5/1/2011	Blizzard		0.00K	0.00K
Mercer (Zone)	5/31/2011	High Wind	35 kts. ES	0.00K	0.00K
Beulah	6/18/2011	Heavy Rain		0.00K	0.00K
Pick City	7/1/2011	Flood		0.00K	0.00K
Golden Valley	7/8/2011	Tornado	EF0	0.00K	0.00K
Beulah	7/8/2011	Tornado	EF0	0.00K	0.00K
Beulah	7/16/2011	Hail	1.75 in.	0.00K	100.00K
Beulah	7/16/2011	Hail	1.75 in.	0.00K	0.00K
Beulah	7/16/2011	Thunderstorm Wind	52 kts. EG	0.00K	0.00K
Beulah	7/16/2011	Hail	1.00 in.	0.00K	0.00K
Hazen	7/16/2011	Hail	0.88 in.	0.00K	0.00K
Hazen	7/16/2011	Thunderstorm Wind	62 kts. MG	0.00K	0.00K
Mercer (Zone)	7/16/2011	Excessive Heat		0.00K	0.00K
Zap	7/22/2011	Heavy Rain		0.00K	0.00K
Zap	7/22/2011	Hail	1.25 in.	0.00K	0.00K
Zap	7/22/2011	Thunderstorm Wind	52 kts. EG	0.00K	0.00K
Zap	7/22/2011	Hail	1.25 in.	0.00K	0.00K
Pick City	7/22/2011	Thunderstorm Wind	61 kts. EG	50.00K	0.00K
Pick City	8/1/2011	Flood		0.00K	0.00K
Zap	8/15/2011	Hail	0.88 in.	0.00K	0.00K
Hazen	8/15/2011	Thunderstorm Wind	56 kts. MG	0.00K	0.00K
Hazen	8/15/2011	Thunderstorm Wind	52 kts. EG	0.00K	0.00K
Beulah	8/15/2011	Thunderstorm Wind	70 kts. EG	10.00K	0.00K

Beulah	8/15/2011	Hail	1.25 in.	0.00K	0.00K
Hazen	8/31/2011	Thunderstorm Wind	53 kts. MG	0.00K	0.00K
Mercer (Zone)	9/20/2011	High Wind	35 kts. ES	0.00K	0.00K
Mercer (Zone)	1/18/2012	Extreme Cold/Wind Chill		0.00K	0.00K
Stanton	5/21/2012	Hail	0.75 in.	0.00K	0.00K
Beulah	6/6/2012	Hail	1.00 in.	0.00K	0.00K
Zap	6/13/2012	Hail	1.75 in.	12.00K	0.00K
Hazen	6/13/2012	Hail	0.75 in.	0.00K	0.00K
Hazen	8/2/2012	Thunderstorm Wind	54 kts. MG	0.00K	0.00K
Hazen	8/24/2012	Hail	1.00 in.	0.00K	0.00K
Mercer (Zone)	10/17/2012	High Wind	51 kts. MG	0.00K	0.00K
Mercer (Zone)	11/10/2012	Heavy Snow		0.00K	0.00K
Mercer (Zone)	1/20/2013	Extreme Cold/Wind Chill		0.00K	0.00K
Mercer (Zone)	1/30/2013	Extreme Cold/wind Chill		0.00K	0.00K
Mercer (Zone)	2/2/2013	Blizzard		0.00K	0.00K
Mercer (Zone)	3/4/2013	Blizzard		0.00K	0.00K
Mercer (Zone)	4/14/2013	Winter Storm		0.00K	0.00K
Hazen	7/8/2013	Thunderstorm Wind	53 kts. MG	0.00K	0.00K
Hazen	7/8/2013	Thunderstorm Wind	56 kts. MG	0.00K	0.00K
Stanton	7/8/2013	Thunderstorm Wind	56 kts. EG	5.00K	0.00K
Pick City	7/8/2013	Thunderstorm Wind	52 kts. EG	0.00K	0.00K
Beulah	8/29/2013	Thunderstorm Wind	61 kts. EG	0.00K	0.00K
Zap	8/30/2013	Hail	2.00 in.	0.00K	0.00K
Zap	8/30/2013	Hail	1.75 in.	0.00K	0.00K
Pick City	8/30/2013	Hail	1.75 in.	0.00K	0.00K
Mercer (Zone)	12/2/2013	Heavy Snow		0.00K	0.00K
Mercer (Zone)	12/6/2013	Extreme Cold/Wind Chill		0.00K	0.00K
Mercer (Zone)	1/4/2014	Extreme Cold/Wind Chill		0.00K	0.00K
Mercer (Zone)	1/15/2014	High Wind	55 kts. MG	0.00K	0.00K
Mercer (Zone)	1/22/2014	Extreme Cold/Wind Chill		0.00K	0.00K
Mercer (Zone)	1/26/2014	Blizzard		0.00K	0.00K
Mercer (Zone)	3/1/2014	Extreme Cold/Wind Chill		0.00K	0.00K
Mercer (Zone)	3/31/2014	Blizzard		0.00K	0.00K
Zap	7/6/2014	Thunderstorm Wind	61 kts. EG	0.00K	0.00K
Zap	7/6/2014	Hail	1.75 in.	60.00K	30.00K

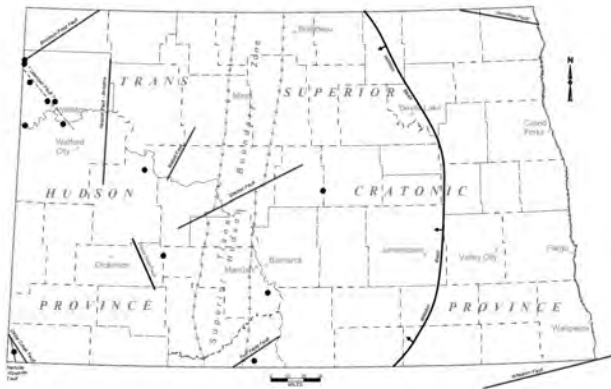
Hazen	7/6/2014	Thunderstorm Wind	70 kts. EG	10.00K	25.00K
Beulah	7/6/2014	Hail	1.75 in.	30.00K	20.00K
Hazen	7/6/2014	Hail	1.50 in.	0.00K	0.00K
Golden Valley	7/6/2014	Thunderstorm Wind	61 kts. EG	10.00K	0.00K
Stanton	7/21/2014	Thunderstorm Wind	53 kts. MG	0.00K	0.00K
Golden Valley	8/15/2014	Flood		2.500M	500.00K
Beulah	9/3/2014	Thunderstorm Wind	52 kts. EG	0.00K	0.00K
Hazen	9/3/2014	Hail	1.00 in.	0.00K	0.00K
Zap	6/1/2015	Thunderstorm Wind	51 kts. MG	0.00K	0.00K
Beulah	6/24/2015	Hail	1.25 in.	0.00K	0.00K
Pick City	7/15/2015	Hail	1.25 in.	0.00K	0.00K
Stanton	7/15/2015	Thunderstorm Wind	56 kts. EG	5.00K	0.00K
Pick City	7/15/2015	Hail	1.00 in	0.00K	0.00K
Mercer (Zone)	7/28/2015	High Wind	54 kts. MG	0.00K	0.00K
Mercer (Zone)	8/22/2015	High Wind	50 kts. EG	0.00K	0.00K
Mercer (Zone)	10/11/2015	High Wind	56 kts. MG	0.00K	0.00K
Mercer (Zone)	11/18/2015	High Wind	56 kts. MG	0.00K	0.00K
Mercer (Zone)	2/6/2016	High Wind	52 kts. MG	0.00K	0.00K
Mercer (Zone)	2/19/2016	High Wind	52 kts. MG	0.00K	0.00K
Beulah	5/25/2016	Funnel Cloud		0.00K	0.00K
Beulah	6/21/2016	Hail	1.5 in.	0.00K	0.00K
Pick City	6/21/2016	Thunderstorm Wind	52 kts. EG	0.00K	0.00K
Stanton	6/21/2016	Hail	1.00 in.	0.00K	0.00K
Stanton	6/21/2016	Hail	1.00 in.	0.00K	0.00K
Golden Valley	7/3/2016	Hail	1.75 in.	0.00K	0.00K
Golden Valley	7/3/2016	Thunderstorm Wind	56 kts. MG	0.00K	0.00K
Beulah	7/3/2016	Hail	1.75 in.	0.00K	0.00K
Hazen	7/3/2016	Thunderstorm Wind	65 kts. EG	100.0K	25.00K
Hazen	7/3/2016	Thunderstorm Wind	63 kts. MG	0.00K	0.00K
Hazen	7/3/2016	Thunderstorm Wind	61 kts. EG	100.0K	20.00K
Beulah	7/10/2016	Thunderstorm Wind	52 kts. EG	0.00K	0.00K
Hazen	7/10/2016	Thunderstorm Wind	54 kts. MG	0.00K	0.00K
Golden Valley	7/16/2016	Hail	1.00 in.	0.00K	0.00K
Stanton	7/20/2016	Hail	1.00 in.	0.00K	0.00K
Hazen	8/15/2016	Hail	0.75 in.	0.00K	0.00K

Mercer (Zone)	11/28/2016	Heavy Snow		0.00K	0.00K
Mercer (Zone)	12/5/2016	Blizzard		0.00K	0.00K
Mercer (Zone)	12/25/2016	Blizzard		0.00K	0.00K
Mercer (Zone)	1/30/2017	High Wind	35 kts. ES	0.00K	0.00K
Mercer (Zone)	3/7/2017	High Wind	54 kts. MG	0.00K	0.00K
Hazen	7/14/2017	Hail	1.5 in.	0.00K	0.00K
Zap	8/12/2017	Hail	0.75 in.	0.00K	0.00K
Mercer (Zone)	3/5/2018	Heavy Snow		0.00K	0.00K
Mercer (Zone)	3/23/2018	Heavy Snow		0.00K	0.00K
Beulah	6/1/2018	Hail	2.00 in.	0.00K	0.00K
Golden Valley	6/1/2018	Tornado	EF0	0.00K	0.00K
Beulah	6/10/2018	Hail	1.00 in.	0.00K	0.00K
Beulah	6/14/2018	Thunderstorm Wind	56 kts. EG	0.00K	0.00K
Beulah	6/26/2018	Hail	1.75 in.	0.00K	0.00K
Golden Valley	6/28/2018	Flash Flood		8.00K	15.00K
Stanton	6/28/2018	Thunderstorm Wind	69 kts. MG	0.00K	0.00K
Pick City	6/28/2018	Thunderstorm Wind	74 kts. EG	35.00K	0.00K
Stanton	6/28/2018	Thunderstorm Wind	113 kts. EG	400.0K	75.00K
Stanton	6/28/2018	Thunderstorm Wind	74 kts. EG	150.0K	0.00K
Stanton	6/28/2018	Thunderstorm Wind	70 kts. EG	300.0K	0.00K
Golden Valley	7/14/2018	Funnel Cloud		0.00K	0.00K
Mercer (Zone)	12/26/2018	Heavy Snow		0.00K	0.00K
Mercer (Zone)	1/27/2019	High Wind	37 kts. MS	0.00K	0.00K
Mercer (Zone)	1/29/2019	Extreme Cold/ Wind Chill		0.00K	0.00K
Mercer (Zone)	2/3/2019	Heavy Snow		0.00K	0.00K
Mercer (Zone)	7/8/2019	Tornado	EF0	0.00K	0.00K
Mercer (Zone)	7/12/2019	Hail	1.00 in.	0.00K	0.00K
Mercer (Zone)	7/15/2019	Thunderstorm Wind	57 kts. MG	0.00K	0.00K
Hazen	8/6/2019	Hail	1.00 in.	0.00K	0.00K
Golden Valley	8/6/2019	Hail	1.5 in.	0.00K	0.00K
Mercer (Zone)	10/9/2019	Heavy Snow		0.00K	0.00K
Mercer (Zone)	11/30/2019	Heavy Snow		0.00K	0.00K
Mercer (Zone)	12/8/2019	Heavy Snow		0.00K	0.00K
Mercer (Zone)	3/1/2020	High Wind	52 kts. EG	0.00K	0.00K
Golden Valley	7/7/2020	Thunderstorm Wind	62 kts. MG	0.00K	0.00K
Stanton	7/7/2020	Thunderstorm Wind	59 kts. MG	0.00K	0.00K
Hazen	7/7/2020	Thunderstorm Wind	57 kts. MG	0.00K	0.00K

Beulah	8/7/2020	Hail	1.25 in.	0.00K	0.00K
Beulah	8/7/2020	Hail	1.5 in.	0.00K	0.00K
Mercer (Zone)	9/2/2020	High Wind	52 kts. EG	0.00K	0.00K
Mercer (Zone)	1/13/2021	High Wind	56 kts. MG	50.00K	0.00K
Mercer (Zone)	2/10/2021	Extreme Cold/Wind Chill		0.00K	0.00K
Mercer (Zone)	3/29/2021	High Wind	50 kts. MG	0.00K	0.00K
Mercer (Zone)	4/1/2021	Drought		0.00K	0.00K
Mercer (Zone)	5/1/2021	Drought		0.00K	0.00K
Mercer (Zone)	6/1/2021	Drought		0.00K	0.00K
Golden Valley	6/5/2021	Thunderstorm Wind	59 kts. MG	0.00K	0.00K
Hazen	6/5/2021	Thunderstorm Wind	54 kts. MG	0.00K	0.00K
Beulah	6/5/2021	Thunderstorm Wind	61 kts. EG	0.00K	0.00K
Stanton	6/5/2021	Thunderstorm Wind	52 kts. MG	0.00K	0.00K
Golden Valley	6/10/2021	Thunderstorm Wind	70 kts. EG	50.00K	0.00K
Golden Valley	6/10/2021	Thunderstorm Wind	50 kts. MG	0.00K	0.00K
Beulah	6/10/2021	Thunderstorm Wind	61 kts. EG	5.00K	0.00K
Beulah	6/10/2021	Thunderstorm Wind	61 kts. MG	0.00K	0.00K
Mercer (Zone)	7/1/2021	Drought		0.00K	0.00K
Beulah	7/16/2021	Hail	1.00 in.	0.00K	0.00K
Beulah	7/16/2021	Hail	2.00 in.	0.00K	0.00K
Golden Valley	7/16/2021	Hail	1.75 in.	0.00K	0.00K
Mercer (Zone)	8/1/2021	Drought		0.00K	0.00K
Hazen	8/30/2021	Hail	1.5 in.	0.00K	0.00K
Beulah	8/30/2021	Hail	1.75 in.	7.00K	0.00K
Mercer (Zone)	9/1/2021	Drought		0.00K	0.00K
Mercer (Zone)	10/1/2021	Drought		0.00K	0.00K
Mercer (Zone)	11/1/2021	Drought		0.00K	0.00K
Mercer (Zone)	11/16/2021	High Wind	51 kts. MG	0.00K	0.00K
Mercer (Zone)	12/1/2021	Drought		0.00K	0.00K
Mercer (Zone)	12/26/2021	Heavy Snow		0.00K	0.00K

Geologic Hazards

Chapter 3 summarizes general threat of geologic hazards in Mercer County. Landslides, earthquakes, and sinkholes are all types of geologic hazards. Landslides have been the phenomenon with the greatest impact in the North Dakota and are generally a consideration for major construction projects in parts of the State. Mercer County's many landslides were documented in Chapter 3. Earthquakes are less commonly considered a risk. Although the risk of an earthquake capable of causing significant damage is slight, there have been earthquakes in recent ND history. The map below illustrates the major faults and tectonic boundaries along with earthquakes that have occurred in North Dakota.



The closest identified earthquake to Mercer County occurred in Sheridan County on November 15, 2008 with a reported magnitude of 2.6. The following excerpt and chart from an article written by Fred J. Anderson and titled *Earthquake Hazards and Probabilities in North Dakota and the Magnitude 9.0 Indonesian Earthquake of December 26, 2004* in the NDGS Newsletter summarizes the risk:

Previous Earthquakes in North Dakota

The first instrumentally verified earthquake in the state was recorded on July 8, 1968 in the vicinity of Huff, North Dakota, just south of the Bismarck-Mandan area. This earthquake has been recorded as a Richter magnitude 3.7 event. Several other earthquakes have been felt within the state beginning as far back as October 9, 1872 (See Historical Timeline of Earthquakes Originating or Felt in North Dakota chart below). As of this writing a total of nine earthquakes have been determined to have occurred within the state and five additional earthquakes were recorded to have been felt within the state although they did not originate within state boundaries (Biek, 1997).....It is interesting to note that based on this

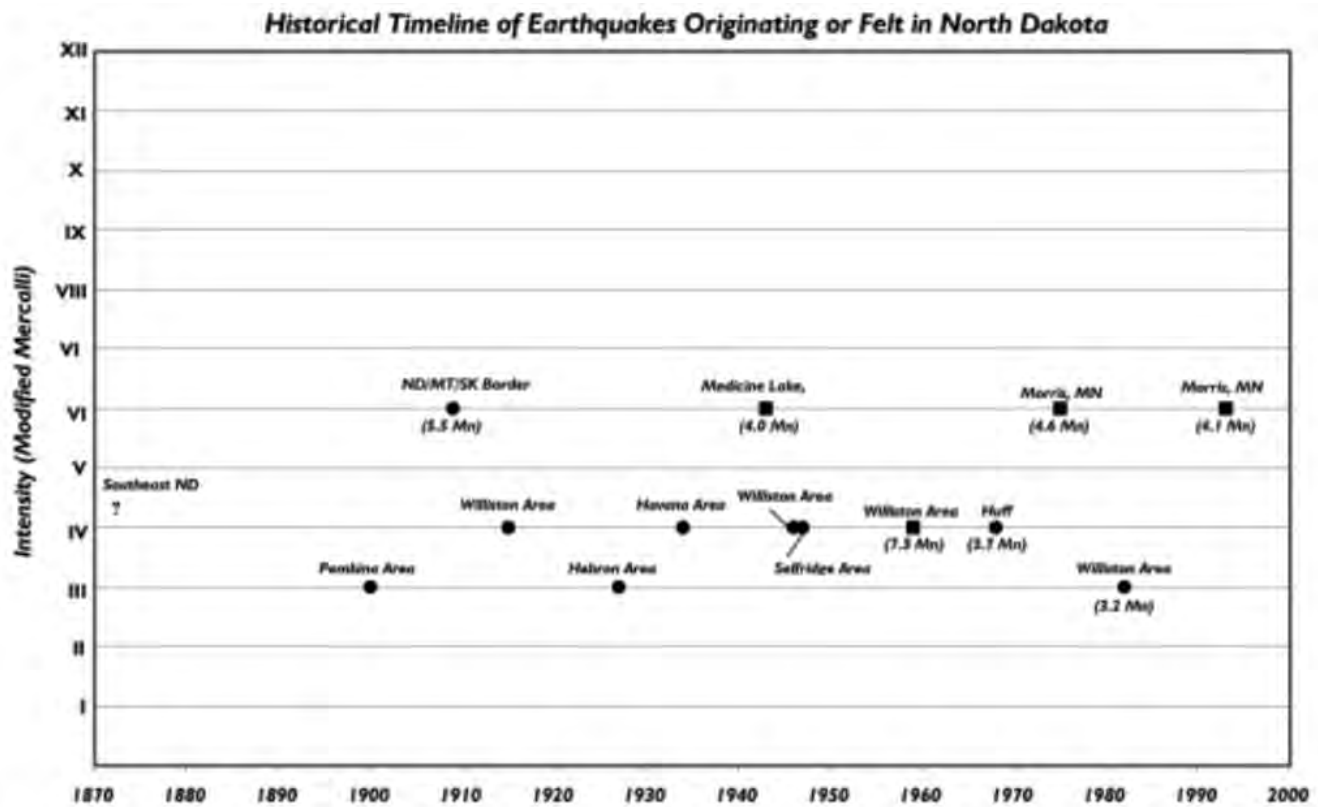
historical record, an earthquake, either originating within the state or being felt within the state, occurs, on an average, of approximately once per decade.

North Dakota Seismic Hazards

..... how North Dakota compares to the rest of the U.S., on the matter of seismic hazard. From a seismological perspective we can look at this in a couple of different ways.

One way to evaluate the seismic hazard of a particular area is to consider what the probability would be that an earthquake of a given magnitude would occur at a particular location of interest during a specified period of time. If one were to consider what the probabilities of an earthquake of magnitude 5.0 or greater (earthquakes of magnitude 5.0 or greater are generally considered to be of a destructive character) occurring within the next 1000 years (roughly 14 lifetimes) at a range of 50 km (around 31 miles) from each major North Dakota city we would find a less than 10 percent chance of experiencing this kind of an earthquake within the next 1000 years.....The city of Williston has the highest probability. This is due to [its] location to preexisting, deeply buried fault structures at the northwestern and southeastern boundaries of the state and on the configuration of the Precambrian basement rocks, previously summarized as related to earthquakes in North Dakota by Bluemle (1989).

Another way to characterize seismic risk is by way of ground acceleration presented as ground shaking hazard, which is the rate of horizontal ground motion for a particular area calculated from the frequency and number of previous earthquakes of various magnitudes and currently available information on fault-slip rates. Compared to the rest of the U.S., North Dakota is well within the area with the lowest potential ground shaking hazard of 0-2% g (when an earthquake occurs the forces caused by ground shaking can be measured and expressed as a percentage of g or the force of gravity at the surface of the earth).



New Construction

As part of the evaluation of potential impacts to property in Mercer County, new construction having occurred between 2016 and 2022 was documented as follows:

- Beulah: 5 new houses/7 major buildings
- Hazen: 17 new houses/40 major buildings
- Golden Valley: 1 new house/1 large shop
- Pick City: 11 new houses /no major buildings
- Stanton: no new houses/1 new industrial building
- Zap: no new houses/no new major buildings

Appendix D: Mitigation Action Determination

Hazards needing priority mitigation were discussed at each community meeting and with planning team members. The public was also requested to identify priority mitigation actions via the community survey. Mitigation action items were developed with multiple activities:

- Early input on potential mitigation action items was obtained at the Planning Team and Community meetings
- Goals and a hierarchy of needs were reviewed and confirmed
- Consultant provided a list of potential mitigation actions
- Status of past mitigation action items was assessed
- Feedback from community survey was reviewed
- Draft mitigation action items compiled by consultant and reviewed by the emergency manager
- Planning team input was requested to refine mitigation action items
- Emergency manager confirms priorities and timeline for final mitigation actions list
- Final mitigation action items were presented at public meeting for review and comment
- Emergency manager confirms final mitigation actions list

Hierarchy of Needs

1. Life/Safety – protecting the lives and ensuring the safety of people is the highest priority
2. Emergency Response Capability – maintaining the capacity of local emergency responders is the second highest priority
3. Critical Facilities Protection – protecting the structure and functionality of critical facilities is the third highest priority
4. Property Protection – protecting existing structures and property, which represent the

wealth and means to livelihood, from hazards is the fourth highest priority

5. Future Development/Economic Capacity – the final priority is to maintain capacity for current business and economic activity, as well as protecting the potential for future development activity

Past Mitigation Action Status

The table on the following page summarizes the status of the mitigation action items from the 2016 Mercer County MHMP.

	completed	ongoing	no longer important	still need completion
Rural Mercer				
1 participate in NFIP workshop		X		
2 develop shelter in place plan	X			
3 mitigate flooding issues		X		
4 Consider Enrolling in NFIP Community Rating System (CRS)		X		
5 Improve drainage along Hwy 200 in the central part of Pick City			X, City & DOT Responsible	
6 Participate in NFIP Training.		X		
7 Participate in Fire-wise education program for homeowners and implement best practices during wildfire season		X		
8 Educate Public about existing Community Shelters.		X		
Beulah Action Items				
1 Install siren on the north end of town		X		
2 Participate in NFIP workshop to educate public about benefits of flood insurance		X		
3 Perform bank stabilization activities on the Knife River		X		
4 Install generators at Civic Center/shelter, lift station#1 & Middle School (Secondary shelter)		X		
5 Install Dry Dams to alleviate overland flooding		X		
6 Continue channel clearance & debris removal program for Knife River		X		
7 Participate in NFIP training		X		
8 Participate in Firewise education program for homeowners & implement best practices during wildfire season		X		
9 Educate Public about the existing community shelter		X		
Golden Valley Action Items				
1 Acquire portable generator for use at shelter or lift station		X		
2 Mitigate flooding issues on County Road 5 near city		X		
3 Examine improvements to existing community shelter or construct new shelter		X		
4 Participate in Firewise education program for homeowners and implement best practices during wildfire season		X		
5 Educate Public about the existing community shelter		X		
Hazen Action Items				
1 Participate in NFIP workshop to educate public about benefits of flood insurance		X		
2 Consider enrolling in NFIP Community Rating System (CRS)		X		
3 Enhance the abandoned rail line west of town to divert/slow water draining from the northwest		X		
4 Continue channel clearance and debris removal programs for Knife River and Antelope Creek		X		
5 Educate Public about the existing community shelter		X		
6 Participate in Firewise education program for homeowners and implement best practices during wildfire season.		X		
7 Participate in NFIP training		X		
Pick City Action Items				
1 Install generator at the water plant	X			
2 Install Siren at southwest corner of town		X		
3 Improve drainage along Highway 200 in the center part of town		X		
4 Construct community storm shelter			X	
5 Participate in Firewise education program for homeowners and implement best practices during wildfire season		X		
Stanton Action Items				
1 Replace siren on south side of town	X			
2 Improve drainage on the north end of town at the intersection of North Avenue and West Street		X		
3 Construct emergency shelter at southwest corner of city near the mobile home park			X	
4 Participate in Firewise education program for homeowners and implement best practices during wildfire season		X		
Zap Action Items				
1 Perform bank stabilization activities on east side of Spring Creek near the Civic Center and City Shop to stop erosion		X		
2 Participate in NFIP workshop to educate public about benefits of flood insurance		X		
3 Install generator at Civic Center/shelter		X		
4 Participate in NFIP Training		X		
5 Participate in Firewise education program for homeowners and implement best practices during wildfire season		X		
6 Educate public about the existing community shelter		X		

Appendix E: Monitoring Forms

Worksheet 7.1

Mitigation Action Progress Report Form

Mitigation Action Progress Report Form

Progress Report Period	From Date:	To Date:
Action/Project Title		
Responsible Agency		
Contact Name		
Contact Phone/Email		
Project Status	<input type="checkbox"/> Project completed <input type="checkbox"/> Project canceled <input type="checkbox"/> Project on schedule <input type="checkbox"/> Anticipated completion date: _____ <input type="checkbox"/> 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. Other comments

Worksheet 7.2 Plan Update Evaluation Worksheet

Plan Update Evaluation Worksheet

Plan Section	Considerations	Explanation
Planning Process	Should new jurisdictions and/or districts be invited to participate in future plan updates?	
	Have any internal or external agencies been invaluable to the mitigation strategy?	
	Can any procedures (e.g., meeting announcements, plan updates) be done differently or more efficiently?	
	Has the Planning Team undertaken any public outreach activities?	
	How can public participation be improved?	
	Have there been any changes in public support and/or decision-maker priorities related to hazard mitigation?	
Capability Assessment	Have jurisdictions adopted new policies, plans, regulations, or reports that could be incorporated into this plan?	
	Are there different or additional administrative, human, technical, and financial resources available for mitigation planning?	
	Are there different or new education and outreach programs and resources available for mitigation activities?	
	Has NFIP participation changed in the participating jurisdictions?	
Risk Assessment	Has a natural and/or technical or human-caused disaster occurred?	
	Should the list of hazards addressed in the plan be modified?	
	Are there new data sources and/or additional maps and studies available? If so, what are they and what have they revealed? Should the information be incorporated into future plan updates?	
	Do any new critical facilities or infrastructure need to be added to the asset lists?	
	Have any changes in development trends occurred that could create additional risks?	
	Are there repetitive losses and/or severe repetitive losses to document?	

Worksheet 7.2

Plan Update Evaluation Worksheet

Plan Section	Considerations	Explanation
Mitigation Strategy	Is the mitigation strategy being implemented as anticipated? Were the cost and timeline estimates accurate?	
	Should new mitigation actions be added to the Action Plan? Should existing mitigation actions be revised or eliminated from the plan?	
	Are there new obstacles that were not anticipated in the plan that will need to be considered in the next plan update?	
	Are there new funding sources to consider?	
	Have elements of the plan been incorporated into other planning mechanisms?	
Plan Maintenance Procedures	Was the plan monitored and evaluated as anticipated?	
	What are needed improvements to the procedures?	