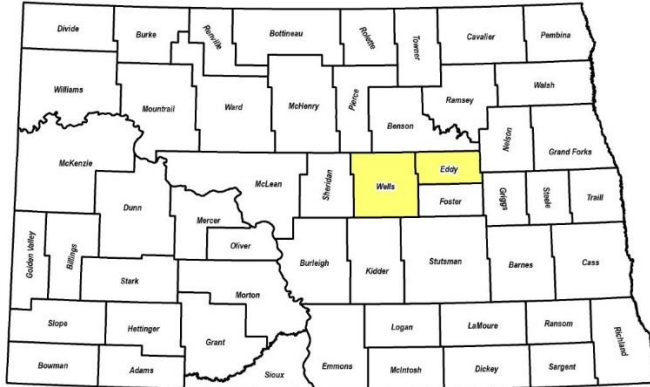


2017 Eddy & Wells Counties, N.D. Multi-Jurisdictional Multi-Hazard Mitigation Plan



Plan Development Managed by:

Eddy County Commission
Eddy County Emergency Management
524 Central Ave
New Rockford, ND 58356
Email: eddycoem@nd.gov
Phone: (701) 947-2434 ext. 2015

Wells County Commission
Wells County Emergency Management
600 Railway St. N., Suite 114
Fessenden, ND 58438
Email: troehric@nd.gov
Phone: (701) 341-1359

Plan Prepared by:



Responsive partner.
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301 1st Street NE, Suite 202
Mandan, ND 58554
Email: dschwartz@wenck.com
Phone: (701) 751-6145

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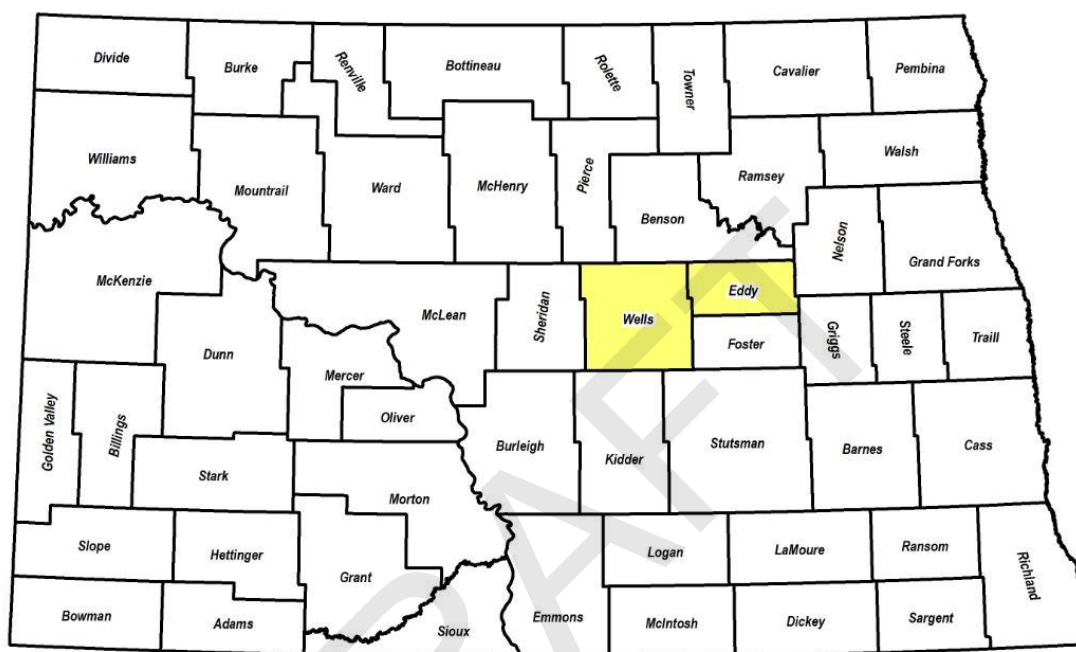
Appendices

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1. Introduction

This document is a collaborate effort between Eddy County, North Dakota and Wells County, North Dakota, herein referred to as The Planning Area. Figure 1.1 illustrates the location of The Planning Area in the state of North Dakota.

Figure 1.1 – The Planning Area



Executive Summary

The updating of the Eddy & Wells Counties Multi-Jurisdictional Multi-Hazard Mitigation Plan (MHMP) was conducted over a 12-month period. It included the review of hazards, risks, vulnerabilities, and capabilities of the county, and resulting mitigation actions for Eddy & Wells Counties County, North Dakota. The review of hazard impacts to the county is ongoing by county officials, as are the efforts to mitigate injuries and damages from natural hazards and man-made threats. The planning process and this plan allow the county's residents, businesses, stakeholders, and federal and state agencies to have input and to identify actions to assure the safety and protection of people and property. A mitigation survey was administered during the planning process. A total of 116 responses were received.

The hazards profiled in this plan include:

- Communicable Disease
- Dam Failure
- Drought
- Flood
- Hazardous Material Release
- Homeland Security Incident
- Severe Summer Weather
- Severe Winter Weather
- Transportation Accident
- Urban Fire/Structure Collapse
- Wildland Fire
- Windstorm

The Eddy & Wells Counties Multi-Jurisdictional Multi-Hazard Plan develops a mitigation strategy consisting of six goals and mitigation projects based on an assessment of risks. A total of 26 projects were identified for **Eddy County**. A total of 26 projects were identified for Eddy County. Of the 26 projects, four are specific to the city of New Rockford. Two county projects are specific to the city of Sheyenne. The remaining projects address the county and all incorporated jurisdictions and unincorporated jurisdictions. A total of 35 projects were identified for **Wells County** and incorporated jurisdictions. Of the 35 identified projects, specific jurisdiction projects include the city of Bowdon (2), the city of Cathay (1), the city of Fessenden (4) and the city of Harvey (4). The remaining projects address the county and incorporated/unincorporated jurisdictions.

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

Goal 1: Implement education and outreach programs to improve public awareness of hazards.

Goal 2: Improve administrative and technical capability to mitigate hazards.

Goal 3: Improve planning and regulatory capability to mitigate hazards.

Goal 4: Reduce impacts of hazards.

Goal 5: Improve resiliency of critical facilities and infrastructure.

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

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

Jurisdictions

The impact and other issues from natural hazard and manmade threats varies between incorporated cities. Based on information gathered at each jurisdictional meeting, a problem statement was formed to summarize the needs of the community. The problem statement for Eddy & Wells Counties and each incorporated city is shown below.

Eddy County

Eddy County can be impacted by communicable disease, drought, flood (overland and riverine), hazardous material release, severe summer weather, severe winter weather, urban fire/structure collapse, wildland fire, and windstorm. Flooding causes annual damages to property due to the presence of High-water tables, inadequate drainage, closed basins, and the source of the Sheyenne River located in neighboring Wells County. Economic loss to the agriculture and livestock industry occurs on a frequency basis. Critical facilities in the county and incorporated jurisdictions need generators for backup power and upgraded emergency alerting. The county needs to retrofit existing or construct new storm shelters. The county has planning and regulatory, administrative and technical, education and outreach, financial, and planning and regulatory capabilities to accomplish mitigation. However, these capabilities need to be

improved and expanded. The county relies on outside sources for funding and to accomplish large-scale mitigation projects.

Improvement and expansion of mitigation capabilities; upgrading of sirens, equipment, and installation of generators; construction of flood control measures; and upgrading of critical facilities and infrastructure are a priority for the county.

City of New Rockford (Eddy County)

The city of New Rockford can be impacted by communicable disease, drought, flood (overland and riverine), hazardous material release, homeland security incident, severe summer weather, severe winter weather, urban fire/structure collapse, wildland fire, and windstorm. The city experiences overland flooding from spring thaw and heavy rains causing damage to property, and critical facilities and infrastructure due to an inadequate storm water drainage system combined with sanitary sewer services. The combined system also causes sewer backups. The sanitary sewer lagoons are in flood-prone areas and are subjected to erosion. Economic loss to the agriculture, livestock and hunting industries occurs on a frequent basis from natural hazards. The city has one storm shelter with a generator and needs further backup generation to establish more storm shelters. The city is at risk to wildland fire due to surrounding topography, vegetation, cat-tails, sloughs and agriculture practices. Local emergency services need upgraded equipment. The city lacks funding for mitigation projects. With little to no capabilities to accomplish major projects independently, the city is dependent on outside sources for mitigation.

Retrofitting and upgrading of combined storm water and sanitary sewer system/lagoons, improved drainage, installation of permanent backup power sources, establishment or construction of new storm shelters, installation of fire protection infrastructure and upgrading of fire protection equipment, expansion of planning and regulatory capabilities, and education and outreach are a priority for the city.

City of Sheyenne (Eddy County)

The city of Sheyenne can be impacted by communicable disease, drought, flood (overland and riverine), hazardous material release, severe summer weather, severe winter weather, urban fire/structure collapse, wildland fire, and windstorm. The city experiences overland flooding causing damage to property, roads, critical facilities and infrastructure and utilities due to an inadequate storm water drainage system. Blocked roads from flooding, severe summer weather and severe winter weather limit access for emergency services. Economic loss to the agriculture and livestock industry occurs on a frequent basis from natural hazards. The city lacks backup generators for critical facilities and infrastructure and does not have an official storm shelter. Local emergency services need upgraded equipment. The city lacks funding for mitigation projects. With little to no capabilities to accomplish major projects independently, the city is dependent on outside sources for mitigation.

Improved drainage, installation of permanent backup power sources, upgrading of fire protection equipment, expansion of planning and regulatory capabilities, and education and outreach are a priority for the city.

Wells County

Wells County can be impacted by communicable disease, drought, flood (overland and riverine), hazardous material release, severe summer weather, severe winter weather, urban fire/structure collapse, wildland fire, and windstorm. Flooding causes annual damages to property due to the presence of High-water tables, inadequate drainage, closed basins, and the source of the Sheyenne River located in neighboring Wells County. Economic loss to the agriculture and livestock industry occurs on a frequency basis. Critical facilities in the county and incorporated jurisdictions need generators for backup power and upgraded emergency alerting. The county needs to retrofit existing or construct new storm shelters. The county has planning and regulatory, administrative and technical, education and outreach, financial, and planning and regulatory capabilities to accomplish mitigation. However, these capabilities need to be improved and expanded. The county relies on outside sources for funding and to accomplish large-scale mitigation projects.

Improvement and expansion of mitigation capabilities; upgrading of sirens, equipment, and installation of generators; construction of flood control measures; and upgrading of critical facilities and infrastructure are a priority for the county.

City of Bowdon

The city of Bowdon can be impacted by communicable disease, drought, flood (overland and riverine), hazardous material release, severe summer weather, severe winter weather, urban fire/structure collapse, wildland fire, and windstorm. The city experiences outages of water as the pumping station does not have a backup generator and is impacted by severe weather. The city does not have an official storm shelter or a dispatch-activated siren. The fire department needs a new fire hall for storage of existing equipment and future needs. The city lacks funding for mitigation projects. With little to no capabilities to accomplish major projects independently, the city is dependent on outside sources for mitigation.

Installation of permanent backup power sources, installation of a dispatch-activated siren, construction of a new fire hall, expansion of planning and regulatory capabilities, and education and outreach are a priority for the city.

City of Cathay

The city of Cathay can be impacted by communicable disease, drought, flood (overland and riverine), hazardous material release, severe summer weather, severe winter weather, urban fire/structure collapse, wildland fire, and windstorm. The city experiences overall flooding on city streets connecting to N.D. Highway 30 resulting in blocked access for emergency services. Economic losses from a diminished tax base (property losses, crop and livestock loss) can ensue after natural disasters. The city does not have an official storm shelter, lacks an early warning system and does not have generators for backup power at critical facilities. The city lacks funding for mitigation projects. With little to no capabilities to accomplish major projects independently, the city is dependent on outside sources for mitigation.

Improved drainage, installation of an early warning system, generators for backup power, construction of a storm shelter, expansion of planning and regulatory capabilities, and education and outreach are a priority for the city.

City of Fessenden

The city of Fessenden can be impacted by communicable disease, drought, flood (overland and riverine), hazardous material release, severe summer weather, severe winter weather, urban fire/structure collapse, wildland fire, and windstorm. The city experiences overland flooding causing damage to property, and critical facilities and infrastructure due an inadequate storm water drainage system. Portions of the sanitary sewer system are among the oldest municipal systems in North America. Economic loss to the agriculture and livestock industry occurs on a frequent basis from natural hazards. The city lacks backup generators for critical facilities and infrastructure, does not have an official storm shelter, and has an outdated early warning system that needs expanding. The city is at risk to wildland fire due to surrounding topography, vegetation, and agriculture practices. Local emergency services need upgraded equipment. The city lacks funding for mitigation projects. With little to no capabilities to accomplish major projects independently, the city is dependent on outside sources for mitigation.

Improved drainage, installation of permanent backup power sources, upgrade sanitary sewer lagoons, upgrade water tower, installation of fire protection infrastructure and upgrading of fire protection equipment, expansion of planning and regulatory capabilities, and education and outreach are a priority for the city.

City of Hamberg

The city of Hamberg can be impacted by communicable disease, drought, flood (overland and riverine), hazardous material release, severe summer weather, severe winter weather, urban fire/structure collapse, wildland fire, and windstorm. The city experiences overall flooding resulting in damages to structures, road and utilities. The city is extremely vulnerable to blocked roads and loss of access for emergency services from severe summer weather and severe winter weather. The city does not have an official storm shelter and lacks an early warning system. The city lacks funding for mitigation projects. With little to no capabilities to accomplish major projects independently, the city is dependent on outside sources for mitigation.

Installation of a right-sized early warning system, construction of a storm shelter, expansion of planning and regulatory capabilities, and education and outreach are a priority for the city.

City of Harvey

The city of Harvey can be impacted by communicable disease, drought, flood (overland and riverine), hazardous material release, severe summer weather, severe winter weather, urban fire/structure collapse, wildland fire, and windstorm. The city experiences overland flooding causing damage to property, and critical facilities and infrastructure due an inadequate storm water drainage system. Economic loss to the agriculture and livestock industry occurs on a frequent basis from natural hazards. The city lacks backup generators for critical facilities and infrastructure, does not have an official storm shelter, and has an outdated early warning system. The city is at risk to wildland fire due to surrounding topography, vegetation, and agriculture practices. Local emergency services need upgraded equipment. The city lacks funding for mitigation projects. With little to no capabilities to accomplish major projects independently, the city is dependent on outside sources for mitigation.

Improved drainage, installation of permanent backup power sources, upgrade sanitary sewer lagoons, installation of fire protection infrastructure and upgrading of fire protection equipment, expansion of planning and regulatory capabilities, and education and outreach are a priority for the city.

City of Hurdsfield

The city of Hurdsfield can be impacted by communicable disease, drought, flood (overland and riverine), hazardous material release, severe summer weather, severe winter weather, urban fire/structure collapse, wildland fire, and windstorm. The city experiences overland flooding causing damage to property, and critical facilities and infrastructure due an inadequate storm water drainage system. Economic loss to the agriculture and livestock industry occurs on a frequent basis from natural hazards. The city lacks backup generators for critical facilities and infrastructure, does not have an official storm shelter, and has an outdated early warning system. The city is at risk to wildland fire due to surrounding topography, vegetation, and agriculture practices. Local emergency services need upgraded equipment. The city lacks funding for mitigation projects. With little to no capabilities to accomplish major projects independently, the city is dependent on outside sources for mitigation.

Improved drainage, installation of permanent backup power sources, upgrade sanitary sewer lagoons, installation of fire protection infrastructure and upgrading of fire protection equipment, expansion of planning and regulatory capabilities, and education and outreach are a priority for the city.

City of Sykeston

The city of Sykeston can be impacted by communicable disease, drought, flood (overland and riverine), hazardous material release, severe summer weather, severe winter weather, urban fire/structure collapse, wildland fire, and windstorm. Blocked roads from flooding, severe summer weather and severe winter weather limit access for emergency services. Economic loss to the agriculture and livestock industry occurs on a frequent basis from natural hazards. The city lacks backup generators for critical facilities and infrastructure and does not have an official storm shelter. Local emergency services need upgraded equipment. The city lacks funding for mitigation projects. With little to no capabilities to accomplish major projects independently, the city is dependent on outside sources for mitigation.

Improved drainage, installation of permanent backup power sources, upgrading of fire protection equipment, expansion of planning and regulatory capabilities, and education and outreach are a priority for the city.

Background

The Eddy & Wells Counties Multi-Jurisdictional Multi-Hazard Mitigation Plan (MHMP) was developed and received approval from the Federal Management Agency (FEMA) in 2010. This plan update is the second update to the mitigation plan for Eddy & Wells Counties.

The MHMP Plan Update Committee understands that the plan must be dynamic and detailed to include the specific risks of threats and hazards to the county and its jurisdictions. Improvements, updates, and revisions will be made constantly to assure this plan continues to mitigate the potential losses and damages that can impact people and property in The Planning Area.

Purpose

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

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

Objective

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

Scope

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

2. Adoption Documentation

Authority

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

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

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

Local: Local governments play an essential role in implementing effective mitigation, both before and after disaster events. Each local government will review all damages, losses, and related impacts to determine the need or requirement for mitigation action and planning whenever seriously affected by a disaster, or when applying for state or federal recovery assistance.

In Eddy County and Wells County, the local governing body responsibility for carrying out plans and policies are the county commissions. The Eddy County Commission and each incorporated city in the county – New Rockford and Sheyenne – are responsible for reviewing and updating ordinances in Eddy County. The Wells County Commission and each incorporated city in the county – Bowdon, Cathay, Fessenden, Hamberg, Harvey, Hurdsfield and Sykeston – are responsible for reviewing and updating ordinances in Wells County. The county commissions represent all townships and unincorporated communities in each county for planning purposes. Budgets are limited and do not allow the county and jurisdictions the ability to complete as many projects as desired.

Promulgation Statement

Government at all levels has the responsibility for the protection of life, property, and the environment from hazards and threats which are known to impact jurisdictions. The jurisdictions of Eddy County and Wells County, by resolution, hereby adopt the concepts and conditions set forth by the 2017 Eddy & Wells Counties, N.D. Multi-Jurisdictional Multi-Hazard Mitigation Plan Update (MHMP).

3. Planning Process

The Planning Process Chapter of any mitigation plan consists of documentation that satisfies requirements set forth by FEMA to achieve an approved plan. This section of the plan cannot be completed until the planning process is finished.

Mitigation planning is already dry and boring as is and therefore, this section is omitted to hopefully prevent anyone willing to review the draft plan from falling asleep.

Let me worry about this section of the plan. Carry on.

Thank you!

DRAFT

4. The Planning Area Profile and Inventory

The profile and inventory of each county and jurisdiction in The Planning Area is shown in the following chapter. The profile and inventory provides a snapshot necessary to understand the physical and social make-up of each jurisdiction to better understand where mitigation actions are necessary and more effective.

The profile and inventory of Eddy County is shown in chapter 4.1 and shown in chapter 4.2 for Wells County. The information provided is as follows:

- Climate and Geography
- Demographics
- Economy
- Buildings and Infrastructure
- Transportation
- New and Future Development

DRAFT

4.1 County and Jurisdictions Profile and Inventory

Eddy County and Incorporated Jurisdictions Overview

Eddy County is in northwest North Dakota and is the smallest county in total land area of the 53 counties in the state encompassing 644 square miles. Of the 644 square miles, approximately 631 square miles of it is land areas (97.91 percent) and 13 square miles (2.09 percent) is water surface areas. The county is approximately eighteen (18) miles from north to south and approximately thirty-six (36) miles from east to west at its widest points.

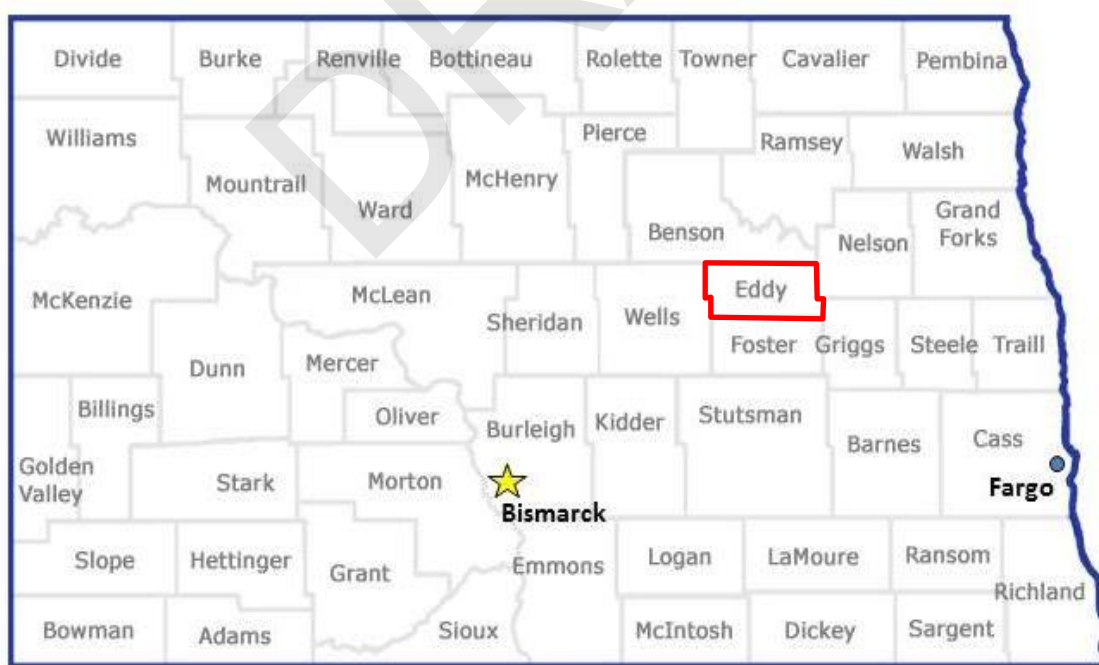
The 2010 population of the county is 2,385 people and has a population density of 3.70 people per square mile. A general map of the county showing jurisdiction locations, transportation routes, airports and bodies of water can be found in Chapter 9, Maps.

The county is bordered on the north by Benson County, on the northeast by Nelson County, on the southeast by Griggs County, on the south by Foster County and on the west by Wells County. U.S. Highway 281, and N.D. Highways 15 and 20 traverse the county. There are no interstate highways in the county.

Organized townships in the county include: Bush, Cherry Lake, Columbia, Colvin, Eddy, Freeborn, Fates Grandfield, Hillsdale, Lake Washington, Munster, New Rockford, Paradise, Pleasant Prairie, Rosefield, Sheldon, Superior and Tiffany.

Figure 4.1.1 – Location of Eddy County in the State of North Dakota

Eddy County is located northwest of the city of Bismarck, the state capitol, in central North Dakota.



The incorporated jurisdictions in the county included in this plan are New Rockford and Sheyenne. Unincorporated communities in the county include Brantford.

Climate and Geography

Information on climate, archeological and historic sites, geology, and natural resources of Eddy County are provided in the following section.

The monthly average temperature, monthly average maximum temperature, monthly average minimum temperature, and average total precipitation are shown for Eddy County in Table 4.1.1. The monthly averages are based on information collected between 1981 and 2010 by the High Plains Regional Climate Center. The average temperature ranges from 7.8 degrees in January to 68.8 degrees in July. Average total precipitation ranges from approximately 0.5 inches in January, February and December, to 3.4 inches in June. The range of average maximum and minimum temperatures are also shown in the table.

Table 4.1.1 – 1981 to 2010 Eddy County Average Monthly Climate Summaries

Eddy County	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Temp (F)	7.8	13.0	25.2	41.8	54.5	63.7	68.8	67.3	57.0	43.3	26.4	12.1
Average Max. Temp (F)	17.3	22.6	34.4	53.6	66.7	75.1	80.6	80.0	69.4	54.5	35.4	20.8
Average Min. Temp (F)	-1.8	3.3	16.0	29.9	42.1	52.2	56.8	54.5	44.4	31.9	17.4	3.4
Average Total Precip. (in.)	0.5	0.5	0.8	1.14	2.5	3.4	3.1	2.2	1.8	1.5	0.7	0.5

Source: High Plains Regional Climate Center

Eddy County has a sub-humid continental climate characterized by marked fluctuations in daily and seasonal maximum and minimum temperatures, and light to moderate precipitation. The precipitation tends to be irregular in occurrence, amount, and area of coverage. The inconsistency of the county's weather arises from the interaction of three major air masses which originate in distinct global regions: cold, dry air from the polar region; warm, moist air from the Gulf of Mexico; and cool, moist air from the northern Pacific. Both the temperature and the moisture characteristics of a northern Pacific air mass change as the air moves across the Rocky Mountains. The resulting air, which is usually mild and dry, reinforces the continental nature of the county's climate. The polar air mass tends to dominate the other two, but its influence is considerably lessened during the summer.

Normally the temperature is moderate until the beginning of July, after which short, hot periods are experienced until the end of August. The freeze-free period is the number of days between the average last occurrence of freezing temperatures in the spring and average first occurrence of 32 degrees or lower in the fall. The length of the freeze-free period approximates the length of the growing season which ranges from 110 days to 129 days between May and September of every year. Topography and local weather conditions can produce subfreezing temperatures at the ground surface while the air temperature a few feet above the ground remains above 32 degrees.

Historic Sites

When planning for mitigation measures or developing areas for construction of homes, businesses, or recreation facilities it must be established that historic and archeological sites will not be negatively impacted by new development. According to the National Register of Historic Places, the following historic sites are listed for Eddy County:

- Eddy County Courthouse, New Rockford, N.D. Added in 1985.
- Marriage, Sylvanus, Octagonal Barn, New Rockford, N.D. Added in 1986.
- Myhre, Jens, Round Barn, New Rockford, N.D. Added in 1986.
- New Rockford Bridge (also known as James River Bridge), New Rockford, N.D. Added in 1997.
- U.S. Post Office, New Rockford, N.D. Added in 1989.

Watersheds

Watersheds are basin-like landforms defined by highpoints and ridgelines that descend into lower elevations. The form of the land dictates the flow of water from all streams and rainfall to a common outlet such as the outflow of a reservoir, mouth of a bay, or any point along a stream channel. The hydrography of Eddy County includes four watersheds summarized in Table 4.1.2. The following are key points describing each watershed. Square miles shown is for the entirety of the watershed and does not represent the extent of the watershed in Eddy County. A map of the watersheds in Eddy County can be found in Chapter 9, Maps.

Table 4.1.2 – Eddy County Watersheds

Watershed	Hydrologic Unit Code (HUC)	Square Miles*
Devils Lake	09020201	3,840
James Headwaters	10160001	1,697
Middle Sheyenne	09020203	2,019
Upper Sheyenne	09020202	1,883

Source: N.D. State Water Commission, U.S. Geological Survey

Demographics

Information on population and poverty for Eddy County is provided in the following section.

Population

Table 4.1.3 summarizes the population statistics for Eddy County. Population statistics for Eddy County for the years 1990, 2000, and 2010, and estimates for 2016, were obtained through the U.S. Census Bureau-Decennial Census. The population projections for 2020 was calculated by applying previous decade population growth/decline statistics to 2010 population statistics.

Table 4.1.3 – 1990 to 2030 Eddy County Population Statistics

Jurisdiction	1990	2000	2010	Percent Change 1990 to 2000	Percent Change 2000 to 2010	Estimate	Projection
						2016	2020
Eddy County	2,951	2,757	2,385	-6.6 percent	-13.5 percent	2,358	2,063
City of New Rockford	1,604	1,463	1,391	-8.8 percent	-4.9 percent	1,390	1,322
City of Sheyenne	272	318	204	+16.9 percent	-35.8 percent	198	131
Remainder of County	1,075	976	790	-9.2 percent	-19.1 percent	770	639

Sources: 2010 U.S. Decennial Census, 2011 to 2015 American Community Survey 5-Year Estimate, Wenck Associates, Inc.

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

The population of Eddy County has been declining for the past several decades despite efforts to create new businesses and new jobs. The decline in population is primarily due to mechanization of the agriculture sector and subsequent decreases in family size. Between 1990 and 2000, the county lost 6.6 percent of its population and an additional 13.5 percent between 2000 and 2010. However, decline has the potential to slow or reverse in the near future. With an expected resurgence in energy development in the western portion of North Dakota, jobs and support services for this industry will disperse geographically. Thus, population growth and an increase in job opportunities may occur in Eddy County over the next five years.

Poverty

Statistics on poverty in Eddy County and incorporated jurisdictions are provided by the 2011-2015 American Community Survey, 5-Year Estimate from the U.S. Census Bureau. Information shown includes number and percent of individuals with incomes below and above the poverty level. The 5-year estimate shows data that was collected by sampling households in Eddy County between 2011 and 2015. Poverty statistics are important to understand where populations in poverty are living, which tend to be more vulnerable to natural hazards and man-made threats.

Table 4.1.4 summarizes poverty statistics in Eddy County and incorporated jurisdictions.

Table 4.1.4 –2011 to 2015 Eddy County Five-Year Estimate Poverty Statistics

Jurisdiction	TOTAL	Income Below Poverty Level	Income Above Poverty Level	Percent Below Poverty Level	Percent Above Poverty Level
Eddy County	2,272	311	1,961	13.7 percent	86.3 percent
City of New Rockford	1,349	217	1,132	16.1 percent	83.9 percent
City of Sheyenne	192	29	163	15.1 percent	84.9 percent

Source: 2011-2015 American Community Survey 5-Year Estimates

The lack of reliable public and private transportation, inadequate childcare in rural areas, and everyday needs such as grocery stores, medical clinics, etc. are not readily available in areas of Eddy County and may contribute to poverty.

Economy

Agriculture is the main economic enterprise in the county. Most of the farms in Eddy County are diversified and derive income from cow-calf operations for beef or dairies, and small grain crops and/or sunflowers. Other sectors of the economy are comprised mostly of agricultural-related industries. Supportive health care services (clinics, Fourth Corporation, dentists, chiropractors, physical therapists, regional public health, Lutheran Home of the Good Shephard – skilled nursing and assisted living – is another major economy engine in Eddy County. Tourism is a growing sector of the local economy.

According to the New Rockford Area Betterment Corporation the following industries are targets of focus for Eddy County while the following supporting resources contribute to these targets.

Target industries. Small manufacturing/assembly, food processing, animal agriculture (dairy, feedlots, etc.), wind energy development, wellness and specialty care providers, and legal services.

Supporting Resources. Abundant water, direct access to US Highway 281 (connects Canada & Mexico), railroad service - BNSF Main Line and Red River Valley & Western, municipal airport, industrial park development lots, diverse agricultural production, ag-friendly zoning, commercial property for sale, tax incentives, economic development organization and Chamber of Commerce.

Major Employers

The name and number of people employed by the largest employers in Eddy County is provided below. Information on major employers is important for mitigation measures to understand the extent of response and other resources needed to ensure continued operation of the economy in Eddy County.

Buildings and Infrastructure Overview

Information on publicly-owned and privately-owned buildings and property, critical facilities and infrastructure, and public services in Eddy County is provided in the following section. This information is important to understand the value of buildings and property at risk, and resources available for each jurisdiction to use when mitigating natural hazards and man-made threats.

Publicly-Owned Buildings and Property

Information on publicly-owned buildings and the insurance limit valuation as of 2017 was provided by the Eddy County Auditor's Office. The information is summarized in Table 4.1.5. Information on publicly-owned buildings is important in mitigation to understand the potential losses and what public assets are at risk to natural hazards and man-made threats. The insurance limit valuation includes the building property, business personal-property, outdoor property and trailer property, if applicable. Due to homeland security concerns, detailed valuation information on each building and/or property is not shown. Contact the Eddy County Auditor's Office for this information.

Of the jurisdictions in Eddy County, the city of New Rockford contains the most publicly-owned buildings with 10 valued at \$3,392,685. The remaining publicly-owned buildings in Eddy County are in unincorporated Colvin and Sheyenne. Four publicly-owned buildings are under county jurisdiction. The total insurance limit valuation of all properties in Eddy County is \$4,119,409.

Table 4.1.5 – 2017 Eddy County Publicly-Owned Buildings/Property and Insurance Limit Valuation

Eddy County, North Dakota		
Jurisdiction	Number of Properties	Insurance Limit Valuation (total, all properties)
Colvin (unincorporated)	1	\$112,102
Eddy County	4	\$219,638
New Rockford	10	\$3,392,685
Sheyenne	4	\$394,984
TOTAL	19	\$4,119,409

Source(s): Eddy County Auditor's Office; N.D. State Fire and Tornado Fund

Storm Shelters

Storm shelters provide area of refuges for people during incidents of natural hazards or man-made threats. Information on storm shelters is necessary in mitigation planning to help reduce or eliminate loss of life. Table 4.1.6 shows information on storm shelters in Eddy County. Designated storm shelters in Eddy County can provide an area of refuge for approximately 834 percent of the county's population. Additional buildings should be identified and retrofitted to increase the sheltering capacity of Eddy County.

Table 4.1.6 – 2017 Eddy County Storm Shelters

Facility Name	Capacity	ADA Compliant	Pet Friendly
New Rockford/Sheyenne School	200	Fully	No
Total Capacity	200		

Source: N.D. Dept. of Emergency Services, WebEOC

Jurisdiction Buildings and Services Provided

Tables 4.1.7 to 4.2.11 profile the housing units, jurisdictional buildings, jurisdictional services, emergency response services, and utilities of Eddy and Wells Counties, and incorporated jurisdictions in The Planning Area. An "X" indicates if the jurisdiction offers the utility or service (either through contract or employees) or possesses the building or resource. Narratives detailing information for incorporated jurisdictions can be found in Chapter 8, Jurisdictions.

Housing Units

Housing units show where populations are located. Table 4.1.7 shows the number of single-family, multifamily and mobile home structures in Eddy County and incorporated jurisdictions. The following are key points:

- Single-family housing units comprise 82.4 percent of all housing units in Eddy County
- Multifamily housing units comprise 13.9 percent of all housing units in Eddy County
- Mobile homes comprise 3.7 percent of all housing units in Eddy County
- The city of New Rockford contains 55.1 percent of all single-family homes, 55.1 percent of all mobile homes and 83.2 percent of all multifamily homes in Eddy County
- Three multi-family homes are in Eddy County are outside incorporated jurisdictions

Table 4.1.7 – 2011 to 2015 Eddy County Housing Units

Housing Units	County – outside cities	City of New Rockford	City of Sheyenne	TOTAL
Single-Family Homes	392	602	98	1,092
Mobile Homes/Boat/RV/Van	10	27	12	49
Multifamily Homes/Units	3	153	28	184
TOTAL	405	782	138	1,325

Source: 2011-2015 American Community Survey 5-Year Estimates

Table 4.1.8 shows the publicly-owned buildings in each jurisdiction by type. A majority of publicly owned buildings in Eddy County are in the city of New Rockford. Building marked with an asterisk (*) are considered publicly-owned by the county and located in a specific city, or the building is a shared resource with another community.

Table 4.1.8 – The Planning Area Publicly-Owned Jurisdictional Buildings

Jurisdictional Buildings		Eddy County	New Rockford	Sheyenne	Wells County	Bowdon	Cathay	Fessenden	Hamberg	Harvey	Hurdsfield	Sykeston
1	Airport/Landing Strip	X	X					X		X		
2	American Red Cross Shelter/ Storm Shelter		X									
3	Armory									X		
4	Auditorium					X		X		X		
5	City Hall		X			X		X		X		X
6	City Shop		X	X		X	X	X	X	X	X	X
7	Community Center		X	X		X	X	X		X		X
8	County Courthouse		X					X				
9	County Highway Department	X			X							
10	County Rural Water District											
11	County Sheriff	X			X							
12	County Shop		X				X	X		X	X	
13	County Water Conservation Board	X			X							
14	Fairgrounds	X						X				
15	Fire Hall		X	X		X	X	X	X	X	X	X
16	Golf Course	X						X		X		
17	Law Enforcement Center	X						X		X		
18	Library		X					X		X		
19	Park		X	X		X	X	X	X	X	X	X
20	Public School		X					X		X		
21	Public Works	X	X	X	X	X	X	X	X	X	X	X
22	Regional Public Health Dept.	X			X							
23	State Shop											
24	Swimming Pool		X					X		X		
25	U.S. Army Corps of Engineers											
26	U.S.D.A. Farm Services Agency		X					X				
27	U.S. Geological Survey											
28	U.S. Post Office	X	X			X			X	X	X	X

X* denotes that the county-owned building is both listed under counties and cities.

1. The only airport in Eddy County is in the city of New Rockford.
2. The New Rockford/Sheyenne School in the city of New Rockford is the only storm shelter in Eddy County.
3. There is not an armory located in Eddy County.
4. There is not an auditorium in Eddy County.

5. The city of New Rockford has a city hall. The city of Sheyenne uses the community center for its city hall.
6. The cities of New Rockford and Sheyenne have city shops.
7. The cities of New Rockford and Sheyenne have community centers. The Brown memorial building in New Rockford is the city's community center.
8. The Eddy County Courthouse is in the city of New Rockford.
9. The county highway department is in the Eddy County Courthouse in the city of New Rockford.
10. The county rural water district does not have a building in Eddy County.
11. The Sheriff's Office is in the Eddy County Courthouse in the city of New Rockford.
12. The Eddy County shop is in the city of New Rockford.
13. The county water conservation board has a building in Eddy County.
14. The Eddy County fairgrounds are in the city of New Rockford.
15. The cities of New Rockford and Sheyenne have fire halls.
16. The New Rockford Golf Course and Event Center is located north of Tomlinson Field north of the city of New Rockford.
17. The Eddy County Courthouse serves as the law enforcement center.
18. The city of New Rockford has a public library.
19. The cities of New Rockford and Sheyenne have public parks. The city of New Rockford has an outdoor ice rink.
20. The public school in Eddy County is in New Rockford.
21. Eddy County and the cities of New Rockford and Sheyenne have public works departments.
22. The regional public health district has an office in the Eddy County Courthouse.
23. Eddy County does not have a state shop.
24. The city of New Rockford has an outdoor pool.
25. The U.S. Army Corps of Engineers does not have a location in Eddy County.
26. The U.S.D.A. Farm Services Agency has a location in the Eddy County Courthouse in the city of New Rockford.
27. The U.S. Geological Survey does not have a location in Eddy County.
28. The city of New Rockford has a post office.

Table 4.1.9 shows the services provided in the counties and city jurisdictions in The Planning Area.

Table 4.1.9 – The Planning Area Jurisdiction Services Provided

Services		Eddy County	New Rockford	Sheyenne	Wells County	Bowdon	Cathay	Fessenden	Hamberg	Harvey	Hurdsfield	Sykeston
1	Inert Landfill		X					X		X		
2	Lagoon cells		3	1		1	1	2	1	3	1	1
3	Landfill	X	X	X						X		
4	Lift Station		2	1		1	1	2	1	2	1	1
5	Official Newspaper	X*	X	X*	X*	X*	X*	X*	X*	X	X*	X*

*Denotes services available to jurisdictions through another jurisdictions or private companies located in neighboring jurisdictions.

Table 4.1.9 – The Planning Area Jurisdiction Services Provided

Services		Eddy County	New Rockford	Sheyenne	Wells County	Bowdon	Cathay	Fessenden	Hamberg	Harvey	Hurdsfield	Sykeston
6	Recycling							X		X		
7	Septic Systems	X										
8	Sanitary Sewer System		X	X	X	X	X	X	X	X	X	X
9	Storm Water System		X	X								
10	Waste Hauler	X*	X	X*	X*	X*	X*	X*	X*	X	X*	X*
11	Water: Rural Water	X			X	X	X	X	X	X	X	X
12	Water: Individual Wells	X	X	X	X	X	X	X	X	X	X	X
13	Water: Municipal Well		X	X						X		

*Denotes services available to jurisdictions through another jurisdictions or private companies located in neighboring jurisdictions.

1. The city of New Rockford has an inert landfill.
2. The city of New Rockford has three lagoon cells and the city of Sheyenne has one lagoon cell.
3. Eddy County maintains a landfill for all residents.
4. The city of New Rockford has two lift stations and the city of Sheyenne has one lift station.
5. The official newspaper of the county and incorporated jurisdictions is the New Rockford Transcript.
6. Eddy County and incorporated jurisdictions do not have recycling.
7. Eddy County residents outside incorporated jurisdictions have septic systems.
8. The cities of New Rockford and Sheyenne have sanitary sewer systems.
9. The cities of New Rockford and Sheyenne have storm sewer systems.
10. Waste Management provides waste hauling services to all incorporated jurisdictions in Eddy County.
11. Central Plains Water District and Greater Ramsey Water District provide drinking water to all county residents.
12. Individual wells are used by county and incorporated jurisdiction residents.
13. The cities of New Rockford and Sheyenne have municipal wells.

Table 4.1.10 shows the emergency response services and facilities in each jurisdiction. Due to the small size of some jurisdictions, services are provided by outside entities or jurisdictions.

Table 4.1.10 – The Planning Area Jurisdictional Emergency Response Services and Facilities

Emergency Response Services/Facilities		Eddy County	New Rockford	Sheyenne	Wells County	Bowdon	Cathay	Fessenden	Hamberg	Harvey	Hurdsfield	Sykeston
1	Ambulance Service	X*	X	X*								
2	Ambulance Hall	X										
3	Crash Rescue Unit		X	X								

*Denotes services available to jurisdictions through another jurisdictions or private companies located in neighboring jurisdictions.

Table 4.1.10 – The Planning Area Jurisdictional Emergency Response Services and Facilities

Emergency Response Services/Facilities		Eddy County	New Rockford	Sheyenne	Wells County	Bowdon	Cathay	Fessenden	Hamberg	Harvey	Hurdsfield	Sykeston
1	Ambulance Service	X*	X	X*		X		X		X		
2	Ambulance Hall	X				X		X		X		
3	Crash Rescue Unit		X	X				X		X		
4	Fire Department		X	X		X	X	X		X		X
5	Fire Hall		X	X		X	X	X		X		X
6	First Responders	X	X	X		X	X	X		X		X
7	Hazardous Materials Response Unit	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*
8	Law Enforcement	X	X*	X*	X	X*	X*	X	X*	X	X*	X*
9	Law Enforcement Building	X	X		X			X		X		
10	Quick Response Unit		X	X				X		X		
11	Specialty Units (Bomb Squad, Dive Rescue, Search & Rescue, etc.)	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*

*Denotes services available to jurisdictions through another jurisdictions or private companies located in neighboring jurisdictions.

1. Ambulance service is provided by the New Rockford Ambulance.
2. The New Rockford Ambulance has an ambulance hall in the city of New Rockford.
3. The fire departments in the cities of New Rockford and Sheyenne have crash rescue units.
4. The cities of New Rockford and Sheyenne have fire departments.
5. The New Rockford Fire Department and Sheyenne Fire Department have fire halls.
6. There are approximately 80 first responders located through Eddy County and incorporated jurisdictions.
7. A hazardous material response unit is provided through mutual aid from Devils Lake.
8. Law enforcement is provided by the Eddy County Sheriff's Office.
9. The Eddy County Courthouse serves as the law enforcement center.
10. The New Rockford Fire Department and Sheyenne Fire Department serve as quick response units.
11. Specialty units are available through mutual aid with Devils Lake emergency services.

Table 4.1.11 shows the utility providers for the counties and incorporated jurisdictions in The Planning Area. Some providers for utilities, such as fuel oil and propane are unknown as residents choose providers on an individual basis.

1. Mid-Continent provides cable to Eddy County and incorporated jurisdictions.
2. Satellite/DirecTV provides cable to Eddy County and incorporated jurisdictions.
3. Northern Plains Electric Cooperative provides electricity to residents in Eddy County outside incorporated jurisdictions.
4. Ottertail Power Company provides electricity to residents in the cities of New Rockford and Sheyenne.
5. Fuel oil is provided by individual entities.
6. N.D. Telephone provides internet services to Eddy County and incorporated jurisdictions.

7. Mid-Continent provides internet services to Eddy County and incorporated jurisdictions.
8. West River Telecom provides internet services to Eddy County and incorporated jurisdictions.
9. Natural gas is provided by Montana-Dakota Utilities and is only available in the cities of New Rockford and Sheyenne.
10. AT&T and Verizon provides cellular services to Eddy County and incorporated jurisdictions.
11. N.D. Telephone provides landline services to Eddy County and incorporated jurisdictions.
12. Propane is provided by individual entities.
13. Central Plains Water District and Greater Ramsey Water District provide drinking water to all county residents outside incorporated jurisdictions.
14. Individuals wells are used by county and incorporated jurisdiction residents.
15. The cities of New Rockford and Sheyenne have municipal wells.

Table 4.1.11 – The Planning Area Utility Providers

Utility Providers		Eddy County	New Rockford	Sheyenne	Wells County	Bowdon	Cathay	Fessenden	Hamberg	Harvey	Hurdsfield	Sykeston
1	Cable: Mid-Continent	X	X	X	X	X	X	X	X	X	X	X
2	Cable: Satellite/DirecTV	X	X	X	X	X	X	X	X	X	X	X
3	Electricity: Northern Plains	X	X	X	X							
4	Electricity: Ottertail Power Company	X	X*	X*	X	X	X	X	X	X	X	X
5	Fuel Oil	X	X	X	X	X	X	X	X	X	X	X
6	Internet: ND Telephone	X	X	X	X	X	X	X	X	X	X	X
7	Internet: Mid-Continent	X	X	X	X	X	X	X	X	X	X	X
8	Internet: West River Telecom	X	X	X								
9	Natural Gas: MDU		X	X								
10	Phone (cellular): AT&T & Verizon	X	X	X	X	X	X	X	X	X	X	X
11	Phone (landline): ND Telephone	X	X	X	X	X	X	X	X	X	X	X
12	Propane	X	X	X	X	X	X	X	X	X	X	X
13	Water: Rural Water	X			X	X	X	X	X	X	X	X
14	Water: Individual Wells		X	X	X	X	X	X	X	X	X	X
15	Water: Municipal Well		X	X						X		

*Denotes services available to jurisdictions through another jurisdictions or private companies located in neighboring jurisdictions.

Transportation

Transportation systems are critical to continued economic operation of any jurisdiction. The mitigation strategy for Eddy County identifies mitigation measures specific to the county's transportation system in Eddy County. This section provides information to assist in accomplishing these mitigation measures.

Airports

Information regarding airports in Eddy County is summarized in Table 4.1.12 and was obtained from the N.D. Aeronautics Commission (NDAC) and Air NAV. The NDAC was established in 1947 by the state legislature, assigning responsibility for state aviation functions and serves the public by providing

economic and technical assistance for the aviation community. Air NAV is a website that publishes aeronautical and airport information released by the Federal Aviation Administration (FAA). The airport operational statistics are for a 12-month period ending May 19, 2015.

- Tomlinson Field in New Rockford has six aircraft based on the field, six single-engine planes, and averages 26 aircraft operations per week. Approximately 74 percent of airport operations are comprised of local general aviation, followed by 22 transient general aviation, four percent air taxi, and less than one percent military.
- There is not a commercial passenger airport in Eddy County.

Table 4.1.12 – Eddy County Airports

Airport	Jurisdiction	Airport Operational Statistics	
Tomlinson Field	City of New Rockford	Aircraft based on the field: 6 Single-engine airplanes: 6	<ul style="list-style-type: none"> • Operations avg. 26/week • 74 percent local general aviation • 22 transient general aviation • 4 percent air taxi • <1 percent military

Source(s): N.D. Aeronautics Commission, AirNAV

It should be noted that despite information being available for one landing strip in Eddy County, many private airstrips are located throughout the county and are used for spraying of crops or other economic or agricultural purposes. The location and size of these airstrips is not available. An aerial map of Tomlinson Field is shown in Chapter 9, Maps.

Bridges

Bridges are critical links in creating and maintaining a unified transportation system. Information on the condition of bridges in Eddy County assists local leaders in development mitigation projects prioritizing funding for bridges.

The N.D. Dept. of Transportation classifies all bridges, regardless of jurisdiction oversight, as structurally deficient or functionally obsolete. Structurally deficient means the condition of the bridge warrants attention and does not mean it is unsafe. A functionally obsolete bridge means the bridge does not meet certain design standards and has nothing to do with structural integrity of the bridge. A bridge is scour-critical if the bridge foundation is determined to be unstable for the calculated scour conditions. Scour-critical bridges may be vulnerable during flooding. The following information on bridges in Eddy County was provided by the 2014 N.D. Multi-Hazard Mitigation Plan.

- Eddy County has one structurally-deficient bridge owned and managed by the state
- Eddy County has one functionally-obsolete bridge owned and managed by the county
- Eddy County has one scour-critical bridge owned and managed by the county

Railroad

Railroads traversing Eddy County are restricted to freight as passenger rail service is not available.

Per the 2007 North Dakota State Rail Plan, Burlington Northern Santa-Fe (BNSF) Railroad operates the Fargo-Minot Line in and the Red River valley & Western (RRVW) Railroad operates the Jamestown-Maddock Line in Eddy County. Information on the transportation system, including freight railroad, bridges and airports, is important for understanding the transportation system and potential risk involved with transportation accidents, among other hazards. The railroads in Eddy County are classified as short-line/regional rail lines.

Table 4.1.13 summarizes information on freight railroads operated in Eddy County. Chapter 9 provides a map showing the extent of the freight railroad transportation system in Eddy County.

Table 4.1.13 – 2007 Eddy County Freight Railroads

Railroad	Rail Line	Subdivision	Length	Max. Speed	Max. Carload	Grain Movements*
BNSF	Fargo-Minot Line	KO Subdivision	203.2 miles	60 mph	143 tons	Bushels: 18,055,988 Tons: 494,447 Cars: 4,431 Cars Per Mile: 22
RRVW	Jamestown-Maddock Line	Seventh Subdivision	48.2 miles	25 mph	143 tons	Bushels: 10,739,359 Tons: 310,150 Cars: 2,779 Cars Per Mile: 25

*Three-Year Average based on statistics from 2002, 2003 and 2004.

Source: North Dakota State Rail Plan, 2007

Roads

U.S. Highway 281, and N.D. Highways 15 and 20 traverse the county. There are no interstate highways in the county.

According to the 2017-2020 N.D. Statewide Transportation Improvement Program, the following road projects are scheduled for construction in Eddy County:

- U.S. Highway 281 is scheduled for a major rehabilitation from the city of Sheyenne north into Benson county just south of the city of Minnewaukan.
- N.D. Highway 20 from the city of Warwick in neighboring Benson County to the junction with N.D. Highway 15 is scheduled for preventative maintenance.
- U.S. Highway 281 from just south of the city of New Rockford to the junction with N.D. Highway 15 is scheduled for major rehabilitation, in addition to structural work.
- U.S. Highway 281 from the junction with N.D. Highway 15 south to the Eddy-Foster county line is scheduled for preventative maintenance.

New and Future Development

New and future developments for incorporated jurisdictions in Eddy County are discussed below. Development occurring over the last five years is listed for the small cities in Eddy County. Analyzing

development trends is important for mitigation to understand where projects are needed and funding is best allocated. Additional information for new and future development occurring over the last five years can be obtained by contacting the mayor of each city.

Eddy County

New development over the last five years in Eddy County includes a new bathroom at the county fairgrounds. As of October 2017, there is no planned or proposed development in Eddy County.

City of New Rockford

Development over the last five years in the city of New Rockford includes the following:

- Demolition of the former city hospital for redevelopment into a 10-unit apartment complex;
- Construction of a new 8-unit apartment building;
- Construction of a new ADA-accessible community swimming pool and bathhouse;
- Construction of a new community ambulance building;
- Renovations to Mick's 281 Service renovation;
- New Rockford-Sheyenne School renovation;
- Dakota Prairie Regional Center for the Arts renovation;
- Lutheran Home of the Good Shepherd long-term care facility renovation;
- Installation of an electronic message board outside New Rockford City Hall;
- Establishment of new veterinarian clinic, and electrician and attorney businesses;
- Approximately five new single-family homes, and
- Renovation of more than a dozen small businesses and single-family homes.

Development planned or proposed for future construction in the city of New Rockford includes the following:

- Construction of a new convenience store and gas station;
- Single-family home development;
- Additional renovation work at New Rockford-Sheyenne School, and
- Infrastructure upgrades to water lines streets, and possible water plant modifications.

City of Sheyenne

Development over the last five years in the city of Sheyenne includes the following:

- Equity Elevator constructed a new elevator in mid-2017 after a fire destroyed their previous operation
- Storage units were constructed in 2017
- Removal of approximately five abandoned/blighted single-family homes and buildings

As of October 2017, no development is planned or proposed for future construction in the city of Sheyenne.

4.2 County and Jurisdictions Profile and Inventory

Wells County and Incorporated Jurisdictions Overview

Wells County is in southwest North Dakota and is the 25th largest county in total land area of the 53 counties in the state encompassing 1,290 square miles. Of the 1,290 square miles, approximately 1,267 square miles of it is land areas (98.22 percent) and 23 square miles (1.78 percent) is water surface areas. The county is approximately thirty-six (36) miles from north to south and approximately thirty-six (36) miles from east to west at its widest points.

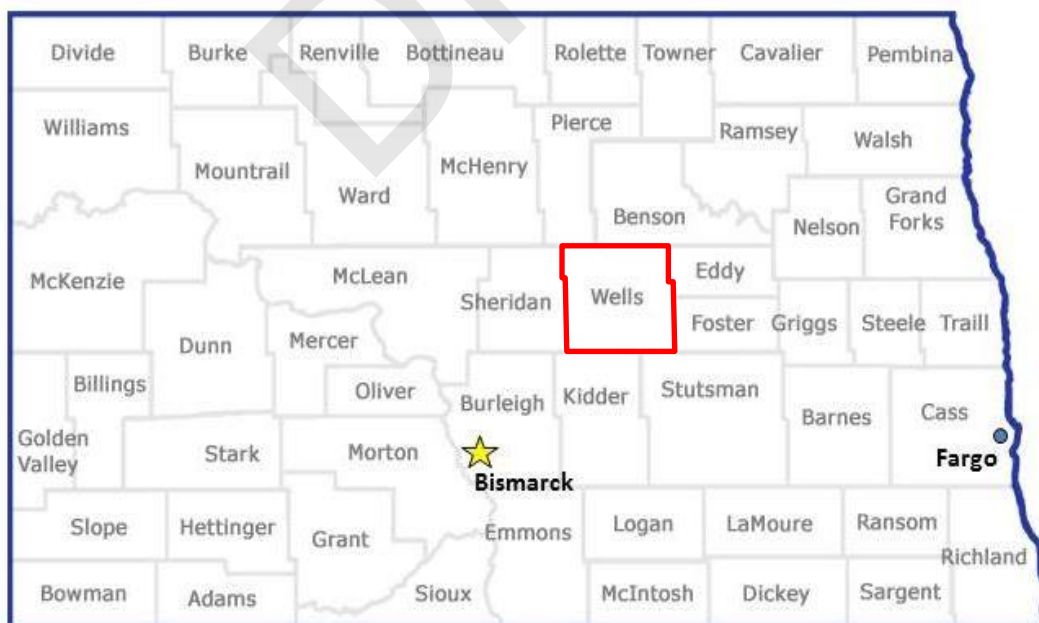
The 2010 population of the county is 4,207 people and has a population density of 3.26 people per square mile. A general map of the county showing jurisdiction locations, transportation routes, airports and bodies of water can be found in Chapter 9, Maps.

The county is bordered on the northwest by Pierce County, north by Benson County, on the east by Eddy County and Foster County, on the southeast by Stutsman County, on the south by Kidder County, and on the west by Sheridan County. U.S. Highway 52 and N.D. Highways 3, 15, 30 and 200 traverse the county. There are no interstate highways in the county.

Organized townships in the county include: Berlin, Bilodeau, Bremen, Bull Moose, Cathay, Chaseley, Crystal Lake, Delger, Fairville, Forward, Fram, Germantown, Haaland, Hamburg, Hawksnest, Heimdal, Hillsdale, Johnson, Lynn, Manfred, Norway Lake, Oshkosh, Pony Gulch, Progress, Rusland, Saint Anna, Silver Lake, South Cottonwood, Speedwell, Sykeston, Valhalla, Wells, West Norway, West Ontario, Western and Woodward.

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

Wells County is located northwest of the city of Bismarck, the state capitol, in central North Dakota.



The incorporated jurisdictions in the county included in this plan are Bowdon, Cathay, Fessenden, Hamberg, Harvey, Hurdsfield and Sykeston. Census-designated places in the county include Heimdahl and unincorporated communities include Bremen, Chaseley, Heaton and Manfred.

Climate and Geography

Information on climate, archeological and historic sites, geology, and natural resources of Wells County are provided in the following section.

The monthly average temperature, monthly average maximum temperature, monthly average minimum temperature, and average total precipitation are shown for Wells County in Table 4.2.1. The monthly averages are based on information collected between 1981 and 2010 by the High Plains Regional Climate Center. The average temperature ranges from 8.4 degrees in January to 68.5 degrees in July. Average total precipitation ranges from approximately 0.5 inches in February to 3.7 inches in June. The range of average maximum and minimum temperatures are also shown in the table.

Table 4.2.1 – 1981 to 2010 Wells County Average Monthly Climate Summaries

Wells County	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Temp (F)	8.4	13.2	25.2	41.3	53.8	63.1	68.5	67.0	56.6	42.8	23.4	12.5
Average Max. Temp (F)	18.1	23.0	34.6	53.5	66.2	74.6	80.6	80.2	69.5	54.6	35.8	21.4
Average Min. Temp (F)	-1.3	3.4	15.7	29.1	41.3	51.4	56.3	53.7	43.5	31.0	16.8	3.5
Average Total Precip. (in.)	0.6	0.5	0.9	1.2	2.5	3.7	3.3	2.6	1.9	1.6	0.9	0.7

Source: High Plains Regional Climate Center

Wells County has a sub-humid continental climate characterized by marked fluctuations in daily and seasonal maximum and minimum temperatures, and light to moderate precipitation. The precipitation tends to be irregular in occurrence, amount, and area of coverage. The inconsistency of the county's weather arises from the interaction of three major air masses which originate in distinct global regions: cold, dry air from the polar region; warm, moist air from the Gulf of Mexico; and cool, moist air from the northern Pacific. Both the temperature and the moisture characteristics of a northern Pacific air mass change as the air moves across the Rocky Mountains. The resulting air, which is usually mild and dry, reinforces the continental nature of the county's climate. The polar air mass tends to dominate the other two, but its influence is considerably lessened during the summer.

Normally the temperature is moderate until the beginning of July, after which short, hot periods are experienced until the end of August. The freeze-free period is the number of days between the average last occurrence of freezing temperatures in the spring and average first occurrence of 32 degrees or lower in the fall. The length of the freeze-free period approximates the length of the growing season which ranges from 110 days to 129 days between May and September of every year. Topography and local weather conditions can produce subfreezing temperatures at the ground surface while the air temperature a few feet above the ground remains above 32 degrees.

Historic Sites

When planning for mitigation measures or developing areas for construction of homes, businesses, or recreation facilities it must be established that historic and archeological sites will not be negatively impacted by new development. According to the National Register of Historic Places, the following historic sites are listed for Wells County:

- Beiseker Mansion (also known as T.L. Beiseker Mansion; Order of the Eastern Star (O.E.S)), Fessenden, N.D. Added in 1977.
- Hurd Round House southeast of Hurdsfield. Added in 1977.
- Vang Evangelical Lutheran Church, unincorporated Manfred, N.D. Added in 2001.
- Wells County Courthouse, Fessenden, N.D. Added in 1977.
- Wells County Fairgrounds, Fessenden, N.D. Added in 1991.

Watersheds

Watersheds are basin-like landforms defined by highpoints and ridgelines that descend into lower elevations. The form of the land dictates the flow of water from all streams and rainfall to a common outlet such as the outflow of a reservoir, mouth of a bay, or any point along a stream channel. The hydrography of Wells County includes four watersheds summarized in Table 4.2.2. The following are key points describing each watershed. Square miles shown is for the entirety of the watershed and does not represent the extent of the watershed in Wells County. A map of the watersheds in Wells County can be found in Chapter 9, Maps.

Table 4.2.2 – Wells County Watersheds

Watershed	Hydrologic Unit Code (HUC)	Square Miles*
Apple Creek	10130103	3,634
James Headwaters	10160001	1,697
Pipestem	10160002	1,070
Upper Sheyenne	09020202	1,883

Source: N.D. State Water Commission, U.S. Geological Survey

Demographics

Information on population and poverty for Wells County is provided in the following section.

Population

Table 4.2.3 summarizes the population statistics for Wells County. Population statistics for Wells County for the years 1990, 2000, and 2010, and estimates for 2016, were obtained through the U.S. Census Bureau-Decennial Census. The population projection for 2020 was calculated by applying previous decade population growth/decline statistics to 2010 population statistics. Statistics on population trends and projections are needed to understand the distribution of people across the county. These statistics

also highlight where potential future needs will be for emergency services based on population distribution growth and density.

Table 4.2.3 – 1990 to 2030 Wells County Population Statistics

Jurisdiction	1990	2000	2010	Percent Change 1990 to 2000	Percent Change 2000 to 2010	Estimate	Projection
						2016	2020
Wells County	5,864	5,102	4,207	-13.0 percent	-17.5 percent	4,098	3,471
City of Bowdon	196	139	131	-29.1 percent	-5.8 percent	130	123
City of Cathay	54	56	43	+3.7 percent	-23.2 percent	42	33
City of Fessenden	655	625	479	-4.6 percent	-23.4 percent	464	367
City of Hamberg	19	28	21	-47.4 percent	-25.0 percent	20	16
City of Harvey	2,263	1,989	1,783	-12.1 percent	-10.4 percent	1,743	1,598
City of Hurdsfield	92	91	84	-1.1 percent	-7.7 percent	81	78
City of Sykeston	167	153	117	-8.4 percent	-23.5 percent	113	90
Remainder of County	2,418	2,021	1,549	-16.4 percent	-23.4 percent	1,505	1,187

Sources: 2010 U.S. Decennial Census, 2011 to 2015 American Community Survey 5-Year Estimate, Wenck Associates, Inc.

The population of Wells County has been declining for the past several decades despite efforts to create new businesses and new jobs. The decline in population is primarily due to mechanization of the agriculture sector and subsequent decreases in family size. Between 1990 and 2000, the county lost 13.0 percent of its population and an additional 17.5 percent between 2000 and 2010. However, decline has the potential to slow or reverse in the near future. With an expected resurgence in energy development in the western portion of North Dakota, jobs and support services for this industry will disperse geographically. Thus, population growth and an increase in job opportunities and may occur in Wells County over the next five years.

Poverty

Statistics on poverty in Wells County and incorporated jurisdictions are provided by the 2011-2015 American Community Survey, 5-Year Estimate from the U.S. Census Bureau. Information shown includes number and percent of individuals with incomes below and above the poverty level.

Table 4.2.4 summarizes poverty statistics in Wells County and incorporated jurisdictions.

Table 4.2.4 –2011 to 2015 Wells County Five-Year Estimate Poverty Statistics

Jurisdiction	TOTAL	Income Below Poverty Level	Income Above Poverty Level	Percent Below Poverty Level	Percent Above Poverty Level
Wells County	4,119	226	3,893	5.5 percent	94.5 percent
City of Bowdon	123	12	111	9.8 percent	90.2 percent
City of Cathay	53	5	48	9.4 percent	90.6 percent
City of Fessenden	464	6	458	1.3 percent	98.7 percent
City of Hamberg	16	2	14	12.5 percent	87.5 percent
City of Harvey	1835	142	1,693	7.7 percent	92.3 percent
City of Hurdsfield	58	2	56	3.4 percent	96.6 percent
City of Sykeston	116	5	111	4.3 percent	95.7 percent

Source: 2011-2015 American Community Survey 5-Year Estimates

The 5-year estimate shows data that was collected by sampling households in Wells County between 2011 and 2015. Poverty statistics are important to understand where populations in poverty are living, which tend to be more vulnerable to natural hazards and man-made threats.

The lack of reliable public and private transportation, inadequate childcare in rural areas, and everyday needs such as grocery stores, medical clinics, etc. are not readily available in areas of Wells County and may contribute to poverty.

Economy

Agriculture is the main economic enterprise in the county. Most of the farms in Wells County are diversified and derive income from cow-calf operations for beef or dairies, and small grain crops and/or sunflowers. Other sectors of the economy are comprised mostly of agricultural-related industries.

Major Employers

The name and number of people employed by the largest employers in Wells County is provided below. Information on major employers is important for mitigation measures to understand the extent of response and other resources needed to ensure continued operation of the economy in Wells County. The following are key points of the major employers:

- St. Aloisius Medical Center: 157 full-time and 77 part-time employees
- Public School Districts (Fessenden and Harvey): 50 full-time and 20 part-time
- The city of Harvey: 13 full-time and 19 part-time employees
- Artisan Flour Mill: 27 full-time and no part-time employees

Buildings and Infrastructure Overview

Information on publicly-owned and privately-owned buildings and property, critical facilities and infrastructure, and public services in Wells County is provided in the following section. This information is important to understand the value of buildings and property at risk, and resources available for each jurisdiction to use when mitigating natural hazards and man-made threats.

Publicly-Owned Buildings and Property

Information on publicly-owned buildings and the insurance limit valuation as of 2017 was provided by the Wells County Auditor's Office. The information is summarized in Table 4.2.5. Information on publicly-owned buildings is important in mitigation to understand the potential losses and what public assets are at risk to natural hazards and man-made threats. The insurance limit valuation includes the building property, business personal-property, outdoor property and trailer property, if applicable. Due to homeland security concerns, detailed valuation information on each building and/or property is not shown. Contact the Wells County Auditor's Office for more information.

INFORMATION ON PUBLICLY-OWNED BUILDINGS AND PROPERTY IS FORTHCOMING FROM THE WELLS COUNTY AUDITORS OFFICE.

Table 4.2.5 – 2017 Wells County Publicly-Owned Buildings/Property and Insurance Limit Valuation

Wells County, North Dakota		
Jurisdiction	Number of Properties	Insurance Limit Valuation (total, all properties)
TOTAL		

Source(s): Wells County Auditor's Office; N.D. State Fire and Tornado Fund

Storm Shelters

Storm shelters provide area of refuges for people during incidents of natural hazards or man-made threats. Information on storm shelters is necessary in mitigation planning to help reduce or eliminate loss of life. Table 4.2.6 shows information on storm shelters in Wells County. Designated storm shelters in Wells County can provide an area of refuge for approximately 14.3 percent of the county's population. Addition buildings should be identified and retrofitted to increase the sheltering capacity of Wells County.

Table 4.2.6 – 2017 Wells County Storm Shelters

Facility Name	Capacity	ADA Compliant	Pet Friendly
Harvey City Hall and Armory	190	Partially	No
Harvey High School	410	Partially	No
Total Capacity	600		

Source: N.D. Dept. of Emergency Services, WebEOC

Jurisdiction Buildings and Services Provided

Tables 4.2.7 to 4.2.11 profile the housing units, jurisdictional buildings, jurisdictional services, emergency response services, and utilities of Eddy and Wells Counties, and incorporated jurisdictions in The Planning Area. An "X" indicates if the jurisdiction offers the utility or service (either through contract or employees) or possesses the building or resource. Narratives detailing information for incorporated jurisdictions can be found in Chapter 8, Jurisdictions.

Housing Units

Housing units show where populations are located. Table 4.2.7 shows the number of single-family, multifamily and mobile home structures in Wells County and incorporated jurisdictions. The following are key points:

- Single-family housing units comprise 80.1 percent of all housing units in Wells County
- Multifamily housing units comprise 12.5 percent of all housing units in Wells County
- Mobile homes comprise 7.3 percent of all housing units in Wells County
- The city of Harvey contains 69.4 percent of all single-family homes, 5.2 percent of all mobile homes and 25.5 percent of all multifamily homes in Wells County

- Single-family homes outside incorporated jurisdictions comprise the largest portion in Wells County numerically (772) and overall percentage (90.5 percent)
- No multifamily homes located in Wells County are outside incorporated jurisdictions, and in the cities of Cathay and Hamberg

Table 4.2.7 – 2011 to 2015 Wells County Housing

Housing Units	County – outside cities	City of Bowdon	City of Cathay	City of Fessenden	City of Hamberg	City of Harvey	City of Hurdsfield	City of Sykeston	TOTAL
Single-Family Homes	772	90	26	237	10	749	55	72	2,011
Mobile Homes/Boat/RV/Van	81	10	1	27	2	56	6	0	183
Multifamily Homes/Units	0	3	0	19	0	275	8	9	314
TOTAL	853	103	27	283	12	1,080	69	81	2,508

Source: 2011-2015 American Community Survey 5-Year Estimates

Table 4.2.8 shows the publicly-owned buildings in each jurisdiction by type. A majority of publicly owned buildings in Wells County are in the cities of Harvey and Fessenden. Building marked with an asterisk (*) are considered publicly-owned by the county and located in a specific city, or the building is a shared resource with another community.

Table 4.1.8 – The Planning Area Publicly-Owned Jurisdictional Buildings

Jurisdictional Buildings	Eddy County	New Rockford	Sheyenne	Wells County	Bowdon	Cathay	Fessenden	Hamberg	Harvey	Hurdsfield	Sykeston
1 Airport/Landing Strip	X	X					X		X		
2 American Red Cross Shelter/ Storm Shelter		X									
3 Armory									X		
4 Auditorium					X		X		X		
5 City Hall		X			X		X		X		X
6 City Shop		X	X		X	X	X	X	X	X	X
7 Community Center		X	X		X	X	X		X		X
8 County Courthouse		X					X				
9 County Highway Department	X			X							
10 County Rural Water District											
11 County Sheriff	X			X							
12 County Shop		X				X	X		X	X	

13	County Water Conservation Board	X			X							
14	Fairgrounds	X						X				
15	Fire Hall		X	X		X	X	X	X	X	X	X
16	Golf Course	X						X		X		
17	Law Enforcement Center	X						X		X		
18	Library		X					X		X		
19	Park		X	X		X	X	X	X	X	X	X
20	Public School		X					X		X		
21	Public Works	X	X	X	X	X	X	X	X	X	X	X
22	Regional Public Health Dept.	X			X							
23	State Shop											
24	Swimming Pool		X					X		X		
25	U.S. Army Corps of Engineers											
26	U.S.D.A. Farm Services Agency		X					X				
27	U.S. Geological Survey											
28	U.S. Post Office	X	X			X			X	X	X	X

X* denotes that the county-owned building is both listed under counties and cities.

1. Airports in Wells County are in the cities of Fessenden and Harvey.
2. Wells County does not have an official Red Cross storm shelter. Storm shelters in the county are the Harvey City Hall and Armory, and Harvey High School.
3. The city of Harvey has an armory.
4. The public schools in the cities of Fessenden and Harvey have auditoriums.
5. The city of Bowdon, Fessenden, Harvey and Sykeston have city halls. The city of Cathay meets at the city hall and the city of Hurdsfield meets at the Auditor's house. The city of Hamberg does not have a city hall.
6. All incorporated jurisdictions in Wells County have city shops.
7. All incorporated jurisdictions in Wells County, except for Hamberg and Hurdsfield, have community centers.
8. The Wells County Courthouse is in the city of Fessenden.
9. The county highway department is in the Wells County Courthouse in the city of Fessenden.
10. The county rural water district meets at the Wells County Courthouse in the city of Fessenden.
11. The Sheriff's Office is in the Wells County Courthouse in the city of Fessenden.
12. Wells County maintains county shops in the cities of Cathay, Fessenden, Harvey and Hurdsfield.
13. The county water rural water district does not have a building in Wells County.
14. The Eddy County fairgrounds are in the city of Fessenden.
15. All incorporated jurisdictions in Wells County have fire halls.
16. The two golf courses in Wells County are the Fessenden Country Club in the city of Fessenden and the Harvey Country Club in the city of Harvey.
17. The Wells County Courthouse in the city of Fessenden serves as the law enforcement center. The cities of Fessenden and Harvey have police departments with a police stations.
18. The cities of Fessenden and Harvey have public libraries.
19. All incorporated cities in Wells County have public parks. The cities of Fessenden and Harvey have outdoor ice rinks.
20. The public schools in Wells County are in the cities of Fessenden and Harvey.
21. Wells County and all incorporated jurisdictions have public works departments.

22. The regional public health district has an office in the Wells County Courthouse.
23. Wells County does not have a state shop.
24. The cities of Fessenden and Harvey have swimming pools.
25. The U.S. Army Corps of Engineers does not have a location in Wells County.
26. The U.S.D.A. Farm Services Agency has a location in the Wells County Courthouse in the city of Fessenden.
27. The U.S. Geological Survey does not have a location in Wells County.
28. All incorporated jurisdictions, except for the cities of Cathay and Hamberg, have a post office.

Table 4.2.9 shows the services provided in the county and city jurisdictions.

Table 4.2.9 – Services Provided in The Planning Area Jurisdictions

Services		Eddy County	New Rockford	Sheyenne	Wells County	Bowdon	Cathay	Fessenden	Hamberg	Harvey	Hurdsfield	Sykeston
1	Inert Landfill		X					X		X		
2	Lagoon cells		3	1		1	1	2	1	3	1	1
3	Landfill	X	X	X						X		
4	Lift Station		2	1		1	1	2	1	2	1	1
5	Official Newspaper	X*	X	X*	X*	X*	X*	X*	X*	X	X*	X*
6	Recycling							X		X		
7	Septic Systems	X										
8	Sanitary Sewer System		X	X	X	X	X	X	X	X	X	X
9	Storm Water System		X	X								
10	Waste Hauler	X*	X	X*	X*	X*	X*	X*	X*	X	X*	X*
11	Water: Rural Water	X			X	X	X	X	X	X	X	X
12	Water: Individual Wells	X	X	X	X	X	X	X	X	X	X	X
13	Water: Municipal Well		X	X						X		

*Denotes services available to jurisdictions through another jurisdictions or private companies located in neighboring jurisdictions.

1. The cities of Fessenden and Harvey have inert landfills.
2. All incorporated jurisdictions in Wells County have lagoon cells. The city of Fessenden has two cells. The city of Harvey has three lagoon cells.
3. The city of Harvey has its own landfill. Remaining incorporated jurisdictions receive garbage services through Double M Sanitation.
4. All incorporated jurisdictions in Wells County have at least one lift station. The cities of Fessenden and Harvey have two lift stations.
5. The official newspaper of the county and incorporated jurisdictions is the Herald-Press.
6. The city of Harvey has recycling. The city of Fessenden has a metal recycling site.
7. Wells County residents outside incorporated jurisdictions have septic systems.
8. All incorporated jurisdictions in Wells County have sanitary sewer systems.
9. All incorporated jurisdictions in Wells County have storm water systems.

10. The city of Harvey hauls its own garbage. Remaining incorporated jurisdictions receive garbage services through Double M Sanitation.
11. Central Plains Water District provides drinking water to all county and incorporated jurisdictions except the city of Harvey.
12. Individual wells are used by county and incorporated jurisdiction residents.
13. The city of Harvey has municipal wells.

Table 4.2.10 shows the emergency response services and facilities in each jurisdiction. Due to the small size of some jurisdictions, services are provided by outside entities or jurisdictions.

Table 4.2.10 – The Planning Area Jurisdictional Emergency Response Services and Facilities

Emergency Response Services/Facilities		Eddy County	New Rockford	Sheyenne	Wells County	Bowdon	Cathay	Fessenden	Hamburg	Harvey	Hurdsfield	Sykeston
1	Ambulance Service	X*	X	X*		X		X		X		
2	Ambulance Hall	X				X		X		X		
3	Crash Rescue Unit		X	X				X		X		
4	Fire Department		X	X		X	X	X		X		X
5	Fire Hall		X	X		X	X	X		X		X
6	First Responders	X	X	X		X	X	X		X		X
7	Hazardous Materials Response Unit	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*
8	Law Enforcement	X	X*	X*	X	X*	X*	X	X*	X	X*	X*
9	Law Enforcement Building	X	X		X			X		X		
10	Quick Response Unit		X	X				X		X		
11	Specialty Units (Bomb Squad, Dive Rescue, Search & Rescue, etc.)	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*

1. Ambulance services in Wells County are provided by Bowdon, Fessenden and Harvey.
2. The ambulance services in Bowdon, Fessenden and Harvey have ambulance halls.
3. The fire departments in the cities of Fessenden and Harvey have crash rescue units.
4. The cities of Bowdon, Cathay, Fessenden, Harvey and Sykeston have fire departments.
5. The Bowdon, Cathay, Fessenden, Harvey and Sykeston Fire Departments have fire halls.
6. The county has first responders.
7. A hazardous material response unit is provided through mutual aid from Devils Lake and/or Minot.
8. Law enforcement is provided by the Wells County Sheriff's Office. The cities of Fessenden and Harvey also have police departments.
9. The Wells County Courthouse serves as the law enforcement center. The police departments in the cities of Fessenden and Harvey have police departments.
10. The fire departments in Fessenden and Harvey serve as quick response units.

11. Specialty units are available through mutual aid with Devils Lake and Minot. Minot would be called for Bomb Squad issues. Dive rescue, and search and rescue would be assisted through Devils Lake or Minot.

Table 4.2.11 shows the utility providers for jurisdictions in Wells County. Some providers for utilities, such as fuel oil and propane are unknown as residents choose providers on an individual basis.

Table 4.11 – The Planning Area Utility Providers

Utility Providers		Eddy County	New Rockford	Sheyenne	Wells County	Bowdon	Cathay	Fessenden	Hamberg	Harvey	Hurdsfield	Sykeston
1	Cable: Mid-Continent	X	X	X	X	X	X	X	X	X	X	X
2	Cable: Satellite/DirecTV	X	X	X	X	X	X	X	X	X	X	X
3	Electricity: Northern Plains	X	X	X	X							
4	Electricity: Ottertail Power Company	X	X*	X*	X	X	X	X	X	X	X	X
5	Fuel Oil	X	X	X	X	X	X	X	X	X	X	X
6	Internet: ND Telephone	X	X	X	X	X	X	X	X	X	X	X
7	Internet: Mid-Continent	X	X	X	X	X	X	X	X	X	X	X
8	Internet: West River Telecom	X	X	X								
9	Natural Gas: MDU		X	X								
10	Phone (cellular): AT&T & Verizon	X	X	X	X	X	X	X	X	X	X	X
11	Phone (landline): ND Telephone	X	X	X	X	X	X	X	X	X	X	X
12	Propane	X	X	X	X	X	X	X	X	X	X	X
13	Water: Rural Water	X			X	X	X	X	X	X	X	X
14	Water: Individual Wells		X	X	X	X	X	X	X	X	X	X
15	Water: Municipal Well		X	X						X		

*Denotes services available to jurisdictions through another jurisdictions or private companies located in neighboring jurisdictions.

1. Mid-Continent provides cable to Wells County and incorporated jurisdictions.
2. Satellite/DirecTV provides cable to Wells County and incorporated jurisdictions.
3. Northern Plains Electric Cooperative provides electricity to residents in Wells County outside incorporated jurisdictions.
4. Ottertail Power Company provides electricity to residents in the incorporated jurisdictions in Wells County.
5. Fuel oil is provided by individual entities.
6. N.D. Telephone provides internet services to Wells County and incorporated jurisdictions.
7. Mid-Continent provides internet services to Eddy County and incorporated jurisdictions.
8. West River Telecom does not provide internet services in Wells County.
9. Wells County does not have natural gas services.
10. AT&T and Verizon provides cellular services to Wells County and incorporated jurisdictions.
11. N.D. Telephone provides landline services to Wells County and incorporated jurisdictions.
12. Propane is provided by individual entities.
13. Central Plains Water District provides drinking water to all county and incorporated jurisdictions except the city of Harvey.

14. Individual wells are used by county and incorporated jurisdiction residents.
15. The city of Harvey has municipal wells.

Transportation

Transportation systems are critical to continued economic operation of any jurisdiction. The mitigation strategy for Wells County identifies mitigation measures specific to the county's transportation system in Wells County. This section provides information to assist in accomplishing these mitigation measures.

Airports

Information regarding airports in Wells County is summarized in Table 4.2.12 and was obtained from the N.D. Aeronautics Commission (NDAC) and Air NAV. The NDAC was established in 1947 by the state legislature, assigning responsibility for state aviation functions and serves the public by providing economic and technical assistance for the aviation community. Air NAV is a website that publishes aeronautical and airport information released by the Federal Aviation Administration (FAA). The following are key points:

- There are two municipal airports in Wells County located in the cities of Fessenden and Harvey. Neither airport offers commercial passenger service, but does provide service for local general aviation, transient general aviation, air taxi and military purposes.

Table 4.2.12 – Wells County Airports

Airport	Jurisdiction	Airport Operational Statistics	
Fessenden-Streibel Municipal Airport	Fessenden	Aircraft based on the field: 2 Single-engine airplanes: 2	<ul style="list-style-type: none"> • Operations avg. 47/month • 71 percent local general aviation • 27 percent transient general aviation • 2 percent air taxi
Harvey Municipal Airport	Harvey	Aircraft based on the field: 14 Single-engine airplanes: 13 Multi-engine airplanes: 1	<ul style="list-style-type: none"> • Operations avg. 33/week • 47 percent transient general aviation • 35 percent local general aviation • 18 percent air taxi • <1 percent military

Sources: N.D. Aeronautics Commission, AirNAV

- The Fessenden-Streibel Municipal Airport has two aircrafts based on the field, two single-engine planes, and averages 47 aircraft operates per month. Approximately 71 percent of airport operations are comprised of local general aviation, followed by 27 percent transient general aviation and two percent air taxi.
- The Harvey Municipal Airport has 14 aircrafts based on the field, 13 single-engine planes, one multi-engine plan and averages 33 aircraft operations per week. Approximately 47 percent of airport operations are comprised of transient general aviation, followed by 35 percent local general aviation, 18 percent air taxi, and less than one percent military.

There is not a commercial passenger airport in Wells County. The data shown for aircraft operations was collected for a 12-month period ending May 12, 2016.

It should be noted that despite information being available for one landing strip in Wells County, many private airstrips are located throughout the county and are used for spraying of crops or other economic or agricultural purposes. The location and size of these airstrips is not available. An aerial map of the airports in Wells County are shown in Chapter 9, Maps.

Bridges

Bridges are critical links in creating and maintaining a unified transportation system. Information on the condition of bridges in Wells County assists local leaders in development mitigation projects prioritizing funding for bridges.

The N.D. Dept. of Transportation classifies all bridges, regardless of jurisdiction oversight, as structurally deficient or functionally obsolete. Structurally deficient means the condition of the bridge warrants attention and does not mean it is unsafe. A functionally obsolete bridge means the bridge does not meet certain design standards and has nothing to do with structural integrity of the bridge. A bridge is scour-critical if the bridge foundation is determined to be unstable for the calculated scour conditions. Scour-critical bridges may be vulnerable during flooding. The following information on bridges in Wells County was provided by the 2014 N.D. Multi-Hazard Mitigation Plan.

- Wells County has six structurally-deficient bridges and one functionally-obsolete bridge owned and managed by the county
- Wells County has no state-owned structures that are functionally-obsolete or structurally-deficient
- Wells County has one scour-critical bridge owned and managed by the county

Railroad

Railroads traversing Wells County are restricted to freight as passenger rail service is not available.

According to the 2007 North Dakota State Rail Plan, two railroad companies operate three freight rail lines in Wells County. The Burlington Northern Santa Fe Railway (BNSF) operates the Fargo Minot line and the Canadian Pacific Railway (CPR) operates the Harvey-Portal Line and Enderlin-Harvey Line. The Red River Valley & Western Railway (RRVW) operated a line traversing the southern portion of Wells County parallel to U.S Highway 52 and N.D. Highway 200, but was completely abandoned in 2004. The railroads in Wells County are classified as short-line/regional rail lines. Table 4.5 summarizes information on freight railroads operated in Wells County. The following are key points.

- The BNSF Fargo-Minot line is 203.2 miles in total length and operates at a maximum speed of 60 mph. The maximum carload for a train on the line is 143 tons. The Fargo-Minot line generated 494,447 tons of freight on average between 2002 and 2004. The line traverses through the city of Hamberg.
- The CP Railway Harvey-Portal Line is 152.5 miles in total length and operates at a maximum speed of between 30 and 49 mph. The maximum carload for a train on the line is 143 tons. The Harvey-Portal Line generated 595,857 tons of freight on average between 2002 and 2004. The line traverses through the city of Harvey.

- The CP Railway Enderlin-Harvey Line is 139.2 miles in total length and operates at a maximum speed of 49 mph. The maximum carload for a train on the line is 143 tons. The Enderlin-Harvey Line generated 570,831 tons of freight on average between 2002 and 2004. The line traverses through the cities of Cathay, Fessenden and Harvey.

Table 4.2.13 – 2007 Wells County Freight Railroads

Railroad	Rail Line	Subdivision	Length	Max. Speed	Max. Carload	Grain Movements
BNSF	Fargo-Minot Line	KO Subdivision	203.2 miles	60 mph	143 tons	494,447
CP Railway	Harvey-Portal Line	Portal Subdivision	152.5 miles	30 to 49 mph	143 tons	595,857
CP Railway	Enderlin-Harvey Line	Carrington Subdivision	139.2 miles	49 mph	143 tons	570,831

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

Source: North Dakota State Rail Plan, 2007

Roads

Wells County is dependent upon its network of federal, state, county and township roads and highways as cars and trucks are the primary mode of transportation for people, and freight to a lesser extent. U.S. Highway 52 and N.D. Highway 200 are major arterial highways traversing the county, while N.D. Highways 3, 15 and 30 are major secondary highways traversing the county. Hard-surfaced and graveled county and township roads comprise the remainder of roads in Wells County. Table 4.2.14 shows the traffic counts on highways in Wells County from the N.D. Dept. of Transportation.

The following are key points.

- The highest commercial truck traffic counts can be found between the cities of Harvey and Fessenden with approximately 1,000 average annual daily vehicles.
- U.S. Highway 52 and N.D. Highway 200 form a shared roadway in the south-central portion of the county near the city of Bowdon. The average number commercial truck traffic at this intersection is 895.

According to the 2017-2020 N.D. Statewide Transportation Improvement Program, the following road projects are scheduled for construction in Eddy County:

- N.D. Highway 3 from the junction with U.S. Highway 52 just south of the city of Harvey to the junction with N.D. Highway 200 is scheduled for preventative maintenance.
- N.D. Highway 3 from the junction with N.D. Highway 200 to the Wells-Kidder County Line is scheduled for minor rehabilitation.

Table 4.2.14 – 2014 Wells County Highways

Highway	General Direction of Travel	Location of Traffic Count	Avg. Annual Daily Traffic (AADT) All Vehicles	Commercial Truck Traffic
U.S. Highway 52	Northwest-Southeast	West of Harvey	1,740	850
U.S. Highway 52	Northwest-Southeast	East of Harvey	2,245	1,015
U.S. Highway 52	Northwest-Southeast	South of Fessenden	1,645	665
U.S. Highway 52	Northwest-Southeast	52/200 Intersection	1,930	675
U.S. Highway 52/200	Northwest-Southeast	West of ND Hwy 30	2,170	905
U.S. Highway 52/200	Northwest-Southeast	East of ND Hwy 30	2,545	825
N.D. Highway 3	North-South	North of Harvey	600	80
N.D. Highway 3	North-South	South of Harvey	750	120
N.D. Highway 3	North-South	3/200 Intersection	490	850
N.D. Highway 30	North-South	Hamberg	275	90
N.D. Highway 30	North-South	15/20 Intersection	460	115
N.D. Highway 200	West-East	West of Hwy 30	840	220
N.D. Highway 200	West-East	East of Hwy 30	590	165
N.D. Highway 200	West-East	West of 52/200	680	170

Source: N.D. Dept. of Transportation

New and Future Development

New and future developments for incorporated jurisdictions in Wells County are discussed below. Development occurring over the last five years is listed for the small cities in Wells County. Analyzing development trends is important for mitigation to understand where projects are needed and funding is best allocated. Additional information for new and future development occurring over the last five years can be obtained by contacting the mayor of each city.

Wells County

City of Bowdon

New development over the last five years includes: the Bowdon Meat Processing Plant which is community-owned and opened in 2013. The plant provides 3-4 full-time jobs and 1-2 part-time jobs. The plant has increased the amount of traffic in city limits.

Future development in the city of Bowdon includes raising of funds to construct a new fire hall. The department has estimates for cost and lots are purchased.

City of Cathay

City of Fessenden

New development in the city of Fessenden over the last five years includes: café on main street was constructed, the elevator has added on a storage/cement building and the city replaced water mains, installed a new pumphouse and sewer pipes in 2013.

Future development in the next five years includes replacement of the city water tower and conversation of the American Legion into a daycare center.

City of Hamberg

City of Harvey

The following development has occurred since the 2011 mitigation plan.

- Ball Park Addition is a single-family subdivision in northeast Harvey. Approximately 14 of the 22 total lots have been sold.
- Lincoln and 9, a former furniture store, has been repurposed into a shopping center.
- A Subway restaurant and New Line Insurance opened.
- Cobblestone Inn Suites was constructed.
- A new vet clinic opened.
- A large downtown building was destroyed in a fire in 2015.

City of Hurdsfield

Development over the last five years in the city of Hurdsfield include: removal of abandoned/blighted single-family homes, construction of new single-family homes, a new roof on the community center, renovated city park with new equipment and Hefty Seed added several new commercial and storage buildings.

Future development anticipated in the next 5 years include: new main street commercial building for Heft Seed, new lift station for the sanitary sewer system, new roof on the city hall/library and installation of a tornado siren.

City of Sykeston

New development over the last five years consisted of the removal of several abandoned single-family homes. No future development is planned or proposed at the time of this plan.

5. Threat and Hazard Identification and Risk Assessment (THIRA)

The Planning Area has a history of damages to crops, livestock, people and property from natural hazards and man-made threats. In the updating of this plan, the Plan Update Committee, jurisdiction, and county and city officials identified 12 hazards and threats to be included in this plan because risk analysis showed that mitigation, planning, response, and preparedness would assist in limiting injury, loss of life, and loss of property. The following sections of this chapter detail the risk assessment for Eddy County, North Dakota and Wells County, North Dakota for each of the 12 natural hazards and man-made threats.

The 12 natural hazards and man-made threats are:

- Communicable Disease
- Dam Failure
- Drought
- Flood (Overland and Riverine)
- Hazardous Material Release
- Homeland Security Incident
- Severe Summer Weather
- Severe Winter Weather
- Urban Fire/Structure Collapse
- Transportation Accident
- Wildland Fire
- Windstorm

The Planning Area history illustrates a considerable risk of damage from disasters. The FEMA Presidential Disaster Declaration map in Figure 5.1 shows that North Dakota, particularly counties in eastern and central portions of the state, are among areas in the nation with the most presidential disaster declarations in the past 50+ years. The frequency of declarations for severe summer and winter storms, and flooding, highlight the need for continued mitigation in The Planning Area pertaining to these disasters.

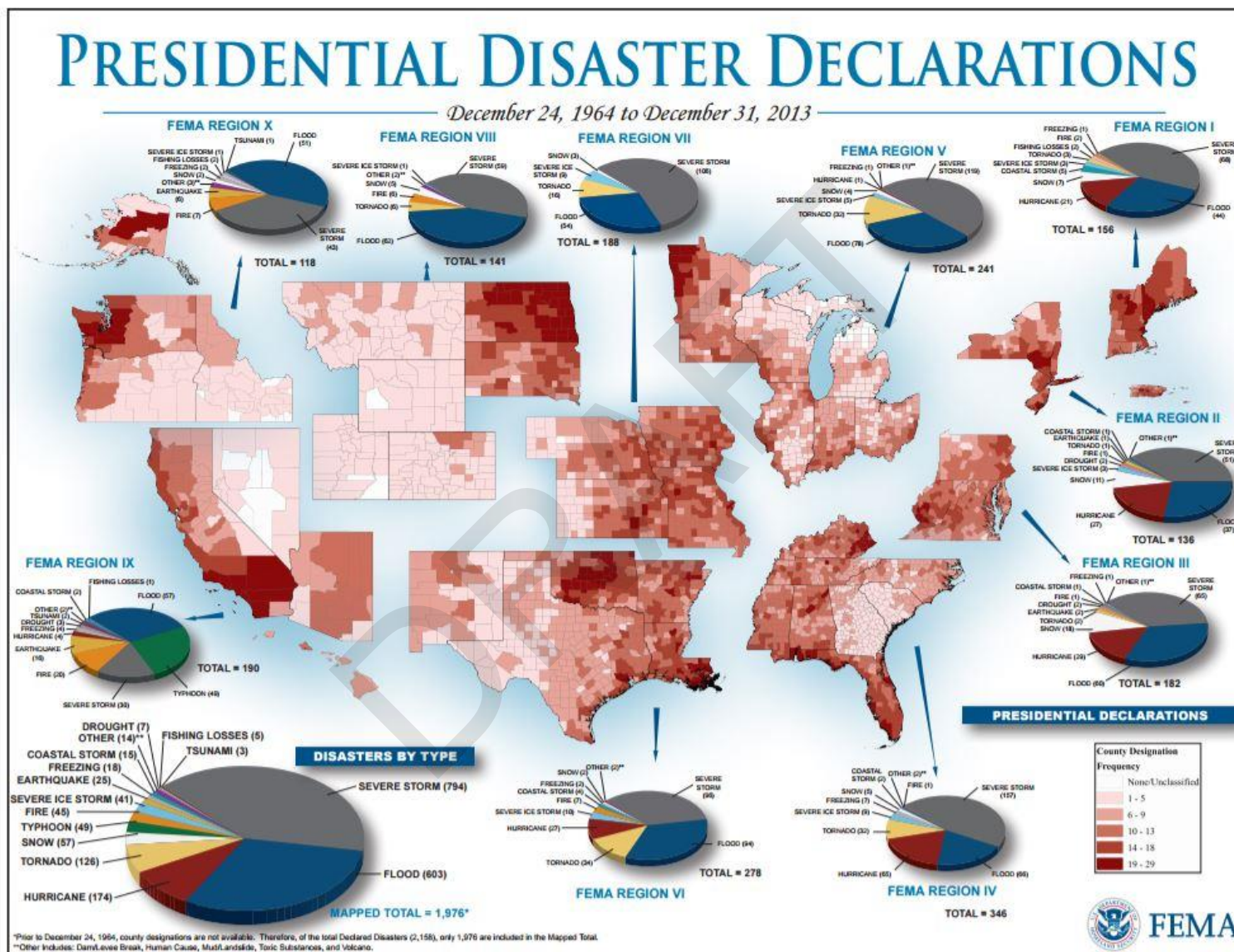
Since 1953, both Eddy County and Wells County have had 20 Presidential Disaster Declarations each. Table 5.1 shows that the declarations for The Planning Area include flooding, snow melt, severe storms and ground saturation. These declarations highlight the hazards that will result in losses in The Planning Area, and the value of mitigation to reduce and/or eliminate losses to people and property.

The following are key points:

- In **Eddy County**, most presidential disaster declarations (17) have occurred between the months of March and July of any given year. No declarations have been declared during the months of February, October, November or December.
- In **Wells County**, most presidential disaster declarations (18) have occurred between the months of March and July of any given year. No declarations have been declared during the months of February, August, October, November and December.

The Presidential Disaster Declarations that are unique to either Eddy County or Wells County are bolded in Table 5.1 following Figure 5.1.

Figure 5.1 – December 24, 1964 to December 31, 2013 Presidential Disaster Declaration Frequency by FEMA Region



Source: Federal Emergency Management Agency

Table 5.1 – 1953 to 2015 Presidential Disaster Declarations for The Planning Area

Eddy County		
Year	Disaster Description/Title	Disaster Number
1969	Flooding	256
1974	Heavy Rains, Snowmelt & Flooding	434
1979	Severe Storms, Snowmelt & Flooding	581
1993	Severe Storms & Flooding	1001
1994	Severe Storms, Flooding	1032
1995	Severe Storms, Flooding, and Ground Saturation	1050
1996	Severe Storms, Flooding, & Ice Jams	1118
1997	Severe Flooding, Severe Winter Storms, Snowmelt, Spring Rains	1174
1997	Severe Winter Storms and Blizzard Conditions	1157
1999	Severe Storms, Flooding, Snow, Ice Ground Saturation, Landslides, and Mudslides	1279
2000	Severe Storms, Flooding and Ground Saturation	1334
2001	Severe Storms, Flooding, & Ground Saturation	1376
2004	Severe Storms, Flooding, and Ground Saturation	1515
2005	Hurricane Katrina Evacuation	3247
2009	Severe Storms and Flooding	1829
2010	Flooding	1907
2011	Flooding	1981 / 3318
2013	Flooding	4118
2014	Severe Storms and Flooding	4190
Wells County		
Year	Disaster Description/Title	Disaster Number
1969	Flooding	256
1974	Heavy Rains, Snowmelt & Flooding	434
1975	Flooding From Rains & Snowmelt	469
1979	Severe Storms, Snowmelt & Flooding	581
1993	Severe Storms & Flooding	1001
1994	Severe Storms, Flooding	1032
1995	Severe Storms, Flooding, and Ground Saturation	1050
1996	Severe Storms, Flooding, & Ice Jams	1118
1997	Severe Flooding, Severe Winter Storms, Snowmelt, Spring Rains	1174
1997	Severe Winter Storms and Blizzard Conditions	1157
1999	Severe Storms, Flooding, Snow, Ice Ground Saturation, Landslides, and Mudslides	1279
2000	Severe Storms, Flooding and Ground Saturation	1334
2001	Severe Storms, Flooding, & Ground Saturation	1376
2005	Hurricane Katrina Evacuation	3247
2009	Severe Storms and Flooding	1829
2010	Flooding	1907
2010	Severe Winter Storm	1901
2011	Flooding	1981
2013	Flooding	4118
2013	Severe Storms and Flooding	4128

Source: FEMA

Risk Assessment Methodology

A risk assessment is process that collects information on the risk of natural hazards and man-made threats to incorporated jurisdictions, and assigns values to those risks to assist with:

1. Identifying and/or comparing courses of action
2. Developing priorities for future mitigation
3. Inform decision-making on creating a local mitigation strategy
 - Foundation for mitigation strategy development

The risk assessment was conducted using the scoring and ranking process found on the following pages.

DRAFT

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

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

Impact per hazard: Ranked _____. Why:

Frequency is how often the hazard occurs.

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

Frequency per hazard: Ranked _____. Why:

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

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

Likelihood per hazard: Ranked _____. Why:

Vulnerability is the amount of:

1. Vulnerable areas: trailer courts, building construction, and blocked roads, etc.
2. Vulnerable population(s): individuals with special needs, elderly, day cares, and schools, etc.
3. Resources: equipment, services or lack thereof that increases or decreases vulnerability

Who and what is affected? When and why? Identify specific areas of vulnerability. What you have or lack: equipment, vehicles, services available, shelters, buildings, and infrastructure.

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

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

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

Capability per hazard: Ranked _____. Why:

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

Table 5.2 summarizes the risk assessment scoring of the natural hazards and man-made threats for The Planning Area and incorporated city jurisdictions, and is repeated in Chapter 8, Jurisdictions. The individual results of risk assessment by jurisdiction for individual hazards and threats are also shown in each hazard profile.

Table 5.2 – The Planning Area Jurisdiction Risk Assessment Scoring Summary

Risk Assessment		Jurisdiction: Eddy County, North Dakota				
<u>Hazard</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<u>Total</u>
Communicable Disease	4	2	3	4	2	11
Dam Failure	4	2	2	3	3	8
Drought	4	2	4	3	1	12
Flood	4	3	4	3	2	12
Hazardous Material Release	4	2	3	3	1	11
Homeland Security Incident	4	1	2	3	1	9
Severe Summer Weather	3	4	4	3	1	13
Severe Winter Weather	3	4	4	3	1	13
Transportation Accident	4	3	3	3	1	12
Urban Fire/Structure Collapse	3	3	4	3	1	12
Wildland Fire	3	3	4	3	2	11
Windstorm	3	4	4	3	1	13

Risk Assessment		Jurisdiction: City of New Rockford (Eddy Co.)				
<u>Hazard</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<u>Total</u>
Communicable Disease	2	2	2	3	1	8
Dam Failure	2	2	2	2	2	6
Drought	3	3	3	3	1	11
Flood	4	4	4	2	1	13
Hazardous Material Release	3	3	3	2	1	10
Homeland Security Incident	2	3	3	2	1	9
Severe Summer Weather	4	4	3	3	2	12
Severe Winter Weather	4	4	3	3	2	12
Transportation Accident	3	3	3	3	1	11
Urban Fire/Structure Collapse	3	2	2	3	1	9
Wildland Fire	2	3	3	2	1	9
Windstorm	4	4	3	2	1	12

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

Table 5.2 – The Planning Area Jurisdiction Risk Assessment Scoring Summary - Continued

Risk Assessment		Jurisdiction: City of Sheyenne (Eddy Co.)				
<u>Hazard</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<u>Total</u>
Communicable Disease	3	2	2	3	1	9
Dam Failure	3	2	1	2	2	6
Drought	3	2	3	3	1	10
Flood	4	3	4	3	1	13
Hazardous Material Release	3	2	3	3	1	10
Homeland Security Incident	3	2	2	2	1	8
Severe Summer Weather	3	4	4	4	1	14
Severe Winter Weather	3	4	4	3	1	13
Transportation Accident	3	3	3	3	1	11
Urban Fire/Structure Collapse	3	3	3	3	1	11
Wildland Fire	3	3	3	3	1	11
Windstorm	3	3	3	3	1	11

Risk Assessment		Jurisdiction: Wells County, North Dakota				
<u>Hazard</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<u>Total</u>
Communicable Disease	4	2	3	2	2	9
Dam Failure	4	2	2	3	3	8
Drought	4	2	4	3	1	12
Flood	4	4	4	4	2	14
Hazardous Material Release	4	2	4	3	1	12
Homeland Security Incident	4	1	2	3	1	9
Severe Summer Weather	3	4	4	3	1	13
Severe Winter Weather	3	4	4	3	1	13
Transportation Accident	4	4	4	4	1	15
Urban Fire/Structure Collapse	3	3	4	3	1	12
Wildland Fire	3	3	4	4	2	12
Windstorm	3	4	4	3	1	13

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

Table 5.2 – The Planning Area Jurisdiction Risk Assessment Scoring Summary - Continued

Risk Assessment		Jurisdiction: City of Bowdon (Wells Co.)				
<u>Hazard</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<u>Total</u>
Communicable Disease	2	2	2	3	1	8
Dam Failure	NA	NA	NA	NA	NA	NA
Drought	3	3	3	3	2	10
Flood	3	2	2	3	1	9
Hazardous Material Release	2	2	2	2	1	7
Homeland Security Incident	2	2	2	2	1	7
Severe Summer Weather	4	3	4	3	1	13
Severe Winter Weather	4	3	4	3	1	13
Transportation Accident	2	2	2	2	1	7
Urban Fire/Structure Collapse	2	2	3	2	1	8
Wildland Fire	2	2	3	2	1	8
Windstorm	3	3	3	3	1	11

Risk Assessment		Jurisdiction: City of Cathay (Wells Co.)				
<u>Hazard</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<u>Total</u>
Communicable Disease	2	2	2	3	1	8
Dam Failure	4	1	2	3	2	8
Drought	3	3	3	3	2	10
Flood	3	2	2	3	1	9
Hazardous Material Release	2	2	2	2	1	7
Homeland Security Incident	2	2	2	2	1	7
Severe Summer Weather	4	3	4	3	1	13
Severe Winter Weather	4	3	4	3	1	13
Transportation Accident	2	2	2	2	1	7
Urban Fire/Structure Collapse	2	2	3	2	1	8
Wildland Fire	2	2	3	2	1	8
Windstorm	3	3	3	3	1	11

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

Table 5.2 – The Planning Area Jurisdiction Risk Assessment Scoring Summary - Continued

Risk Assessment		Jurisdiction: City of Fessenden (Wells Co.)				
<u>Hazard</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<u>Total</u>
Communicable Disease	3	2	2	2	1	8
Dam Failure	NA	NA	NA	NA	NA	NA
Drought	3	3	3	3	1	11
Flood	4	4	4	4	1	15
Hazardous Material Release	4	2	3	4	1	12
Homeland Security Incident	3	2	2	2	1	8
Severe Summer Weather	3	4	4	3	2	12
Severe Winter Weather	3	4	4	3	2	12
Transportation Accident	3	3	3	3	1	11
Urban Fire/Structure Collapse	3	4	4	3	2	12
Wildland Fire	3	4	3	4	2	12
Windstorm	3	4	4	3	2	12

Risk Assessment		Jurisdiction: City of Hamberg (Wells Co.)				
<u>Hazard</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<u>Total</u>
Communicable Disease	2	2	2	3	1	8
Dam Failure	NA	NA	NA	NA	NA	NA
Drought	3	3	3	3	2	10
Flood	3	2	2	3	1	9
Hazardous Material Release	2	2	2	2	1	7
Homeland Security Incident	2	2	2	2	1	7
Severe Summer Weather	4	3	4	3	1	13
Severe Winter Weather	4	3	4	3	1	13
Transportation Accident	2	2	2	2	1	7
Urban Fire/Structure Collapse	2	2	3	2	1	8
Wildland Fire	2	2	3	2	1	8
Windstorm	3	3	3	3	1	11

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

Table 5.2 – The Planning Area Jurisdiction Risk Assessment Scoring Summary - Continued

Risk Assessment		Jurisdiction: City of Harvey (Wells Co.)				
<u>Hazard</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<u>Total</u>
Communicable Disease	3	4	2	4	2	13
Dam Failure	4	2	2	3	3	8
Drought	4	3	3	4	2	12
Flood	4	4	4	4	1	15
Hazardous Material Release	4	4	4	4	1	15
Homeland Security Incident	3	2	2	2	1	8
Severe Summer Weather	3	4	4	3	2	12
Severe Winter Weather	3	4	4	3	2	12
Transportation Accident	3	3	3	3	1	11
Urban Fire/Structure Collapse	3	4	4	3	2	12
Wildland Fire	3	4	3	4	2	12
Windstorm	3	4	4	3	2	12

Risk Assessment		Jurisdiction: City of Hurdsfield (Wells Co.)				
<u>Hazard</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<u>Total</u>
Communicable Disease	2	2	2	3	1	8
Dam Failure	NA	NA	NA	NA	NA	NA
Drought	3	3	3	3	2	10
Flood	3	2	2	3	1	9
Hazardous Material Release	2	2	2	2	1	7
Homeland Security Incident	2	2	2	2	1	7
Severe Summer Weather	4	3	4	3	1	13
Severe Winter Weather	4	3	4	3	1	13
Transportation Accident	2	2	2	2	1	7
Urban Fire/Structure Collapse	2	2	3	2	1	8
Wildland Fire	2	2	3	2	1	8
Windstorm	3	3	3	3	1	11

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

Table 5.2 – The Planning Area Jurisdiction Risk Assessment Scoring Summary - Continued

Risk Assessment		Jurisdiction: City of Sykeston (Wells Co.)				
<u>Hazard</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<u>Total</u>
Communicable Disease	2	2	3	3	1	9
Dam Failure	4	2	2	3	3	8
Drought	4	3	3	4	2	12
Flood	3	3	3	3	1	11
Hazardous Material Release	3	2	2	3	1	9
Homeland Security Incident	3	2	2	2	1	8
Severe Summer Weather	3	4	4	3	2	12
Severe Winter Weather	3	4	4	3	2	12
Transportation Accident	3	2	3	3	1	10
Urban Fire/Structure Collapse	3	2	2	3	1	9
Wildland Fire	3	4	3	4	2	12
Windstorm	3	4	4	3	2	12

5.1.1 Communicable Disease

Including animal, human and plant diseases.

Characteristics

Communicable disease is an illness that is caused by an infectious agent, such as bacteria, virus, fungi or parasites and/or toxin microorganisms and is transmittable from an infected animal, person or plant to another animal, person or plant.

Seasonal Pattern	None
Duration	Hours/Days
Speed of Onset	6 weeks or less
Location	County-wide across all jurisdictions (incorporated and/or unincorporated)

For more information regarding communicable disease please reference the **State of North Dakota** Multi-Hazard Mitigation Plan. The plan can be accessed by following the link provided below.

<http://www.nd.gov/des/uploads/resources/915/final-ndmhmp-update.pdf>

History

The history of communicable disease for animals, human and plants is summarized below. A detailed hazard history for Eddy County can be found on a disc located at the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment.

Animal. Information regarding animal loss was not tracked by the N.D. Dept. of Agriculture and therefore, no specific animal loss data was available. However, the Plan Update Committee indicated that animal losses occur annually and vary in severity.

Human. Communicable Disease data from the N.D. Dept. of Health indicated that between 2005 and 2015 approximately 107 cases of communicable diseases were reported in Eddy County. Approximately 46.7 percent (50) cases were influenza. Table 5.1.1.1 on the following page shows the type and number of communicable disease reported in Eddy County between 2005 and 2015.

Plant. Crop loss from communicable disease is tracked by the United States Department of Agriculture, Risk Management Agency (RMA). The RMA provides data on the crop type affected, damage cause description, determined acres and indemnity amount. The damage cause description identifies the cause of damage, determines acres identifies the number of acres lost due to damage, and the indemnity amount identifies the total amount of the loss for the designated peril. **Between January 1, 2001 and December 31, 2016, Eddy County experienced 91 incidents of crop loss due to communicable disease between January 1, 2001 and December 31, 2016, impacting approximately 231,445 acres of crops totaling \$1,757,661 in losses.**

The Plan Update Committee indicated that crop/plant losses occur annually and vary in severity.

Probability and Magnitude

Probability. Per the communicable disease history for animals, humans and plants in Eddy County, the probability of communicable disease is approximately 100 percent. The Plan Update Committee indicated the probability of communicable disease as likely, meaning that there is between 10 and 100 percent probability in the next year of an occurrence.

Magnitude. The Plan Update Committee ranked the magnitude or severity of communicable disease as catastrophic meaning that more than 50 percent of animals, humans and plants in Eddy County could be impacted if an incident occurred.

Animal. With the lack of animal loss data from the N.D. Dept. of Agriculture, the magnitude of animal loss from communicable disease cannot be determined.

- The Plan Update Committee indicated that with the local economy heavily dependent on agriculture, measurable animal losses may have a substantial impact.

Human. The magnitude of communicable for humans can range from low to high, depending on the disease involved. Influenza is a communicable disease that is commonplace and the magnitude is managed by modern medical advances. However, the jet-age has contributed to faster spread of disease. With the re-emergence of Ebola and spread of the Zika Virus, the magnitude for communicable disease in humans has the potential to be catastrophic.

Plant. Per crop loss data from the RMA the following statistics illustrate the probability and magnitude of communicable diseases on crops in Eddy County.

- There were 97 incidents of crop loss due to communicable disease between January 1, 2001 and December 31, 2016, resulting approximately 6.1 occurrences annually.
- Crop losses totaled \$4,367,110 between January 1, 2001 and December 31, 2016, resulting approximately \$272,944 in losses annually.
- Crop loss data in dollars was not available pre-2001.

Table 5.1.1.1 – 2005 to 2015 Eddy County Communicable Disease History - Human

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total by Disease	Percent by Disease
Campylobacteriosis	0	1	1	1	0	0	1	0	2	0	0	6	5.6%
Carbapenem	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Chicken Pox	0	1	0	0	0	0	0	0	0	0	0	1	0.9%
Coccidioidomycosis	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Cryptosporidiosis	0	0	0	0	0	0	0	0	1	0	0	1	0.9%
E.coli, Shiga-Toxin	0	0	0	0	1	0	0	0	0	0	0	1	0.9%
Giardiasis	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Group A	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Haemophilus	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
HBV	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
HCV	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Influenza	7	0	0	7	19	0	2	0	5	5	5	50	46.7%
Listeriosis	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Meningitis, Bacterial	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Pertussis	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Rocky Mountain	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Salmonellosis	0	0	0	1	0	0	0	0	0	0	2	3	2.8%
Shigellosis	0	1	0	0	0	0	0	0	0	0	0	1	0.9%
Staphylococcus	8	1	4	2	2	0	1	0	1	3	1	23	21.5%
Streptococcus	1	0	0	1	0	1	0	0	2	0	1	6	5.6%
TB-Active	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
TB-LTBI	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Tularemia	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Vancomycin	0	1	2	1	0	0	2	2	2	1	1	12	11.2%
Vibrio Cholerae	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
West Nile Infection	1	0	1	0	0	0	0	1	0	0	0	3	2.8%
Total by Year	17	5	8	13	22	1	6	3	13	9	10	107	100.0%

Source: State Epidemiologist, N.D. Dept. of Health

Risk Assessment

Table 5.1.1.2 shows the risk assessment as determined by individual jurisdictions and the Plan Update Committee for communicable disease. The risk assessment methodology can be found in the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment. The total in Table 5.1.1.2 represents the sum of each jurisdiction's impact, frequency, likelihood and vulnerability to a hazard less the jurisdiction's capabilities to respond to the hazard.

Table 5.1.1.2 – Eddy County Communicable Disease Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Eddy County	4	2	3	4	2	11
City of New Rockford	2	2	2	3	1	8
City of Sheyenne	3	2	2	3	1	9

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

Table 5.1.1.3 provides information on the specific impact, frequency, likelihood, vulnerability and capability of communicable disease in The Planning Area. A list of impacts of communicable disease identified as commonplace regardless of the jurisdiction are listed below.

Identified Impacts – Communicable Disease

- Business Interruptions
- Crop Loss
- Delayed Emergency Response
- Evacuation (Localized)
- Government Interruptions
- Human Injury/Death
- Increased Public Safety Runs
- Livestock Injury/Death
- Loss of Economy
- Loss/Overcrowded Medical Facilities
- Loss of Potable Water
- Loss of Wildlife Habitat
- Mass Casualties
- Personal Injury/Death Risk
- School Closure
- Wildlife Injury/Death

Table 5.1.1.3 – The Planning Area Communicable Disease Risk Assessment

	Eddy County, North Dakota	Wells County, North Dakota
Impact	<ul style="list-style-type: none"> • Business Interruptions • Delayed Emergency Response • Human Injury/Death • Loss/Overcrowded Medical Facilities • Mass Casualties • Personal Injury/Death Risk • School Closure 	<ul style="list-style-type: none"> • Business Interruptions • Delayed Emergency Response • Human Injury/Death • Increased Public Safety Runs • Livestock Injury/Death • Loss/Overcrowded Medical Facilities • Mass Casualties • Personal Injury/Death Risk • School Closure
Frequency	<ul style="list-style-type: none"> • Annual reports of disease in animals, humans and plants • Increase in vector-borne diseases • No major outbreaks have been reported or emergency declared • 2009 – H1N1 • 2015 – Norovirus • Kids get sick earlier and illness lasts longer • Annual influenza cases 	<ul style="list-style-type: none"> • Annual reports of disease in animals, humans and plants • Increase in vector-borne diseases • No major outbreaks have been reported or emergency declared • 2009 – H1N1 • 2015 – Norovirus • Kids get sick earlier and illness lasts longer • Annual influenza cases
Likelihood	<p><u>More likely</u></p> <ul style="list-style-type: none"> • Public schools with students in close quarters • History repeats – will happen again • Society more mobile • Less vaccinations/declining rates • Presence of insects <p><u>Less likely</u></p> <ul style="list-style-type: none"> • Education and outreach at public school • Spraying for mosquitos • District Health conducting education and outreach 	<p><u>More likely</u></p> <ul style="list-style-type: none"> • Public schools with students in close quarters • History repeats – will happen again • Society more mobile • Less vaccinations/declining rates • Presence of insects <p><u>Less likely</u></p> <ul style="list-style-type: none"> • Education and outreach at public school • Spraying for mosquitos • District Health conducting education and outreach

Table 5.1.1.3 – The Planning Area Communicable Disease Risk Assessment - Continued

	Eddy County, North Dakota	Wells County, North Dakota
Vulnerability	<p>Approximately 602 individuals under the age of 20, and 507 individuals age 65 and older, representing 25.4 and 21.4 percent of the population, respectively, and would be most vulnerable if an outbreak did occur.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • No hospital or medical facility in the county • High youth and elderly population • Agriculture economy • No clinic in Sheyenne <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • Mass media/internet • Spraying for mosquitos • District Health conducting education and outreach 	<p>Approximately 716 individuals under the age of 20, and 514 individuals age 65 and older, representing 17.0 and 12.2 percent of the population, respectively, and would be most vulnerable if an outbreak did occur.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • High youth and elderly population • Agriculture economy • No clinic in communities except Fessenden and Harvey • People from outside county to conduct work <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • St. Aloisius Medical Center • Mass media/internet • Spraying for mosquitos • District Health conducting education and outreach • Part-time clinics in Fessenden and Harvey
Capability	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address communicable disease. 	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address communicable disease.

Vulnerabilities to Publicly-Owned Buildings and Property

Most structures remain unaffected by impacts from communicable disease as animals, humans and plants are susceptible to the hazard. Buildings can become contaminated with mold, which can potentially render the building uninhabitable and is expensive to remediate. A summary of publicly-owned buildings is provided in Chapter 4, Profile and Inventory.

Vulnerabilities of Critical Facilities and Infrastructure

Since animals, humans and plants are affected by communicable disease, critical facilities and infrastructure are relatively unaffected in structural terms. However, critical facilities such as hospitals and clinics can become contaminated and/or quickly overwhelmed if an outbreak of communicable disease occurs in humans. Shortages or outages of medical supplies and staff can limit or stop altogether the functionality of medical facilities and services. Critical facilities in Eddy County should take steps to decrease this risk, such as developing or updating a continuity of operations plan or a mass casualty plan.

Similarly, emergency services can also become stressed as the population in the county is dispersed over a large geographic area. Other facilities at risk are those that house large populations in close quarters such as assisted living facilities, correction centers, day cares, public schools and nursing homes, such as the Prairie Learning Center. The vulnerability and exposure to communicable disease are likely to increase due to greater frequency of the West Nile Virus and Influenza, and an aging population. The emergence of the Ebola and Zika Virus's may also increase vulnerability to communicable disease as the convenience of air travel allows for communicable diseases to spread quicker.

Due to presence of a livestock industry in Eddy County, veterinary services can also become overwhelmed in the case of an outbreak in farm animals and livestock. The onset of stress to veterinarian and medical facilities can occur quickly with limited personnel and resources.

Vulnerabilities to New and Future Development

New development would largely avoid physical impact from communicable disease and not be vulnerable. While mold may make a building uninhabitable, it is not a communicable disease. However, new structures could be susceptible to deterioration from contamination if structures are not constructed properly. Ebola, Hantavirus or Zika (if detected) would require a thorough decontamination, patient isolation and temporary abandonment of the building/room until decontamination is complete.

Conversely, new development will increase the risk of communicable disease as it is an indication of an increasing population and/or population density.

Data Limitations and Other Key Documents

The lack of available animal loss data from the N.D. Dept. of Agriculture results in the inability to track livestock losses from natural hazards and man-made threats. Similarly, the U.S. Dept. of Agriculture-Risk Management Agency is not able to provide monetary crop loss information prior to 2001.

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

- Eddy County Emergency Operations Plan
- Eddy County Evacuation and Shelter Plan
- Eddy County Local Emergency Operations Plan
- Eddy County Pandemic Influenza Response Plan
- Eddy County Point of Dispensing (POD) Plan
- Eddy County Threat and Hazard Identification and Risk Assessment (THIRA)
- North Dakota Continuity of Operations Plan
- North Dakota Emergency Operations Plan
- North Dakota State Disaster Recovery Plan
- North Dakota State Hazard Mitigation Plan
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)

DRAFT

5.1.2 Communicable Disease

Including animal, human and plant diseases.

Characteristics

Communicable disease is an illness that is caused by an infectious agent, such as bacteria, virus, fungi or parasites and/or toxin microorganisms and is transmittable from an infected animal, person or plant to another animal, person or plant.

Seasonal Pattern	None
Duration	Hours/Days
Speed of Onset	6 weeks or less
Location	County-wide across all jurisdictions (incorporated and/or unincorporated)

For more information regarding communicable disease please reference the **State of North Dakota** Multi-Hazard Mitigation Plan. The plan can be accessed by following the link provided below.

<http://www.nd.gov/des/uploads/resources/915/final-ndmhmp-update.pdf>

History

The history of communicable disease for animals, human and plants is summarized below. A detailed hazard history for Wells County can be found on a disc located at the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment.

Animal. Information regarding animal loss was not tracked by the N.D. Dept. of Agriculture and therefore, no specific animal loss data was available. However, the Plan Update Committee indicated that animal losses occur annually and vary in severity.

Human. Communicable Disease data from the N.D. Dept. of Health indicated that between 2005 and 2015 approximately 261 cases of communicable diseases were reported in Wells County. Approximately 64.8 percent (169) cases were influenza. Table 5.1.2.1 on the following page shows the type and number of communicable disease reported in Wells County between 2005 and 2015.

Plant. Crop loss from communicable disease is tracked by the United States Department of Agriculture, Risk Management Agency (RMA). The RMA provides data on the crop type affected, damage cause description, determined acres and indemnity amount. The damage cause description identifies the cause of damage, determines acres identifies the number of acres lost due to damage, and the indemnity amount identifies the total amount of the loss for the designated peril. **Between January 1, 2001 and December 31, 2016, Wells County experienced 139 incidents of crop loss due to communicable disease between January 1, 2001 and December 31, 2016, impacting approximately 77,698 acres of crops totaling \$4,367,110 in losses.**

The Plan Update Committee indicated that crop/plant losses occur annually and vary in severity.

Probability and Magnitude

Probability. Per the communicable disease history for animals, humans and plants in Wells County, the probability of communicable disease is approximately 100 percent. The Plan Update Committee indicated the probability of communicable disease as likely, meaning that there is between 10 and 100 percent probability in the next year of an occurrence.

Magnitude. The Plan Update Committee ranked the magnitude or severity of communicable disease as catastrophic meaning that more than 50 percent of animals, humans and plants in Wells County could be impacted if an incident occurred.

Animal. With the lack of animal loss data from the N.D. Dept. of Agriculture, the magnitude of animal loss from communicable disease cannot be determined.

- The Plan Update Committee indicated that with the local economy heavily dependent on agriculture, measurable animal losses may have a substantial impact.

Human. The magnitude of communicable for humans can range from low to high, depending on the disease involved. Influenza is a communicable disease that is commonplace and the magnitude is managed by modern medical advances. However, the jet-age has contributed to faster spread of disease. With the re-emergence of Ebola and spread of the Zika Virus, the magnitude for communicable disease in humans has the potential to be catastrophic.

Plant. Per crop loss data from the RMA the following statistics illustrate the probability and magnitude of communicable diseases on crops in Wells County.

- There were 169 incidents of crop loss due to communicable disease between January 1, 2001 and December 31, 2016, resulting approximately 10.5 occurrences annually.
- Crop losses totaled \$4,367,110 between January 1, 2001 and December 31, 2016, resulting approximately \$272,944 in losses annually.
- Crop loss data in dollars was not available pre-2001.

Table 5.1.2.1 – 2005 to 2015 Wells County Communicable Disease History - Human

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total by Disease	Percent by Disease
Campylobacteriosis	0	1	0	0	1	1	0	0	3	0	1	7	2.7%
Carbapenem	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Chicken Pox	0	0	0	0	1	4	0	0	0	0	1	6	2.3%
Coccidioidomycosis	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Cryptosporidiosis	0	0	0	0	1	0	0	0	0	0	0	1	0.4%
E.coli, Shiga-Toxin	0	1	0	0	0	0	0	0	0	0	1	2	0.8%
Giardiasis	0	0	0	1	1	0	0	0	1	0	0	3	1.1%
Group A	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Haemophilus	0	0	0	1	0	0	0	0	0	0	0	1	0.4%
HBV	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
HCV	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Influenza	21	7	25	22	26	1	5	12	22	18	10	169	64.8%
Listeriosis	0	0	0	0	1	0	0	0	0	0	0	1	0.4%
Meningitis, Bacterial	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Pertussis	0	1	0	0	0	0	0	0	0	0	0	1	0.4%
Rocky Mountain	0	0	0	0	0	1	0	0	1	0	0	2	0.8%
Salmonellosis	0	0	0	0	0	1	1	0	0	2	0	4	1.5%
Shigellosis	0	0	0	1	0	0	0	0	0	1	0	2	0.8%
Staphylococcus	10	8	2	0	0	0	0	1	1	1	0	23	8.8%
Streptococcus	0	0	2	1	0	2	0	1	2	0	1	9	3.4%
TB-Active	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
TB-LTBI	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Tularemia	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Vancomycin	0	2	0	0	0	4	5	6	2	0	0	19	7.3%
Vibrio Cholerae	0	0	0	0	0	0	0	0	1	0	0	1	0.4%
West Nile Infection	0	1	5	1	0	1	0	0	2	0	0	10	3.8%
Total by Year	31	21	34	27	31	15	11	20	35	22	14	261	100.0%

Source: State Epidemiologist, N.D. Dept. of Health

Risk Assessment

Table 5.1.2.2 shows the risk assessment as determined by individual jurisdictions and the Plan Update Committee for communicable disease. The risk assessment methodology can be found in the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment. The total in Table 5.1.2.2 represents the sum of each jurisdiction's impact, frequency, likelihood and vulnerability to a hazard less the jurisdiction's capabilities to respond to the hazard.

Table 5.1.2.2 – Wells County Communicable Disease Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Wells County	4	2	3	2	2	9
City of Bowdon	2	2	2	3	1	8
City of Cathay	2	2	2	3	1	8
City of Fessenden	3	2	2	2	1	8
City of Hamberg	2	2	2	3	1	8
City of Harvey	3	4	2	4	2	13
City of Hurdsfield	2	2	2	3	1	8
City of Sykeston	2	2	3	3	1	9

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

Table 5.1.2.3 provides information on the specific impact, frequency, likelihood, vulnerability and capability of communicable disease in The Planning Area. A list of impacts of communicable disease identified as commonplace regardless of the jurisdiction are listed below.

Identified Impacts – Communicable Disease

- Business Interruptions
- Crop Loss
- Delayed Emergency Response
- Evacuation (Localized)
- Government Interruptions
- Human Injury/Death
- Increased Public Safety Runs
- Livestock Injury/Death
- Loss of Economy
- Loss/Overcrowded Medical Facilities
- Loss of Potable Water
- Loss of Wildlife Habitat
- Mass Casualties
- Personal Injury/Death Risk
- School Closure
- Wildlife Injury/Death

Table 5.1.1.3 – The Planning Area Communicable Disease Risk Assessment

	Eddy County, North Dakota	Wells County, North Dakota
Impact	<ul style="list-style-type: none"> • Business Interruptions • Delayed Emergency Response • Human Injury/Death • Loss/Overcrowded Medical Facilities • Mass Casualties • Personal Injury/Death Risk • School Closure 	<ul style="list-style-type: none"> • Business Interruptions • Delayed Emergency Response • Human Injury/Death • Increased Public Safety Runs • Livestock Injury/Death • Loss/Overcrowded Medical Facilities • Mass Casualties • Personal Injury/Death Risk • School Closure
Frequency	<ul style="list-style-type: none"> • Annual reports of disease in animals, humans and plants • Increase in vector-borne diseases • No major outbreaks have been reported or emergency declared • 2009 – H1N1 • 2015 – Norovirus • Kids get sick earlier and illness lasts longer • Annual influenza cases 	<ul style="list-style-type: none"> • Annual reports of disease in animals, humans and plants • Increase in vector-borne diseases • No major outbreaks have been reported or emergency declared • 2009 – H1N1 • 2015 – Norovirus • Kids get sick earlier and illness lasts longer • Annual influenza cases
Likelihood	<p><u>More likely</u></p> <ul style="list-style-type: none"> • Public schools with students in close quarters • History repeats – will happen again • Society more mobile • Less vaccinations/declining rates • Presence of insects <p><u>Less likely</u></p> <ul style="list-style-type: none"> • Education and outreach at public school • Spraying for mosquitos • District Health conducting education and outreach 	<p><u>More likely</u></p> <ul style="list-style-type: none"> • Public schools with students in close quarters • History repeats – will happen again • Society more mobile • Less vaccinations/declining rates • Presence of insects <p><u>Less likely</u></p> <ul style="list-style-type: none"> • Education and outreach at public school • Spraying for mosquitos • District Health conducting education and outreach

Table 5.1.1.3 – The Planning Area Communicable Disease Risk Assessment - Continued

	Eddy County, North Dakota	Wells County, North Dakota
Vulnerability	<p>Approximately 602 individuals under the age of 20, and 507 individuals age 65 and older, representing 25.4 and 21.4 percent of the population, respectively, and would be most vulnerable if an outbreak did occur.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • No hospital or medical facility in the county • High youth and elderly population • Agriculture economy • No clinic in Sheyenne <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • Mass media/internet • Spraying for mosquitos • District Health conducting education and outreach 	<p>Approximately 716 individuals under the age of 20, and 514 individuals age 65 and older, representing 17.0 and 12.2 percent of the population, respectively, and would be most vulnerable if an outbreak did occur.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • High youth and elderly population • Agriculture economy • No clinic in communities except Fessenden and Harvey • People from outside county to conduct work <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • St. Aloisius Medical Center • Mass media/internet • Spraying for mosquitos • District Health conducting education and outreach • Part-time clinics in Fessenden and Harvey
Capability	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address communicable disease. 	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address communicable disease.

Vulnerabilities to Publicly-Owned Buildings and Property

Most structures remain unaffected by impacts from communicable disease as animals, humans and plants are susceptible to the hazard. Buildings can become contaminated with mold, which can potentially render the building uninhabitable and is expensive to remediate. A summary of publicly-owned buildings is provided in Chapter 4, Profile and Inventory.

Vulnerabilities of Critical Facilities and Infrastructure

Since animals, humans and plants are affected by communicable disease, critical facilities and infrastructure are relatively unaffected in structural terms. However, critical facilities such as hospitals and clinics can become contaminated and/or quickly overwhelmed if an outbreak of communicable disease occurs in humans. Shortages or outages of medical supplies and staff can limit or stop altogether the functionality of medical facilities and services. St. Aloisius Medical Center would be more vulnerable and should take steps to decrease this risk, such as developing a continuity of operations plan or a mass casualty plan.

Similarly, emergency services can also become stressed as the population in the county is dispersed over a large geographic area. Other facilities at risk are those that house large populations in close quarters such as assisted living facilities, correction centers, day cares, public schools and nursing homes, such as the Prairie Learning Center. The vulnerability and exposure to communicable disease are likely to increase due to greater frequency of the West Nile Virus and Influenza, and an aging population. The emergence of the Ebola and Zika Virus's may also increase vulnerability to communicable disease as the convenience of air travel allows for communicable diseases to spread quicker.

Due to presence of a livestock industry in Wells County, veterinary services can also become overwhelmed in the case of an outbreak in farm animals and livestock. The onset of stress to veterinarian and medical facilities can occur quickly with limited personnel and resources.

Vulnerabilities to New and Future Development

New development would largely avoid physical impact from communicable disease and not be vulnerable. While mold may make a building uninhabitable, it is not a communicable disease. However, new structures could be susceptible to deterioration from contamination if structures are not constructed properly. Ebola, Hantavirus or Zika (if detected) would require a thorough decontamination, patient isolation and temporary abandonment of the building/room until decontamination is complete.

Conversely, new development will increase the risk of communicable disease as it is an indication of an increasing population and/or population density.

Data Limitations and Other Key Documents

The lack of available animal loss data from the N.D. Dept. of Agriculture results in the inability to track livestock losses from natural hazards and man-made threats. Similarly, the U.S. Dept. of Agriculture-Risk Management Agency is not able to provide monetary crop loss information prior to 2001.

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

- North Dakota Continuity of Operations Plan
- North Dakota Emergency Operations Plan
- North Dakota State Disaster Recovery Plan
- North Dakota State Hazard Mitigation Plan
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)
- Wells County Emergency Operations Plan
- Wells County Evacuation and Shelter Plan
- Wells County Local Emergency Operations Plan
- Wells County Pandemic Influenza Response Plan
- Wells County Point of Dispensing (POD) Plan
- Wells County Threat and Hazard Identification and Risk Assessment (THIRA)

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5.2.1 Dam Failure

Characteristics

A dam is any artificial man-made barrier that impounds or diverts water or underground streams. A dam failure is defined as a sudden, rapid, and uncontrolled release of impounded water that will create a potential significant downstream hazard.

Seasonal Pattern	None
Duration	Days/Weeks
Speed of Onset	Minutes to Hours
Location	Inundation Area Specific to Each Dam

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

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

Medium (Significant) Hazard – Dams located in predominantly rural or agricultural areas where failure may damage isolated homes, main highways, railroads or cause interruption of minor public utilities. The potential for the loss of lives may be expected if the dam fails.

High Hazard – Dams located upstream of developed and urban areas where failure may cause severe damage to homes, industrial and commercial building, and major public utilities. There is a potential for the loss of more than a few lives if the dam fails.

For more information regarding drought please reference the **State of North Dakota** Multi-Hazard Mitigation Plan. The plan can be accessed by following the link provided below.

<http://www.nd.gov/des/uploads/resources/915/final-ndmhmp-update.pdf>

History

Per the National Performance of Dams Program, Stanford University, no dam incidents were reported for Eddy County.

Probability and Magnitude

Probability. Based on dam failure history for Eddy County and the risk assessment conducted by the Plan Update Committee, the probability of dam failure is possible, meaning there is between a one and 10 percent chance of occurring.

Magnitude. The Plan Update Committee ranked the magnitude or severity of dam failure as catastrophic as more than 50 percent of the county and people would be affected.

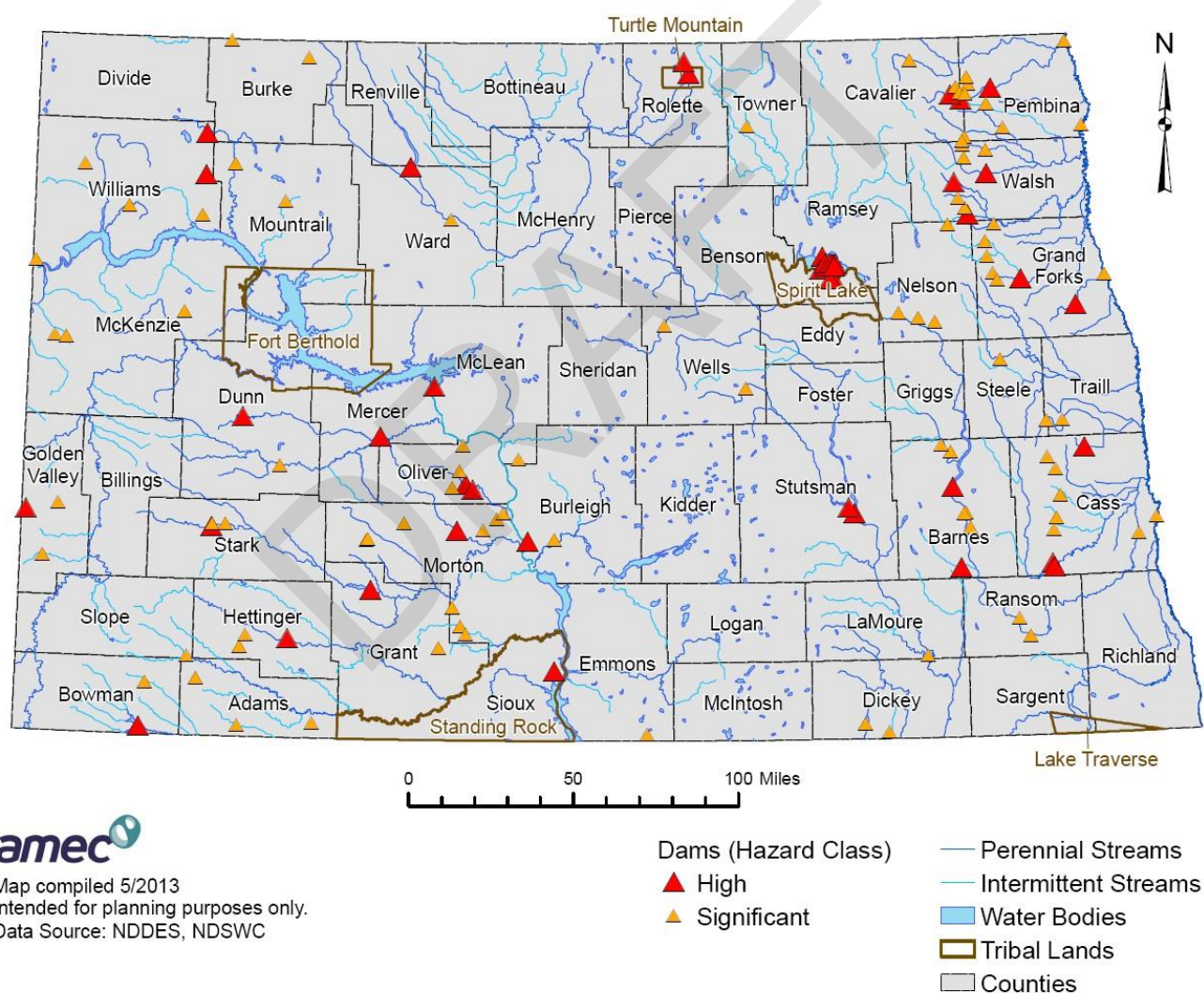
List of Dams – Eddy County

Per information provided by the National Inventory of Dams, there are approximately six dams in Eddy County. Due to homeland security purposes, detailed information regarding dams located in Eddy County is not provided in this plan. This information can be accessed through the National Inventory of Dams website:

http://nid.usace.army.mil/cm_apex/f?p=838:1:0::NO

Per the 2014 North Dakota State Hazard Mitigation Plan, there are no high hazard or medium (significant) hazard dams in Eddy County. Figure 5.2.1.1 illustrates the location of high and medium (significant) hazard dams in the state of North Dakota in relation to Eddy County.

Figure 5.2.1.1 – North Dakota High and Medium (Significant) Hazard Dams



Source: 2014 State of North Dakota Hazard Mitigation Plan

Risk Assessment

Table 5.2.1.2 shows the risk assessment as determined by individual jurisdictions and the Plan Update Committee for dam failure. The risk assessment methodology can be found in the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment. The total in Table 5.2.1.2 represents the sum of each jurisdiction's impact, frequency, likelihood and vulnerability to a hazard less the jurisdiction's capabilities to respond to the hazard.

Table 5.2.1.2 – Eddy County Dam Failure Risk Assessment Scored Chart Summary

Dam Failure	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Eddy County	4	2	2	3	3	8
City of New Rockford	2	2	2	2	2	6
City of Sheyenne	3	2	1	2	2	6

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

Table 5.2.1.3 provides information on the specific impact, frequency, likelihood, vulnerability and capability of dam failure in The Planning Area. A list of impacts of dam failure identified as commonplace regardless of the jurisdiction are listed below.

Identified Impacts – Dam Failure

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

Table 5.2.1.3 – The Planning Area Dam Failure Risk Assessment

	Eddy County, North Dakota	Wells County, North Dakota
Impact	<ul style="list-style-type: none"> Blocked Roads (washed out roads) Crop Loss Delayed Emergency Response Evacuation (Localized) Flooding (Street) Flooding (Structure) Livestock Injury/Death Loss of Potable Water Property Damage 	<ul style="list-style-type: none"> Blocked Roads (washed out roads) Crop Loss Delayed Emergency Response Evacuation (Localized) Flooding (Street & Structure) Livestock Injury/Death Loss of Potable Water Property Damage Sewer Backup
Frequency	<ul style="list-style-type: none"> Never an occurrence of a dam failure 	<ul style="list-style-type: none"> In 2009 and 2011, substantial flooding from spring melt threatened the integrity of the Harvey Dam
Likelihood	<p><u>More likely</u></p> <ul style="list-style-type: none"> Heavy rains and/or melting of snow pack may lead to dams becoming overwhelmed <p><u>Less likely</u></p> <ul style="list-style-type: none"> Annual dam inspections 	<p><u>More likely</u></p> <ul style="list-style-type: none"> Heavy rains and/or melting of snow pack may lead to dams becoming overwhelmed <p><u>Less likely</u></p> <ul style="list-style-type: none"> Harvey Dam and Sykeston Dam EAP updated annually Annual dam inspections
Vulnerability	<p><u>More vulnerable</u></p> <ul style="list-style-type: none"> Critical facilities and infrastructure, and homes and businesses located in the inundation area <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> Annual dam inspections 	<p><u>More vulnerable</u></p> <ul style="list-style-type: none"> Critical facilities and infrastructure, and homes and businesses located in the inundation area Harvey Dam is an earthen dam – trees and saplings threaten integrity <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> Harvey Dam and Sykeston Dam EAP updated annually Annual dam inspections CodeRED
Capability	<ul style="list-style-type: none"> See Chapter 7 for a list of capabilities to address dam failure. 	<ul style="list-style-type: none"> See Chapter 7 for a list of capabilities to address dam failure.

Vulnerabilities of Publicly-Owned Buildings and Property

Significant hazard dams have the potential to impact publicly-owned buildings and property. County-owned buildings located in the inundation area are vulnerable to the hazard. Due to homeland security concerns, publicly-owned buildings located in dam inundation areas in Eddy County are not identified. Please contact Eddy County Emergency Management for this information. Contact information can be found in Chapter 10, Plan Maintenance. A summary of city and publicly-owned buildings is provided in Chapter 4, Profile and Inventory.

Vulnerabilities of Critical Facilities and Infrastructure

Critical facilities and infrastructure are vulnerable to dam failures like publicly-owned buildings and property if located in the inundation area of a dam. Critical facilities and infrastructure located in inundation areas are highly susceptible to impacts from flood waters with the potential to be destroyed. Due to homeland security concerns, critical facilities and infrastructure located in dam inundation areas in Eddy County are not identified. Please contact Eddy County Emergency Management for this information.

Vulnerabilities to New and Future Development

New and future development geographically located in dam inundation areas are most at risk to dam failure. New and future development would not be at risk to dam failure if constructed at an elevation outside of inundation areas. However, given the nature of the hazard, a dam failure incident would have catastrophic impacts on structures located in or out of inundation areas. Although flood waters resulting from dam failures tend to flow along floodplains, flood waters would extend beyond the floodplain due to the volume of water released. As such, development located outside of the floodplain can still be at risk to a dam failure.

Data Limitations and Other Key Documents

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

- Eddy County Emergency Operations Plan
- Eddy County Evacuation and Shelter Plan
- Eddy County Local Emergency Operations Plan
- Eddy County Shelter and Mass Care Plan
- Eddy County Threat and Hazard Identification and Risk Assessment (THIRA)
- North Dakota Continuity of Operations Plan
- North Dakota Emergency Operations Plan
- North Dakota State Disaster Recovery Plan
- North Dakota State Hazard Mitigation Plan
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)

5.2.2 Dam Failure

Characteristics

A dam is any artificial man-made barrier that impounds or diverts water or underground streams. A dam failure is defined as a sudden, rapid, and uncontrolled release of impounded water that will create a potential significant downstream hazard.

Seasonal Pattern	None
Duration	Days/Weeks
Speed of Onset	Minutes to Hours
Location	Inundation Area Specific to Each Dam

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

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

Medium (Significant) Hazard – Dams located in predominantly rural or agricultural areas where failure may damage isolated homes, main highways, railroads or cause interruption of minor public utilities. The potential for the loss of lives may be expected if the dam fails.

High Hazard – Dams located upstream of developed and urban areas where failure may cause severe damage to homes, industrial and commercial building, and major public utilities. There is a potential for the loss of more than a few lives if the dam fails.

For more information regarding drought please reference the **State of North Dakota** Multi-Hazard Mitigation Plan. The plan can be accessed by following the link provided below.

<http://www.nd.gov/des/uploads/resources/915/final-ndmhmp-update.pdf>

History

Per the National Performance of Dams Program, Stanford University, no dam incidents were reported for Wells County. However, in 2009 and 2011, substantial flooding from spring melt threatened the integrity of the Harvey Dam

Probability and Magnitude

Probability. Based on dam failure history for Wells County and the risk assessment conducted by the Plan Update Committee, the probability of dam failure is possible, meaning there is between a one and 10 percent chance of occurring.

Magnitude. The Plan Update Committee ranked the magnitude or severity of dam failure as catastrophic as more than 50 percent of the county and people would be affected.

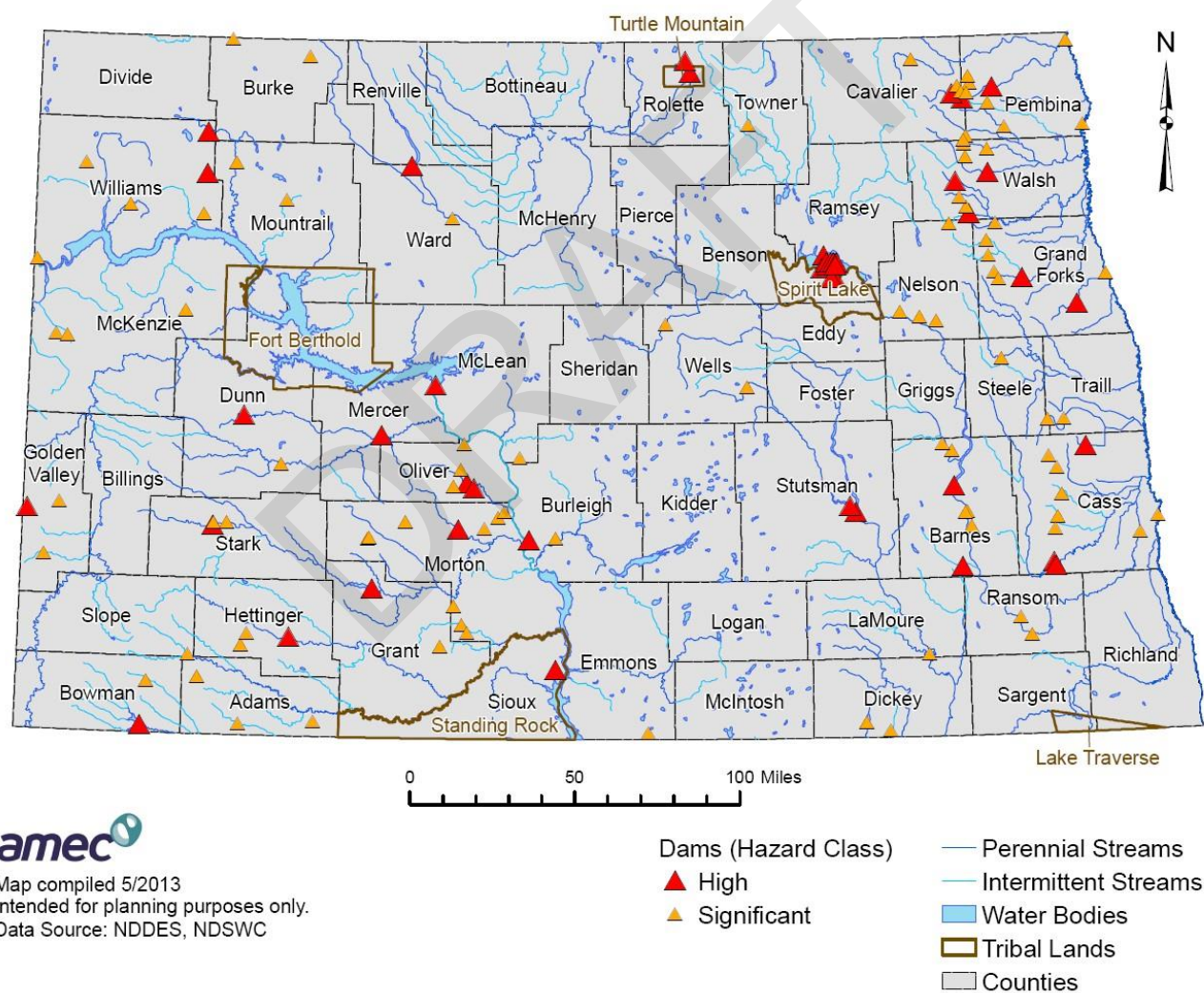
List of Dams – Wells County

Per information provided by the National Inventory of Dams, there are approximately 14 dams in Wells County. Due to homeland security purposes, detailed information regarding dams located in Wells County is not provided in this plan. This information can be accessed through the National Inventory of Dams website:

http://nid.usace.army.mil/cm_apex/f?p=838:1:0::NO

Per the 2014 North Dakota State Hazard Mitigation Plan, there are no high hazard dams and two medium (significant) hazard dams in Wells County. Figure 5.2.2.1 illustrates the location of high and medium (significant) hazard dams in the state of North Dakota, and the location of the medium (significant) dams in Wells County.

Figure 5.2.2.1 – North Dakota High and Medium (Significant) Hazard Dams



Source: 2014 State of North Dakota Hazard Mitigation Plan

Risk Assessment

Table 5.2.2.2 shows the risk assessment as determined by individual jurisdictions and the Plan Update Committee for dam failure. The risk assessment methodology can be found in the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment. The total in Table 5.2.2.2 represents the sum of each jurisdiction's impact, frequency, likelihood and vulnerability to a hazard less the jurisdiction's capabilities to respond to the hazard.

Table 5.2.2.2 – Wells County Dam Failure Risk Assessment Scored Chart Summary

Dam Failure	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Wells County	4	2	2	3	3	8
City of Bowdon	NA	NA	NA	NA	NA	NA
City of Cathay	4	1	2	3	2	8
City of Fessenden	NA	NA	NA	NA	NA	NA
City of Hamberg	NA	NA	NA	NA	NA	NA
City of Harvey	4	2	2	3	3	8
City of Hurdsfield	NA	NA	NA	NA	NA	NA
City of Sykeston	4	2	2	3	3	8

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

Table 5.2.2.3 provides information on the specific impact, frequency, likelihood, vulnerability and capability of dam failure in The Planning Area. A list of impacts of dam failure identified as commonplace regardless of the jurisdiction are listed below.

Identified Impacts – Dam Failure

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

Table 5.2.2.3 – The Planning Area Dam Failure Risk Assessment

	Eddy County, North Dakota	Wells County, North Dakota
Impact	<ul style="list-style-type: none"> Blocked Roads (washed out roads) Crop Loss Delayed Emergency Response Evacuation (Localized) Flooding (Street) Flooding (Structure) Livestock Injury/Death Loss of Potable Water Property Damage 	<ul style="list-style-type: none"> Blocked Roads (washed out roads) Crop Loss Delayed Emergency Response Evacuation (Localized) Flooding (Street & Structure) Livestock Injury/Death Loss of Potable Water Property Damage Sewer Backup
Frequency	<ul style="list-style-type: none"> Never an occurrence of a dam failure 	<ul style="list-style-type: none"> In 2009 and 2011, substantial flooding from spring melt threatened the integrity of the Harvey Dam
Likelihood	<p><u>More likely</u></p> <ul style="list-style-type: none"> Heavy rains and/or melting of snow pack may lead to dams becoming overwhelmed <p><u>Less likely</u></p> <ul style="list-style-type: none"> Annual dam inspections 	<p><u>More likely</u></p> <ul style="list-style-type: none"> Heavy rains and/or melting of snow pack may lead to dams becoming overwhelmed <p><u>Less likely</u></p> <ul style="list-style-type: none"> Harvey Dam and Sykeston Dam EAP updated annually Annual dam inspections
Vulnerability	<p><u>More vulnerable</u></p> <ul style="list-style-type: none"> Critical facilities and infrastructure, and homes and businesses located in the inundation area <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> Annual dam inspections 	<p><u>More vulnerable</u></p> <ul style="list-style-type: none"> Critical facilities and infrastructure, and homes and businesses located in the inundation area Harvey Dam is an earthen dam – trees and saplings threaten integrity <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> Harvey Dam and Sykeston Dam EAP updated annually Annual dam inspections CodeRED
Capability	<ul style="list-style-type: none"> See Chapter 7 for a list of capabilities to address dam failure. 	<ul style="list-style-type: none"> See Chapter 7 for a list of capabilities to address dam failure.

Vulnerabilities of Publicly-Owned Buildings and Property

Significant hazard dams have the potential to impact publicly-owned buildings and property. County-owned buildings located in the inundation area are vulnerable to the hazard. Due to homeland security concerns, publicly-owned buildings located in dam inundation areas in Wells County are not identified. Please contact Wells County Emergency Management for this information. Contact information can be found in Chapter 10, Plan Maintenance. A summary of city and publicly-owned buildings is provided in Chapter 4, Profile and Inventory.

Vulnerabilities of Critical Facilities and Infrastructure

Critical facilities and infrastructure are vulnerable to dam failures like publicly-owned buildings and property if located in the inundation area of a dam. Critical facilities and infrastructure located in inundation areas are highly susceptible to impacts from flood waters with the potential to be destroyed. Due to homeland security concerns, critical facilities and infrastructure located in dam inundation areas in Wells County are not identified. Please contact Wells County Emergency Management for this information. Contact information can be found in Chapter 10, Plan Maintenance.

Vulnerabilities to New and Future Development

New and future development geographically located in dam inundation areas are most at risk to dam failure. New and future development would not be at risk to dam failure if constructed at an elevation outside of inundation areas. However, given the nature of the hazard, a dam failure incident would have catastrophic impacts on structures located in or out of inundation areas. Although flood waters resulting from dam failures tend to flow along floodplains, flood waters would extend beyond the floodplain due to the volume of water released. As such, development located outside of the floodplain can still be at risk to a dam failure.

Data Limitations and Other Key Documents

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

- Harvey Dam Emergency Action Plan
- North Dakota Continuity of Operations Plan
- North Dakota Emergency Operations Plan
- North Dakota State Disaster Recovery Plan
- North Dakota State Hazard Mitigation Plan
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)
- Sykeston Dam Emergency Action Plan
- Wells County Emergency Operations Plan
- Wells County Evacuation and Shelter Plan
- Wells County Local Emergency Operations Plan
- Wells County Shelter and Mass Care Plan
- Wells County Threat and Hazard Identification and Risk Assessment (THIRA)

5.3.1 Drought

Including precipitation levels well below normal and heat – temperatures higher than normal.

Characteristics

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

Seasonal Pattern	Summer
Duration	Weeks/months, up to a decade in severe cases
Speed of Onset	Slow and gradual
Location	Total geographic extent of Eddy County

For more information regarding drought please reference the **State of North Dakota** Multi-Hazard Mitigation Plan. The plan can be accessed by following the link provided below.

<http://www.nd.gov/des/uploads/resources/915/final-ndmhmp-update.pdf>

History

Table 5.3.1.1 summarizes the history of drought in Eddy County and indicates 19 occurrences of the hazard between 1976 and 2016. A state-wide drought was declared in 1980, 1981, 2002, 2005 and 2012 impacting all counties in North Dakota. A detailed hazard history for Eddy County can be found on a disc located at the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment.

Information gathered from Plan Update Committee meetings indicated that while dryer periods have come and gone, the one true drought was in 1988. Participants also noted a five-to 10-year cyclical pattern where dry conditions will persist for that period, then transition to more wet conditions.

Table 5.3.1.1 – Eddy County Drought Hazard History Summary

Drought					
Occurrences	Date Range	Fatalities	Injuries	Property Damage	Crop Damage
19	1976 to 2016	NA	NA	\$94,340	\$94,340

Source(s): 2014 State of North Dakota MHMP, National Climatic Data Center (NCDC), National Oceanic and Atmospheric Administration (NOAA), U.S. Drought Monitor

Crop loss. Crop loss from drought is tracked by the United States Department of Agriculture, Risk Management Agency (RMA). The RMA provides data on the crop type affected, damage cause description, determined acres and indemnity amount. The damage cause description identifies the cause of damage, determines acres identifies the number of acres lost due to damage, and the indemnity amount identifies the total amount of the loss for the designated peril. Between January 1, 2001 and December 31, 2016, Eddy County experienced 242 incidents of crop loss due to drought impacting approximately 120,745 acres of crops totaling \$8,399,900 in losses.

Probability and Magnitude

Probability. Per Table 5.3.1.1, the probability of drought in Eddy County is approximately 46 percent based on 19 occurrences between 1976 and 2016. The Plan Update Committee indicated the probability of drought in Eddy County as high likely meaning that there is a 100 percent probability in the next year of a drought.

Magnitude. The magnitude of drought can be determined by examining the number of weeks in drought by U.S. Drought Monitor intensity level, and crop loss estimates.

U.S. Drought Monitor

- D0 (Abnormally Dry): Between 2000 and September 30, 2017, Eddy County experienced a combined total of 413 consecutive weeks with abnormally dry conditions.
- D1 (Moderate Drought): Between 2000 and September 30, 2017, Eddy County experienced a combined total of 145 consecutive weeks with moderate drought conditions.
- D2 (Severe Drought): Between 2000 and September 30, 2017, Eddy County experienced a combined total of 40 consecutive weeks with severe drought conditions.
- D3 (Extreme Drought): Between 2000 and September 30, 2017, Eddy County has not experienced any consecutive weeks with extreme drought conditions.
- D4 (Exceptional Drought): Between 2000 and September 30, 2017, Eddy County has not experienced any consecutive weeks with exceptional drought conditions.

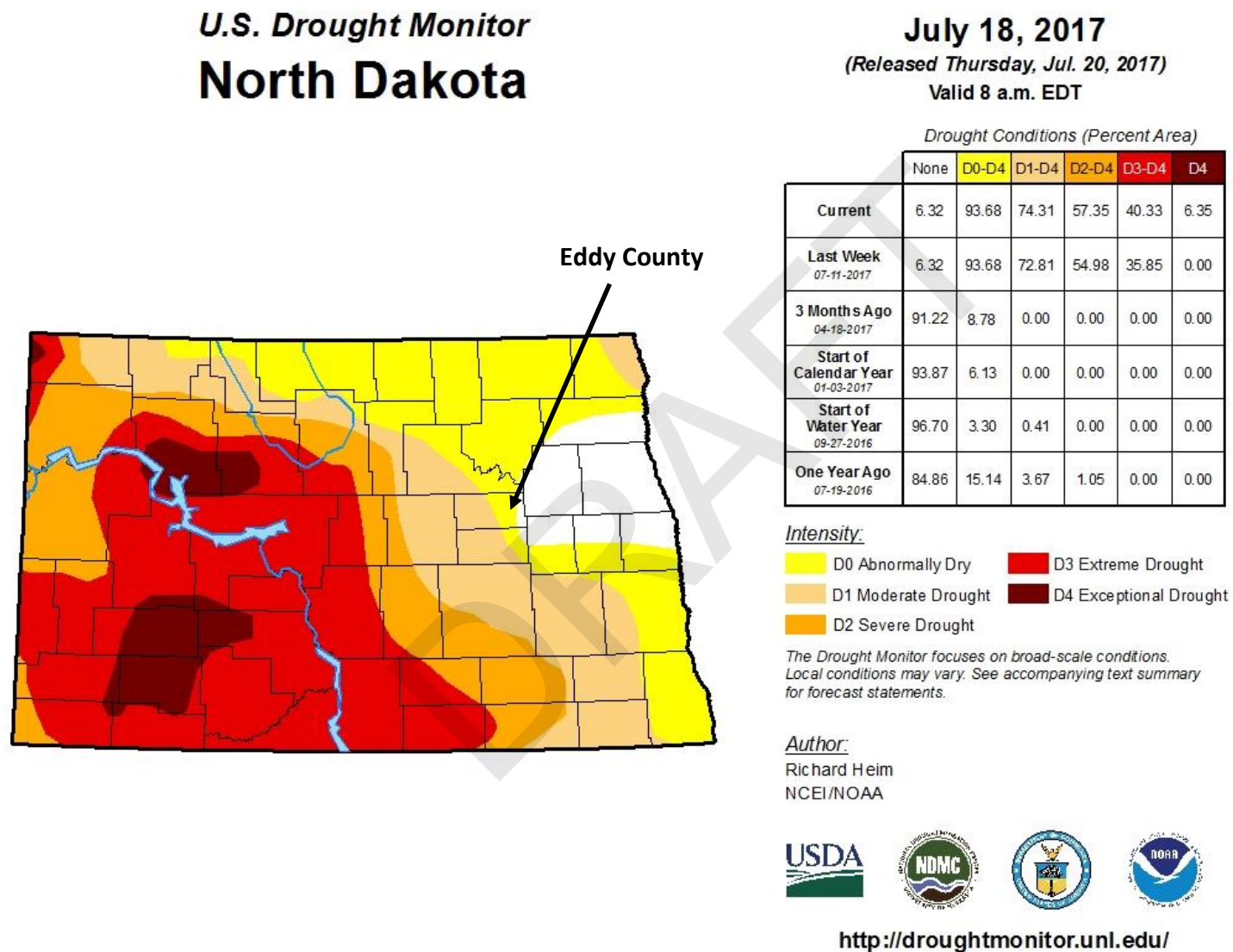
Crop Loss

- Annualized estimated crop losses of \$428,673 between 2003 and 2012 per 2014 NDMHMP.
- Annualized estimated crop losses of \$1,414,894 between 2001 and 2016 per the USDA, RMA.

The Plan Update Committee indicated the magnitude or impact of drought in Eddy County as catastrophic meaning that more than 50 percent of the county, its people and property are affected if a drought of significance occurred.

Figure 5.3.1.1 shows drought conditions for Eddy County for July 18, 2018, provided by the U.S. Drought Monitor. Information on drought conditions for the previous week, three months prior, start of calendar year, start of water year and one-year ago are also available. As of July 18, 2018, Eddy County was experiencing abnormally dry conditions and moderate drought. The Drought Monitor fluctuates throughout the year and the information shown in Figure 5.3.1.1 is not indicative of future risk.

Figure 5.3.1.1 – July 18, 2018 U.S. Drought Monitor – North Dakota



Source: U.S. Drought Monitor

Risk Assessment

Table 5.3.1.2 shows the risk assessment as determined by individual jurisdictions and the Plan Update Committee for drought. The risk assessment methodology can be found in the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment. The total in Table 5.3.1.2 represents the sum of each jurisdiction's impact, frequency, likelihood and vulnerability to a hazard less the jurisdiction's capabilities to respond to the hazard.

Table 5.3.1.2 – Eddy County Drought Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Eddy County	4	2	4	3	1	12
City of New Rockford	3	3	3	3	1	11
City of Sheyenne	3	2	3	3	1	10

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

Table 5.3.1.3 provides information on the specific impact, frequency, likelihood, vulnerability and capability of drought in The Planning Area. A list of impacts of drought identified as commonplace regardless of the jurisdiction are listed below.

Identified Impacts – Drought

- Business Interruptions
- Crop Loss
- Human Injury/Death
- Increased Fire Potential
- Livestock Injury/Death
- Loss of Econom
- Loss of Potable Water
- Loss of Wildlife Habitat
- Property Damage
- Soil Erosion
- Wildlife Injury/Death

Table 5.3.1.3 – The Planning Area Drought Risk Assessment

	Eddy County, North Dakota	Wells County, North Dakota
Impact	<ul style="list-style-type: none"> • Business Interruptions • Crop Loss • Increased Fire Potential • Livestock Injury/Death • Loss of Potable Water • Combine or baler fires from dry conditions 	<ul style="list-style-type: none"> • Crop Loss • Increased Fire Potential • Livestock Injury/Death • Loss of Potable Water • Combine or baler fires from dry conditions
Frequency	<ul style="list-style-type: none"> • Annual periods of dry conditions • Cycle every 10 years • Drought of 1988 and 1989 • Burn bans implemented annually 	<ul style="list-style-type: none"> • Annual periods of dry conditions • Cycle every 10 years • Drought of 1988 and 1989 • Burn bans implemented annually
Likelihood	<p><u>More likely</u></p> <ul style="list-style-type: none"> • Overdue for drought based on wet/dry cycle <p><u>Less likely</u></p> <ul style="list-style-type: none"> • Modern ag practices – drain tile, irrigation, no till farming 	<p><u>More likely</u></p> <ul style="list-style-type: none"> • Overdue for drought based on wet/dry cycle <p><u>Less likely</u></p> <ul style="list-style-type: none"> • Modern ag practices – drain tile, irrigation, no till farming
Vulnerability	<p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • Livestock ponds dry up or become dangers for livestock to ingest due to bacteria • Agriculture economy • Removal of shelter belts/tree rows • Lack of water sources for fire suppression • City lagoons and county water infrastructure <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • Modern ag practices – drain tile, irrigation systems, etc. • No till farming • Advanced forecasting and weather simulations • Small cities and county residents on rural water system 	<p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • Livestock ponds dry up or become dangers for livestock to ingest due to bacteria • Agriculture economy • Removal of shelter belts/tree rows • City lagoons and county water infrastructure <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • Modern ag practices – drain tile, irrigation systems, etc. • No till farming • farming • Advanced forecasting and weather simulations • St. Aloisius Medical Center • Small cities and county residents on rural water system
Capability	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address drought. 	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address drought.

Vulnerabilities to Publicly-Owned Buildings and Property

Drought does not have a direct impact on structures. However, loss of water supply would influence the function of publicly-owned buildings. Disruptions in service and extended periods of closure may occur. Drought would threaten publicly-owned buildings and property from the increase in fire threat and the potential decrease in available water for fire suppression. A summary of publicly-owned buildings is provided in Chapter 4, Profile and Inventory.

Vulnerabilities of Critical Facilities and Infrastructure

Critical facilities that rely on water for operation and continued use are most vulnerable to drought. Large employers in the agriculture sector and manufacturing can be negatively affected by drought and are viewed as critical facilities, depending on the number of people they employ and the impact they have on local economies. Critical facilities and infrastructure vulnerable to drought include public water systems that provide drinking water and disposal of waste water, among others. Many public water systems extract water from surface bodies of water. If water levels become too low, public water systems may be forced to ration water or cease operation altogether.

Vulnerabilities to New and Future Development

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

The agriculture sector is becoming increasingly mechanized and requires larger amounts of water. Increased demand for water in the agriculture sector will simultaneously increase the vulnerability of drought in Eddy County.

With the possibility of climate change, this hazard may impact Eddy County with more frequency and increased severity.

Data Limitations and Other Key Documents

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

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

- Eddy County Emergency Operations Plan
- Eddy County Evacuation and Shelter Plan

- Eddy County Local Emergency Operations Plan
- Eddy County Shelter and Mass Care Plan
- Eddy County Threat and Hazard Identification and Risk Assessment (THIRA)
- North Dakota Continuity of Operations Plan
- North Dakota Drought Mitigation Plan
- North Dakota Emergency Operations Plan
- North Dakota State Disaster Recovery Plan
- North Dakota State Hazard Mitigation Plan
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)

DRAFT

5.3.2 Drought

Including precipitation levels well below normal and heat – temperatures higher than normal.

Characteristics

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

Seasonal Pattern	Summer
Duration	Weeks/months, up to a decade in severe cases
Speed of Onset	Slow and gradual
Location	Total geographic extent of Wells County

For more information regarding drought please reference the **State of North Dakota** Multi-Hazard Mitigation Plan. The plan can be accessed by following the link provided below.

<http://www.nd.gov/des/uploads/resources/915/final-ndmhmp-update.pdf>

History

Table 5.3.2.1 summarizes the history of drought in Wells County and indicates 19 occurrences of the hazard between 1976 and 2016. A state-wide drought was declared in 1980, 1981, 2002, 2005 and 2012 impacting all counties in North Dakota. A detailed hazard history for Wells County can be found on a disc located at the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment.

Information gathered from Plan Update Committee meetings indicated that while dryer periods have come and gone, the one true drought was in 1988. Participants also noted a five-to 10-year cyclical pattern where dry conditions will persist for that period, then transition to more wet conditions.

Table 5.3.2.1 – Wells County Drought Hazard History Summary

Drought					
Occurrences	Date Range	Fatalities	Injuries	Property Damage	Crop Damage
19	1976 to 2016	NA	NA	\$94,340	\$94,340

Source(s): 2014 State of North Dakota MHMP, National Climatic Data Center (NCDC), National Oceanic and Atmospheric Administration (NOAA), U.S. Drought Monitor

Crop loss. Crop loss from drought is tracked by the United States Department of Agriculture, Risk Management Agency (RMA). The RMA provides data on the crop type affected, damage cause description, determined acres and indemnity amount. The damage cause description identifies the cause of damage, determines acres identifies the number of acres lost due to damage, and the indemnity amount identifies the total amount of the loss for the designated peril. Between January 1, 2001 and December 31, 2016, Wells County experienced 36 incidents of crop loss due to drought impacting approximately 354,635 acres of crops totaling \$22,638,300 in losses.

Probability and Magnitude

Probability. Per Table 5.3.2.1, the probability of drought in Wells County is approximately 46 percent based on 19 occurrences between 1976 and 2016. The Plan Update Committee indicated the probability of drought in Wells County as high likely meaning that there is a 100 percent probability in the next year of a drought.

Magnitude. The magnitude of drought can be determined by examining the number of weeks in drought by U.S. Drought Monitor intensity level, and crop loss estimates.

U.S. Drought Monitor

- D0 (Abnormally Dry): Between 2000 and September 30, 2017, Wells County experienced a combined total of 438 consecutive weeks with abnormally dry conditions.
- D1 (Moderate Drought): Between 2000 and September 30, 2017, Wells County experienced a combined total of 166 consecutive weeks with moderate drought conditions.
- D2 (Severe Drought): Between 2000 and September 30, 2017, Wells County experienced a combined total of 13 consecutive weeks with severe drought conditions.
- D3 (Extreme Drought): Between 2000 and September 30, 2017, Wells County has not experienced any consecutive weeks with extreme drought conditions.
- D4 (Exceptional Drought): Between 2000 and September 30, 2017, Wells County has not experienced any consecutive weeks with exceptional drought conditions.

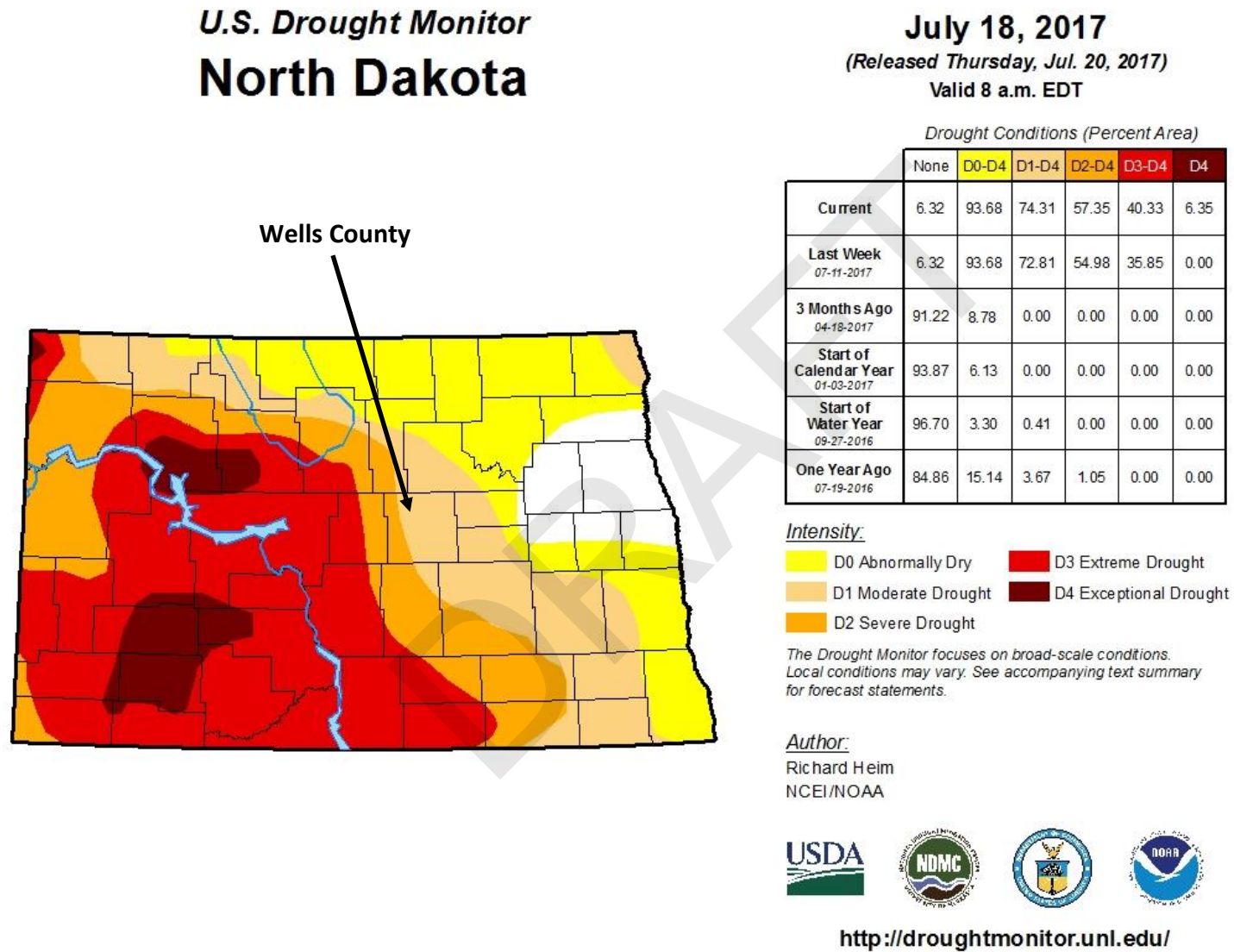
Crop Loss

- Annualized estimated crop losses of \$1,413,616 between 2003 and 2012 per 2014 NDMHMP.
- Annualized estimated crop losses of \$1,414,894 between 2001 and 2016 per the USDA, RMA.

The Plan Update Committee indicated the magnitude or impact of drought in Wells County as catastrophic meaning that more than 50 percent of the county, its people and property are affected if a drought of significance occurred.

Figure 5.3.2.1 shows drought conditions for Wells County for July 18, 2018, provided by the U.S. Drought Monitor. Information on drought conditions for the previous week, three months prior, start of calendar year, start of water year and one-year ago are also available. As of July 18, 2018, Wells County was experiencing moderate to severe drought. The Drought Monitor fluctuates throughout the year and the information shown in Figure 5.3.2.1 is not indicative of future risk.

Figure 5.3.2.1 – July 18, 2018 U.S. Drought Monitor – North Dakota



Source: U.S. Drought Monitor

Risk Assessment

Table 5.3.2.2 shows the risk assessment as determined by individual jurisdictions and the Plan Update Committee for drought. The risk assessment methodology can be found in the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment. The total in Table 5.3.2.2 represents the sum of each jurisdiction's impact, frequency, likelihood and vulnerability to a hazard less the jurisdiction's capabilities to respond to the hazard.

Table 5.3.2.2 – Wells County Drought Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Wells County	4	2	4	3	1	12
City of Bowdon	3	3	3	3	2	10
City of Cathay	3	3	3	3	2	10
City of Fessenden	3	3	3	3	1	11
City of Hamberg	3	3	3	3	2	10
City of Harvey	4	3	3	4	2	12
City of Hurdsfield	3	3	3	3	2	10
City of Sykeston	4	3	3	4	2	12

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

Table 5.3.2.3 provides information on the specific impact, frequency, likelihood, vulnerability and capability of drought in The Planning Area. A list of impacts of drought identified as commonplace regardless of the jurisdiction are listed below.

Identified Impacts – Drought

- Business Interruptions
- Crop Loss
- Human Injury/Death
- Increased Fire Potential
- Livestock Injury/Death
- Loss of Econom
- Loss of Potable Water
- Loss of Wildlife Habitat
- Property Damage
- Soil Erosion
- Wildlife Injury/Death

Table 5.3.2.3 – The Planning Area Drought Risk Assessment

	Eddy County, North Dakota	Wells County, North Dakota
Impact	<ul style="list-style-type: none"> • Business Interruptions • Crop Loss • Increased Fire Potential • Livestock Injury/Death • Loss of Potable Water • Combine or baler fires from dry conditions 	<ul style="list-style-type: none"> • Crop Loss • Increased Fire Potential • Livestock Injury/Death • Loss of Potable Water • Combine or baler fires from dry conditions
Frequency	<ul style="list-style-type: none"> • Annual periods of dry conditions • Cycle every 10 years • Drought of 1988 and 1989 • Burn bans implemented annually 	<ul style="list-style-type: none"> • Annual periods of dry conditions • Cycle every 10 years • Drought of 1988 and 1989 • Burn bans implemented annually
Likelihood	<p><u>More likely</u></p> <ul style="list-style-type: none"> • Overdue for drought based on wet/dry cycle <p><u>Less likely</u></p> <ul style="list-style-type: none"> • Modern ag practices – drain tile, irrigation, no till farming 	<p><u>More likely</u></p> <ul style="list-style-type: none"> • Overdue for drought based on wet/dry cycle <p><u>Less likely</u></p> <ul style="list-style-type: none"> • Modern ag practices – drain tile, irrigation, no till farming
Vulnerability	<p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • Livestock ponds dry up or become dangers for livestock to ingest due to bacteria • Agriculture economy • Removal of shelter belts/tree rows • Lack of water sources for fire suppression • City lagoons and county water infrastructure <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • Modern ag practices – drain tile, irrigation systems, etc. • No till farming • Advanced forecasting and weather simulations • Small cities and county residents on rural water system 	<p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • Livestock ponds dry up or become dangers for livestock to ingest due to bacteria • Agriculture economy • Removal of shelter belts/tree rows • City lagoons and county water infrastructure <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • Modern ag practices – drain tile, irrigation systems, etc. • No till farming • farming • Advanced forecasting and weather simulations • St. Aloisius Medical Center • Small cities and county residents on rural water system
Capability	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address drought. 	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address drought.

Vulnerabilities to Publicly-Owned Buildings and Property

Drought does not have a direct impact on structures. However, loss of water supply would influence the function of publicly-owned buildings. Disruptions in service and extended periods of closure may occur. Drought would threaten publicly-owned buildings and property from the increase in fire threat and the potential decrease in available water for fire suppression. A summary of publicly-owned buildings is provided in Chapter 4, Profile and Inventory.

Vulnerabilities of Critical Facilities and Infrastructure

Critical facilities that rely on water for operation and continued use are most vulnerable to drought. Large employers in the agriculture sector and manufacturing can be negatively affected by drought and are viewed as critical facilities, depending on the number of people they employ and the impact they have on local economies. Critical facilities and infrastructure vulnerable to drought include public water systems that provide drinking water and disposal of waste water, among others. Many public water systems extract water from surface bodies of water. If water levels become too low, public water systems may be forced to ration water or cease operation altogether.

Vulnerabilities to New and Future Development

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

The agriculture sector is becoming increasingly mechanized and requires larger amounts of water. Increased demand for water in the agriculture sector will simultaneously increase the vulnerability of drought in Wells County.

With the possibility of climate change, this hazard may impact Wells County with more frequency and increased severity.

Data Limitations and Other Key Documents

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

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

- North Dakota Continuity of Operations Plan
- North Dakota Drought Mitigation Plan

- North Dakota Emergency Operations Plan
- North Dakota State Disaster Recovery Plan
- North Dakota State Hazard Mitigation Plan
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)
- Wells County Emergency Operations Plan
- Wells County Evacuation and Shelter Plan
- Wells County Local Emergency Operations Plan
- Wells County Shelter and Mass Care Plan
- Wells County Threat and Hazard Identification and Risk Assessment (THIRA)

DRAFT

5.4.1 Flood

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

Characteristics

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

Seasonal Pattern	Spring and summer
Duration	Several hours for flash flooding; up to 2 weeks or several months depending on severity for major flooding
Speed of Onset	Minutes for flash flooding. More than 24 hours warning for major flooding.
Location	Low-lying areas near or adjacent to bodies of water, or with inadequate drainage.

For more information regarding flood please reference the **State of North Dakota** Multi-Hazard Mitigation Plan. The plan can be accessed by following the link provided below.

<http://www.nd.gov/des/uploads/resources/915/final-ndmhmp-update.pdf>

History

Table 5.4.1.1 summarizes the history of flooding in Eddy County and indicates 24 reported instances of the hazard between June 2000 and December 2016. There have been 16 Presidential Disaster Declarations involving flooding that has included Eddy County. The Plan Update Committee also indicated annual occurrences of flooding impacting critical facilities and infrastructure. This information is shown in Table 5.4.1.4.

A detailed hazard history for Eddy County can be found on a disc located at the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment.

Table 5.4.1.1 – Eddy County Flood Hazard History Summary

Flood					
Occurrences	Date Range	Fatalities	Injuries	Property Damage	Crop Damage
24	June 2000 to Dec. 2016	0	0	\$216,000.00	\$15,000.00

Source(s): National Climatic Data Center (NCDC), National Oceanic and Atmospheric Administration (NOAA)

Per the 2014 State of North Dakota MHMP, the following points pertain to flooding history in Eddy County:

- There were 13 presidential disaster and emergency declarations declared that included Eddy County between 1989 and 2013.
- Between 2000 and February 2013, there were five flood events in Eddy County that resulted in \$15,000 in property damages. Similarly, there were 14 flash flood events in the county during the same time frame resulting in \$201,000 in property damages.

Crop Loss. Crop loss from flood is tracked by the United States Department of Agriculture, Risk Management Agency (RMA). The RMA provides data on the crop type affected, damage cause description, determined acres and indemnity amount. The damage cause description identifies the cause of damage, determines acres identifies the number of acres lost due to damage, and the indemnity amount identifies the total amount of the loss for the designated peril. Between January 1, 2001 and December 31, 2016, Eddy County experienced 25 incidents of crop loss due to flooding impacting approximately 333 acres of crops totaling \$30,950 in losses.

FEMA Assistance. Eddy County has received federal assistance from FEMA for flood-related damages. The following information was provided by Eddy County Emergency Management.

- 2009: \$446,171.08
- 2010: \$53,618.43
- 2011: \$837,325.41
- 2013: \$14,065.54
- 2014: \$118,564.83

Probability and Magnitude

Probability. Per Table 5.4.1.1, the probability of flooding in Eddy County is 71 percent based on 24 flood occurrences between June 2000 and December 2016. However, the Plan Update Committee indicated the probability of a flood in Eddy County as highly likely meaning that there is a 100 percent probability in the next year of a flood occurrence.

Magnitude. Based on history of flooding in Table 5.4.1.1 and crop loss information from the USDA-RMA, Eddy County can anticipate approximately \$12,706 in property damages and \$1,934 in crop losses annually. The Plan Update Committee indicated the magnitude of a flood in Eddy County as highly likely meaning that there is a 100 percent probability of a flood occurrence to a varying degree of severity in the next year.

Per the 2014 State of North Dakota MHMP, in 2009-2010, FEMA conducted a HAZUS Flood Average Annualized Loss (AAL) study. The study was performed for the entire continental United States using the MR4 release of HAZUS-MH. The inputs for the AAL included 30-meter Digital Elevation Model (DEM) and the default census block data in HAZUS MR4, which utilized the 2000 Decennial Census data. The purpose of the AAL study was to identify flood-prone areas and communicate relative flood risk in terms of people and property vulnerable to damage. The AAL study data provides potential dollar losses for four flood frequencies as follows: 10-percent (10-year), 2-percent (50-year), 1-percent (100-year), and 0.2 percent (500-year). The average annualized loss estimates are then calculated based on the aggregated dollar losses from the various flood frequencies (averaged and annualized).

The following are key points for Eddy County derived from the study:

- Estimated \$3,000 in average annualized losses due to business disruption
- Estimated \$21,000 in average annualized residential building loss
- Estimated \$8,000 in average annualized residential contents loss
- No average annualized commercial building losses

- Estimated \$2,000 in average annualized commercial contents losses
- Estimated \$5,000 in average annualized other building losses
- Estimated \$19,000 in average annualized other contents losses
- **Total estimated average annualized losses of \$58,000 in Eddy County due to flooding**

National Flood Insurance Program (NFIP)

Table 5.4.1.2 shows the communities participating in the National Flood Insurance Program.

Communities that participate in the National Flood Insurance Program (NFIP) are required to adopt flood plain regulations that meet NFIP objectives:

- New buildings must be protected from flooding damages because of a 1-percent chance flood.
- New development must not cause an increase in flood damages to other property.

Table 5.4.1.2 – Participation in National Flood Insurance Program (NFIP) – Eddy County

Jurisdiction	CID #	Initial FHBM Identified	Initial FIRM Identified	Mapped
Eddy County	380694	NA	NA	(NSFHA)
City of New Rockford	380031	11/23/73	06/01/98	06/01/98(L)

Source: FEMA Community Status Book Report, North Dakota

- The city of Sheyenne does not participate in the NFIP.
- Digital Flood Insurance Rate Maps (DFIRMs) for Eddy County and incorporated jurisdictions can be found on a disc located at the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment.
- A map of the watersheds of Eddy County is shown in Chapter 9, Maps.
- Chapter 6, Mitigation Strategy includes mitigation projects to enroll jurisdictions and encourage participation in the National Flood Insurance Program (NFIP).
- Mitigation Project PR-3 encourages enrollment and participation in the NFIP for the city of Sheyenne.
- Mitigation Project PR-4 encourages review of local ordinances to meet or exceed minimum federal and state requirements, comply with NFIP, and enroll in the Community Rating System.

NFIP Program Policies, Claims and Loss Payments. Per the NFIP, as of August 31, 2017, there is one NFIP policy in Eddy County and one NFIP policy in the city of New Rockford. Since 1978, six claims have been made with five being closed totaling \$19,676.56 in payments.

Repetitive Loss Properties. Per FEMA, a repetitive loss (RL) property is any insurable building for which two or more claims of more than \$1,000 were paid by the National Flood Insurance Program (NFIP) within any rolling ten-year period, since 1978. A RL property may or may not be currently insured by the NFIP. There are no repetitive loss properties in Eddy County.

Risk Assessment

Table 5.4.1.3 shows the risk assessment as determined by individual jurisdictions and the Plan Update Committee for flood. The risk assessment methodology can be found in the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment. The total in Table 5.4.1.3 represents the sum of each jurisdiction's impact, frequency, likelihood and vulnerability to a hazard less the jurisdiction's capabilities to respond to the hazard.

Table 5.4.1.3 – Eddy County Flood Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Eddy County	4	3	4	3	2	12
City of New Rockford	4	4	4	2	1	13
City of Sheyenne	4	3	4	3	1	13

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

Table 5.4.1.4 provides information on the specific impact, frequency, likelihood, vulnerability and capability of flood in The Planning Area. A list of impacts of flood identified as commonplace regardless of the jurisdiction are listed below.

Identified Impacts – Flood

- Blocked Roads
- Business Interruptions
- Crop Loss
- Delayed Emergency Response
- Downed Power Lines
- Downed Trees
- Evacuation (Localized)
- Flooding (Street)
- Flooding (Structure)
- HAZMAT Release
- Human Injury/Death
- Increased Fire Potential
- Increased Public Safety Runs
- Livestock Injury/Death
- Loss of Economy
- Loss/Overcrowded Medical Facilities
- Loss of Potable Water
- Loss of Power
- Loss of Transportation/Accessibility
- Loss of Wildlife Habitat
- Property Damage
- Sewer Backup
- Wildlife Injury/Death

Table 5.4.1.3 – The Planning Area Flood Risk Assessment - continued

	Eddy County, North Dakota	Wells County, North Dakota
Impact	<ul style="list-style-type: none"> • Blocked Roads • Business Interruptions • Delayed Emergency Response • Downed Power Lines • Flooding (Street and overland) • Livestock Injury/Death • Loss of Economy • Loss of Potable Water • Loss of Power • Property Damage • Sewer Backup 	<ul style="list-style-type: none"> • Blocked Roads • Business Interruptions • Delayed Emergency Response • Downed Power Lines • Flooding (Street and overland) • Livestock Injury/Death • Loss of Economy • Loss of Potable Water • Loss of Power • Property Damage • Sewer Backup
Frequency	<ul style="list-style-type: none"> • Multiple Presidential Disaster Declarations (See Chapter 5, THIRA and Chapter 5.4, Flood) • Annual occurrences of riverine and overland flooding • Annual reports of blocked roads from standing water • Heavy rains/downpours and spring melt contribute to flooding annually 	<ul style="list-style-type: none"> • Multiple Presidential Disaster Declarations (See Chapter 5, THIRA and Chapter 5.4, Flood) • Annual occurrences of riverine and overland flooding • Annual reports of blocked roads from standing water • Heavy rains/downpours and spring melt contribute to flooding annually
Likelihood	<p><u>More likely</u></p> <ul style="list-style-type: none"> • Spring snow melt and heavy rains occurring annually • Lack of storm water system in rural areas & high-water table • More paved or impervious surfaces • Presence of low-lying areas in farm land • Installation of drain tile/water culvert in rural areas <p><u>Less likely</u></p> <ul style="list-style-type: none"> • Installation of drain tile/water culvert in rural areas 	<p><u>More likely</u></p> <ul style="list-style-type: none"> • Spring snow melt and heavy rains occurring annually • Lack of storm water system in rural areas & high-water table • More paved or impervious surfaces • Presence of low-lying areas in farm land • Installation of drain tile/water culvert in rural areas <p><u>Less likely</u></p> <ul style="list-style-type: none"> • Installation of drain tile/water culvert in rural areas

Table 5.4.1.3 – The Planning Area Flood Risk Assessment

	Eddy County, North Dakota	Wells County, North Dakota
Vulnerability	<p>Approximately 602 individuals under the age of 20, and 507 individuals age 65 and older, representing 25.4 and 21.4 percent of the population, respectively, and would be most vulnerable if a flood did occur.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • Frozen culverts • Low-lying roads • Undersized and inadequate drainage • Housing developments/structures in flood-prone areas • Lack of flood operations/management plan • Lack of generators for some critical facilities/infrastructure <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • County enrolled in the NFIP • Storm-Ready Communities 	<p>Approximately 716 individuals under the age of 20, and 514 individuals age 65 and older, representing 17.0 and 12.2 percent of the population, respectively, and would be most vulnerable if a flood did occur.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • County not enrolled in the NFIP • Frozen culverts • Low-lying roads • Undersized and inadequate drainage in some areas • Housing developments/structures in flood-prone areas • Lack of flood operations/management plan • Lack of generators for some critical facilities and infrastructure <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • Harvey and Sykeston Dams provide flood control • Rip-rap on some culverts • Flared-ends on culverts
Capability	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address flood. 	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address flood.

Vulnerabilities to Publicly-Owned Buildings and Property

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

Vulnerabilities of Critical Facilities and Infrastructure

Damage to critical infrastructure such as drinking water and sewer systems, roadways and electric power lines can happen when flooding occurs. Drinking water and sewer systems can be shut down when power to lift stations and water treatment facilities are suspended. Roads can be washed out or blocked from overland flooding, which limits access to critical facilities such as emergency services, schools and shelters. In Eddy County, the Plan Update Committee identified lift stations located in low-lying areas, buildings located in flood-prone areas, culverts, critical facilities/infrastructure without a generator and roads as the most vulnerable to flooding. An inventory of infrastructure and publicly-owned buildings and property is provided in Chapter 4 Profile and Inventory.

Vulnerabilities to New and Future Development

New and future development is at high-risk to flooding if constructed in a floodplain. With projected increases in local economic activity over the next five years from spillover in energy development, more people will be vulnerable to flooding if development is not restricted from flood-prone areas. Mapping helps determine which areas are flood-prone and not suitable for development. New and future development in Eddy County is more vulnerable to flooding as it does not have flood maps with enough detail to assist the county and cities in planning for future growth accordingly.

Data Limitations and Other Key Documents

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

- Eddy County Emergency Operations Plan
- Eddy County Evacuation and Shelter Plan
- Eddy County Local Emergency Operations Plan
- Eddy County Shelter and Mass Care Plan
- Eddy County Threat and Hazard Identification and Risk Assessment (THIRA)
- North Dakota Continuity of Operations Plan
- North Dakota Emergency Operations Plan
- North Dakota State Disaster Recovery Plan
- North Dakota State Hazard Mitigation Plan
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)

5.4.2 Flood

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

Characteristics

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

Seasonal Pattern	Spring and summer
Duration	Several hours for flash flooding; up to 2 weeks or several months depending on severity for major flooding
Speed of Onset	Minutes for flash flooding. More than 24 hours warning for major flooding.
Location	Low-lying areas near or adjacent to bodies of water, or with inadequate drainage.

For more information regarding flood please reference the **State of North Dakota** Multi-Hazard Mitigation Plan. The plan can be accessed by following the link provided below.

<http://www.nd.gov/des/uploads/resources/915/final-ndmhmp-update.pdf>

History

Table 5.4.2.1 summarizes the history of flooding in Wells County and indicates 12 reported instances of the hazard between May 2006 and December 2016. There have been 16 Presidential Disaster Declarations involving flooding that has included Wells County. The Plan Update Committee also indicated annual occurrences of flooding impacting critical facilities and infrastructure. This information is shown in Table 5.4.2.4.

A detailed hazard history for Wells County can be found on a disc located at the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment.

Table 5.4.2.1 – Wells County Flood Hazard History Summary

Flood					
Occurrences	Date Range	Fatalities	Injuries	Property Damage	Crop Damage
12	May 2006 to Dec. 2016	0	0	\$2,609,000.00	\$10,000.00

Source(s): National Climatic Data Center (NCDC), National Oceanic and Atmospheric Administration (NOAA)

Per the 2014 State of North Dakota MHMP, the following points pertain to flooding history in Wells County:

- There were 12 presidential disaster and emergency declarations declared that included Wells County between 1989 and 2013.
- Between 2000 and February 2013, there were two flood events in Wells County that resulted in \$2,450,000 in property damages. Similarly, there were six flash flood events in the county during the same time frame resulting in \$155,000 in property damages.

Crop Loss. Crop loss from flood is tracked by the United States Department of Agriculture, Risk Management Agency (RMA). The RMA provides data on the crop type affected, damage cause description, determined acres and indemnity amount. The damage cause description identifies the cause of damage, determines acres identifies the number of acres lost due to damage, and the indemnity amount identifies the total amount of the loss for the designated peril. Between January 1, 2001 and December 31, 2016, Wells County experienced 17 incidents of crop loss due to flooding between impacting approximately 184 acres of crops totaling \$9,060 in losses.

Probability and Magnitude

Probability. Per Table 5.4.2.1, the probability of flooding in Wells County is 92 percent based on 12 flood occurrences between May 2006 and December 2016. However, the Plan Update Committee indicated the probability of a flood in Wells County as likely meaning that there is between a 10 and 100 percent probability in the next year of a flood occurrence.

Magnitude. Based on history of flooding in Table 5.4.2.1 and crop loss information from the USDA-RMA, Wells County can anticipate approximately \$237,182 in property damages and \$566 in crop losses annually. The Plan Update Committee indicated the magnitude of a flood in Wells County as highly likely meaning that there is a 100 percent probability of a flood occurrence to a varying degree of severity in the next year.

Per the 2014 State of North Dakota MHMP, in 2009-2010, FEMA conducted a HAZUS Flood Average Annualized Loss (AAL) study. The study was performed for the entire continental United States using the MR4 release of HAZUS-MH. The inputs for the AAL included 30-meter Digital Elevation Model (DEM) and the default census block data in HAZUS MR4, which utilized the 2000 Decennial Census data. The purpose of the AAL study was to identify flood-prone areas and communicate relative flood risk in terms of people and property vulnerable to damage. The AAL study data provides potential dollar losses for four flood frequencies as follows: 10-percent (10-year), 2-percent (50-year), 1-percent (100-year), and 0.2 percent (500-year). The average annualized loss estimates are then calculated based on the aggregated dollar losses from the various flood frequencies (averaged and annualized).

The following are key points for Wells County derived from the study:

- Estimated \$11,000 in average annualized losses due to business disruption
- Estimated \$84,000 in average annualized residential building loss
- Estimated \$130,000 in average annualized residential contents loss
- Estimated \$17,000 in average annualized commercial building losses
- Estimated \$50,000 in average annualized commercial contents losses
- Estimated \$29,000 in average annualized other building losses
- Estimated \$67,000 in average annualized other contents losses
- **Total estimated average annualized losses of \$396,000 in Wells County due to flooding**

National Flood Insurance Program (NFIP)

Table 5.4.2.2 shows the communities participating in the National Flood Insurance Program.

Communities that participate in the National Flood Insurance Program (NFIP) are required to adopt flood plain regulations that meet NFIP objectives:

- New buildings must be protected from flooding damages because of a 1-percent chance flood.
- New development must not cause an increase in flood damages to other property.

Table 5.4.2.2 – Participation in National Flood Insurance Program (NFIP) – Wells County

Jurisdiction	CID #	Initial FHBM Identified	Initial FIRM Identified	Mapped
City of Fessenden	380226	01/17/75	NA	(NSFHA)
City of Harvey	380231	01/24/75	08/05/86	08/05/86(M)
City of Sykeston	380207	01/17/75	NA	(NSFHA)

Source: FEMA Community Status Book Report, North Dakota

- Wells County and the cities of Bowdon, Cathay, Hamberg, Hurdsfield do not participate in the NFIP.
- There is one Digital Flood Insurance Rate Map (DFIRM) for the city of Harvey. The DFIRM can be found on a disc located at the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment.
- A map of the watersheds of Wells County is shown in Chapter 9, Maps.
- Chapter 6, Mitigation Strategy includes mitigation projects to enroll jurisdictions and encourage participation in the National Flood Insurance Program (NFIP).
- Mitigation Project PR-3 encourages enrollment and participation in the NFIP.
- Mitigation Project PR-4 encourages review of local ordinances to meet or exceed minimum federal and state requirements, comply with NFIP, and enroll in the Community Rating System.

NFIP Program Policies, Claims and Loss Payments. Per the NFIP, as of August 31, 2017, there are no NFIP policies in Wells County.

Repetitive Loss Properties. Per FEMA, a repetitive loss (RL) property is any insurable building for which two or more claims of more than \$1,000 were paid by the National Flood Insurance Program (NFIP) within any rolling ten-year period, since 1978. A RL property may or may not be currently insured by the NFIP. There are no repetitive loss properties in Wells County.

Risk Assessment

Table 5.4.2.3 shows the risk assessment as determined by individual jurisdictions and the Plan Update Committee for flood. The risk assessment methodology can be found in the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment. The total in Table 5.4.2.3 represents the sum of each jurisdiction's impact, frequency, likelihood and vulnerability to a hazard less the jurisdiction's capabilities to respond to the hazard.

Table 5.4.2.3 – Wells County Flood Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Wells County	4	4	4	4	2	14
City of Bowdon	3	2	2	3	1	9
City of Cathay	3	2	2	3	1	9
City of Fessenden	4	4	4	4	1	15
City of Hamberg	3	2	2	3	1	9
City of Harvey	4	4	4	4	1	15
City of Hurdsfield	3	2	2	3	1	9
City of Sykeston	3	3	3	3	1	11

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

Table 5.4.2.4 provides information on the specific impact, frequency, likelihood, vulnerability and capability of flood in The Planning Area. A list of impacts of flood identified as commonplace regardless of the jurisdiction are listed below.

Identified Impacts – Flood

- Blocked Roads
- Business Interruptions
- Crop Loss
- Delayed Emergency Response
- Downed Power Lines
- Downed Trees
- Evacuation (Localized)
- Flooding (Street)
- Flooding (Structure)
- HAZMAT Release
- Human Injury/Death
- Increased Fire Potential
- Increased Public Safety Runs
- Livestock Injury/Death
- Loss of Economy
- Loss/Overcrowded Medical Facilities
- Loss of Potable Water
- Loss of Power
- Loss of Transportation/Accessibility
- Loss of Wildlife Habitat
- Property Damage
- Sewer Backup
- Wildlife Injury/Death

Table 5.4.2.3 – The Planning Area Flood Risk Assessment

	Eddy County, North Dakota	Wells County, North Dakota
Impact	<ul style="list-style-type: none"> Blocked Roads Business Interruptions Delayed Emergency Response Downed Power Lines Flooding (Street and overland) Livestock Injury/Death Loss of Economy Loss of Potable Water Loss of Power Property Damage Sewer Backup 	<ul style="list-style-type: none"> Blocked Roads Business Interruptions Delayed Emergency Response Downed Power Lines Flooding (Street and overland) Livestock Injury/Death Loss of Economy Loss of Potable Water Loss of Power Property Damage Sewer Backup
Frequency	<ul style="list-style-type: none"> Multiple Presidential Disaster Declarations (See Chapter 5, THIRA and Chapter 5.4, Flood) Annual occurrences of riverine and overland flooding Annual reports of blocked roads from standing water Heavy rains/downpours and spring melt contribute to flooding annually 	<ul style="list-style-type: none"> Multiple Presidential Disaster Declarations (See Chapter 5, THIRA and Chapter 5.4, Flood) Annual occurrences of riverine and overland flooding Annual reports of blocked roads from standing water Heavy rains/downpours and spring melt contribute to flooding annually
Likelihood	<p><u>More likely</u></p> <ul style="list-style-type: none"> Spring snow melt and heavy rains occurring annually Lack of storm water system in rural areas & high-water table More paved or impervious surfaces Presence of low-lying areas in farm land Installation of drain tile/water culvert in rural areas <p><u>Less likely</u></p> <ul style="list-style-type: none"> Installation of drain tile/water culvert in rural areas 	<p><u>More likely</u></p> <ul style="list-style-type: none"> Spring snow melt and heavy rains occurring annually Lack of storm water system in rural areas & high-water table More paved or impervious surfaces Presence of low-lying areas in farm land Installation of drain tile/water culvert in rural areas <p><u>Less likely</u></p> <ul style="list-style-type: none"> Installation of drain tile/water culvert in rural areas

Table 5.4.2.3 – The Planning Area Flood Risk Assessment - continued

	Eddy County, North Dakota	Wells County, North Dakota
Vulnerability	<p>Approximately 602 individuals under the age of 20, and 507 individuals age 65 and older, representing 25.4 and 21.4 percent of the population, respectively, and would be most vulnerable if a flood did occur.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • Frozen culverts • Low-lying roads • Undersized and inadequate drainage • Housing developments/structures in flood-prone areas • Lack of flood operations/management plan • Lack of generators for some critical facilities/infrastructure <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • County enrolled in the NFIP • Storm-Ready Communities 	<p>Approximately 716 individuals under the age of 20, and 514 individuals age 65 and older, representing 17.0 and 12.2 percent of the population, respectively, and would be most vulnerable if a flood did occur.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • County not enrolled in the NFIP • Frozen culverts • Low-lying roads • Undersized and inadequate drainage in some areas • Housing developments/structures in flood-prone areas • Lack of flood operations/management plan • Lack of generators for some critical facilities and infrastructure <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • Harvey and Sykeston Dams provide flood control • Rip-rap on some culverts • Flared-ends on culverts
Capability	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address flood. 	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address flood.

Vulnerabilities to Publicly-Owned Buildings and Property

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

Vulnerabilities of Critical Facilities and Infrastructure

Damage to critical infrastructure such as drinking water and sewer systems, roadways and electric power lines can happen when flooding occurs. Drinking water and sewer systems can be shut down when power to lift stations and water treatment facilities are suspended. Roads can be washed out or blocked from overland flooding, which limits access to critical facilities such as emergency services, schools and shelters. In Wells County, the Plan Update Committee identified lift stations located in low-lying areas, buildings located in flood-prone areas, culverts, critical facilities/infrastructure without a generator and roads as the most vulnerable to flooding. **In the city of Harvey, damage to roadways from flooding impacts the water transmission line from the city's water wells to the water treatment plant.** An inventory of infrastructure and publicly-owned buildings and property is provided in Chapter 4 Profile and Inventory.

Vulnerabilities to New and Future Development

New and future development is at high-risk to flooding if constructed in a floodplain. With projected increases in local economic activity over the next five years from spillover in energy development, more people will be vulnerable to flooding if development is not restricted from flood-prone areas. Mapping helps determine which areas are flood-prone and not suitable for development. New and future development in Wells County is more vulnerable to flooding as it does not have flood maps with enough detail to assist the county and cities in planning for future growth accordingly.

Data Limitations and Other Key Documents

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

- North Dakota Continuity of Operations Plan
- North Dakota Emergency Operations Plan
- North Dakota State Disaster Recovery Plan
- North Dakota State Hazard Mitigation Plan
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)
- Wells County Emergency Operations Plan
- Wells County Evacuation and Shelter Plan
- Wells County Local Emergency Operations Plan
- Wells County Shelter and Mass Care Plan
- Wells County Threat and Hazard Identification and Risk Assessment (THIRA)

5.5.1 Hazardous Material Release

Characteristics

Hazardous materials are any substance in any quantity or form that may pose an unreasonable risk to the safety, health, environment, and property of citizens. The term “hazardous material” covers a wide array of products, from relatively innocuous ones such as hair spray in aerosol dispensers and wash preservatives such as creosote to highly toxic or poisonous material such as polychlorinated biphenyl (PCB’s) and phosgene gas. The potential severity of hazards of these materials is varied but the primary reason for their designation is their risk to public safety.

Seasonal Pattern	None
Duration	Minutes/hours/days
Speed of Onset	No warning
Location	Along major transportation routes (road, rail, etc.) and storage sites

For more information regarding hazardous material release please reference the **State of North Dakota** Multi-Hazard Mitigation Plan. The plan can be accessed by following the link provided below.

<http://www.nd.gov/des/uploads/resources/915/final-ndmhmp-update.pdf>

History

Table 5.5.1.1 summarizes the history of hazardous material release in Eddy County and indicates two instances of the hazard between March 30, 2004 and August 13, 2008. A detailed hazard history for Eddy County can be found on a disc located at the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment.

Table 5.5.1.1 – Eddy County Hazardous Material Release Hazard History Summary

Incident Date	Latitude	Longitude	Contaminant	Volume	Units	Contained
3/30/2004	47.68009	-99.11496	Unleaded Gasoline	6,000.00	gallons	--
8/13/2008	47.5946	-98.91547	Crude Oil	200.00	gallons	--
TOTAL				6,200.00		
AVERAGE				3,100.00		

Source(s): N.D. Dept. of Health

- Approximately 6,200 gallons of hazardous materials were spilled between March 30, 2004 and August 13, 2008.
- Eddy County can expect an average spill size of approximately 3,100 gallons.

Probability and Magnitude

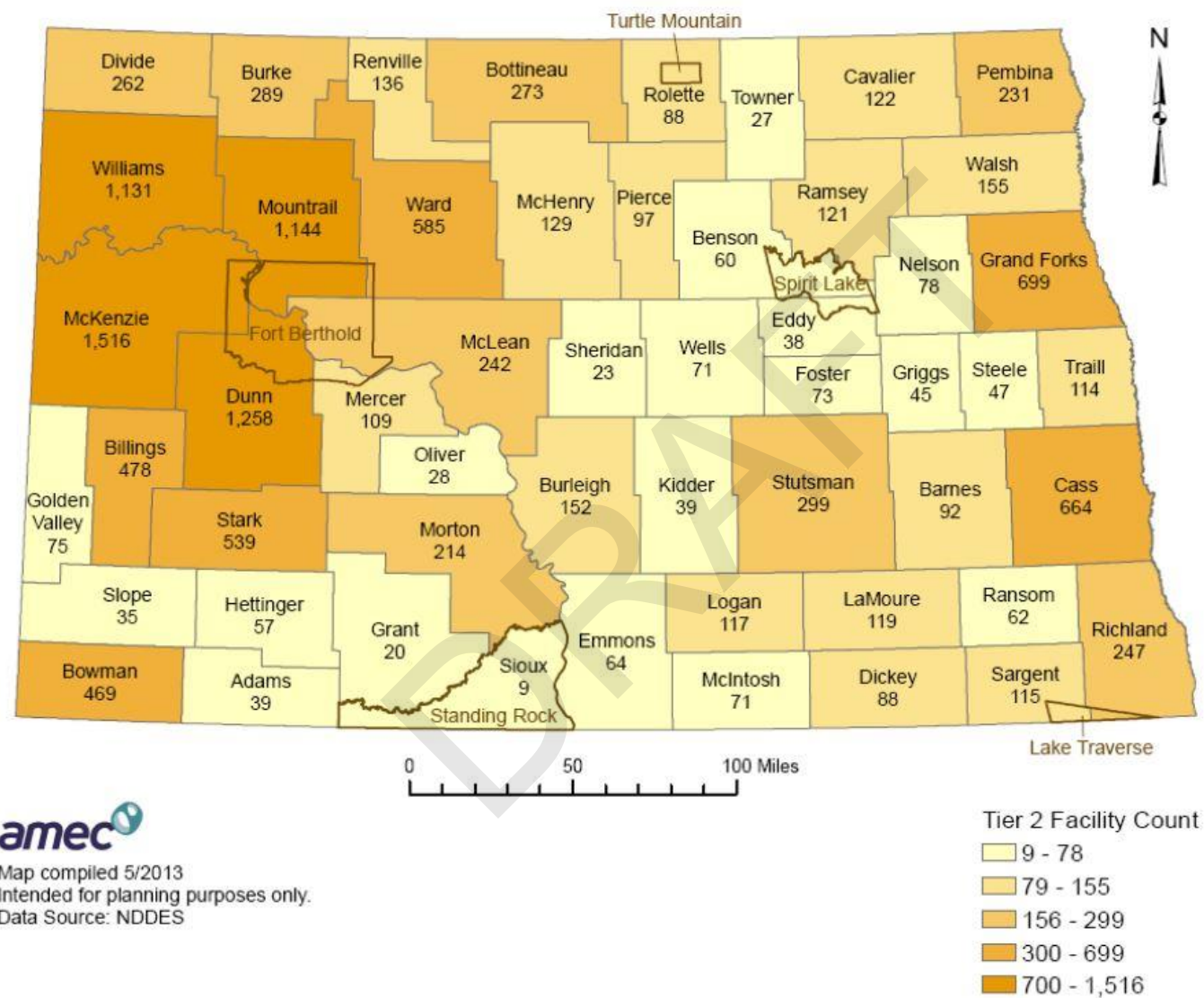
Probability. Per Table 5.5.1.1, the probability of hazardous material release in Eddy County is 14 percent based on two reported occurrences between 2004 and 2017. A spill/release can be expected to occur once every seven years. The Plan Update Committee indicated the probability of a hazardous material release is likely meaning that there is between 10 and 100 percent probability in the next year of an incident.

- **Airports.** Hazardous materials are transported via plane to and from Eddy County using Tomlinson Field or private landing strips. There are no reported incidents of a plane crash carrying hazardous materials in Eddy County.
- **Facilities (Extremely Hazardous Substance).** These facilities are required under Occupational Safety and Health Administration regulations to maintain the material safety data sheets and report the chemical quantities that equal or exceed either 500 pounds or the threshold planning quantity. As of 2011, there are eight facilities that meet this definition located in Eddy County.
- **Pipelines.** There three pipelines traversing the western portion Eddy County. The pipelines transport gas and hazardous liquids. The magnitude of a spill varies but will most likely be minimal. Figure 5.5.1.2 on the following pages illustrates the extent of pipelines in Eddy County.
- **Road.** It is unknown if the reports incidents in Table 5.5.1.1 were the result of a transportation accident or a leak from a storage site. The N.D. Dept. of Health provided the data, but did not specify the cause of the release/spill. However, according to Eddy County Emergency Management and the Plan Update Committee, releases/spills do occur from road transportation accidents.
- **Rail.** No hazardous material incidents involving railroads has occurred in Eddy County.
- **Tier II.** Tier II refers to facilities covered by the Emergency Planning and Community Right-to-Know Act (EPCRA). These facilities are required to submit an inventory of chemicals used to their Local Emergency Plan Update Committee (LEPC), the state emergency response commission and local fire departments each year. **Per the 2014 State of North Dakota MHMP, approximately 38 Tier II facilities are in Eddy County.** Figure 5.5.1.1 on the following page illustrates the number of Tier II sites in the state of North Dakota by county.
- The HAZMAT Vulnerability Analysis for Eddy County is low due to a small number of Tier II sites and a moderate presence of pipelines per the state mitigation plan.

Magnitude. Per Table 5.5.1.1, the largest reported spill/release was approximately 6,000 gallons of unleaded gasoline occurring on March 30, 2004. With the lack detail on the cause of leaks/spills, the magnitude of a hazardous material release from these sources in Eddy County would be minimal. However, any type of release/spill in the county could pose a challenge due to the small size of emergency services and low population.

The Plan Update Committee indicated the magnitude or impact of a hazardous material release as catastrophic meaning more than 50 percent of the county, its people and property could be affected.

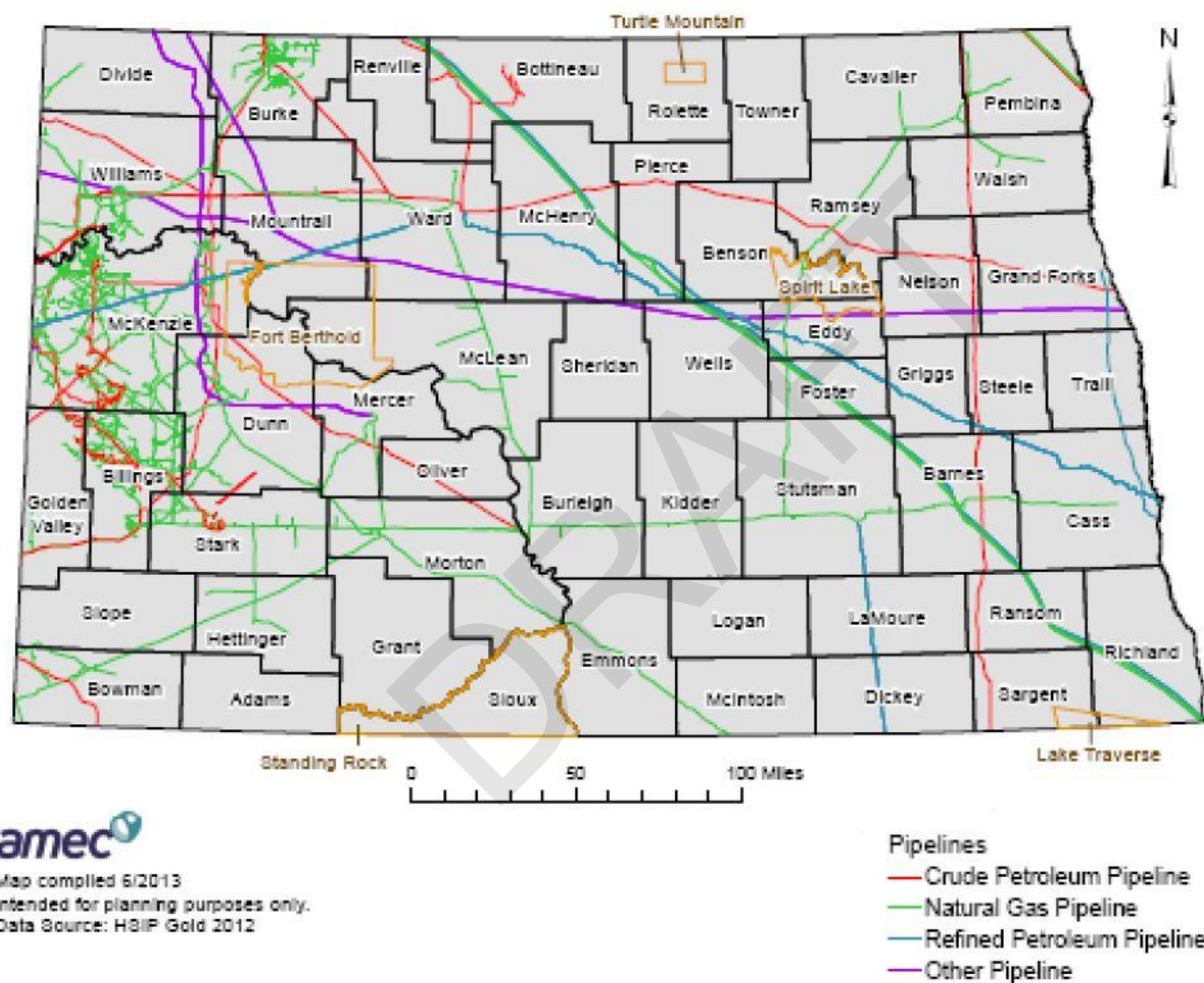
Figure 5.5.1.1 – 2011 North Dakota Tier II Sites



Map compiled 5/2013
Intended for planning purposes only.
Data Source: NDDIS

Source: 2014 State of North Dakota MHMP

Figure 5.5.1.2 – 2013 North Dakota Pipelines



Source: 2014 State of North Dakota MHMP

Risk Assessment

Table 5.5.1.2 shows the risk assessment as determined by individual jurisdictions and the Plan Update Committee for hazardous material release. The risk assessment methodology can be found in the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment. The total in Table 5.5.1.2 represents the sum of each jurisdiction's impact, frequency, likelihood and vulnerability to a hazard less the jurisdiction's capabilities to respond to the hazard.

Table 5.5.1.2 – Eddy County Hazardous Material Release Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Eddy County	4	2	3	3	1	11
City of New Rockford	3	3	3	2	1	10
City of Sheyenne	3	2	3	3	1	10

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

Table 5.5.1.3 provides information on the specific impact, frequency, likelihood, vulnerability and capability of hazardous material release in The Planning Area. A list of impacts of hazardous material release identified as commonplace regardless of the jurisdiction are listed below.

Identified Impacts – Hazardous Material Release

- Environmental Degradation
- Evacuation (Localized)
- Explosion
- HAZMAT Release
- Human Injury/Death
- Increased Fire Potential
- Increased Public Safety Runs
- Livestock Injury/Death
- Loss of Economy
- Loss of Potable Water
- Loss of Transportation/Accessibility
- Loss of Wildlife Habitat
- Mass Casualties
- Property Damage
- School Closure
- Wildlife Injury/Death

Table 5.5.1.3 – The Planning Area Hazardous Material Release Risk Assessment

	Eddy County, North Dakota	Wells County, North Dakota
Impact	<ul style="list-style-type: none"> • Crop and livestock loss • Loss of life/injury • Outage of potable water treatment facilities and infrastructure • Blocked access for emergency services/commuting • Disruption to storm sewer/water supply • Disruption to medical facilities and emergency services 	<ul style="list-style-type: none"> • Evacuation (Localized) • Explosion • HAZMAT Release • Blocked access for emergency services • Cause structure or wildland fires
Frequency	<p>Constant transportation of chemicals and materials to sustain commerce, agriculture and an expected residential quality of life</p> <ul style="list-style-type: none"> • Small leaks and spills occurring annually 	<p>Constant transportation of chemicals and materials to sustain commerce, agriculture and an expected residential quality of life</p> <ul style="list-style-type: none"> • 1986: truck carrying urbanism was struck by a train • Late-1980s: derailed train by Heimdal carrying arsenic • 2015: Crude oil train derailment in Heimdal
Likelihood	<p><u>More likely</u></p> <ul style="list-style-type: none"> • Higher highway traffic volumes • Presence of U.S. Highway 281 and N.D. Highway 15 • Presence of railroad with trains moving at high speeds • Chemical storage facilities in the county and incorporated cities • Farmers hauling more chemicals used and stored locally • Bulk plants located in the county • Presence of pipelines <p><u>Less likely</u></p> <ul style="list-style-type: none"> • Slow-down in oil and gas activity • No hauling of hazardous materials via aircraft 	<p><u>More likely</u></p> <ul style="list-style-type: none"> • Higher highway traffic volumes • Presence of railroad with trains moving at high speeds • Presence of U.S. Highway 52, and N.D. Highways 3, 15, 30 and 200 • Chemical storage facilities in the county and incorporated cities • Farmers hauling more chemicals used and stored locally • Bulk plants located in the county • Presence of pipelines <p><u>Less likely</u></p> <ul style="list-style-type: none"> • Slow-down in oil and gas activity • No hauling of hazardous materials via aircraft

Table 5.5.1.3 – The Planning Area Hazardous Material Release Risk Assessment

	Eddy County, North Dakota	Wells County, North Dakota
Vulnerability	<p>Approximately 602 individuals under the age of 20, and 507 individuals age 65 and older, representing 25.4 and 21.4 percent of the population, respectively, and would be most vulnerable if a hazardous material release did occur.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • Lack of hazardous materials flow study • Emergency services only trained to the awareness level • Higher highway traffic volumes • Presence of U.S. Highway 281 and N.D. Highway 15 • Presence of railroad with trains moving at high speeds • Chemical storage facilities in the county and incorporated cities • Farmers hauling more chemicals used and stored locally • Bulk plants located in the county • Presence of pipelines <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • No hauling of hazardous materials via aircraft • Access to state and regional HAZMAT teams and sources • Sparse populations 	<p>Approximately 716 individuals under the age of 20, and 514 individuals age 65 and older, representing 17.0 and 12.2 percent of the population, respectively, and would be most vulnerable if a hazardous material release did occur.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • Emergency services only trained to the awareness level • Higher highway traffic volumes • Presence of railroad with trains moving at high speeds • Presence of U.S. Highway 52, and N.D. Highways 3, 15, 30 and 200 • Chemical storage facilities in the county and incorporated cities • Farmers hauling more chemicals used and stored locally • Bulk plants located in the county • Presence of pipelines <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • Hazardous material flow study • No hauling of hazardous materials via aircraft • Access to state and regional HAZMAT teams and sources • Sparse populations
Capability	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address hazardous material release. 	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address flood hazardous material release.

Vulnerabilities to Publicly-Owned Buildings and Property

All publicly-owned buildings are at risk to hazardous material release as this type of hazard can occur anywhere at any given time for a multitude of reasons. Buildings and property located near or adjacent to transportation modes, such as highways, railroads or airports are more at risk as the hazard typically occurs during transportation of hazardous materials. **The Eddy County Courthouse in the city of New Rockford is located 0.3 miles from the railroad.**

If facilities are located near fixed hazardous material sites, such as propane or anhydrous ammonia tanks, the risk is increased as the source for the hazard will always be present. If an explosion were to occur, building and property located nearby could experience moderate to severe damage and contamination, depending on the intensity and duration of the release. A summary of publicly-owned buildings is provided in Chapter 4, Profile and Inventory.

Vulnerabilities of Critical Facilities and Infrastructure

Like publicly-owned buildings and property, the vulnerability of the hazard to critical facilities and infrastructure depends largely on location. Critical facilities and infrastructure located near transportation arteries or hazardous material storage sites are most at risk. Depending on the facility or infrastructure, impact could range from moderate to severe. Water infrastructure could become contaminated and threaten public health.

Vulnerabilities to New and Future Development

The vulnerability of new and future development depends largely on the type and density being proposed and where development is allowed. Residential development should be developed in areas away from hazardous material storage sites or major transportation arteries where chemicals are transported. If new development is already in progress, a development moratorium should be implemented to stop future growth or densities should be limited to reduce the number of people potentially at risk.

Development in the industrial and agriculture sectors maintain demand for hazardous materials and are best situated near storage sites or transportation arteries to limit time spent in transit. Ultimately, hazardous materials should be prohibited from locating in residential or commercial areas, near hospitals, schools or community gathering spaces. If already existing, plans should be put into place for relocation at a future time when funding permits or an appropriate alternative site becomes available.

Data Limitations and Other Key Documents

The difficulty in understanding a hazardous material release is the lack of complete data reported on past releases. If any of the following information – location, time of day, wind speed/direction, temperature, humidity, method of release (transportation or facility failure), the amount of release and what material(s) are involved – is not reported, the ability to understand the true impact of the hazard is limited.

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

- Eddy County Emergency Operations Plan
- Eddy County Evacuation and Shelter Plan

- Eddy County Local Emergency Operations Plan
- Eddy County Shelter and Mass Care Plan
- Eddy County Threat and Hazard Identification and Risk Assessment (THIRA)
- North Dakota Continuity of Operations Plan
- North Dakota Emergency Operations Plan
- North Dakota State Disaster Recovery Plan
- North Dakota State Hazard Mitigation Plan
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)

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5.5.2 Hazardous Material Release

Characteristics

Hazardous materials are any substance in any quantity or form that may pose an unreasonable risk to the safety, health, environment, and property of citizens. The term “hazardous material” covers a wide array of products, from relatively innocuous ones such as hair spray in aerosol dispensers and wash preservatives such as creosote to highly toxic or poisonous material such as polychlorinated biphenyl (PCB’s) and phosgene gas. The potential severity of hazards of these materials is varied but the primary reason for their designation is their risk to public safety.

Seasonal Pattern	None
Duration	Minutes/hours/days
Speed of Onset	No warning
Location	Along major transportation routes (road, rail, etc.) and storage sites

For more information regarding hazardous material release please reference the **State of North Dakota** Multi-Hazard Mitigation Plan. The plan can be accessed by following the link provided below.

<http://www.nd.gov/des/uploads/resources/915/final-ndmhmp-update.pdf>

History

Table 5.5.2.1 summarizes the history of hazardous material release in Wells County and indicates 26 instances of the hazard between July 31, 1982 and September 27, 2016. A detailed hazard history for Wells County can be found on a disc located at the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment.

- A total of approximately 97,844 gallons of hazardous materials were spilled between July 31, 1982 and September 27, 2016. Not all reported spills in Wells County reported the volume of the spill.
- The average size of a release/spill was 4,659.24 gallons.
- The largest spill occurred May 6, 2015 at unincorporated Heimdal, Wells County. The spill was caused by a train derailment and resulted in 60,000 gallons of crude oil being spilled. The town of Heimdal was evacuated. **MORE INFORMATION TO COME ON THIS.**

Table 5.5.2.1 – Wells County Hazardous Material Release Hazard History Summary

Incident Date	Latitude	Longitude	Contaminant	Volume	Units	Contained
7/31/1982	47.84038	-99.95141	Diesel Fuel	3,000.00	gallons	--
10/1/1985	47.76771	-99.93009	Fuel Oil	--	--	--
5/13/1993	47.45041	-99.93704	Diesel Fuel	3,000.00	gallons	--
11/8/1993	47.78228	-99.97279	Transformer Oil	600.00	gallons	--
1/7/2001	47.76771	-99.93009	Diesel - Overfill. Onto snow and Ice.	40.00	gallons	--
3/18/2001	47.76771	-99.93009	"Not more than 20 gal diesel" spilled in fueling overflow, by local jobber.	20.00	gallons	--
5/23/2001	47.76781	-99.95138	Diesel fuel	40.00	gallons	--
9/30/2002	47.75327	-99.93024	Diesel Fuel	150.00	gallons	--
1/5/2005	47.76771	-99.93009	Railroad diesel fuel	25.00	gallons	--
4/18/2005	47.76771	-99.93009	Transformer oil	14.00	gallons	--
6/8/2005	47.76771	-99.93009	#2 Diesel Fuel	30.00	gallons	--
5/7/2006	47.40692	-99.91557	UAN (urea/ammonium nitrate) 28% nitrogen solution	9,500.00	gallons	--
4/15/2008	47.76771	-99.93009	anhydrous ammonia	5.00	gallons	--
3/18/2010	47.76771	-99.93009	antifreeze/ethylene glycol	10.00	gallons	--
4/28/2010	47.4432	-99.95554	Urea fertilizer	10,000.00	pounds	--
8/16/2010	47.78228	-99.97279	diesel spill	100.00	gallons	--
6/13/2011	47.45045	-100.00104	Liquid Nitrogen Fertilizer - 28%	10,000.00	gallons	--
8/2/2012	47.62452	-99.91597	#2 Dyed Diesel	700.00	gallons	--
12/20/2013	47.77409	-99.93949	presumably heating oil/diesel fuel/kerosene/gasoline	--	--	--
2/7/2014	47.77098	-99.93208	bulk petroleum	--	--	--
4/1/2015	47.77521	-99.94304	petroleum and potentially some fill w/coal clinkers	--	--	Yes
5/6/2015	47.79252	-99.64014	Crude Oil	60,000.00	gallons	Yes
9/6/2015	47.78903	-99.98252	Diesel Fuel	500.00	gallons	Yes
2/22/2016	47.76983	-99.93019	Diesel spill	100.00	gallons	Yes
9/7/2016	47.45802	-99.41476	Transformer oil	--	--	Yes
9/27/2016	47.77719	-99.94553	Sonalan HFP herbicide	10.00	gallons	Yes
TOTAL				97,844.00		
AVERAGE				4,659.24		

Source(s): N.D. Dept. of Health

Probability and Magnitude

Probability. Per Table 5.5.2.1, the probability of hazardous material release in Wells County is 72 percent based on 26 occurrences between 1982 and 2017. A spill/release can be expected to occur three times every four years. The Plan Update Committee indicated the probability of a hazardous material release is high likely meaning that there is a 100 percent probability in the next year of an incident.

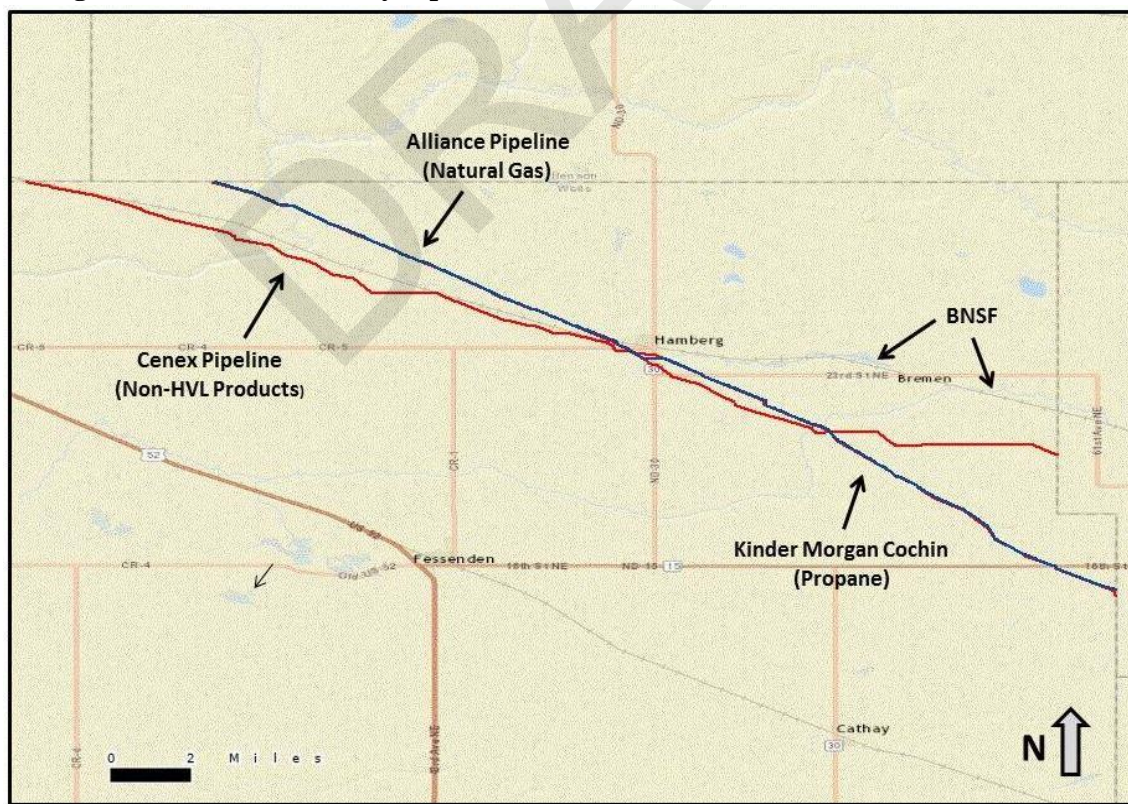
- **Airports.** Hazardous materials are transported via plane to and from Wells County using the Fessenden-Streibel Municipal Airport, Harvey Municipal Airport and private landing strips. There are no reported incidents of a plane crash carrying hazardous materials in Wells County.
- **Facilities (Extremely Hazardous Substance).** These facilities are required under Occupational Safety and Health Administration regulations to maintain the material safety data sheets and report the chemical quantities that equal or exceed either 500 pounds or the threshold planning quantity. As of 2011, there are 12 facilities that meet this definition located in Wells County.

- Pipelines.** There are three pipelines traversing the northeast corner of Wells County. The pipelines in Wells County traverse the northeast-portion of the county and are parallel to the BNSF railroad. The pipelines pass immediately south of the city of Hamberg. Figure 5.5.2.3 on the following pages illustrates the extent of pipelines in the State of North Dakota by county.

According to the National Pipeline Mapping System website, the Alliance Pipeline and Kinder Morgan pipeline operate on a simultaneous right-of-way. The Alliance pipeline transports Natural Gas and the Kinder Morgan Cochin pipeline transports Propane. The pipeline owned and operated by Cenex Pipeline transports Non-HVL Products.

Per the 2015 Wells County Hazardous Materials Flow Study, the Alliance Pipeline transports a total of 1.6 billion cubic feet of natural gas is each day through Wells County, equivalent to the heating needs of seven million homes. The pipeline is remotely monitored and operated by a gas control center 24 hours a day, 365 days a year. Any portion of the pipeline can be isolated if leaks or other problems are detected. The Cenex Pipeline transports gasoline and diesel. The 2014 annual throughput in Wells County was 2,104,363 barrels. The pipeline is operated via a Supervisory Control and Data Acquisition (SCADA) system equipped with leak detection monitoring and is monitored 24/hour a day. The Kinder Morgan Chochin Pipeline transports Liquefied Petroleum Gas. Information on the volume of the hazardous materials transported through these pipelines was not available. Figure 5.5.2.1 illustrates the pipelines traversing Wells County.

Figure 5.5.2.1 Wells County Pipelines



Source: 2015 Wells County Hazardous Materials Flow Study

- **Road.** It is unknown if the reports incidents in Table 5.5.2.1 were the result of a transportation accident or a leak from a storage site. The N.D. Dept. of Health provided the data, but did not specify the cause of the release/spill. However, according to Wells County Emergency Management and the Plan Update Committee, releases/spills do occur from road transportation accidents.

Per the 2015 Wells County Hazardous Materials Flow Study, the most common hazardous material type being transported through Wells County on highway is UN 1203 (Gasoline), accounting for 33 percent of all observed vehicles transporting hazardous materials. The second most common hazardous material commodity transported through Wells County is UN Number 1075 (liquefied petroleum gas) comprising 17 percent of all observed vehicles, followed by UN Number 1993 (diesel/fuel oil/flammable liquid) comprising 13 percent of all observed vehicles.

- **Rail.** The Burlington Northern Santa Fe Railroad (BNSF) and Canadian Pacific Railway (CP Rail) support freight needs in Wells County. The Red River Valley and Western (RRV&W) did support freight needs in Wells County, but has been abandoned in its entirety since 2004.

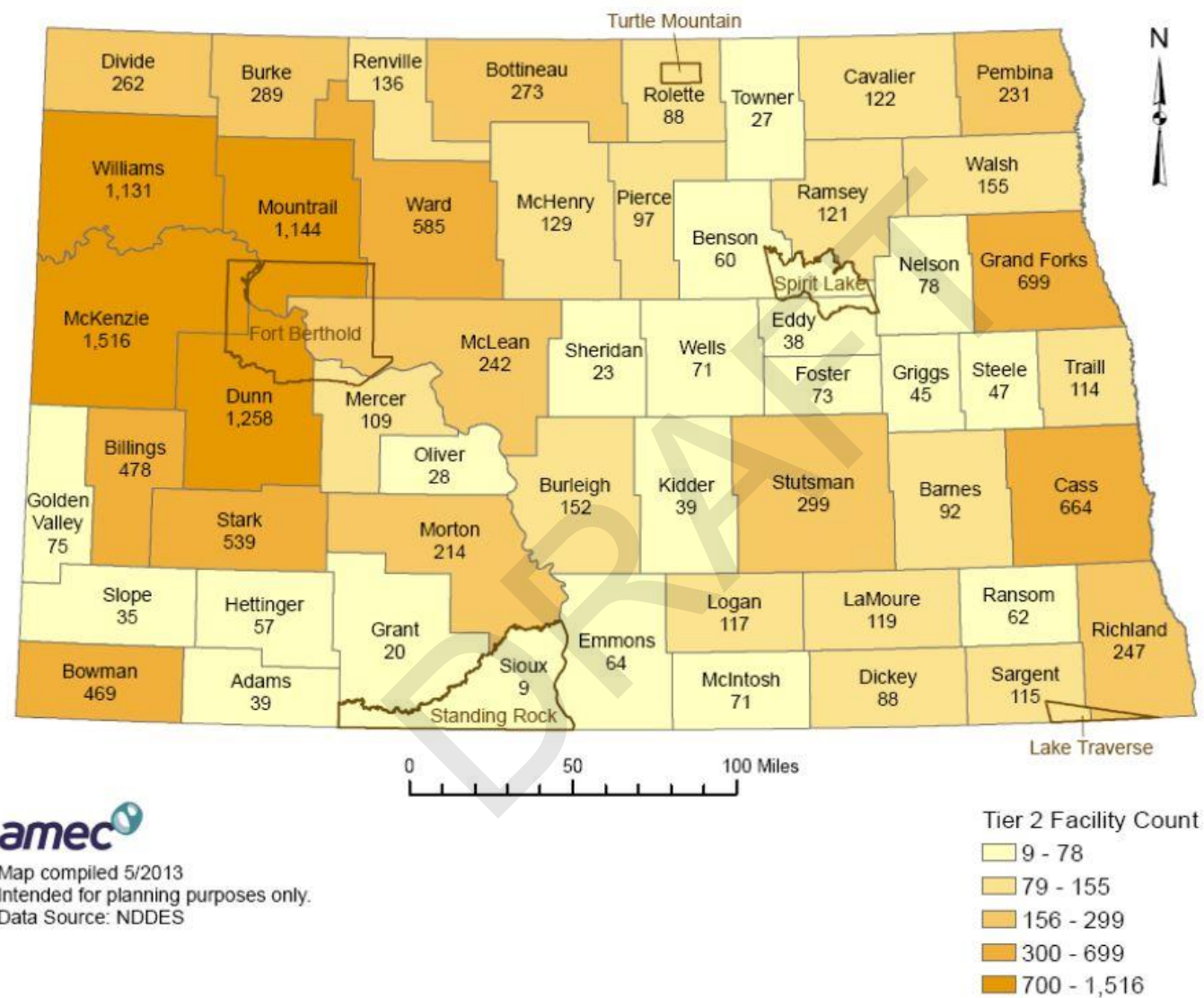
An average of 0.66 train cars carrying hazardous materials are transported daily through Wells County by Canadian Pacific Railway between January 1, 2014 and December 31, 2014. The most common hazardous material shipped through Wells County by CP Railway is UN1993 (Diesel/Fuel Oil/Flammable Liquid) accounting for 9.8 percent of all shipments of hazardous materials for the calendar year.

- **Tier II.** Tier II refers to facilities covered by the Emergency Planning and Community Right-to-Know Act (EPCRA). These facilities are required to submit an inventory of chemicals used to their Local Emergency Plan Update Committee (LEPC), the state emergency response commission and local fire departments each year. **Per the 2014 State of North Dakota MHMP, approximately 71 Tier II facilities are in Wells County.** Figure 5.5.2.2 on the following page illustrates the number of Tier II sites in the state of North Dakota by county.
- The HAZMAT Vulnerability Analysis for Wells County is low-moderate due to the number of Tier II sites and presence of pipelines per the state mitigation plan. This vulnerability may have increased to moderate after the train derailment in Heimdal.

Magnitude. Per Table 5.5.2.1, the largest reported spill/release was approximately 60,000 gallons of crude oil occurring on May 6, 2015, from the train derailment in Heimdal. With the lack detail on the cause of leaks/spills, the magnitude of a hazardous material release from these sources in Wells County would be minimal. However, any type of release/spill in the county could pose a challenge due to the small size of emergency services and low population.

The Plan Update Committee indicated the magnitude or impact of a hazardous material release as catastrophic meaning more than 50 percent of the county, its people and property could be affected.

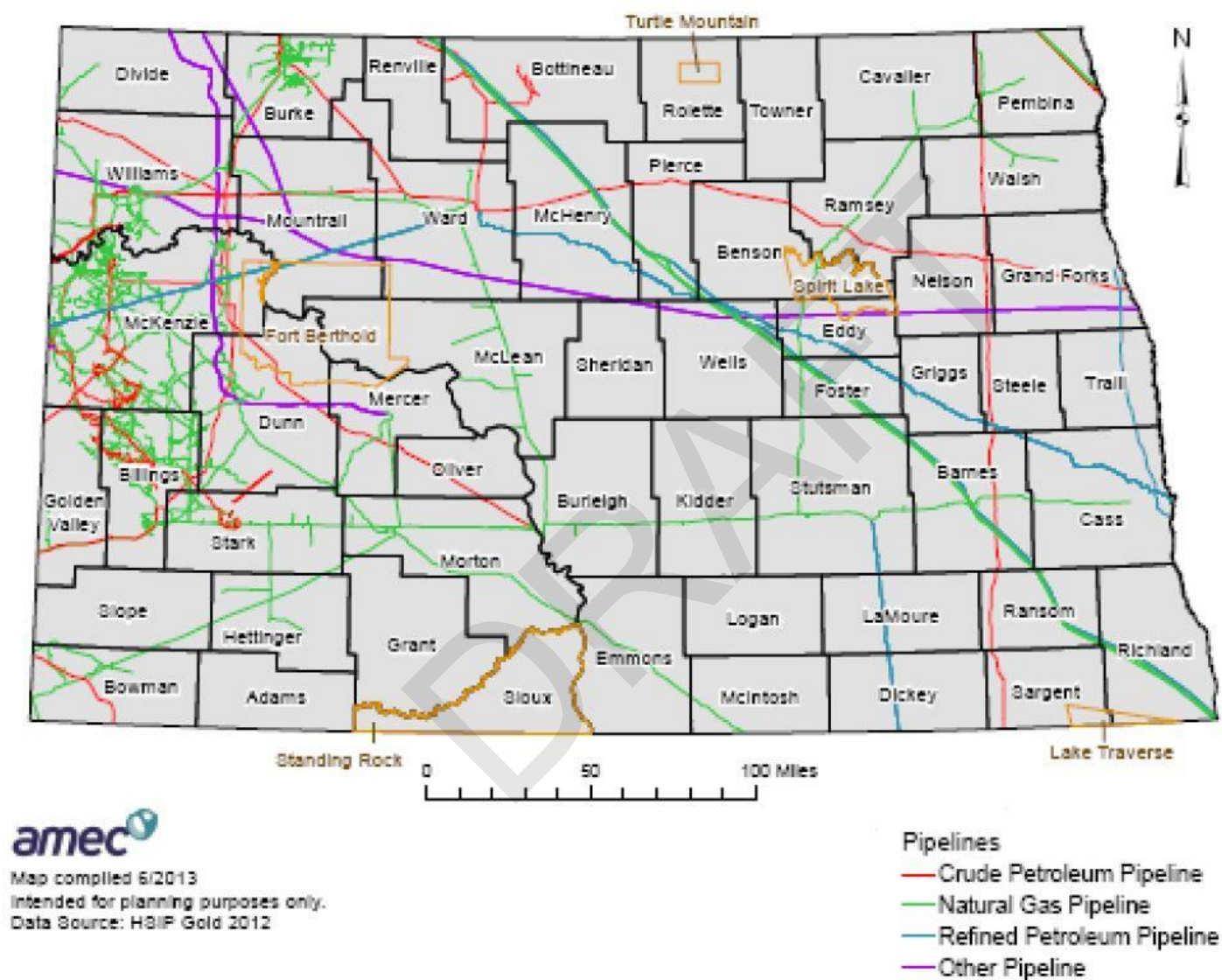
Figure 5.5.2.2 – 2011 North Dakota Tier II Sites



Map compiled 5/2013
Intended for planning purposes only.
Data Source: NDDIS

Source: 2014 State of North Dakota MHMP

Figure 5.5.2.3 – 2013 North Dakota Pipelines



Source: 2014 State of North Dakota MHMP

Risk Assessment

Table 5.5.2.2 shows the risk assessment as determined by individual jurisdictions and the Plan Update Committee for hazardous material release. The risk assessment methodology can be found in the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment. The total in Table 5.5.2.2 represents the sum of each jurisdiction's impact, frequency, likelihood and vulnerability to a hazard less the jurisdiction's capabilities to respond to the hazard.

Table 5.5.2.2 – Wells County Hazardous Material Release Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Wells County	4	2	4	3	1	12
City of Bowdon	2	2	2	2	1	7
City of Cathay	2	2	2	2	1	7
City of Fessenden	4	2	3	4	1	12
City of Hamberg	2	2	2	2	1	7
City of Harvey	4	4	4	4	1	15
City of Hurdsfield	2	2	2	2	1	7
City of Sykeston	3	2	2	3	1	9

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

Table 5.5.2.3 provides information on the specific impact, frequency, likelihood, vulnerability and capability of hazardous material release in The Planning Area. A list of impacts of hazardous material release identified as commonplace regardless of the jurisdiction are listed below.

Identified Impacts – Hazardous Material Release

- Environmental Degradation
- Evacuation (Localized)
- Explosion
- HAZMAT Release
- Human Injury/Death
- Increased Fire Potential
- Increased Public Safety Runs
- Livestock Injury/Death
- Loss of Economy
- Loss of Potable Water
- Loss of Transportation/Accessibility
- Loss of Wildlife Habitat
- Mass Casualties
- Property Damage
- School Closure
- Wildlife Injury/Death

Table 5.5.2.3 – The Planning Area Hazardous Material Release Risk Assessment

	Eddy County, North Dakota	Wells County, North Dakota
Impact	<ul style="list-style-type: none"> • Crop and livestock loss • Loss of life/injury • Outage of potable water treatment facilities and infrastructure • Blocked access for emergency services/commuting • Disruption to storm sewer/water supply • Disruption to medical facilities and emergency services 	<ul style="list-style-type: none"> • Evacuation (Localized) • Explosion • HAZMAT Release • Blocked access for emergency services • Cause structure or wildland fires
Frequency	<p>Constant transportation of chemicals and materials to sustain commerce, agriculture and an expected residential quality of life</p> <ul style="list-style-type: none"> • Small leaks and spills occurring annually 	<p>Constant transportation of chemicals and materials to sustain commerce, agriculture and an expected residential quality of life</p> <ul style="list-style-type: none"> • 1986: truck carrying urbanism was struck by a train • Late-1980s: derailed train by Heimdal carrying arsenic • 2015: Crude oil train derailment in Heimdal
Likelihood	<p><u>More likely</u></p> <ul style="list-style-type: none"> • Higher highway traffic volumes • Presence of U.S. Highway 281 and N.D. Highway 15 • Presence of railroad with trains moving at high speeds • Chemical storage facilities in the county and incorporated cities • Farmers hauling more chemicals used and stored locally • Bulk plants located in the county • Presence of pipelines <p><u>Less likely</u></p> <ul style="list-style-type: none"> • Slow-down in oil and gas activity • No hauling of hazardous materials via aircraft 	<p><u>More likely</u></p> <ul style="list-style-type: none"> • Higher highway traffic volumes • Presence of railroad with trains moving at high speeds • Presence of U.S. Highway 52, and N.D. Highways 3, 15, 30 and 200 • Chemical storage facilities in the county and incorporated cities • Farmers hauling more chemicals used and stored locally • Bulk plants located in the county • Presence of pipelines <p><u>Less likely</u></p> <ul style="list-style-type: none"> • Slow-down in oil and gas activity • No hauling of hazardous materials via aircraft

Table 5.5.2.3 – The Planning Area Hazardous Material Release Risk Assessment

	Eddy County, North Dakota	Wells County, North Dakota
Vulnerability	<p>Approximately 602 individuals under the age of 20, and 507 individuals age 65 and older, representing 25.4 and 21.4 percent of the population, respectively, and would be most vulnerable if a hazardous material release did occur.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • Lack of hazardous materials flow study • Emergency services only trained to the awareness level • Higher highway traffic volumes • Presence of U.S. Highway 281 and N.D. Highway 15 • Presence of railroad with trains moving at high speeds • Chemical storage facilities in the county and incorporated cities • Farmers hauling more chemicals used and stored locally • Bulk plants located in the county • Presence of pipelines <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • No hauling of hazardous materials via aircraft • Access to state and regional HAZMAT teams and sources • Sparse populations 	<p>Approximately 716 individuals under the age of 20, and 514 individuals age 65 and older, representing 17.0 and 12.2 percent of the population, respectively, and would be most vulnerable if a hazardous material release did occur.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • Emergency services only trained to the awareness level • Higher highway traffic volumes • Presence of railroad with trains moving at high speeds • Presence of U.S. Highway 52, and N.D. Highways 3, 15, 30 and 200 • Chemical storage facilities in the county and incorporated cities • Farmers hauling more chemicals used and stored locally • Bulk plants located in the county • Presence of pipelines <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • Hazardous material flow study • No hauling of hazardous materials via aircraft • Access to state and regional HAZMAT teams and sources • Sparse populations
Capability	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address hazardous material release. 	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address flood hazardous material release.

Vulnerabilities to Publicly-Owned Buildings and Property

All publicly-owned buildings are at risk to hazardous material release as this type of hazard can occur anywhere at any given time for a multitude of reasons. Buildings and property located near or adjacent to transportation modes, such as highways, railroads or airports are more at risk as the hazard typically occurs during transportation of hazardous materials. **The Wells County Courthouse in the city of Fessenden is located across the street from the railroad.**

If facilities are located near fixed hazardous material sites, such as propane or anhydrous ammonia tanks, the risk is increased as the source for the hazard will always be present. If an explosion were to occur, building and property located nearby could experience moderate to severe damage and contamination, depending on the intensity and duration of the release. A summary of publicly-owned buildings is provided in Chapter 4, Profile and Inventory.

Vulnerabilities of Critical Facilities and Infrastructure

Like publicly-owned buildings and property, the vulnerability of the hazard to critical facilities and infrastructure depends largely on location. Critical facilities and infrastructure located near transportation arteries or hazardous material storage sites are most at risk. Depending on the facility or infrastructure, impact could range from moderate to severe. Water infrastructure could become contaminated and threaten public health.

The St. Aloisius Medical Center is a critical facility located in the city of Harvey. The hospital or emergency services could be shut down temporarily or indefinitely due to an incident. If a release were to occur on a major roadway, emergency services would be limited and response times could be reduced or eliminated.

Vulnerabilities to New and Future Development

The vulnerability of new and future development depends largely on the type and density being proposed and where development is allowed. Residential development should be developed in areas away from hazardous material storage sites or major transportation arteries where chemicals are transported. If new development is already in progress, a development moratorium should be implemented to stop future growth or densities should be limited to reduce the number of people potentially at risk.

Development in the industrial and agriculture sectors maintain demand for hazardous materials and are best situated near storage sites or transportation arteries to limit time spent in transit. Ultimately, hazardous materials should be prohibited from locating in residential or commercial areas, near hospitals, schools or community gathering spaces. If already existing, plans should be put into place for relocation at a future time when funding permits or an appropriate alternative site becomes available.

Data Limitations and Other Key Documents

The difficulty in understanding a hazardous material release is the lack of complete data reported on past releases. If any of the following information – location, time of day, wind speed/direction, temperature, humidity, method of release (transportation or facility failure), the amount of release and what material(s) are involved – is not reported, the ability to understand the true impact of the hazard is limited.

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

- 2015 Wells County Hazardous Materials Flow Study
- North Dakota Continuity of Operations Plan
- North Dakota Emergency Operations Plan
- North Dakota State Disaster Recovery Plan
- North Dakota State Hazard Mitigation Plan
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)
- Wells County Emergency Operations Plan
- Wells County Evacuation and Shelter Plan
- Wells County Local Emergency Operations Plan
- Wells County Shelter and Mass Care Plan
- Wells County Threat and Hazard Identification and Risk Assessment (THIRA)

DRAFT

5.6.1 Homeland Security Incident

Including biological terrorism, chemical terrorism, civil unrest, cyber terrorism, explosive terrorism and radiological/nuclear terrorism.

Characteristics

A homeland security incident is any intentional human-caused incident, domestic or international, that causes mass casualties, large economic losses, or widespread panic in the country. Terrorism and civil unrest are examples of human-caused hazards that are intentional and often planned. Forms of civil unrest can range from groups blocking sidewalks, roadways, and buildings to mobs rioting and looting. Civil unrest may be spontaneous, as when a mob erupts into violence, or it may be planned, as when a demonstration or protest intentionally interferes with another individual's or group's lawful business.

Seasonal Pattern	None
Duration	Minutes/hours/days
Speed of Onset	Little to no warning
Location	Total geographic extent of Eddy County – most likely targeting critical facilities and infrastructure such as the Eddy County Courthouse

For more information regarding homeland security incident, please reference the North Dakota State Hazard Mitigation Plan. The plan can be accessed by following the link provided below.

<http://www.nd.gov/des/uploads/resources/915/final-ndmhmp-update.pdf>

History

The Eddy County Sheriff's Office indicated one homeland security incident in Eddy County.

September 6, 2015. Eddy County Sheriff's Office was working a wedding dance at the New Rockford Eagles Club. An active-shooter shot two people resulting in one fatality and two injuries. More detailed information on the event can be obtained by contacting the Eddy County Sheriff's Office.

According to the 2014 North Dakota State Hazard Mitigation Plan, Eddy County has experienced \$4,390 in vandalism/theft on local government facilities and \$11,544 in vandalism/theft on school district buildings.

Probability and Magnitude

Probability. The Plan Update Committee indicated the probability of a homeland security incident as possible, meaning that there is between a one and 10 percent probability in the next year of an incident.

Magnitude. The Plan Update Committee indicated the magnitude of a homeland security incident can be catastrophic meaning more than 50 percent of the jurisdiction and its people can be affected.

Risk Assessment

Table 5.6.1.1 shows the risk assessment as determined by individual jurisdictions and the Plan Update Committee for homeland security incident. The risk assessment methodology can be found in the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment. The total in Table 5.6.1.1 represents the sum of each jurisdiction's impact, frequency, likelihood and vulnerability to a hazard less the jurisdiction's capabilities to respond to the hazard.

Table 5.6.1.1 – Eddy County Homeland Security Incident Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Eddy County	4	1	2	3	1	9
City of New Rockford	2	3	3	2	1	9
City of Sheyenne	3	2	2	2	1	8

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

Table 5.6.1.2 provides information on the specific impact, frequency, likelihood, vulnerability and capability of homeland security incident in The Planning Area. A list of impacts of homeland security incident identified as commonplace regardless of the jurisdiction are listed below.

Identified Impacts – Homeland Security Incident

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

Table 5.6.1.3 – The Planning Area Homeland Security Incident Risk Assessment

	Eddy County, North Dakota	Wells County, North Dakota
Impact	<ul style="list-style-type: none"> • Business Interruptions • Delayed Emergency Response • Downed Power Lines • Evacuation (Full) • Evacuation (Localized) • Explosion • HAZMAT Release • Increased Fire Potential • Increased Public Safety Runs • Livestock Injury/Death • Loss of Economy • Loss of Potable Water • Loss/Overcrowded Medical Facilities • Loss of Power • Mass Casualties • Property Damage • School Closure 	<ul style="list-style-type: none"> • Business Interruptions • Delayed Emergency Response • Downed Power Lines • Evacuation (Full) • Evacuation (Localized) • Explosion • HAZMAT Release • Increased Fire Potential • Increased Public Safety Runs • Livestock Injury/Death • Loss of Economy • Loss of Potable Water • Loss/Overcrowded Medical Facilities • Loss of Power • Mass Casualties • Property Damage • School Closure
Frequency	<ul style="list-style-type: none"> • No school bomb threats • No reports of local terrorism • Annual occurrences of vandalism to homes and cars 	<ul style="list-style-type: none"> • In 2013, a fugitive jumped on the train in Harvey and lead law enforcement to the city of Drake where he was arrested. • No school bomb threats • No reports of local terrorism • Annual occurrences of vandalism to homes and cars
Likelihood	<p><u>More likely</u></p> <ul style="list-style-type: none"> • Presence of public schools • Presence of hazardous material storage sites and industrial operations <p><u>Less likely</u></p> <ul style="list-style-type: none"> • No large regional or international attractions • Sparse population compared to Bismarck, Minot, Fargo, etc. 	<p><u>More likely</u></p> <ul style="list-style-type: none"> • Presence of public schools • Presence of hazardous material storage sites and industrial operations <p><u>Less likely</u></p> <ul style="list-style-type: none"> • No large regional or international attractions • Sparse population compared to Bismarck, Minot, Fargo, etc.

Table 5.6.1.3 – The Planning Area Homeland Security Incident Risk Assessment

	Eddy County, North Dakota	Wells County, North Dakota
Vulnerability	<p>Approximately 602 individuals under the age of 20, and 507 individuals age 65 and older, representing 25.4 and 21.4 percent of the population, respectively, and would be most vulnerable if a homeland security incident did occur.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • Presence of public schools • Presence of hazardous material storage sites and industrial operations • High youth and elderly population • Agriculture, and oil and gas economy <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • No commercial passenger air service • No major universities or secondary educational institutions 	<p>Approximately 716 individuals under the age of 20, and 514 individuals age 65 and older, representing 17.0 and 12.2 percent of the population, respectively, and would be most vulnerable if a homeland security incident did occur.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • Presence of public schools • Presence of hazardous material storage sites and industrial operations • High youth and elderly population • Agriculture, and oil and gas economy <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • No commercial passenger air service • No major universities or secondary educational institutions
Capability	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address homeland security incident. 	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address homeland security incident.

Vulnerabilities to Publicly-Owned Buildings and Property

Publicly-owned buildings and property are vulnerable to homeland security incidents. Facilities supporting functions key to daily operations of the county, such as the Eddy County Courthouse and buildings supporting emergency services such as fire and ambulance halls, would be the most vulnerable to an attack. A summary of city and publicly-owned buildings is provided in Chapter 4, Profile and Inventory.

Vulnerabilities of Critical Facilities and Infrastructure

Like publicly-owned buildings and property, the vulnerability of the hazard to critical facilities and infrastructure is imminent. The Eddy County Courthouse is most at risk to a homeland security incident. Incidents affecting infrastructure such as roads, hospitals, water pipes and power lines can disrupt economic activity, limit access for emergency services, and put people at risk due to a shortage or outage of critical materials and infrastructure. Water and electrical systems are infrastructure assumed to be most vulnerable to a homeland security incident.

Vulnerabilities to New and Future Development

Homeland security incidents are nearly impossible to predict and, therefore, vulnerabilities to new and future development cannot be determined. However, new and future development constructed near major highways, or critical facilities and infrastructure, are assumed be more vulnerable and susceptible to incidents as these areas are typically the target of such incidents.

Data Limitations and Other Key Documents

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

- Eddy County Emergency Operations Plan
- Eddy County Evacuation and Shelter Plan
- Eddy County Local Emergency Operations Plan
- Eddy County Shelter and Mass Care Plan
- Eddy County Threat and Hazard Identification and Risk Assessment (THIRA)
- North Dakota Continuity of Operations Plan
- North Dakota Emergency Operations Plan
- North Dakota State Disaster Recovery Plan
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)

5.6.2 Homeland Security Incident

Including biological terrorism, chemical terrorism, civil unrest, cyber terrorism, explosive terrorism and radiological/nuclear terrorism.

Characteristics

A homeland security incident is any intentional human-caused incident, domestic or international, that causes mass casualties, large economic losses, or widespread panic in the country. Terrorism and civil unrest are examples of human-caused hazards that are intentional and often planned. Forms of civil unrest can range from groups blocking sidewalks, roadways, and buildings to mobs rioting and looting. Civil unrest may be spontaneous, as when a mob erupts into violence, or it may be planned, as when a demonstration or protest intentionally interferes with another individual's or group's lawful business.

Seasonal Pattern	None
Duration	Minutes/hours/days
Speed of Onset	Little to no warning
Location	Total geographic extent of Wells County – most likely targeting critical facilities and infrastructure such as the Wells County Courthouse

For more information regarding homeland security incident, please reference the North Dakota State Hazard Mitigation Plan. The plan can be accessed by following the link provided below.

<http://www.nd.gov/des/uploads/resources/915/final-ndmhmp-update.pdf>

History

According to the 2014 North Dakota State Hazard Mitigation Plan, Wells County has experienced \$264 in vandalism/theft on local government facilities and \$8,514 in vandalism/theft on school district buildings.

Probability and Magnitude

Probability. The Plan Update Committee indicated the probability of a homeland security incident as possible, meaning that there is between a one and 10 percent probability in the next year of an incident.

Magnitude. The Plan Update Committee indicated the magnitude of a homeland security incident is catastrophic meaning more than 50 percent of the jurisdiction and its people can be affected.

Risk Assessment

Table 5.6.2.1 shows the risk assessment as determined by individual jurisdictions and the Plan Update Committee for homeland security incident. The risk assessment methodology can be found in the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment. The total in Table 5.6.2.1 represents the sum of each jurisdiction's impact, frequency, likelihood and vulnerability to a hazard less the jurisdiction's capabilities to respond to the hazard.

Table 5.6.2.1 – Wells County Homeland Security Incident Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Wells County	4	1	2	3	1	9
City of Bowdon	2	2	2	2	1	7
City of Cathay	2	2	2	2	1	7
City of Fessenden	3	2	2	2	1	8
City of Hamberg	2	2	2	2	1	7
City of Harvey	3	2	2	2	1	8
City of Hurdsfield	2	2	2	2	1	7
City of Sykeston	3	2	2	2	1	8

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

Table 5.6.2.2 provides information on the specific impact, frequency, likelihood, vulnerability and capability of homeland security incident in The Planning Area. A list of impacts of homeland security incident identified as commonplace regardless of the jurisdiction are listed below.

Identified Impacts – Homeland Security Incident

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

Table 5.6.1.3 – The Planning Area Homeland Security Incident Risk Assessment

	Eddy County, North Dakota	Wells County, North Dakota
Impact	<ul style="list-style-type: none"> • Business Interruptions • Delayed Emergency Response • Downed Power Lines • Evacuation (Full) • Evacuation (Localized) • Explosion • HAZMAT Release • Increased Fire Potential • Increased Public Safety Runs • Livestock Injury/Death • Loss of Economy • Loss of Potable Water • Loss/Overcrowded Medical Facilities • Loss of Power • Mass Casualties • Property Damage • School Closure 	<ul style="list-style-type: none"> • Business Interruptions • Delayed Emergency Response • Downed Power Lines • Evacuation (Full) • Evacuation (Localized) • Explosion • HAZMAT Release • Increased Fire Potential • Increased Public Safety Runs • Livestock Injury/Death • Loss of Economy • Loss of Potable Water • Loss/Overcrowded Medical Facilities • Loss of Power • Mass Casualties • Property Damage • School Closure
Frequency	<ul style="list-style-type: none"> • No school bomb threats • No reports of local terrorism • Annual occurrences of vandalism to homes and cars 	<ul style="list-style-type: none"> • In 2013, a fugitive jumped on the train in Harvey and lead law enforcement to the city of Drake where he was arrested. • No school bomb threats • No reports of local terrorism • Annual occurrences of vandalism to homes and cars
Likelihood	<p><u>More likely</u></p> <ul style="list-style-type: none"> • Presence of public schools • Presence of hazardous material storage sites and industrial operations <p><u>Less likely</u></p> <ul style="list-style-type: none"> • No large regional or international attractions • Sparse population compared to Bismarck, Minot, Fargo, etc. 	<p><u>More likely</u></p> <ul style="list-style-type: none"> • Presence of public schools • Presence of hazardous material storage sites and industrial operations <p><u>Less likely</u></p> <ul style="list-style-type: none"> • No large regional or international attractions • Sparse population compared to Bismarck, Minot, Fargo, etc.

Table 5.6.1.3 – The Planning Area Homeland Security Incident Risk Assessment

	Eddy County, North Dakota	Wells County, North Dakota
Vulnerability	<p>Approximately 602 individuals under the age of 20, and 507 individuals age 65 and older, representing 25.4 and 21.4 percent of the population, respectively, and would be most vulnerable if a homeland security incident did occur.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • Presence of public schools • Presence of hazardous material storage sites and industrial operations • High youth and elderly population • Agriculture, and oil and gas economy <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • No commercial passenger air service • No major universities or secondary educational institutions 	<p>Approximately 716 individuals under the age of 20, and 514 individuals age 65 and older, representing 17.0 and 12.2 percent of the population, respectively, and would be most vulnerable if a homeland security incident did occur.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • Presence of public schools • Presence of hazardous material storage sites and industrial operations • High youth and elderly population • Agriculture, and oil and gas economy <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • No commercial passenger air service • No major universities or secondary educational institutions
Capability	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address homeland security incident. 	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address homeland security incident.

Vulnerabilities to Publicly-Owned Buildings and Property

Publicly-owned buildings and property are vulnerable to homeland security incidents. Facilities supporting functions key to daily operations of the county, such as the Wells County Courthouse and buildings supporting emergency services such as fire and ambulance halls, would be the most vulnerable to an attack. A summary of city and publicly-owned buildings is provided in Chapter 4, Profile and Inventory.

Vulnerabilities of Critical Facilities and Infrastructure

Like publicly-owned buildings and property, the vulnerability of the hazard to critical facilities and infrastructure is imminent. The Wells County Courthouse and the St. Aloisius Medical Center are critical facilities most at risk to a homeland security incident. Incidents affecting infrastructure such as roads, hospitals, water pipes and power lines can disrupt economic activity, limit access for emergency services, and put people at risk due to a shortage or outage of critical materials and infrastructure. The Harvey and Sykeston Dams, and water and electrical systems, are infrastructure assumed to be most vulnerable to a homeland security incident.

Vulnerabilities to New and Future Development

Homeland security incidents are nearly impossible to predict and, therefore, vulnerabilities to new and future development cannot be determined. However, new and future development constructed near major highways, or critical facilities and infrastructure, are assumed be more vulnerable and susceptible to incidents as these areas are typically the target of such incidents.

Data Limitations and Other Key Documents

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

- North Dakota Continuity of Operations Plan
- North Dakota Emergency Operations Plan
- North Dakota State Disaster Recovery Plan
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)
- Wells County Emergency Operations Plan
- Wells County Evacuation and Shelter Plan
- Wells County Local Emergency Operations Plan
- Wells County Shelter and Mass Care Plan
- Wells County Threat and Hazard Identification and Risk Assessment (THIRA)

5.7.1 Severe Summer Weather

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

Characteristics

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

Seasonal Pattern	April to November
Duration	2 to 5 hours
Speed of Onset	12 to 16 hours warning
Location	Total geographic extent of Eddy County

For more information regarding severe summer weather please reference the **State of North Dakota** Multi-Hazard Mitigation Plan. The plan can be accessed by following the link provided below.

<http://www.nd.gov/des/uploads/resources/915/final-ndmhmp-update.pdf>

History

Table 5.7.1.1 summarizes the history of severe summer weather in Eddy County and indicates 138 instances of the hazard between 1950 and 2015. A detailed hazard history for Eddy County can be found on a disc located at the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment.

Table 5.7.1.1 – Eddy County Severe Summer Weather Hazard History Summary

Severe Summer Weather					
Occurrences	Date Range	Fatalities	Injuries	Property Damage	Crop Damage
138	1950 to 2015	5.00	39.00	\$382,500	\$610,000

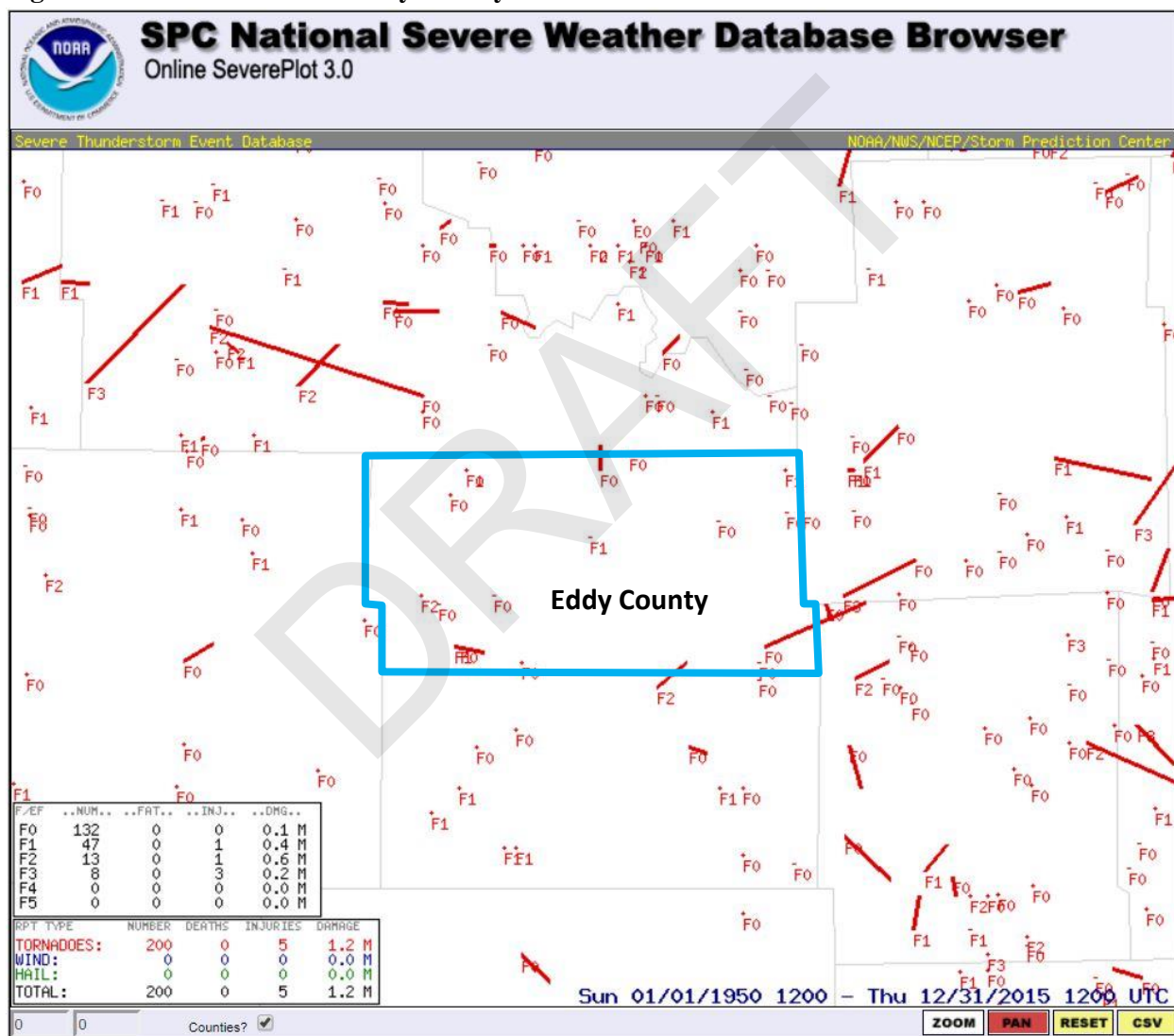
Sources: National Climatic Data Center (NCDC), National Oceanic and Atmospheric Administration (NOAA)

Crop Loss. Crop loss from severe summer weather is tracked by the United States Department of Agriculture, Risk Management Agency (RMA). The RMA provides data on the crop type affected, damage cause description, determined acres and indemnity amount. The damage cause description identifies the cause of damage, determines acres identifies the number of acres lost due to damage, and the indemnity amount identifies the total amount of the loss for the designated peril. Between January 1, 2001 and December 31, 2016, Eddy County experienced 1,258 incidents of crop loss due to severe summer weather impacting approximately 389,302 acres of crops totaling \$36,083,591 in losses.

The following severe summer weather history for Eddy County was provided by the 2014 State of North Dakota MHMP.

- **Hail.** Between 2000 and 2013 approximately 35 hail events occurred in Eddy County.
- **Thunderstorm.** Between 2000 and 2013 approximately 36 thunderstorms occurred in Eddy County.
- **Tornado.** Between 1950 and 2013 approximately 15 tornadoes occurred in Eddy County. Figure 5.7.1.1 illustrates the paths of tornadoes in Eddy County between 1950 and 2015.

Figure 5.7.1.1 – 1950 to 2015 Eddy County Tornado Occurrences



Source: National Oceanic and Atmospheric Administration

Probability and Magnitude

Probability. Per Table 5.7.1.1, the probability of severe summer weather in Eddy County is 100 percent based on 138 occurrences between 1950 and 2015.

The Plan Update Committee indicated the probability of severe summer weather in Eddy County is highly likely, meaning that there is a 100 percent probability in the next year of a severe summer weather occurrence.

Magnitude. Per Table 5.7.1.1, Eddy County can anticipate approximately \$5,795 in annual property damages and \$546,721 in crop damages annually from severe summer weather based on information shown in the history section of this hazard profile.

The Plan Update Committee indicated the magnitude or impact of severe summer weather as critical meaning between a 10 and 100 percent change Eddy County will be impacted by an incident in the next year.

The following statistics pertaining to magnitude of severe summer weather for Eddy County were provided by the 2014 State of North Dakota MHMP.

- **Hail.** Between 1989 and 2013, approximately \$49,281 was paid in claims on local government critical facilities and property insured by the state in Eddy County resulting from hail damage. Another \$20,947 was paid in claims on public school district facilities and property insured by the state during the same period resulting from hail damage. The largest recorded hail size in Eddy County was 4.5 inches in diameter.
- **Lightning.** Between 1989 and 2013, approximately \$1,369 was paid in claims on local government critical facilities and property insured by the state in Eddy County.
- **Tornado.** Between 1950 and 2012 the highest-rated tornado ever to strike Eddy County was an F2.
- **Wind.** The strongest non-tornado wind gust in Eddy County was 81 m.p.h. Between 1989 and 2013, approximately 5,598 was paid in claims on local government critical facilities and property insured by the state in Eddy County resulting from wind damage. Another \$241 was paid in claims on public school district facilities and property insured by the state during the same period resulting from wind damage.

Risk Assessment

Table 5.7.1.2 shows the risk assessment as determined by individual jurisdictions and the Plan Update Committee for severe summer weather. The risk assessment methodology can be found in the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment. The total in Table 5.7.1.2 represents the sum of each jurisdiction's impact, frequency, likelihood and vulnerability to a hazard less the jurisdiction's capabilities to respond to the hazard.

Table 5.7.1.2 – Eddy County Severe Summer Weather Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Eddy County	3	4	4	3	1	13
City of Sheyenne	4	4	3	3	2	12
City of New Rockford	3	4	4	4	1	14

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

Table 5.7.1.3 provides information on the specific impact, frequency, likelihood, vulnerability and capability of severe summer weather in The Planning Area. A list of impacts of severe summer weather identified as commonplace regardless of the jurisdiction are listed below.

Identified Impacts – Severe Summer Weather

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

Table 5.7.1.3 – The Planning Area Severe Summer Weather Risk Assessment

	Eddy County, North Dakota	Wells County, North Dakota
Impact	<ul style="list-style-type: none"> Blocked Roads Business Interruptions Delayed Emergency Response Downed Power Lines Downed Trees Flooding (Street) Flooding (Structure) Livestock Injury/Death Loss of Potable Water Loss of Power Property Damage Sewer Backup 	<ul style="list-style-type: none"> Blocked Roads from water and trees Delayed Emergency Response from blocked roads Downed Power Lines Downed Trees Flooding (Street) Flooding (Structure) HAZMAT Release Increased Fire Potential Loss of Power Loss of Transportation/Accessibility Property Damage Sewer Backup
Frequency	<ul style="list-style-type: none"> Multiple storms annually Annual occurrences of high saturation causing drain fields to work incorrectly Annual loss of power or brown-outs due to tree limbs and high winds Annual occurrences of river flooding from run-off and drainage 	<ul style="list-style-type: none"> Multiple storms annually Major hail storms in 2009 and 2015 resulting in significant property damage Southern Wells County is impacts by at least 1 confirmed tornado each year Annual occurrences of high saturation causing drain fields to work incorrectly Annual loss of power or brown-outs due to tree limbs and high winds Tom's Home Furnishings started on fire due to lightning strike in 1990s Lightning strikes to school radio towers result in outage of radio system
Likelihood	<ul style="list-style-type: none"> Climatic patterns of the area will result in several storms per year 	<ul style="list-style-type: none"> Climatic patterns of the area will result in several storms per year

Table 5.7.1.3 – The Planning Area Severe Summer Weather Risk Assessment

	Eddy County, North Dakota	Wells County, North Dakota
Vulnerability	<p>Approximately 602 individuals under the age of 20, and 507 individuals age 65 and older, representing 25.4 and 21.4 percent of the population, respectively, and would be most vulnerable if an event did occur.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • Agriculture economy • Flat terrain and open topography • Moving and shifting of culverts from water drainage • Trees from shelter belts blocking the roads <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • County residents “self-mitigate” due to hazard being constant in North Dakota • Advanced weather forecasting/warning • Emergency sirens • CodeRED 	<p>Approximately 716 individuals under the age of 20, and 514 individuals age 65 and older, representing 17.0 and 12.2 percent of the population, respectively, and would be most vulnerable if an event did occur.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • N.D. Highway 15 underpass • Rural residents in southern portion of county do not have a tornado shelter • Moving and shifting of culverts from water drainage • Trees from shelter belts blocking the roads • Lack of road use/condition agreements to prevent damage before storms during construction projects • Agriculture economy • Flat terrain and open topography <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • County residents “self-mitigate” due to hazard being constant in North Dakota • Advanced weather forecasting/warning • Emergency sirens • CodeRED
Capability	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address severe summer weather. 	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address severe summer weather.

Vulnerabilities to Publicly-Owned Buildings and Property

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

Vulnerabilities of Critical Facilities and Infrastructure

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

Vulnerabilities to New and Future Development

Building codes ensure buildings and structures are built adequately to better withstand severe summer weather. Eddy County is working to adopt building codes. Jurisdictions with a high number of trailer and mobile homes, which are more susceptible to severe weather and may experience more impact from the hazard. An inventory of the household units by type in jurisdictions in Eddy County is shown in Chapter 4, Profile and Inventory.

As populations grow, more people are at risk of injury and potential death from tornadoes, large hail and windblown debris such as tree branches. Strengthening of buildings codes would mitigate impacts from the hazard. This mitigation project for the county can be found in Chapter 6, Mitigation Strategy.

Data Limitations and Other Key Documents

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

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

- Eddy County Emergency Operations Plan
- Eddy County Evacuation and Shelter Plan
- Eddy County Local Emergency Operations Plan
- Eddy County Shelter and Mass Care Plan
- Eddy County Threat and Hazard Identification and Risk Assessment (THIRA)
- North Dakota Continuity of Operations Plan

- North Dakota Drought Mitigation Plan
- North Dakota Emergency Operations Plan
- North Dakota State Disaster Recovery Plan
- North Dakota State Hazard Mitigation Plan
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)

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5.7.2 Severe Summer Weather

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

Characteristics

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

Seasonal Pattern	April to November
Duration	2 to 5 hours
Speed of Onset	12 to 16 hours warning
Location	Total geographic extent of Wells County

For more information regarding severe summer weather please reference the **State of North Dakota** Multi-Hazard Mitigation Plan. The plan can be accessed by following the link provided below.

<http://www.nd.gov/des/uploads/resources/915/final-ndmhmp-update.pdf>

History

Table 5.7.2.1 summarizes the history of severe summer weather in Wells County and indicates 140 instances of the hazard between 1950 and 2015. A detailed hazard history for Wells County can be found on a disc located at the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment.

Table 5.7.2.1 – Wells County Severe Summer Weather Hazard History Summary

Severe Summer Weather					
Occurrences	Date Range	Fatalities	Injuries	Property Damage	Crop Damage
140	1950 to 2015	5.00	1.00	\$1,554,500	\$820,000

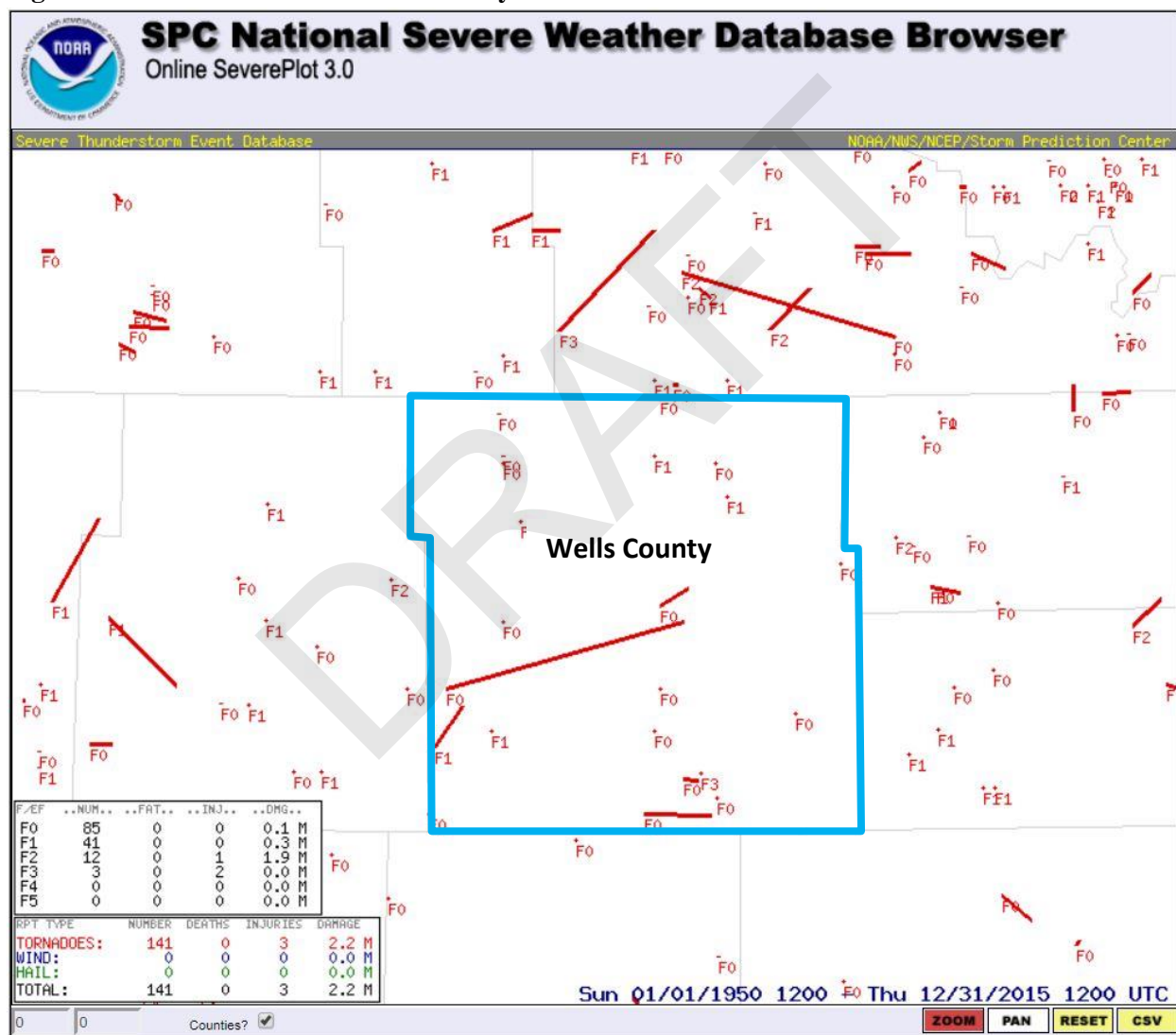
Sources: National Climatic Data Center (NCDC), National Oceanic and Atmospheric Administration (NOAA)

Crop Loss. Crop loss from severe summer weather is tracked by the United States Department of Agriculture, Risk Management Agency (RMA). The RMA provides data on the crop type affected, damage cause description, determined acres and indemnity amount. The damage cause description identifies the cause of damage, determines acres identifies the number of acres lost due to damage, and the indemnity amount identifies the total amount of the loss for the designated peril. Between January 1, 2001 and December 31, 2016, Wells County experienced 602 incidents of crop loss due to severe summer weather impacting approximately 1,045,380 acres of crops totaling \$110,029,704 in losses.

The following severe summer weather history for Wells County was provided by the 2014 State of North Dakota MHMP.

- **Hail.** Between 2000 and 2013 approximately 29 hail events occurred in Wells County.
 - **Thunderstorm.** Between 2000 and 2013 approximately 16 thunderstorms occurred in Wells County.
 - **Tornado.** Between 1950 and 2013 approximately 22 tornadoes occurred in Wells County.
- Figure 5.7.2.1 illustrates the paths of tornadoes in Wells County between 1950 and 2015.

Figure 5.7.2.1 – 1950 to 2015 Wells County Tornado Occurrences



Source: National Oceanic and Atmospheric Administration

Probability and Magnitude

Probability. Per Table 5.7.2.1, the probability of severe summer weather in Wells County is 100 percent based on 140 occurrences between 1950 and 2015. Wells County can anticipate approximately \$23,553 in annual property damages and \$166,712 in crop damages annually from severe summer weather based on information shown in the history section of this hazard profile.

The Plan Update Committee indicated the probability of severe summer weather in Wells County is highly likely, meaning that there is a 100 percent probability in the next year of a severe summer weather occurrence.

Magnitude. Per Table 5.7.2.1, Wells County can anticipate approximately \$23,553 in annual property damages and \$166,712 in crop damages annually from severe summer weather based on information shown in the history section of this hazard profile.

The Plan Update Committee indicated the magnitude or impact of severe summer weather as catastrophic meaning as an estimated 50 percent or more of Wells County could be affected.

The following statistics pertaining to magnitude of severe summer weather for Wells County were provided by the 2014 State of North Dakota MHMP.

- **Hail.** Between 1989 and 2013, approximately \$51,404 was paid in claims on local government critical facilities and property insured by the state in Wells County resulting from hail damage. Another \$105,864 was paid in claims on public school district facilities and property insured by the state during the same period resulting from hail damage. The largest recorded hail size in Wells County was 3.5 inches in diameter.
- **Lightning.** Between 1989 and 2013, approximately \$37,308 was paid in claims on local government critical facilities and property insured by the state in Wells County. Another \$6,494 was paid in claims on public school district facilities and property insured by the state during the same period resulting from lightning damage.
- **Tornado.** Between 1950 and 2012 the highest-rated tornado ever to strike Wells County was an F3.
- **Wind.** The strongest non-tornado wind gust in Wells County was 81 m.p.h. Between 1989 and 2013, approximately \$17,297 was paid in claims on local government critical facilities and property insured by the state in Wells County resulting from wind damage. Another \$950 was paid in claims on public school district facilities and property insured by the state during the same period resulting from wind damage.

Risk Assessment

Table 5.7.2.2 shows the risk assessment as determined by individual jurisdictions and the Plan Update Committee for severe summer weather. The risk assessment methodology can be found in the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment. The total in Table 5.7.2.2 represents the sum of each jurisdiction's impact, frequency, likelihood and vulnerability to a hazard less the jurisdiction's capabilities to respond to the hazard.

Table 5.7.2.2 – Wells County Severe Summer Weather Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Wells County	3	4	4	3	1	13
City of Bowdon	4	3	4	3	1	13
City of Cathay	4	3	4	3	1	13
City of Fessenden	3	4	4	3	2	12
City of Hamberg	4	3	4	3	1	13
City of Harvey	3	4	4	3	2	12
City of Hurdsfield	4	3	4	3	1	13
City of Sykeston	3	4	4	3	2	12

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

Table 5.7.2.3 provides information on the specific impact, frequency, likelihood, vulnerability and capability of severe summer weather in The Planning Area. A list of impacts of severe summer weather identified as commonplace regardless of the jurisdiction are listed below.

Identified Impacts – Severe Summer Weather

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

Table 5.7.2.3 – The Planning Area Severe Summer Weather Risk Assessment

	Eddy County, North Dakota	Wells County, North Dakota
Impact	<ul style="list-style-type: none"> Blocked Roads Business Interruptions Delayed Emergency Response Downed Power Lines Downed Trees Flooding (Street) Flooding (Structure) Livestock Injury/Death Loss of Potable Water Loss of Power Property Damage Sewer Backup 	<ul style="list-style-type: none"> Blocked Roads from water and trees Delayed Emergency Response from blocked roads Downed Power Lines Downed Trees Flooding (Street) Flooding (Structure) HAZMAT Release Increased Fire Potential Loss of Power Loss of Transportation/Accessibility Property Damage Sewer Backup
Frequency	<ul style="list-style-type: none"> Multiple storms annually Annual occurrences of high saturation causing drain fields to work incorrectly Annual loss of power or brown-outs due to tree limbs and high winds Annual occurrences of river flooding from run-off and drainage 	<ul style="list-style-type: none"> Multiple storms annually Major hail storms in 2009 and 2015 resulting in significant property damage Southern Wells County is impacts by at least 1 confirmed tornado each year Annual occurrences of high saturation causing drain fields to work incorrectly Annual loss of power or brown-outs due to tree limbs and high winds Tom's Home Furnishings started on fire due to lightning strike in 1990s Lightning strikes to school radio towers result in outage of radio system
Likelihood	<ul style="list-style-type: none"> Climatic patterns of the area will result in several storms per year 	<ul style="list-style-type: none"> Climatic patterns of the area will result in several storms per year

Table 5.7.2.3 – The Planning Area Severe Summer Weather Risk Assessment

	Eddy County, North Dakota	Wells County, North Dakota
Vulnerability	<p>Approximately 602 individuals under the age of 20, and 507 individuals age 65 and older, representing 25.4 and 21.4 percent of the population, respectively, and would be most vulnerable if an event did occur.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • Agriculture economy • Flat terrain and open topography • Moving and shifting of culverts from water drainage • Trees from shelter belts blocking the roads <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • County residents “self-mitigate” due to hazard being constant in North Dakota • Advanced weather forecasting/warning • Emergency sirens • CodeRED 	<p>Approximately 716 individuals under the age of 20, and 514 individuals age 65 and older, representing 17.0 and 12.2 percent of the population, respectively, and would be most vulnerable if an event did occur.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • N.D. Highway 15 underpass • Rural residents in southern portion of county do not have a tornado shelter • Moving and shifting of culverts from water drainage • Trees from shelter belts blocking the roads • Lack of road use/condition agreements to prevent damage before storms during construction projects • Agriculture economy • Flat terrain and open topography <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • County residents “self-mitigate” due to hazard being constant in North Dakota • Advanced weather forecasting/warning • Emergency sirens • CodeRED
Capability	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address severe summer weather. 	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address severe summer weather.

Vulnerabilities to Publicly-Owned Buildings and Property

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

Vulnerabilities of Critical Facilities and Infrastructure

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

Vulnerabilities to New and Future Development

Building codes ensure buildings and structures are built adequately to better withstand severe summer weather. Wells County and incorporated jurisdictions have adopted the state building codes, but lack enforcement. Jurisdictions with a high number of trailer and mobile homes, which are more susceptible to severe weather and may experience more impact from the hazard. An inventory of the household units by type in jurisdictions in Wells County is shown in Chapter 4, Profile and Inventory.

As populations grow, more people are at risk of injury and potential death from tornadoes, large hail and windblown debris such as tree branches. Strengthening of buildings codes would mitigate impacts from the hazard. This mitigation project for the county can be found in Chapter 6, Mitigation Strategy.

Data Limitations and Other Key Documents

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

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

- North Dakota Continuity of Operations Plan
- North Dakota Drought Mitigation Plan
- North Dakota Emergency Operations Plan
- North Dakota State Disaster Recovery Plan
- North Dakota State Hazard Mitigation Plan
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)

- Wells County Emergency Operations Plan
- Wells County Evacuation and Shelter Plan
- Wells County Local Emergency Operations Plan
- Wells County Shelter and Mass Care Plan
- Wells County Threat and Hazard Identification and Risk Assessment (THIRA)

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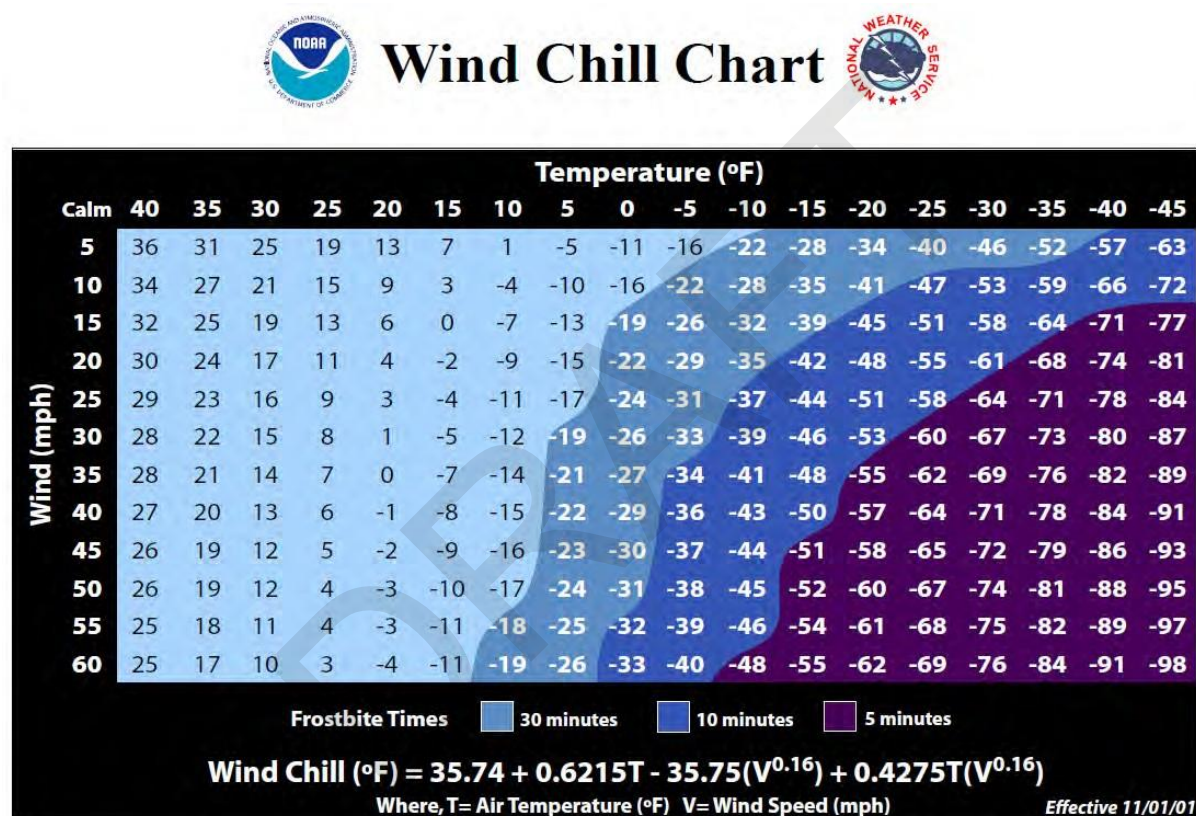
5.8.1 Severe Winter Weather

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

Characteristics

Winter storms have the capability to completely immobilize large areas of a state or several states simultaneously. Winter storms occur in several forms, such as heavy snow storms, blizzards, and ice storms. Each in its own way is a potential killer of hundreds of people, livestock and wildlife, whenever the storm strikes. A brief explanation of each follows Figure 5.8.1.1.

Figure 5.8.1.1 – Wind Chill Chart



Source: National Weather Service

Blizzards are the most dramatic and dangerous winter storms. A blizzard has winds of 35 mph or more with snow and blowing snow reducing visibility to less than ¼ mile for at least 3 hours. Blizzards are usually characterized by low temperatures and by strong-winds bearing substantial amounts of snow. Snowfall is usually present during the preliminary stages of the blizzard. However, most of the snow in a blizzard is in the form of fine, powdery particles of snow which are whipped up from the surface in such great density that at times the visibility is only a few yards, creating a blinding condition.

Extreme Cold includes prolonged periods of cold temperatures throughout the winter months. People are forced to limit time spent outdoors in extreme frigid conditions. When cold temperatures combine with wind, dangerous wind chill occurs. Wind chill describes how cold it feels and is based on heat loss

on exposed skin from wind and cold. The wind chill makes it feel much colder than the actual temperature.

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

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

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

Seasonal Pattern	November to April
Duration	Hours/days
Speed of Onset	12 to 16 hours warning
Location	Total geographic extent of Eddy County

For more information regarding severe winter weather please reference the **State of North Dakota** Multi-Hazard Mitigation Plan. The plan can be accessed by following the link provided below.

<http://www.nd.gov/des/uploads/resources/915/final-ndmhmp-update.pdf>

History

Table 5.8.1.1 summarizes the history of severe winter weather in Eddy County and indicates 136 instances of the hazard between 1950 and 2015. A detailed hazard history for Eddy County can be found on a disc located at the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment.

Table 5.8.1.1 – Eddy County Severe Winter Weather Hazard History Summary

Severe Winter Weather					
Occurrences	Date Range	Injuries	Fatalities	Property Damage	Crop Damage
136	1950 to 2015	2.00	0.00	\$6,019,000	\$0.00

Sources: National Climatic Data Center (NCDC), National Oceanic and Atmospheric Administration (NOAA)

- Per the 2014 State of North Dakota MHMP there was one winter storm declarations in Eddy County between 1989 and 2013.

Crop Loss. Crop loss from severe winter weather is tracked by the United States Department of Agriculture, Risk Management Agency (RMA). The RMA provides data on the crop type affected, damage cause description, determined acres and indemnity amount. The damage cause description identifies the cause of damage, determines acres identifies the number of acres lost due to damage, and the indemnity amount identifies the total amount of the loss for the designated peril. Between January 1, 2001 and December 31, 2016, Eddy County experienced 113 incidents of crop loss due to severe winter weather impacting approximately 43,958 acres of crops totaling \$2,671,731 in losses.

Probability and Magnitude

Probability. Per Table 5.8.1.1, the probability of severe winter weather in Eddy County is approximately 100 percent based on 136 occurrences between 1950 and 2015.

- The Plan Update Committee indicated the probability of severe winter weather in Eddy County is highly likely, meaning that there is a 100 percent probability in the next year the hazard.

Magnitude. Per Table 5.8.1.1, the magnitude of severe winter weather in Eddy County is approximately \$6,019,000 in property damages between 1950 and 2015, or approximately \$91,200 annually. Two injuries in that time-period were reported.

- The Plan Update Committee indicated the magnitude or impact of severe winter weather as critical meaning between 10 and 100 percent or more of Eddy County could be affected.

The following statistics pertaining to magnitude of severe winter weather for Eddy County were provided by the 2014 State of North Dakota MHMP.

- Between 2000 and 2013, a total of \$14,000 in property damages was reported equating to approximately \$1,077 in annual damages.
- Approximately \$39,382 in crop insurance payments were paid between 2003 and 2012 in Eddy County. Annual crop losses amounted to \$6,122.

Risk Assessment

Table 5.8.1.2 shows the risk assessment as determined by individual jurisdictions and the Plan Update Committee for severe winter weather. The risk assessment methodology can be found in the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment. The total in Table 5.8.1.2 represents the sum of each jurisdiction's impact, frequency, likelihood and vulnerability to a hazard less the jurisdiction's capabilities to respond to the hazard.

Table 5.8.1.2 – Eddy County Severe Winter Weather Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Eddy County	3	4	4	3	1	13
City of New Rockford	4	4	3	3	2	12
City of Sheyenne	3	4	4	3	1	13

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

Table 5.8.1.3 provides information on the specific impact, frequency, likelihood, vulnerability and capability of severe winter weather in The Planning Area. A list of impacts of severe winter weather identified as commonplace regardless of the jurisdiction are listed below.

Identified Impacts – Severe Winter Weather

- Blocked Roads
- Building Collapse
- Business Interruptions
- Delayed Emergency Response
- Downed Power Lines
- Downed Trees
- Evacuation (Localized)
- HAZMAT Release
- Human Injury/Death
- Increased Fire Potential
- Increased Public Safety Runs
- Livestock Injury/Death
- Loss of Economy
- Loss of Power (increased risk of carbon monoxide poisoning)
- Loss of Wildlife Habitat
- Loss of Transportation/Accessibility
- Property Damage
- School Closure
- Wind Chill

Vulnerabilities of Critical Facilities and Infrastructure

The greatest issues for critical facilities resulting from severe winter weather impacts are inaccessibility due to blocked roads, and utility and power outages. Emergency services can have trouble providing services during power outages and are limited in responding to emergencies when roads are blocked from snow drifts. Critical facilities with backup generators are better equipped to handle impacts from severe winter weather if loss of power does occur. The Eddy County Courthouse, lift stations and numerous critical facilities and infrastructure in Eddy County need to upgrade existing generators or install new. See Chapter 6, Mitigation Strategy for a list of generators needed throughout the county.

The greatest issue for critical infrastructure is maintenance of the road system during severe winter weather. During blizzards or snow storms, cars and trucks can become stranded if roads are blocked with heavy snow and ice. This can result in extended response times for emergency services and prevent access to communities. Prolonged closures of roads can threaten propane, fuel and food supplies, and medical supplies. Suspended power lines are highly susceptible to fallen tree branches, other debris or accumulation of ice, leading to power outages. Restoration of power can take up to several days or even a week. All jurisdictions in the county have experienced power outages during severe winter weather to varying degrees of extent. Delivery of water to jurisdictions can be interrupted by water main breakage resulting from freeze and thaw cycles.

Table 5.8.2.3 – The Planning Area Severe Winter Weather Risk Assessment

	Eddy County, North Dakota	Wells County, North Dakota
Impact	<ul style="list-style-type: none"> • Blocked Roads • Building Collapse • Business Interruptions • Delayed Emergency Response • Downed Power Lines • Downed Trees • Human Injury/Death • Increased Public Safety Runs • Livestock Injury/Death • Loss of Economy • Loss of Power (increased risk of carbon monoxide poisoning) • Loss of Transportation/Accessibility • Property Damage • School Closure 	<ul style="list-style-type: none"> • Blocked Roads • Building Collapse • Business Interruptions • Delayed Emergency Response • Downed Power Lines • Downed Trees • Human Injury/Death • Increased Public Safety Runs • Livestock Injury/Death • Loss of Economy • Loss of Power (increased risk of carbon monoxide poisoning) • Loss of Transportation/Accessibility • Property Damage • School Closure
Frequency	<ul style="list-style-type: none"> • Multiple occurrences of blizzard, extreme low temps, heavy snow annually • Major storm with power outages in surrounding area Christmas 2016 	<ul style="list-style-type: none"> • Multiple occurrences of blizzard, extreme low temps, heavy snow annually • Major storm with power outages in surrounding area Christmas 2016
Likelihood	<ul style="list-style-type: none"> • Climatic patterns of the area will result in several storms per year 	<ul style="list-style-type: none"> • Climatic patterns of the area will result in several storms per year

Table 5.8.2.3 – The Planning Area Severe Winter Weather Risk Assessment - continued

	Eddy County, North Dakota	Wells County, North Dakota
Vulnerability	<p>Approximately 602 individuals under the age of 20, and 507 individuals age 65 and older, representing 25.4 and 21.4 percent of the population, respectively, and would be most vulnerable if an event did occur.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • Agriculture economy • Flat terrain and open topography • Lack of debris management plan • Lack of generators at some critical facilities and infrastructure • Flooding a likely secondary hazard/impact due to inadequate drainage from melting snow <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • Windbreaks/shelter belts • Advanced warning systems such as reverse 911, cell phones, internet, TV • Building codes and zoning • County residents “self-mitigate” due to hazard being constant in North Dakota 	<p>Approximately 716 individuals under the age of 20, and 514 individuals age 65 and older, representing 17.0 and 12.2 percent of the population, respectively, and would be most vulnerable if an event did occur.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • Agriculture economy • Flat terrain and open topography • Lack of debris management plan • Lack of generators at some critical facilities and infrastructure • Flooding a likely secondary hazard/impact due to inadequate drainage from melting snow <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • Windbreaks/shelter belts • Advanced warning systems such as reverse 911, cell phones, internet, TV • Building codes and zoning • County residents “self-mitigate” due to hazard being constant in North Dakota
Capability	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address severe winter weather. 	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address severe winter weather.

Vulnerabilities to Publicly-Owned Buildings and Property

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

Vulnerabilities to New and Future Development

Increases in population further complicate matters when dealing with severe winter weather. An example of this would be higher numbers of people susceptible to vehicle accidents on icy or blocked roads, health hazards due to wind chill and extreme cold. Conversely, increases in populations in existing jurisdictions may lessen the risk to impacts from severe winter weather as it leads to less isolated populations and increases the number of people reachable by emergency services during an emergency.

Data Limitations and Other Key Documents

Residents often experience impacts from these hazards, such as minor structural damage, increased utilities, loss of livestock, frozen water lines, they do not report.

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

- Eddy County Emergency Operations Plan
- Eddy County Evacuation and Shelter Plan
- Eddy County Local Emergency Operations Plan
- Eddy County Shelter and Mass Care Plan
- Eddy County Threat and Hazard Identification and Risk Assessment (THIRA)
- North Dakota Continuity of Operations Plan
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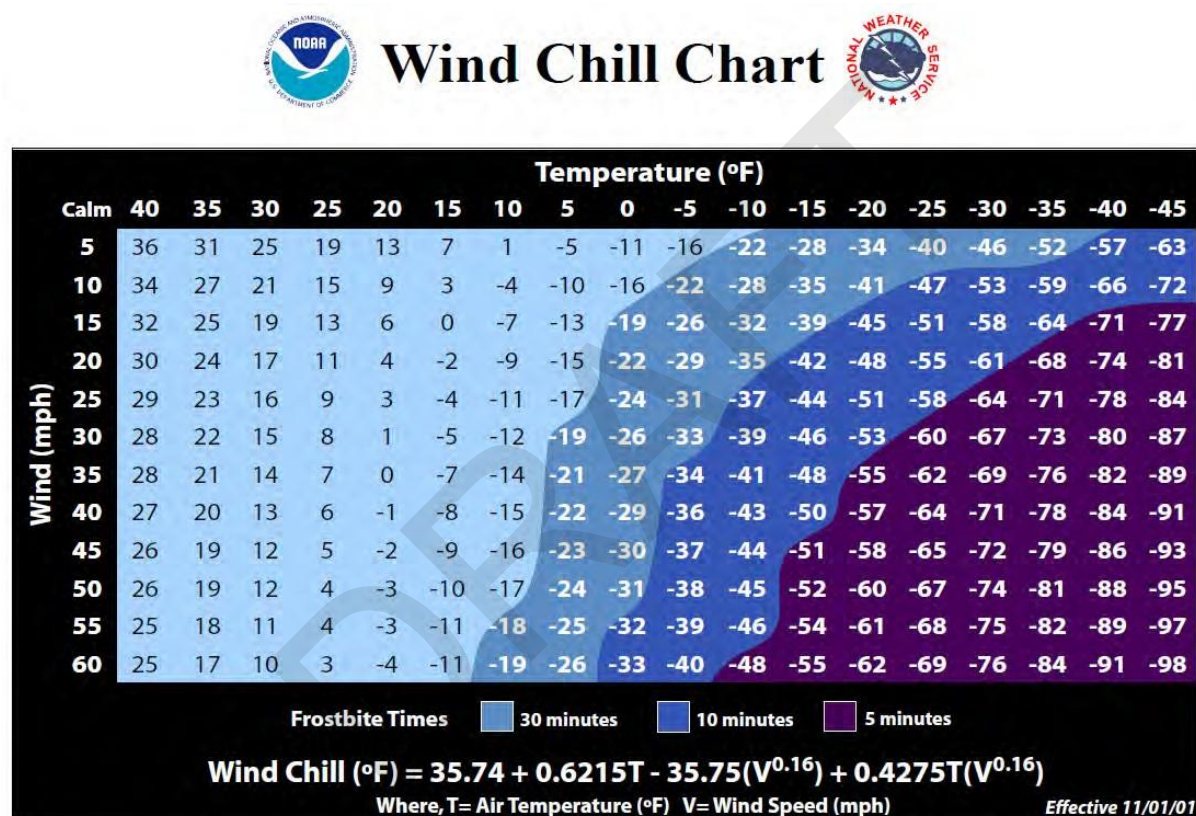
5.8.2 Severe Winter Weather

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

Characteristics

Winter storms have the capability to completely immobilize large areas of a state or several states simultaneously. Winter storms occur in several forms, such as heavy snow storms, blizzards, and ice storms. Each in its own way is a potential killer of hundreds of people, livestock and wildlife, whenever the storm strikes. A brief explanation of each follows Figure 5.8.2.1.

Figure 5.8.2.1 – Wind Chill Chart



Source: National Weather Service

Blizzards are the most dramatic and dangerous winter storms. A blizzard has winds of 35 mph or more with snow and blowing snow reducing visibility to less than ¼ mile for at least 3 hours. Blizzards are usually characterized by low temperatures and by strong-winds bearing substantial amounts of snow. Snowfall is usually present during the preliminary stages of the blizzard. However, most of the snow in a blizzard is in the form of fine, powdery particles of snow which are whipped up from the surface in such great density that at times the visibility is only a few yards, creating a blinding condition.

Extreme Cold includes prolonged periods of cold temperatures throughout the winter months. People are forced to limit time spent outdoors in extreme frigid conditions. When cold temperatures combine with wind, dangerous wind chill occurs. Wind chill describes how cold it feels and is based on heat loss

on exposed skin from wind and cold. The wind chill makes it feel much colder than the actual temperature.

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

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

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

Seasonal Pattern	November to April
Duration	Hours/days
Speed of Onset	12 to 16 hours warning
Location	Total geographic extent of Wells County

For more information regarding severe winter weather please reference the **State of North Dakota** Multi-Hazard Mitigation Plan. The plan can be accessed by following the link provided below.

<http://www.nd.gov/des/uploads/resources/915/final-ndmhmp-update.pdf>

History

Table 5.8.2.1 summarizes the history of severe winter weather in Wells County and indicates 111 instances of the hazard between 1950 and 2015. A detailed hazard history for Wells County can be found on a disc located at the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment.

Table 5.8.2.1 – Wells County Severe Winter Weather Hazard History Summary

Severe Winter Weather					
Occurrences	Date Range	Injuries	Fatalities	Property Damage	Crop Damage
111	1950 to 2015	1.00	1.00	\$3,620,000	\$0.00

Sources: National Climatic Data Center (NCDC), National Oceanic and Atmospheric Administration (NOAA)

- Per the 2014 State of North Dakota MHMP there were two winter storm declarations in Wells County between 1989 and 2013.

Crop Loss. Crop loss from severe winter weather is tracked by the United States Department of Agriculture, Risk Management Agency (RMA). The RMA provides data on the crop type affected, damage cause description, determined acres and indemnity amount. The damage cause description identifies the cause of damage, determines acres identifies the number of acres lost due to damage, and the indemnity amount identifies the total amount of the loss for the designated peril. Between January 1, 2001 and December 31, 2016, Wells County experienced 137 incidents of crop loss due to severe winter weather impacting approximately 76,932 acres of crops totaling \$5,255,056 in losses.

Probability and Magnitude

Probability. Per Table 5.8.2.1, the probability of severe winter weather in Wells County is approximately 100 percent based on 111 occurrences between 1950 and 2015.

- The Plan Update Committee indicated the probability of severe winter weather in Wells County is highly likely, meaning that there is a 100 percent probability in the next year the hazard.

Magnitude. Per Table 5.8.2.1, the magnitude of severe winter weather in Wells County is approximately \$3,620,000 in property damages between 1950 and 2015, or approximately \$54,848 annually. In that time-period one injury and one fatality was reported.

- The Plan Update Committee indicated the magnitude or impact of severe winter weather as critical meaning between 10 and 100 percent or more of Eddy County could be affected.

Risk Assessment

Table 5.8.2.2 shows the risk assessment as determined by individual jurisdictions and the Plan Update Committee for severe winter weather. The risk assessment methodology can be found in the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment. The total in Table 5.8.2.2 represents the sum of each jurisdiction's impact, frequency, likelihood and vulnerability to a hazard less the jurisdiction's capabilities to respond to the hazard.

Table 5.8.2.2 – Wells County Severe Winter Weather Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Wells County	3	4	4	3	1	13
City of Bowdon	4	3	4	3	1	13
City of Cathay	4	3	4	3	1	13
City of Fessenden	3	4	4	3	2	12
City of Hamberg	4	3	4	3	1	13
City of Harvey	3	4	4	3	2	12
City of Hurdsfield	4	3	4	3	1	13
City of Sykeston	3	4	4	3	2	12

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

Table 5.8.2.3 provides information on the specific impact, frequency, likelihood, vulnerability and capability of severe winter weather in The Planning Area. A list of impacts of severe winter weather identified as commonplace regardless of the jurisdiction are listed below.

Identified Impacts – Severe Winter Weather

- Blocked Roads
- Building Collapse
- Business Interruptions
- Delayed Emergency Response
- Downed Power Lines
- Downed Trees
- Evacuation (Localized)
- HAZMAT Release
- Human Injury/Death
- Increased Fire Potential
- Increased Public Safety Runs
- Livestock Injury/Death
- Loss of Economy
- Loss of Power (increased risk of carbon monoxide poisoning)
- Loss of Wildlife Habitat
- Loss of Transportation/Accessibility
- Property Damage
- School Closure
- Wind Chill

Vulnerabilities of Critical Facilities and Infrastructure

The greatest issues for critical facilities resulting from severe winter weather impacts are inaccessibility due to blocked roads, and utility and power outages. Emergency services can have trouble providing services during power outages and are limited in responding to emergencies when roads are blocked from snow drifts. Critical facilities with backup generators are better equipped to handle impacts from severe winter weather if loss of power does occur. The Wells County Courthouse, lift stations and numerous critical facilities and infrastructure in Wells County need to upgrade existing generators or install new. See Chapter 6, Mitigation Strategy for a list of generators needed throughout the county.

The greatest issue for critical infrastructure is maintenance of the road system during severe winter weather. During blizzards or snow storms, cars and trucks can become stranded if roads are blocked with heavy snow and ice. This can result in extended response times for emergency services and prevent access to communities. Prolonged closures of roads can threaten propane, fuel and food supplies, and medical supplies. Suspended power lines are highly susceptible to fallen tree branches, other debris or accumulation of ice, leading to power outages. Restoration of power can take up to several days or even a week. All jurisdictions in the county have experienced power outages during severe winter weather to varying degrees of extent. Delivery of water to jurisdictions can be interrupted by water main breakage resulting from freeze and thaw cycles.

Table 5.8.2.3 – The Planning Area Severe Winter Weather Risk Assessment

	Eddy County, North Dakota	Wells County, North Dakota
Impact	<ul style="list-style-type: none"> • Blocked Roads • Building Collapse • Business Interruptions • Delayed Emergency Response • Downed Power Lines • Downed Trees • Human Injury/Death • Increased Public Safety Runs • Livestock Injury/Death • Loss of Economy • Loss of Power (increased risk of carbon monoxide poisoning) • Loss of Transportation/Accessibility • Property Damage • School Closure 	<ul style="list-style-type: none"> • Blocked Roads • Building Collapse • Business Interruptions • Delayed Emergency Response • Downed Power Lines • Downed Trees • Human Injury/Death • Increased Public Safety Runs • Livestock Injury/Death • Loss of Economy • Loss of Power (increased risk of carbon monoxide poisoning) • Loss of Transportation/Accessibility • Property Damage • School Closure
Frequency	<ul style="list-style-type: none"> • Multiple occurrences of blizzard, extreme low temps, heavy snow annually • Major storm with power outages in surrounding area Christmas 2016 	<ul style="list-style-type: none"> • Multiple occurrences of blizzard, extreme low temps, heavy snow annually • Major storm with power outages in surrounding area Christmas 2016
Likelihood	<ul style="list-style-type: none"> • Climatic patterns of the area will result in several storms per year 	<ul style="list-style-type: none"> • Climatic patterns of the area will result in several storms per year

Table 5.8.2.3 – The Planning Area Severe Winter Weather Risk Assessment - continued

	Eddy County, North Dakota	Wells County, North Dakota
Vulnerability	<p>Approximately 602 individuals under the age of 20, and 507 individuals age 65 and older, representing 25.4 and 21.4 percent of the population, respectively, and would be most vulnerable if an event did occur.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • Agriculture economy • Flat terrain and open topography • Lack of debris management plan • Lack of generators at some critical facilities and infrastructure • Flooding a likely secondary hazard/impact due to inadequate drainage from melting snow <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • Windbreaks/shelter belts • Advanced warning systems such as reverse 911, cell phones, internet, TV • Building codes and zoning • County residents “self-mitigate” due to hazard being constant in North Dakota 	<p>Approximately 716 individuals under the age of 20, and 514 individuals age 65 and older, representing 17.0 and 12.2 percent of the population, respectively, and would be most vulnerable if an event did occur.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • Agriculture economy • Flat terrain and open topography • Lack of debris management plan • Lack of generators at some critical facilities and infrastructure • Flooding a likely secondary hazard/impact due to inadequate drainage from melting snow <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • Windbreaks/shelter belts • Advanced warning systems such as reverse 911, cell phones, internet, TV • Building codes and zoning • County residents “self-mitigate” due to hazard being constant in North Dakota
Capability	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address severe winter weather. 	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address severe winter weather.

Vulnerabilities to Publicly-Owned Buildings and Property

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

Vulnerabilities to New and Future Development

Increases in population further complicate matters when dealing with severe winter weather. An example of this would be higher numbers of people susceptible to vehicle accidents on icy or blocked roads, health hazards due to wind chill and extreme cold. Conversely, increases in populations in existing jurisdictions may lessen the risk to impacts from severe winter weather as it leads to less isolated populations and increases the number of people reachable by emergency services during an emergency.

Data Limitations and Other Key Documents

Residents often experience impacts from these hazards, such as minor structural damage, increased utilities, loss of livestock, frozen water lines, they do not report.

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

- North Dakota Continuity of Operations Plan
- North Dakota Emergency Operations Plan
- North Dakota State Disaster Recovery Plan
- North Dakota State Hazard Mitigation Plan
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)
- Wells County Emergency Operations Plan
- Wells County Evacuation and Shelter Plan
- Wells County Local Emergency Operations Plan
- Wells County Shelter and Mass Care Plan
- Wells County Threat and Hazard Identification and Risk Assessment (THIRA)

5.9.1 Transportation Accident

Including Aircraft, Bicycle, Boat, Bus, Pedestrian, Railway, Truck and Vehicle Accidents.

Characteristics

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

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

Seasonal Pattern	None
Duration	Minutes/hours/days/months – depending on extent of accident
Speed of Onset	Little to no warning
Location	Total geographic extent of the Eddy County

For more information regarding transportation accident please reference the **State of North Dakota** Multi-Hazard Mitigation Plan. The plan can be accessed by following the link provided below.

<http://www.nd.gov/des/uploads/resources/915/final-ndmhmp-update.pdf>

History

Per the Plan Update Committee, traffic accidents with minor damage or injuries occur monthly in Eddy County. Accidents on a more significant scale occur sparingly throughout the year.

Per the N.D. Dept. of Transportation, Eddy County had an average of 66 crashes per year between 2005 and 2015 for a total of 728 incidents. The following are key points from Table 5.9.1.1:

- Eddy County experienced 657 property damage only crashes, 66 injury crashes resulting in 100 injuries, and five fatal crashes resulting in six fatalities.
- Approximately 90 percent of crashes were property-damage only.
- Approximately 89 property damage only crashes occurred in 2005, the highest number of any given year.
- Approximately 19 injuries were reported from crashes in 2011.

Table 5.9.1.1 – 2005 to 2015 Eddy County, N.D. Vehicle Accidents

Year	Property Damage Only (PDO)	Injury Crashes	Total Injuries	Fatal Crashes	Total Fatalities	Total Crashes
2005	89	5	NA	0	NA	94
2006	49	6	11	0	0	55
2007	88	4	8	1	1	93
2008	67	3	4	1	1	71
2009	65	6	10	0	0	71
2010	89	7	11	0	0	96
2011	82	8	19	1	1	91
2012	75	10	16	1	2	86
2013	27	5	6	0	0	32
2014	17	7	10	1	1	25
2015	9	5	5	0	0	14
TOTAL	657	66	100	5	6	728

Source: N.D. Dept. of Transportation

Probability and Magnitude

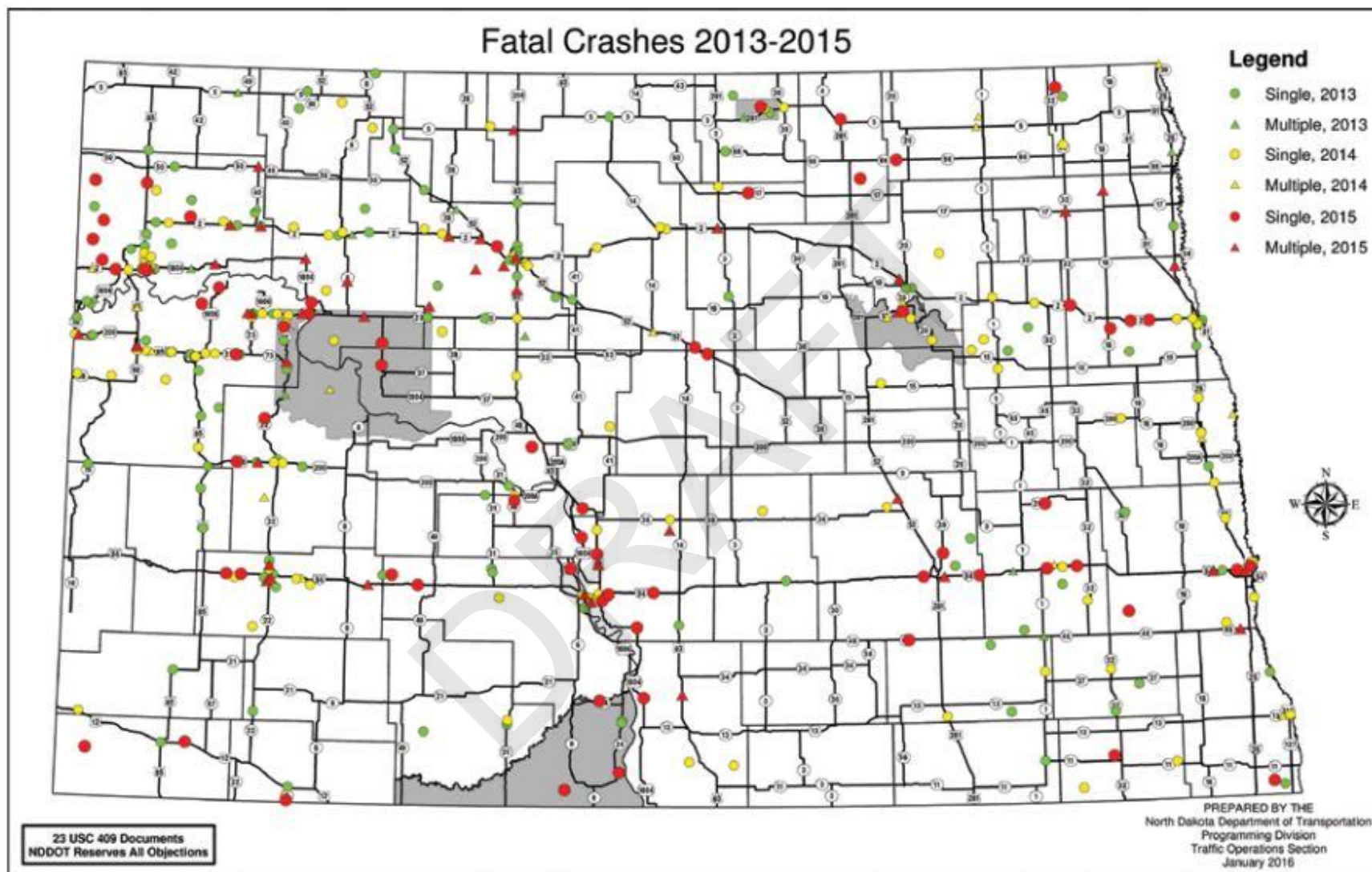
Probability. The Plan Update Committee indicated the probability of a transportation accident for Eddy County as likely, meaning that there is between a 10 and 100 percent probability in the next year of an incident. The following are key points.

- Per meeting participants at Plan Update Committee Meetings, the probability of minor crashes is monthly with major crashes occurring sparingly throughout the year.
- Per the N.D. Dept. of Transportation, Eddy County averages 66 crashes per year, resulting in approximately 5.5 crashes per month.
- **Figure 5.9.1.1 on the following page illustrates the location of fatal traffic crashes in Eddy County and greater North Dakota between 2013 and 2015.**

Magnitude. The Plan Update Committee indicated the magnitude of a transportation accident for Eddy County would be catastrophic and result in noticeable damage to people, buildings and property. The following are key points from data provided by the N.D. Dept. of Transportation for the year 2011.

- Costs from motor vehicle crashes occurring in Eddy County totaled \$7,121,638
- Approximately 19 injuries were reported totaling \$1,082,202.
- One fatality was reported.
- Fatal costs amounted to \$6,039,436.

Figure 5.9.1.1 – 2013 to 2015 Eddy County, N.D. Vehicle Accidents



Source: N.D. Dept. of Transportation

Risk Assessment

Table 5.9.1.2 shows the risk assessment as determined by individual jurisdictions and the planning committee for transportation accident. The risk assessment methodology can be found in the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment. The total in Table 5.9.1.2 represents the sum of each jurisdiction's impact, frequency, likelihood and vulnerability to a hazard less the jurisdiction's capabilities to respond to the hazard.

Table 5.9.1.2 – Eddy County Transportation Accident Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Eddy County	4	3	3	3	1	12
City of New Rockford	3	3	3	3	1	11
City of Sheyenne	3	3	3	3	1	11

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

Table 5.9.1.3 provides information on the specific impact, frequency, likelihood, vulnerability and capability of transportation accident in The Planning Area. A list of impacts of transportation accident identified as commonplace regardless of the jurisdiction are listed below.

Identified Impacts – Transportation Accident

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

Table 5.9.1.3 – The Planning Area Transportation Accident Risk Assessment

	Eddy County, North Dakota	Wells County, North Dakota
Impact	<ul style="list-style-type: none"> Explosion HAZMAT Release Human Injury/Death Increased Public Safety Runs Mass Casualties 	<ul style="list-style-type: none"> Explosion HAZMAT Release Human Injury/Death Increased Public Safety Runs Mass Casualties
Frequency	<ul style="list-style-type: none"> Multiple accidents involving cars, trucks and other vehicles annually Most accidents occur on U.S. Highway 281 and N.D. Highway 15 	<ul style="list-style-type: none"> Multiple accidents involving cars, trucks and other vehicles annually Most accidents occur on U.S. Highway 52, and N.D. Highways 3, 15, 30 and 200
Likelihood	<p><u>More likely</u></p> <ul style="list-style-type: none"> Presence of railroad Presence of U.S. Highway 281 and N.D. Highway 15 <p><u>Less likely</u></p> <ul style="list-style-type: none"> Slow-down in oil and gas activity 	<p><u>More likely</u></p> <ul style="list-style-type: none"> Presence of railroad Presence of U.S. Highway 52, and N.D. Highways 3, 15, 30 and 200 <p><u>Less likely</u></p> <ul style="list-style-type: none"> Slow-down in oil and gas activity
Vulnerability	<p>Approximately 602 individuals under the age of 20, and 507 individuals age 65 and older, representing 25.4 and 21.4 percent of the population, respectively, and would be most vulnerable/susceptible to a transportation accident.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> Presence of railroad Presence of U.S. Highway 281 and N.D. Highway 15 Two lane highways and roads with narrow shoulders and poorly marked intersections <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> Passing lanes, intersections and signage upgrades made 	<p>Approximately 716 individuals under the age of 20, and 514 individuals age 65 and older, representing 17.0 and 12.2 percent of the population, respectively, and would be most vulnerable/susceptible to a transportation accident.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> Presence of railroad Presence of U.S. Highway 52, and N.D. Highways 3, 15, 30 and 200 Two lane highways and roads with narrow shoulders and poorly marked intersections <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> Passing lanes, intersections and signage upgrades made
Capability	<ul style="list-style-type: none"> See Chapter 7 for a list of capabilities to address transportation accident. 	<ul style="list-style-type: none"> See Chapter 7 for a list of capabilities to address transportation accident.

Vulnerabilities to Publicly-Owned Buildings and Property

Publicly-owned buildings and property should not be affected by transportation accidents except in an instance where a train derails or vehicle crashes into a building. Should an accident of this nature occur, damage could exceed hundreds of thousands or millions of dollars, depending on the structure impacted. Buildings supporting key functions to daily county operations most vulnerable include, but are not limited to: Eddy County Courthouse, public schools and buildings supporting emergency services. A summary of city and county-owned buildings and property in Eddy County is provided in Chapter 4, Profile and Inventory.

Vulnerabilities of Critical Facilities and Infrastructure

Like publicly-owned buildings and property, critical facilities and infrastructure should not be affected by transportation accidents, except in rare occurrences. Vulnerabilities could include a closure of a major transportation artery or primary route due to an accident, which can block access for emergency services. A transportation accident can result in power outages if it occurred on a highway where power lines were near and are impacted from the accident.

Vulnerabilities to New and Future Development

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

Data Limitations and Other Key Documents

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

- Eddy County Emergency Operations Plan
- Eddy County Evacuation and Shelter Plan
- Eddy County Local Emergency Operations Plan
- Eddy County Shelter and Mass Care Plan
- Eddy County Threat and Hazard Identification and Risk Assessment (THIRA)
- North Dakota Continuity of Operations Plan
- North Dakota Emergency Operations Plan
- North Dakota State Disaster Recovery Plan
- North Dakota State Hazard Mitigation Plan
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)

5.9.2 Transportation Accident

Including Aircraft, Bicycle, Boat, Bus, Pedestrian, Railway, Truck and Vehicle Accidents.

Characteristics

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

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

Seasonal Pattern	None
Duration	Minutes/hours/days/months – depending on extent of accident
Speed of Onset	Little to no warning
Location	Total geographic extent of the Wells County

For more information regarding transportation accident please reference the **State of North Dakota** Multi-Hazard Mitigation Plan. The plan can be accessed by following the link provided below.

<http://www.nd.gov/des/uploads/resources/915/final-ndmhmp-update.pdf>

History

Per the Plan Update Committee, traffic accidents with minor damage or injuries occur monthly in Wells County. Accidents on a more significant scale occur sparingly throughout the year.

Per the N.D. Dept. of Transportation, Wells County had an average of 135 crashes per year between 2005 and 2015 for a total of 1,486 incidents. The following are key points from Table 5.9.2.1:

- Wells County experienced 1,294 property damage only crashes, 182 injury crashes resulting in 239 injuries, and 10 fatal crashes resulting in 11 fatalities.
- Approximately 87 percent of crashes were property-damage only.
- Approximately 165 property damage only crashes occurred in 2007, the highest number of any given year.
- Approximately 34 injuries were reported in 2011.
- Four fatal crashes occurred in 2009.

Table 5.9.2.1 – 2005 to 2015 Wells County, N.D. Vehicle Accidents

Year	Property Damage Only (PDO)	Injury Crashes	Total Injuries	Fatal Crashes	Total Fatalities	Total Crashes
2005	131	13	NA	1	NA	145
2006	134	12	15	1	1	147
2007	165	17	23	0	0	182
2008	135	13	17	1	1	149
2009	118	13	21	4	4	135
2010	126	21	33	0	0	147
2011	133	23	34	1	3	157
2012	124	20	27	2	2	146
2013	120	18	22	0	0	138
2014	58	16	22	0	0	74
2015	50	16	25	0	0	66
TOTAL	1,294	182	239	10	11	1,486

Source: N.D. Dept. of Transportation

Probability and Magnitude

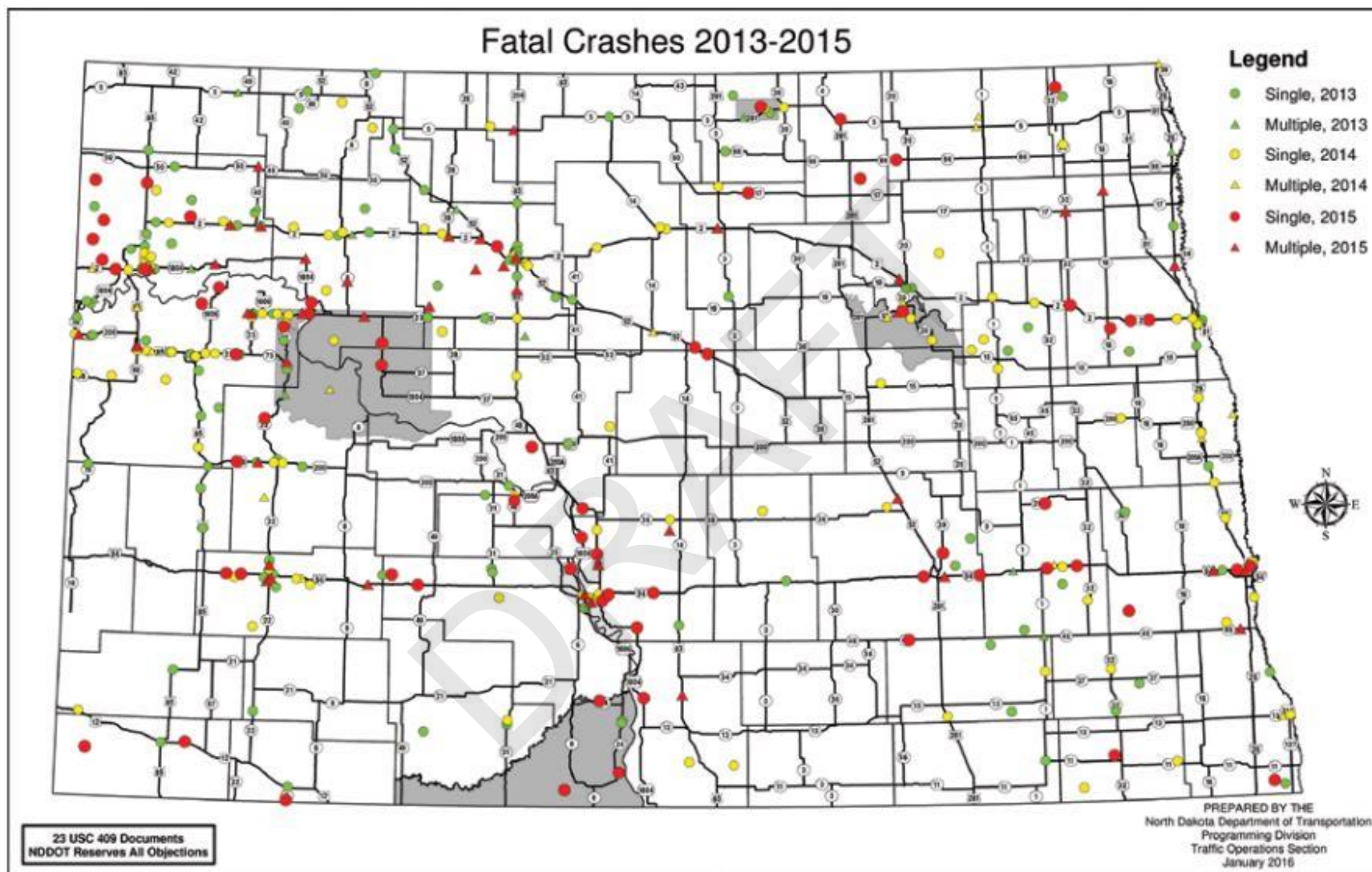
Probability. The Plan Update Committee indicated the probability of a transportation accident for Wells County as high likely, meaning that there is a 100 percent probability in the next year of an incident. The following are key points.

- Per meeting participants at Plan Update Committee Meetings, the probability of minor crashes is monthly with major crashes occurring sparingly throughout the year.
- Per the N.D. Dept. of Transportation, Wells County averages 135 crashes per year, resulting in approximately 11.25 crashes per month.
- **Figure 5.9.2.1 on the following page illustrates the location of fatal traffic crashes in Wells County and greater North Dakota between 2013 and 2015.**

Magnitude. The Plan Update Committee indicated the magnitude of a transportation accident for Wells County would be catastrophic and result in noticeable damage to people, buildings and property. The following are key points from data provided by the N.D. Dept. of Transportation for the year 2011.

- Costs from motor vehicle crashes occurring in Wells County totaled \$20,054,880
- Approximately 34 injuries were reported totaling \$1,936,572.
- Three fatalities were reported.
- Fatal costs amounted to \$18,118,308.

Figure 5.9.2.1 – 2013 to 2015 Wells County, N.D. Vehicle Accidents



Source: N.D. Dept. of Transportation

Risk Assessment

Table 5.9.2.2 shows the risk assessment as determined by individual jurisdictions and the planning committee for transportation accident. The risk assessment methodology can be found in the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment. The total in Table 5.9.2. represents the sum of each jurisdiction's impact, frequency, likelihood and vulnerability to a hazard less the jurisdiction's capabilities to respond to the hazard.

Table 5.9.2.2 – Wells County Transportation Accident Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Wells County	4	4	4	4	1	15
City of Bowdon	2	2	2	2	1	7
City of Cathay	2	2	2	2	1	7
City of Fessenden	3	3	3	3	1	11
City of Hamberg	2	2	2	2	1	7
City of Harvey	3	3	3	3	1	11
City of Hurdsfield	2	2	2	2	1	7
City of Sykeston	3	2	3	3	1	10

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

Table 5.9.2.3 provides information on the specific impact, frequency, likelihood, vulnerability and capability of transportation accident in The Planning Area. A list of impacts of transportation accident identified as commonplace regardless of the jurisdiction are listed below.

Identified Impacts – Transportation Accident

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

Table 5.9.2.3 – The Planning Area Transportation Accident Risk Assessment

	Eddy County, North Dakota	Wells County, North Dakota
Impact	<ul style="list-style-type: none"> • Explosion • HAZMAT Release • Human Injury/Death • Increased Public Safety Runs • Mass Casualties 	<ul style="list-style-type: none"> • Explosion • HAZMAT Release • Human Injury/Death • Increased Public Safety Runs • Mass Casualties
Frequency	<ul style="list-style-type: none"> • Multiple accidents involving cars, trucks and other vehicles annually • Most accidents occur on U.S. Highway 281 and N.D. Highway 15 	<ul style="list-style-type: none"> • Multiple accidents involving cars, trucks and other vehicles annually • Most accidents occur on U.S. Highway 52, and N.D. Highways 3, 15, 30 and 200
Likelihood	<p><u>More likely</u></p> <ul style="list-style-type: none"> • Presence of railroad • Presence of U.S. Highway 281 and N.D. Highway 15 <p><u>Less likely</u></p> <ul style="list-style-type: none"> • Slow-down in oil and gas activity 	<p><u>More likely</u></p> <ul style="list-style-type: none"> • Presence of railroad • Presence of U.S. Highway 52, and N.D. Highways 3, 15, 30 and 200 <p><u>Less likely</u></p> <ul style="list-style-type: none"> • Slow-down in oil and gas activity
Vulnerability	<p>Approximately 602 individuals under the age of 20, and 507 individuals age 65 and older, representing 25.4 and 21.4 percent of the population, respectively, and would be most vulnerable/susceptible to a transportation accident.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • Presence of railroad • Presence of U.S. Highway 281 and N.D. Highway 15 • Two lane highways and roads with narrow shoulders and poorly marked intersections <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • Passing lanes, intersections and signage upgrades made 	<p>Approximately 716 individuals under the age of 20, and 514 individuals age 65 and older, representing 17.0 and 12.2 percent of the population, respectively, and would be most vulnerable/susceptible to a transportation accident.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • Presence of railroad • Presence of U.S. Highway 52, and N.D. Highways 3, 15, 30 and 200 • Two lane highways and roads with narrow shoulders and poorly marked intersections <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • Passing lanes, intersections and signage upgrades made
Capability	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address transportation accident. 	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address transportation accident.

Vulnerabilities to Publicly-Owned Buildings and Property

Publicly-owned buildings and property should not be affected by transportation accidents except in an instance where a train derails or vehicle crashes into a building. Should an accident of this nature occur, damage could exceed hundreds of thousands or millions of dollars, depending on the structure impacted. Buildings supporting key functions to daily county operations most vulnerable include, but are not limited to: Wells County Courthouse, St Aloisius Medical Center, public schools and buildings supporting emergency services. A summary of city and county-owned buildings and property in Wells County is provided in Chapter 4, Profile and Inventory.

Vulnerabilities of Critical Facilities and Infrastructure

Like publicly-owned buildings and property, critical facilities and infrastructure should not be affected by transportation accidents, except in rare occurrences. Vulnerabilities could include a closure of a major transportation artery or primary route due to an accident, which can block access for emergency services. A transportation accident can result in power outages if it occurred on a highway where power lines were near and are impacted from the accident.

Vulnerabilities to New and Future Development

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

Data Limitations and Other Key Documents

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

- North Dakota Continuity of Operations Plan
- North Dakota Emergency Operations Plan
- North Dakota State Disaster Recovery Plan
- North Dakota State Hazard Mitigation Plan
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)
- Wells County Emergency Operations Plan
- Wells County Evacuation and Shelter Plan
- Wells County Local Emergency Operations Plan
- Wells County Shelter and Mass Care Plan
- Wells County Threat and Hazard Identification and Risk Assessment (THIRA)

5.10.1 Urban Fire/Structure Collapse

Including Urban Fire/Structure Collapse.

Characteristics

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

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

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

Seasonal Pattern	None
Duration	Minutes/hours/days
Speed of Onset	Little to no warning
Location	Total geographic extent of Eddy County

For more information regarding urban fire/structure collapse please reference the **State of North Dakota** Multi-Hazard Mitigation Plan. The plan can be accessed by following the link provided below.

<http://www.nd.gov/des/uploads/resources/915/final-ndmhmp-update.pdf>

History

Table 5.10.1.1 summarizes the history of urban fire/structure collapse in Eddy County and indicates 36 structure fires, 31 vehicle fires and 128 other fires between January 1, 2005 and November 1, 2016. The data was provided by the National Fire Incident Reporting System (NFIRS). A detailed hazard history for Eddy County can be found on a disc located at the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment.

Probability and Magnitude

Probability. Per Table 5.10.1.1, the probability of urban fire/structure collapse in Eddy County is 100 percent based on 166 occurrences between January 1, 2005 and November 1, 2016, or approximately 16 fires per year. However, the probability varies significantly between departments as little data was reported for the Sheyenne City Department. The Plan Update Committee indicated the probability of

urban fire/structure collapse in Eddy County as highly likely.

Magnitude. The magnitude of a structure fire can range anywhere from negligible for small fires extinguished immediately to catastrophic for fires threatening structural integrity and resulting in demolition. The magnitude for structure fires in terms of human life can be categorized as catastrophic as any loss of life would have a significant impact on a small community. The Sheyenne City Fire Department, although reporting the smallest fires numerically reporting the largest damages with \$900,000 in total losses. The losses were the result of the total loss of the former school building due to fire in December 2015. During the same time frame, the fire protection districts in Eddy County responded to 49 medical treatment calls.

The Plan Update Committee indicated the magnitude or impact of urban fire/structure collapse as critical meaning that between 25 and 50 percent of Eddy County could be affected if a structure fire impacted critical facilities or infrastructure.

Table 5.10.1.1 – January 1, 2005 to November 1, 2016 Eddy County Urban Fire/Structure Collapse Hazard History Summary

Fire Protection Agency	Fires				Rescue Calls			Losses	
	Structure	Vehicle	Other	Total	Medical	All Others	Totals	Total Fire	Total Loss
New Rockford Fire Dept.	17	8	51	76	22	11	33	\$33,650.00	\$42,150.00
New Rockford Fire Protection Dist.	6	9	50	65	14	0	14	\$300.00	\$17,300.00
Sheyenne City Dept.	1	0	0	1	0	0	0	\$900,000.00	\$900,000.00
Sheyenne Rural Fire Dept.	12	14	27	53	13	0	13	\$218,700.00	\$218,700.00
TOTAL	36	31	128	195	49	11	60	\$1,152,650.00	\$1,178,150.00

Note: All fires, rescue calls and loss statistics are from January 1, 2005 to November 1, 2016

Source: National Fire Incident Reporting System Summary by Incident Type

Risk Assessment

Table 5.10.1.2 shows the risk assessment as determined by individual jurisdictions and the Plan Update Committee for urban fire/structure collapse. The risk assessment methodology can be found in the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment. The total in Table 5.10.1.2 represents the sum of each jurisdiction's impact, frequency, likelihood and vulnerability to a hazard less the jurisdiction's capabilities to respond to the hazard.

Table 5.10.1.2 – Eddy County Urban Fire/Structure Collapse Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability	Total
Eddy County	3	3	4	3	1	12
City of New Rockford	3	2	2	3	1	9
City of Sheyenne	3	3	3	3	1	11

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

Table 5.10.1.3 provides information on the specific impact, frequency, likelihood, vulnerability and capability of urban fire/structure collapse in The Planning Area. Impacts that are bolded indicate an impact holding more value than the rest listed. A list of impacts of urban fire/structure collapse identified as commonplace regardless of the jurisdiction are listed below.

Identified Impacts – Urban Fire/Structure Collapse

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

Vulnerabilities to Publicly-Owned Buildings and Property

All publicly-owned buildings and property are vulnerable to urban fire/structure collapse. The risk to the hazard depends on the location of the building and if it is equipped with fire suppression mechanisms, such as sprinkler systems and smoke detectors, among others. Risk to publicly-owned building and property also depends on the proximity of fire suppression equipment and response times from fire departments/districts. Older publicly-owned buildings may be more susceptible to fire being built to older building and electrical codes. Publicly-owned buildings with flat roofs are more at risk to building collapse from snow loads. Flat-roofed buildings, whether publicly-owned or privately owned, are typically located in the downtown area or older and/or more established neighborhoods of incorporated jurisdictions. A summary of publicly-owned buildings is provided in Chapter 4, Profile and Inventory.

Vulnerabilities of Critical Facilities and Infrastructure

Like publicly-owned buildings and property, critical facilities and infrastructure are vulnerable to urban fire/structure collapse. If an incident were to occur, the critical facility or infrastructure could result in loss of or delay in services. A fire affecting critical infrastructure such as power lines or lift stations could leave residents without power, potable water or sanitary sewer, depending on the severity of the incident. Loss of communications from fire can also occur and result in a complete shutdown of daily operations of critical facilities and infrastructure. Communication infrastructure suspended in the air and not buried underground is most vulnerable.

Table 5.10.3 – The Planning Area Urban Fire/Structure Collapse Risk Assessment

	Eddy County, North Dakota	Wells County, North Dakota
Impact	<ul style="list-style-type: none"> • Building Collapse • Business Interruptions • Evacuation (Localized) • Explosion • HAZMAT Release • Human Injury/Death • Loss of Economy • Property Damage 	<ul style="list-style-type: none"> • Building Collapse • Business Interruptions • Evacuation (Localized) • Explosion • HAZMAT Release • Human Injury/Death • Loss of Economy • Property Damage
Frequency	<ul style="list-style-type: none"> • Approximately 1 to 3 occurrences of structure fires and building collapses annually • Total loss of 115-year-old former school building in December 2015 	<ul style="list-style-type: none"> • Approximately 1 to 3 occurrences of structure fires and building collapses annually
Likelihood	<p><u>More likely</u></p> <ul style="list-style-type: none"> • Presence of older commercial and residential buildings with outdated electrical • Older downtown structures sharing common walls and single-family spaced close together • Some structures lack modern electrical/sprinkler systems <p><u>Less likely</u></p> <ul style="list-style-type: none"> • Fire safety prevention week 	<p><u>More likely</u></p> <ul style="list-style-type: none"> • Presence of older commercial and residential buildings with outdated electrical • Older downtown structures sharing common walls and single-family spaced close together • Some structures lack modern electrical/sprinkler systems <p><u>Less likely</u></p> <ul style="list-style-type: none"> • Fire safety prevention week
Vulnerability	Approximately 602 individuals under the age of 20, and 507 individuals age 65 and older, representing 25.4 and 21.4 percent of the population, respectively, and would be most vulnerable/susceptible to an urban fire/structure collapse.	Approximately 716 individuals under the age of 20, and 514 individuals age 65 and older, representing 17.0 and 12.2 percent of the population, respectively, and would be most vulnerable/susceptible to an urban fire/structure collapse.

Table 5.10.3 – The Planning Area Urban Fire/Structure Collapse Risk Assessment

	Eddy County, North Dakota	Wells County, North Dakota
Vulnerability	<p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • Presence of older commercial and residential buildings with outdated electrical • Older downtown structures sharing common walls and single-family spaced close together • Some structures lack modern electrical/sprinkler systems • Lack of smoke detectors in critical facilities <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • Presence of fire hydrants in some communities • Well-trained and educated fire departments/districts • Smoke detectors 	<p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • Presence of older commercial and residential buildings with outdated electrical • Older downtown structures sharing common walls and single-family spaced close together • Some structures lack modern electrical/sprinkler systems • Lack of smoke detectors in critical facilities <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • Presence of fire hydrants in some communities • Well-trained and educated fire departments/districts • Smoke detectors
Capability	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address urban fire/structure collapse. 	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address urban fire/structure collapse.

Vulnerabilities to New and Future Development

New and future development could be more vulnerable in communities that lack building codes. Buildings in jurisdictions that lack building codes could be more susceptible to snow loads, structural instability, and may lack fire suppression systems. Eddy County is in the process of adopting building codes. Adoption and enforcement of building codes should reduce the risk and vulnerability to new and future development. An inventory of household units by type by jurisdiction in Eddy County is shown in Chapter 4, Profile and Inventory.

As populations grow, more people are at risk of injury and potential death from urban fire/structure collapses. Strengthening of buildings codes would mitigate impacts from the hazard. This mitigation project for the county can be found in Chapter 6, Mitigation Strategy.

Data Limitations and Other Key Documents

NFIRS reports by fire department and/or district responding, not by location of the incident. Fire departments from neighboring counties have coverage over parts of Eddy County through mutual aid agreements. Total number of fires reported may be more than what has been reported.

Also, the lack of a definition of the 'Other Fires' category in data from NFIRS limits the understanding of the hazard to develop appropriate mitigation strategies. In Eddy County, fires classified as 'Other Fires' are more frequent than structure and vehicle fires.

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

- Eddy County Emergency Operations Plan
- Eddy County Evacuation and Shelter Plan
- Eddy County Local Emergency Operations Plan
- Eddy County Shelter and Mass Care Plan
- Eddy County Threat and Hazard Identification and Risk Assessment (THIRA)
- North Dakota Continuity of Operations Plan
- North Dakota Emergency Operations Plan
- North Dakota State Disaster Recovery Plan
- North Dakota State Hazard Mitigation Plan
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)

5.10.2 Urban Fire/Structure Collapse

Including Urban Fire/Structure Collapse.

Characteristics

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

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

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

Seasonal Pattern	None
Duration	Minutes/hours/days
Speed of Onset	Little to no warning
Location	Total geographic extent of Wells County

For more information regarding urban fire/structure collapse please reference the **State of North Dakota** Multi-Hazard Mitigation Plan. The plan can be accessed by following the link provided below.

<http://www.nd.gov/des/uploads/resources/915/final-ndmhmp-update.pdf>

History

Table 5.10.2.1 summarizes the history of urban fire/structure collapse in Wells County and indicates 73 structure fires, 67 vehicle fires and 1253 other fires between January 1, 2005 and November 1, 2016. The data was provided by the National Fire Incident Reporting System (NFIRS). A detailed hazard history for Wells County can be found on a disc located at the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment.

Probability and Magnitude

Probability. Per Table 5.10.2.1, the probability of urban fire/structure collapse in Wells County is 100 percent based on 393 occurrences between January 1, 2005 and November 1, 2016, or approximately 33 fires per year. However, the probability varies significantly between departments as no data was reported for the Cathay Fire Department. The Plan Update Committee indicated the probability of urban fire/structure collapse in Wells County as highly likely.

Magnitude. The magnitude of a structure fire can range anywhere from negligible for small fires extinguished immediately to catastrophic for fires threatening structural integrity and resulting in demolition. The magnitude for structure fires in terms of human life can be categorized as catastrophic as any loss of life would have a significant impact on a small community. The Fessenden Fire Protection District reported the largest losses with \$1,827,050 total losses between January 1, 2005 to November 1, 2016, respectively. During the same time frame, the fire protection districts in Wells County responded to 109 medical treatment calls.

The Plan Update Committee indicated the magnitude or impact of urban fire/structure collapse as critical meaning that between 25 and 50 percent of Wells County could be affected if a structure fire impacted critical facilities or infrastructure.

Table 5.10.2.1 – January 1, 2005 to November 1, 2016 Wells County Urban Fire/Structure Collapse Hazard History Summary

Fire Protection Agency	Fires				Rescue Calls			Losses	
	Structure	Vehicle	Other	Total	Medical	All Others	Totals	Total Fire	Total Loss
Bowdon Fire Dept.	3	4	10	17	0	0	0	\$10,000.00	\$10,100.00
Bowdown Fire Protection Dist.	0	1	0	1	0	0	0	\$8,000.00	\$8,000.00
Cathay Fire Dept.	0	0	0	0	0	0	0	\$0.00	\$0.00
Fessenden Fire Protection Dist.	14	13	20	47	7	5	12	\$1,701,100.00	\$1,827,050.00
Harvey Fire Dept.	28	17	10	55	87	8	95	\$53,000.00	\$366,000.00
Harvey Fire Protection Dist.	25	32	212	269	15	9	24	\$361,450.00	\$486,450.00
Sykeston Fire Protection Dist.	3	0	1	4	0	0	0	\$25,000.00	\$25,000.00
TOTAL	73	67	253	393	109	22	131	\$2,158,550.00	\$2,722,600.00

Note: All fires, rescue calls and loss statistics are from January 1, 2005 to November 1, 2016

Source: National Fire Incident Reporting System Summary by Incident Type

Risk Assessment

Table 5.10.2.2 shows the risk assessment as determined by individual jurisdictions and the Plan Update Committee for urban fire/structure collapse. The risk assessment methodology can be found in the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment. The total in Table 5.10.2.2 represents the sum of each jurisdiction's impact, frequency, likelihood and vulnerability to a hazard less the jurisdiction's capabilities to respond to the hazard.

Table 5.10.2.2 – Wells County Urban Fire/Structure Collapse Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability	Total
Wells County	3	3	4	3	1	12
City of Bowdon	2	2	3	2	1	8
City of Cathay	2	2	3	2	1	8
City of Fessenden	3	4	4	3	2	12
City of Hamberg	2	2	3	2	1	8
City of Harvey	3	4	4	3	2	12
City of Hurdsfield	2	2	3	2	1	8
City of Sykeston	3	2	2	3	1	9

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

Table 5.10.2.3 provides information on the specific impact, frequency, likelihood, vulnerability and capability of urban fire/structure collapse in The Planning Area. Impacts that are bolded indicate an impact holding more value than the rest listed. A list of impacts of urban fire/structure collapse identified as commonplace regardless of the jurisdiction are listed below.

Identified Impacts – Urban Fire/Structure Collapse

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

Vulnerabilities to Publicly-Owned Buildings and Property

All publicly-owned buildings and property are vulnerable to urban fire/structure collapse. The risk to the hazard depends on the location of the building and if it is equipped with fire suppression mechanisms, such as sprinkler systems and smoke detectors, among others. Risk to publicly-owned building and property also depends on the proximity of fire suppression equipment and response times from fire departments/districts. Older publicly-owned buildings may be more susceptible to fire being built to older building and electrical codes. Publicly-owned buildings with flat roofs are more at risk to building collapse from snow loads. Flat-roofed buildings, whether publicly-owned or privately owned, are typically located in the downtown area or older and/or more established neighborhoods of incorporated jurisdictions. A summary of publicly-owned buildings is provided in Chapter 4, Profile and Inventory.

Vulnerabilities of Critical Facilities and Infrastructure

Like publicly-owned buildings and property, critical facilities and infrastructure are vulnerable to urban fire/structure collapse. If an incident were to occur, the critical facility or infrastructure could result in loss of or delay in services. A fire affecting critical infrastructure such as power lines or lift stations could leave residents without power, potable water or sanitary sewer, depending on the severity of the incident. Loss of communications from fire can also occur and result in a complete shutdown of daily operations of critical facilities and infrastructure. Communication infrastructure suspended in the air and not buried underground is most vulnerable.

Table 5.10.3 – The Planning Area Urban Fire/Structure Collapse Risk Assessment

	Eddy County, North Dakota	Wells County, North Dakota
Impact	<ul style="list-style-type: none"> • Building Collapse • Business Interruptions • Evacuation (Localized) • Explosion • HAZMAT Release • Human Injury/Death • Loss of Economy • Property Damage 	<ul style="list-style-type: none"> • Building Collapse • Business Interruptions • Evacuation (Localized) • Explosion • HAZMAT Release • Human Injury/Death • Loss of Economy • Property Damage
Frequency	<ul style="list-style-type: none"> • Approximately 1 to 3 occurrences of structure fires and building collapses annually • Total loss of 115-year-old former school building in December 2015 	<ul style="list-style-type: none"> • Approximately 1 to 3 occurrences of structure fires and building collapses annually
Likelihood	<p><u>More likely</u></p> <ul style="list-style-type: none"> • Presence of older commercial and residential buildings with outdated electrical • Older downtown structures sharing common walls and single-family spaced close together • Some structures lack modern electrical/sprinkler systems <p><u>Less likely</u></p> <ul style="list-style-type: none"> • Fire safety prevention week 	<p><u>More likely</u></p> <ul style="list-style-type: none"> • Presence of older commercial and residential buildings with outdated electrical • Older downtown structures sharing common walls and single-family spaced close together • Some structures lack modern electrical/sprinkler systems <p><u>Less likely</u></p> <ul style="list-style-type: none"> • Fire safety prevention week
Vulnerability	Approximately 602 individuals under the age of 20, and 507 individuals age 65 and older, representing 25.4 and 21.4 percent of the population, respectively, and would be most vulnerable/susceptible to an urban fire/structure collapse.	Approximately 716 individuals under the age of 20, and 514 individuals age 65 and older, representing 17.0 and 12.2 percent of the population, respectively, and would be most vulnerable/susceptible to an urban fire/structure collapse.

Table 5.10.3 – The Planning Area Urban Fire/Structure Collapse Risk Assessment

	Eddy County, North Dakota	Wells County, North Dakota
Vulnerability	<p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • Presence of older commercial and residential buildings with outdated electrical • Older downtown structures sharing common walls and single-family spaced close together • Some structures lack modern electrical/sprinkler systems • Lack of smoke detectors in critical facilities <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • Presence of fire hydrants in some communities • Well-trained and educated fire departments/districts • Smoke detectors 	<p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • Presence of older commercial and residential buildings with outdated electrical • Older downtown structures sharing common walls and single-family spaced close together • Some structures lack modern electrical/sprinkler systems • Lack of smoke detectors in critical facilities <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • Presence of fire hydrants in some communities • Well-trained and educated fire departments/districts • Smoke detectors
Capability	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address urban fire/structure collapse. 	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address urban fire/structure collapse.

Vulnerabilities to New and Future Development

New and future development could be more vulnerable in communities that lack building codes. Buildings in jurisdictions that lack building codes could be more susceptible to snow loads, structural instability, and may lack fire suppression systems. All jurisdictions in Wells County have adopted state building codes, but do not have enforcement. Adoption and enforcement of building codes should reduce the risk and vulnerability to new and future development. An inventory of household units by type by jurisdiction in Wells County is shown in Chapter 4, Profile and Inventory.

As populations grow, more people are at risk of injury and potential death from urban fire/structure collapses. Strengthening of buildings codes would mitigate impacts from the hazard. This mitigation project for the county can be found in Chapter 6, Mitigation Strategy.

Data Limitations and Other Key Documents

NFIRS reports by fire department and/or district responding, not by location of the incident. Fire departments from neighboring counties have coverage over parts of Wells County through mutual aid agreements. Total number of fires reported may be more than what has been reported.

Also, the lack of a definition of the ‘Other Fires’ category in data from NFIRS limits the understanding of the hazard to develop appropriate mitigation strategies. In Wells County, fires classified as ‘Other Fires’ are more frequent than structure and vehicle fires.

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

- North Dakota Continuity of Operations Plan
- North Dakota Emergency Operations Plan
- North Dakota State Disaster Recovery Plan
- North Dakota State Hazard Mitigation Plan
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)
- Wells County Emergency Operations Plan
- Wells County Evacuation and Shelter Plan
- Wells County Local Emergency Operations Plan
- Wells County Shelter and Mass Care Plan
- Wells County Threat and Hazard Identification and Risk Assessment (THIRA)

5.11.1 Wildland Fire

Including Wildland Fire and Rural Fire.

Characteristics

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

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

Rural Fire. Rural fires result from farming activities whereby farm equipment may ignite a fire while haying, harvesting and other farming activities.

Seasonal Pattern	Spring to Fall
Duration	Hours/days
Speed of Onset	No warning if result of natural hazard
Location	Total geographic extent of Eddy County

For more information regarding wildland fire please reference the **State of North Dakota** Multi-Hazard Mitigation Plan. The plan can be accessed by following the link provided below.

<http://www.nd.gov/des/uploads/resources/915/final-ndmhmp-update.pdf>

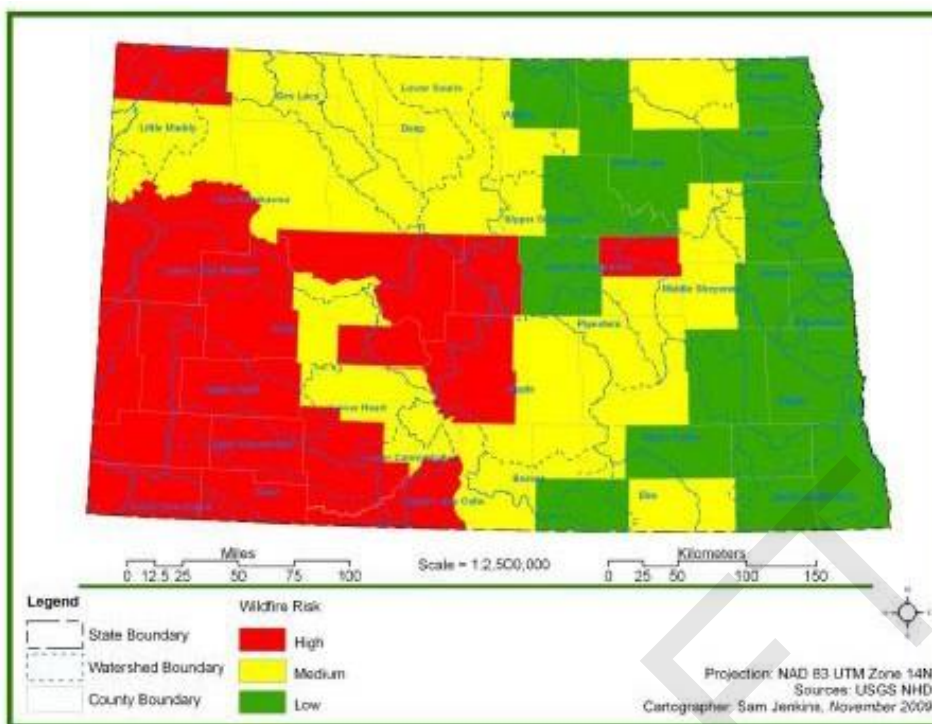
History

According to National Fire and Aviation Management, between August 2009 and June 2016, there were 31 wildland fires reported in Eddy County impacting 898 acres. According to the 2014 State of North Dakota MHMP, between 2009 and 2012, there were 13 wildland fires reported in Eddy County burning 288 acres.

Crop Loss. Crop loss from wildland fire is tracked by the United States Department of Agriculture, Risk Management Agency (RMA). The RMA provides data on the crop type affected, damage cause description, determined acres and indemnity amount. The damage cause description identifies the cause of damage, determines acres identifies the number of acres lost due to damage, and the indemnity amount identifies the total amount of the loss for the designated peril. Between January 1, 2001 and December 31, 2016, Eddy County experienced one incident of crop loss due to wildland fire impacting approximately 207 acres of crops totaling \$6,922 in losses.

Probability and Magnitude

Probability. The probability of wildland fire occurring in Eddy County is 100 percent based on 31 occurrences between August 2009 and June 2016. The Plan Update Committee indicated the probability of wildland fire in Eddy County is highly likely meaning there is a 100 percent chance in the next year of an occurrence of the hazard. Figure 5.11.1.1 shows the risk of wildland in Eddy County compared to the remaining counties in the state.

Figure 5.11.1.1 – Wildland Risk by North Dakota County

Source: 2014 State of North Dakota MHMP

The probability of wildland fire impacting people and property depends on the WUI. Areas where land and human development intermingle with vegetation has the highest probability of a wildland fire impacting people and property, not overall probability of a wildland fire occurring. Figures 5.11.1.2 to 5.11.1.3 show the WUI for incorporated cities in Eddy County. The areas colored in orange indicate areas with the highest probability of a wildland fire impacting people and property.

Magnitude. Wildland fire data is provided by National Fire and Aviation Management and highlights the magnitude of wildland fire in Eddy County. The following are key points:

- The largest wildland fire in Eddy County in 2016 and burned 250 acres.
- The average size of a wildland fire in Eddy County was 29 acres.
- Three structures were threatened by a wildland fire occurring May 25, 2015.

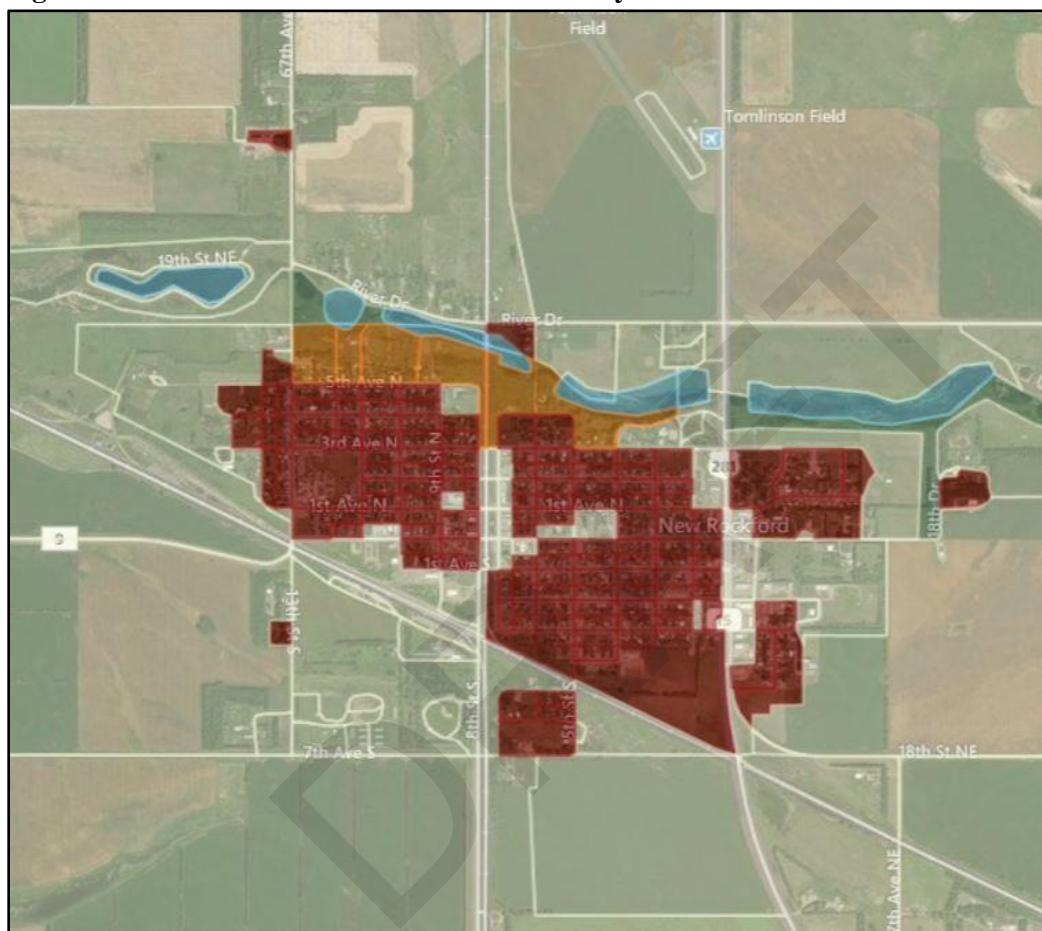
The magnitude of wildland fire in Eddy County can also be determined by using data from the 2014 State of North Dakota Multi-Hazard Mitigation Plan. The following are key points:

- There are 27 and three housing units in Eddy County in high-risk and moderate-risk areas containing a total population of 28 and four people, respectively.
- Approximately 30 housing units and \$1,521,000 in housing unit value located in high and moderate wildland fire risk areas in Eddy County.

The Plan Update Committee indicated the magnitude or impact of wildland fire as critical meaning between 25 and 50 percent of people and property in Eddy County could be affected.

Wildland Urban Interface (WUI) is the zone of transition between unoccupied land and human development. Communities that are within 0.5 miles of the zone may also be included. These lands and communities adjacent to and surrounded by wildlands are at risk to wildland fires. There are two types of WUI: intermix and interface. Intermix refers to areas where housing and vegetation intermingle. Interface refers to areas with housing near contiguous wildland vegetation. Figures 5.11.1.2 to 5.11.1.3 show the WUI for incorporated cities in Eddy County.

Figure 5.11.1.1 – Wildland-Urban Interface - City of New Rockford

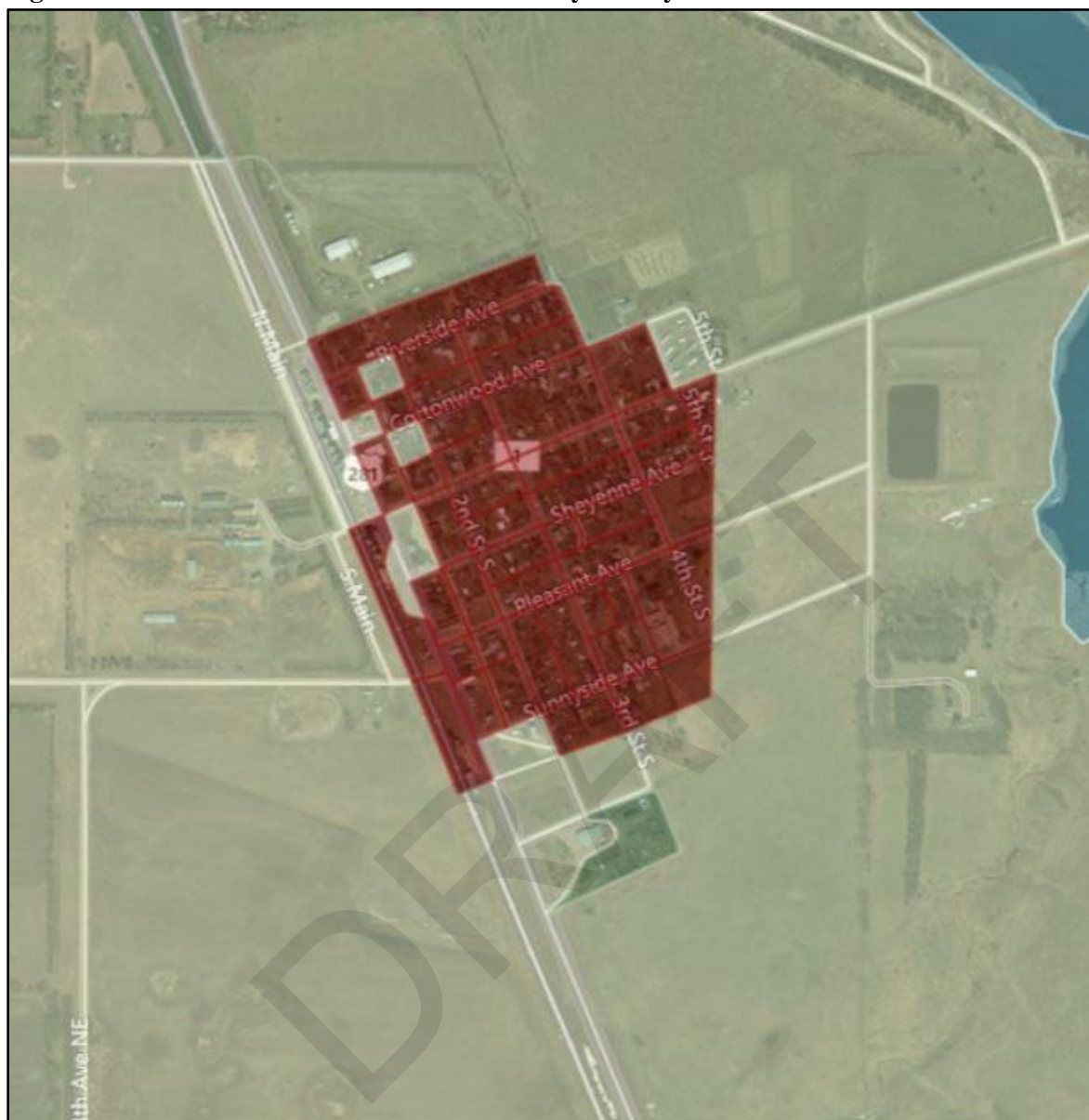


Source: University of Wisconsin, Silvics Lab – Spatial Analysis for Conservation and Sustainability



The greatest risk of wildland fire posed for the city of New Rockford is on its north border as shown by the WUI. As indicated on the map by the orange shading, the intermix is present in northern and southern portions of the city.

Figure 5.11.1.2 – Wildland-Urban Interface - City of Sheyenne



Source: University of Wisconsin, Silvics Lab – Spatial Analysis for Conservation and Sustainability



The city of Sheyenne does not have a wildland fire interface or intermix according to the WUI map above. Therefore, it is assumed the city is at a lower risk to wildland fire than the city of New Rockford.

Risk Assessment

Table 5.11.1.2 shows the risk assessment as determined by individual jurisdictions and the Plan Update Committee for wildland fire. The risk assessment methodology can be found in the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment. The total in Table 5.11.1.2 represents the sum of each jurisdiction's impact, frequency, likelihood and vulnerability to a hazard less the jurisdiction's capabilities to respond to the hazard.

Table 5.11.1.2 – Eddy County Wildland Fire Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Eddy County	3	3	4	3	2	11
City of New Rockford	2	3	3	2	1	9
City of Sheyenne	3	3	3	3	1	11

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

Table 5.11.1.3 provides information on the specific impact, frequency, likelihood, vulnerability and capability of wildland fire in The Planning Area. A list of impacts of wildland fire identified as commonplace regardless of the jurisdiction are listed below.

Identified Impacts – Wildland Fire

- Blocked Roads
- Building Collapse
- Business Interruptions
- Crop Loss
- Delayed Emergency Response
- Downed Power Lines
- Downed Trees
- Evacuation (Localized)
- Explosion
- HAZMAT Release
- Human Injury/Death
- Increased Fire Potential
- Increased Public Safety Runs
- Livestock Injury/Death
- Loss of Economy
- Loss of Power
- Loss of Transportation/Accessibility
- Loss of Wildlife Habitat
- Mass Casualties
- Property Damage
- Wildlife Injury/Death

Table 5.11.1.3 – The Planning Area Wildland Fire Collapse Risk Assessment

	Eddy County, North Dakota	Wells County, North Dakota
Impact	<ul style="list-style-type: none"> Blocked Roads Business Interruptions Delayed Emergency Response Downed Power Lines Downed Trees Evacuation (Localized) Explosion HAZMAT Release Increased Fire Potential Livestock Injury/Death Loss of Power Loss of Wildlife Habitat 	<ul style="list-style-type: none"> Blocked Roads Business Interruptions Delayed Emergency Response Downed Power Lines Downed Trees Evacuation (Localized) Explosion HAZMAT Release Increased Fire Potential Livestock Injury/Death Loss of Power Loss of Wildlife Habitat
Frequency	<ul style="list-style-type: none"> Controlled burns becoming out of control approximately 50 percent of the time on an annual basis 	<ul style="list-style-type: none"> Controlled burns becoming out of control approximately 50 percent of the time on an annual basis
Likelihood	<p>Likelihood of Wildland Fire is dependent on local weather conditions</p> <p><u>More likely</u></p> <ul style="list-style-type: none"> Largely amount of grass and vegetation Misuse of fire management by farmers Increased truck traffic hauling hazardous materials Overgrown vegetation along railroad tracks Dry conditions (when present) <p><u>Less likely</u></p> <ul style="list-style-type: none"> Burn Bans Less CRP Farmers have supply of water for fire suppression on site 	<p>Likelihood of Wildland Fire is dependent on local weather conditions</p> <p><u>More likely</u></p> <ul style="list-style-type: none"> Largely amount of grass and vegetation Misuse of fire management by farmers Increased truck traffic hauling hazardous materials Overgrown vegetation along railroad tracks Dry conditions (when present) <p><u>Less likely</u></p> <ul style="list-style-type: none"> Burn Bans Less CRP Farmers have supply of water for fire suppression on site

Table 5.11.1.3 – The Planning Area Wildland Fire Collapse Risk Assessment

	Eddy County, North Dakota	Wells County, North Dakota
Vulnerability	<p>Approximately 602 individuals under the age of 20, and 507 individuals age 65 and older, representing 25.4 and 21.4 percent of the population, respectively, and would be most vulnerable to a wildland fire.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • Lack of fire break around the cities • Depends on wind speed • Lonetree Wildlife Management Areas <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • Fire index signs • County conducts mowing along roads and infrastructure • Emergency sirens • Less CRP acreage 	<p>Approximately 716 individuals under the age of 20, and 514 individuals age 65 and older, representing 17.0 and 12.2 percent of the population, respectively, and would be most vulnerable to a wildland fire.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • Lack of fire break around the city • Homes/structures adjacent to sloughs and areas with dry vegetation • Depends on wind speed • Lonetree Wildlife Management Areas <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • Fire index signs • County conducts mowing along roads and infrastructure • Emergency sirens • Less CRP acreage
Capability	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to wildland fire. 	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to wildland fire.

Vulnerabilities to Publicly-Owned Buildings and Property

Publicly-owned buildings and property located in the Wildland-Urban Interface (WUI) or in remote areas are vulnerable to wildland fire. The risk of the hazard depends on building and property location, and if emergency services can reach the property in a timely manner. An inventory of publicly-owned buildings and property is shown in Chapter 4, Profile and Inventory.

The lack of firebreaks around jurisdictions in Eddy County is a vulnerability to publicly-owned buildings and properties. If a wildland fire were to grow and become uncontrollable, buildings and properties would be at risk from the spread of the fire. All incorporated jurisdictions in Eddy County lack fire breaks. Breaks can and should be implemented where the WUI poses the greatest threat to people and property. Maps of the WUI shown in this chapter illustrate where measures should be implemented to mitigate wildland fires.

Vulnerabilities of Critical Facilities and Infrastructure

Like publicly-owned buildings and property, critical facilities and infrastructure are vulnerable to wildland fire. The vulnerability will vary depending on location from the wildland-urban interface. If an incident were to occur, depending on the facility or infrastructure impacted, a loss of or delay in emergency or utility services could be the result. Maps of the WUI shown in this chapter illustrate where measures should be implemented to mitigate wildland fires.

Vulnerabilities to New and Future Development

Rural homesteads on large parcels of land in remote areas are a trend in residential development in areas of North Dakota surrounding larger cities like Bismarck and Minot. Eddy County should incorporate planning and zoning regulations limiting where new residential development can occur, specifically large rural lots. The vulnerability of new and future development to wildland fire also increases as the distance from fire departments and emergency services increases. Residential development in remote areas increases the opportunity for human-induced wildland fires.

Data Limitations and Other Key Documents

Fire department and district boundaries cross county lines, and therefore, coverage in some areas of the county is provided by departments and districts based in neighboring counties. Similarly, departments in Eddy County also provide coverage to neighboring counties. This cross-over may provide challenging to data tracking purposes.

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

- Eddy County Emergency Operations Plan
- Eddy County Evacuation and Shelter Plan
- Eddy County Local Emergency Operations Plan
- Eddy County Shelter and Mass Care Plan
- Eddy County Threat and Hazard Identification and Risk Assessment (THIRA)
- North Dakota Continuity of Operations Plan

- North Dakota Drought Mitigation Plan
- North Dakota Emergency Operations Plan
- North Dakota State Disaster Recovery Plan
- North Dakota State Hazard Mitigation Plan
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)

DRAFT

5.11.2 Wildland Fire

Including Wildland Fire and Rural Fire.

Characteristics

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

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

Rural Fire. Rural fires result from farming activities whereby farm equipment may ignite a fire while haying, harvesting and other farming activities.

Seasonal Pattern	Spring to Fall
Duration	Hours/days
Speed of Onset	No warning if result of natural hazard
Location	Total geographic extent of Wells County

For more information regarding wildland fire please reference the **State of North Dakota** Multi-Hazard Mitigation Plan. The plan can be accessed by following the link provided below.

<http://www.nd.gov/des/uploads/resources/915/final-ndmhmp-update.pdf>

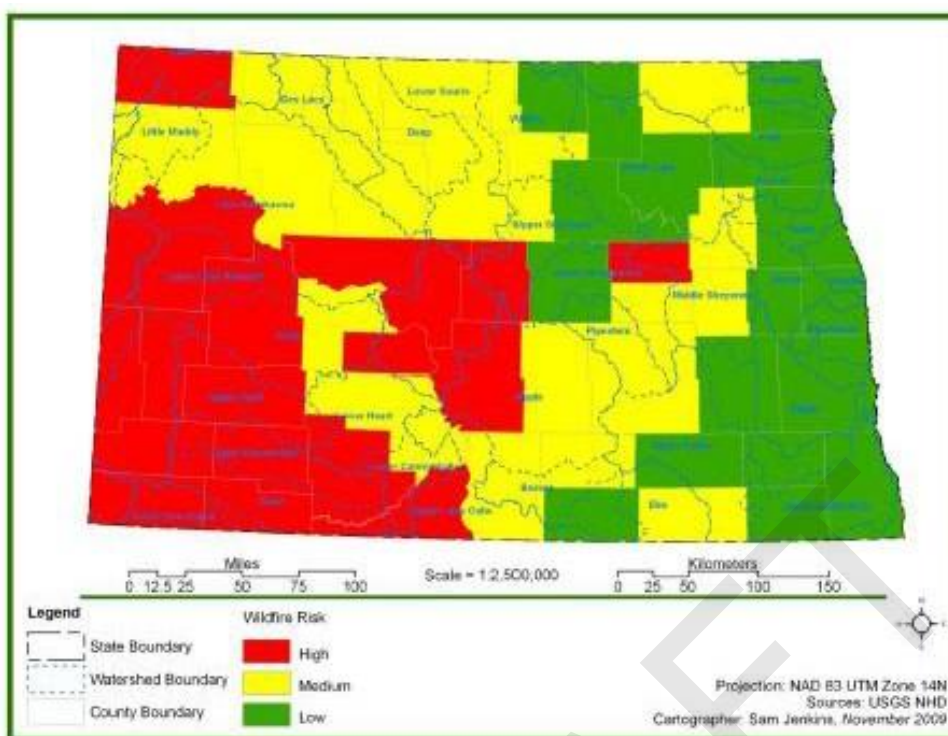
History

According to National Fire and Aviation Management, between April 2010 and November 2016, there were 13 wildland fires reported in Wells County impacting 306 acres. According to the 2014 State of North Dakota MHMP, between 2009 and 2012, there were three wildland fires reported in Wells County burning 15 acres.

Crop Loss. Crop loss from wildland fire is tracked by the United States Department of Agriculture, Risk Management Agency (RMA). The RMA provides data on the crop type affected, damage cause description, determined acres and indemnity amount. The damage cause description identifies the cause of damage, determines acres identifies the number of acres lost due to damage, and the indemnity amount identifies the total amount of the loss for the designated peril. Between January 1, 2001 and December 31, 2016, Wells County experienced one incident of crop loss due to wildland fire impacting approximately 45 acres of crops totaling \$2,468 in losses.

Probability and Magnitude

Probability. The probability of wildland fire occurring in Wells County is 100 percent based on 13 occurrences between April 2010 and November 2016. The Plan Update Committee indicated the probability of wildland fire in Wells County is highly likely meaning there is a 100 percent chance in the next year of an occurrence of the hazard. Figure 5.11.2.1 shows the risk of wildland in Wells County compared to the remaining counties in the state.

Figure 5.11.2.1 – Wildland Risk by North Dakota County

Source: 2014 State of North Dakota MHMP

The probability of wildland fire impacting people and property depends on the WUI. Areas where land and human development intermingle with vegetation has the highest probability of a wildland fire impacting people and property, not overall probability of a wildland fire occurring. Figures 5.11.2.2 to 5.11.2.8 show the WUI for incorporated cities in Wells County. The areas colored in orange indicate areas with the highest probability of a wildland fire impacting people and property.

Magnitude. Wildland fire data is provided by National Fire and Aviation Management and highlights the magnitude of wildland fire in Wells County. The following are key points:

- The largest wildland fire in Wells County in 2015 and burned 225 acres.
- The average size of a wildland fire in Eddy County was 25 acres.
- One structure was threatened by a wildland fire occurring March 31, 2015.

The magnitude of wildland fire in Wells County can also be determined by using data from the 2014 State of North Dakota Multi-Hazard Mitigation Plan. The following are key points:

- There are 14 and 11 housing units in Wells County in high-risk and moderate-risk areas containing a total population of 29 and 10 people, respectively.
- Approximately 25 housing units and \$1,390,000 in housing unit value located in high and moderate wildland fire risk areas in Wells County.

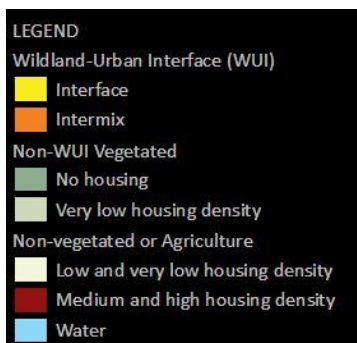
The Plan Update Committee indicated the magnitude or impact of wildland fire as critical meaning more than between 25 and 50 percent of people and property in Wells County could be affected.

Wildland Urban Interface (WUI) is the zone of transition between unoccupied land and human development. Communities that are within 0.5 miles of the zone may also be included. These lands and communities adjacent to and surrounded by wildlands are at risk to wildland fires. There are two types of WUI: intermix and interface. Intermix refers to areas where housing and vegetation intermingle. Interface refers to areas with housing near contiguous wildland vegetation. Figures 5.11.2.2 to 5.11.2.8 show the WUI for incorporated cities in Wells County.

Figure 5.11.2.2 – Wildland-Urban Interface - City of Bowdon



Source: University of Wisconsin, Silvics Lab – Spatial Analysis for Conservation and Sustainability

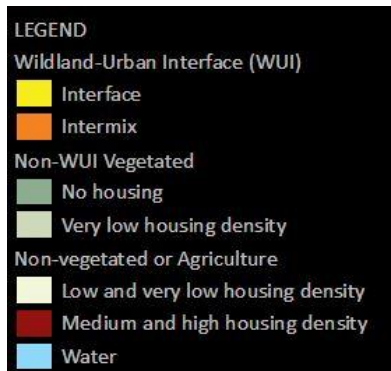


The city of Bowdon does not have a wildland fire interface or intermix according to the WUI map above. Therefore, it is assumed the city is at a lower risk to wildland fire than jurisdictions with an interface or intermix present.

Figure 5.11.2.3 – Wildland-Urban Interface - City of Cathay



Source: University of Wisconsin, Silvics Lab – Spatial Analysis for Conservation and Sustainability



The city of Cathay does not have a wildland fire interface or intermix according to the WUI map above. Therefore, it is assumed the city is at a lower risk to wildland fire than jurisdictions with an interface or intermix present.

Figure 5.11.2.4 – Wildland-Urban Interface - City of Fessenden

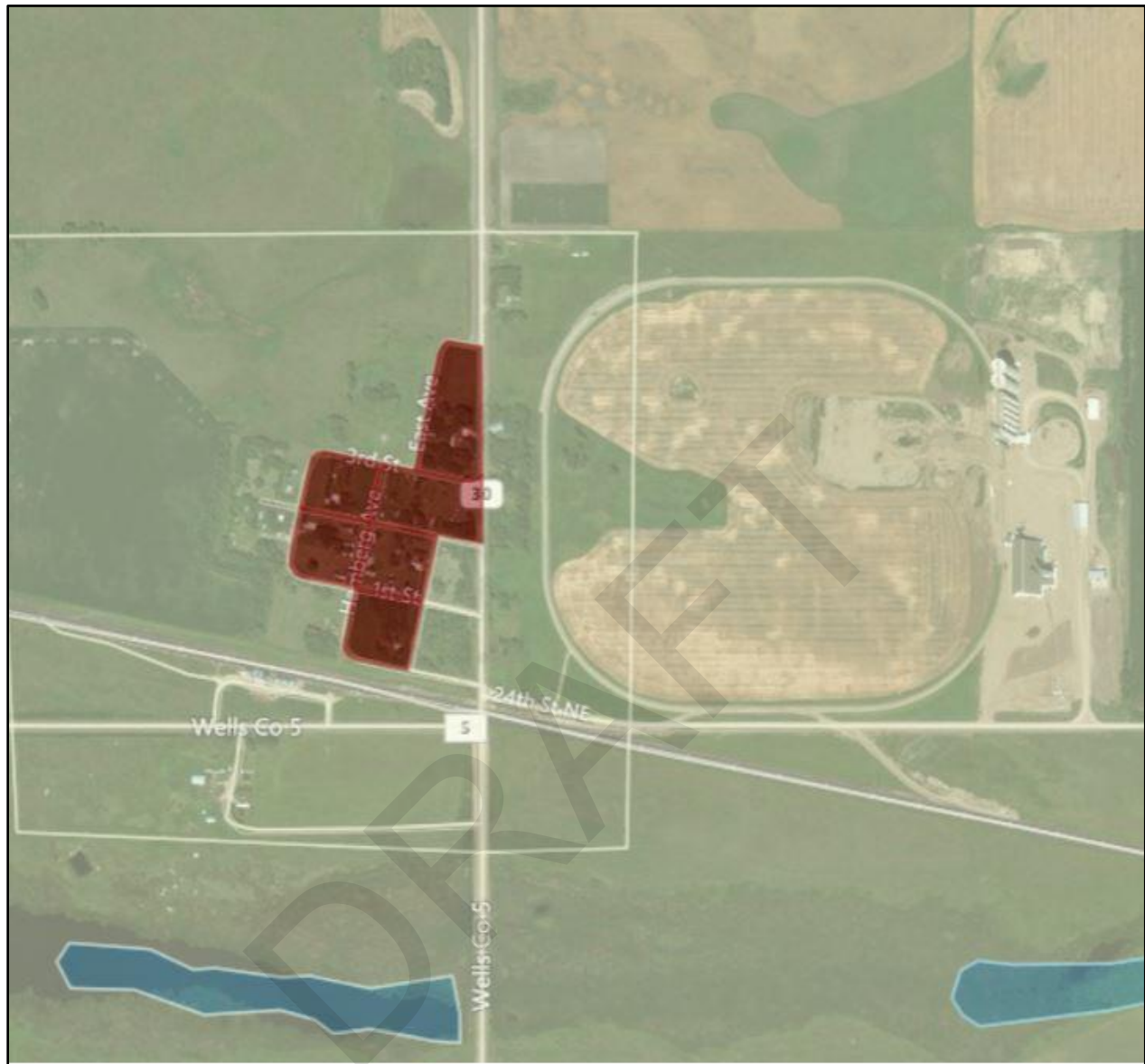


Source: University of Wisconsin, Silvics Lab – Spatial Analysis for Conservation and Sustainability

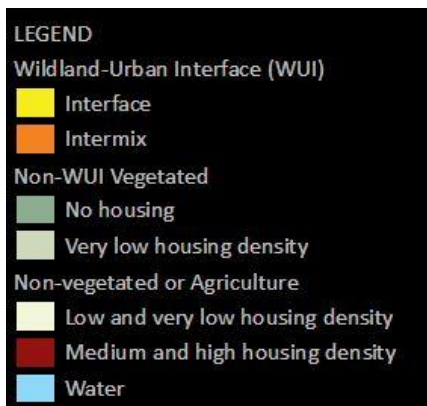


The city of Fessenden does not have a wildland fire interface or intermix according to the WUI map above. Therefore, it is assumed the city is at a lower risk to wildland fire than jurisdictions with an interface or intermix present.

Figure 5.11.2.5 – Wildland-Urban Interface - City of Hamberg

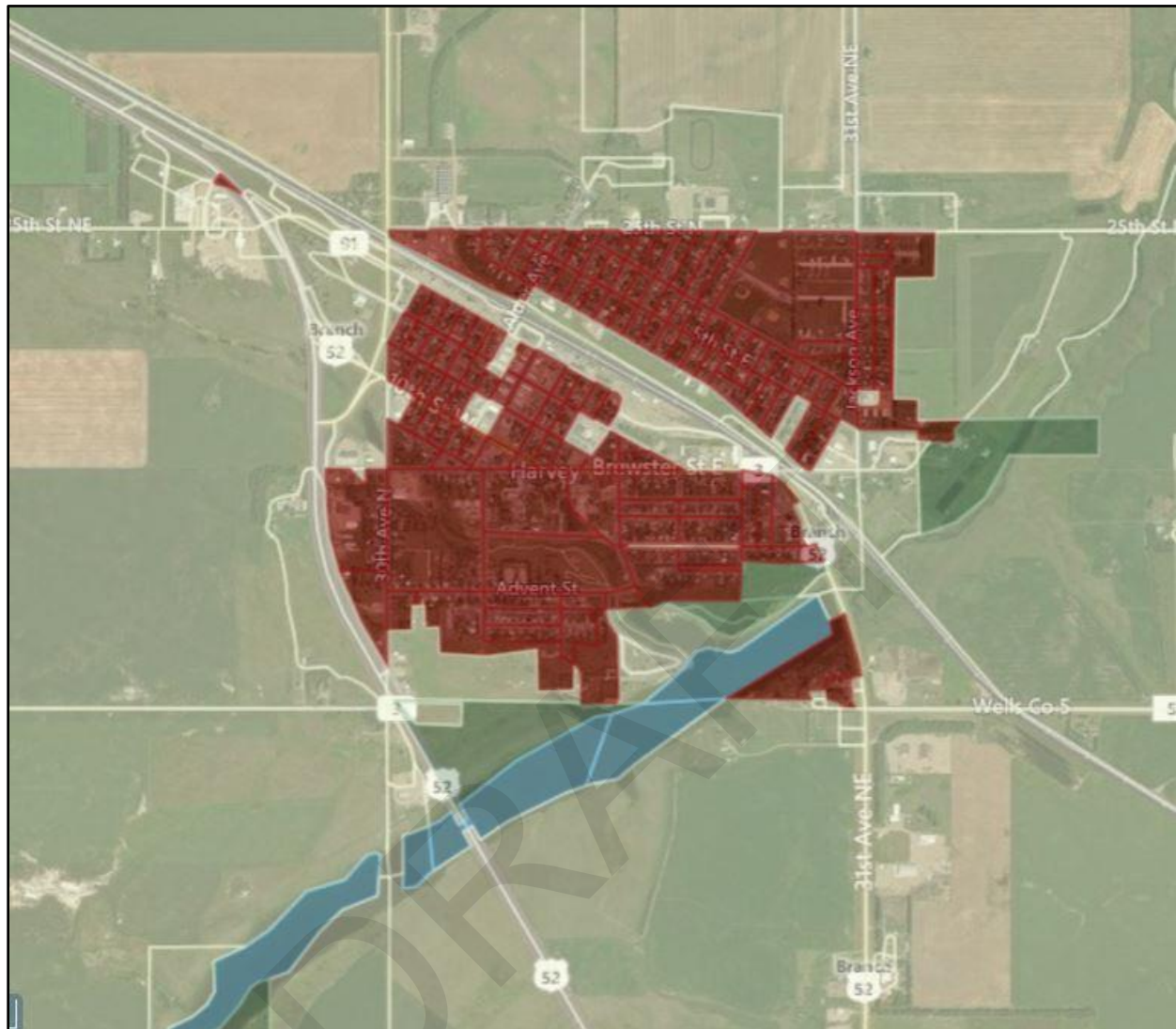


Source: University of Wisconsin, Silvics Lab – Spatial Analysis for Conservation and Sustainability



The city of Hamberg does not have a wildland fire interface or intermix according to the WUI map above. Therefore, it is assumed the city is at a lower risk to wildland fire than jurisdictions with an interface or intermix present.

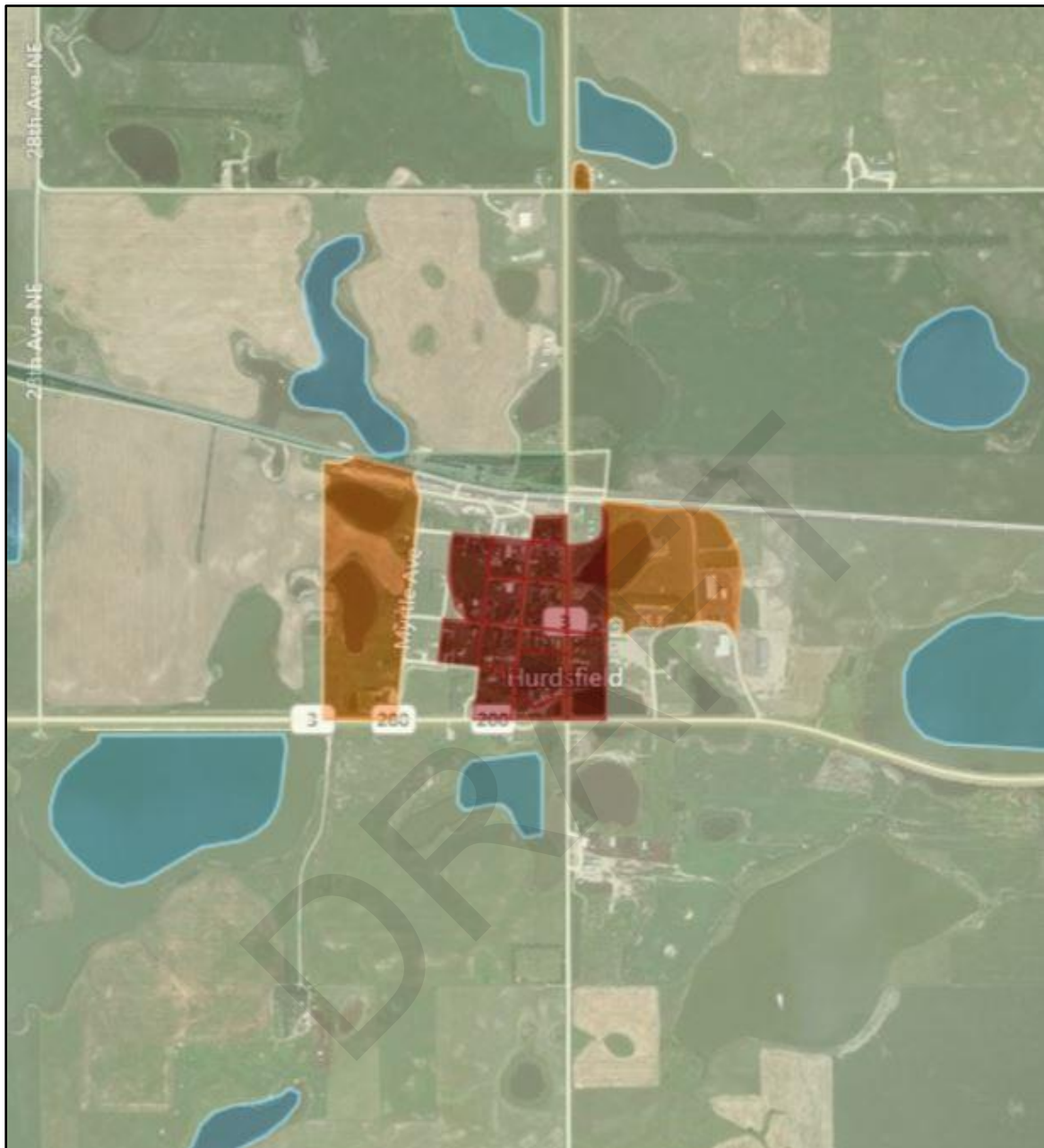
Figure 5.11.2.6 – Wildland-Urban Interface - City of Harvey



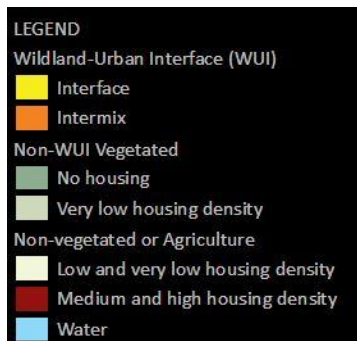
Source: University of Wisconsin, Silvics Lab – Spatial Analysis for Conservation and Sustainability



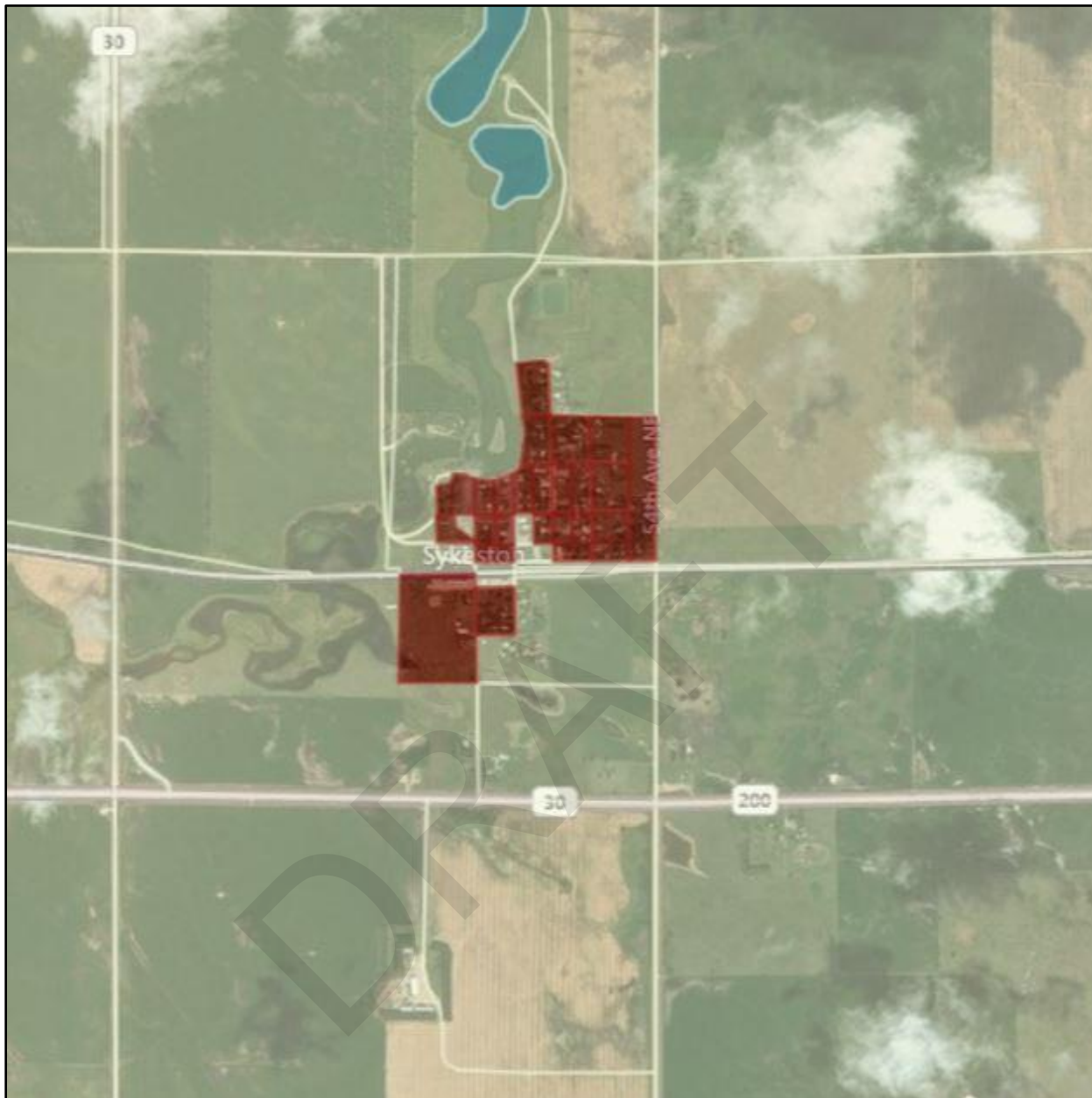
The city of Harvey does not have a wildland fire interface or intermix according to the WUI map above. Therefore, it is assumed the city is at a lower risk to wildland fire than jurisdictions with an interface or intermix present.

Figure 5.11.2.7 – Wildland-Urban Interface - City of Hurdsfield

Source: University of Wisconsin, Silvics Lab – Spatial Analysis for Conservation and Sustainability



The city of Hurdsfield has a wildland fire intermix west of the city along Myrtle Avenue and east-northeast of the city. These areas are most at risk to wildland fire. Mitigation measures such as annual fire fuel removal or fire breaks should be analyzed for effectiveness.

Figure 5.11.2.8 – Wildland-Urban Interface - City of Sykeston

Source: University of Wisconsin, Silvics Lab – Spatial Analysis for Conservation and Sustainability

LEGEND	
Wildland-Urban Interface (WUI)	
	Interface
	Intermix
Non-WUI Vegetated	
	No housing
	Very low housing density
Non-vegetated or Agriculture	
	Low and very low housing density
	Medium and high housing density
	Water

The city of Sykeston does not have a wildland fire interface or intermix according to the WUI map above. Therefore, it is assumed the city is at a lower risk to wildland fire than jurisdictions with an interface or intermix present.

Risk Assessment

Table 5.11.2.2 shows the risk assessment as determined by individual jurisdictions and the Plan Update Committee for wildland fire. The risk assessment methodology can be found in the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment. The total in Table 5.11.2.2 represents the sum of each jurisdiction's impact, frequency, likelihood and vulnerability to a hazard less the jurisdiction's capabilities to respond to the hazard.

Table 5.11.2.2 – Wildland Fire Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Wells County	3	3	4	4	2	12
City of Bowdon	2	2	3	2	1	8
City of Cathay	2	2	3	2	1	8
City of Fessenden	3	4	3	4	2	12
City of Hamberg	2	2	3	2	1	8
City of Harvey	3	4	3	4	2	12
City of Hurdsfield	2	2	3	2	1	8
City of Sykeston	3	4	3	4	2	12

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

Table 5.11.2.3 provides information on the specific impact, frequency, likelihood, vulnerability and capability of wildland fire in The Planning Area. A list of impacts of wildland fire identified as commonplace regardless of the jurisdiction are listed below.

Identified Impacts – Wildland Fire

- Blocked Roads
- Building Collapse
- Business Interruptions
- Crop Loss
- Delayed Emergency Response
- Downed Power Lines
- Downed Trees
- Evacuation (Localized)
- Explosion
- HAZMAT Release
- Human Injury/Death
- Increased Fire Potential
- Increased Public Safety Runs
- Livestock Injury/Death
- Loss of Economy
- Loss of Power
- Loss of Transportation/Accessibility
- Loss of Wildlife Habitat
- Mass Casualties
- Property Damage
- Wildlife Injury/Death

Table 5.11.2.3 – The Planning Area Wildland Fire Collapse Risk Assessment

	Eddy County, North Dakota	Wells County, North Dakota
Impact	<ul style="list-style-type: none"> Blocked Roads Business Interruptions Delayed Emergency Response Downed Power Lines Downed Trees Evacuation (Localized) Explosion HAZMAT Release Increased Fire Potential Livestock Injury/Death Loss of Power Loss of Wildlife Habitat 	<ul style="list-style-type: none"> Blocked Roads Business Interruptions Delayed Emergency Response Downed Power Lines Downed Trees Evacuation (Localized) Explosion HAZMAT Release Increased Fire Potential Livestock Injury/Death Loss of Power Loss of Wildlife Habitat
Frequency	<ul style="list-style-type: none"> Controlled burns becoming out of control approximately 50 percent of the time on an annual basis 	<ul style="list-style-type: none"> Controlled burns becoming out of control approximately 50 percent of the time on an annual basis
Likelihood	<p>Likelihood of Wildland Fire is dependent on local weather conditions</p> <p><u>More likely</u></p> <ul style="list-style-type: none"> Largely amount of grass and vegetation Misuse of fire management by farmers Increased truck traffic hauling hazardous materials Overgrown vegetation along railroad tracks Dry conditions (when present) <p><u>Less likely</u></p> <ul style="list-style-type: none"> Burn Bans Less CRP Farmers have supply of water for fire suppression on site 	<p>Likelihood of Wildland Fire is dependent on local weather conditions</p> <p><u>More likely</u></p> <ul style="list-style-type: none"> Largely amount of grass and vegetation Misuse of fire management by farmers Increased truck traffic hauling hazardous materials Overgrown vegetation along railroad tracks Dry conditions (when present) <p><u>Less likely</u></p> <ul style="list-style-type: none"> Burn Bans Less CRP Farmers have supply of water for fire suppression on site

Table 5.11.2.3 – The Planning Area Wildland Fire Collapse Risk Assessment

	Eddy County, North Dakota	Wells County, North Dakota
Vulnerability	<p>Approximately 602 individuals under the age of 20, and 507 individuals age 65 and older, representing 25.4 and 21.4 percent of the population, respectively, and would be most vulnerable to a wildland fire.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • Lack of fire break around the cities • Depends on wind speed • Lonetree Wildlife Management Areas <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • Fire index signs • County conducts mowing along roads and infrastructure • Emergency sirens • Less CRP acreage 	<p>Approximately 716 individuals under the age of 20, and 514 individuals age 65 and older, representing 17.0 and 12.2 percent of the population, respectively, and would be most vulnerable to a wildland fire.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • Lack of fire break around the city • Homes/structures adjacent to sloughs and areas with dry vegetation • Depends on wind speed • Lonetree Wildlife Management Areas <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> • Fire index signs • County conducts mowing along roads and infrastructure • Emergency sirens • Less CRP acreage
Capability	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to wildland fire. 	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to wildland fire.

Vulnerabilities to Publicly-Owned Buildings and Property

Publicly-owned buildings and property located in the Wildland-Urban Interface (WUI) or in remote areas are vulnerable to wildland fire. The risk of the hazard depends on building and property location, and if emergency services can reach the property in a timely manner. An inventory of publicly-owned buildings and property is shown in Chapter 4, Profile and Inventory.

The lack of firebreaks around jurisdictions in Wells County is a vulnerability to publicly-owned buildings and properties. If a wildland fire were to grow and become uncontrollable, buildings and properties would be at risk from the spread of the fire. All incorporated jurisdictions in Wells County lack fire breaks. Breaks can and should be implemented where the WUI poses the greatest threat to people and property. Maps of the WUI shown in this chapter illustrate where measures should be implemented to mitigate wildland fires.

Vulnerabilities of Critical Facilities and Infrastructure

Like publicly-owned buildings and property, critical facilities and infrastructure are vulnerable to wildland fire. The vulnerability will vary depending on location from the wildland-urban interface. If an incident were to occur, depending on the facility or infrastructure impacted, a loss of or delay in emergency or utility services could be the result. Maps of the WUI shown in this chapter illustrate where measures should be implemented to mitigate wildland fires.

Vulnerabilities to New and Future Development

Rural homesteads on large parcels of land in remote areas are a trend in residential development in areas of North Dakota surrounding larger cities like Bismarck and Minot. Wells County should incorporate planning and zoning regulations limiting where new residential development can occur, specifically large rural lots. The vulnerability of new and future development to wildland fire also increases as the distance from fire departments and emergency services increases. Residential development in remote areas increases the opportunity for human-induced wildland fires.

Data Limitations and Other Key Documents

Fire department and district boundaries cross county lines, and therefore, coverage in some areas of the county is provided by departments and districts based in neighboring counties. Similarly, departments in Wells County also provide coverage to neighboring counties. This cross-over may provide challenging to data tracking purposes.

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

- North Dakota Continuity of Operations Plan
- North Dakota Drought Mitigation Plan
- North Dakota Emergency Operations Plan
- North Dakota State Disaster Recovery Plan
- North Dakota State Hazard Mitigation Plan
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)

Chapter 5

- Wells County Emergency Operations Plan
- Wells County Evacuation and Shelter Plan
- Wells County Local Emergency Operations Plan
- Wells County Shelter and Mass Care Plan
- Wells County Threat and Hazard Identification and Risk Assessment (THIRA)

DRAFT

5.12.1 Windstorm

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

Characteristics

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

Seasonal Pattern	None
Duration	2 to 6 hours
Speed of Onset	12 to 16 hours warning
Location	Total geographic extent of Eddy County

In the U.S., FEMA recognizes four wind zones. Wind speeds reach up to 160 miles per hour in Zone II. No special wind regions are identified in Eddy County.

Figure 5.12.1.1 Wind Zones in the United States



Source: Federal Emergency Management Agency

For more information regarding windstorm please reference the **State of North Dakota** Multi-Hazard Mitigation Plan. The plan can be accessed by following the link provided below.

<http://www.nd.gov/des/uploads/resources/915/final-ndmhmp-update.pdf>

History

Table 5.12.1.1 summarizes the history of windstorm in Eddy County and indicates 22 instances of the hazard between 1950 and 2015. A detailed hazard history for Eddy County can be found on a disc located at the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment.

Table 5.12.1.1 – Eddy County Windstorm Hazard History Summary

Windstorm					
Occurrences	Date Range	Fatalities	Injuries	Property Damage	Crop Damage
22	1950 to 2015	0.00	0.00	\$4,000.00	\$0.00

Sources: National Climatic Data Center (NCDC), National Oceanic and Atmospheric Administration (NOAA)

- Per the 2014 State of North Dakota MHMP, between 2000 and 2013 Eddy County experienced 15 high wind events.

Crop Loss. Crop loss from windstorm is tracked by the United States Department of Agriculture, Risk Management Agency (RMA). The RMA provides data on the crop type affected, damage cause description, determined acres and indemnity amount. The damage cause description identifies the cause of damage, determines acres identifies the number of acres lost due to damage, and the indemnity amount identifies the total amount of the loss for the designated peril. Between January 1, 2001 and December 31, 2016, Eddy County experienced 64 incidents of crop loss due to windstorm impacting approximately 6,513 acres of crops totaling \$399,782 in losses.

Probability and Magnitude

Probability. Per Table 5.12.1.1, the probability of windstorm in Eddy County is 33 percent based on 22 occurrences between 1950 and 2015. The Plan Update Committee indicated the probability of windstorm in Eddy County is highly likely meaning that there is nearly a 100 percent probability in the next year of a windstorm occurrence.

Magnitude. The magnitude of windstorm in Eddy County can be determined through realized property damage and crop loss.

- Per Table 5.12.1.1, Eddy County experiences approximately \$61 in annual property damages.
- Per Table 5.12.1.1, Eddy County experienced \$6,057 in annual in crop losses.
- The Plan Update Committee indicated the magnitude or impact of windstorm as critical meaning an estimated 25 to 50 percent of Eddy County could be affected.

Risk Assessment

Table 5.12.1.2 shows the risk assessment as determined by individual jurisdictions and the Plan Update Committee for windstorm. The risk assessment methodology can be found in the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment. The total in Table 5.12.1.2 represents the sum of each jurisdiction's impact, frequency, likelihood and vulnerability to a hazard less the jurisdiction's capabilities to respond to the hazard.

Table 5.12.1.2 – Eddy County Windstorm Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Eddy County	3	4	4	3	1	13
City of New Rockford	4	4	3	2	1	12
City of Sheyenne	3	3	3	3	1	11

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

Table 5.12.1.3 provides information on the specific impact, frequency, likelihood, vulnerability and capability of windstorm in The Planning Area. A list of impacts of windstorm identified as commonplace regardless of the jurisdiction are listed below.

Identified Impacts – Windstorm

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

Table 5.12.1.3 – The Planning Area Windstorm Collapse Risk Assessment

	Eddy County, North Dakota	Wells County, North Dakota
Impact	<ul style="list-style-type: none"> Blocked Roads Business Interruptions Delayed Emergency Response Downed Power Lines/Loss of Power Downed Trees Evacuation (Localized) Explosion Livestock Injury/Death Loss of Transportation/Accessibility Property Damage 	<ul style="list-style-type: none"> Blocked Roads Business Interruptions Delayed Emergency Response Downed Power Lines/Loss of Power Downed Trees Evacuation (Localized) Explosion Livestock Injury/Death Loss of Transportation/Accessibility Property Damage
Frequency	<ul style="list-style-type: none"> Multiple storms annually Straight-line winds occurring in 2014 	<ul style="list-style-type: none"> Multiple storms annually Straight-line winds occurring in 2014
Likelihood	<ul style="list-style-type: none"> Climatic patterns will result in several storms per year 	<ul style="list-style-type: none"> Climatic patterns will result in several storms per year
Vulnerability	<p>Approximately 602 individuals under the age of 20, and 507 individuals age 65 and older, representing 25.4 and 21.4 percent of the population, respectively, and would be most vulnerable to a windstorm.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> High youth and elderly population Agriculture economy Lack of shelter with generator Flat terrain and open topography <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> Windbreaks/shelter belts Advanced warning (reverse 911, cell phones, internet, TV) Building codes and zoning County residents “self-mitigate” due to hazard being constant in North Dakota 	<p>Approximately 716 individuals under the age of 20, and 514 individuals age 65 and older, representing 17.0 and 12.2 percent of the population, respectively, and would be most vulnerable to a windstorm.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> High youth and elderly population Agriculture economy Lack of shelter with generator Flat terrain and open topography <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> Windbreaks/shelter belts Advanced warning (reverse 911, cell phones, internet, TV) Building codes and zoning County residents “self-mitigate” due to hazard being constant in North Dakota
Capability	<ul style="list-style-type: none"> See Chapter 7 for a list of capabilities to windstorm. 	<ul style="list-style-type: none"> See Chapter 7 for a list of capabilities to windstorm.

Vulnerabilities to Publicly-Owned Buildings and Property

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

Vulnerabilities of Critical Facilities and Infrastructure

Critical facilities such as hospitals, schools, water towers, roadways and other specialty facilities such as nursing homes and assisted living facilities are vulnerable to windstorms in a similar fashion to publicly-owned buildings and property. Infrastructure such as power lines are susceptible to wind and debris, which can disrupt service and cause power outages. Disruptions in water service can be caused by damage to water towers or power lines. Roadways can become blocked due to windblown debris, limiting access for emergency services. Bodies of water, although not necessarily considered critical facilities or infrastructure, are impacted from windstorm as branches and debris can accumulate and cause river snagging and increase the impact of flooding. This increase in flooding can directly impact critical facilities and infrastructure depending on its location to water.

Vulnerabilities to New and Future Development

Building codes ensure buildings and structures are built adequately to better withstand windstorm. Eddy County and incorporated cities have adopted state building codes, but lack enforcement. Jurisdictions with a high number of trailer and mobile homes, which are more susceptible to severe weather and may experience more impact from the hazard. New development that is primarily recreation and cabin style development is most susceptible to windstorm. A breakdown of the house units by type in jurisdictions in Eddy County is shown in Chapter 4, Profile and Inventory.

As populations grow, more people are at risk of injury and potential death from windstorms. Strengthening of buildings codes would mitigate impacts from the hazard. This mitigation project for the county can be found in Chapter 6, Mitigation Strategy.

Data Limitations and Other Key Documents

Windstorms may not have been independently recorded from severe summer weather or severe winter weather prior to 1996. Windstorm impacts and damages may be categorized under another hazard and not classified as a windstorm event. Thus, Eddy County does not have a detailed and recorded hazard history of windstorms prior to 1996.

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

- Eddy County Emergency Operations Plan
- Eddy County Evacuation and Shelter Plan

- Eddy County Local Emergency Operations Plan
- Eddy County Shelter and Mass Care Plan
- Eddy County Threat and Hazard Identification and Risk Assessment (THIRA)
- North Dakota Continuity of Operations Plan
- North Dakota Drought Mitigation Plan
- North Dakota Emergency Operations Plan
- North Dakota State Disaster Recovery Plan
- North Dakota State Hazard Mitigation Plan
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)

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5.12.2 Windstorm

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

Characteristics

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

Seasonal Pattern	None
Duration	2 to 6 hours
Speed of Onset	12 to 16 hours warning
Location	Total geographic extent of Wells County

In the U.S., FEMA recognizes four wind zones. Wind speeds reach up to 160 miles per hour in Zone II. No special wind regions are identified in Wells County.

Figure 5.12.2.1 Wind Zones in the United States



Source: Federal Emergency Management Agency

For more information regarding windstorm please reference the **State of North Dakota** Multi-Hazard Mitigation Plan. The plan can be accessed by following the link provided below.

<http://www.nd.gov/des/uploads/resources/915/final-ndmhmp-update.pdf>

History

Table 5.12.2.1 summarizes the history of windstorm in Wells County and indicates 28 instances of the hazard between 1950 and 2015. A detailed hazard history for Wells County can be found on a disc located at the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment.

Table 5.12.2.1 – Wells County Windstorm Hazard History Summary

Windstorm					
Occurrences	Date Range	Fatalities	Injuries	Property Damage	Crop Damage
28	1950 to 2015	0.00	0.00	\$110,000.00	\$40,000.00

Sources: National Climatic Data Center (NCDC), National Oceanic and Atmospheric Administration (NOAA)

- Per the 2014 State of North Dakota MHMP, between 2000 and 2013 Wells County experienced 23 high wind events.

Crop Loss. Crop loss from windstorm is tracked by the United States Department of Agriculture, Risk Management Agency (RMA). The RMA provides data on the crop type affected, damage cause description, determined acres and indemnity amount. The damage cause description identifies the cause of damage, determines acres identifies the number of acres lost due to damage, and the indemnity amount identifies the total amount of the loss for the designated peril. Between January 1, 2001 and December 31, 2016, Wells County experienced 64 incidents of crop loss due to windstorm impacting approximately 66,785 acres of crops totaling \$5,502,870 in losses.

Probability and Magnitude

Probability. Per Table 5.12.2.1, the probability of windstorm in Wells County is 42 percent based on 28 occurrences between 1950 and 2015. The Plan Update Committee indicated the probability of windstorm in Wells County is highly likely, meaning that there is nearly a 100 percent probability in the next year of a windstorm occurrence.

Magnitude. The magnitude of windstorm in Wells County can be determined through realized property damage and crop loss.

- Per Table 5.12.1.1, Wells County experiences approximately \$1,667 in annual property damages.
- Per Table 5.12.1.1, Wells County experienced \$6,06 in annual in crop losses. Conversely, annual crop losses due to windstorm equal \$83,377 based on information from the U.S. Dept. of Agriculture, Risk Management Agency.
- The Plan Update Committee indicated the magnitude or impact of windstorm as critical meaning an estimated 25 to 50 percent of Wells County could be affected.

Risk Assessment

Table 5.12.2.2 shows the risk assessment as determined by individual jurisdictions and the Plan Update Committee for windstorm. The risk assessment methodology can be found in the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment. The total in Table 5.12.2.2 represents the sum of each jurisdiction's impact, frequency, likelihood and vulnerability to a hazard less the jurisdiction's capabilities to respond to the hazard.

Table 5.12.2.2 – Wells County Windstorm Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Wells County	3	4	4	3	1	13
City of Bowdon	3	3	3	3	1	11
City of Cathay	3	3	3	3	1	11
City of Fessenden	3	4	4	3	2	12
City of Hamberg	3	3	3	3	1	11
City of Harvey	3	4	4	3	2	12
City of Hurdsfield	3	3	3	3	1	11
City of Sykeston	3	4	4	3	2	12

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

Table 5.12.2.3 provides information on the specific impact, frequency, likelihood, vulnerability and capability of windstorm in The Planning Area. A list of impacts of windstorm identified as commonplace regardless of the jurisdiction are listed below.

Identified Impacts – Windstorm

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

Table 5.12.2.3 – The Planning Area Windstorm Collapse Risk Assessment

	Eddy County, North Dakota	Wells County, North Dakota
Impact	<ul style="list-style-type: none"> Blocked Roads Business Interruptions Delayed Emergency Response Downed Power Lines/Loss of Power Downed Trees Evacuation (Localized) Explosion Livestock Injury/Death Loss of Transportation/Accessibility Property Damage 	<ul style="list-style-type: none"> Blocked Roads Business Interruptions Delayed Emergency Response Downed Power Lines/Loss of Power Downed Trees Evacuation (Localized) Explosion Livestock Injury/Death Loss of Transportation/Accessibility Property Damage
Frequency	<ul style="list-style-type: none"> Multiple storms annually Straight-line winds occurring in 2014 	<ul style="list-style-type: none"> Multiple storms annually Straight-line winds occurring in 2014
Likelihood	<ul style="list-style-type: none"> Climatic patterns will result in several storms per year 	<ul style="list-style-type: none"> Climatic patterns will result in several storms per year
Vulnerability	<p>Approximately 602 individuals under the age of 20, and 507 individuals age 65 and older, representing 25.4 and 21.4 percent of the population, respectively, and would be most vulnerable to a windstorm.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> High youth and elderly population Agriculture economy Lack of shelter with generator Flat terrain and open topography <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> Windbreaks/shelter belts Advanced warning (reverse 911, cell phones, internet, TV) Building codes and zoning County residents “self-mitigate” due to hazard being constant in North Dakota 	<p>Approximately 716 individuals under the age of 20, and 514 individuals age 65 and older, representing 17.0 and 12.2 percent of the population, respectively, and would be most vulnerable to a windstorm.</p> <p><u>More vulnerable</u></p> <ul style="list-style-type: none"> High youth and elderly population Agriculture economy Lack of shelter with generator Flat terrain and open topography <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> Windbreaks/shelter belts Advanced warning (reverse 911, cell phones, internet, TV) Building codes and zoning County residents “self-mitigate” due to hazard being constant in North Dakota
Capability	<ul style="list-style-type: none"> See Chapter 7 for a list of capabilities to windstorm. 	<ul style="list-style-type: none"> See Chapter 7 for a list of capabilities to windstorm.

Vulnerabilities to Publicly-Owned Buildings and Property

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

Vulnerabilities of Critical Facilities and Infrastructure

Critical facilities such as hospitals, schools, water towers, roadways and other specialty facilities such as nursing homes and assisted living facilities are vulnerable to windstorms in a similar fashion to publicly-owned buildings and property. Infrastructure such as power lines are susceptible to wind and debris, which can disrupt service and cause power outages. Disruptions in water service can be caused by damage to water towers or power lines. Roadways can become blocked due to windblown debris, limiting access for emergency services. Bodies of water, although not necessarily considered critical facilities or infrastructure, are impacted from windstorm as branches and debris can accumulate and cause river snagging and increase the impact of flooding. This increase in flooding can directly impact critical facilities and infrastructure depending on its location to water.

Vulnerabilities to New and Future Development

Building codes ensure buildings and structures are built adequately to better withstand windstorm. Wells County and incorporated cities have adopted state building codes, but lack enforcement. Jurisdictions with a high number of trailer and mobile homes, which are more susceptible to severe weather and may experience more impact from the hazard. New development that is primarily recreation and cabin style development is most susceptible to windstorm. A breakdown of the house units by type in jurisdictions in Wells County is shown in Chapter 4, Profile and Inventory.

As populations grow, more people are at risk of injury and potential death from windstorms. Strengthening of buildings codes would mitigate impacts from the hazard. This mitigation project for the county can be found in Chapter 6, Mitigation Strategy.

Data Limitations and Other Key Documents

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

- North Dakota Continuity of Operations Plan
- North Dakota Drought Mitigation Plan

- North Dakota Emergency Operations Plan
- North Dakota State Disaster Recovery Plan
- North Dakota State Hazard Mitigation Plan
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)
- Wells County Emergency Operations Plan
- Wells County Evacuation and Shelter Plan
- Wells County Local Emergency Operations Plan
- Wells County Shelter and Mass Care Plan
- Wells County Threat and Hazard Identification and Risk Assessment (THIRA)

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6. Eddy & Wells Counties, North Dakota, Mitigation Strategy

Mitigation Purpose, Goals, and Projects

The Eddy & Wells Counties Multi-Jurisdictional Multi-Hazard Mitigation Plan includes a mitigation strategy consisting of six goals and specific mitigation projects for each incorporated jurisdiction based on the risk assessment developed at Plan Update Committee and jurisdictional meetings.

- The mitigation strategy for Eddy County can be found in Chapter 6.1, Eddy County Mitigation Strategy.
- The mitigation strategy for Wells County can be found in Chapter 6.2, Wells County Mitigation Strategy.

The following are the six goals that were reviewed, updated and approved for this plan update:

Goal 1: Implement education and outreach programs to improve public awareness of hazards.

Goal 2: Improve administrative and technical capability to mitigate hazards.

Goal 3: Improve planning and regulatory capability to mitigate hazards.

Goal 4: Reduce impacts of hazards.

Goal 5: Improve resiliency of critical facilities and infrastructure.

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

All natural hazards and man-made threats were considered and mitigation projects were formulated based on the potential or previous effects of hazards, the high probability of hazard or threat occurrences, the vulnerability of jurisdictions to hazards, and hazards each project can mitigate.

Mitigation Project Development

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

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

Scoring and Prioritization

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

Each project was scored using a one to five (1 to 5) scoring. A score of one (1) indicated a project is ineffective, not feasible and/or too costly, and a five (5) indicated the project was highly effective, feasible and/or a higher benefit compared to cost. A score of three (3) was neutral.

Prioritization of Mitigation Projects

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

The Plan Update Committee prioritized each mitigation project on a high, medium and low designation based on scoring of the documentation, past experiences and professional judgment, and what projects are technically feasible to accomplish is based on the capabilities of all jurisdictions. Mitigation project prioritization can be found in the respective mitigation strategy for each county.

Acronyms and Definitions

Mitigation projects are accomplished best through collaboration of people and resources. Responsible agencies and partners are identified in each mitigation project. The acronyms and definitions used in the responsible agency and partners section for mitigation projects are shown in Chapter 6.1, Eddy County Mitigation Strategy and Chapter 6.2, Wells County Mitigation Strategy.

Problem Statements

Problem statements provide a concise description of the vulnerabilities of the county and incorporated jurisdiction to natural hazards and man-made threats that should be addressed through mitigation actions. The problem statement for Eddy County and Wells County, which assisted in formulating specific mitigation actions to reduce the impacts of hazards, is shown before the mitigation actions in the county's respective mitigation strategy chapter. The specific mitigation actions to reduce the impacts of hazards for both counties in The Planning Area are found after the problem statement. The problem statements and jurisdiction-specific mitigation projects can be found in Chapter 8, Jurisdictions.

6.1 Eddy County, North Dakota, Mitigation Strategy

Mitigation Purpose, Goals, and Projects

The Eddy & Wells Counties Multi-Jurisdictional Multi-Hazard Mitigation Plan includes a mitigation strategy consisting of six goals and specific mitigation projects for each incorporated jurisdiction based on the risk assessment developed at Plan Update Committee and jurisdictional meetings.

A total of 26 projects were identified for Eddy County. A total of 26 projects were identified for Eddy County. Of the 26 projects, four are specific to the city of New Rockford. Two county projects are specific to the city of Sheyenne. The remaining projects address the county and all incorporated jurisdictions and unincorporated jurisdictions.

All natural hazards and man-made threats were considered and mitigation projects were formulated based on the potential or previous effects of hazards, the high probability of hazard or threat occurrences, the vulnerability of jurisdictions to hazards, and hazards each project can mitigate. The problem statement for Eddy & Wells Counties, which assisted in formulating specific mitigation actions to reduce the impacts of hazards, is shown before the mitigation actions.

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

Goal 1: Implement education and outreach programs to improve public awareness of hazards.

Goal 2: Improve administrative and technical capability to mitigate hazards.

Goal 3: Improve planning and regulatory capability to mitigate hazards.

Goal 4: Reduce impacts of hazards.

Goal 5: Improve resiliency of critical facilities and infrastructure.

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

Mitigation Project Development

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

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

Scoring and Prioritization

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

Each project was scored using a one to five (1 to 5) scoring. A score of one (1) indicated a project is ineffective, not feasible and/or too costly, and a five (5) indicated the project was highly effective, feasible and/or a higher benefit compared to cost. A score of three (3) was neutral.

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

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

Table 6.1 on the following page summarizes the projects by priority by Jurisdiction.

Table 6.1 – Prioritization of Mitigation Projects by Jurisdiction

Jurisdiction	Project Number by Prioritization		
	<u>Low</u>	<u>Medium</u>	<u>High</u>
Eddy County	--	AT-2, AT-4, AT-8, AT-9, EO-2, EO-3, EO-4, EO-5, PR-5, I-1	AT-1, AT-3, AT-5, AT-6, AT-7, EO-1, F-1, PR-1, PR-2, PR-3, PR-4, I-2
City of New Rockford	--	--	1, 2, 3, 4
City of Sheyenne	--	--	AT-3

Acronyms and Definitions

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

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

Acronym/Definition	Entity
BOR	Bureau of Reclamation
CDBG	Community Development Block Grant
City Council/Commission	City of New Rockford, City of Sheyenne
County Commission	Eddy County Commission
County Highway Dept.	Eddy County Road/Highway Department/Public Works
Emergency Management	Eddy County Emergency Management
Emergency Services	Ambulance, fire, law enforcement, special units
EPA	Environmental Protection Agency
Extension Service	NDSU/Eddy County Extension Service
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FSA	USDA - Farm Service Agency
Historical Society	State Historical Society of North Dakota
HUD	Housing and Urban Development
Media	<u>Newspaper:</u> New Rockford Transcript, Devils Lake Journal <u>Social Media:</u> Eddy County Facebook page <u>Website:</u> Eddy County/City of New Rockford website <u>Radio Stations:</u> KZZY, Eddy County Station #13
Medical Service Providers	Carrington Health Center/CHI St. Alexius Health (Carrington), clinics
NCDC	National Climatic Data Center
NDAC	N.D. Association of Counties
NDDes	N.D. Dept. of Emergency Services
NDDC	N.D. Dept. of Commerce
NDDH	N.D. Dept. of Health
NDDOT	N.D. Dept. of Transportation
NDLC	N.D. League of Cities
NDTOA	N.D. Townships Officers Association
NOAA	National Oceanic and Atmospheric Administration
NRCS	U.S.D.A. Natural Resources Conservation Service
NWS	National Weather Service
Planning & Zoning	Planning and Zoning Board, County Commission, City Councils
Public Health	Eddy County Public Health, N.D. Dept. of Health
Public Utilities	<u>Communications:</u> AT&T, N.D. Telephone Company, Midcontinent, Verizon <u>Electricity:</u> Otter Tail Power Company, Northern Plains Electric Cooperative <u>Internet:</u> N.D. Telephone Company, Midcontinent <u>Natural Gas:</u> MDU (cities only) <u>Waste:</u> Municipal <u>Water:</u> Municipal wells, private wells, water districts
Public Works	Public Works Department of each incorporated jurisdiction
Red Cross	American Red Cross

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

Acronym/Definition	Entity
Regional Council	North Central Planning Council
RD	U.S. Dept. of Agriculture – Rural Development
Social Services	Eddy County Social Services
SWC	N.D. State Water Commission
U.S.A.C.E.	United States Army Corps. of Engineers
U.S.D.A.	United States Department of Agriculture
U.S. Dept. of Interior	United States Department of Interior
U.S.F.W.S.	United States Fish and Wildlife Service
U.S.F.S.	United States Forest Service
Water District	Central Plains Water District, Greater Ramsey Water District, Spirit Lake Rural Water District

Problem Statements

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

Eddy County

Eddy County can be impacted by communicable disease, drought, flood (overland and riverine), hazardous material release, severe summer weather, severe winter weather, urban fire/structure collapse, wildland fire, and windstorm. Flooding causes annual damages to property due to the presence of a high-water tables, inadequate drainage, closed basins, and the source of the Sheyenne River located in neighboring Wells County. Economic loss to the agriculture and livestock industry occurs on a frequency basis. Critical facilities in the county and incorporated jurisdictions need generators for backup power and upgraded emergency alerting. The county needs to retrofit existing or construct new storm shelters. The county has planning and regulatory, administrative and technical, education and outreach, financial, and planning and regulatory capabilities to accomplish mitigation. However, these capabilities need to be improved and expanded. The county relies on outside sources for funding and to accomplish large-scale mitigation projects.

Improvement and expansion of mitigation capabilities; upgrading of sirens, equipment, and installation of generators; construction of flood control measures; and upgrading of critical facilities and infrastructure are a priority for the county.

Eddy County Project AT-1: Expand administrative and technical mitigation capabilities.

Description/Benefit	Expand administrative and technical mitigation capabilities to improve county readiness and preparedness. <u>Staff</u> <ul style="list-style-type: none">Continue Floodplain Administrator educationContinue to develop and enhance GIS Coordination and develop paid position <u>Technical</u> <ul style="list-style-type: none">Complete HAZUS AnalysisMaintain StormReady CertificationMaintain Firewise Certification (New Rockford and Sheyenne)Upgrade or expand navigation signs for emergency servicesStudy fire breaks for incorporated jurisdictions, and critical facilities and infrastructure						
Hazards Addressed	All						
Affected Jurisdictions	Eddy County and incorporated jurisdictions						
Project Status	New						
Priority	High						
Responsible Agency	City Councils, County Commission, Emergency Services						
Partners	Emergency Management, Extension Service, Media, Medical Service Providers, Planning & Zoning, USDA						
Completion Timeframe	Ongoing			Cost	Project-specific		
Funding Source	Local, state, federal grants. FEMA, Public Utilities, Regional Council, RD.						
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	4	5	3	4	30
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element		Process for Integration		
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Eddy County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment		Approval by county commission		

Eddy County Project AT-2: Expand and enforce building codes.

Description/Benefit	Improve administrative and technical, and planning and regulatory capabilities through establishment of a building code enforcement contract from an outside source, establishment of a county position or education of existing county departments, to enforcement of building codes. Building codes can be enforced to increase structural integrity of new structures or renovation of existing.						
Hazards Addressed	All hazards						
Affected Jurisdiction(s)	Eddy County and incorporated jurisdictions						
Project Status	New						
Priority	Medium						
Responsible Agency	City Councils, County Commission, Planning & Zoning						
Partners	Emergency Services, NDDH, Public Health						
Completion Timeframe	2 to 3 years				Cost	\$10,000 to \$20,000	
Funding Source	Local, state, federal grants. City Councils, County Commission.						
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
3	5	3	3	4	3	5	26
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Eddy County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by county commission or city councils	

Eddy County Project AT-3: Upgrade and expand early warning system(s).

Description/Benefit		Coverage of current outdoor early warning system/sirens does not provide coverage to an adequate geographic expanse of the county. Upgrade existing manually-activated sirens to dispatch-activated sirens. There are no existing outdoor early warning sirens for the county outside incorporated cities. <u>Upgrade:</u> City of Sheyenne Purchase NOAA weather radios for rural populations and unincorporated communities.					
Hazards Addressed		Flood, Hazardous Material Release, Severe Summer Weather, Severe Winter Weather, Wildland Fire, Windstorm (All)					
Affected Jurisdiction(s)		City of Sheyenne					
Project Status		Ongoing					
Priority		High					
Responsible Agency		City Councils, Emergency Management					
Partners		Emergency Services, FEMA, NDDES, NWS					
Completion Timeframe		1 to 2 years			Cost	Up to \$25,000 per siren, plus installation	
Funding Source		9-1-1 funding. State Homeland Security Grant Program. City general fund.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>			<u>Plan Element</u>			<u>Process for Integration</u>	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Eddy County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city council	

Eddy County Project AT-4: Upgrade existing fire index sign and install new digital signs at strategic points in the county.

Description/Benefit		Improve public awareness and education of North Dakota Fire Danger index through installation of upgraded fire index signs. The fire danger index from the state provides an indication of rural fire potential for grasslands, and its ability to spread. Upgrade: Manual fire index sign to a digital sign at New Rockford City Hall New Digital Signs: City of Sheyenne, Intersection of U.S. Highway 281 and N.D. Highway 15 in Eddy County outside New Rockford city limits					
Hazards Addressed		Hazardous Material Release, Severe Summer Weather, Urban Fire/Structure Collapse, Wildland Fire, Windstorm					
Affected Jurisdiction(s)		Eddy County and incorporated jurisdictions					
Project Status		New					
Priority		Medium					
Responsible Agency		Emergency Management, Emergency Services					
Partners		County Commission, County Highway Dept., NDDDES, NDDOT, NWS, USFS					
Completion Timeframe		2 to 3 years			Cost	\$15,000 to \$30,000 per sign	
Funding Source		Local, state, federal grants. U.S.F.S.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	5	4	4	32
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Eddy County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.	

Eddy County Project AT-5: Create hazard incident reporting system.

Description/Benefit		Improve public reporting of incidents to emergency management. Build detailed database of hazard history to provide statistics to support grant applications. Assist local emergency services in planning for preparedness and response.					
Hazards Addressed		All					
Affected Jurisdiction(s)		Eddy County and incorporated jurisdictions					
Project Status		New					
Priority		High					
Responsible Agency		Emergency Management					
Partners		City Councils, County Commission, County Highway Dept., Emergency Services, Public Works					
Completion Timeframe		Up to 1 year, then ongoing			Cost	Staff-time	
Funding Source		Local resources.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized		Plan Element Utilized			Process for Integration		
Hazard Mitigation Plan		Capability Assessment, Hazard History, Risk Assessment			Created by Emergency Management, adopted by city councils/county commission		

Eddy County Project AT-6: Upgrade existing or purchase new equipment for emergency services.

Description/Benefit		Purchase and/or install upgraded equipment for ambulance, fire and law enforcement. Improve administrative and technical capabilities of emergency services to mitigation the impact of hazards. Community Ambulance Services-New Rockford (CASNR): Eddy County Sheriff's Office: P25 compliant two-way radio base New Rockford Volunteer Fire Department: Water tender equipment, SCBAs, bunker gear New Rockford Rural Volunteer Fire Department: Water tender equipment Sheyenne Volunteer Fire Department: Repeater, P25 compliant two-way radio base, SCBAs, bunker gear Sheyenne Rural Volunteer Fire Department: Repeater, P25 compliant two-way radio base, SCBAs					
Hazards Addressed		All hazards					
Affected Jurisdiction(s)		Eddy County and incorporated jurisdictions					
Project Status		New					
Priority		High					
Responsible Agency		Emergency Management, Emergency Services					
Partners		City Councils, County Commission					
Completion Timeframe		1 to 3 years			Cost	Project-specific	
Funding Source		Local, state, federal grants. CDBG, Emergency Services, FEMA, HUD, Public Utilities, RD, USFS.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	4	5	34
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Eddy County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.	

Eddy County Project AT-7: Install permanent generators and upgrade existing permanent or portable generators, at critical facilities and infrastructure.

Description/Benefit	Upgrade existing generators or install new generators to establish permanent source of backup power to maintain continued operation of the following critical facilities and infrastructure: <u>Upgrade</u> <ul style="list-style-type: none">Eddy County Courthouse <u>Install new</u> <ul style="list-style-type: none">City of New Rockford: City water wells, water treatment plantCity of Sheyenne: Ostby Hall (to establish storm shelter), water well and lift station, fire hall						
Hazards Addressed	All hazards						
Affected Jurisdiction(s)	Eddy County and incorporated jurisdictions						
Project Status	Ongoing						
Priority	High						
Responsible Agency	County Commission, City Councils, Emergency Management						
Partners	County Highway Dept., Emergency Services, Medical Services Providers, Public Utilities						
Completion Timeframe	2 to 3 years			Cost	\$30,000 to \$60,000		
Funding Source	Public Utilities, Regional Council, RD. FEMA Pre-Disaster Mitigation Grant Program (PDM). State Homeland Security Grants.						
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	5	4	4	32
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element Utilized		Process for Integration		
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Eddy County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment		Approval by city councils. Approval by county commission.		

Eddy County Project AT-8: Create and establish permanent county-wide maintenance system for drainage ditches and storm water systems to reduce or eliminate occurrences of overland flooding.

Description/Benefit		Create county-wide drainage ditch/storm water maintenance system to control flow of runoff to eliminate blocked roads, maintain access for city residents and emergency services, and continued operation of public infrastructure.					
Hazards Addressed		Communicable Disease, Drought, Flood (Overland), Severe Summer Weather, Severe Winter Weather, Wildland Fire, Windstorm					
Affected Jurisdiction(s)		Eddy County and incorporated jurisdictions					
Project Status		New					
Priority		Medium					
Responsible Agency		City Councils, County Commission, County Highway Dept., Public Works					
Partners		Emergency Services, NDDH, Public Health, SWC, USDA, Water District					
Completion Timeframe		1 year			Cost	Staff-time	
Funding Source		Local budgets. State and federal grants.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	4	5	3	31
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized		Plan Element Utilized			Process for Integration		
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Eddy County Mitigation Strategy		Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.		

Eddy County Project AT-9: Establish and implement vector control protocol and application system.

Description/Benefit	Control vector population and prevent spread of disease.						
Hazards Addressed	Communicable Disease, Drought, Flood (overland and riverine), Severe Summer Weather						
Affected Jurisdiction(s)	Eddy County and incorporated jurisdictions						
Project Status	New						
Priority	Medium						
Responsible Agency	Public Health						
Partners	Emergency Management, Emergency Services, Medical Services Providers, NDDDES, NDDH, Social Services						
Completion Timeframe	1 to 2 years				Cost	\$4,000 to \$6,000 annually	
Funding Source	Local, state, federal grants. Extension Service, FEMA, NDDH, Public Health, Regional Council.						
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	4	4	4	31
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element Utilized		Process for Integration		
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Eddy County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment		Approval by city councils. Approval by county commission.		

Eddy County Project EO-1: Conduct outreach and education to improve household disaster preparedness through use of websites, social media, local media outlets, utility inserts, mailings, etc. Develop new websites and media outlets where necessary.

Description/Benefit		Continued education and outreach to keep households and vulnerable populations ready in case of a disaster. Special attention paid to maintaining and further developing: severe weather awareness campaign, are you prepared information, shelter-in-place pamphlets, fire prevention school safety, storm spotters program, among others. Existing websites should be updated when necessary. Specific outreach should be developed for special needs populations, low-income residents, homeless and other vulnerable populations. Existing: Eddy County Facebook page, Eddy County/City of New Rockford website, CASNR website, New Rockford Fire Department Facebook page, education pamphlets and brochures for distribution Develop new: City of Sheyenne					
Hazards Addressed		All hazards					
Affected Jurisdiction(s)		Eddy County and incorporated jurisdictions					
Project Status		Ongoing and Continue/New					
Priority		High					
Responsible Agency		County Commission, City Councils, Emergency Management					
Partners		Extension Service, Emergency Services, Housing Authority, Media, Public Health, Public Utilities, Red Cross					
Completion Timeframe		Ongoing		Cost	\$1,000 to 2,000 annually		
Funding Source		Local resources. State and federal grants.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element		Process for Integration		
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Eddy County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment		Approval by city councils. Approval by county commission.		

Eddy County Project EO-2: Increase awareness of methods for prevention of communicable diseases.

Description/Benefit		Make public aware of risk of communicable diseases and methods for prevention in people; animals and crops for economic impact. Methods for people should focus on young and elderly populations, hand-washing techniques, and media for education such as utility inserts, etc. Methods for animals and crops should focus on pesticides, fungicides, herbicides and insecticides commonly used in agriculture-based economies.					
Hazards Addressed		Communicable Disease (All)					
Affected Jurisdiction(s)		Eddy County and incorporated jurisdictions					
Project Status		Ongoing and Continue/New					
Priority		Medium					
Responsible Agency		Public Health					
Partners		Emergency Management, Emergency Services, Extension Service, Medical Services Providers, USDA					
Completion Timeframe		Ongoing			Cost	Project-specific	
Funding Source		Public Health. Local, state and federal grants.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Eddy County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.	

Eddy County Project EO-3: Increase awareness of drought tolerant practices and soil conservation methods in farming and ranching, and municipalities.

Description/Benefit		Make public aware of crop programs, and drought tolerant practices and soil conversation methods in farming and ranching. Educating the public on rationing/restrictions on livestock feed and water usage. Prevent loss of crops and livestock during drought.					
Hazards Addressed		Drought, Severe Summer Weather, Severe Winter Weather, Wildland Fire					
Affected Jurisdiction(s)		Eddy County and incorporated jurisdictions					
Project Status		Ongoing and Continue					
Priority		Medium					
Responsible Agency		Extension Service					
Partners		Emergency Management, FSA, Media, NRCS, NWS, USDA					
Completion Timeframe		Ongoing			Cost	TBD	
Funding Source		Rural Development. Local resources. State and federal grants.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Eddy County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.	

Eddy County Project EO-4: Make public aware of risk of shortage or outage of critical materials or infrastructure and encourage citizens to be proactive and self-sufficient.

Description/Benefit		Make public aware of risk of shortage of critical materials and/or infrastructure and encourage citizens to be self-sufficient. Educate residents on the importance of an emergency kit and household emergency response plan, shelter-in-place, stocking of food and medical supplies, fuel for heating, backup power generation. Education should also focus on understanding risks involved with natural hazards and manmade threats in respective communities.					
Hazards Addressed		All					
Affected Jurisdiction(s)		Eddy County and incorporated jurisdictions					
Project Status		New					
Priority		Medium					
Responsible Agency		Emergency Management, Public Health					
Partners		County Commission, City Councils, Extension Service, Media, NDDes, NDDH, Public Utilities					
Completion Timeframe		Ongoing			Cost	TBD	
Funding Source		Local budgets. State and federal grants. Private sector.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Eddy County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.	

Eddy County Project EO-5: Increase awareness of Severe Summer Weather and Severe Winter Weather.

Description/Benefit		Make public aware of risk to severe summer weather and severe winter weather through participation in the Severe Winter Weather Awareness Week and Severe Summer Weather Awareness Week hosted by the N.D. Dept. of Emergency Services.					
Hazards Addressed		Severe Summer Weather, Severe Winter Weather (all)					
Affected Jurisdiction(s)		Eddy County and incorporated jurisdictions					
Project Status		Ongoing and Continue					
Priority		Medium					
Responsible Agency		Emergency Management, Emergency Services					
Partners		County Commission, City Councils, Extension Service, Media, NDDDES, NDDH, NWS, Public Health, Public Utilities					
Completion Timeframe		Ongoing			Cost	Staff time	
Funding Source		Local budgets. State and federal grants. Private sector.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Eddy County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.	

Eddy County F-1: Expand and improve existing or implement new financial mitigation capabilities.

Description/Benefit	Expand financial mitigation capabilities to generate funds for completion of mitigation projects. To reflect changes in development and mitigate areas impacted by hazards through impact fees. 1. Create and implement impact fees for new development in areas prone to impacts from natural hazards and man-made threats. 2. Restructure and improve building permit fees. 3. Restructure and increase utility fees based on projected future infrastructure maintenance costs and necessary capital improvements. 4. Create revenue stream and allocate resources to invest in equipment and emergency services capabilities.						
Hazards Addressed	All						
Affected Jurisdiction(s)	Eddy County and incorporated jurisdictions						
Project Status	Ongoing and Continue						
Priority	High						
Responsible Agency	City Councils, County Commission						
Partners	Emergency Management, Emergency Services, FEMA, NDAC, NDLC, Planning & Zoning, Public Utilities						
Completion Timeframe	4 to 5 years			Cost	Staff-time		
Funding Source	Local budgets and staff time.						
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
4	5	5	3	3	4	5	29
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element		Process for Integration		
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Eddy County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment		Approval by city councils. Approval by county commission.		

Eddy County Project PR-1: Assure Eddy & Wells Counties, North Dakota has FEMA-Approved Mitigation Plan.

Description/Benefit		Continuous assessment of vulnerabilities to the county and incorporated jurisdiction, and update of hazards and impacts, monitoring of mitigation project implementation and progress.					
Hazards Addressed		All					
Affected Jurisdiction(s)		Eddy County and incorporated jurisdictions					
Project Status		New					
Priority		High					
Responsible Agency		County Commission, Emergency Management					
Partners		County Highway Dept., Emergency Services, Extension Service, Medical Service Providers, Planning & Zoning, Public Health, SWC, Water District					
Completion Timeframe		4 to 5 years			Cost	\$25,000 to \$50,000 (update of plan)	
Funding Source		Local budgets match. FEMA’s PDM or HMGP Grant program.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
Hazard Mitigation Plan (all other existing mechanisms)			All elements			Adoption by county commission and city councils. Approval NDDDES and FEMA.	

Eddy County PR-2: Update and expand existing or create new planning and regulatory capabilities to address development.

Description/Benefit		Build the planning and regulatory capability of incorporated jurisdictions by updating existing and/or expand and create new plans, policies, and ordinances. To ensure new and existing structures adhere to building standards to withstand impacts from oil and gas, and renewable energy development may lead to economic and population growth. <ul style="list-style-type: none">• Specific research should be conducted to address abandoned/blighted properties through zoning and other regulations.• Updating of emergency plans is a priority.• Specific regulations should be developed for museums and historic buildings to address mitigation. A list of plans, policies, codes and ordinances either in place or lacking in Eddy County and incorporated jurisdictions can be found in Table 7.1.4 in Chapter 7.1 – Eddy County Capability Assessment.					
Hazards Addressed		All					
Affected Jurisdiction(s)		Eddy County and incorporated jurisdictions					
Project Status		Ongoing and Continue/New					
Priority		High					
Responsible Agency		City Councils, County Commission, Planning & Zoning					
Partners		Emergency Management, Emergency Services, County Highway Dept., NDAC, NDDH, NDDDES, NDLC, Public Health, RD					
Completion Timeframe		2 to 5 years			Cost	\$0 to \$10,000	
Funding Source		Local budgets. Local, state and federal grants. Private sector.					
Values: 1 is low (negative impact and/or too costly) – Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	3	3	4	5	30
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
All mechanisms shown in Chapter 7.1 – Eddy County Capability Assessment			Capability Assessment, Hazard History, Risk Assessment			Approval by county commission/city council/commission	

Eddy County PR-3: Enroll the city of Sheyenne in the National Flood Insurance Program (NFIP).

Description/Benefit		Ensure economic resiliency. Residents with property at risk would be insured. Ensure continuous review and updating or implementation of flood ordinances and flood control measures.					
Hazards Addressed		Flood (overland and riverine), Severe Summer Weather, Severe Winter Weather					
Affected Jurisdiction(s)		City of Sheyenne					
Project Status		New					
Priority		High					
Responsible Agency		Emergency Management and City Council					
Partners		County Commission, Planning & Zoning, SWC					
Completion Timeframe		2 to 3 years			Cost	Free (local administrative costs will apply)	
Funding Source		Local resources and staff-time.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	4	4	5	32
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized		Plan Element Utilized			Process for Integration		
National Flood Insurance Program		Capability Assessment, Hazard History, Risk Assessment			Approval and adoption by county commission and city council.		

Eddy County PR-4: Encourage jurisdictions to review local flood ordinances to meet or exceed minimum federal and state requirements and comply with the NFIP (once enrolled), and enroll in the Community Rating System.

Description/Benefit		To ensure Eddy County and incorporated jurisdictions meet or exceed the NFIP to prepare for enrollment in the NFIP.					
Hazards Addressed		Flood (overland and riverine)					
Affected Jurisdiction(s)		Eddy County and City of New Rockford. City of Sheyenne (once enrolled).					
Project Status		Ongoing and Continue/New					
Priority		High					
Responsible Agency		City Councils, County Commission, Emergency Management, Planning & Zoning					
Partners		Emergency Services, NDAC, NDDDES, NDLC, SWC					
Completion Timeframe		Ongoing			Cost	\$0 to \$1,000 annually	
Funding Source		Local staff-time. SWC.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element Utilized			Process for Integration	
National Flood Insurance Program			Capability Assessment, Hazard History, Risk Assessment			Approval and adoption by county commission and city councils.	

Eddy County PR-5: Create post-disaster debris management plan.

Description/Benefit		Provide temporary staging site for disposal of waste from structures to improve resiliency and recovery efforts, and maintain quality of life. Avoid environmental impacts from debris contaminated environmentally sensitive areas.					
Hazards Addressed		Communicable Disease (all)					
Affected Jurisdiction(s)		Eddy County and incorporated jurisdictions					
Project Status		New					
Priority		Medium					
Responsible Agency		County Commission, Emergency Management, Planning & Zoning					
Partners		City Councils, County Highway Dept., NDAC, NDDDES, NDDH, NDLC, Public Health, Public Utilities					
Completion Timeframe		1 year			Cost	Up to \$2,000	
Funding Source		Local budgets. State Grants. Private resources.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	4	5	3	31
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Eddy County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.	

Eddy County Project I-1: Retrofit and/or upgrade bridges and culverts, and raise road grades, to withstand natural hazards and prevent blockage to maintain access for emergency services.

Description/Benefit		Increase resiliency of bridges, culverts and roads to maintain transportation to assure economic vitality and access for emergency services. Economic impact resulting in lost time and consumption of additional fuel from disruption in local transportation systems.					
		A detailed description of each bridge, culvert and road is shown on the following page.					
Hazards Addressed		Flood (overland and riverine), Hazardous Material Release, Severe Summer Weather, Severe Winter Weather, Wildland Fire, Windstorm					
Affected Jurisdiction(s)		Eddy County and incorporated jurisdictions					
Project Status		Ongoing and Continue/New					
Priority		Medium					
Responsible Agency		County Commission, County Highway Dept.					
Partners		Emergency Management, Emergency Services, Planning & Zoning, NDDOT					
Completion Timeframe		Ongoing			Cost	Project-specific	
Funding Source		FHWA and NDDOT. FEMA Hazard Mitigation, Section 406. State and federal grants.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	4	2	3	28
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Eddy County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.	

Eddy County Project I-1: Retrofit and/or upgrade bridges and culverts, and raise road grades, to withstand natural hazards and prevent blockage to maintain access for emergency services.

Bridges:

Culverts:

Road Grade Raises:

DRAFT

Eddy County Project I-2: Upgrade existing or construct new storm shelters/community safe rooms.

Description/Benefit		Provide safe area of refuge for permanent residents and temporary populations a seasonal/recreational population from severe weather. Reduce/eliminate loss of life from hazards and man-made threats. Upgrade existing shelters to be fully ADA compliant and pet-friendly. Construct new storm shelters/community safe room in jurisdictions currently lacking a storm shelter/safe room. Emergency Management should contract American Red Cross to set up tour for designation of facilities in each jurisdiction. More information on community shelters can be found through the following link: https://www.fema.gov/media-library/assets/documents/5090 New: City of New Rockford (Archie Campbell Park with 14 pad sites), City of Sheyenne					
Hazards Addressed		All					
Affected Jurisdiction(s)		Eddy County and incorporated jurisdictions					
Project Status		New					
Priority		High					
Responsible Agency		Emergency Management					
Partners		County Commission, City Councils, Emergency Services, NDDes					
Completion Timeframe		3 to 5 years			Cost	\$75,000 to \$150,000	
Funding Source		Local, state and federal grants. FEMA Pre-Disaster Mitigation Grant Program (PDM).					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	4	4	33
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Eddy County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.	

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

Table 6.3 – Mitigation Project Number and Hazard Addressed – Eddy County

Incorporated Jurisdiction and Mitigation Project Number	Communicable Disease	Dam Failure	Drought	Flood	Hazardous Material Release	Homeland Security Incident	Severe Summer Weather	Severe Winter Weather	Transportation Accident	Urban Fire/Structure Collapse	Wildland Fire	Windstorm
Administrative & Technical												
AT-1			X	X			X	X		X	X	X
AT-2*	X	X	X	X	X	X	X	X	X	X	X	X
AT-3*	X	X	X	X	X	X	X	X	X	X	X	X
AT-4*				X	X		X				X	
AT-5*					X		X			X	X	X
AT-6	X	X	X	X	X	X	X	X	X	X	X	X
AT-7*	X	X	X	X	X	X	X	X	X	X	X	X
AT-8*	X	X	X	X	X	X	X	X	X	X	X	X
AT-9	X	X	X	X	X	X	X	X	X	X	X	X
Education & Outreach												
EO-1*	X	X	X	X	X	X	X	X	X	X	X	X
EO-2	X											
EO-3			X				X	X			X	
EO-4*	X	X	X	X	X	X	X	X	X	X	X	X
EO-5*	X	X	X	X	X	X	X	X	X	X	X	X
Financial												
F-1*	X	X	X	X	X	X	X	X	X	X	X	X
Planning & Regulatory												
PR-1*	X	X	X	X	X	X	X	X	X	X	X	X
PR-2*	X	X	X	X	X	X	X	X	X	X	X	X
PR-3				X			X	X				
PR-4*				X								
PR-5*	X	X	X	X	X	X	X	X	X	X	X	X

Table 6.3 – Mitigation Project Number and Hazard Addressed – Eddy County – Continued

Incorporated Jurisdiction and Mitigation Project Number	Communicable Disease	Dam Failure	Drought	Flood	Hazardous Material Release	Homeland Security Incident	Severe Summer Weather	Severe Winter Weather	Transportation Accident	Urban Fire/Structure Collapse	Wildland Fire	Windstorm
<u>Infrastructure</u>												
I-1*				X	X		X	X			X	X
I-2*	X	X	X	X	X	X	X	X	X	X	X	X
<u>City of New Rockford</u>												
Project 1*	X			X			X	X				
Project 2*	X			X			X	X				X
Project 3*	X			X			X	X				
Project 4				X			X	X			X	

6.2 Wells County, North Dakota, Mitigation Strategy

Mitigation Purpose, Goals, and Projects

The Eddy & Wells Counties Multi-Jurisdictional Multi-Hazard Mitigation Plan includes a mitigation strategy consisting of six goals and specific mitigation projects for each incorporated jurisdiction based on the risk assessment developed at Plan Update Committee and jurisdictional meetings.

A total of 35 projects were identified for Wells County and incorporated jurisdictions. Of the 35 identified projects, specific jurisdiction projects include the city of Bowdon (2), the city of Cathay (1), the city of Fessenden (4) and the city of Harvey (4). The remaining projects address the county and incorporated/unincorporated jurisdictions.

All natural hazards and man-made threats were considered and mitigation projects were formulated based on the potential or previous effects of hazards, the high probability of hazard or threat occurrences, the vulnerability of jurisdictions to hazards, and hazards each project can mitigate. The problem statement for Eddy & Wells Counties, which assisted in formulating specific mitigation actions to reduce the impacts of hazards, is shown before the mitigation actions.

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

Goal 1: Implement education and outreach programs to improve public awareness of hazards.

Goal 2: Improve administrative and technical capability to mitigate hazards.

Goal 3: Improve planning and regulatory capability to mitigate hazards.

Goal 4: Reduce impacts of hazards.

Goal 5: Improve resiliency of critical facilities and infrastructure.

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

Mitigation Project Development

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

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

Scoring and Prioritization

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

Each project was scored using a one to five (1 to 5) scoring. A score of one (1) indicated a project is ineffective, not feasible and/or too costly, and a five (5) indicated the project was highly effective, feasible and/or a higher benefit compared to cost. A score of three (3) was neutral.

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

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

Table 6.1 on the following page summarizes the projects by priority by Jurisdiction.

Table 6.1 – Prioritization of Mitigation Projects by Jurisdiction

Jurisdiction	Project Number by Prioritization		
	Low	Medium	High
Wells County	--	AT-2, AT-4, AT-6, AT-8, EO-2, EO-3, EO-5, PR-5, I-2	AT-1, AT-3, AT-5, AT-7, AT-9, EO-1 EO-4, F-1, PR-1, PR-2, PR-3, PR-4, I-1, I-3, I-4
City of Bowdon	--	--	1, 2
City of Cathay	--	--	1
City of Fessenden	--	4	1, 2, 3
City of Harvey		1	2, 3, 4

Acronyms and Definitions

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

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

Acronym/Definition	Entity
BOR	Bureau of Reclamation
CDBG	Community Development Block Grant
City Council/Commission	Incorporated cities in Wells County
County Commission	Wells County Commission
County Highway Dept.	Wells County Road/Highway Department/Public Works
Emergency Management	Wells County Emergency Management
Emergency Services	Ambulance, fire, law enforcement, special units
EPA	Environmental Protection Agency
Extension Service	NDSU/Wells County Extension Service
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FSA	USDA - Farm Service Agency
Historical Society	State Historical Society of North Dakota
HUD	Housing and Urban Development
Media	<u>Newspaper:</u> Wells County Herald-Press, Minot Daily News, <u>Social Media:</u> Wells County Sheriff's Office Facebook page, Wells County Emergency Management Facebook page <u>Website:</u> City of Harvey website, City of Fessenden website, Wells County website <u>Radio Stations:</u> KHND, KTZU (Velva), KXMC (Minot)
Medical Service Providers	St. Aloisius Medical Center (Harvey), clinics
NCDC	National Climatic Data Center
NDAC	N.D. Association of Counties
NDDDES	N.D. Dept. of Emergency Services
NDDC	N.D. Dept. of Commerce
NDDH	N.D. Dept. of Health
NDDOT	N.D. Dept. of Transportation
NDLC	N.D. League of Cities
NDTOA	N.D. Townships Officers Association
NOAA	National Oceanic and Atmospheric Administration
NRCS	U.S.D.A. Natural Resources Conservation Service
NWS	National Weather Service
Planning & Zoning	Planning and Zoning Board, County Commission, City Councils
Public Health	Wells County District Health, N.D. Dept. of Health
Public Utilities	<u>Communications:</u> AT&T, N.D. Telephone Company, Midcontinent, SRT Communications, Verizon <u>Electricity:</u> Otter Tail Power Company, Northern Plains Electric Cooperative, Verendrye Electric Cooperative <u>Internet:</u> Telephone Company, Midcontinent <u>Natural Gas:</u> N/A <u>Waste:</u> Municipal, Double M Sanitation, Waste Management <u>Water:</u> Municipal wells, private wells, water districts

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

Acronym/Definition	Entity
Public Works	Public Works Department of each incorporated jurisdiction
Red Cross	American Red Cross
Regional Council	South Central Dakota Regional Council
RD	U.S. Dept. of Agriculture – Rural Development
Social Services	Wells County Social Services
SWC	N.D. State Water Commission
U.S.A.C.E.	United States Army Corps. of Engineers
U.S.D.A.	United States Department of Agriculture
U.S. Dept. of Interior	United States Department of Interior
U.S.F.W.S.	United States Fish and Wildlife Service
U.S.F.S.	United States Forest Service
Water District	Central Plains Rural Water District

Problem Statements

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

Wells County

Wells County can be impacted by communicable disease, drought, flood (overland and riverine), hazardous material release, severe summer weather, severe winter weather, urban fire/structure collapse, wildland fire, and windstorm. Flooding causes annual damages to property due to the presence of High-water tables, inadequate drainage, closed basins, and the source of the Sheyenne River located in neighboring Wells County. Economic loss to the agriculture and livestock industry occurs on a frequency basis. Critical facilities in the county and incorporated jurisdictions need generators for backup power and upgraded emergency alerting. The county needs to retrofit existing or construct new storm shelters. The county has planning and regulatory, administrative and technical, education and outreach, financial, and planning and regulatory capabilities to accomplish mitigation. However, these capabilities need to be improved and expanded. The county relies on outside sources for funding and to accomplish large-scale mitigation projects.

Improvement and expansion of mitigation capabilities; upgrading of sirens, equipment, and installation of generators; construction of flood control measures; and upgrading of critical facilities and infrastructure are a priority for the county.

Wells County Project AT-1: Expand administrative and technical mitigation capabilities.

Description/Benefit	Expand administrative and technical mitigation capabilities to improve county readiness and preparedness. <u>Staff</u> <ul style="list-style-type: none">• Establish Floodplain Administrator position• Continue to develop and enhance GIS Coordination and develop paid position <u>Technical</u> <ul style="list-style-type: none">• Complete HAZUS Analysis• Become certified and receive StormReady Certification• Become certified and receive Firewise Certification• Upgrade or expand navigation signs for emergency services• Study fire breaks for incorporated jurisdictions, and critical facilities and infrastructure						
Hazards Addressed	All						
Affected Jurisdictions	Wells County and incorporated jurisdictions						
Project Status	New						
Priority	High						
Responsible Agency	City Councils, County Commission, Emergency Services						
Partners	Emergency Management, Extension Service, Media, Medical Service Providers, Planning & Zoning, USDA						
Completion Timeframe	Ongoing			Cost	Project-specific		
Funding Source	Local, state, federal grants. FEMA, Public Utilities, Regional Council, RD.						
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	4	5	3	4	30
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized		Plan Element			Process for Integration		
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy		Capability Assessment, Hazard History, Risk Assessment			Approval by county commission		

Wells County Project AT-2: Expand and enforce building codes.

Description/Benefit		Improve administrative and technical, and planning and regulatory capabilities through establishment of a building code enforcement contract from an outside source, establishment of a county position or education of existing county departments, to enforcement of building codes. Building codes can be enforced to increase structural integrity of new structures or renovation of existing.					
Hazards Addressed		All hazards					
Affected Jurisdiction(s)		Wells County and incorporated jurisdictions					
Project Status		Ongoing and continue					
Priority		Medium					
Responsible Agency		City Councils, County Commission, Planning & Zoning					
Partners		Emergency Services, NDDH, Public Health, Township Board					
Completion Timeframe		12 to 18 months			Cost	\$10,000 to \$20,000	
Funding Source		Local, state, federal grants. City Councils, County Commission.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
4	5	3	3	4	3	5	27
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element		Process for Integration		
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment		Approval by county commission, city councils or township board		

Wells County Project AT-3: Upgrade and expand early warning system(s).

Description/Benefit		Coverage of current outdoor early warning system/sirens does not provide coverage to an adequate geographic expanse of the county. Upgrade existing manually-activated sirens to dispatch-activated sirens. Install new dispatch-activated sirens where necessary. There are no existing outdoor early warning sirens for the county outside incorporated cities. Purchase NOAA weather radios for rural communities. <ul style="list-style-type: none">• Upgrade: City of Fessenden (keep existing in same location), City of Sykeston• New: City of Bowdon, City of Fessenden (inside public school), City of Hurdsville• NOAA Weather Radios: City of Cathay, City of Hamberg; Heimdal (unincorporated) <i>The city of Harvey has ordered new sirens which will be installed sometime in 2017.</i>					
Hazards Addressed		Flood, Hazardous Material Release, Severe Summer Weather, Wildland Fire (All)					
Affected Jurisdiction(s)		Wells County and incorporated jurisdictions					
Project Status		Ongoing					
Priority		High					
Responsible Agency		City Councils, Emergency Management					
Partners		County Commission, Emergency Services, FEMA, NDDDES, NWS					
Completion Timeframe		1 to 2 years			Cost	Up to \$25,000 per siren, plus installation	
Funding Source		9-1-1 funding. State Homeland Security Grant Program. City and county general fund.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.	

Wells County Project AT-4: Install digital fire index signage at strategic points in the county.

Description/Benefit		Improve public awareness and education of North Dakota Fire Danger index through installation of fire index signs. The fire danger index from the state provides an indication of rural fire potential for grasslands, and its ability to spread. Upgrade: Manual fire index sign to a digital sign in the city of Harvey. New Digital Signs: City of Fessenden outside fire hall, Intersection of U.S. Highway 52 and N.D. Highway 200						
Hazards Addressed		Hazardous Material Release, Severe Summer Weather, Urban Fire/Structure Collapse, Wildland Fire, Windstorm						
Affected Jurisdiction(s)		Wells County and incorporated jurisdictions						
Project Status		New						
Priority		Medium						
Responsible Agency		Emergency Management, Emergency Services						
Partners		County Commission, County Highway Dept., NDDDES, NDDOT, NWS, USFS						
Completion Timeframe		2 to 3 years			Cost	\$15,000 to \$30,000 per sign		
Funding Source		Local, state, federal grants. U.S.F.S.						
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)								
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL	
5	5	5	4	5	4	4	32	
Integration of Mitigation Plan Requirements into Local Planning Mechanisms								
Planning Mechanisms Utilized			Plan Element			Process for Integration		
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.		

Wells County Project AT-5: Create hazard incident reporting system.

Description/Benefit		Improve public reporting of incidents to emergency management. Build detailed database of hazard history to provide statistics to support grant applications. Assist local emergency services in planning for preparedness and response.					
Hazards Addressed		All					
Affected Jurisdiction(s)		Wells County and incorporated jurisdictions					
Project Status		New					
Priority		High					
Responsible Agency		Emergency Management					
Partners		City Councils, County Commission, County Highway Dept., Emergency Services, Public Works					
Completion Timeframe		Up to 1 year, then ongoing			Cost	Staff-time	
Funding Source		Local resources.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>			<u>Plan Element Utilized</u>			<u>Process for Integration</u>	
Hazard Mitigation Plan			Capability Assessment, Hazard History, Risk Assessment			Created by Emergency Management, adopted by city councils/county commission	

Wells County Project AT-6: Upgrade existing or purchase new equipment for emergency services.

Description/Benefit		Purchase and/or install upgraded equipment for ambulance, fire, law enforcement, medical facilities and special units. Improve administrative and technical capabilities of emergency services to mitigation the impact of hazards. St. Aloisius Medical Center: Decontamination and mass casualty supplies Bowdon Ambulance Service: Bowdon Volunteer Fire Department: SCBAs, bunker gear, radios, ATV wildland fire units Cathay Volunteer Fire Department: SCBAs, bunker gear, radios, fire truck, ATV wildland fire units Fessenden Ambulance Service: Fessenden Volunteer Fire Department: 4500 PSI tanks, compressor, SCBAs and tank Fessenden Police Department: Vehicles, radios, lightbars, computers, drone with camera, EOC trailer/camper. Harvey Ambulance Service: Harvey Volunteer Fire Department: SCBAs, bunker gear Harvey Police Department: Sykeston Volunteer Fire Department: Wells County Sheriff's Office:					
Hazards Addressed		All hazards					
Affected Jurisdiction(s)		Wells County and incorporated jurisdictions					
Project Status		New					
Priority		Medium					
Responsible Agency		Emergency Management, Emergency Services					
Partners		City Councils, County Commission					
Completion Timeframe		1 to 3 years			Cost	Project-specific	
Funding Source		Local, state, federal grants. CDBG, Emergency Services, FEMA, HUD, Public Utilities, RD, USFS.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	4	5	34
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.	

Wells County Project AT-7: Install permanent generators and upgrade existing permanent or portable generators, at critical facilities and infrastructure.

Description/Benefit	Upgrade existing generators or install new generators to establish permanent source of backup power to maintain continued operation of the following critical facilities and infrastructure: <u>Upgrade</u> <ul style="list-style-type: none">Wells County Shop (Fessenden and Harvey) <u>Install new</u> <ul style="list-style-type: none">City of Bowdon: Water pump station, fire station (sized for construction of new fire hall)City of Cathay: Fire hall, lift station and pumphouseCity of Fessenden: Fessenden-Bowdon Public School, lift stations, city shop, city hall/fire department/police department, pump houseCity of Harvey: Armory/city hall/police station, B.M. Hanson Elementary, fire station, Harvey High School, Harvey Ambulance HallCity of Hurdsfield: Lift stationCity of Sykeston: Lift station, fire hall, water tower for recirculation pump						
Hazards Addressed	All hazards						
Affected Jurisdiction(s)	Wells County and incorporated jurisdictions						
Project Status	Ongoing						
Priority	High						
Responsible Agency	County Commission, City Councils, Emergency Management						
Partners	County Highway Dept., Emergency Services, Medical Services Providers, Public Utilities						
Completion Timeframe	2 to 3 years				Cost	\$30,000 to \$60,000	
Funding Source	Public Utilities, RD. FEMA Pre-Disaster Mitigation Grant Program (PDM). State Homeland Security Grants.						
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	5	4	4	32
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element Utilized			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.	

Wells County Project AT-8: Create and establish permanent county-wide maintenance system for drainage ditches and storm water systems to reduce or eliminate occurrences of overland flooding.

Description/Benefit		Create county-wide drainage ditch/storm water maintenance system to control flow of runoff to eliminate blocked roads, maintain access for city residents and emergency services, and continued operation of public infrastructure.					
Hazards Addressed		Communicable Disease, Drought, Flood (Overland), Severe Summer Weather, Severe Winter Weather, Wildland Fire, Windstorm					
Affected Jurisdiction(s)		Wells County and incorporated jurisdictions					
Project Status		New					
Priority		Medium					
Responsible Agency		City Councils, County Commission, County Highway Dept., Public Works					
Partners		Emergency Services, NDDH, Public Health, SWC, USDA, Water District					
Completion Timeframe		1 to 2 years			Cost	Staff-time	
Funding Source		Local budgets. State and federal grants.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	4	5	3	31
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element Utilized			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.	

Wells County Project AT-9: Establish and implement vector control protocol and application system.

Description/Benefit		Control vector population and prevent spread of disease. Harvey Underpass: Seal off underpass to control pigeon populations and eliminate risk of disease.					
Hazards Addressed		Communicable Disease, Drought, Flood (overland and riverine), Severe Summer Weather					
Affected Jurisdiction(s)		Wells County and incorporated jurisdictions					
Project Status		New					
Priority		High					
Responsible Agency		Public Health					
Partners		Emergency Management, Emergency Services, Medical Services Providers, NDDDES, NDDH, Social Services					
Completion Timeframe		1 to 2 years			Cost	\$4,000 to \$6,000 annually	
Funding Source		Local, state, federal grants. Extension Service, FEMA, NDDH, Public Health, Regional Council.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	4	4	4	31
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>			<u>Plan Element Utilized</u>			<u>Process for Integration</u>	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.	

Wells County Project EO-1: Conduct outreach and education to improve household disaster preparedness through use of websites, social media, local media outlets, utility inserts, mailings, etc. Develop new websites and media outlets.

Description/Benefit		Continued education and outreach to keep households and vulnerable populations ready in case of a disaster. Special attention paid to maintaining and further developing: severe weather awareness campaign, are you prepared information, shelter-in-place pamphlets, fire prevention school safety, storm spotters program, among others. Existing websites should be updated when necessary. Specific outreach should be developed for special needs populations, low-income residents, homeless and other vulnerable populations. Existing: Wells County Emergency Management Facebook page, Wells County website, City of Harvey website, City of Fessenden website, Fessenden Police Department Facebook page, education pamphlets and brochures for distribution Update: City of Bowdon – add hazard information. Develop new: Social media: cities of Cathay and Hamberg; Websites: cities of Cathay, Hamberg, Hurdsfield and Sykeston					
Hazards Addressed		All hazards					
Affected Jurisdiction(s)		Wells County and incorporated jurisdictions					
Project Status		Ongoing and Continue/New					
Priority		High					
Responsible Agency		County Commission, City Councils, Emergency Management					
Partners		Extension Service, Emergency Services, Media, Public Health, Public Utilities, Red Cross					
Completion Timeframe		Ongoing			Cost	\$1,000 to 2,000 annually	
Funding Source		Local resources. State and federal grants.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element		Process for Integration		
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment		Approval by city councils. Approval by county commission.		

Wells County Project EO-2: Increase awareness of methods for prevention of communicable diseases.

Description/Benefit		Make public aware of risk of communicable diseases and methods for prevention in people; animals and crops for economic impact. Methods for people should focus on young and elderly populations, hand-washing techniques, and media for education such as utility inserts, etc. Methods for animals and crops should focus on pesticides, fungicides, herbicides and insecticides commonly used in agriculture-based economies.					
Hazards Addressed		Communicable Disease (All)					
Affected Jurisdiction(s)		Wells County and incorporated jurisdictions					
Project Status		Ongoing and Continue/New					
Priority		Medium					
Responsible Agency		Public Health					
Partners		Emergency Management, Emergency Services, Extension Service, Medical Services Providers, USDA					
Completion Timeframe		Ongoing			Cost	Project-specific	
Funding Source		Public Health. Local, state and federal grants.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.	

Wells County Project EO-3: Increase awareness of drought tolerant practices and soil conservation methods in farming and ranching, and municipalities.

Description/Benefit		Make public aware of crop programs, and drought tolerant practices and soil conversation methods in farming and ranching. Educating the public on rationing/restrictions on livestock feed and water usage. Prevent loss of crops and livestock during drought.					
Hazards Addressed		Drought, Severe Summer Weather, Severe Winter Weather, Wildland Fire					
Affected Jurisdiction(s)		Wells County and incorporated jurisdictions					
Project Status		Ongoing and Continue					
Priority		Medium					
Responsible Agency		Extension Service					
Partners		Emergency Management, FSA, Media, NRCS, NWS, USDA					
Completion Timeframe		Ongoing			Cost	TBD	
Funding Source		Rural Development. Local resources. State and federal grants.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.	

Wells County Project EO-4: Make public aware of risk of shortage or outage of critical materials or infrastructure and encourage citizens to be proactive and self-sufficient.

Description/Benefit	Make public aware of risk of shortage of critical materials and/or infrastructure and encourage citizens to be self-sufficient. Educate residents on the importance of an emergency kit and household emergency response plan, shelter-in-place, stocking of food and medical supplies, fuel for heating, backup power generation. Education should also focus on understanding risks involved with natural hazards and manmade threats in respective communities.						
Hazards Addressed	All						
Affected Jurisdiction(s)	Wells County and incorporated jurisdictions						
Project Status	New						
Priority	High						
Responsible Agency	Emergency Management, Public Health						
Partners	County Commission, City Councils, Extension Service, Media, NDDes, NDDH, Public Utilities						
Completion Timeframe	Ongoing			Cost	TBD		
Funding Source	Local budgets. State and federal grants. Private sector.						
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized		Plan Element			Process for Integration		
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy		Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.		

Wells County Project EO-5: Increase awareness of Severe Summer Weather and Severe Winter Weather.

Description/Benefit	Make public aware of risk to severe summer weather and severe winter weather through participation in the Severe Winter Weather Awareness Week and Severe Summer Weather Awareness Week hosted by the N.D. Dept. of Emergency Services.						
Hazards Addressed	Severe Summer Weather, Severe Winter Weather (all)						
Affected Jurisdiction(s)	Wells County and incorporated jurisdictions						
Project Status	Ongoing and Continue						
Priority	Medium						
Responsible Agency	Emergency Management, Emergency Services						
Partners	County Commission, City Councils, Extension Service, Media, NDDes, NDDH, NWS, Public Health, Public Utilities						
Completion Timeframe	Ongoing			Cost	TBD		
Funding Source	Local budgets. State and federal grants. Private sector.						
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized		Plan Element			Process for Integration		
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy		Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.		

Wells County F-1: Expand and improve existing or implement new financial mitigation capabilities.

Description/Benefit		Expand financial mitigation capabilities to generate funds for completion of mitigation projects. To reflect changes in development and mitigate areas impacted by hazards through impact fees. <div><div>1. Create and implement impact fees for new development in areas prone to impacts from natural hazards and man-made threats.</div><div>2. Restructure and improve building permit fees.</div><div>3. Restructure and increase utility fees based on projected future infrastructure maintenance costs and necessary capital improvements.</div><div>4. Research funding options for improvements to road infrastructure with specific attention paid to U.S. Highways 52 and N.D. Highway 200</div><div>5. Create revenue stream and allocate resources to invest in equipment and emergency services capabilities.</div></div>					
Hazards Addressed		All					
Affected Jurisdiction(s)		Wells County and incorporated jurisdictions					
Project Status		Ongoing and Continue					
Priority		High					
Responsible Agency		City Councils, County Commission					
Partners		Emergency Management, Emergency Services, FEMA, NDAC, NDLC, Planning & Zoning, Public Utilities					
Completion Timeframe		4 to 5 years			Cost	Staff-time	
Funding Source		Local budgets and staff time.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
4	5	5	3	3	4	5	29
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.	

Wells County Project PR-1: Assure Eddy & Wells Counties, North Dakota has FEMA-Approved Mitigation Plan.

Description/Benefit		Continuous assessment of vulnerabilities to the county and incorporated jurisdiction, and update of hazards and impacts, monitoring of mitigation project implementation and progress.					
Hazards Addressed		All					
Affected Jurisdiction(s)		Wells County and incorporated jurisdictions					
Project Status		New					
Priority		High					
Responsible Agency		County Commission, Emergency Management					
Partners		County Highway Dept., Emergency Services, Extension Service, Medical Service Providers, Planning & Zoning, Public Health, SWC, Water District					
Completion Timeframe		4 to 5 years			Cost	\$25,000 to \$50,000 (update of plan)	
Funding Source		Local budgets. FEMA’s PDM or HMGP Grant program.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
Hazard Mitigation Plan (all other existing mechanisms)			All elements			Adoption by county commission and city councils. Approval NDDDES and FEMA.	

Wells County PR-2: Update/expand existing or create new planning and regulatory capabilities to address development.

Description/Benefit		Build the planning and regulatory capability of incorporated jurisdictions by updating existing and/or expand and create new plans, policies, and ordinances. To ensure new and existing structures adhere to building standards to withstand impacts from oil and gas, and renewable energy development may lead to economic and population growth. <ul style="list-style-type: none">• Specific research should be conducted to address abandoned/blighted properties through zoning and other regulations.• Updating of emergency plans is a priority.• Specific regulations should be developed for museums and historic buildings to address mitigation. A list of plans, policies, codes and ordinances either in place or lacking in Wells County and incorporated jurisdictions can be found in Chapter 7.2 – Wells County Capability Assessment.					
Hazards Addressed		All					
Affected Jurisdiction(s)		Wells County and incorporated jurisdictions					
Project Status		Ongoing and Continue/New					
Priority		High					
Responsible Agency		City Councils, County Commission, Planning & Zoning					
Partners		Emergency Management, Emergency Services, County Highway Dept., NDAC, NDDH, NDDDES, NDLC, Public Health, RD					
Completion Timeframe		2 to 5 years		Cost	\$0 to \$10,000		
Funding Source		Local budgets. Local, state and federal grants. Private sector.					
Values: 1 is low (negative impact and/or too costly) – Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	3	3	4	5	30
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element		Process for Integration		
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment		Approval by city councils. Approval by county commission.		

Wells County PR-3: Enroll Wells County and incorporated jurisdictions in National Flood Insurance Program (NFIP).

Description/Benefit	Ensure economic resiliency. Residents with property at risk would be insured. Ensure continuous review and updating or implementation of flood ordinances and flood control measures.						
Hazards Addressed	Flood (overland and riverine), Severe Summer Weather, Severe Winter Weather						
Affected Jurisdiction(s)	Wells County and the cities of Bowdon, Cathay, Hamberg, Hurdsfield						
Project Status	Ongoing and continue						
Priority	High						
Responsible Agency	City Councils, County Commission, Emergency Management						
Partners	Planning & Zoning, SWC						
Completion Timeframe	2 to 3 years			Cost	Free (local administrative costs will apply)		
Funding Source	Local resources and staff-time.						
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	3	4	4	5	31
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized		Plan Element Utilized			Process for Integration		
National Flood Insurance Program		Capability Assessment, Hazard History, Risk Assessment			Approval and adoption by county commission and city councils.		

Wells County PR-4: Encourage jurisdictions to review local flood ordinances to meet or exceed minimum federal and state requirements and comply with the NFIP (once enrolled), and enroll in the Community Rating System.

Description/Benefit		To ensure Wells County and incorporated jurisdictions meet or exceed the NFIP to prepare for enrollment in the NFIP.					
Hazards Addressed		Flood (overland and riverine)					
Affected Jurisdiction(s)		The cities of Fessenden, Harvey and Sykeston. Wells County and the cities of Bowdon, Cathay, Hamberg, Hurdsfield (once enrolled).					
Project Status		Ongoing and Continue/New					
Priority		High					
Responsible Agency		City Councils, County Commission, Emergency Management, Planning & Zoning					
Partners		Emergency Services, NDAC, NDDES, NDLC, SWC					
Completion Timeframe		4 to 5 years			Cost	\$0 to \$1,000	
Funding Source		Local staff-time. SWC.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element Utilized			Process for Integration	
National Flood Insurance Program			Capability Assessment, Hazard History, Risk Assessment			Approval and adoption by county commission and city councils.	

Wells County PR-5: Create post-disaster debris management plan.

Description/Benefit		Provide temporary staging site for disposal of waste from structures to improve resiliency and recovery efforts, and maintain quality of life. Avoid environmental impacts from debris contaminated environmentally sensitive areas.					
Hazards Addressed		Communicable Disease (all)					
Affected Jurisdiction(s)		Wells County and incorporated jurisdictions					
Project Status		New					
Priority		Medium					
Responsible Agency		Emergency Management, Planning & Zoning					
Partners		City Councils, County Commission, County Highway Dept., NDAC, NDDDES, NDDH, NDLC, Public Health, Public Utilities					
Completion Timeframe		1 year			Cost	Up to \$2,000.00	
Funding Source		Local budgets. State Grants. Private resources.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	4	5	3	31
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.	

Wells County Project I-1: Assure continued monitoring and maintenance of the Harvey Dam, and all other dams in Wells County.

Description/Benefit		To protect human life and property from dam failures. Eliminate possibility of a repeat event like the Sheep Creek Dam incident in 1970. See Chapter 5.2, Dam Failure for a list of dams in Wells County.					
Hazards Addressed		Dam Failure (Severe Summer Weather, Severe Winter Weather)					
Affected Jurisdictions		Wells County and incorporated jurisdictions					
Project Status		Ongoing and Continue					
Priority		High					
Responsible Agency		Water District					
Partners		County Commission, Emergency Management, SWC, engineering firms					
Completion Timeframe		Ongoing			Cost	Project-specific	
Funding Source		Water District. County Commission.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element Utilized			Process for Integration	
Local emergency operations plan, emergency action plans			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.	

Wells County Project I-2: Retrofit and/or upgrade bridges and culverts, and raise road grades, to withstand natural hazards and prevent blockage to maintain access for emergency services.

Description/Benefit		Increase resiliency of bridges, culverts and roads to maintain transportation to assure economic vitality and access for emergency services. A detailed description of each bridge, culvert and road is shown on the following page.					
Hazards Addressed		Flood (overland and riverine), Hazardous Material Release, Severe Summer Weather, Severe Winter Weather, Wildland Fire, Windstorm					
Affected Jurisdiction(s)		Wells County and incorporated jurisdictions					
Project Status		Ongoing and Continue/New					
Priority		Medium					
Responsible Agency		County Commission, County Highway Dept.					
Partners		Emergency Management, Emergency Services, Planning & Zoning, NDDOT					
Completion Timeframe		Ongoing			Cost	Project-specific	
Funding Source		FHWA and NDDOT. FEMA Hazard Mitigation, Section 406. State and federal grants.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	4	2	3	28
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element		Process for Integration		
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment		Approval by city councils. Approval by county commission.		

Wells County Project I-2: Retrofit and/or upgrade bridges and culverts, and raise road grades, to withstand natural hazards and prevent blockage to maintain access for emergency services.

Bridges:

Culverts:

Road Grade Raises:

DRAFT

Wells County Project I-3: Upgrade existing or construct new storm shelters/community safe rooms.

Description/Benefit		Provide safe area of refuge for permanent residents and temporary populations a seasonal/recreational population from severe weather. Reduce/eliminate loss of life from hazards and man-made threats. Upgrade existing shelters to be fully ADA compliant and pet-friendly. Construct new storm shelters/community safe room in jurisdictions currently lacking a storm shelter/safe room. Emergency Management should contract American Red Cross to set up tour for designation of facilities in each jurisdiction. More information on community shelters can be found through the following link: https://www.fema.gov/media-library/assets/documents/5090 <ul style="list-style-type: none">• Wells County: Location in south-central portion of the county for use by rural residents/farmers. This area of the county has a strong population base and needs protection from severe weather.• Cities of Bowdon, Cathay, Hurdsfield and Sykeston• City of Fessenden/Wells County: Wells County Fair Grounds					
Hazards Addressed		All					
Affected Jurisdiction(s)		Wells County and incorporated jurisdictions					
Project Status		New					
Priority		High					
Responsible Agency		Emergency Management					
Partners		County Commission, City Councils, Emergency Services, NDDDES, Red Cross					
Completion Timeframe		3 to 5 years		Cost	\$75,000 to \$150,000		
Funding Source		Local, state and federal grants. FEMA Pre-Disaster Mitigation Grant Program (PDM).					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	4	4	33
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element		Process for Integration		
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment		Approval by city councils. Approval by county commission.		

Wells County Project I-4: Conduct hydrology/engineering study for Pipestem Creek and Rocky Run Creek to identify effective flood control measures and drainage improvements.

Description/Benefit		Construction of detention/retention ponds, floodwalls, berms, revetments or bioengineered bank-stabilization techniques to slow runoff of overland flooding from heavy rains and snowmelt, and flood waters from riverine flooding. Detention/retention ponds provide controlled release of water and reduce/eliminate areas and structures from being inundated with flooding.					
		Specific areas or sites?					
Hazards Addressed		Flood (riverine and overland), Severe Summer Weather, Severe Winter Weather					
Affected Jurisdiction(s)		Wells County and incorporated jurisdiction (townships)					
Project Status		New					
Priority		High					
Responsible Agency		County Commission, Water District					
Partners		City Councils, Emergency Management, Emergency Services, Public Works, NDDes, SWC					
Completion Timeframe		1 to 2 years			Cost	Project-specific	
Funding Source		Local, state and federal grants.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	4	4	3	30
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.	

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

Table 6.3 – Mitigation Project Number and Hazard Addressed – Wells County

Incorporated Jurisdiction and Mitigation Project Number	Communicable Disease	Dam Failure	Drought	Flood	Hazardous Material Release	Homeland Security Incident	Severe Summer Weather	Severe Winter Weather	Transportation Accident	Urban Fire/Structure Collapse	Wildland Fire	Windstorm
Administrative & Technical												
AT-1			X	X			X	X		X	X	X
AT-2*	X	X	X	X	X	X	X	X	X	X	X	X
AT-3*	X	X	X	X	X	X	X	X	X	X	X	X
AT-4*				X	X		X				X	
AT-5*					X		X			X	X	X
AT-6	X	X	X	X	X	X	X	X	X	X	X	X
AT-7*	X	X	X	X	X	X	X	X	X	X	X	X
AT-8*	X	X	X	X	X	X	X	X	X	X	X	X
AT-9	X	X	X	X	X	X	X	X	X	X	X	X
Education & Outreach												
EO-1*	X	X	X	X	X	X	X	X	X	X	X	X
EO-2	X											
EO-3			X				X	X			X	
EO-4*	X	X	X	X	X	X	X	X	X	X	X	X
EO-5*	X	X	X	X	X	X	X	X	X	X	X	X
Financial												
F-1*	X	X	X	X	X	X	X	X	X	X	X	X
Planning & Regulatory												
PR-1*	X	X	X	X	X	X	X	X	X	X	X	X
PR-2*	X	X	X	X	X	X	X	X	X	X	X	X
PR-3				X			X	X				
PR-4*				X								
PR-5*	X	X	X	X	X	X	X	X	X	X	X	X

Table 6.3 – Mitigation Project Number and Hazard Addressed – Wells County – Continued

Incorporated Jurisdiction and Mitigation Project Number	Communicable Disease	Dam Failure	Drought	Flood	Hazardous Material Release	Homeland Security Incident	Severe Summer Weather	Severe Winter Weather	Transportation Accident	Urban Fire/Structure Collapse	Wildland Fire	Windstorm
<u>Infrastructure</u>												
I-1 *		X		X			X	X				
I-2*				X	X		X	X			X	X
I-3	X	X	X	X	X	X	X	X	X	X	X	X
I-4*				X			X	X				
<u>City of Bowdon</u>												
Project 1*	X			X			X	X				X
Project 2	X	X	X	X	X	X	X	X	X	X	X	X
<u>City of Cathay</u>												
Project 1	X			X			X	X				X
<u>City of Fessenden</u>												
Project 1*	X			X			X	X				
Project 2*	X			X			X	X				X
Project 3				X			X	X		X	X	
Project 4*							X	X				X
<u>City of Harvey</u>												
Project 1*	X			X			X	X				
Project 2	X		X	X			X	X				
Project 3				X	X		X	X	X			

7. Mitigation Capability Assessment

Capability for mitigation is divided into four categories: administrative and technical, education and outreach, financial, and planning and regulatory. Each identified resource in the four mitigation capability categories can be used to implement mitigation strategies and access funding for projects.

- Chapter 7.1 inventories and analyses the mitigation capabilities of Eddy County.
- Chapter 7.2 inventories and analyses the mitigation capabilities of Wells County.
- Table 7.1 on the following page lists **state and federal funding sources** for mitigation.

A definition of each mitigation capability category is as follows:

Administrative and Technical	Identification of administrative and technical capabilities, which include: staff and their skills and tools for mitigation planning to implement specific mitigation actions.
Education and Outreach	Identification of education and outreach programs, and methods already in place to implement mitigation activities and communicate hazard-related information.
Financial	Identification of access to or eligibility to use funding resources for hazard mitigation for jurisdictions.
Planning and Regulatory	Jurisdictional plans, policies, codes, and ordinances adopted and in place that prevent and reduce the impacts of hazards.

Mitigation Funding Sources

Table 7.1 lists state and federal sources for mitigation. These sources are able to fund and administer mitigation projects in addition to the aforementioned local capabilities of Eddy County and Wells County, and incorporated jurisdictions.

Table 7.1 – State and Federal Mitigation Funding Sources

Funding Source	Managing Agencies
AmeriCorps	Corporation for National & Community Service
Community Development Block Grant (CDBG)	US Housing and Urban Development North Dakota Department of Commerce
Economic Development Administration (EDA) Grants and Investments	US Economic Development Administration
Emergency Watershed Protection	US Natural Resources Conservation Service
Environmental Quality Incentives Program	US Natural Resources Conservation Service
Flood Mitigation Assistance Program (FMA)	North Dakota State Water Commission and FEMA
Hazard Mitigation Grant Program (HMGP)	North Dakota Department of Emergency Services and FEMA
Hazardous Fuels Mitigation Program	North Dakota Department of Transportation
Homeland Security Grants	North Dakota Department of Emergency Services, US Department of Justice, US Department of Homeland Security
Individual Assistance (IA)	FEMA, North Dakota Department of Emergency Services
Map Modernization Program	North Dakota State Water Commission and FEMA
National Fire Plan (NFP)	North Dakota Forest Service and US Forest Service
NRCS Conservation Programs	U.S.D.A. Natural Resources Conservation Service
Pre-Disaster Mitigation (PDM) Grants	North Dakota Department of Emergency Services and FEMA
Public Assistance (PA)	North Dakota Department of Emergency Services and FEMA
Repetitive Flood Claims (RFC) Grant	North Dakota State Water Commission and FEMA
Rural Fire Assistance (RFA) Grant	National Interagency Fire Center
SBA Pre-Disaster Mitigation Loan Program	U.S. Small Business Administration (SBA)
Severe Repetitive Loss (SRL) Grant	North Dakota State Water Commission and FEMA
Small Flood Control Projects	US Army Corps of Engineers (USACE)
Streambank & Shoreline Protection	US Army Corps of Engineers (USACE)
Wetland Program Development Grants (WPDGs)	US Environmental Protection Agency

7.1 Eddy County Mitigation Capability Assessment

The mitigation capabilities for Eddy County and The Planning Area are shown in in the following tables:

- Table 7.1.1 highlights **administrative and technical** capabilities.
- Table 7.1.2 highlights **education and outreach** capabilities.
- Table 7.1.3 highlights **financial** capabilities.
- Table 7.1.4 highlights **planning and regulatory** capabilities.
- Table 7.1.5 shows the **utilization of planning mechanisms** in Eddy County by hazard and mitigation project.
- Table 7.1.6 lists **state and federal sources** for mitigation.

The following bullet points summarize the structure of each table in this chapter.

- Boxes checked with an “X” indicate the presence of the capability
- Boxes left blank indicate the jurisdiction is lacking the capability
- Boxes marked with an asterisk (*) indicates a capability that can be obtained through the county, contracted services, or an outside entity
- Narratives following each table detail the capabilities of Eddy County and Wells County. The numbering in the tables corresponds to the number in the narrative.

***Note:** It should be noted that the mitigation capabilities of each county and incorporated jurisdictions are shown in combined tables. This method allows the two counties and incorporated jurisdictions to compare capabilities to encourage collaborative mitigation efforts.*

Table 7.1.1 shows the administrative and technical capabilities of Eddy County and The Planning Area. A box marked with an “X” indicates the jurisdiction has or has access to the administrative or technical capability for mitigation. An asterisk (*) denotes an administrative and technical capability that can be obtained through the county for incorporated jurisdictions, or contracted services or an outside entity for the county.

Table 7.1.1 – Eddy County Administrative and Technical Capabilities

Administrative and Technical Mitigation Capability		Eddy County	City of New Rockford	City of Sheyenne	Wells County	City of Bowdon	City of Cathay	City of Fessenden	City of Hamberg	City of Harvey	City of Hurdsville	City of Sykeston
Administration												
1	County/City Council or Commission	X	X	X	X	X	X	X	X	X	X	X
2	Local Emergency Planning Committee	X	*	*	X	*	*	*	*	*	*	*
3	Mitigation Planning Committee	X	*	*	X	*	*	*	*	*	*	*
4	Mutual Aid Agreements	X	*	*	X	*	*	*	*	*	*	*
5	Other Staff for Administration	X	*	*	X	*	*	*	*	*	*	*
6	Planning Commission	X	X	*	X	*	*	X	*	X	*	*
7	Planning and Zoning Administrator	X	*	*	X	*	*	*	*	*	*	*
8	Planning and Zoning Board	X	*	*	X	*	*	*	*	*	*	*
9	Water Resource Board	X	*	*	X	*	*	*	*	*	*	*
10	Weed Board	X	*	*	X	*	*	*	*	*	*	*
Staff												
1	911 Coordinator/Director and User Board	X	*	*	X	*	*	*	*	*	*	*
2	Chief Building Official/Inspector/Board	*	*	*	*	*	*	*	*	*	*	*
3	Civil Engineer	*	*	*	*	*	*	*	*	*	*	*
4	Community Planner/Planning Services	*	*	*	*	*	*	*	*	*	*	*
5	Emergency Management	X	*	*	X	*	*	*	*	*	*	*
6	Emergency Services (ambulance, police, fire)	X*	X	X	X*	X	X	X	*	X	*	*
7	Floodplain Administrator	X	*	*								
8	GIS Coordinator	X										
9	Grant Writing Staff	X	*	*	X	*	*	*	*	*	*	*
10	Public Health	X	*	*	X	*	*	*	*	*	*	*
11	Public Works and/or Highway Department	X	X	*	X	*	*	X	*	X	*	*
12	Sheriff	X	*	*	X	*	*	*	*	*	*	*
Technical												
1	Emergency Services GIS/GPS capable	X	*	*						^		
2	Emergency Siren (dispatch-activated)		3	1				1		1		1
3	Emergency Siren (manually-activated)											
4	Fire Break											
5	Fire Index Sign	X	X	*	X	*	*	*	*	X	*	*
6	Fire ISO Rating		6	7		9		5		5		8

*Denotes administrative and technical capability that can be obtained through the county, contracted services, or an outside entity.

Table 7.1.1 – Eddy County Administrative and Technical Capabilities - Continued

Administrative and Technical Mitigation Capability		Eddy County	City of New Rockford	City of Sheyenne	Wells County	City of Bowdon	City of Cathay	City of Fessenden	City of Hamberg	City of Harvey	City of Hurdfield	City of Sykeston
Technical												
7	Firewise Certification		X	X								
8	Generator (permanent)	1	8	2								
9	Generator (portable)	1			3			1		1		
10	HAZUS Analysis											
11	Infrastructure Maintenance Programs	X	X	*	X	*	*	X	*	X	*	*
12	Navigation Signs for Emergency Services	X	X	X	X	X	X	X	X	X	X	X
13	Reporting of Data to Emergency Manager	X	X	X	X	X	X	X	X	X	X	X
14	StormReady Certification	X	X	X								
15	Warning Systems/Services	X	*	*	X	*	*	*	*	*	*	*

*Denotes administrative and technical capability that can be obtained through the county, contracted services, or an outside entity.

Administration

1. Eddy County has an active county commission. All incorporated jurisdictions in Eddy County have active city councils.
2. The county has an active Local Emergency Planning Committee (LEPC). Incorporated jurisdictions in Eddy County are served by the county LEPC.
3. The county has an active mitigation planning committee. The cities of New Rockford and Sheyenne are also served by the mitigation planning committee.
4. The county and incorporated jurisdictions have mutual aid agreements in place.
5. The county has staff for administration. Incorporated jurisdictions rely on the county for administration.
6. The Eddy County Commission serves as the planning commission for the county and the city of Sheyenne. The city of New Rockford has its own planning commission.
7. Eddy County has a zoning administrator.
8. The Eddy County Commission serves as the planning and zoning board for the county and incorporated cities.
9. The county is served by the Eddy County Water Resource Board.
10. The county is served by the Eddy County Weed Board.

Staff

1. Eddy County is part of a five-county agreement (Benson, Eddy, Nelson, Pierce and Ramsey) for 9-1-1 coordination. The county still has a full-time coordinator.
2. Eddy County does not have a local chief building inspector. Inspection services are available through the state of North Dakota.

3. Eddy County has a contract for engineering services and does not have an engineer on staff.
4. The executive director of the New Rockford Area Betterment Corporation serves as the community planner for Eddy County and the cities of New Rockford and Sheyenne. The county also has the option to contract with an outside entity for community planning services.
5. Eddy County has full-time emergency management.
6. Eddy County receives emergency services from the Sheyenne Volunteer Fire Department, Community Ambulance Services-New Rockford (CASNR), New Rockford Volunteer Fire Department, New Rockford Rural Volunteer Fire Department, Sheyenne Volunteer Fire Department and Sheyenne Rural Volunteer Fire Department.
7. The emergency manager for Eddy County serves as the floodplain administrator for the county and the cities of New Rockford and Sheyenne.
8. The Eddy County Tax Equalization Director has GIS software.
9. Eddy County has staff to conduct grant writing. The county can also contract for grant writing services to an outside entity.
10. Eddy County has administrative and technical support for public health through Lake Region District Health Unit. This includes Regional Emergency Preparedness and Response staff and Environmental Health services similar to the support Wells County District Health Unit receives from Central Valley Health District.
11. The Eddy County Road Department serves as the public works department for the county and the city of Sheyenne. The city of New Rockford has its own public works department.
12. The Eddy County Sheriff's Office provides law enforcement to the county and the cities of New Rockford and Sheyenne. No city police department exist in Eddy County.

Technical

1. The Eddy County Sheriff's Office has GIS/GPS capabilities.
2. Eddy County does not maintain dispatch-activated emergency sirens. The city of New Rockford has three emergency sirens activated by radio/phone. The city of Sheyenne has one emergency siren activated by radio/phone.
3. Eddy County and the cities of New Rockford and Sheyenne do not have any manually-activated emergency sirens.
4. Eddy County and the cities of New Rockford and Sheyenne do not have fire breaks.
5. Eddy County has a fire index sign located next to city hall in the city of New Rockford. The sign is manual and not digital.
6. The ISO rating for the New Rockford Volunteer Fire Department is six and for New Rockford Rural Volunteer Fire Department is 6X. The ISO rating for the Sheyenne Volunteer Fire Department is seven and for the Sheyenne Rural Volunteer Fire Department is 7X.
7. The cities of New Rockford and Sheyenne have Firewise Certification.
8. Eddy County has a portable generator on a trailer that can be dispensed throughout the county. The city of New Rockford does not have any portable generators.
9. Eddy County has a permanent generator at the Eddy County Courthouse. The city of New Rockford has permanent generators at the following locations: ambulance hall, nursing home (two), fire station, Bison Lodge, public school and at both lift stations. The city of Sheyenne has permanent generators at the fire hall and Ostby Hall.
10. Eddy County does not have HAZUS Analysis.

11. Eddy County conducts infrastructure maintenance programs on an as-needed basis.
12. Eddy County and the cities of New Rockford and Sheyenne have street signed for navigation by emergency services.
13. Eddy County Emergency Management receives hazard data from North Dakota State Radio and the cities of New Rockford and Sheyenne.
14. Eddy County and the cities of New Rockford and Sheyenne are StormReady Certified.
15. Eddy County and the cities of New Rockford and Sheyenne have early warning systems.

Table 7.1.2 shows the education and outreach capabilities of Eddy County and The Planning Area. A box marked with an “X” indicates the jurisdiction has or has access to the education and outreach capability for mitigation. An asterisk (*) denotes an education and outreach capability that can be obtained through the county for incorporated jurisdictions, or contracted services or an outside entity for the county.

Table 7.1.2 – Eddy County Education and Outreach Capabilities

Education and Outreach Mitigation Capability		Eddy County	City of New Rockford	City of Sheyenne	Wells County	City of Bowdon	City of Cathay	City of Fessenden	City of Hamberg	City of Harvey	City of Hurdsville	City of Sykeston
1	County/City Events	X	X	X	X	X	*	X	*	X	*	*
2	County Emergency Management	X	*	*	X	*	*	*	*	*	*	*
3	Entities Providing Public Education	X	X	X	X	X	X	X	*	X	*	X
4	Non-Profit Organizations/Citizen Groups	X	X	X	X	X	X	X	*	X	*	X
5	Other	X	*	*								
6	Private Entities	*	*	*	*	*	*	*	*	*	*	*
7	Public-Private Partnerships	X	*	*								
8	School Programs	X	X	*	X	*	*	X	*	X	*	*
9	Social Media	X	X	*	X	*	*	X	*	X	*	*
10	Website with Hazard Education	X	X	*	X	*	*	X	*	X	*	*

*Denotes education and outreach mitigation capability available to the jurisdiction through the county, contracted services, or an outside entity.

Education and Outreach

1. Eddy County and the cities of New Rockford and Sheyenne have events where education and outreach can be conducted. These events include, but are not limited to: Life Saver’s in the Park, Operation Summer Storm every April, school reunions, 4th of July parades and events, etc. Annual tornado drills are conducted at the public school, nursing home and courthouse. CPR and First Aide training is also offered to the community.
2. Eddy County has full-time emergency management that conducts education and outreach with county officials, volunteer emergency response and the public, and training and exercises with volunteer emergency responses. The county also participates in severe winter weather awareness week and severe summer weather awareness week.

3. The Community Ambulance Services-New Rockford (CASNR), New Rockford Volunteer Fire Department, Sheyenne Volunteer Fire Department conduct education and outreach to county officials and the public.
4. Non-profit organizations and citizen groups in Eddy County providing education and outreach include, but are not limited to: Lion's Club, church groups, Homemaker's Group, American Legion, Boy Scouts, Girl Scouts and 4-H.
5. The city of New Rockford is in the process of becoming a Cardiac Ready community which requires 20 AEDs in the community.
6. Railroads and elevators are private entities providing education and outreach in Eddy County.
7. The Eddy County Local Emergency Planning Committee (LEPC) is a public-private partnership providing education and outreach. Also, BNSF conducts Transcaer Training.
8. Fire Prevention Week and D.A.R.E. are school programs providing education and outreach to public schools in Eddy County. Public schools also educate public school children through various safety programs.
9. Eddy County maintains a Facebook page with hazard information.
10. Eddy County and the city of New Rockford maintain a joint website with hazard information. The city of Sheyenne does not have a website.

Table 7.1.3 shows the financial capabilities of The Planning Area. A box marked with an "X" indicates the jurisdiction has or has access to the financial capability for mitigation. An asterisk (*) denotes a financial capability that can be obtained through the county for incorporated jurisdictions, or contracted services or an outside entity for the county.

Table 7.1.3 – Eddy County Financial Capabilities

Financial Mitigation Capability		Eddy County	City of New Rockford	City of Sheyenne	Wells County	City of Bowdon	City of Cathay	City of Fessenden	City of Hamburg	City of Harvey	City of Hurdsfield	City of Sykeston
1	Authority to Levy Taxes for Specific Purposes (sales tax or special assessments)	X	X	X	X	X	X	X	X	X	X	X
2	Building Permits	X	X		X	X	X	X		X		
3	Capital Improvements Fund		X		X			X		X		
4	Comm. Dev. Block Grant (CDBG)				X		X					
5	Electric Utility Fee	X	X	X	X	X	X	X	X	X	X	X
6	General Obligation Bond/Special Tax Bond	X	X	X	X	X	X	X	X	X	X	X
7	Impact Fees for New Development	X	*	*	X	*	*	*	*	*	*	*
8	Private Entities or Activities	*	*	*	*	*	*	*	*	*	*	*
9	Road District Tax											
10	Sanitary Sewer Utility Fee	*	X	X	*	X	X	X		X	X	X
11	State Funding Programs	*	*	*	*	*	*	*	*	*	*	*
12	Storm Water Utility Fee									X		
13	Street Maintenance Fee											
14	Water Utility Fee	X	X	X	X	X	X	X	X	X	X	X

Financial

1. Eddy County and the cities of New Rockford and Sheyenne have the authority to levy taxes for specific purposes.
2. Eddy County and the city of New Rockford have building permits. The city of Sheyenne does not have building permits. The county is in the process of adopting a zoning policy that will include building permits.
3. Eddy County uses funding from its general fund for capital improvements, but does not have a separate capital improvement fund. The city of New Rockford has an infrastructure fund used for capital needs.
4. Funding through the Community Development Block Grant (CDBG) is not available as Eddy County and the cities of New Rockford and Sheyenne does not meet the low-to-moderate income threshold.
5. Eddy County and the cities of New Rockford and Sheyenne pay electric utility fees.
6. General obligation bonds and special tax bonds have been used for financing in Eddy County and the cities of New Rockford and Sheyenne.
7. Impact fees for new development are included on conditional use permits in Eddy County. The county can charge impact fees for development in the cities of New Rockford and Sheyenne, if warranted.
8. Private entities conduct fundraisers in Eddy County and incorporated cities. The former public school in the city of Sheyenne charges a fee for use of the facility for activities.
9. There is not a road district tax in Eddy County.
10. The cities of New Rockford and Sheyenne charge sanitary sewer utility fees. Eddy County does not have a separate fee, but does benefit from this fee.
11. Eddy County and the cities of New Rockford and Sheyenne are eligible to apply for and have received funding from various programs from the state of North Dakota.
12. Eddy County and the cities of New Rockford and Sheyenne do not have a storm water utility fee.
13. Eddy County and the cities of New Rockford and Sheyenne do not have a street maintenance fee.
14. Eddy County and the cities of New Rockford and Sheyenne have a water utility fee. Water utilities are provided by Central Plains and Greater Ramsey Water District.

In addition to the financial capabilities of Eddy County the Planning Area in Table 7.1.3, the following local, regional, state and federal entities can be used to obtain funding for mitigation.

- | | |
|---|-------------------------------------|
| • Ambulance Districts; | • School Districts; |
| • Electric Cooperatives; | • N.D. Dept. of Public Health; |
| • Extension Service; | • N.D. Dept. of Emergency Services; |
| • Federal Emergency Management Agency (FEMA); | • Townships, and |
| • Fire Districts; | • Utility providers. |

Table 7.1.4 shows the planning and regulatory capabilities of Eddy County and The Planning Area. Boxes marked with an “X” indicate the jurisdiction has the planning and regulatory capability. An asterisk (*) indicates a capability that can be obtained through the county, contracted services, or an outside entity.

Table 7.1.4 – Eddy County Planning and Regulatory Capabilities

Planning and Regulatory Mitigation Capability		Eddy County	City of New Rockford	City of Sheyenne	Wells County	City of Bowdon	City of Cathay	City of Fessenden	City of Hamberg	City of Harvey	City of Hurdfield	City of Sykeston
1	Abandoned Building/Nuisance Ordinance		X					X		X		
2	Building Codes	^	*	*	X	*	*	*	*	*	*	*
3	Building Permits	X	X		X			X		X		
4	Burn Bans	X	*	*	X	*	*	*	*	*	*	*
5	Capital Improvement Plan											
6	Chief Building Official/Inspector/Board	*	*	*	*	*	*	*	*	*	*	*
7	Comm. Animal Feed Operation (CAFO) Ord.	X	*	*								
8	Community Wildfire Protection Plan											
9	Comprehensive Plan											
10	Continuity of Operations Plan				X	*	*	*	*	*	*	*
11	Crew Camp Ordinance											
12	Drought Management Plan											
13	Easements	X	X	X	X	X	X	X	X	X	X	X
14	Economic Development Plan	*	X	*	X	*	*	*	*	X	*	*
15	Evacuation and Shelter Plan	X	*	*	X	*	*	*	*	*	*	*
16	FEMA Flood Map	X	X	X	X							
17	Flood Insurance Study	X	X	X								
18	Flood Operations/Management Plan											
19	Flood Ordinance	X	X	X								
20	Flood Risk Management Feasibility Study	X	X	X								
21	Grain Bin Ordinance											
22	Hazard Mitigation Plan	X	*	*	X	*	*	*	*	*	*	*
23	Hazardous Material Flow Study	X	*	*	X	*	*	*	*	*	*	*
24	Impact Fees	X	*	*								
25	Land Use Plan											
26	Local Emergency Operations Plan	X	*	*	X	*	*	*	*	X	*	X
27	National Flood Insurance Program (NFIP)	X	X					X		X		X
28	Noise Control Ordinance		X									
29	Pandemic Influenza Response Plan	*	*	*	*	*	*	*	*	*	*	*
30	Planning Commission	X	X	*	X	*	*	X	*	X	*	*
31	Point of Dispensing (POD) Plan	*	*	*	*	*	*	*	*	*	*	*

*Denotes planning and regulatory mitigation capability available through the county, contracted services, or an outside entity.

^ Denotes planning and regulatory mitigation capability in progress.

Table 7.1.4 – Eddy County Planning and Regulatory Capabilities

	Planning and Regulatory Mitigation Capability	Eddy County	City of New Rockford	City of Sheyenne	Wells County	City of Bowdon	City of Cathay	City of Fessenden	City of Hamberg	City of Harvey	City of Hurdsville	City of Sykeston
32	Shelter and Mass Care Plan	X*	*	*	X	*	*	*	*	*	*	*
33	Site Plan Review Requirements	X	X		X	*	*	X	*	X	*	*
34	Storm Water Management Plan	X	*	*								
35	Strategic Plan	X	*	*	X	*	*	*	*	*	*	*
36	Subdivision Ordinance				X	*	*	*	*	X	*	*
37	Transportation Plan	*	*	*	X	*	*	*	*	*	*	*
38	Water Conservation Plan	X	*	*								
39	Zoning	^			X	*	*	*	*	X	*	*

*Denotes planning and regulatory mitigation capability available through the county, contracted services, or an outside entity.

^ Denotes planning and regulatory mitigation capability in progress.

Planning and Regulatory

1. Eddy County and the city of Sheyenne do not have abandoned building nuisance ordinances. The city of New Rockford has an abandoned building process.
2. Eddy County does not have building codes, but is in the process of developing and implementing building codes. The cities of New Rockford and Sheyenne follow the state building codes.
3. Eddy County and the city of New Rockford have building permits. The city of Sheyenne does not have building permits. The county is in the process of adopting a zoning policy that will include building permits.
4. The Eddy County Commission and emergency management work together and issue burn bans when appropriate. The cities of New Rockford and Sheyenne follow burn bans issued by the county.
5. Eddy County and the cities of New Rockford and Sheyenne do not have capital improvement plans.
6. Eddy County does not have a local chief building inspector. Inspection services are available through the state of North Dakota.
7. Eddy County has a commercial animal feed operation ordinance. The ordinance also applies to the cities of New Rockford and Sheyenne.
8. Eddy County and the cities of New Rockford and Sheyenne do not have a community wildfire protection plan.
9. Eddy County and the cities of New Rockford and Sheyenne do not have a comprehensive plan.
10. Eddy County and the cities of New Rockford and Sheyenne do not have a continuity of operations plan.
11. Eddy County and the cities of New Rockford and Sheyenne do not have a crew camp ordinance.
12. Eddy County and the cities of New Rockford and Sheyenne do not have a drought management plan.
13. Eddy County and the cities of New Rockford and Sheyenne have easements for flowage and drainage of water.

14. The New Rockford Area Betterment Corporation serves has an economic development strategy, but not an official plan.
15. Eddy County has an evacuation and shelter plan. The plan includes the cities of New Rockford and Sheyenne.
16. Eddy County and the cities of New Rockford and Sheyenne have Digital Flood Insurance Rate Maps (DFIRMs).
17. Eddy County and the cities of New Rockford and Sheyenne have a flood insurance study.
18. Eddy County does not have a flood operations/management plan.
19. Eddy County and the cities of New Rockford and Sheyenne have flood ordinances.
20. Eddy County has a flood risk management feasibility study which also applies to the cities of New Rockford and Sheyenne.
21. Eddy County does not have a grain bin ordinance.
22. Eddy County has a multi-jurisdictional multi-hazard mitigation plan. The plan is a joint planning effort with neighboring Wells County. The cities of New Rockford and Sheyenne are included in this plan.
23. Eddy County has a hazardous materials flow study.
24. Impact fees for new development are included on conditional use permits in Eddy County. The county can charge impact fees for development in the cities of New Rockford and Sheyenne, if warranted.
25. Eddy County and the cities of New Rockford and Sheyenne do not have a land use plan.
26. Eddy County has a local emergency operations plan. The plan includes the cities of New Rockford and Sheyenne.
27. Eddy County and the city of New Rockford are enrolled in the National Flood Insurance Program (NFIP). The city of Sheyenne is not enrolled.
28. Eddy County and the city and Sheyenne do not have a noise control ordinance. The city of New Rockford has a noise control ordinance.
29. Eddy County has a pandemic influenza response plan through Lake Region District Health Unit based in Devils Lake. The unit includes Benson, Eddy, pierce and Ramsey Counties. The cities of New Rockford and Sheyenne are included in this plan.
30. The Eddy County Commission serves as the planning commission for the county and the city of Sheyenne. The city of New Rockford has its own planning commission.
31. Eddy County has a point of dispensing plan through Lake Region District Health Unit based in Devils Lake. The unit includes Benson, Eddy, pierce and Ramsey Counties. The cities of New Rockford and Sheyenne are included in this plan.
32. Eddy County has a shelter and mass care plan through Lake Region District Health Unit based in Devils Lake. The unit includes Benson, Eddy, pierce and Ramsey Counties. The cities of New Rockford and Sheyenne are included in this plan. However, Eddy County Emergency Management has developed shelter and mass care protocols specific to the county.
33. Eddy County and the city of New Rockford have site plan review requirements. The city of Sheyenne does not.
34. Eddy County has a storm water management plan. The cities of New Rockford and Sheyenne are included in this plan.
35. Eddy County as a strategic plan. The cities of New Rockford and Sheyenne are included in this plan.
36. Eddy County does not have subdivision ordinances.

37. Eddy County and the cities of New Rockford and Sheyenne do not have a transportation plan. However, the county and cities are included in the state transportation plan.
38. Eddy County has a water conservation plan which includes both the cities of New Rockford and Sheyenne.
39. Eddy County does not have zoning but is in the process of implementing zoning. The cities of New Rockford and Sheyenne also do not have zoning.

Supplemental Planning and Regulatory Capabilities

Strategic plans for jurisdictions aside from incorporated cities such as townships can be used for mitigation purposes. In addition to strategic plans, townships that have zoning in place, including a zoning commission and a zoning administrator, can use zoning for mitigation purposes. In Eddy County, the following townships have relinquished zoning authority to the county: Cherry Lake, Pleasant Prairie, Rosefield, Lake Washington, Freeborn, Colvin, Munster, Paradise, Gates, Eddy and Tiffany. The townships of Columbia and New Rockford enact their own zoning.

Integration of Mitigation Plan into Planning Mechanisms

To integrate the requirements of the mitigation plan into jurisdiction-specific planning mechanisms, such as comprehensive or capital improvement plans, incorporated cities will need to identify their current planning mechanisms, which elements of the mitigation plan to incorporate, and the method for doing so. The tables shown above in this chapter identify the current planning mechanisms for each county and incorporated city in Eddy County and The Planning Area. Details regarding these planning mechanisms are discussed for the counties in this chapter, but are shown in Chapter 8, Jurisdictions for incorporate cities.

The jurisdiction profiles in Chapter 8 will also supplement existing jurisdiction-specific plans for the cities of New Rockford and Sheyenne. The cities have and will continue to participate in county-wide planning initiatives such as the local emergency operations plan by providing risk assessment data, or consider mitigation plan goals and mitigation strategies when updating zoning or implementing subdivision ordinances.

Current planning mechanisms, the mitigation plan elements incorporated and the method for incorporation are discussed after each mitigation project in Chapter 6, Mitigation Strategy and Chapter 8, Jurisdictions.

Table 7.1.5 illustrates the utilization of planning mechanisms in Eddy County by natural hazard and/or man-made threat and projects addressed.

Table 7.1.5 – Utilization of Planning Mechanisms in Eddy County, North Dakota

Planning Mechanism	Communicable Disease	Dam Failure	Drought	Flood	Hazardous Material Release	Homeland Security Incident	Severe Summer Weather	Severe Winter Weather	Transportation Accident	Urban Fire/ Structure Collapse	Wildland Fire	Windstorm	Projects Addressed
Abandoned Bldg./Nuisance Ord.	X	X	X	X	X	X	X	X	X	X	X	X	PR-2
Building Codes	X		X	X	X	X	X	X		X	X	X	AT-1, AT-2, PR2
Building Permits	X	X	X	X	X	X	X	X		X	X	X	AT-1, PR-2,
Burn Bans			X		X	X	X		X		X	X	AT-1
Capital Improvement Plan	X	X	X	X	X	X	X	X	X	X	X	X	PR-2, I-1, I-2
Chief Building Official/Inspector/Board	X	X	X	X	X	X	X	X		X	X	X	AT-1, AT-2
Commercial Animal Feed Operation (CAFO) Ordinance	X		X	X	X		X	X		X			PR-2
Community Wildfire Protection Plan			X				X				X	X	PR-2
Comprehensive Plan	X	X	X	X	X	X	X	X	X	X	X	X	PR-2, I-1, I-2
Continuity of Operations Plan	X	X	X	X	X	X	X	X	X	X	X	X	PR-2
Crew Camp Ordinance	X		X	X	X	X	X	X	X	X	X	X	PR-2
Drought Management Plan			X		X	X	X			X	X	X	EO-3, PR-2
Easements	X	X	X	X	X	X	X	X	X	X	X	X	AT-1, PR-2
Economic Development Plan	X	X	X	X	X	X	X	X	X	X	X	X	PR-2
Evacuation and Shelter Plan	X	X	X	X	X	X	X	X	X	X	X	X	PR-2
FEMA Flood Map				X			X	X					PR-3, PR-4
Flood Insurance Study				X			X	X					PR-2, PR-3, PR-4

Table 7.1.5 – Utilization of Planning Mechanisms in Eddy County, North Dakota – continued

Planning Mechanism	Communicable Disease	Dam Failure	Drought	Flood	Hazardous Material Release	Homeland Security Incident	Severe Summer Weather	Severe Winter Weather	Transportation Accident	Urban Fire/ Structure Collapse	Wildland Fire	Windstorm	Projects Addressed
Flood Operations/Management Plan		X		X			X	X					PR-2, PR-3, PR-4
Flood Ordinance				X			X	X					PR-2, PR-3, PR-4
Flood Risk Mgmt. Feasibility Study		X		X			X	X					PR-2, PR-3, PR-4
Grain Bin Ordinance	X	X	X	X	X	X	X	X	X	X	X	X	AT-1, PR-2
Hazard Mitigation Plan	X	X	X	X	X	X	X	X	X	X	X	X	PR-1
Hazardous Material Flow Study				X	X	X	X	X	X		X		PR-2
Impact Fees	X	X	X	X	X	X	X	X	X	X	X	X	F-1
Land Use Plan	X	X	X	X	X	X	X	X	X	X	X	X	PR-2
Local Emergency Operations Plan	X	X	X	X	X	X	X	X	X	X	X	X	EO-4, PR-2, I-2
National Flood Insurance Program (NFIP)				X			X	X					PR-3, PR-4
Noise Control Ordinance					X		X	X	X	X		X	AT-1, PR-2
Pandemic Influenza Response Plan	X							X					EO-2, PR-2
Planning Commission	X	X	X	X	X	X	X	X	X	X	X	X	AT-1
Point of Dispensing (POD) Plan	X		X	X			X	X	X	X			EO-2, PR-2
Shelter and Mass Care Plan	X	X	X	X	X	X	X	X	X	X	X	X	EO-2, PR-2
Site Plan Review Requirements	X	X	X	X	X	X	X	X	X	X	X	X	AT-1, PR-2
Storm Water Management Plan				X			X	X					AT-8, PR-2
Strategic Plan	X	X	X	X	X	X	X	X	X	X	X	X	PR-2
Subdivision Ordinance	X			X	X		X	X	X	X	X	X	AT-1, PR-2
Transportation Plan				X	X	X	X	X	X	X		X	PR-2
Water Conservation Plan			X			X	X	X		X	X		PR-2
Zoning	X	X	X	X	X	X	X	X	X	X	X	X	PR-2

Mitigation Funding Sources

Table 7.1.6 lists state and federal sources for mitigation. These sources can fund and administer mitigation projects in addition to the local capabilities of the county and city jurisdictions.

Table 7.1.6 – State and Federal Mitigation Funding Sources

Funding Source	Managing Agencies
AmeriCorps	Corporation for National & Community Service
Community Development Block Grant (CDBG)	US Housing and Urban Development North Dakota Department of Commerce
Economic Development Administration (EDA) Grants and Investments	US Economic Development Administration
Emergency Watershed Protection	US Natural Resources Conservation Service
Environmental Quality Incentives Program	US Natural Resources Conservation Service
Flood Mitigation Assistance Program (FMA)	North Dakota State Water Commission and FEMA
Hazard Mitigation Grant Program (HMGP)	North Dakota Department of Emergency Services and FEMA
Hazardous Fuels Mitigation Program	North Dakota Department of Transportation
Homeland Security Grants	North Dakota Department of Emergency Services, US Department of Justice, US Department of Homeland Security
Individual Assistance (IA)	FEMA, North Dakota Department of Emergency Services
Map Modernization Program	North Dakota State Water Commission and FEMA
National Fire Plan (NFP)	North Dakota Forest Service and US Forest Service
NRCS Conservation Programs	U.S.D.A. Natural Resources Conservation Service
Pre-Disaster Mitigation (PDM) Grants	North Dakota Department of Emergency Services and FEMA
Public Assistance (PA)	North Dakota Department of Emergency Services and FEMA
Repetitive Flood Claims (RFC) Grant	North Dakota State Water Commission and FEMA
Rural Fire Assistance (RFA) Grant	National Interagency Fire Center
SBA Pre-Disaster Mitigation Loan Program	U.S. Small Business Administration (SBA)
Severe Repetitive Loss (SRL) Grant	North Dakota State Water Commission and FEMA
Small Flood Control Projects	US Army Corps of Engineers (USACE)
Streambank & Shoreline Protection	US Army Corps of Engineers (USACE)
Wetland Program Development Grants (WPDGs)	US Environmental Protection Agency

7.2 Wells County Mitigation Capability Assessment

The mitigation capabilities for Wells County and The Planning Area are shown in in the following tables:

- Table 7.2.1 highlights **administrative and technical** capabilities.
- Table 7.2.2 highlights **education and outreach** capabilities.
- Table 7.2.3 highlights **financial** capabilities.
- Table 7.2.4 highlights **planning and regulatory** capabilities.
- Table 7.2.5 shows the **utilization of planning mechanisms** in Wells County by hazard and mitigation project.
- Table 7.2.6 lists **state and federal sources** for mitigation.

The following bullet points summarize the structure of each table in this chapter.

- Boxes checked with an “X” indicate the presence of the capability
- Boxes left blank indicate the jurisdiction is lacking the capability
- Boxes marked with an asterisk (*) indicates a capability that can be obtained through the county, contracted services, or an outside entity
- Narratives following each table detail the capabilities of Eddy County and Wells County. The numbering in the tables corresponds to the number in the narrative.

***Note:** It should be noted that the mitigation capabilities of each county and incorporated jurisdictions are shown in combined tables. This method allows the two counties and incorporated jurisdictions to compare capabilities to encourage collaborative mitigation efforts.*

Table 7.2.1 shows the administrative and technical capabilities of Wells County and The Planning Area. A box marked with an “X” indicates the jurisdiction has or has access to the administrative or technical capability for mitigation. An asterisk (*) denotes an administrative and technical capability that can be obtained through the county for incorporated jurisdictions, or contracted services or an outside entity for the county.

Table 7.2.1 – Wells County Administrative and Technical Capabilities

Administrative and Technical Mitigation Capability		Eddy County	City of New Rockford	City of Sheyenne	Wells County	City of Bowdon	City of Cathay	City of Fessenden	City of Hamberg	City of Harvey	City of Hurdfield	City of Sykeston
Administration												
1	County/City Council or Commission	X	X	X	X	X	X	X	X	X	X	X
2	Local Emergency Planning Committee	X	*	*	X	*	*	*	*	*	*	*
3	Mitigation Planning Committee	X	*	*	X	*	*	*	*	*	*	*
4	Mutual Aid Agreements	X	X	X	X	X	X	X	X	X	X	X
5	Other Staff for Administration	X	*	*	X	*	*	*	*	*	*	*
6	Planning Commission	X	X	*	X	*	*	X	*	X	*	*
7	Planning and Zoning Administrator	X	*	*	X	*	*	*	*	X	*	*
8	Planning and Zoning Board	X	*	*	X	*	*	*	*	X	*	*
9	Water Resource Board/District	X	*	*	X	*	*	*	*	*	*	*
10	Weed Board	X	*	*	X	*	*	*	*	*	*	*
Staff												
1	911 Coordinator/Director and User Board	X	*	*	X	*	*	*	*	*	*	*
2	Chief Building Official/Inspector/Board	*	*	*	*	*	*	*	*	*	*	*
3	Civil Engineer	*	*	*	*	*	*	*	*	*	*	*
4	Community Planner/Planning Services	*	*	*	X	*	*	*	*	*	*	*
5	Emergency Management	X	*	*	X	*	*	*	*	*	*	*
6	Emergency Services (ambulance, police, fire)	X*	X	X	X*	X	X	X	*	X	*	X
7	Floodplain Administrator	X	*	*								
8	GIS Coordinator	X										
9	Grant Writing Staff	X	*	*	X	*	*	*	*	*	*	*
10	Public Health	X	*	*	X*	*	*	*	*	*	*	*
11	Public Works and/or Highway Dept.	X	X	*	X	*	*	X	*	X	*	*
12	Sheriff	X	*	*	X	*	*	*	*	*	*	*
Technical												
1	Emergency Services GIS/GPS capable	X	*	*						^		
2	Emergency Siren (dispatch-activated)		3	1				1		1		1
3	Emergency Siren (manually-activated)											
4	Fire Break											
5	Fire Index Sign	X	X	*	X	*	*	*	*	X	*	*
6	Fire ISO Rating		6	7		9		5		5		8

*Denotes administrative and technical capability that can be obtained through the county, contracted services, or an outside entity.

Table 7.2.1 – Eddy County Administrative and Technical Capabilities - Continued

Administrative and Technical Mitigation Capability		Eddy County	City of New Rockford	City of Sheyenne	Wells County	City of Bowdon	City of Cathay	City of Fessenden	City of Hamberg	City of Harvey	City of Hurdfield	City of Sykeston
Technical												
7	Firewise Certification		X	X								
8	Generator (permanent)	1	8	2								
9	Generator (portable)	1			3			1		1		
10	HAZUS Analysis											
11	Infrastructure Maintenance Programs	X	X	*	X	*	*	X	*	X	*	*
12	Navigation Signs for Emergency Services	X	X	X	X	X	X	X	X	X	X	X
13	Reporting of Data to Emergency Manager	X	X	X	X	X	X	X	X	X	X	X
14	StormReady Certification	X	X	X								
15	Warning Systems/Services	X	*	*	X	*	*	*	*	*	*	*

*Denotes administrative and technical capability that can be obtained through the county, contracted services, or an outside entity.

Administration

1. Wells County has an active county commission. All incorporated jurisdictions in Wells County have active city councils.
2. The county has an active Local Emergency Planning Committee (LEPC). Incorporated jurisdictions in Wells County are served by the county LEPC.
3. Wells County has an active mitigation planning committee. Incorporated jurisdictions in Wells County are served by this committee.
4. The county and incorporated jurisdictions have mutual aid agreements in place.
5. The county has staff for administration. Incorporated jurisdictions rely on the county for administration.
6. The Wells County Commission serves as the planning commission for the county and incorporated jurisdiction except the city of Harvey. The city of Harvey has its own planning commission.
7. Wells County has a zoning administrator. The city of Harvey has its own zoning administrator.
8. The Wells County Commission serves as the planning and zoning board for the county and incorporated cities except the city of Harvey. The city of Harvey has its own planning and zoning board.
9. The county and incorporated jurisdictions are served by the Wells County Water Resource District.
10. The county and incorporated jurisdictions are served by the Wells County Weed Board.

Staff

1. Wells County has a 9-1-1 coordinator that also serves incorporated jurisdictions.
2. Wells County does not have a local chief building inspector. Inspection services are available through the state of North Dakota.

3. Wells County has a contract for engineering services and does not have an engineer on staff.
4. The Wells County Planning and Zoning Administrator serves as the community planner for Wells County and incorporated jurisdictions. The county also has the option to contract with an outside entity for supplemental community planning services.
5. Wells County has full-time emergency management.
6. Wells County receives ambulance, fire and law enforcement from the following entities:
 - Ambulance: Bowdon Ambulance Service, Fessenden Ambulance Service, Harvey Ambulance Service
 - Fire: Bowdon Volunteer Fire Dept., Cathay Volunteer Fire Dept., Fessenden Volunteer Fire Dept., Harvey Volunteer Fire Dept., Sykeston Volunteer Fire Dept.
 - Law Enforcement: Wells County Sheriff's Office, Fessenden Police Dept., Harvey Police Dept.
7. Wells County does not have a floodplain administrator.
8. Wells County does not have a geographic information system (GIS) coordinator.
9. Wells County has staff to conduct grant writing. The county can also contract for grant writing services to an outside entity.
10. Wells County Public Health and Central Valley Health District provide public health services.
11. The Wells County Road Dept. serves as the public works department for the county incorporated jurisdictions. The cities of Fessenden and Harvey have their own public works departments.
12. The Wells County Sheriff's Office provides law enforcement to the county and incorporated cities. The cities of Fessenden and Harvey have their own police departments.

Technical

1. Wells County does not have GIS/GPS capabilities. The city of Harvey is working to implement GIS/GPS capabilities.
2. Wells County does not maintain dispatch-activated emergency sirens. The city of Fessenden has a dispatch-activated siren, but needs to be upgraded. The city of Harvey has an existing dispatch-activated siren and is in the process of installing a new siren. The city of Sykeston has a dispatch-activated siren but needs to be upgraded. The cities of Bowdon, Cathay, Hamberg and Hurdsfield do not have emergency sirens.
3. Wells County and incorporated cities do not have any manually-activated emergency sirens.
4. Wells County and incorporated cities do not have fire breaks.
5. Wells County has a fire index sign located in the city of Harvey. The sign is manual and not digital.
6. The ISO rating for fire departments in Wells County are shown in Table 7.2.1.
7. Wells County and incorporated jurisdiction do not have Firewise Certification.
8. Wells County and incorporated jurisdictions have the following permanent generators:
 - St. Aloisius Health Center in the city of Harvey has one permanent generator.
 - The city of Harvey's water plant has one permanent generator.
9. Wells County and incorporated jurisdictions have the following portable generators:
 - Wells County Shop has three portable generators.
 - Wells County Courthouse/KTL Building has a portable generator.
 - Wells County District Health has a portable generator.
 - The city of Fessenden has one portable generator.
 - The city of Harvey has one portable generator.

10. Wells County does not have HAZUS Analysis.
11. Wells County and incorporated jurisdictions conduct infrastructure maintenance programs on an as-needed basis.
12. Wells County and incorporated jurisdictions have street signs for navigation by emergency services.
13. Wells County Emergency Management receives hazard data from North Dakota State Radio, incorporated cities, and volunteer emergency services.
14. Wells County and incorporated jurisdictions do not have StormReady Certification.
15. Wells County and incorporated jurisdictions utilize CodeRed for early warning systems/services.

Table 7.2.2 shows the education and outreach capabilities of Wells County and The Planning Area. A box marked with an “X” indicates the jurisdiction has or has access to the education and outreach capability for mitigation. An asterisk (*) denotes an education and outreach capability that can be obtained through the county for incorporated jurisdictions, or contracted services or an outside entity for the county.

Table 7.2.2 – Wells County Education and Outreach Capabilities

Education and Outreach Mitigation Capability		Eddy County	City of New Rockford	City of Sheyenne	Wells County	City of Bowdon	City of Cathay	City of Fessenden	City of Hamberg	City of Harvey	City of Hurdfield	City of Sykeston
1	County/City Events	X	X	X	X	X	*	X	*	X	*	*
2	County Emergency Management	X	*	*	X	*	*	*	*	*	*	*
3	Entities Providing Public Education	X	X	X	X	X	X	X	*	X	*	X
4	Non-Profit Organizations/Citizen Groups	X	X	X	X	X	X	X	*	X	*	X
5	Other	X	*	*								
6	Private Entities	*	*	*	*	*	*	*	*	*	*	*
7	Public-Private Partnerships	X	*	*								
8	School Programs	X	X	*	X	*	*	X	*	X	*	*
9	Social Media	X	X	*	X	*	*	X	*	X	*	*
10	Website with Hazard Education	X	X	*	X	X	*	X	*	X	*	*

*Denotes education and outreach mitigation capability available to the jurisdiction through the county, contracted services, or an outside entity.

Education and Outreach

1. Wells County and incorporated jurisdictions have events where education and outreach is conducted. These events include, but are not limited to: school reunions, 4th of July parades and events, etc. Wells County Public Health District also conducts events where education and outreach is conducted.
2. Wells County has full-time emergency management that conducts education and outreach with county officials, volunteer emergency response and the public, and training and exercises with volunteer emergency responses. The Wells County Emergency Manager conducts CPR and Fire Aid training. The county also participates in the statewide annual tornado drill, severe winter weather awareness week and severe summer weather awareness week.

3. The Bowdon Ambulance Service, Fessenden Ambulance Service, Harvey Ambulance Service, Bowdon Volunteer Fire Dept., Cathay Volunteer Fire Dept., Fessenden Volunteer Fire Dept., Harvey Volunteer Fire Dept. and Sykeston Volunteer Fire Dept. provide ongoing education and outreach.
4. Non-profit organizations and citizen groups in Wells County providing education and outreach include, but are not limited to: auxiliaries, church groups, Boy Scouts, Girl Scouts and 4-H.
5. No other entities providing education and outreach in Eddy County were identified.
6. Alliance Pipeline, railroads and elevators provide education and outreach in Wells County.
7. The Wells County Local Emergency Planning Committee (LEPC) is a public-private partnership providing education and outreach.
8. Fire Prevention Week and D.A.R.E. are school programs providing education and outreach to public schools in Wells County. Public schools also educate public school children through various safety programs such as handwashing.
9. Wells County Emergency Management maintains a Facebook page with hazard information. All incorporated cities in Wells County except for Cathay and Hamberg maintain social media pages.
10. Wells County and the cities of Fessenden and Harvey maintain websites with hazard information. The city of Bowdon has a website, but does not have hazard information.

Table 7.2.3 shows the financial capabilities of Wells County and The Planning Area. A box marked with an “X” indicates the jurisdiction has or has access to the financial capability for mitigation. An asterisk (*) denotes a financial capability that can be obtained through the county for incorporated jurisdictions, or contracted services or an outside entity for the county.

Table 7.2.3 – Wells County Financial Capabilities

Financial Mitigation Capability		Eddy County	City of New Rockford	City of Sheyenne	Wells County	City of Bowdon	City of Cathay	City of Fessenden	City of Hamberg	City of Harvey	City of Hurdfield	City of Sykeston
1	Authority to Levy Taxes for Specific Purposes (sales tax or special assessments)	X	X	X	X	X	X	X	X	X	X	X
2	Building Permits	X	X		X	X	X	X		X		
3	Capital Improvements Fund		X		X			X		X		
4	Comm. Dev. Block Grant (CDBG)				X		X					
5	Electric Utility Fee	X	X	X	X	X	X	X	X	X	X	X
6	General Obligation Bond/Special Tax Bond	X	X	X	X	X	X	X	X	X	X	X
7	Impact Fees for New Development	X	*	*	X	*	*	*	*	*	*	*
8	Private Entities or Activities	*	*	*	*	*	*	*	*	*	*	*
9	Road District Tax											
10	Sanitary Sewer Utility Fee	*	X	X	*	X	X	X		X	X	X
11	State Funding Programs	*	*	*	*	*	*	*	*	*	*	*
12	Storm Water Utility Fee									X		
13	Street Maintenance Fee											
14	Water Utility Fee	X	X	X	X	X	X	X	X	X	X	X

* Denotes financial mitigation capability available to the jurisdiction through the county, contracted services, or an outside entity.

Financial

1. Wells County and incorporated jurisdictions have the authority to levy taxes for specific purposes.
2. Wells County and incorporated jurisdictions have building permits, but only charge for major projects.
3. Wells County and the cities of Fessenden and Harvey have a capital improvements fund.
4. Funding through the Community Development Block Grant (CDBG) is available in Wells County. The city of Cathay has received CDBG funding.
5. Wells County and incorporated jurisdictions pay electric utility fees.
6. General obligation bonds and special tax bonds have been used for financing in Wells County and incorporated jurisdictions.
7. Wells County and incorporated jurisdictions do not have impact fees for new development.
8. Private entities conduct fundraisers in Wells County.
9. There is not a road district tax in Wells County.
10. Wells County and incorporated jurisdictions charge sanitary sewer utility fees.
11. Wells County and incorporated jurisdictions are eligible to apply for and receive funding from various programs from the state of North Dakota.
12. The cities of Fessenden and Harvey have storm water utility fees.
13. Wells County and incorporated jurisdictions do not have a street maintenance fee.
14. The city of Harvey has its own water wells and charges a water utility fee. Central Plains Water District provides potable water to Wells County and remaining incorporated jurisdictions and charges a water utility fee.

In addition to the financial capabilities of Eddy County and The Planning Area in Table 7.2.3, the following local, regional, state and federal entities can be used to obtain funding for mitigation.

- Ambulance Districts;
- Electric Cooperatives;
- Extension Service;
- Federal Emergency Management Agency (FEMA);
- Fire Districts;
- School Districts;
- N.D. Dept. of Public Health;
- N.D. Dept. of Emergency Services;
- Townships, and
- Utility providers.

Table 7.2.4 shows the planning and regulatory capabilities of Wells County and The Planning Area. Boxes marked with an “X” indicate the jurisdiction has the planning and regulatory capability. An asterisk (*) indicates a capability that can be obtained through the county, contracted services, or an outside entity.

Table 7.2.4 – Eddy County Planning and Regulatory Capabilities

Planning and Regulatory Mitigation Capability		Eddy County	City of New Rockford	City of Sheyenne	Wells County	City of Bowdon	City of Cathay	City of Fessenden	City of Hamberg	City of Harvey	City of Hurdfield	City of Sykeston
1	Abandoned Building/Nuisance Ordinance		X					X		X		
2	Building Codes	^	*	*	X	*	*	*	*	*	*	*
3	Building Permits	X	X		X			X		X		
4	Burn Bans	X	*	*	X	*	*	*	*	*	*	*
5	Capital Improvement Plan											
6	Chief Building Official/Inspector/Board	*	*	*	*	*	*	*	*	*	*	*
7	Comm. Animal Feed Operation (CAFO) Ord.	X	*	*								
8	Community Wildfire Protection Plan											
9	Comprehensive Plan											
10	Continuity of Operations Plan				X	*	*	*	*	*	*	*
11	Crew Camp Ordinance											
12	Drought Management Plan											
13	Easements	X	X	X	X	X	X	X	X	X	X	X
14	Economic Development Plan	*	X	*	X	*	*	*	*	X	*	*
15	Evacuation and Shelter Plan	X	*	*	X	*	*	*	*	*	*	*
16	FEMA Flood Map	X	X	X	X							
17	Flood Insurance Study	X	X	X								
18	Flood Operations/Management Plan											
19	Flood Ordinance	X	X	X								
20	Flood Risk Management Feasibility Study	X	X	X								
21	Grain Bin Ordinance											
22	Hazard Mitigation Plan	X	*	*	X	*	*	*	*	*	*	*
23	Hazardous Material Flow Study	X	*	*	X	*	*	*	*	*	*	*
24	Impact Fees	X	*	*								
25	Land Use Plan											
26	Local Emergency Operations Plan	X	*	*	X	*	*	*	*	X	*	X
27	National Flood Insurance Program (NFIP)	X	X					X		X		X
28	Noise Control Ordinance		X									
29	Pandemic Influenza Response Plan	*	*	*	*	*	*	*	*	*	*	*
30	Planning Commission	X	X	*	X	*	*	X	*	X	*	*
31	Point of Dispensing (POD) Plan	*	*	*	*	*	*	*	*	*	*	*

*Denotes planning and regulatory mitigation capability available through the county, contracted services, or an outside entity.

^ Denotes planning and regulatory mitigation capability in progress.

Table 7.2.4 – Eddy County Planning and Regulatory Capabilities

Planning and Regulatory Mitigation Capability		Eddy County	City of New Rockford	City of Sheyenne	Wells County	City of Bowdon	City of Cathay	City of Fessenden	City of Hamberg	City of Harvey	City of Hurdsville	City of Sykeston
32	Shelter and Mass Care Plan	X*	*	*	X	*	*	*	*	*	*	*
33	Site Plan Review Requirements	X	X		X	*	*	X	*	X	*	*
34	Storm Water Management Plan	X	*	*								
35	Strategic Plan	X	*	*	X	*	*	*	*	*	*	*
36	Subdivision Ordinance				X	*	*	*	*	X	*	*
37	Transportation Plan	*	*	*	X	*	*	*	*	*	*	*
38	Water Conservation Plan	X	*	*								
39	Zoning	^			X	*	*	*	*	X	*	*

*Denotes planning and regulatory mitigation capability available through the county, contracted services, or an outside entity.

^ Denotes planning and regulatory mitigation capability in progress.

Planning and Regulatory

1. Wells County and incorporated jurisdictions do not have an abandoned building nuisance ordinances. However, the cities of Fessenden and Harvey have “Home Rules.”
2. Wells County has not adopted have building codes, but incorporated jurisdictions in the county have adopted and follow the state building codes.
3. Wells County and incorporated jurisdictions have building permits, but only charge for major projects.
4. The Wells County Commission and the emergency management department work together and issue burn bans, when appropriate. Incorporated jurisdictions follow burn bans issued by the county.
5. Wells County and incorporated jurisdictions do not have capital improvement plans.
6. Wells County does not have a local chief building inspector. Inspection services are available through the state of North Dakota.
7. Wells County and incorporated jurisdictions do not have a commercial animal feed operation ordinance.
8. Wells County and incorporated jurisdictions do not have a community wildfire protection plan.
9. Wells County and incorporated jurisdictions do not have a comprehensive plan.
10. Wells County has a continuity of operations plan that also applies to incorporated jurisdictions. However, the plan needs updating.
11. Wells County and incorporated jurisdictions do not have a crew camp ordinance.
12. Wells County and incorporated jurisdictions do not have a drought management plan.
13. Wells County and incorporated jurisdictions have easements for flowage and drainage of water.
14. Wells County has an economic development board that maintains an economic development plan that covers the entire county. The city of Harvey has its own economic development plan. serves has an economic development strategy, but not an official plan.

15. Wells County has an evacuation and shelter plan. The plan includes all incorporated jurisdictions.
16. The Jamestown River traverses through Wells County and has Digital Flood Insurance Rate Maps (DFIRMs). These maps apply to incorporated jurisdictions in Wells County where necessary.
17. Wells County and incorporated jurisdictions do not have a flood insurance study.
18. Wells County and incorporated jurisdictions do not have a flood operations/management plan.
19. Wells County and incorporated jurisdictions do not have flood ordinances.
20. Wells County and incorporated jurisdictions do not have a flood risk management feasibility study.
21. Wells County and incorporated jurisdictions do not have a grain bin ordinance.
22. Wells County has a multi-jurisdictional multi-hazard mitigation plan. The plan is a joint planning effort with neighboring Eddy County. All incorporated jurisdictions are included in this plan.
23. Wells County has a hazardous materials flow study.
24. Wells County and incorporated jurisdictions do not have impact fees for new development.
25. Wells County and incorporated jurisdictions do not have a land use plan.
26. Wells County has a local emergency operations plan. The plan applies to all incorporated jurisdictions.
27. Wells County is not enrolled in the National Flood Insurance Program (NFIP). Only the cities of Fessenden, Harvey and Sykeston are enrolled and participate in the program.
28. Wells County and incorporated jurisdictions do not have a noise control ordinance.
29. Wells County has a pandemic influenza response plan through the county health district and Central Valley Health District. All incorporated jurisdictions in the county are included in this plan.
30. The Wells County Commission serves as the planning commission for the county and incorporated jurisdiction except the city of Harvey. The city of Harvey has its own planning commission.
31. Wells County has a point of dispensing plan through its county health district and Central Valley Health District. All incorporated jurisdictions in the county are included in this plan.
32. Wells County has a shelter and mass care plan through its county health district and Central Valley Health District. All incorporated jurisdictions in the county are included in this plan.
33. Wells County and incorporated jurisdictions have site plan review requirements. The cities of Fessenden and Harvey have their own site plan review requirements.
34. Wells County and incorporated jurisdictions do not have a storm water management plan.
35. Wells County has a strategic plan. All incorporated jurisdictions are included in this plan.
36. Wells County has subdivision ordinances. The ordinances also apply to all incorporated jurisdictions. The city of Harvey has its own subdivision ordinances.
37. The county and incorporated jurisdictions are also included in the state transportation plan.
38. Wells County and incorporated jurisdictions do not have a water conservation plan.
39. Wells County and incorporated jurisdictions have zoning.

Supplemental Planning and Regulatory Capabilities

Strategic plans for jurisdictions aside from incorporated cities such as townships can be used for mitigation purposes. In addition to strategic plans, townships that have zoning in place, including a zoning commission and a zoning administrator, can use zoning for mitigation purposes. In Wells County, the following townships have zoning ordinances independent from the county: Forward, Hillsdale, Speedwell, Valhalla and Western. Townships that have relinquished zoning authority to Wells County include: Berlin, Bilodeau, Cathay, Chaseley, Delger, Fairville, Hamburg, Hawksnest, Heimdal, Johnson, Lynn, Manfred, Norway Lake, S. Cottonwood, West Norway, West Ontario and Woodward.

Integration of Mitigation Plan into Planning Mechanisms

To integrate the requirements of the mitigation plan into jurisdiction-specific planning mechanisms, such as comprehensive or capital improvement plans, incorporated cities will need to identify their current planning mechanisms, which elements of the mitigation plan to incorporate, and the method for doing so. The tables shown above in this chapter identify the current planning mechanisms for each county and incorporated city in Wells County and The Planning Area. Details regarding these planning mechanisms are discussed for the counties in this chapter, but are shown in Chapter 8, Jurisdictions for incorporated cities.

The jurisdiction profiles in Chapter 8 will also supplement existing jurisdiction-specific plans for incorporated jurisdictions in Wells County. The cities have and will continue to participate in county-wide planning initiatives such as the local emergency operations plan by providing risk assessment data, or consider mitigation plan goals and mitigation strategies when updating zoning or implementing subdivision ordinances.

Current planning mechanisms, the mitigation plan elements incorporated and the method for incorporation are discussed after each mitigation project in Chapter 6, Mitigation Strategy and Chapter 8, Jurisdictions.

Table 7.2.5 on the following page illustrates the utilization of planning mechanisms in Wells County by natural hazard and/or man-made threat and projects addressed.

Table 7.2.5 – Utilization of Planning Mechanisms in Wells County, North Dakota

Planning Mechanism	Communicable Disease	Dam Failure	Drought	Flood	Hazardous Material Release	Homeland Security Incident	Severe Summer Weather	Severe Winter Weather	Transportation Accident	Urban Fire/ Structure Collapse	Wildland Fire	Windstorm	Projects Addressed
Abandoned Bldg./Nuisance Ord.	X	X	X	X	X	X	X	X	X	X	X	X	PR-2
Building Codes	X		X	X	X	X	X	X		X	X	X	AT-1, AT-2, PR2
Building Permits	X	X	X	X	X	X	X	X		X	X	X	AT-1, PR-2,
Burn Bans			X		X	X	X		X		X	X	AT-1
Capital Improvement Plan	X	X	X	X	X	X	X	X	X	X	X	X	PR-2, I-1, I-2, I-3
Chief Building Official/Inspector/Board	X	X	X	X	X	X	X	X		X	X	X	AT-1, AT-2
Commercial Animal Feed Operation (CAFO) Ordinance	X		X	X	X		X	X		X			PR-2
Community Wildfire Protection Plan			X				X				X	X	PR-2
Comprehensive Plan	X	X	X	X	X	X	X	X	X	X	X	X	PR-2, I-1, I-2, I-3
Continuity of Operations Plan	X	X	X	X	X	X	X	X	X	X	X	X	PR-2
Crew Camp Ordinance	X		X	X	X	X	X	X	X	X	X	X	PR-2
Drought Management Plan			X		X	X	X			X	X	X	EO-3, PR-2
Easements	X	X	X	X	X	X	X	X	X	X	X	X	AT-1, PR-2
Economic Development Plan	X	X	X	X	X	X	X	X	X	X	X	X	PR-2
Evacuation and Shelter Plan	X	X	X	X	X	X	X	X	X	X	X	X	PR-2
FEMA Flood Map				X			X	X					PR-3, PR-4
Flood Insurance Study				X			X	X					PR-2, PR-3, PR-4

Table 7.2.5 – Utilization of Planning Mechanisms in Wells County, North Dakota – continued

Planning Mechanism	Communicable Disease	Dam Failure	Drought	Flood	Hazardous Material Release	Homeland Security Incident	Severe Summer Weather	Severe Winter Weather	Transportation Accident	Urban Fire/ Structure Collapse	Wildland Fire	Windstorm	Projects Addressed
Flood Operations/Management Plan		X		X			X	X					PR-2, PR-3, PR-4
Flood Ordinance				X			X	X					PR-2, PR-3, PR-4
Flood Risk Mgmt. Feasibility Study		X		X			X	X					PR-2, PR-3, PR-4
Grain Bin Ordinance	X	X	X	X	X	X	X	X	X	X	X	X	AT-1, PR-2
Hazard Mitigation Plan	X	X	X	X	X	X	X	X	X	X	X	X	PR-1
Hazardous Material Flow Study				X	X	X	X	X	X		X		PR-2
Impact Fees	X	X	X	X	X	X	X	X	X	X	X	X	F-1
Land Use Plan	X	X	X	X	X	X	X	X	X	X	X	X	PR-2
Local Emergency Operations Plan	X	X	X	X	X	X	X	X	X	X	X	X	EO-4, PR-2, I-2
National Flood Insurance Program (NFIP)				X			X	X					PR-3, PR-4
Noise Control Ordinance					X		X	X	X	X		X	AT-1, PR-2
Pandemic Influenza Response Plan	X							X					EO-2, PR-2
Planning Commission	X	X	X	X	X	X	X	X	X	X	X	X	AT-1
Point of Dispensing (POD) Plan	X		X	X			X	X	X	X			EO-2, PR-2
Shelter and Mass Care Plan	X	X	X	X	X	X	X	X	X	X	X	X	EO-2, PR-2
Site Plan Review Requirements	X	X	X	X	X	X	X	X	X	X	X	X	AT-1, PR-2
Storm Water Management Plan				X			X	X					AT-8, PR-2, I-4
Strategic Plan	X	X	X	X	X	X	X	X	X	X	X	X	PR-2
Subdivision Ordinance	X			X	X		X	X	X	X	X	X	AT-1, PR-2
Transportation Plan				X	X	X	X	X	X	X		X	PR-2
Water Conservation Plan			X			X	X	X		X	X		PR-2, I-4
Zoning	X	X	X	X	X	X	X	X	X	X	X	X	PR-2

Mitigation Funding Sources

Table 7.2.6 lists state and federal sources for mitigation. These sources can fund and administer mitigation projects in addition to the local capabilities of the county and city jurisdictions.

Table 7.2.6 – State and Federal Mitigation Funding Sources

Funding Source	Managing Agencies
AmeriCorps	Corporation for National & Community Service
Community Development Block Grant (CDBG)	US Housing and Urban Development North Dakota Department of Commerce
Economic Development Administration (EDA) Grants and Investments	US Economic Development Administration
Emergency Watershed Protection	US Natural Resources Conservation Service
Environmental Quality Incentives Program	US Natural Resources Conservation Service
Flood Mitigation Assistance Program (FMA)	North Dakota State Water Commission and FEMA
Hazard Mitigation Grant Program (HMGP)	North Dakota Department of Emergency Services and FEMA
Hazardous Fuels Mitigation Program	North Dakota Department of Transportation
Homeland Security Grants	North Dakota Department of Emergency Services, US Department of Justice, US Department of Homeland Security
Individual Assistance (IA)	FEMA, North Dakota Department of Emergency Services
Map Modernization Program	North Dakota State Water Commission and FEMA
National Fire Plan (NFP)	North Dakota Forest Service and US Forest Service
NRCS Conservation Programs	U.S.D.A. Natural Resources Conservation Service
Pre-Disaster Mitigation (PDM) Grants	North Dakota Department of Emergency Services and FEMA
Public Assistance (PA)	North Dakota Department of Emergency Services and FEMA
Repetitive Flood Claims (RFC) Grant	North Dakota State Water Commission and FEMA
Rural Fire Assistance (RFA) Grant	National Interagency Fire Center
SBA Pre-Disaster Mitigation Loan Program	U.S. Small Business Administration (SBA)
Severe Repetitive Loss (SRL) Grant	North Dakota State Water Commission and FEMA
Small Flood Control Projects	US Army Corps of Engineers (USACE)
Streambank & Shoreline Protection	US Army Corps of Engineers (USACE)
Wetland Program Development Grants (WPDGs)	US Environmental Protection Agency

8. Jurisdictions

This serves as a mini “Plan Within the Plan” chapter and includes the following information for each incorporated city jurisdiction in The Planning Area:

1. Profile and Inventory

- Location
- Population & Vulnerable Population
- Housing Units and Household Size
- Businesses
- New and Future Development

2. Risk Assessment

- Score Summary
- Hazard Scoring Notes

3. Mitigation Strategy

- Problem Statement
- Mitigation Projects

4. Mitigation Capabilities

- Capability Definitions

5. Integration into Planning Mechanisms

6. Plan Maintenance

Comparative statistics of each jurisdiction in The Planning Area are shown in Chapter 4, Profile and Inventory.

The incorporated cities in The Planning Area are shown alphabetically by county below and in the following chapter.

Eddy County

- City of New Rockford (8.1)
- City of Sheyenne (8.2)

Wells County

- City of Bowdon (8.3)
- City of Cathay (8.4)
- City of Fessenden (8.5)
- City of Hamberg (8.6)
- City of Harvey (8.7)
- City of Hurdsfield (8.8)
- City of Sykeston (8.9)

8.1 City of New Rockford

The following profile includes information specific to the city of New Rockford for mitigation planning purposes. The information included is as follows:

- Profile and Inventory;
- Risk Assessment;
- Hazard Scoring Notes;
- Mitigation Projects, and
- Capabilities for Mitigation.

Integration into Planning Mechanisms

The process for integration of the mitigation plan into existing planning mechanisms is discussed at the bottom of each mitigation project in section 8.1.4, section 8.1.5 and in Chapter 6, Mitigation Strategy.

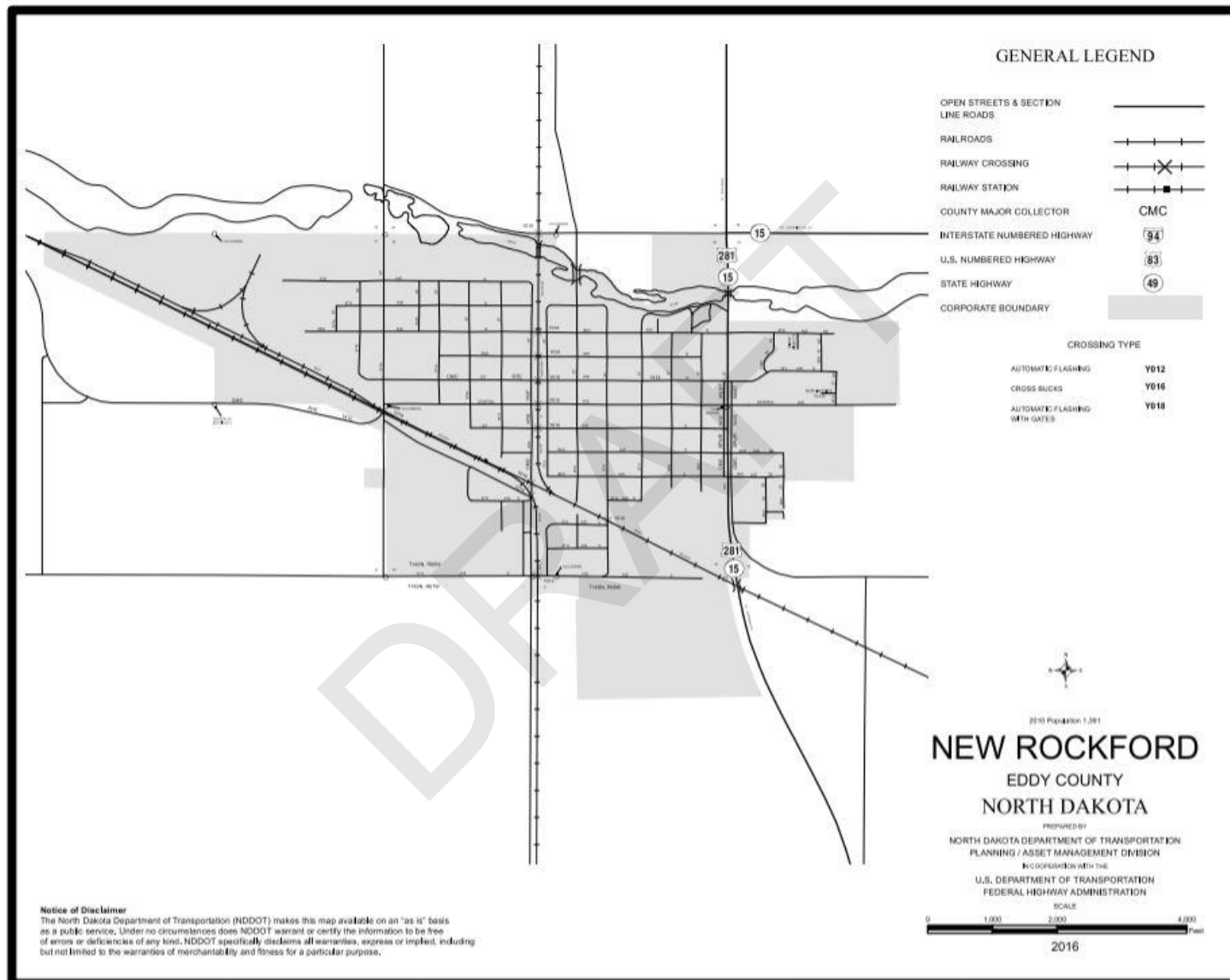
Plan Maintenance

Plan maintenance is shown in section 8.1.6.

Critical Facilities and Infrastructure

Figure 8.8.1 is a map of the city of New Rockford.

Figure 8.1.1 – City of New Rockford Base Map



Source: N.D. Dept. of Transportation

8.1.1 Profile and Inventory

The location, total population, vulnerable populations, housing units and household size, businesses, critical facilities and infrastructure, new and future development, services, jurisdictional buildings, emergency response services and utilities are shown for the city of New Rockford. Detailed narratives follow each section heading to profile the city.

Detailed information on public buildings, services provided, emergency response services and utilities can be found in Chapter 4, Profile and Inventory.

Location

The city of New Rockford is located at the intersection of U.S. Highway 281 and N.D. Highway 15 approximately 40 miles south-southwest of the city of Devils Lake and approximately 40 miles east of the city of Harvey in neighboring Wells County, the largest city in The Planning Area. The city of New Rockford is the county seat located in west-central Eddy County.

Population

Per the 2010 U.S. Decennial Census the city of New Rockford contains 1,391 people. The 2011 to 2015 American Community Survey 5-Year Estimate recorded a population of 1,428 people, an increase of 37 people, or 2.6 percent from 2010.

Vulnerable Populations

Per the 2010 U.S. Decennial Census, the population of the city of New Rockford consists of 317 individuals under the age of 20, and 379 individuals age 65 and older, representing 22.8 percent and 27.2 percent of the population, respectively.

The city is the location of the New Rockford-Sheyenne Public School serving grades K to 12.

The following age-restricted, senior housing developments and supportive housing, and the number of units/people contained therein are in the city of New Rockford:

- Lutheran Home of the Good Shepherd: 74 skilled nursing beds (11 in secured Alzheimer's unit), six basic care beds, 16 assisted living apartments. The facility also has a child care center for employees.
- Four Corporation Group Homes: 1 has six consumers, another has eight consumers

Housing Units and Household Size

The 2011 to 2015 American Community Survey 5-Year Estimate shows there is a total of 782 housing units in the city consisting of 602 single-family homes, 158 multifamily homes and 27 mobile homes.

Per the 2010 U.S. Decennial Census, there are 628 households in the city of New Rockford resulting in an average household size of 2.21 people.

Businesses

Due to the size of the city of New Rockford, information on businesses can be obtained by contacting the New Rockford Area Betterment Corporation.

New Development

Development over the last five years in the city of New Rockford includes the following:

- Demolition of the former city hospital for redevelopment into a 10-unit apartment complex;
- Construction of a new 8-unit apartment building;
- Construction of a new ADA-accessible community swimming pool and bathhouse;
- Construction of a new community ambulance building;
- Renovations to Mick's 281 Service renovation;
- New Rockford-Sheyenne School renovation;
- Dakota Prairie Regional Center for the Arts renovation;
- Lutheran Home of the Good Shepherd long-term care facility renovation;
- Installation of an electronic message board outside New Rockford City Hall;
- Establishment of new veterinarian clinic, and electrician and attorney businesses;
- Approximately five new single-family homes, and
- Renovation of more than a dozen small businesses and single-family homes.

Future Development

Development planned or proposed for future construction in the city of New Rockford includes the following:

- Construction of a new convenience store and gas station;
- Single-family home development;
- Additional renovation work at New Rockford-Sheyenne School, and
- Infrastructure upgrades to water lines streets, and possible water plant modifications.

8.1.2 Risk Assessment and Hazard Scoring Notes

Table 8.1.1 summarizes the risk assessment scoring of the city of New Rockford. The risk assessment and hazard scoring notes for each hazard specific to the city are shown in Table 8.1.2. Risk assessment notes for impact, frequency, likelihood and vulnerability ubiquitous for jurisdictions in The Planning Area are found in Chapter 5, Threat and Hazard Identification Assessment in each respective hazard profile.

Table 8.1.1 – City of New Rockford Jurisdiction Risk Assessment Scoring Summary

Risk Assessment			Jurisdiction:	City of New Rockford		
<u>Hazard</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<u>Total</u>
Communicable Disease	2	2	2	3	1	8
Dam Failure	2	2	2	2	2	6
Drought	3	3	3	3	1	11
Flood	4	4	4	2	1	13
Hazardous Material Release	3	3	3	2	1	10
Homeland Security Incident	2	3	3	2	1	9
Severe Summer Weather	4	4	3	3	2	12
Severe Winter Weather	4	4	3	3	2	12
Transportation Accident	3	3	3	3	1	11
Urban Fire/Structure Collapse	3	2	2	3	1	9
Wildland Fire	2	3	3	2	1	9
Windstorm	4	4	3	2	1	12

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

Table 8.1.2 – City of New Rockford Jurisdiction Risk Assessment

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Communicable Disease	<ul style="list-style-type: none"> • Business interruptions • Children missing school • Staff issues at businesses and city • Loss of economy • Loss/Overcrowded Medical Facilities – resulting in transfer of patients to other facilities 	<ul style="list-style-type: none"> • Annual occurrences of influenza and other disease. 	<u>More likely</u> <ul style="list-style-type: none"> • High youth and elderly population • Agriculture economy • Society more mobile 	<u>More vulnerable</u> <ul style="list-style-type: none"> • High youth and elderly population • Agriculture economy • Sanitary sewers/lagoons experience erosion • Presence of abandoned buildings 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> • Education and outreach at public school • Spraying for mosquitos • District Health conducting education and outreach 	<u>Less vulnerable</u> <ul style="list-style-type: none"> • Medical clinics • Mass media/internet • Spraying for mosquitos • District Health conducting education and outreach 	
Dam Failure	<ul style="list-style-type: none"> • Flooding (streets) • Loss of storm water lagoon • Damage to sanitary sewer lagoons • Loss of portable water delivery system • Property damage 	<ul style="list-style-type: none"> • Never an occurrence of a dam failure 	<u>More likely</u> <ul style="list-style-type: none"> • Increasing intensity of severe weather 	<u>More vulnerable</u> <ul style="list-style-type: none"> • Increasing intensity of severe weather • Roads in inundation area 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> • Continued monitoring and maintenance of dam 	<u>Less vulnerable</u> <ul style="list-style-type: none"> • One access road impacted 	

Table 8.1.2 – City of New Rockford Jurisdiction Risk Assessment – Continued

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Drought	<ul style="list-style-type: none"> • Business Interruptions • Crop Loss • Increased Fire Potential • Loss of Economy (decline in hunting activities) • Fire along railroad infrastructure • Increase in insect populations further impacting crops, livestock and people • Property damage 	<ul style="list-style-type: none"> • Annual periods of dry conditions • 10-year cycle • Drought of 1988 and 1989 • 2008 had dry conditions • Burn bans implemented annually • 2016, prairie potholes dried up 	<u>More likely</u> <ul style="list-style-type: none"> • Overdue for drought based on wet/dry cycle • Result of climatic patterns 	<u>More vulnerable</u> <ul style="list-style-type: none"> • High youth and elderly population • Campgrounds • Small local businesses • Economy dependent on out-of-town visitors • Agriculture economy 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> • Modern agricultural practices and no-till farming will decrease severity and help limit impact 	<u>Less vulnerable</u> <ul style="list-style-type: none"> • Modern agricultural practices and no-till farming will decrease severity and help limit impact 	
Flood	<ul style="list-style-type: none"> • Blocked roads (1st Ave South and 10th St., 3rd Ave and 7th St.) • Delayed emergency response • Limited access for emergency services • Property damage • Flooding (street & structure) • Sewer backup from inadequate combined storm water/sanitary sewer system 	<ul style="list-style-type: none"> • Multiple instances of blocked roads and overland flooding in the city during heavy rain events or spring snow melt 	<u>More likely</u> <ul style="list-style-type: none"> • Inadequate drainage in certain areas of the city • Snow melt and rain • Parts of city located in floodplain • Adjacent to James River • Aged water system 	<u>More vulnerable</u> <ul style="list-style-type: none"> • Inadequate drainage in certain areas of the city • Potable/drinking water system is aged – approximately 85 blocks • Aging combined storm water/sanitary sewer system 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> • City public works clears drains and works to improve drainage 	<u>Less vulnerable</u> <ul style="list-style-type: none"> • Enrolled in NFIP • Flood ordinances • Some drain tile in the area 	

Table 8.1.2 – City of New Rockford Jurisdiction Risk Assessment - Continued

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Hazardous Material Release	<ul style="list-style-type: none"> Property damage Potential for loss of life/injury Explosion Evacuation (localized)/Shelter-in-Place Explosion HAZMAT Release Mass casualties School closure 	<ul style="list-style-type: none"> Oil spill in 2015 Anhydrous ammonia release in 1984/1985 	<u>More likely</u> <ul style="list-style-type: none"> Increase in oil and gas activity and railroad traffic Increase in ag and chemical traffic Increase in train speeds Presence of U.S. Highway 281 through middle of the city Presence of railroad 	<u>More vulnerable</u> <ul style="list-style-type: none"> Lack of truck route More chemicals stored in and near the city No grade-separated pass with railroad Increase in train speeds Presence of U.S. Highway 281 and N.D. Highway 15 Presence of railroad 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Ordinances in place to address development and location of hazardous material sites 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Ordinances in place to address development and location of hazardous material sites Access to state and regional HAZMAT teams and resources 	
Homeland Security Incident	<ul style="list-style-type: none"> Evacuation (full) Human Injury/Death Loss/Overcrowded Medical facilities Loss of power/downed power lines Mass Casualties School Closure 	<ul style="list-style-type: none"> 2015, public shooting at private event-one person killed 	<u>More likely</u> <ul style="list-style-type: none"> Public school Largest city in the area Presence of county courthouse Drug transportation increasing on highways through the area 	<u>More vulnerable</u> <ul style="list-style-type: none"> High youth and elderly population Agriculture, and oil and gas economy No hospital Presence of U.S. Highway 281 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Sparse population No large regional or international attractions 	<u>Less vulnerable</u> <ul style="list-style-type: none"> No commercial passenger air service 	

Table 8.1.2 – City of New Rockford Jurisdiction Risk Assessment - Continued

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Severe Summer Weather	<ul style="list-style-type: none"> • Loss of power/downed lines • Flooding of areas with poor drainage from rain • Blocked roads for emergency services and general economic activity • Delayed emergency response • Human Injury/Death • Sewer backup from inadequate combined storm water/sanitary sewer system 	<ul style="list-style-type: none"> • Multiple storms annually 	<ul style="list-style-type: none"> • Climatic patterns of the area will result in several storms per year 	<u>More vulnerable</u> <ul style="list-style-type: none"> • Agriculture economy • Lack of shelter with generator • Flat terrain and open topography 	See Chapter 7
				<u>Less vulnerable</u> <ul style="list-style-type: none"> • Advanced weather forecasting/warning • Dispatch-activated siren • Reverse 911 • Building codes 	
Severe Winter Weather	<ul style="list-style-type: none"> • Loss of power/downed lines • Blocked roads for emergency services • School closure • Delayed Emergency Response • Human Injury/Death • Sewer backup from inadequate combined storm water/sanitary sewer system 	<ul style="list-style-type: none"> • Multiple storms (around 3 to 5) annually • Major storm with power outages in surrounding area Christmas 2016 	<ul style="list-style-type: none"> • Climatic patterns of the area will result in several storms per year 	<u>More vulnerable</u> <ul style="list-style-type: none"> • Aging combined storm water/sanitary sewer system • Lack of shelter with generator • Flat terrain and open topography • River View Court • Lutheran Home 	See Chapter 7
				<u>Less vulnerable</u> <ul style="list-style-type: none"> • Advanced weather forecasting/warning • CodeRED • Building codes 	

Table 8.1.2 – City of New Rockford Jurisdiction Risk Assessment - Continued

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Transportation Accident	<ul style="list-style-type: none"> Blocked roads Delayed emergency response Evacuation (localized) HAZMAT release Human injury/death 	<ul style="list-style-type: none"> Anhydrous ammonia release in 1985 Multiple accidents at intersection of U.S. Highway 281 and N.D. Highway 15 Increase in traffic volumes Train-vehicle accidents east of the city 3 miles in 2015 	<u>More likely</u> <ul style="list-style-type: none"> Presence of railroad U.S. Highway 281 and N.D. Highway 3 Constant truck traffic through town to grain elevator Intersection of U.S. Highway 281 and N.D. Highway 15 	<u>More vulnerable</u> <ul style="list-style-type: none"> Presence of railroad U.S. Highway 281 and N.D. Highway 3 Constant truck traffic through town to grain elevator Intersection of U.S. Highway 281 and N.D. Highway 15 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Increased education and awareness Driver's Education 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Increased education and awareness Driver's Education Stop signs and traffic control 	
Urban Fire/Structure Collapse	<ul style="list-style-type: none"> Property Damage HAZMT Release Human Injury/Death Fire at New Rockford Transcript in 2015 	<ul style="list-style-type: none"> Reports of structure and vehicles fires annually Fire at New Rockford Transcript in 2015 	<u>More likely</u> <ul style="list-style-type: none"> Presence of older commercial and residential buildings with outdated electrical Older downtown structures sharing common walls and single-family spaced close together 	<u>More vulnerable</u> <ul style="list-style-type: none"> Presence of buildings with outdated electrical Older downtown structures close together 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Increased education and awareness Smoke detectors at critical facilities and infrastructure 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Spacing of houses and structures (new) Building codes adopted Fire department with new equipment and well-trained volunteers 	

Table 8.1.2 – City of New Rockford Jurisdiction Risk Assessment - Continued

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Wildland Fire	<ul style="list-style-type: none"> Strain on local fire department/district Loss of economy due to impact to crops/livestock Blocked roads limiting access for emergency services Delayed emergency response Human injury/death Strain on water availability for suppression 	<ul style="list-style-type: none"> Controlled burns becoming out of control approximately 50 percent of the time One major fire annually Shelterbelt fire in 2016 	<u>More likely</u> <ul style="list-style-type: none"> Strain on local emergency services Increased truck traffic Overgrown vegetation along railroad tracks Dry conditions (when present) 	<u>More vulnerable</u> <ul style="list-style-type: none"> Lack of fire break around the city Homes/structures adjacent to sloughs and areas with dry vegetation Railroad ditches 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Burn Bans Less CRP Farmers have supply of water for fire suppression on site 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Fire Index Sign City conducts mowing Emergency siren Availability of water in river/sloughs/ponds for fire suppression nearby Depends on wind speed 	
Windstorm	<ul style="list-style-type: none"> Loss of power/downed lines Blocked roads for emergency services Downed trees Property damage Loss of economy Blocking of drainage ditches along U.S. Highway 281 preventing drainage 	<ul style="list-style-type: none"> Multiple storms annually Straight-line winds most likely occur between May and August of every year 	Climatic patterns of the area will result in several storms per year	<u>More vulnerable</u> <ul style="list-style-type: none"> Healthy urban canopy Flat terrain and open topography 	See Chapter 7
				<u>Less vulnerable</u> <ul style="list-style-type: none"> Building codes Public works trims and clears excess branches and vegetation on an as-needed basis 	

8.1.3 Mitigation Strategy

The Eddy and Wells Counties Multi-Jurisdictional Multi-Hazard Plan Update includes a mitigation strategy consisting of six goals in Chapter 6. The following problem statement and mitigation projects address the mitigation needs of the city of New Rockford. It should be noted that some mitigation projects that pertain to all jurisdictions are included to encourage county-wide collaboration.

Problem Statement

The city of New Rockford can be impacted by communicable disease, drought, flood (overland and riverine), hazardous material release, homeland security incident, severe summer weather, severe winter weather, urban fire/structure collapse, wildland fire, and windstorm. The city experiences overland flooding from spring thaw and heavy rains causing damage to property, and critical facilities and infrastructure due to an inadequate storm water drainage system combined with sanitary sewer services. The combined system also causes sewer backups. The sanitary sewer lagoons are in flood-prone areas and are subjected to erosion. Economic loss to the agriculture, livestock and hunting industries occurs on a frequent basis from natural hazards. The city has one storm shelter with a generator and needs further backup generation to establish more storm shelters. The city is at risk to wildland fire due to surrounding topography, vegetation, cat-tails, sloughs and agriculture practices. Local emergency services need upgraded equipment. The city lacks funding for mitigation projects. With little to no capabilities to accomplish major projects independently, the city is dependent on outside sources for mitigation.

Retrofitting and upgrading of combined storm water and sanitary sewer system/lagoons, improved drainage, installation of permanent backup power sources, establishment or construction of new storm shelters, installation of fire protection infrastructure and upgrading of fire protection equipment, expansion of planning and regulatory capabilities, and education and outreach are a priority for the city.

City of New Rockford Project 1: Conduct engineering study to identify scope of work and cost to retrofit and/or upgrade combined storm water & sanitary sewer system.

Description/Benefit		Existing combined system drains into same drain field, is aged and is overwhelmed during events of heavy precipitation and snow melt. Waterlines freeze during the winter and businesses experience a loss of economy due to water outages. Households also experience water outages due to frozen pipes. The lift station can also be overwhelmed and fails causing sewer backups. Approximately 85 blocks of the system need upgrading. Close catch basins and install valley gutters to detour water north and south. Systems could be separated into two individual systems.					
Hazards Addressed		Communicable Disease, Flooding (overland), Severe Summer Weather, Severe Winter Weather (all)					
Affected Jurisdictions		City of New Rockford					
Project Status		New					
Priority		High					
Responsible Agency		City Commission, Public Works					
Partners		Emergency Management, Public Health, Regional Council, SWC					
Completion Timeframe		10+ years			Cost	\$8,000,000+	
Funding Source		Local, state, federal grants. FEMA, Public Utilities, Regional Council, RD.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	4	5	3	4	30
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element		Process for Integration		
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Eddy County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment		Approval by city commission		

City of New Rockford Project 2: Conduct hydrology study of U.S. Highway 281 ditches to improve drainage.

Description/Benefit		Studying the drainage ditches along U.S. Highway 281 provides the city of New Rockford and Eddy County information to develop a plan to improve drainage. The ditches have become filled with silt, debris, and excess vegetation restricting the flow of storm water out of the city.					
Hazards Addressed		Communicable Disease, Flooding (overland), Severe Summer Weather, Severe Winter Weather, Windstorm (all)					
Affected Jurisdictions		City of New Rockford					
Project Status		Ongoing and continue.					
Priority		High					
Responsible Agency		City Commission, County Commission, Engineering Firms, NDDOT, Public Works, USDOT					
Partners		Emergency Management, SWC					
Completion Timeframe		1-2 years			Cost	\$50,000+	
Funding Source		Local, state, federal grants. FEMA, NDDOT, USDOT.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	4	4	4	32
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Eddy County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Partner with NDDOT and SWV. Approval by city commission	

City of New Rockford Project 3: Construct drainage improvements.

Description/Benefit	Construction of new or retrofitting of existing streets and drainage systems to increase drainage capacity to maintain access for emergency services and reduce or eliminate property damage. <ul style="list-style-type: none">• 1st Ave South and 10th St.• 3rd Ave and 7th St.• Strategic points on the James River• City drain (two trenches)						
Hazards Addressed	Communicable Disease, Flood (riverine and overland), Severe Summer Weather, Severe Winter Weather						
Affected Jurisdiction(s)	City of New Rockford						
Project Status	New						
Priority	High						
Responsible Agency	City Commission, Public Works						
Partners	Emergency Management, Emergency Services, Engineering Firms						
Completion Timeframe	2 to 5 years				Cost	Project-specific	
Funding Source	State and federal grants. FEMA. SWC. Local resources.						
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	5	4	4	32
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Eddy County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city commission	

City of New Rockford Project 4: Install rip-rap at sewage lagoons to prevent erosion.

Description/Benefit	Installation of rip-rap at the existing sewer lagoons will reduce or eliminate erosion caused by flooding, severe summer weather, severe winter weather and windstorm, and ensure continued sanitary sewer service to prevent backups and reduce or eliminate property damage.						
Hazards Addressed	Flood, Severe Summer Weather, Severe Winter Weather, Wildland Fire						
Affected Jurisdiction(s)	City of New Rockford						
Project Status	New						
Priority	High						
Responsible Agency	City Council, Public Works						
Partners	County Commission, Emergency Management, Public Health, Public Utilities, SWC, Water Board, Water District						
Completion Timeframe	5 years			Cost	TBD		
Funding Source	Local, state and federal grants.						
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	4	3	4	31
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element		Process for Integration		
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Eddy County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment		Approval by city commission		

Eddy County Project AT-7: Install permanent generators and upgrade existing permanent or portable generators, at critical facilities and infrastructure.

Description/Benefit	Upgrade existing generators or install new generators to establish permanent source of backup power to maintain continued operation of the following critical facilities and infrastructure: <u>Upgrade</u> <ul style="list-style-type: none">Eddy County Courthouse <u>Install new</u> <ul style="list-style-type: none">City of New Rockford: City water wells, water treatment plantCity of Sheyenne: Ostby Hall (to establish storm shelter), water well and lift station, fire hall						
Hazards Addressed	All hazards						
Affected Jurisdiction(s)	Eddy County and incorporated jurisdictions						
Project Status	New						
Priority	Medium						
Responsible Agency	County Commission, City Councils, Emergency Management						
Partners	County Highway Dept., Emergency Services, Medical Services Providers, Public Utilities						
Completion Timeframe	2 to 3 years			Cost	\$30,000 to \$60,000		
Funding Source	Public Utilities, Regional Council, RD. FEMA Pre-Disaster Mitigation Grant Program (PDM). State Homeland Security Grants.						
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	5	4	4	32
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element Utilized		Process for Integration		
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Eddy County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment		Approval by city councils. Approval by county commission.		

Eddy County PR-2: Update and expand existing or create new planning and regulatory capabilities to address development.

Description/Benefit		Build the planning and regulatory capability of incorporated jurisdictions by updating existing and/or expand and create new plans, policies, and ordinances. To ensure new and existing structures adhere to building standards to withstand impacts from hazards energy development (oil and gas) in the western portion of the state may lead to economic and population growth. <ul style="list-style-type: none">• Specific research should be conducted to address abandoned/blighted properties through zoning and other regulations.• Updating of emergency plans is a priority.• Specific regulations should be developed for museums and historic buildings to address mitigation. A list of plans, policies, codes and ordinances either in place or lacking in Eddy County and incorporated jurisdictions can be found in Chapter 7.1 – Eddy County Capability Assessment.					
Hazards Addressed		All					
Affected Jurisdiction(s)		Eddy County and incorporated jurisdictions					
Project Status		Ongoing and Continue/New					
Priority		High					
Responsible Agency		City Councils, County Commission, Planning & Zoning					
Partners		Emergency Management, Emergency Services, County Highway Dept., NDAC, NDDH, NDDDES, NDLC, Public					
Completion Timeframe		2 to 5 years		2 to 5		2 to 5 years	
Funding Source		Local budgets. Local, state and federal grants. Private sector.					
Values: 1 is low (negative impact and/or too costly) – Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	3	3	4	5	30
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
All mechanisms shown in Chapter 7.1 – Eddy County Capability Assessment			Capability Assessment, Hazard History, Risk Assessment			Approval by county commission/city council/commission	

Eddy County Project I-3: Construct new storm shelters/community safe rooms.

Description/Benefit		Provide safe area of refuge for permanent residents and temporary populations a seasonal/recreational population from severe weather. Reduce/eliminate loss of life from hazards and man-made threats. Upgrade existing shelters to be fully ADA compliant and pet-friendly. Construct new storm shelters/community safe room in jurisdictions currently lacking a storm shelter/safe room. More information on community shelters can be found through the following link: https://www.fema.gov/media-library/assets/documents/5090 New: City of New Rockford (Archie Campbell Park with 14 pad sites), City of Sheyenne					
Hazards Addressed		All					
Affected Jurisdiction(s)		Eddy County and incorporated jurisdictions					
Project Status		New					
Priority		High					
Responsible Agency		Emergency Management					
Partners		County Commission, City Councils, Emergency Services, NDDes					
Completion Timeframe		3 to 5 years			Cost	\$75,000 to \$150,000	
Funding Source		Local, state and federal grants. FEMA Pre-Disaster Mitigation Grant Program (PDM).					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	4	4	33
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element		Process for Integration		
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Eddy County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment		Approval by city councils. Approval by county commission.		

8.1.4 Mitigation Capability Assessment

Capability for mitigation is divided into four categories: Administrative and Technical, Education and Outreach, Financial, and Planning and Regulatory. Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. **Tables comparing the mitigation capabilities of the city of New Rockford with all other jurisdictions in The Planning Area can be found in Chapter 7, County Mitigation Capability Assessment.**

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

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

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

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

8.1.5 Integration of Mitigation Plan into Planning Mechanisms

Integration of the plan into current planning mechanisms is critical in mitigation to communicate the needs of each jurisdiction to achieve an all-inclusive mitigation strategy. The process for integration of the mitigation plan is included after each mitigation project, which shows the planning mechanism utilized, the plan element used for integration and the process for integration.

8.1.6 Plan Maintenance

An important aspect of any useable plan is the maintenance and upkeep of the document. At any given time, planning, risk analysis, updating the situation assessment, research, coordinating, disaster response or other activity is occurring. Plan maintenance ensures the plan will remain useful in the county for many years. A mitigation action progress report form to conduct plan maintenance is in Chapter 10 of this plan.

8.2 City of Sheyenne

The following profile includes information specific to the city of Sheyenne for mitigation planning purposes. The information included is as follows:

- Profile and Inventory;
- Risk Assessment;
- Hazard Scoring Notes;
- Mitigation Projects, and
- Capabilities for Mitigation.

Integration into Planning Mechanisms

The process for integration of the mitigation plan into existing planning mechanisms is discussed at the bottom of each mitigation project in section 8.2.4, section 8.2.5 and in Chapter 6, Mitigation Strategy.

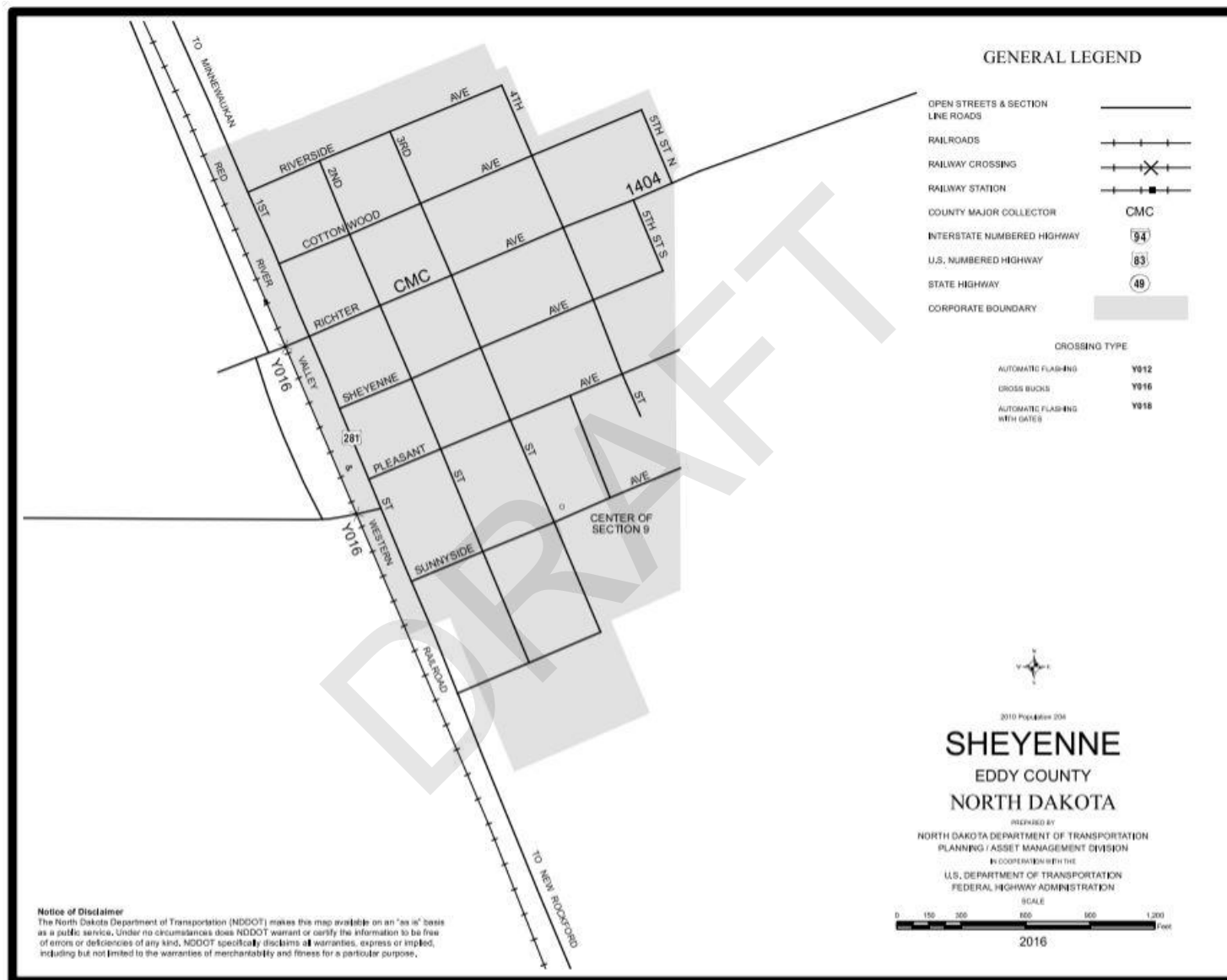
Plan Maintenance

Plan maintenance is shown in section 8.2.6.

Critical Facilities and Infrastructure

Figure 8.8.1 is a map of the city of Sheyenne.

Figure 8.2.1 – City of Sheyenne Base Map



Source: N.D. Dept. of Transportation

8.2.1 Profile and Inventory

The location, total population, vulnerable populations, housing units and household size, businesses, critical facilities and infrastructure, new and future development, services, jurisdictional buildings, emergency response services and utilities are shown for the city of Sheyenne. Detailed narratives follow each section heading to profile the city.

Detailed information on public buildings, services provided, emergency response services and utilities can be found in Chapter 4, Profile and Inventory.

Location

The city of Sheyenne is located at the intersection of U.S. Highway 281 and Eddy County Highway located one-mile south of the border between Eddy County and Ramsey County approximately 11 miles north of the city of New Rockford, the county seat.

Population

Per the 2010 U.S. Decennial Census the city of Sheyenne contains 204 people. The 2011 to 2015 American Community Survey 5-Year Estimate recorded a population of 192 people, a decrease of 12 people, or 5.9 percent from 2010.

Vulnerable Populations

Per the 2010 U.S. Decennial Census, the population of the city of Sheyenne consists of 28 individuals under the age of 20, and 50 individuals age 65 and older, representing 13.7 percent and 24.5 percent of the population, respectively.

The public school in the city has been closed for several years. The structure is now used as a hotel/lodge.

There are no age-restricted and senior housing developments located in the city.

Housing Units and Household Size

The 2011 to 2015 American Community Survey 5-Year Estimate shows there is a total of 138 housing units in the city consisting of 98 single-family homes, 28 multifamily homes and 12 mobile homes.

Per the 2010 U.S. Decennial Census, there are 103 households in the city of Sheyenne resulting in an average household size of 1.98 people.

Businesses

Businesses located in the city of Sheyenne include: Sheyenne Bar, Gowan Construction, Brenno Meats, Cenex, Warren Implement, Close Construction, Aggregate Industries and the post office.

New and Future Development

Development over the last five years in the city of Sheyenne includes the following:

- Equity Elevator constructed a new elevator in mid-2017 after a fire destroyed their previous operation
- Storage units were constructed in 2017
- Removal of approximately five abandoned/blighted single-family homes and buildings

As of October 2017, no development is planned or proposed for future construction in the city of Sheyenne.

8.2.1 Risk Assessment and Hazard Scoring Notes

Table 8.2.1 summarizes the risk assessment scoring of the city of Sheyenne. The risk assessment and hazard scoring notes for each hazard specific to the city are shown after Table 8.2.1. Risk assessment notes for impact, frequency, likelihood and vulnerability ubiquitous for jurisdictions in The Planning Area are found in Chapter 5, Threat and Hazard Identification Assessment in each respective hazard profile.

Table 8.2.1 – City of Sheyenne Jurisdiction Risk Assessment Scoring Summary

Risk Assessment			Jurisdiction:	City of Sheyenne		
<u>Hazard</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<u>Total</u>
Communicable Disease	3	2	2	3	1	9
Dam Failure	3	2	1	2	2	6
Drought	3	2	3	3	1	10
Flood	4	3	4	3	1	13
Hazardous Material Release	3	2	3	3	1	10
Homeland Security Incident	3	2	2	2	1	8
Severe Summer Weather	3	4	4	4	1	14
Severe Winter Weather	3	4	4	3	1	13
Transportation Accident	3	3	3	3	1	11
Urban Fire/Structure Collapse	3	3	3	3	1	11
Wildland Fire	3	3	3	3	1	11
Windstorm	3	3	3	3	1	11

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

Table 8.2.2 – City of Sheyenne Jurisdiction Risk Assessment

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Communicable Disease	<ul style="list-style-type: none"> Delayed Emergency Response Mass Casualties 	<ul style="list-style-type: none"> Annual occurrences of influenza and other disease Emergency response volunteers are sick annually 	<u>More likely</u> <ul style="list-style-type: none"> High elderly population Agriculture economy 	<u>More vulnerable</u> <ul style="list-style-type: none"> High elderly population Agriculture economy Presence of abandoned buildings No hospital or clinic 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Spraying for mosquitos District Health conducting education and outreach 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Mass media/internet Spraying for mosquitos District Health conducting education and outreach 	
Dam Failure	<ul style="list-style-type: none"> Blocked Roads Flooding (streets) 	<ul style="list-style-type: none"> Never an occurrence of a dam failure, but always a possibility 	<u>More likely</u> <ul style="list-style-type: none"> Increasing intensity of severe weather 	<u>More vulnerable</u> <ul style="list-style-type: none"> Increasing intensity of severe weather Roads in inundation area 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Continued monitoring and maintenance of dam 	<u>Less vulnerable</u> <ul style="list-style-type: none"> One access road impacted 	
Drought	<ul style="list-style-type: none"> Crop Loss Increased Fire Potential Loss of Economy (decline in hunting activities and agriculture sector) Wildlife Injury/Death 	<ul style="list-style-type: none"> Annual periods of dry conditions 10-year cycle Drought of 1988 and 1989 2008 had dry conditions Burn bans implemented annually 2016, prairie potholes dried up 	<u>More likely</u> <ul style="list-style-type: none"> Overdue for drought based on wet/dry cycle Result of climatic patterns Changing climate 	<u>More vulnerable</u> <ul style="list-style-type: none"> High elderly population Agriculture economy Volunteers leave jobs for fires Changing climate 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Modern agricultural practices and no-till farming will decrease severity and help limit impact 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Modern agricultural practices and no-till farming will decrease severity and help limit impact 	

Table 8.2.2 – City of Sheyenne Jurisdiction Risk Assessment – Continued

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Flood	<ul style="list-style-type: none"> Blocked roads Delayed emergency response Limited access for emergency services 	<ul style="list-style-type: none"> Multiple instances of blocked roads and overland flooding in the city during heavy rain events or spring snow melt 	<u>More likely</u> <ul style="list-style-type: none"> Inadequate drainage in certain areas of the city Every time it rains or snow melts Changing climate 	<u>More vulnerable</u> <ul style="list-style-type: none"> Township roads outside city with undersized culverts Changing climate 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> City public works clears drains and works to improve drainage 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Enrolled in NFIP Flood ordinances Some drain tile in the area 	
Hazardous Material Release	<ul style="list-style-type: none"> Property damage Explosion Evacuation (localized)/Shelter-in-Place Explosion HAZMAT Release Mass casualties 	<ul style="list-style-type: none"> A couple small accidents and spill each year Chemical spill on U.S. Highway 281 occurring every couple of years 	<u>More likely</u> <ul style="list-style-type: none"> Increase in oil and gas activity and railroad traffic Increase in ag and chemical traffic Presence of U.S. Highway 281 through middle of the city Anhydrous tank on west side of city 	<u>More vulnerable</u> <ul style="list-style-type: none"> Lack of truck route Increase in oil and gas activity and railroad traffic Increase in ag and chemical traffic Presence of U.S. Highway 281 through middle of the city Anhydrous tank on west side of city 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Ordinances in place to address development and location of hazardous material sites 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Ordinances in place to address development and location of hazardous material sites Access to state and regional HAZMAT teams and resources 	

Table 8.2.2 – City of Sheyenne Jurisdiction Risk Assessment - Continued

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Homeland Security Incident	<ul style="list-style-type: none"> Human Injury/Death Loss of power/downed power lines 	<ul style="list-style-type: none"> No incidents other than minor vandalism occurring annually 	<u>More likely</u> <ul style="list-style-type: none"> Presence of U.S. Highway 281 Drug transportation increasing on highways through the area 	<u>More vulnerable</u> <ul style="list-style-type: none"> High youth and elderly population Agriculture, and oil and gas economy No hospital Presence of U.S. Highway 281 Anhydrous tank on west side of city 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Sparse population No large regional or international attractions 	<u>Less vulnerable</u> <ul style="list-style-type: none"> No commercial passenger air service 	
Severe Summer Weather	<ul style="list-style-type: none"> Delayed emergency response Human Injury/Death Lightning strikes Loss of power/downed lines 	<ul style="list-style-type: none"> Multiple storms annually 	<ul style="list-style-type: none"> Climatic patterns of the area will result in several storms per year Changing climate 	<u>More vulnerable</u> <ul style="list-style-type: none"> Agriculture economy Lack of shelter with generator Flat terrain and open topography Overhead power lines Older buildings and structures 	See Chapter 7
				<u>Less vulnerable</u> <ul style="list-style-type: none"> Advanced weather forecasting/warning Dispatch-activated siren Reverse 911 Building codes 	

Table 8.2.2 – City of Sheyenne Jurisdiction Risk Assessment - Continued

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Severe Winter Weather	<ul style="list-style-type: none"> Blocked roads for emergency services Delayed Emergency Response Human Injury/Death 	<ul style="list-style-type: none"> Multiple storms (around 3 to 5) annually Major storm with power outages in surrounding area Christmas 2016 	<ul style="list-style-type: none"> Climatic patterns of the area will result in several storms per year Changing climate 	<u>More vulnerable</u> <ul style="list-style-type: none"> No hospital or clinic Lack of shelter with generator High elderly population Slowed emergency response 	See Chapter 7
				<u>Less vulnerable</u> <ul style="list-style-type: none"> Advanced weather forecasting/warning CodeRED Building codes 	
Urban Fire/Structure Collapse	<ul style="list-style-type: none"> Delayed Emergency Response Human Injury/Death Loss of Economy 	<ul style="list-style-type: none"> Reports of structure and vehicles fires annually 	<u>More likely</u> <ul style="list-style-type: none"> Presence of older commercial and residential buildings with outdated electrical Older downtown structures sharing common walls and single-family spaced close together 	<u>More vulnerable</u> <ul style="list-style-type: none"> Presence of buildings with outdated electrical Older downtown structures close together Lack of updated fire equipment and volunteers 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Increased education and awareness Smoke detectors at critical facilities and infrastructure 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Spacing of houses and structures (new) Building codes adopted Lack of generator at fire hall 	

Table 8.2.2 – City of Sheyenne Jurisdiction Risk Assessment - Continued

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Wildland Fire	<ul style="list-style-type: none"> Blocked roads limiting access for emergency services Delayed Emergency Response Loss of economy due to impact to crops/livestock Strain on water availability for suppression 	<ul style="list-style-type: none"> Controlled burns out of control approximately 50 percent time One major fire annually 	<u>More likely</u> <ul style="list-style-type: none"> Strain on local emergency services Dry conditions (when present) Farm/ranch operations Changing climate 	<u>More vulnerable</u> <ul style="list-style-type: none"> Lack of fire break around the city Homes/structures adjacent to sloughs and areas with dry vegetation Railroad ditches Lack of updated fire equipment and volunteers 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Burn Bans Less CRP Farmers have supply of water for fire suppression on site 	<u>Less vulnerable</u> <ul style="list-style-type: none"> City conducts mowing Emergency siren Availability of water in river/sloughs/ponds for fire suppression nearby Depends on wind speed 	
Windstorm	<ul style="list-style-type: none"> Blocked roads for emergency services Downed Trees Increased Fire Potential Loss of Economy Property Damage 	<ul style="list-style-type: none"> Multiple storms annually Structure fires may spread to wildland fires due to wind speeds 	<ul style="list-style-type: none"> Climatic patterns of the area will result in several storms per year Changing climate 	<u>More vulnerable</u> <ul style="list-style-type: none"> Healthy urban canopy Flat terrain and open topography Overhead power lines High elderly population 	See Chapter 7
				<u>Less vulnerable</u> <ul style="list-style-type: none"> Public works trims and clears excess branches and vegetation on an as-needed basis 	

8.2.3 Mitigation Strategy

The Eddy & Wells Counties Multi-Jurisdictional Multi-Hazard Plan Update includes a mitigation strategy consisting of six goals in Chapter 6. The following problem statement and mitigation projects address the mitigation needs of the city of Sheyenne. It should be noted that some mitigation projects that pertain to all jurisdictions are included to encourage county-wide collaboration.

Problem Statement

The city of Sheyenne can be impacted by communicable disease, drought, flood (overland and riverine), hazardous material release, severe summer weather, severe winter weather, urban fire/structure collapse, wildland fire, and windstorm. The city experiences overland flooding causing damage to property, roads, critical facilities and infrastructure and utilities due an inadequate storm water drainage system. Blocked roads from flooding, severe summer weather and severe winter weather limit access for emergency services. Economic loss to the agriculture and livestock industry occurs on a frequent basis from natural hazards. The city lacks backup generators for critical facilities and infrastructure and does not have an official storm shelter. Local emergency services need upgraded equipment. The city lacks funding for mitigation projects. With little to no capabilities to accomplish major projects independently, the city is dependent on outside sources for mitigation.

Improved drainage, installation of permanent backup power sources, upgrading of fire protection equipment, expansion of planning and regulatory capabilities, and education and outreach are a priority for the city.

Eddy County Project AT-3: Upgrade and expand early warning system(s).

Description/Benefit		Coverage of current outdoor early warning system/sirens does not provide coverage to an adequate geographic expanse of the county. Upgrade existing manually-activated sirens to dispatch-activated sirens. There are no existing outdoor early warning sirens for the county outside incorporated cities. <u>Upgrade:</u> City of Sheyenne Purchase NOAA weather radios for rural populations and unincorporated communities.					
Hazards Addressed		Flood, Hazardous Material Release, Severe Summer Weather, Severe Winter Weather, Wildland Fire, Windstorm (All)					
Affected Jurisdiction(s)		City of Sheyenne					
Project Status		Ongoing					
Priority		High					
Responsible Agency		City Councils, Emergency Management					
Partners		Emergency Services, FEMA, NDDES, NWS					
Completion Timeframe		1 to 2 years			Cost	Up to \$25,000 per siren, plus installation	
Funding Source		9-1-1 funding. State Homeland Security Grant Program. City general fund.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Eddy County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city council	

Eddy County Project AT-7: Install permanent generators and upgrade existing permanent or portable generators, at critical facilities and infrastructure.

Description/Benefit	Upgrade existing generators or install new generators to establish permanent source of backup power to maintain continued operation of the following critical facilities and infrastructure: <u>Upgrade</u> <ul style="list-style-type: none">Eddy County Courthouse <u>Install new</u> <ul style="list-style-type: none">City of New Rockford: City water wells, water treatment plantCity of Sheyenne: Ostby Hall (to establish storm shelter), water well and lift station, fire hall						
Hazards Addressed	All hazards						
Affected Jurisdiction(s)	Eddy County and incorporated jurisdictions						
Project Status	Ongoing						
Priority	High						
Responsible Agency	County Commission, City Councils, Emergency Management						
Partners	County Highway Dept., Emergency Services, Medical Services Providers, Public Utilities						
Completion Timeframe	2 to 3 years			Cost	\$30,000 to \$60,000		
Funding Source	Public Utilities, Regional Council, RD. FEMA Pre-Disaster Mitigation Grant Program (PDM). State Homeland Security Grants.						
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	5	4	4	32
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element Utilized		Process for Integration		
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Eddy County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment		Approval by city councils. Approval by county commission.		

Eddy County Project AT-8: Create and establish permanent county-wide maintenance system for drainage ditches and storm water systems to reduce or eliminate occurrences of overland flooding.

Description/Benefit		Create county-wide drainage ditch/storm water maintenance system to control flow of runoff to eliminate blocked roads, maintain access for city residents and emergency services, and continued operation of public infrastructure.					
Hazards Addressed		Communicable Disease, Drought, Flood (Overland), Severe Summer Weather, Severe Winter Weather, Wildland Fire, Windstorm					
Affected Jurisdiction(s)		Eddy County and incorporated jurisdictions					
Project Status		New					
Priority		Medium					
Responsible Agency		City Councils, County Commission, County Highway Dept., Public Works					
Partners		Emergency Services, NDDH, Public Health, SWC, USDA, Water District					
Completion Timeframe		1 year			Cost	Staff-time	
Funding Source		Local budgets. State and federal grants.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	4	5	3	31
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized		Plan Element Utilized			Process for Integration		
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Eddy County Mitigation Strategy		Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.		

Eddy County PR-2: Update and expand existing or create new planning and regulatory capabilities to address development.

Description/Benefit	Build the planning and regulatory capability of incorporated jurisdictions by updating existing and/or expand and create new plans, policies, and ordinances. To ensure new and existing structures adhere to building standards to withstand impacts from hazards energy development (oil and gas) in the western portion of the state may lead to economic and population growth. <ul style="list-style-type: none">• Specific research should be conducted to address abandoned/blighted properties through zoning and other regulations.• Updating of emergency plans is a priority.• Specific regulations should be developed for museums and historic buildings to address mitigation. A list of plans, policies, codes and ordinances either in place or lacking in Eddy County and incorporated jurisdictions can be found in Table 7.1.4 in Chapter 7.1 – Eddy County Capability Assessment.						
Hazards Addressed	All						
Affected Jurisdiction(s)	Eddy County and incorporated jurisdictions						
Project Status							
Priority							
Responsible Agency	City Councils, County Commission, Planning & Zoning						
Partners	Emergency Management, Emergency Services, County Highway Dept., NDAC, NDDDES, NDLC, RD						
Completion Timeframe	2 to 5 years			Cost	\$0 to \$10,000		
Funding Source	Local budgets. Local, state and federal grants. Private sector.						
Values: 1 is low (negative impact and/or too costly) – Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element		Process for Integration		
All mechanisms shown in Chapter 7.1 – Eddy County Capability Assessment			Capability Assessment, Hazard History, Risk Assessment		Approval by county commission/city council/commission		

Eddy County PR-3: Enroll the city of Sheyenne in the National Flood Insurance Program (NFIP).

Description/Benefit	Ensure economic resiliency. Residents with property at risk would be insured. Ensure continuous review and updating or implementation of flood ordinances and flood control measures.						
Hazards Addressed	Flood (overland and riverine), Severe Summer Weather, Severe Winter Weather						
Affected Jurisdiction(s)	City of Sheyenne						
Project Status	New						
Priority	High						
Responsible Agency	Emergency Management and City Council						
Partners	County Commission, Planning & Zoning, SWC						
Completion Timeframe	2 to 3 years			Cost	Free (local administrative costs will apply)		
Funding Source	Local resources and staff-time.						
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	4	4	5	32
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized		Plan Element Utilized			Process for Integration		
National Flood Insurance Program		Capability Assessment, Hazard History, Risk Assessment			Approval and adoption by county commission and city council.		

Eddy County Project I-3: Construct new storm shelters/community safe rooms.

Description/Benefit		Provide safe area of refuge for permanent residents and temporary populations a seasonal/recreational population from severe weather. Reduce/eliminate loss of life from hazards and man-made threats. Upgrade existing shelters to be fully ADA compliant and pet-friendly. Construct new storm shelters/community safe room in jurisdictions currently lacking a storm shelter/safe room. Emergency Management should contract American Red Cross to set up tour for designation of facilities in each jurisdiction. More information on community shelters can be found through the following link: https://www.fema.gov/media-library/assets/documents/5090 New: City of New Rockford (Archie Campbell Park with 14 pad sites), City of Sheyenne					
Hazards Addressed		All					
Affected Jurisdiction(s)		Eddy County and incorporated jurisdictions					
Project Status		New					
Priority		High					
Responsible Agency		Emergency Management					
Partners		County Commission, City Councils, Emergency Services, NDDes					
Completion Timeframe		3 to 5 years			Cost	\$75,000 to \$150,000	
Funding Source		Local, state and federal grants. FEMA Pre-Disaster Mitigation Grant Program (PDM).					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element		Process for Integration		
			Capability Assessment, Hazard History, Risk Assessment				

8.2.4 Mitigation Capability Assessment

Capability for mitigation is divided into four categories: Administrative and Technical, Education and Outreach, Financial, and Planning and Regulatory. Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. **Tables comparing the mitigation capabilities of the city of Sheyenne with all other jurisdictions in The Planning Area can be found in Chapter 7, County Mitigation Capability Assessment.**

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

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

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

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

8.2.5 Integration of Mitigation Plan into Planning Mechanisms

Integration of the plan into current planning mechanisms is critical in mitigation to communicate the needs of each jurisdiction to achieve an all-inclusive mitigation strategy. The process for integration of the mitigation plan is included after each mitigation project, which shows the planning mechanism utilized, the plan element used for integration and the process for integration.

8.2.6 Plan Maintenance

An important aspect of any useable plan is the maintenance and upkeep of the document. At any given time, planning, risk analysis, updating the situation assessment, research, coordinating, disaster response or other activity is occurring. Plan maintenance ensures the plan will remain useful in the county for many years. A mitigation action progress report form to conduct plan maintenance is in Chapter 10 of this plan.

8.3 City of Bowdon

The following profile includes information specific to the city of Bowdon for mitigation planning purposes. The information included is as follows:

- Profile and Inventory;
- Risk Assessment;
- Hazard Scoring Notes;
- Mitigation Projects, and
- Capabilities for Mitigation.

Integration into Planning Mechanisms

The process for integration of the mitigation plan into existing planning mechanisms is discussed at the bottom of each mitigation project in section 8.3.4, section 8.3.5 and in Chapter 6, Mitigation Strategy.

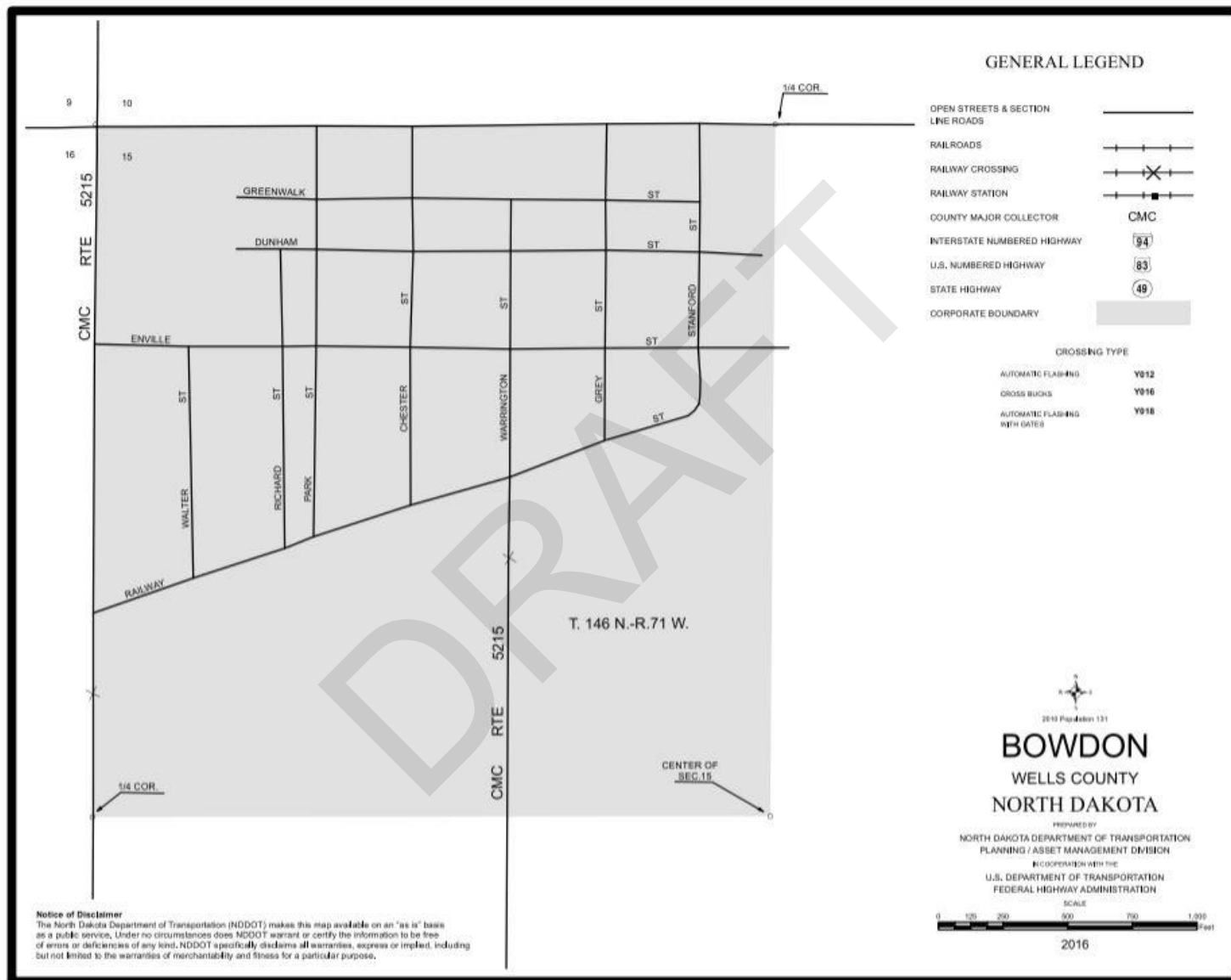
Plan Maintenance

Plan maintenance is shown in section 8.3.6.

Critical Facilities and Infrastructure

Figure 8.8.1 is a map of the city of Bowdon.

Figure 8.3.1 – City of Bowdon Base Map



Source: N.D. Dept. of Transportation

8.3.1 Profile and Inventory

The location, total population, vulnerable populations, housing units and household size, businesses, critical facilities and infrastructure, new and future development, services, jurisdictional buildings, emergency response services and utilities are shown for the city of Bowdon. Detailed narratives follow each section heading to profile the city.

Detailed information on public buildings, services provided, emergency response services and utilities can be found in Chapter 4, Profile and Inventory.

Location

The city of Bowdon is in south-central Wells County approximately six miles west of the intersection of U.S. Highway 52 and N.D. Highway 200, and approximately one-mile north of N.D. Highway 200. The city is located approximately 16 miles south-southwest of the city of Fessenden, the county seat, and approximately 27 miles south-southeast of the city of Harvey, the largest city in The Planning Area.

Population

Per the 2010 U.S. Decennial Census the city of Bowdon contains 131 people. The 2011 to 2015 American Community Survey 5-Year Estimate recorded a population of 123 people, a decrease of eight people, or 6.1 percent from 2010.

Vulnerable Populations

Per the 2010 U.S. Decennial Census, the population of the city of Bowdon consists of 10 individuals under the age of 20, and 64 individuals age 65 and older, representing 7.6 percent and 48.9 percent of the population, respectively.

- The city, although not the location of the Fessenden-Bowdon Public School, serves grades K to 12 with approximately 140 students as of the 2016/2017 academic school year.
- There are no age-restricted and senior housing developments located in the city.

Housing Units and Household Size

The 2011 to 2015 American Community Survey 5-Year Estimate shows there is a total of 103 housing units in the city consisting of 90 single-family homes, three multifamily homes and 10 mobile homes.

Per the 2010 U.S. Decennial Census, there are 77 households in the city of Bowdon resulting in an average household size of 1.70 people.

Businesses

Businesses located in the city of Bowdon include: Bowdon Meat Processing Plant, a grocery store, post office, Bank Forward and 1st International Bank.

New and Future Development

New development over the last five years includes: the Bowdon Meat Processing Plant which is community-owned and opened in 2013. The plant provides 3-4 full-time jobs and 1-2 part-time jobs. The plant has increased the amount of traffic in city limits.

Future development in the city of Bowdon includes raising of funds to construct a new fire hall. The department has estimates for cost and lots are purchased.

8.3.1 Risk Assessment and Hazard Scoring Notes

Table 8.3.1 summarizes the risk assessment scoring of the city of Bowdon. The risk assessment and hazard scoring notes for each hazard specific to the city are shown after Table 8.3.1. Risk assessment notes for impact, frequency, likelihood and vulnerability ubiquitous for jurisdictions in The Planning Area are found in Chapter 5, Threat and Hazard Identification Assessment in each respective hazard profile.

Table 8.3.1 – City of Bowdon Jurisdiction Risk Assessment Scoring Summary

Risk Assessment			Jurisdiction:	City of Bowdon		
<u>Hazard</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<u>Total</u>
Communicable Disease	2	2	2	3	1	8
Dam Failure	NA	NA	NA	NA	NA	NA
Drought	3	3	3	3	2	10
Flood	3	2	2	3	1	9
Hazardous Material Release	2	2	2	2	1	7
Homeland Security Incident	2	2	2	2	1	7
Severe Summer Weather	4	3	4	3	1	13
Severe Winter Weather	4	3	4	3	1	13
Transportation Accident	2	2	2	2	1	7
Urban Fire/Structure Collapse	2	2	3	2	1	8
Wildland Fire	2	2	3	2	1	8
Windstorm	3	3	3	3	1	11

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

Table 8.3.2 – City of Bowdon Jurisdiction Risk Assessment

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Communicable Disease	<ul style="list-style-type: none"> • Evacuation (localized) • Mass Casualties • School Closure 	<ul style="list-style-type: none"> • Annual occurrences of influenza and other disease. 	<u>More likely</u> <ul style="list-style-type: none"> • High elderly population • Agriculture economy • Society more mobile 	<u>More vulnerable</u> <ul style="list-style-type: none"> • High elderly population • Agriculture economy • Presence of abandoned buildings 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> • City pays for mosquito spraying • District Health conducting education and outreach 	<u>Less likely</u> <ul style="list-style-type: none"> • City pays for mosquito spraying • District Health conducting education and outreach 	
Drought	<ul style="list-style-type: none"> • Increased Fire Potential • Loss of Economy (decline in hunting activity) 	<ul style="list-style-type: none"> • Annual periods of dry conditions • 10-year cycle • Drought of 1988 and 1989 • 2008 had dry conditions • Burn bans implemented annually 	<u>More likely</u> <ul style="list-style-type: none"> • Overdue for drought based on wet/dry cycle • Result of climatic patterns 	<u>More vulnerable</u> <ul style="list-style-type: none"> • High elderly population • Lots of sloughs and dry grasses in local area • Agriculture economy • Vacant lots 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> • Modern agricultural practices and no-till farming will decrease severity and help limit impact 	<u>Less vulnerable</u> <ul style="list-style-type: none"> • Modern agricultural practices and no-till farming will decrease severity and help limit impact • City has a water tower 	

Table 8.3.2 – City of Bowdon Jurisdiction Risk Assessment – Continued

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Flood	<ul style="list-style-type: none"> Blocked roads limiting access for emergency services Sewer Backup 	<ul style="list-style-type: none"> Multiple instances of blocked roads and overland flooding approximately four times annually 1993-major flood 	<u>More likely</u> <ul style="list-style-type: none"> Inadequate storm water main Major snow melt and high rain fall 	<u>More vulnerable</u> <ul style="list-style-type: none"> Lack of drainage ditch maintenance system Lack of storm shelter with generator Lack of adequate storm drains 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Emergency services clear drains 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Emergency services clear drains 	
Hazardous Material Release	<ul style="list-style-type: none"> Evacuation (localized)/Shelter-in-Place Explosion Human Injury/Death Increased fire potential 	<ul style="list-style-type: none"> No major incidents reported in city limits 	<u>More likely</u> <ul style="list-style-type: none"> More farmers moving fertilizer and chemical/higher traffic 	<u>More vulnerable</u> <ul style="list-style-type: none"> Underground gas/diesel tanks on Railway Street/Warrington St. More farmers moving fertilizer and chemical/higher traffic 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> No elevator or fertilizer plant 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Railroad inactive Truck route 	
Homeland Security Incident	<ul style="list-style-type: none"> Evacuation (full) 	<ul style="list-style-type: none"> Annual occurrences of localized vandalism 	<u>More likely</u> <ul style="list-style-type: none"> No local law enforcement 	<u>More vulnerable</u> <ul style="list-style-type: none"> High elderly population No local law enforcement No hospital 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Sparse population Inactive railroad 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Sparse population Inactive railroad 	

Table 8.3.2 – City of Bowdon Jurisdiction Risk Assessment - Continued

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Severe Summer Weather	<ul style="list-style-type: none"> Loss of power/downed lines Blocked roads for emergency services and general economic activity Sewer Backup 	<ul style="list-style-type: none"> Multiple storms annually 	<ul style="list-style-type: none"> Climatic patterns of the area will result in several storms per year 	<u>More vulnerable</u> <ul style="list-style-type: none"> Lack of drainage ditch maintenance system Lack of storm shelter with generator 	See Chapter 7
				<u>Less vulnerable</u> <ul style="list-style-type: none"> Advanced weather forecasting/warning Dispatch-activated siren Reverse 911 	
Severe Winter Weather	<ul style="list-style-type: none"> Loss of power/downed lines Blocked roads for emergency services and general economic activity Sewer Backup 	<ul style="list-style-type: none"> Multiple storms (around 3 to 5) annually Major storm with power outages in surrounding area Christmas 2016 	<ul style="list-style-type: none"> Climatic patterns of the area will result in several storms per year 	<u>More vulnerable</u> <ul style="list-style-type: none"> Lack of drainage ditch maintenance system Lack of storm shelter with generator 	See Chapter 7
				<u>Less vulnerable</u> <ul style="list-style-type: none"> Advanced weather forecasting/warning Dispatch-activated siren Reverse 911 	
Transportation Accident	<ul style="list-style-type: none"> Blocked Roads Human Injury/Death 	<ul style="list-style-type: none"> No major accidents in the last 15 years 	<u>More likely</u> <ul style="list-style-type: none"> U.S. Highway 52 	<u>More vulnerable</u> <ul style="list-style-type: none"> U.S. Highway 52 Bar in city limits 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Increased education and awareness 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Increased education and awareness Traffic control signage No school or elevator 	

Table 8.3.2 – City of Bowdon Jurisdiction Risk Assessment - Continued

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Urban Fire/Structure Collapse	<ul style="list-style-type: none"> Property Damage Human Injury/Death Loss of Potable Water 	<ul style="list-style-type: none"> Small fires reported once every couple of years 	<u>More likely</u> <ul style="list-style-type: none"> Presence of older commercial and residential buildings with outdated electrical Older downtown structures sharing common walls and single-family spaced close together 	<u>More vulnerable</u> <ul style="list-style-type: none"> Presence of buildings with outdated electrical Older downtown structures close together Lack of generator at fire station 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Increased education and awareness Smoke detectors 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Spacing of houses and structures (new) 	
Wildland Fire	<ul style="list-style-type: none"> Delayed Emergency Response 	<ul style="list-style-type: none"> Controlled burns out of control approximately 50 percent of time 	<u>More likely</u> <ul style="list-style-type: none"> Increased truck traffic Dry conditions (when present) 	<u>More vulnerable</u> <ul style="list-style-type: none"> 6 of 20 volunteers live in city limits Lack of generator at fire station 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Farmers have supply of water on site 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Locals clear excess vegetation 	
Windstorm	<ul style="list-style-type: none"> Loss of power/downed lines Blocked roads for emergency services and general economic activity Sewer Backup 	<ul style="list-style-type: none"> Multiple storms annually Straight-line winds event occurred in 2015 	<ul style="list-style-type: none"> Climatic patterns of the area will result in several storms per year Flat terrain and constant strong wind gusts 	<u>More vulnerable</u> <ul style="list-style-type: none"> Healthy urban canopy Flat terrain and open topography Lack of official storm shelter 	See Chapter 7

8.3.3 Mitigation Strategy

The Eddy & Wells Counties Multi-Jurisdictional Multi-Hazard Plan Update includes a mitigation strategy consisting of six goals in Chapter 6. The following problem statement and mitigation projects address the mitigation needs of the city of Bowdon. It should be noted that some mitigation projects that pertain to all jurisdictions are included to encourage county-wide collaboration.

Problem Statement

The city of Bowdon can be impacted by communicable disease, drought, flood (overland and riverine), hazardous material release, severe summer weather, severe winter weather, urban fire/structure collapse, wildland fire, and windstorm. The city experiences outages of water as the pumping station does not have a backup generator and is impacted by severe weather. The city does not have an official storm shelter or a dispatch-activated siren. The fire department needs a new fire hall for storage of existing equipment and future needs. The city lacks funding for mitigation projects. With little to no capabilities to accomplish major projects independently, the city is dependent on outside sources for mitigation.

Installation of permanent backup power sources, installation of a dispatch-activated siren, construction of a new fire hall, expansion of planning and regulatory capabilities, and education and outreach are a priority for the city.

City of Bowdon Project 1: Upgrade existing storm water drainage system/ditches to reduce or eliminate occurrences of overland flooding and maintain access for emergency services.

Description/Benefit		Upgrade drainage infrastructure through the city of Bowdon by expanding the number of drain sites to improve drainage and reduce or eliminate occurrences of overland flooding and blocked roads.					
Hazards Addressed		Communicable Disease, Flood (riverine and overland), Severe Summer Weather, Severe Winter Weather, Windstorm					
Affected Jurisdiction(s)		City of Bowdon					
Project Status		New					
Priority		High					
Responsible Agency		City Council					
Partners		Emergency Management, Emergency Services, Public Works, NDDes					
Completion Timeframe		3 to 5 years			Cost	Project-specific	
Funding Source		Local, state and federal grants.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	4	4	4	32
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city council	

City of Bowdon Project 2: Construct new fire hall/community center.

Description/Benefit		The size of the existing fire hall does not provide adequate space for emergency services to facilitate an appropriate emergency operations center and store equipment. Inadequate work space for emergency services personnel and supportive staff is also an issue. A combination of this project with Wells County Project AT-7 will provide backup power generation improving county and city sheltering capabilities.					
Hazards Addressed		All					
Affected Jurisdiction(s)		City of Bowdon					
Project Status		New					
Priority		High					
Responsible Agency		City Council, Emergency Services					
Partners		County Commission, Emergency Management, Planning & Zoning, Public Works, NDAC, NDDES, NDLC, Regional Council					
Completion Timeframe		5 to 10 years			Cost	Project-specific	
Funding Source		Local district fees or updating of existing taxes. State and federal grants. CBDG program. Private loans.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	4	5	34
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element Utilized			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city council	

Wells County Project AT-3: Upgrade and expand early warning system(s).

Description/Benefit		Coverage of current outdoor early warning system/sirens does not provide coverage to an adequate geographic expanse of the county. Upgrade existing manually-activated sirens to dispatch-activated sirens. Install new dispatch-activated sirens where necessary. There are no existing outdoor early warning sirens for the county outside incorporated cities. Purchase NOAA weather radios for rural communities. <ul style="list-style-type: none">• Upgrade: City of Fessenden (keep existing in same location), City of Sykeston• New: City of Bowdon, City of Fessenden (inside public school), City of Hurdsville• NOAA Weather Radios: City of Cathay, City of Hamberg; Heimdal (unincorporated) <i>The city of Harvey has ordered new sirens which will be installed sometime in 2017.</i>					
Hazards Addressed		Flood, Hazardous Material Release, Severe Summer Weather, Wildland Fire (All)					
Affected Jurisdiction(s)		Wells County and incorporated jurisdictions					
Project Status		Ongoing					
Priority		High					
Responsible Agency		City Councils, Emergency Management					
Partners		County Commission, Emergency Services, FEMA, NDDDES, NWS					
Completion Timeframe		1 to 2 years			Cost	Up to \$25,000 per siren, plus installation	
Funding Source		9-1-1 funding. State Homeland Security Grant Program. City and county general fund.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.	

Wells County Project AT-7: Install permanent generators and upgrade existing permanent or portable generators, at critical facilities and infrastructure.

Description/Benefit	Upgrade existing generators or install new generators to establish permanent source of backup power to maintain continued operation of the following critical facilities and infrastructure: <u>Upgrade</u> <ul style="list-style-type: none">Wells County Shop (Fessenden and Harvey) <u>Install new</u> <ul style="list-style-type: none">City of Bowdon: Water pump station, fire station (sized for construction of new fire hall)City of Cathay: Fire hall, lift station and pumphouseCity of Fessenden: Fessenden-Bowdon Public School, lift stations, city shop, city hall/fire department/police department, pump houseCity of Harvey: Armory/city hall/police station, B.M. Hanson Elementary, fire station, Harvey High School, Harvey Ambulance HallCity of Hurdsfield: Lift stationCity of Sykeston: Lift station, fire hall, water tower for recirculation pump						
Hazards Addressed	All hazards						
Affected Jurisdiction(s)	Wells County and incorporated jurisdictions						
Project Status	Ongoing						
Priority	High						
Responsible Agency	County Commission, City Councils, Emergency Management						
Partners	County Highway Dept., Emergency Services, Medical Services Providers, Public Utilities						
Completion Timeframe	2 to 3 years				Cost	\$30,000 to \$60,000	
Funding Source	Public Utilities, RD. FEMA Pre-Disaster Mitigation Grant Program (PDM). State Homeland Security Grants.						
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	5	4	4	32
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element Utilized			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.	

Wells County PR-4: Encourage jurisdictions to review local flood ordinances to meet or exceed minimum federal and state requirements and comply with the NFIP (once enrolled), and enroll in the Community Rating System.

Description/Benefit		To ensure Wells County and incorporated jurisdictions meet or exceed the NFIP to prepare for enrollment in the NFIP.					
Hazards Addressed		Flood (overland and riverine)					
Affected Jurisdiction(s)		The cities of Fessenden, Harvey and Sykeston. Wells County and the cities of Bowdon, Cathay, Hamberg, Hurdsfield (once enrolled).					
Project Status		Ongoing and Continue/New					
Priority		High					
Responsible Agency		City Councils, County Commission, Emergency Management, Planning & Zoning					
Partners		Emergency Services, NDAC, NDDES, NDLC, SWC					
Completion Timeframe		4 to 5 years			Cost	\$0 to \$1,000	
Funding Source		Local staff-time. SWC.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element Utilized			Process for Integration	
National Flood Insurance Program			Capability Assessment, Hazard History, Risk Assessment			Approval and adoption by county commission and city councils.	

Wells County Project I-3: Construct new storm shelters/community safe rooms.

Description/Benefit	Provide safe area of refuge for permanent residents and temporary populations a seasonal/recreational population from severe weather. Reduce/eliminate loss of life from hazards and man-made threats. Upgrade existing shelters to be fully ADA compliant and pet-friendly. Construct new storm shelters/community safe room in jurisdictions currently lacking a storm shelter/safe room. Emergency Management should contract American Red Cross to set up tour for designation of facilities in each jurisdiction. More information on community shelters can be found through the following link: https://www.fema.gov/media-library/assets/documents/5090 <ul style="list-style-type: none">• Wells County: Location in south-central portion of the county for use by rural residents/farmers. This area of the county has a strong population base and needs protection from severe weather.• Cities of Bowdon, Hurdsville and Sykeston• City of Fessenden/Wells County: Wells County Fair Grounds						
Hazards Addressed	All						
Affected Jurisdiction(s)	Wells County and incorporated jurisdictions						
Project Status	New						
Priority	High						
Responsible Agency	Emergency Management						
Partners	County Commission, City Councils, Emergency Services, NDDDES, Red Cross						
Completion Timeframe	3 to 5 years			Cost	\$75,000 to \$150,000		
Funding Source	Local, state and federal grants. FEMA Pre-Disaster Mitigation Grant Program (PDM).						
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	4	4	33
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized		Plan Element			Process for Integration		
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy		Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.		

8.3.4 Mitigation Capability Assessment

Capability for mitigation is divided into four categories: Administrative and Technical, Education and Outreach, Financial, and Planning and Regulatory. Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. **Tables comparing the mitigation capabilities of the city of Bowdon with all other jurisdictions in The Planning Area can be found in Chapter 7, County Mitigation Capability Assessment.**

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

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

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

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

8.3.5 Integration of Mitigation Plan into Planning Mechanisms

Integration of the plan into current planning mechanisms is critical in mitigation to communicate the needs of each jurisdiction to achieve an all-inclusive mitigation strategy. The process for integration of the mitigation plan is included after each mitigation project, which shows the planning mechanism utilized, the plan element used for integration and the process for integration.

8.3.6 Plan Maintenance

An important aspect of any useable plan is the maintenance and upkeep of the document. At any given time, planning, risk analysis, updating the situation assessment, research, coordinating, disaster response or other activity is occurring. Plan maintenance ensures the plan will remain useful in the county for many years. A mitigation action progress report form to conduct plan maintenance is in Chapter 10 of this plan.

8.4 City of Cathay

The following profile includes information specific to the city of Cathay for mitigation planning purposes. The information included is as follows:

- Profile and Inventory;
- Risk Assessment;
- Hazard Scoring Notes;
- Mitigation Projects, and
- Capabilities for Mitigation.

Integration into Planning Mechanisms

The process for integration of the mitigation plan into existing planning mechanisms is discussed at the bottom of each mitigation project in section 8.4.4, section 8.4.5 and in Chapter 6, Mitigation Strategy.

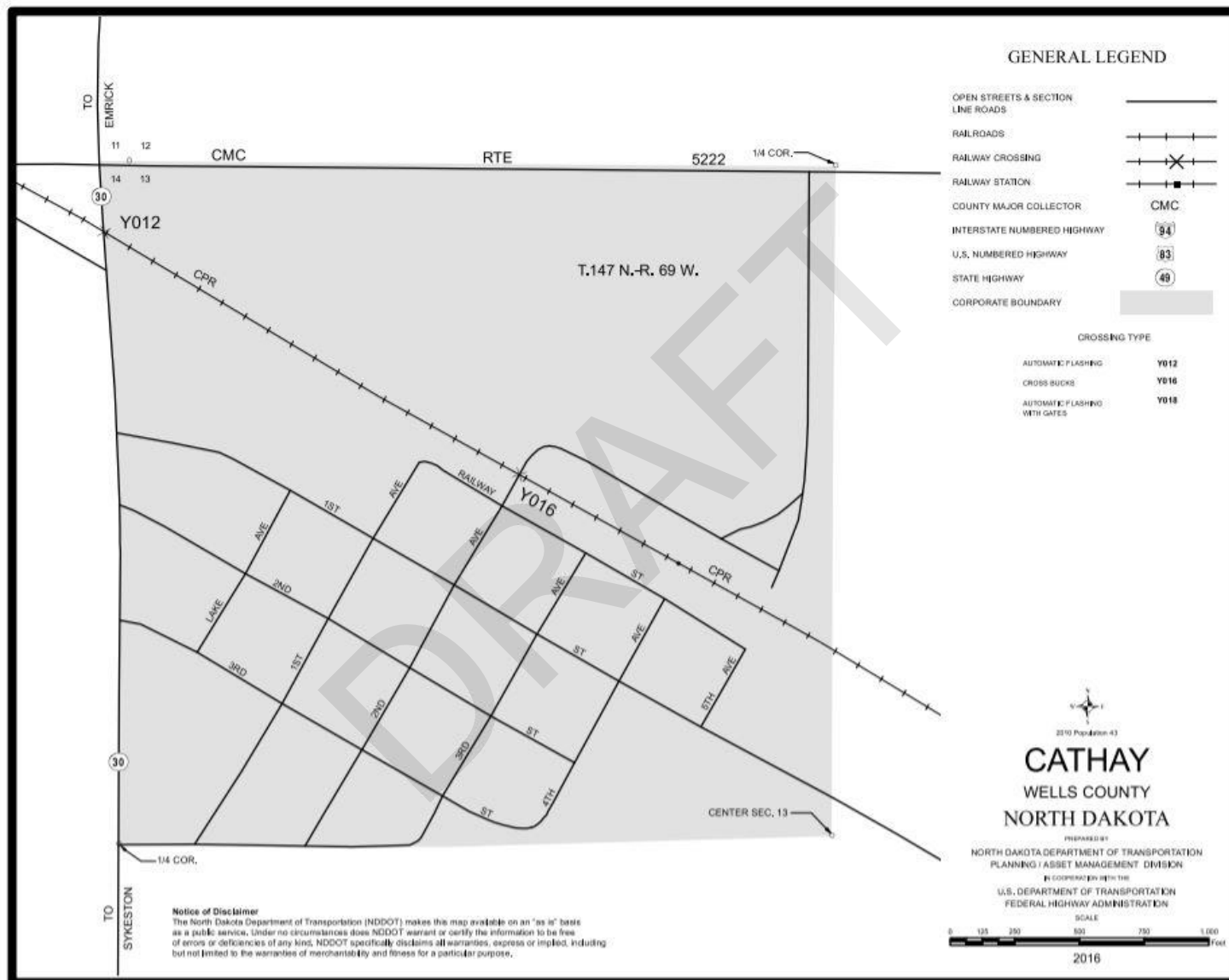
Plan Maintenance

Plan maintenance is shown in section 8.4.6.

Critical Facilities and Infrastructure

Figure 8.8.1 is a map of the city of Cathay.

Figure 8.4.1 – City of Cathay Base Map



Source: N.D. Dept. of Transportation

8.4.1 Profile and Inventory

The location, total population, vulnerable populations, housing units and household size, businesses, critical facilities and infrastructure, new and future development, services, jurisdictional buildings, emergency response services and utilities are shown for the city of Cathay. Detailed narratives follow each section heading to profile the city.

Detailed information on public buildings, services provided, emergency response services and utilities can be found in Chapter 4, Profile and Inventory.

Location

The city of Cathay is in east-central Wells County on N.D. Highway 30 approximately seven miles north of the city of Sykeston. N.D. Highway 30 and N.D. Highway 200 intersect at the city of Sykeston. The city is located approximately 16 miles south-southeast of the city of Fessenden, the county seat, and approximately 33 miles south-southeast of the city of Harvey, the largest city in The Planning Area.

Population

Per the 2010 U.S. Decennial Census the city of Cathay contains 43 people. The 2011 to 2015 American Community Survey 5-Year Estimate recorded a population of 53 people, an increase of 10 people, or 23.3 percent from 2010.

Vulnerable Populations

Per the 2010 U.S. Decennial Census, the population of the city of Cathay consists of 13 individuals under the age of 20, and nine individuals age 65 and older, representing 30.2 percent and 20.9 percent of the population, respectively.

There is not a public school located in the city.

There are no age-restricted and senior housing developments located in the city.

Housing Units and Household Size

The 2011 to 2015 American Community Survey 5-Year Estimate shows there is a total of 27 housing units in the city consisting of 26 single-family homes, no multifamily homes and one mobile home.

Per the 2010 U.S. Decennial Census, there are 19 households in the city of Cathay resulting in an average household size of 2.26 people.

Businesses

Businesses located in the city of Cathay include:

New and Future Development

New and future development over the last five years in the city of Cathay includes construction of several new homes and removal of blighted/abandoned properties. The city is looking to build a new community center that will include space for the city hall, fire hall and a storm shelter.

8.4.1 Risk Assessment and Hazard Scoring Notes

Table 8.4.1 summarizes the risk assessment scoring of the city of Cathay. The risk assessment and hazard scoring notes for each hazard specific to the city are shown after Table 8.4.1. Risk assessment notes for impact, frequency, likelihood and vulnerability ubiquitous for jurisdictions in The Planning Area are found in Chapter 5, Threat and Hazard Identification Assessment in each respective hazard profile.

Table 8.4.1 – City of Cathay Jurisdiction Risk Assessment Scoring Summary

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

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

Table 8.4.2 – City of Cathay Jurisdiction Risk Assessment

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Communicable Disease	<ul style="list-style-type: none"> Evacuation (localized) Mass Casualties 	<ul style="list-style-type: none"> Annual occurrences of influenza and other disease. 	<u>More likely</u> <ul style="list-style-type: none"> High elderly population Agriculture economy 	<u>More vulnerable</u> <ul style="list-style-type: none"> Inadequate drainage in certain areas of the city Agriculture economy Presence of abandoned buildings 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> District Health conducting education and outreach 	<u>Less vulnerable</u> <ul style="list-style-type: none"> District Health conducting education and outreach 	
Dam Failure	<ul style="list-style-type: none"> Washing out of roads Limited access to and from city for emergency services 	<ul style="list-style-type: none"> Never an occurrence of a failure of the Cathay Dam 	<u>More likely</u> <ul style="list-style-type: none"> Presence of Cathay Dam Heavy snowfall/heavy rains resulting in substantial spring melt 	<u>More vulnerable</u> <ul style="list-style-type: none"> Presence of Cathay Dam Heavy snowfall/heavy rains resulting in substantial spring melt 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Emergency Action Plan 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Emergency Action Plan 	
Drought	<ul style="list-style-type: none"> Increased Fire Potential Loss of Economy (decline in hunting activity) 	<ul style="list-style-type: none"> Annual periods of dry conditions 10-year cycle Drought of 1988 and 1989 2008 had dry conditions Burn bans implemented annually 	<u>More likely</u> <ul style="list-style-type: none"> Overdue for drought based on wet/dry cycle 	<u>More vulnerable</u> <ul style="list-style-type: none"> High elderly population 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Modern agricultural practices and no-till farming will decrease severity and help limit impact 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Modern agricultural practices and no-till farming will decrease severity and help limit impact 	

Table 8.4.2 – City of Cathay Jurisdiction Risk Assessment - Continued

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Flood	<ul style="list-style-type: none"> Blocked roads Limited access for emergency services Property damage Flooding (street & structure) 	<ul style="list-style-type: none"> Multiple instances of blocked roads and overland flooding in the city during heavy rain events or spring snow melt 	<u>More likely</u> <ul style="list-style-type: none"> Inadequate drainage in certain areas of the city 	<u>More vulnerable</u> <ul style="list-style-type: none"> Sanitary sewer system/lagoons need upgrading 	See Chapter 7
			<u>Less likely</u>	<u>Less vulnerable</u> <ul style="list-style-type: none"> Some drain tile in the area 	
Hazardous Material Release	<ul style="list-style-type: none"> Evacuation (localized)/Shelter-in-Place Explosion Human Injury/Death Increased fire potential 	<ul style="list-style-type: none"> No major incidents reported in city limits 	<u>More likely</u> <ul style="list-style-type: none"> Farmers hauling more chemicals used and stored locally 	<u>More vulnerable</u> <ul style="list-style-type: none"> Presence of chemical/fertilizer plant in city limits 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> No elevator 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Railroad inactive Truck route 	
Homeland Security Incident	<ul style="list-style-type: none"> Evacuation (full) 	<ul style="list-style-type: none"> Annual occurrences of localized vandalism 	<u>More likely</u> <ul style="list-style-type: none"> No local law enforcement 	<u>More vulnerable</u> <ul style="list-style-type: none"> High elderly population No local law enforcement 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Sparse population Inactive railroad 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Sparse population Inactive railroad 	
Severe Summer Weather	<ul style="list-style-type: none"> Loss of power/downed lines Blocked roads Sewer Backup 	<ul style="list-style-type: none"> Multiple storms annually 	<ul style="list-style-type: none"> Climatic patterns of the area will result in several storms per year 	<u>More vulnerable</u> <ul style="list-style-type: none"> Lack of local alerting Lack of storm shelter with generator 	See Chapter 7
				<u>Less vulnerable</u> <ul style="list-style-type: none"> Advanced weather forecasting/warning Reverse 911 	

Table 8.4.2 – City of Cathay Jurisdiction Risk Assessment - Continued

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Severe Winter Weather	<ul style="list-style-type: none"> Loss of power/downed lines Blocked roads for emergency services and general economic activity Sewer Backup 	<ul style="list-style-type: none"> Multiple storms (around 3 to 5) annually Major storm with power outages in surrounding area Christmas 2016 	<ul style="list-style-type: none"> Climatic patterns of the area will result in several storms per year 	<u>More vulnerable</u> <ul style="list-style-type: none"> Lack of local alerting Lack of storm shelter with generator 	See Chapter 7
				<u>Less vulnerable</u> <ul style="list-style-type: none"> Advanced weather forecasting/warning Reverse 911 	
Transportation Accident	<ul style="list-style-type: none"> Blocked Roads Human Injury/Death 	<ul style="list-style-type: none"> No major accidents in the last 15 years 	<u>More likely</u> <ul style="list-style-type: none"> N.D. Highway 30 	<u>More vulnerable</u> <ul style="list-style-type: none"> N.D. Highway 30 Bar in city limits 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Increased education and awareness 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Increased education and awareness Traffic control signage No school or elevator 	
Urban Fire/Structure Collapse	<ul style="list-style-type: none"> Property Damage Human Injury/Death Loss of Potable Water 	<ul style="list-style-type: none"> Small fires reported once every couple of years 	<u>More likely</u> <ul style="list-style-type: none"> Presence of buildings with outdated electrical Older structures 	<u>More vulnerable</u> <ul style="list-style-type: none"> Presence of buildings with outdated electrical Older structures 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Increased education and awareness 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Sparse population 	

Table 8.4.2 – City of Cathay Jurisdiction Risk Assessment - Continued

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Wildland Fire	<ul style="list-style-type: none"> Delayed Emergency Response 	<ul style="list-style-type: none"> Controlled burns out of control approximately 50 percent of time 	<u>More likely</u> <ul style="list-style-type: none"> Dry conditions (when present) 	<u>More vulnerable</u> <ul style="list-style-type: none"> Lack of fire break around city 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Farmers have supply of water on site 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Locals clear excess vegetation 	
Windstorm	<ul style="list-style-type: none"> Loss of power/downed lines Blocked roads for emergency services and general economic activity Sewer Backup 	<ul style="list-style-type: none"> Multiple storms annually Straight-line winds event occurred in 2015 	<ul style="list-style-type: none"> Climatic patterns of the area will result in several storms per year Flat terrain and constant strong wind gusts 	<u>More vulnerable</u> <ul style="list-style-type: none"> Healthy urban canopy Flat terrain and open topography Lack of official storm shelter 	See Chapter 7

8.4.3 Mitigation Strategy

The Eddy & Wells Counties Multi-Jurisdictional Multi-Hazard Plan Update includes a mitigation strategy consisting of six goals in Chapter 6. The following problem statement and mitigation projects address the mitigation needs of the city of Cathay. It should be noted that some mitigation projects that pertain to all jurisdictions are included to encourage county-wide collaboration.

Problem Statement

The city of Cathay can be impacted by communicable disease, drought, flood (overland and riverine), hazardous material release, severe summer weather, severe winter weather, urban fire/structure collapse, wildland fire, and windstorm. The city experiences overall flooding on city streets connecting to N.D. Highway 30 resulting in blocked access for emergency services. Economic losses from a diminished tax base (property losses, crop and livestock loss) can ensue after natural disasters. The city does not have an official storm shelter, lacks an early warning system and does not have generators for backup power at critical facilities. The city lacks funding for mitigation projects. With little to no capabilities to accomplish major projects independently, the city is dependent on outside sources for mitigation.

Improved drainage, installation of an early warning system, generators for backup power, construction of a storm shelter, expansion of planning and regulatory capabilities, and education and outreach are a priority for the city.

City of Cathay Project 1: Upgrade existing storm water drainage system/ditches to reduce or eliminate occurrences of overland flooding and maintain access for emergency services.

Description/Benefit	Upgrade drainage infrastructure by upgrade ditches to improve drainage and reduce or eliminate occurrences of overland flooding and blocked roads. The street west of the fire hall to the highway is most frequently impacted.						
Hazards Addressed	Communicable Disease, Flood (riverine and overland), Severe Summer Weather, Severe Winter Weather, Windstorm						
Affected Jurisdiction(s)	City of Cathay						
Project Status	New						
Priority	High						
Responsible Agency	City Council						
Partners	Emergency Management, Emergency Services, Public Works, NDDes						
Completion Timeframe	2 years				Cost	Project-specific	
Funding Source	Local, state and federal grants.						
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
4	5	4	4	4	4	5	30
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city council	

Wells County Project AT-3: Upgrade and expand early warning system(s).

Description/Benefit		Coverage of current outdoor early warning system/sirens does not provide coverage to an adequate geographic expanse of the county. Upgrade existing manually-activated sirens to dispatch-activated sirens. Install new dispatch-activated sirens where necessary. There are no existing outdoor early warning sirens for the county outside incorporated cities. Purchase NOAA weather radios for rural communities. <ul style="list-style-type: none">• Upgrade: City of Fessenden (keep existing in same location), City of Sykeston• New: City of Bowdon, City of Fessenden (inside public school), City of Hurdsville• NOAA Weather Radios: City of Cathay, City of Hamberg; Heimdal (unincorporated) <i>The city of Harvey has ordered new sirens which will be installed sometime in 2017.</i>					
Hazards Addressed		Flood, Hazardous Material Release, Severe Summer Weather, Wildland Fire (All)					
Affected Jurisdiction(s)		Wells County and incorporated jurisdictions					
Project Status		Ongoing					
Priority		High					
Responsible Agency		City Councils, Emergency Management					
Partners		County Commission, Emergency Services, FEMA, NDDDES, NWS					
Completion Timeframe		1 to 2 years			Cost	Up to \$25,000 per siren, plus installation	
Funding Source		9-1-1 funding. State Homeland Security Grant Program. City and county general fund.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.	

Wells County Project AT-7: Install permanent generators and upgrade existing permanent or portable generators, at critical facilities and infrastructure.

Description/Benefit	Upgrade existing generators or install new generators to establish permanent source of backup power to maintain continued operation of the following critical facilities and infrastructure: <u>Upgrade</u> <ul style="list-style-type: none">Wells County Shop (Fessenden and Harvey) <u>Install new</u> <ul style="list-style-type: none">City of Bowdon: Water pump station, fire station (sized for construction of new fire hall)City of Cathay: Fire hall, lift station and pumphouseCity of Fessenden: Fessenden-Bowdon Public School, lift stations, city shop, city hall/fire department/police department, pump houseCity of Harvey: Armory/city hall/police station, B.M. Hanson Elementary, fire station, Harvey High School, Harvey Ambulance HallCity of Hurdsfield: Lift stationCity of Sykeston: Lift station, fire hall, water tower for recirculation pump						
Hazards Addressed	All hazards						
Affected Jurisdiction(s)	Wells County and incorporated jurisdictions						
Project Status	Ongoing						
Priority	High						
Responsible Agency	County Commission, City Councils, Emergency Management						
Partners	County Highway Dept., Emergency Services, Medical Services Providers, Public Utilities						
Completion Timeframe	2 to 3 years				Cost	\$30,000 to \$60,000	
Funding Source	Public Utilities, RD. FEMA Pre-Disaster Mitigation Grant Program (PDM). State Homeland Security Grants.						
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	5	4	4	32
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element Utilized			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.	

Wells County Project AT-8: Create and establish permanent county-wide maintenance system for drainage ditches and storm water systems to reduce or eliminate occurrences of overland flooding.

Description/Benefit		Create county-wide drainage ditch/storm water maintenance system to control flow of runoff to eliminate blocked roads, maintain access for city residents and emergency services, and continued operation of public infrastructure.					
Hazards Addressed		Communicable Disease, Drought, Flood (Overland), Severe Summer Weather, Severe Winter Weather, Wildland Fire, Windstorm					
Affected Jurisdiction(s)		Wells County and incorporated jurisdictions					
Project Status		New					
Priority		Medium					
Responsible Agency		City Councils, County Commission, County Highway Dept., Public Works					
Partners		Emergency Services, NDDH, Public Health, SWC, USDA, Water District					
Completion Timeframe		1 to 2 years			Cost	Staff-time	
Funding Source		Local budgets. State and federal grants.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	4	5	3	31
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element Utilized			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.	

8.4.4 Mitigation Capability Assessment

Capability for mitigation is divided into four categories: Administrative and Technical, Education and Outreach, Financial, and Planning and Regulatory. Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. **Tables comparing the mitigation capabilities of the city of Cathay with all other jurisdictions in The Planning Area can be found in Chapter 7, County Mitigation Capability Assessment.**

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

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

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

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

8.4.5 Integration of Mitigation Plan into Planning Mechanisms

Integration of the plan into current planning mechanisms is critical in mitigation to communicate the needs of each jurisdiction to achieve an all-inclusive mitigation strategy. The process for integration of the mitigation plan is included after each mitigation project, which shows the planning mechanism utilized, the plan element used for integration and the process for integration.

8.4.6 Plan Maintenance

An important aspect of any useable plan is the maintenance and upkeep of the document. At any given time, planning, risk analysis, updating the situation assessment, research, coordinating, disaster response or other activity is occurring. Plan maintenance ensures the plan will remain useful in the county for many years. A mitigation action progress report form to conduct plan maintenance is in Chapter 10 of this plan.

8.5 City of Fessenden

The following profile includes information specific to the city of Fessenden for mitigation planning purposes. The information included is as follows:

- Profile and Inventory;
- Risk Assessment;
- Hazard Scoring Notes;
- Mitigation Projects, and
- Capabilities for Mitigation.

Integration into Planning Mechanisms

The process for integration of the mitigation plan into existing planning mechanisms is discussed at the bottom of each mitigation project in section 8.5.4, section 8.5.5 and in Chapter 6, Mitigation Strategy.

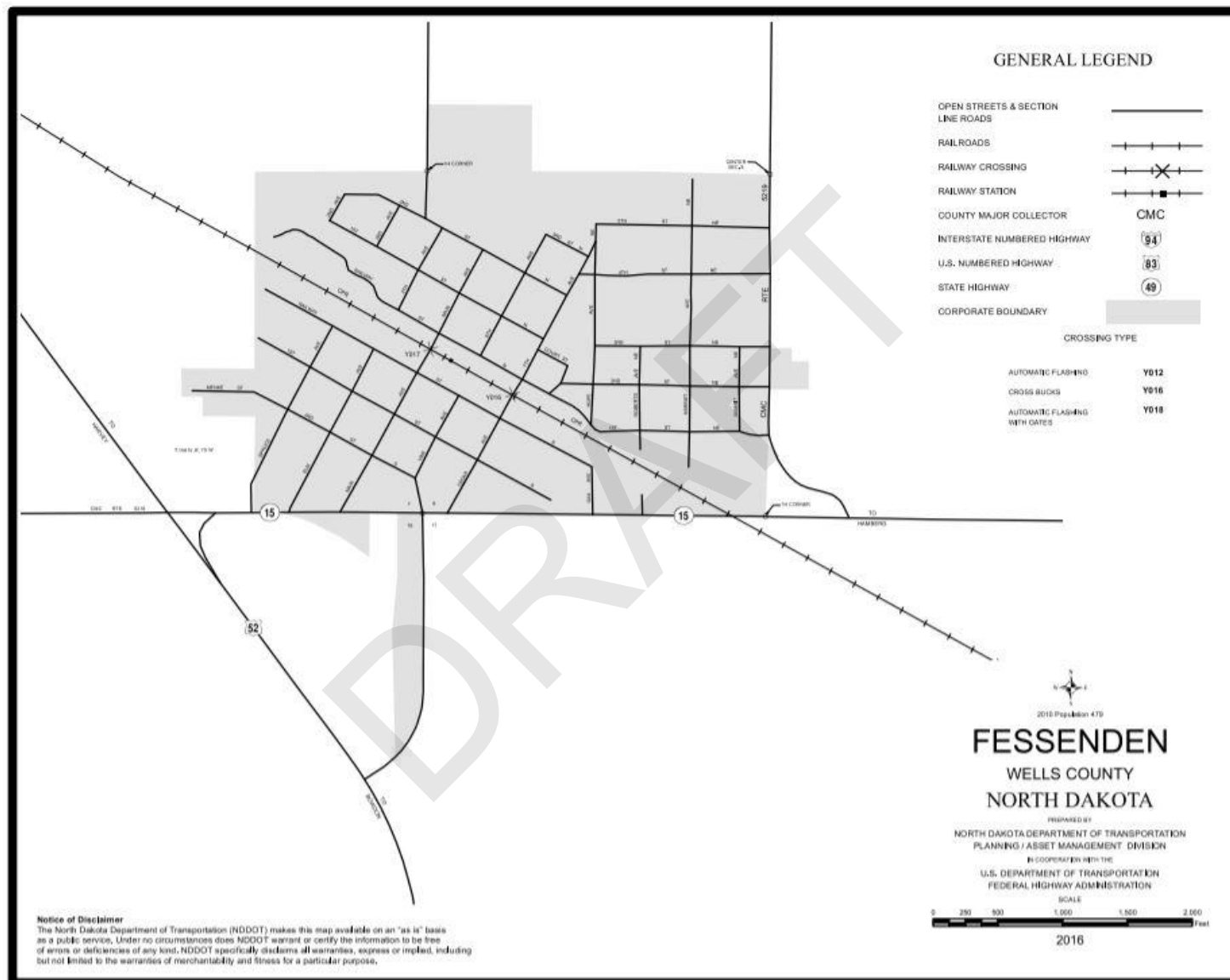
Plan Maintenance

Plan maintenance is shown in section 8.5.6.

Critical Facilities and Infrastructure

Figure 8.8.1 is a map of the city of Fessenden.

Figure 8.5.1 – City of Fessenden Base Map



Source: N.D. Dept. of Transportation

8.5.1 Profile and Inventory

The location, total population, vulnerable populations, housing units and household size, businesses, critical facilities and infrastructure, new and future development, services, jurisdictional buildings, emergency response services and utilities are shown for the city of Fessenden. Detailed narratives follow each section heading to profile the city.

Detailed information on public buildings, services provided, emergency response services and utilities can be found in Chapter 4, Profile and Inventory.

Location

The city of Fessenden is located at the intersection of U.S. Highway 52 and N.D. Highway 15 in central Wells County. The city is the county seat and is located approximately 17 miles southeast of the city of Harvey, the largest city in The Planning Area.

Population

Per the 2010 U.S. Decennial Census the city of Fessenden contains 479 people. The 2011 to 2015 American Community Survey 5-Year Estimate recorded a population of 464 people, a decrease of 15 people, or 3.1 percent from 2010.

Vulnerable Populations

Per the 2010 U.S. Decennial Census, the population of the city of Fessenden consists of 86 individuals under the age of 20, and 145 individuals age 65 and older, representing 18.0 percent and 30.3 percent of the population, respectively.

- The city is the location of the Fessenden-Bowdon Public School serving grades K to 12 with approximately 140 students as of the 2016/2017 academic school year.
- The city is home to the Wells County Fair which is held annually during the summer months and can attract up to 1,000 people.
- There are no age-restricted and senior housing developments located in the city. However, Four Corporation Group Homes has a location in the city with five consumers.

Housing Units and Household Size

The 2011 to 2015 American Community Survey 5-Year Estimate shows there is a total of 283 housing units in the city consisting of 237 single-family homes, 19 multifamily homes and 27 mobile homes.

Per the 2010 U.S. Decennial Census, there are 236 households in the city of Fessenden resulting in an average household size of 2.03 people.

Businesses

Information on businesses and economic development in the city of Fessenden can be obtained by contacting Fessenden Civic & Commerce.

New and Future Development

New development in the city of Fessenden over the last five years includes: café on main street was constructed, the elevator has added on a storage/cement building and the city replaced water mains, installed a new pumphouse and sewer pipes in 2013.

Future development in the next five years includes replacement of the city water tower and conversation of the American Legion into a daycare center.

8.5.1 Risk Assessment and Hazard Scoring Notes

Table 8.5.1 summarizes the risk assessment scoring of the city of Fessenden. The risk assessment and hazard scoring notes for each hazard specific to the city are shown after Table 8.5.1. Risk assessment notes for impact, frequency, likelihood and vulnerability ubiquitous for jurisdictions in The Planning Area are found in Chapter 5, Threat and Hazard Identification Assessment in each respective hazard profile.

Table 8.5.1 – City of Fessenden Jurisdiction Risk Assessment Scoring Summary

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

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

Table 8.5.2 – City of Fessenden Jurisdiction Risk Assessment

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Communicable Disease	<ul style="list-style-type: none"> • Business interruptions • Children missing school • Delayed Emergency Response 	<ul style="list-style-type: none"> • Annual occurrences of influenza and other disease. 	<u>More likely</u> <ul style="list-style-type: none"> • High youth and elderly population • Agriculture economy • Society more mobile 	<u>More vulnerable</u> <ul style="list-style-type: none"> • High youth and elderly population • Agriculture economy • Sanitary sewer/lagoon oldest system in the United States • Presence of abandoned buildings 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> • Education and outreach at public school • Spraying for mosquitos • District Health conducting education and outreach 	<u>Less vulnerable</u> <ul style="list-style-type: none"> • Mass media/internet • Spraying for mosquitos • District Health conducting education and outreach 	
Drought	<ul style="list-style-type: none"> • Business Interruptions • Crop Loss • Increased Fire Potential • Loss of Economy (decline in hunting activities) • Fire along railroad infrastructure • Increase in insect populations further impacting crops, livestock and people • Property Damage • Loss of water due to outdated water tower • Farm equipment fires 	<ul style="list-style-type: none"> • Annual periods of dry conditions • 10-year cycle • Drought of 1988 and 1989 • 2008 had dry conditions • Burn bans implemented annually 	<u>More likely</u> <ul style="list-style-type: none"> • Overdue for drought based on wet/dry cycle • Result of climatic patterns 	<u>More vulnerable</u> <ul style="list-style-type: none"> • High youth and elderly population • Lots of sloughs and dry grasses in local area • Agriculture economy • City has 500,000-gallon water tower built in 1921 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> • Modern agricultural practices and no-till farming will decrease severity and help limit impact 	<u>Less vulnerable</u> <ul style="list-style-type: none"> • Modern agricultural practices and no-till farming will decrease severity and help limit impact 	

Table 8.5.2 – City of Fessenden Jurisdiction Risk Assessment – Continued

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Flood	<ul style="list-style-type: none"> Blocked roads limiting access for emergency services Overland flooding of low-lying city streets Overland flooding north of public school N.D. Highway 15 underpass becomes blocked Sewer Backup Property Damage 	<ul style="list-style-type: none"> Multiple instances of blocked roads and overland flooding approximately four times annually 1993-major flood 	<u>More likely</u> <ul style="list-style-type: none"> Undersized culverts Undersized storm water lines Inadequate drainage 	<u>More vulnerable</u> <ul style="list-style-type: none"> Undersized culvert at intersection of Railway Street and Oak Avenue Undersized storm water north of public school Northeast portion of the city between County Road 1 and 7th Ave N Undersized man-made Fessenden Drain #2 Undersized storm water on 2nd St S. and Main N.D. Highway 15 underpass 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> City public works continuously working to clear drains and improve drainage 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Undersized man-made Fessenden Drain #2 due to flat terrain Flood ordinances 	
Hazardous Material Release	<ul style="list-style-type: none"> Potential for loss of life/injury Evacuation (localized)/Shelter-in-Place Explosion HAZMAT Release Human Injury/Death Increased fire potential 	<ul style="list-style-type: none"> No major incidents reported in city limits Heimdal located in the county just northeast of the city experienced explosive train derailment in 2015 	<u>More likely</u> <ul style="list-style-type: none"> Increase in oil and gas railroad traffic, and ag and chemical traffic Presence of U.S. Highway 52 by the city 	<u>More vulnerable</u> <ul style="list-style-type: none"> Increase in oil and gas railroad traffic, and ag and chemical traffic Presence of U.S. Highway 52 by the city 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Ordinances in place to address hazardous material sites 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Ordinances in place to address hazardous material sites Access to state and regional HAZMAT 	

Table 8.5.2 – City of Fessenden Jurisdiction Risk Assessment - Continued

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Homeland Security Incident	<ul style="list-style-type: none"> Evacuation (full) Human Injury/Death Loss/Overcrowded Medical facilities Loss of power/downed power lines Mass Casualties School Closure 	<ul style="list-style-type: none"> Never any major occurrences other than annual occurrences of localized vandalism 	<u>More likely</u> <ul style="list-style-type: none"> Presence of school Wells County Seat & county courthouse Drug transportation increasing on highways through the area Railroad traversing through center of city 	<u>More vulnerable</u> <ul style="list-style-type: none"> High youth and elderly population Agriculture, and oil and gas economy No hospital Presence of U.S. Highway 52 Presence of school Wells County Seat & county courthouse Drug transportation increasing on highways through the area Railroad traversing through center of city 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Sparse population No large regional or international attractions 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Sparse population No commercial passenger air service 	
Severe Summer Weather	<ul style="list-style-type: none"> Loss of power/downed lines Flooding of streets/areas with poor drainage from rain (See flood notes) Blocked roads for emergency services and general economic activity Human Injury/Death Sewer backup Loss of Water 	<ul style="list-style-type: none"> Multiple storms annually 	<ul style="list-style-type: none"> Climatic patterns of the area will result in several storms per year 	<u>More vulnerable</u> <ul style="list-style-type: none"> Lack of storm shelter Lack of generators at public school, city shop, city hall, lift stations, pumphouse Inadequate drainage 	See Chapter 7
				<u>Less vulnerable</u> <ul style="list-style-type: none"> Advanced weather forecasting/warning Dispatch-activated siren Reverse 911 	

Table 8.5.2 – City of Fessenden Jurisdiction Risk Assessment - Continued

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Severe Winter Weather	<ul style="list-style-type: none"> Blocked at-grade crossings with railroad Limited access for emergency services School Closure Loss of power/downed lines Lack of snow removal equipment Human Injury/Death 	<ul style="list-style-type: none"> Multiple storms (around 3 to 5) annually Major storm with power outages in surrounding area Christmas 2016 	<ul style="list-style-type: none"> Climatic patterns of the area will result in several storms per year 	<u>More vulnerable</u> <ul style="list-style-type: none"> Lack of storm shelter Lack of generators at public school, city shop, city hall, lift stations, pumphouse Inadequate drainage Lack of grade-separated railroad crossing in city Inadequate drainage Lack of shelter belt on south side of city 	See Chapter 7
				<u>Less vulnerable</u> <ul style="list-style-type: none"> Advanced weather forecasting/warning Dispatch-activated siren Reverse 911 	
Transportation Accident	<ul style="list-style-type: none"> Blocked Roads Delayed Emergency Response Evacuation (localized) HAZMAT Release Human Injury/Death Mass Casualties 	<ul style="list-style-type: none"> Multiple accidents at intersection of U.S. Highway 52 and N.D. Highway 15-road to blocked Major auto accident once every other year 	<u>More likely</u> <ul style="list-style-type: none"> Increased oil and gas railroad activity and truck traffic with chemicals and U.S. Highway 52 and N.D. Highway 3 	<u>More vulnerable</u> <ul style="list-style-type: none"> Increased oil and gas railroad activity and truck traffic with chemicals Railroad through center of city U.S. Highway 52 and N.D. Highway 3 Airport located two miles north of city 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Increased education and awareness 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Increased education and awareness Traffic control signage 	

Table 8.5.2 – City of Fessenden Jurisdiction Risk Assessment - Continued

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Urban Fire/Structure Collapse	<ul style="list-style-type: none"> Property Damage HAZMT Release Human Injury/Death Loss of Power 	<ul style="list-style-type: none"> Bar & Supper Club, and Main Street Café burned to ground in 2009 Auto parts and service store burned down in 2004/2005 	<u>More likely</u> <ul style="list-style-type: none"> Presence of older commercial and residential buildings with outdated electrical Older downtown structures sharing common walls and single-family spaced close together 	<u>More vulnerable</u> <ul style="list-style-type: none"> Presence of buildings with outdated electrical Older downtown structures close together Lack of smoke detectors at Wells County Courthouse No generator at fire station or pumphouse 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Increased education and awareness Smoke detectors at critical facilities and infrastructure 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Spacing of houses and structures (new) Building codes adopted Fire dept. with new equipment and training 	
Wildland Fire	<ul style="list-style-type: none"> Loss of Economy Strain on local emergency response resources Fires along railroad tracks Damage to county fair grounds and areas in south-central portion of the city 	<ul style="list-style-type: none"> Controlled burns out of control approximately 50 percent of time One major fire annually Shelterbelt fire in 2016 	<u>More likely</u> <ul style="list-style-type: none"> Increased truck and railroad traffic Overgrown vegetation along railroad tracks Dry conditions (when present) 	<u>More vulnerable</u> <ul style="list-style-type: none"> Heavily wooded/vegetation across Vine Avenue from county fair grounds Railroad ditches No generator at fire station or pumphouse 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Burn Bans Less CRP Farmers have supply of water on site 	<u>Less vulnerable</u> <ul style="list-style-type: none"> City conducts mowing Emergency siren Tree row cleaned out north of town 	

Table 8.5.2 – City of Fessenden Jurisdiction Risk Assessment - Continued

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Windstorm	<ul style="list-style-type: none"> Blocked roads for emergency services Downed trees Human Injury/Death Increased Fire Potential Loss of Economy Loss of Potable Water Loss of Power/Downed Lines Property Damage Sewer Backup 	<ul style="list-style-type: none"> Multiple storms annually Straight-line winds event occurred in 2015 	<ul style="list-style-type: none"> Climatic patterns of the area will result in several storms per year Flat terrain and constant strong wind gusts 	<u>More vulnerable</u> <ul style="list-style-type: none"> Healthy urban canopy Flat terrain and open topography Lack of official storm shelter 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Increased education and awareness Smoke detectors at critical facilities and infrastructure 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Building codes Public works trims and clears excess branches and vegetation on an as-needed basis 	

8.5.3 Mitigation Strategy

The Eddy and Wells Counties Multi-Jurisdictional Multi-Hazard Plan Update includes a mitigation strategy consisting of six goals in Chapter 6. The following problem statement and mitigation projects address the mitigation needs of the city of Fessenden. It should be noted that some mitigation projects that pertain to all jurisdictions are included to encourage county-wide collaboration.

Problem Statement

The city of Fessenden can be impacted by communicable disease, drought, flood (overland and riverine), hazardous material release, severe summer weather, severe winter weather, urban fire/structure collapse, wildland fire, and windstorm. The city experiences overland flooding causing damage to property, and critical facilities and infrastructure due an inadequate storm water drainage system. Portions of the sanitary sewer system are among the oldest municipal systems in North America. Economic loss to the agriculture and livestock industry occurs on a frequent basis from natural hazards. The city lacks backup generators for critical facilities and infrastructure, does not have an official storm shelter, and has an outdated early warning system that needs expanding. The city is at risk to wildland fire due to surrounding topography, vegetation, and agriculture practices. Local emergency services need upgraded equipment. The city lacks funding for mitigation projects. With little to no capabilities to accomplish major projects independently, the city is dependent on outside sources for mitigation.

Improved drainage, installation of permanent backup power sources, upgrade sanitary sewer lagoons, upgrade water tower, installation of fire protection infrastructure and upgrading of fire protection equipment, expansion of planning and regulatory capabilities, and education and outreach are a priority for the city.

City of Fessenden Project 1: Study feasibility of constructing new or upgrading the existing lagoon.

Description/Benefit		The city of Fessenden was the first municipality in the North America to use a lagoon system for treating wastewater. The lagoon is passed its useful life and needs to be upgraded or a new system should be built.					
Hazards Addressed		Communicable Disease, Flood, Severe Summer Weather, Severe Winter Weather, Windstorm (all)					
Affected Jurisdiction(s)		City of Fessenden					
Project Status		New					
Priority		High					
Responsible Agency		City Council, Public Works					
Partners		Emergency Management, FEMA, Public Health, Public Utilities, SWC					
Completion Timeframe		5 years			Cost	\$100,000+	
Funding Source		Local, state and federal grants. FEMA, NDDDES, SWC.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element		Process for Integration		
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment		Study feasibility and cost of the project. Approval by city council.		

City of Fessenden Project 2: Upgrade existing storm water drainage system/ditches to reduce or eliminate occurrences of overland flooding and maintain access for emergency services.

Description/Benefit		Upgrade drainage infrastructure through the city of Fessenden with specific attention paid to the following locations to reduce or eliminate property damage and occurrences of standing water/overland flooding to maintain access for emergency services. <ul style="list-style-type: none">• Undersized culvert at intersection of Railway Street and Oak Avenue• Undersized storm water north of public school• Northeast portion of the city between County Road 1 and 7th Ave N• Undersized man-made Fessenden Drain #2• Undersized storm water on 2nd St S. and Main• N.D. Highway 15 underpass (NDDOT)					
Hazards Addressed		Communicable Disease, Flood (riverine and overland), Severe Summer Weather, Severe Winter Weather, Windstorm					
Affected Jurisdiction(s)		City of Fessenden					
Project Status		Ongoing and continue					
Priority		High					
Responsible Agency		City Council					
Partners		Emergency Management, Emergency Services, Public Works, NDDDES					
Completion Timeframe		Project-specific			Cost	Project-specific	
Funding Source		Local, state and federal grants.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	4	34
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city council	

City of Fessenden Project 3: Upgrade existing water tower to maintain supply of potable water for drinking and fire suppression.

Description/Benefit		The existing 500,000-gallon water tower was constructed in 1921 and is at the end of its useful life. This water is used by the fire department for fire suppression and by area farmers for agricultural practices. The existing tower is made of metal and is expensive and time-consuming to maintain.					
Hazards Addressed		Flood (riverine and overland), Severe Summer Weather, Severe Winter Weather, Urban Fire/Structure Collapse, Wildland Fire (all)					
Affected Jurisdiction(s)		City of Fessenden					
Project Status		New					
Priority		High					
Responsible Agency		City Council					
Partners		Emergency Management, Emergency Services, Public Works, RD. Private sector.					
Completion Timeframe		3 years			Cost	Project-specific	
Funding Source		Local, state and federal grants. City general fund. Water utility tax. Local sales tax.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element		Process for Integration		
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment		Study feasibility and cost of the project. Approval by city council.		

City of Fessenden Project 4: Install living snow fence on south side of the city.

Description/Benefit		Snow and debris accumulates in city limits from winds coming from the south. The snow and debris limits mobility and access for emergency services.					
Hazards Addressed		Severe Summer Weather, Severe Winter Weather, Windstorm					
Affected Jurisdiction(s)		City of Fessenden					
Project Status		New					
Priority		Medium					
Responsible Agency		City Council					
Partners		Emergency Management, Emergency Services, NRCS, Public Works					
Completion Timeframe		1 year			Cost	\$10,000	
Funding Source		Local, state and federal grants. City general fund. NRCS.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	3	5	5	4	4	4	30
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Study feasibility and cost of the project. Approval by city council.	

Wells County Project AT-7: Install permanent generators and upgrade existing permanent or portable generators, at critical facilities and infrastructure.

Description/Benefit	Upgrade existing generators or install new generators to establish permanent source of backup power to maintain continued operation of the following critical facilities and infrastructure: <u>Upgrade</u> <ul style="list-style-type: none">Wells County Shop (Fessenden and Harvey) <u>Install new</u> <ul style="list-style-type: none">City of Bowdon: Water pump station, fire station (sized for construction of new fire hall)City of Cathay: Fire hall, lift station and pumphouseCity of Fessenden: Fessenden-Bowdon Public School, lift stations, city shop, city hall/fire department/police department, pump houseCity of Harvey: Armory/city hall/police station, B.M. Hanson Elementary, fire station, Harvey High School, Harvey Ambulance HallCity of Hurdsfield: Lift stationCity of Sykeston: Lift station, fire hall, water tower for recirculation pump						
Hazards Addressed	All hazards						
Affected Jurisdiction(s)	Wells County and incorporated jurisdictions						
Project Status	Ongoing						
Priority	High						
Responsible Agency	County Commission, City Councils, Emergency Management						
Partners	County Highway Dept., Emergency Services, Medical Services Providers, Public Utilities						
Completion Timeframe	2 to 3 years				Cost	\$30,000 to \$60,000	
Funding Source	Public Utilities, RD. FEMA Pre-Disaster Mitigation Grant Program (PDM). State Homeland Security Grants.						
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	5	4	4	32
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element Utilized			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.	

Wells County PR-2: Update/expand existing or create new planning and regulatory capabilities to address development.

Description/Benefit		Build the planning and regulatory capability of incorporated jurisdictions by updating existing and/or expand and create new plans, policies, and ordinances. To ensure new and existing structures adhere to building standards to withstand impacts from oil and gas, and renewable energy development may lead to economic and population growth. <ul style="list-style-type: none">• Specific research should be conducted to address abandoned/blighted properties through zoning and other regulations.• Updating of emergency plans is a priority.• Specific regulations should be developed for museums and historic buildings to address mitigation. A list of plans, policies, codes and ordinances either in place or lacking in Wells County and incorporated jurisdictions can be found in Chapter 7.2 – Wells County Capability Assessment.					
Hazards Addressed		All					
Affected Jurisdiction(s)		Wells County and incorporated jurisdictions					
Project Status		Ongoing and Continue/New					
Priority		High					
Responsible Agency		City Councils, County Commission, Planning & Zoning					
Partners		Emergency Management, Emergency Services, County Highway Dept., NDAC, NDDH, NDDES, NDLC, Public Health, RD					
Completion Timeframe		2 to 5 years		Cost	\$0 to \$10,000		
Funding Source		Local budgets. Local, state and federal grants. Private sector.					
Values: 1 is low (negative impact and/or too costly) – Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	3	3	4	5	30
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element		Process for Integration		
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment		Approval by city councils. Approval by county commission.		

Wells County Project I-3: Upgrade existing or construct new storm shelters/community safe rooms.

Description/Benefit	Provide safe area of refuge for permanent residents and temporary populations a seasonal/recreational population from severe weather. Reduce/eliminate loss of life from hazards and man-made threats. Upgrade existing shelters to be fully ADA compliant and pet-friendly. Construct new storm shelters/community safe room in jurisdictions currently lacking a storm shelter/safe room. Emergency Management should contract American Red Cross to set up tour for designation of facilities in each jurisdiction. More information on community shelters can be found through the following link: https://www.fema.gov/media-library/assets/documents/5090 <ul style="list-style-type: none">• Wells County: Location in south-central portion of the county for use by rural residents/farmers. This area of the county has a strong population base and needs protection from severe weather.• Cities of Bowdon, Cathay, Hurdsfield and Sykeston• City of Fessenden/Wells County: Wells County Fair Grounds						
Hazards Addressed	All						
Affected Jurisdiction(s)	Wells County and incorporated jurisdictions						
Project Status	New						
Priority	High						
Responsible Agency	Emergency Management						
Partners	County Commission, City Councils, Emergency Services, NDDes, Red Cross						
Completion Timeframe	3 to 5 years				Cost	\$75,000 to \$150,000	
Funding Source	Local, state and federal grants. FEMA Pre-Disaster Mitigation Grant Program (PDM).						
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	4	4	33
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element		Process for Integration		
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment		Approval by city councils. Approval by county commission.		

8.5.4 Mitigation Capability Assessment

Capability for mitigation is divided into four categories: Administrative and Technical, Education and Outreach, Financial, and Planning and Regulatory. Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. **Tables comparing the mitigation capabilities of the city of Fessenden with all other jurisdictions in The Planning Area can be found in Chapter 7, County Mitigation Capability Assessment.**

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

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

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

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

8.5.5 Integration of Mitigation Plan into Planning Mechanisms

Integration of the plan into current planning mechanisms is critical in mitigation to communicate the needs of each jurisdiction to achieve an all-inclusive mitigation strategy. The process for integration of the mitigation plan is included after each mitigation project, which shows the planning mechanism utilized, the plan element used for integration and the process for integration.

8.5.6 Plan Maintenance

An important aspect of any useable plan is the maintenance and upkeep of the document. At any given time, planning, risk analysis, updating the situation assessment, research, coordinating, disaster response or other activity is occurring. Plan maintenance ensures the plan will remain useful in the county for many years. A mitigation action progress report form to conduct plan maintenance is in Chapter 10 of this plan.

8.6 City of Hamberg

The following profile includes information specific to the city of Hamberg for mitigation planning purposes. The information included is as follows:

- Profile and Inventory;
- Risk Assessment;
- Hazard Scoring Notes;
- Mitigation Projects, and
- Capabilities for Mitigation.

Integration into Planning Mechanisms

The process for integration of the mitigation plan into existing planning mechanisms is discussed at the bottom of each mitigation project in section 8.6.4, section 8.6.5 and in Chapter 6, Mitigation Strategy.

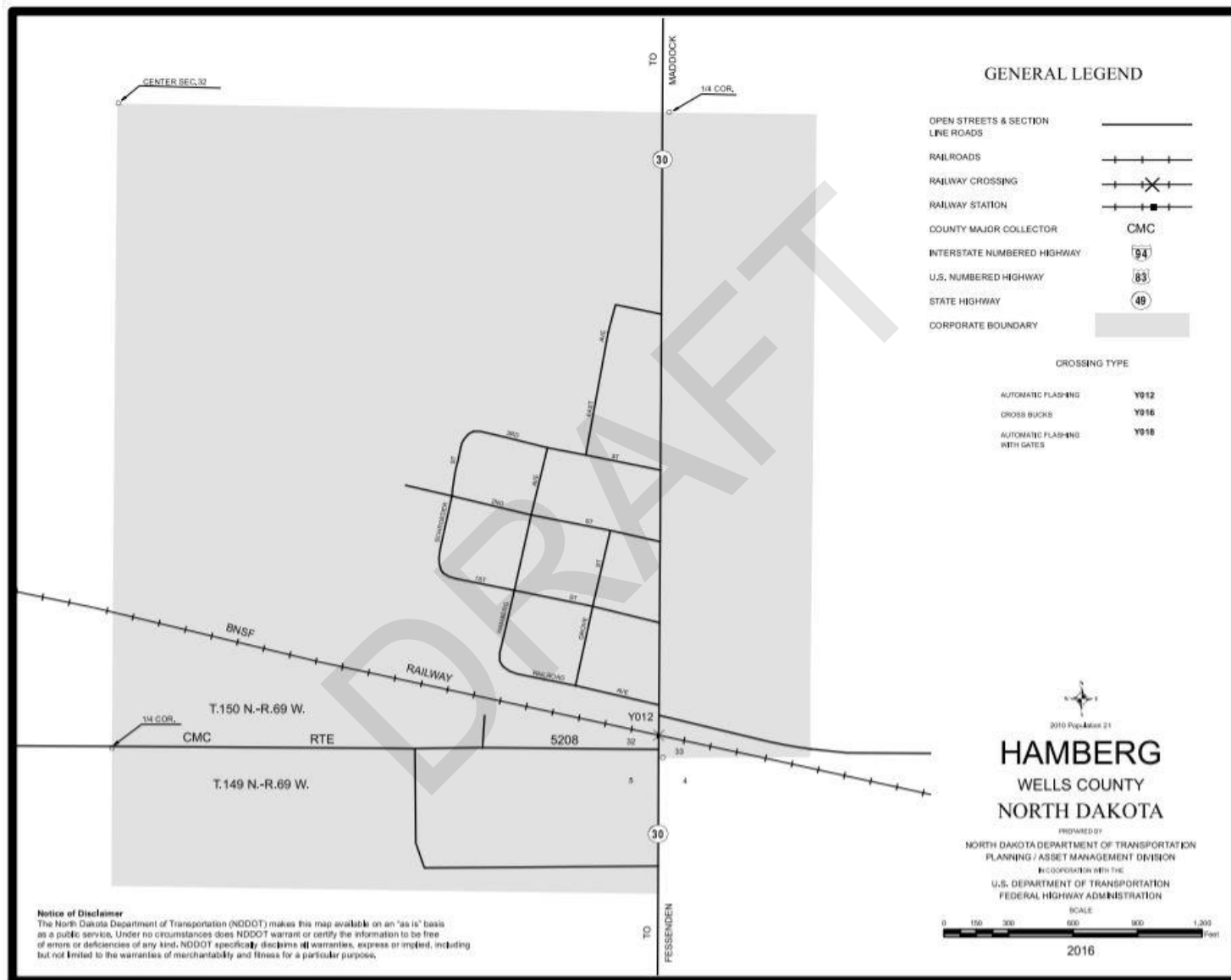
Plan Maintenance

Plan maintenance is shown in section 8.6.6.

Critical Facilities and Infrastructure

Figure 8.8.1 is a map of the city of Hamberg.

Figure 8.6.1 – City of Hamberg Base Map



Source: N.D. Dept. of Transportation

8.6.1 Profile and Inventory

The location, total population, vulnerable populations, housing units and household size, businesses, critical facilities and infrastructure, new and future development, services, jurisdictional buildings, emergency response services and utilities are shown for the city of Hamberg. Detailed narratives follow each section heading to profile the city.

Detailed information on public buildings, services provided, emergency response services and utilities can be found in Chapter 4, Profile and Inventory.

Location

The city of Hamberg is in northeast Wells County on N.D. Highway 30. The city is located approximately 14 miles northeast of the city of Fessenden, the county seat, and approximately 20 miles east of the city of Harvey, the largest city in The Planning Area.

Population

Per the 2010 U.S. Decennial Census the city of Hamberg contains 21 people. The 2011 to 2015 American Community Survey 5-Year Estimate recorded a population of 16 people, a decrease of five people, or 23.8 percent from 2010.

Vulnerable Populations

Per the 2010 U.S. Decennial Census, the population of the city of Hamberg consists of two individuals under the age of 20, and seven individuals age 65 and older, representing 9.5 percent and 33.3 percent of the population, respectively.

There is not a public school located in the city.

There are no age-restricted and senior housing developments located in the city.

Housing Units and Household Size

The 2011 to 2015 American Community Survey 5-Year Estimate shows there is a total of 12 housing units in the city consisting of 10 single-family homes, no multifamily homes and two mobile homes.

Per the 2010 U.S. Decennial Census, there are 11 households in the city of Hamberg resulting in an average household size of 1.91 people.

Businesses

There are no businesses located in the city of Hamberg.

New and Future Development

New and future development over the last five years in the city of Cathay includes construction of several new homes and removal of blighted/abandoned properties. The city is looking to build a new community center that will include space for the city hall, fire hall and a storm shelter.

8.6.1 Risk Assessment and Hazard Scoring Notes

Table 8.6.1 summarizes the risk assessment scoring of the city of Hamberg. The risk assessment and hazard scoring notes for each hazard specific to the city are shown after Table 8.6.1. Risk assessment notes for impact, frequency, likelihood and vulnerability ubiquitous for jurisdictions in The Planning Area are found in Chapter 5, Threat and Hazard Identification Assessment in each respective hazard profile.

Table 8.6.1 – City of Hamberg Jurisdiction Risk Assessment Scoring Summary

Risk Assessment			Jurisdiction:	City of Hamberg		
<u>Hazard</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<u>Total</u>
Communicable Disease	2	2	2	3	1	8
Dam Failure	NA	NA	NA	NA	NA	NA
Drought	3	3	3	3	2	10
Flood	3	2	2	3	1	9
Hazardous Material Release	2	2	2	2	1	7
Homeland Security Incident	2	2	2	2	1	7
Severe Summer Weather	4	3	4	3	1	13
Severe Winter Weather	4	3	4	3	1	13
Transportation Accident	2	2	2	2	1	7
Urban Fire/Structure Collapse	2	2	3	2	1	8
Wildland Fire	2	2	3	2	1	8
Windstorm	3	3	3	3	1	11

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

Table 8.6.2 – City of Hamberg Jurisdiction Risk Assessment

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Communicable Disease	<ul style="list-style-type: none"> Evacuation (localized) Mass Casualties 	<ul style="list-style-type: none"> Annual occurrences of influenza and other disease. 	<u>More likely</u> <ul style="list-style-type: none"> High elderly population Agriculture economy 	<u>More vulnerable</u> <ul style="list-style-type: none"> Inadequate drainage in certain areas of the city Agriculture economy Presence of abandoned buildings 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> District Health conducting education and outreach 	<u>Less vulnerable</u> <ul style="list-style-type: none"> District Health conducting education and outreach 	
Dam Failure	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> NA 	See Chapter 7
Drought	<ul style="list-style-type: none"> Increased Fire Potential Loss of Economy (decline in hunting activity) 	<ul style="list-style-type: none"> Annual periods of dry conditions 10-year cycle Drought of 1988 and 1989 2008 had dry conditions Burn bans implemented annually 	<u>More likely</u> <ul style="list-style-type: none"> Overdue for drought based on wet/dry cycle 	<u>More vulnerable</u> <ul style="list-style-type: none"> High elderly population 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Modern agricultural practices and no-till farming will decrease severity and help limit impact 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Modern agricultural practices and no-till farming will decrease severity and help limit impact 	
Flood	<ul style="list-style-type: none"> Blocked roads Limited access for emergency services Property damage Flooding (street & structure) 	<ul style="list-style-type: none"> Multiple instances of blocked roads and overland flooding in the city during heavy rain events or spring snow melt 	<u>More likely</u> <ul style="list-style-type: none"> Inadequate drainage in certain areas of the city 	<u>More vulnerable</u> <ul style="list-style-type: none"> Inadequate drainage in certain areas of the city 	See Chapter 7

Table 8.6.2 – City of Hamberg Jurisdiction Risk Assessment - Continued

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Hazardous Material Release	<ul style="list-style-type: none"> Evacuation (localized)/Shelter-in-Place Explosion Human Injury/Death Increased fire potential 	<ul style="list-style-type: none"> No major incidents reported in city limits 	<u>More likely</u> <ul style="list-style-type: none"> Farmers hauling more chemicals used and stored locally 	<u>More vulnerable</u> <ul style="list-style-type: none"> Presence of chemical/fertilizer plant in city limits 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> No elevator 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Railroad inactive Truck route 	
Homeland Security Incident	<ul style="list-style-type: none"> Evacuation (full) 	<ul style="list-style-type: none"> Annual occurrences of localized vandalism 	<u>More likely</u> <ul style="list-style-type: none"> No local law enforcement 	<u>More vulnerable</u> <ul style="list-style-type: none"> High elderly population No local law enforcement 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Sparse population Inactive railroad 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Sparse population Inactive railroad 	
Severe Summer Weather	<ul style="list-style-type: none"> Loss of power/downed lines Blocked roads Sewer Backup 	<ul style="list-style-type: none"> Multiple storms annually 	<ul style="list-style-type: none"> Climatic patterns of the area will result in several storms per year 	<u>More vulnerable</u> <ul style="list-style-type: none"> Lack of local alerting Lack of storm shelter with generator 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Sparse population Inactive railroad 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Sparse population Inactive railroad 	
Severe Winter Weather	<ul style="list-style-type: none"> Loss of power/downed lines Blocked roads for emergency services and general economic activity Sewer Backup 	<ul style="list-style-type: none"> Multiple storms (around 3 to 5) annually Major storm with power outages in surrounding area Christmas 2016 	<ul style="list-style-type: none"> Climatic patterns of the area will result in several storms per year 	<u>More vulnerable</u> <ul style="list-style-type: none"> Lack of local alerting Lack of storm shelter with generator 	See Chapter 7
				<u>Less vulnerable</u> <ul style="list-style-type: none"> Advanced weather forecasting/warning Reverse 911 	

Table 8.6.2 – City of Hamberg Jurisdiction Risk Assessment - Continued

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Transportation Accident	<ul style="list-style-type: none"> Blocked Roads Human Injury/Death 	<ul style="list-style-type: none"> No major accidents in the last 15 years 	<u>More likely</u> <ul style="list-style-type: none"> N.D. Highway 30 	<u>More vulnerable</u> <ul style="list-style-type: none"> N.D. Highway 30 Bar in city limits 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Increased education and awareness 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Increased education and awareness Traffic control signage No school or elevator 	
Urban Fire/Structure Collapse	<ul style="list-style-type: none"> Property Damage Human Injury/Death Loss of Potable Water 	<ul style="list-style-type: none"> Small fires reported once every couple of years 	<u>More likely</u> <ul style="list-style-type: none"> Presence of buildings with outdated electrical Older structures 	<u>More vulnerable</u> <ul style="list-style-type: none"> Presence of buildings with outdated electrical Older structures 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Increased education and awareness 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Sparse population 	
Wildland Fire	<ul style="list-style-type: none"> Delayed Emergency Response 	<ul style="list-style-type: none"> Controlled burns out of control approximately 50 percent of time 	<u>More likely</u> <ul style="list-style-type: none"> Dry conditions (when present) 	<u>More vulnerable</u> <ul style="list-style-type: none"> Lack of fire break around city 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Farmers have supply of water on site 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Locals clear excess vegetation 	
Windstorm	<ul style="list-style-type: none"> Loss of power/downed lines Blocked roads for emergency services and general economic activity Sewer Backup 	<ul style="list-style-type: none"> Multiple storms annually Straight-line winds event occurred in 2015 	<ul style="list-style-type: none"> Climatic patterns of the area will result in several storms per year Flat terrain and constant strong wind gusts 	<u>More vulnerable</u> <ul style="list-style-type: none"> Healthy urban canopy Flat terrain and open topography Lack of official storm shelter 	See Chapter 7

8.6.3 Mitigation Strategy

The Eddy & Wells Counties Multi-Jurisdictional Multi-Hazard Plan Update includes a mitigation strategy consisting of six goals in Chapter 6. The following problem statement and mitigation projects address the mitigation needs of the city of Hamberg. It should be noted that some mitigation projects that pertain to all jurisdictions are included to encourage county-wide collaboration.

Problem Statement

The city of Hamberg can be impacted by communicable disease, drought, flood (overland and riverine), hazardous material release, severe summer weather, severe winter weather, urban fire/structure collapse, wildland fire, and windstorm. The city experiences overall flooding resulting in damages to structures, road and utilities. The city is extremely vulnerable to blocked roads and loss of access for emergency services from severe summer weather and severe winter weather. The city does not have an official storm shelter and lacks an early warning system. The city lacks funding for mitigation projects. With little to no capabilities to accomplish major projects independently, the city is dependent on outside sources for mitigation.

Installation of a right-sized early warning system, construction of a storm shelter, expansion of planning and regulatory capabilities, and education and outreach are a priority for the city.

Wells County Project AT-3: Upgrade and expand early warning system(s).

Description/Benefit		Coverage of current outdoor early warning system/sirens does not provide coverage to an adequate geographic expanse of the county. Upgrade existing manually-activated sirens to dispatch-activated sirens. Install new dispatch-activated sirens where necessary. There are no existing outdoor early warning sirens for the county outside incorporated cities. Purchase NOAA weather radios for rural communities. <ul style="list-style-type: none">• Upgrade: City of Fessenden (keep existing in same location), City of Sykeston• New: City of Bowdon, City of Fessenden (inside public school), City of Hurdsville• NOAA Weather Radios: City of Cathay, City of Hamberg; Heimdal (unincorporated) <i>The city of Harvey has ordered new sirens which will be installed sometime in 2017.</i>					
Hazards Addressed		Flood, Hazardous Material Release, Severe Summer Weather, Wildland Fire (All)					
Affected Jurisdiction(s)		Wells County and incorporated jurisdictions					
Project Status		Ongoing					
Priority		High					
Responsible Agency		City Councils, Emergency Management					
Partners		County Commission, Emergency Services, FEMA, NDDDES, NWS					
Completion Timeframe		1 to 2 years			Cost	Up to \$25,000 per siren, plus installation	
Funding Source		9-1-1 funding. State Homeland Security Grant Program. City and county general fund.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.	

Wells County Project AT-8: Create and establish permanent county-wide maintenance system for drainage ditches and storm water systems to reduce or eliminate occurrences of overland flooding.

Description/Benefit		Create county-wide drainage ditch/storm water maintenance system to control flow of runoff to eliminate blocked roads, maintain access for city residents and emergency services, and continued operation of public infrastructure.					
Hazards Addressed		Communicable Disease, Drought, Flood (Overland), Severe Summer Weather, Severe Winter Weather, Wildland Fire, Windstorm					
Affected Jurisdiction(s)		Wells County and incorporated jurisdictions					
Project Status		New					
Priority		Medium					
Responsible Agency		City Councils, County Commission, County Highway Dept., Public Works					
Partners		Emergency Services, NDDH, Public Health, SWC, USDA, Water District					
Completion Timeframe		1 to 2 years			Cost	Staff-time	
Funding Source		Local budgets. State and federal grants.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	4	5	3	31
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element Utilized			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.	

8.6.4 Mitigation Capability Assessment

Capability for mitigation is divided into four categories: Administrative and Technical, Education and Outreach, Financial, and Planning and Regulatory. Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. **Tables comparing the mitigation capabilities of the city of Hamberg with all other jurisdictions in The Planning Area can be found in Chapter 7, County Mitigation Capability Assessment.**

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

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

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

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

8.6.5 Integration of Mitigation Plan into Planning Mechanisms

Integration of the plan into current planning mechanisms is critical in mitigation to communicate the needs of each jurisdiction to achieve an all-inclusive mitigation strategy. The process for integration of the mitigation plan is included after each mitigation project, which shows the planning mechanism utilized, the plan element used for integration and the process for integration.

8.6.6 Plan Maintenance

An important aspect of any useable plan is the maintenance and upkeep of the document. At any given time, planning, risk analysis, updating the situation assessment, research, coordinating, disaster response or other activity is occurring. Plan maintenance ensures the plan will remain useful in the county for many years. A mitigation action progress report form to conduct plan maintenance is in Chapter 10 of this plan.

8.7 City of Harvey

The following profile includes information specific to the city of Harvey for mitigation planning purposes. The information included is as follows:

- Profile and Inventory;
- Risk Assessment;
- Hazard Scoring Notes;
- Mitigation Projects, and
- Capabilities for Mitigation.

Integration into Planning Mechanisms

The process for integration of the mitigation plan into existing planning mechanisms is discussed at the bottom of each mitigation project in section 8.7.4, section 8.7.5 and in Chapter 6, Mitigation Strategy.

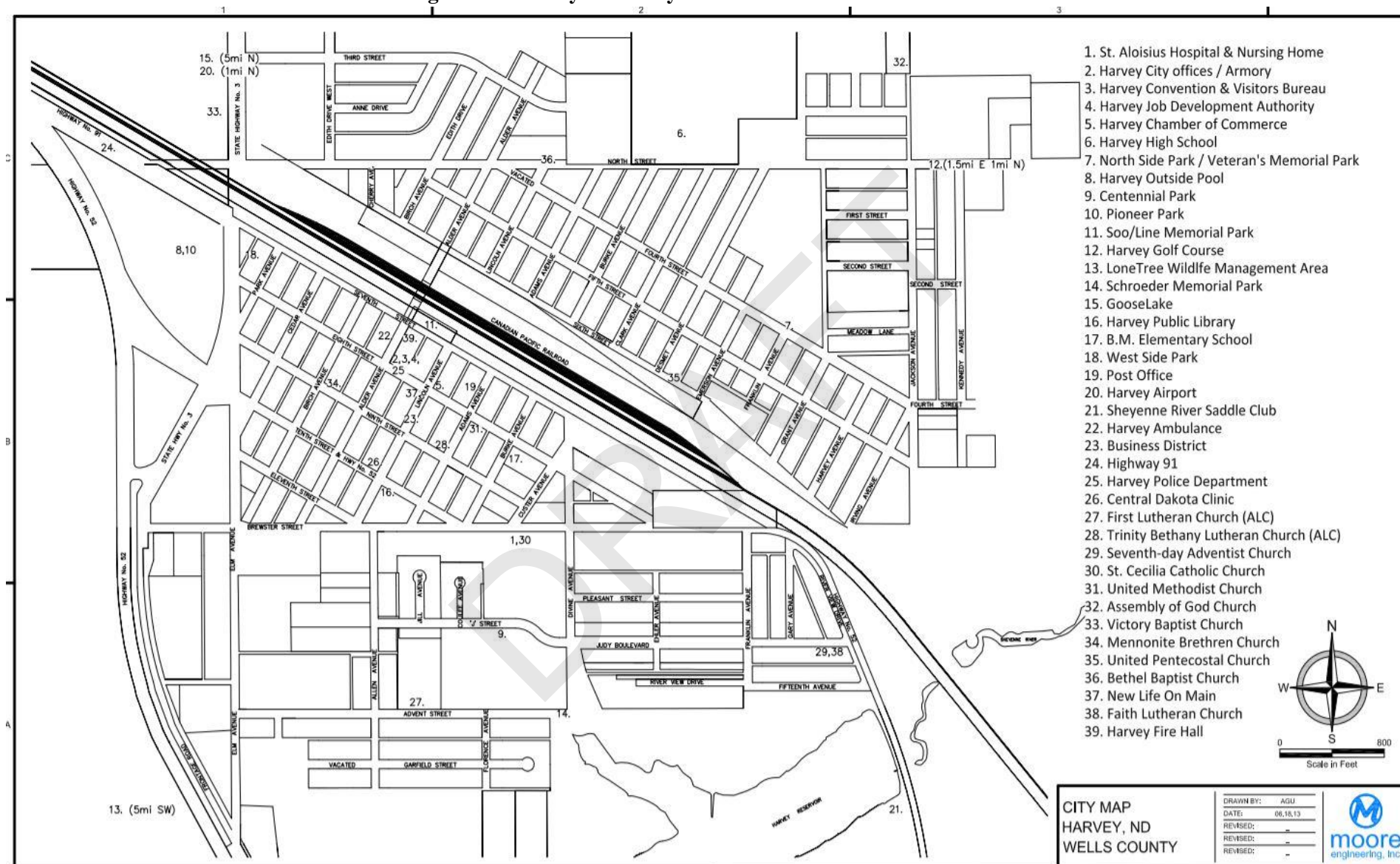
Plan Maintenance

Plan maintenance is shown in section 8.7.6.

Critical Facilities and Infrastructure

Figure 8.8.1 is a map of the city of Harvey illustrating the location of critical facilities and infrastructure.

Figure 8.7.1 – City of Harvey Critical Facilities and Infrastructure



Source: City of Harvey, Harvey Job Development Authority, Moore Engineering

8.7.1 Profile and Inventory

The location, total population, vulnerable populations, housing units and household size, businesses, critical facilities and infrastructure, new and future development, services, jurisdictional buildings, emergency response services and utilities are shown for the city of Harvey. Detailed narratives follow each section heading to profile the city.

Detailed information on public buildings, services provided, emergency response services and utilities can be found in Chapter 4, Profile and Inventory.

Location

The city of Harvey is in central North Dakota at the intersection of N.D. Highway 3 and U.S. Highway 52 approximately 70 miles southeast of the city of Minot. The city is located at the head waters of the Sheyenne River. U.S. Highway 52 is one of North Dakota's major trucking routes.

Population

Per the 2010 U.S. Decennial Census the city of Harvey has a population of 1,783 people down from 1,989 people in 2000. The 2011 to 2015 American Community Survey 5-Year Estimate recorded a population of 1,920 people, an increase of 137 people, or 7.7 percent from 2010.

The city of Harvey is the largest city in The Planning Area.

Vulnerable Populations

Per the 2010 U.S. Decennial Census, the population of the city of Harvey consists of 360 individuals under the age of 20, and 575 individuals age 65 and older, representing 20.2 percent and 32.2 percent of the population, respectively.

The city is the location of the B.M. Hanson Elementary School serving approximately 279 students in grades K to 8 and the Harvey High School serving approximately 142 students in grades 9 to 12.

Preschool education is provided by Early Explorers and Headstart and special needs is provided by Lonetree Special Education.

The following age-restricted and senior housing developments are in the city of Harvey:

- Senior Villa: 8 units
- St. Aloisius Senior Apartments: 16 units

Housing Units and Household Size

The 2011 to 2015 American Community Survey 5-Year Estimate shows there is a total of 1,080 housing units in the city consisting of 749 single-family homes, 275 multifamily homes and 56 mobile homes.

Per the 2010 U.S. Decennial Census, there are 824 households in the city of Harvey resulting in an average household size of 2.16 people.

Businesses

Information on businesses and economic development in the city of Harvey can be obtained by contacting the Harvey Jobs Development Authority.

New and Future Development

The following development has occurred since the 2011 mitigation plan.

- Ball Park Addition is a single-family subdivision in northeast Harvey. Approximately 14 of the 22 total lots have been sold.
- Lincoln and 9, a former furniture store, has been repurposed into a shopping center.
- A Subway restaurant and New Line Insurance opened.
- Cobblestone Inn Suites was constructed.
- A new vet clinic opened.
- A large downtown building was destroyed in a fire in 2015.

8.7.2 Risk Assessment and Hazard Scoring Notes

Table 8.7.1 summarizes the risk assessment scoring of the city of Harvey. The risk assessment and hazard scoring notes for each hazard specific to the city are shown in Table 8.7.2. Risk assessment notes for impact, frequency, likelihood and vulnerability ubiquitous for jurisdictions in The Planning Area are found in Chapter 5, Threat and Hazard Identification Assessment in each respective hazard profile.

Table 8.7.1 – City of Harvey Jurisdiction Risk Assessment Scoring Summary

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

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

Table 8.7.2 – City of Harvey Jurisdiction Risk Assessment

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Communicable Disease	<ul style="list-style-type: none"> Business interruptions Children missing school Staff issues at businesses and city Loss of economy Evacuation (localized) Loss/Overcrowded Medical Facilities – resulting in transfer of patients to other facilities Mass Casualties 	<ul style="list-style-type: none"> Annual occurrences of influenza and other disease. 2009 – H1N1 2015 – Norovirus Kids get sick earlier and illness lasts longer 	<u>More likely</u> <ul style="list-style-type: none"> High youth and elderly population Agriculture economy Society more mobile Less vaccinations 	<u>More vulnerable</u> <ul style="list-style-type: none"> High youth and elderly population Agriculture economy Short on doctors at St. Aloisius 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Education and outreach at public school Spraying for mosquitos Hand sanitizers in public schools and businesses District Health conducting education and outreach 	<u>Less vulnerable</u> <ul style="list-style-type: none"> St. Aloisius Medical Center 3 clinics Mass media/internet Spraying for mosquitos Hand sanitizers in public schools and businesses District Health conducting education and outreach 	
Dam Failure	<ul style="list-style-type: none"> Loss of storm water lagoon Damage to sanitary sewer lagoons Substantial damage to water treatment plant and water supply to the city Loss of railroad infrastructure immediately below the dam Destruction of several road and bridges immediately downstream Impact to approximately 20 homes in Peaceful Valley Subdivision 	<ul style="list-style-type: none"> Never an occurrence of a failure of the Harvey Dam In 2009 and 2011, substantial flooding from spring melt threatened the integrity of the Harvey Dam 	<u>More likely</u> <ul style="list-style-type: none"> Presence of Harvey Dam Heavy snowfall/heavy rains resulting in substantial spring melt 	<u>More vulnerable</u> <ul style="list-style-type: none"> Presence of Harvey Dam Heavy snowfall/heavy rains resulting in substantial spring melt 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Undersized culvert under adjacent railroad infrastructure which helps to hold back excess water Emergency Action Plan 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Undersized culvert under adjacent railroad infrastructure which helps to hold back excess water Emergency Action Plan 	

Table 8.7.2 – City of Harvey Jurisdiction Risk Assessment - Continued

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Drought	<ul style="list-style-type: none"> • Business Interruptions • Crop Loss • Increased Fire Potential • Livestock Injury/Death • Loss of Economy • Fire along railroad infrastructure • Increase in insect populations further impacting crops, livestock and people 	<ul style="list-style-type: none"> • Annual periods of dry conditions • 10-year cycle • Drought of 1988 and 1989 • 2008 had dry conditions • Burn bans implemented annually 	<u>More likely</u> <ul style="list-style-type: none"> • Overdue for drought based on wet/dry cycle • Result of climatic patterns 	<u>More vulnerable</u> <ul style="list-style-type: none"> • High youth and elderly population • Agriculture economy • Removal of shelter belts/tree rows and lack of replacement 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> • Modern agricultural practices and no-till farming will decrease severity and help limit impact 		
Flood	<ul style="list-style-type: none"> • Blocked roads • Limited access for emergency services • Property damage • Flooding (street & structure) • Loss of potable water from damage to water transmission lines • Sewer backup • Loss of access to St. Aloisius • Loss of access to water treatment plant 	<ul style="list-style-type: none"> • Multiple instances of blocked roads and overland flooding in the city during heavy rain events or spring snow melt • Underpass floods frequently when heavy rains occur – estimated at between 4 and 5 occurrences annually 	<u>More likely</u> <ul style="list-style-type: none"> • Inadequate drainage in certain areas of the city • Presence of Sheyenne River 	<u>More vulnerable</u> <ul style="list-style-type: none"> • Inadequate drainage in certain areas of the city • Aging sanitary sewer system • Underpass • Storm water lines undersized 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> • City public works clears drains and works to improve drainage 	<u>Less vulnerable</u> <ul style="list-style-type: none"> • Enrolled in NFIP • Flood ordinances • Critical facilities and infrastructure not in areas prone to flooding • Storm water lagoons can hold some excess water 	

Table 8.7.2 – City of Harvey Jurisdiction Risk Assessment - Continued

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Hazardous Material Release	<ul style="list-style-type: none"> Property damage Potential for loss of life/injury Explosion Evacuation (localized)/Shelter-in-Place HAZMAT Release Mass casualties School closure Loss of critical facilities and infrastructure Loss/overcrowded medical facilities Increased fire potential 	<ul style="list-style-type: none"> No major incidents reported in city limits Heimdal located in the county just east of Harvey experienced train derailment in 2015 Small spills involving chemicals in the city occasionally 	<u>More likely</u> <ul style="list-style-type: none"> Increase in oil and gas activity and railroad traffic Increase in ag and chemical traffic Increase in train speeds Presence of U.S. Highway 52 and N.D. Highway 3 Presence of railroad Farmers hauling more chemicals used and stored locally 	<u>More vulnerable</u> <ul style="list-style-type: none"> Lack of truck route More chemicals stored in and near the city One grade-separated pass with railroad Increase in train speeds Presence of U.S. highway 52 and N.D. Highway 3 Presence of railroad Emergency services only trained to the awareness level Chemical processing plants located in city limits Bulk Anhydrous plant in city limits 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Ordinance in place directing truck traffic carrying hazardous materials 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Ordinance in place directing truck traffic carrying hazardous materials Access to state and regional HAZMAT teams and resources Fall-out shelter located below Armory/City Hall/Police Station 	

Table 8.7.2 – City of Harvey Jurisdiction Risk Assessment - Continued

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Homeland Security Incident	<ul style="list-style-type: none"> • Evacuation (full) • Human Injury/Death • Loss/Overcrowded Medical facilities • Mass Casualties • School Closure 	<ul style="list-style-type: none"> • In 2013, a fugitive jumped on the train in Harvey and lead law enforcement to the city of Drake where he was arrested. • No school threats • No reports of local terrorism • Annual occurrences of vandalism to homes and cars 	<u>More likely</u> <ul style="list-style-type: none"> • Public school • Largest city in the area • Economic activity center of the area 	<u>More vulnerable</u> <ul style="list-style-type: none"> • High youth and elderly population • Agriculture, and oil and gas economy • Chemical processing plants in city limits • Bulk Anhydrous plant in city limits 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> • Sparse population compared to Bismarck, Minot, Fargo, etc. • No large regional or international attractions 	<u>Less vulnerable</u> <ul style="list-style-type: none"> • No commercial passenger air service 	
Severe Summer Weather	<ul style="list-style-type: none"> • Property damage (loss of shingles, broken windows) • Loss of power • Loss of potable water • Flooding of areas with poor drainage • Blocked roads for emergency services and general economic activity • Delayed emergency response • Increased fire potential • Downed trees • Human Injury/Death • Mass Casualties 	<ul style="list-style-type: none"> • Multiple storms annually • Major hail storms in 2009 and 2015 resulting in significant property damage 	<ul style="list-style-type: none"> • Climatic patterns of the area will result in several storms per year • 	<u>More vulnerable</u> <ul style="list-style-type: none"> • Agriculture economy • Lack of shelter with generator • Flat terrain and open topography 	See Chapter 7
				<u>Less vulnerable</u> <ul style="list-style-type: none"> • Advanced weather forecasting/warning • Dispatch-activated siren • CodeRED • Building codes 	

Table 8.7.2 – City of Harvey Jurisdiction Risk Assessment - Continued

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Severe Winter Weather	<ul style="list-style-type: none"> Loss of power Loss of potable water Flooding of areas with poor drainage due to spring melt Blocked roads for emergency services Downed trees Property damage School closure Closure of critical facilities and infrastructure Delayed Emergency Response Human Injury/Death Increased fire potential Loss of potable water Mass Casualties 	<ul style="list-style-type: none"> Multiple storms annually Major storm with power outages in surrounding area Christmas 2016 	<ul style="list-style-type: none"> Climatic patterns of the area will result in several storms per year 	<u>More vulnerable</u> <ul style="list-style-type: none"> Agriculture economy Lack of shelter with generator Flat terrain and open topography Large fixed-income population 	See Chapter 7
				<u>Less vulnerable</u> <ul style="list-style-type: none"> Advanced weather forecasting/warning CodeRED Building codes 	
Transportation Accident	<ul style="list-style-type: none"> Blocked roads Delayed emergency response HAZMAT release Human injury/death Mass Casualties 	<ul style="list-style-type: none"> Multiple accidents involving cars, trucks and other vehicles annually Most accidents occur on U.S. Highway 52 and N.D. Highway 3 or at the intersection itself 	<u>More likely</u> <ul style="list-style-type: none"> Presence of railroad U.S. Highway 52 and N.D. Highway 3 Constant truck traffic in and around bulk anhydrous plant in city limits 	<u>More vulnerable</u> <ul style="list-style-type: none"> Presence of railroad U.S. Highway 52 and N.D. Highway 3 Bulk anhydrous plant in city limits Lack of truck route 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Driver's Education Addition of turning lanes and signage at U.S. Highway 52 and N.D. Highway 3 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Driver's Education Addition of turning lanes and signage at U.S. Highway 52 and N.D. Highway 3 Lowering of speed on U.S. Highway 52 bypass 	

Table 8.7.2 – City of Harvey Jurisdiction Risk Assessment - Continued

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Urban Fire/Structure Collapse	<ul style="list-style-type: none"> Property loss and/or damage Loss of critical facilities or infrastructure School closure HAZMT release Human/injury/death Loss of potable water Loss of legal services business, storage space and eight apartments in 2015 downtown Damage to city and fire infrastructure if occurring during winter months Depletion of potable water 	<ul style="list-style-type: none"> Reports of structure and vehicles fires annually 2015 fire in older downtown building; total loss Business fire occurring every 10 years 	<u>More likely</u> <ul style="list-style-type: none"> Presence of older commercial and residential buildings with outdated electrical Older downtown structures sharing common walls and single-family spaced close together 	<u>More vulnerable</u> <ul style="list-style-type: none"> Presence of buildings with outdated electrical Older downtown structures Lack of generator at fire station Lack of smoke detectors at critical facilities and infrastructure 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Increased education and awareness Smoke detectors at critical facilities and infrastructure 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Spacing of houses and structures (new) Building codes adopted Fire department with new equipment and well-trained volunteers 	
Wildland Fire	<ul style="list-style-type: none"> Strain on local fire department/district Loss of economy due to impact to crops/livestock Blocked roads limiting access for emergency services Human injury/death Livestock injury/death Property damage Strain on water availability for suppression Depletion of potable water when used for fire suppression 	<ul style="list-style-type: none"> Controlled burns becoming out of control approximately 50 percent of the time on an annual basis 	<u>More likely</u> <ul style="list-style-type: none"> Increased truck traffic hauling HAZMAT Overgrown vegetation along railroad tracks Dry conditions (when present) 	<u>More vulnerable</u> <ul style="list-style-type: none"> Lack of fire break Homes/structures adjacent to sloughs/dry vegetation Depends on wind speed 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Burn Bans Less CRP Farmers have supply of water for fire suppression on site 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Fire Index Sign City conducts mowing Emergency siren Availability of water in river/sloughs/ponds for fire suppression nearby 	

Table 8.7.2 – City of Harvey Jurisdiction Risk Assessment - Continued

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Windstorm	<ul style="list-style-type: none"> • Loss of power • Loss of potable water • Blocked roads for emergency services • Downed trees • Property damage • Loss of economy 	<ul style="list-style-type: none"> • Multiple storms annually • Straight-line winds occurring in 2014 	<ul style="list-style-type: none"> • Climatic patterns of the area will result in several storms per year 	<p><u>More vulnerable</u></p> <ul style="list-style-type: none"> • High youth and elderly population • Agriculture economy • Healthy urban canopy • Flat terrain and open topography <p>Building codes decrease vulnerability.</p>	See Chapter 7

8.7.3 Mitigation Strategy

The Eddy and Wells Counties Multi-Jurisdictional Multi-Hazard Plan Update includes a mitigation strategy consisting of six goals in Chapter 6. The following problem statement and mitigation projects address the mitigation needs of the city of Harvey. It should be noted that some mitigation projects that pertain to all jurisdictions are included to encourage county-wide collaboration.

Problem Statement

The city of Harvey can be impacted by communicable disease, drought, flood (overland and riverine), hazardous material release, severe summer weather, severe winter weather, urban fire/structure collapse, wildland fire, and windstorm. The city experiences overland flooding causing damage to property, and critical facilities and infrastructure due an inadequate storm water drainage system. Economic loss to the agriculture and livestock industry occurs on a frequent basis from natural hazards. The city lacks backup generators for critical facilities and infrastructure, does not have an official storm shelter, and has an outdated early warning system. The city is at risk to wildland fire due to surrounding topography, vegetation, and agriculture practices. Local emergency services need upgraded equipment. The city lacks funding for mitigation projects. With little to no capabilities to accomplish major projects independently, the city is dependent on outside sources for mitigation.

Improved drainage, installation of permanent backup power sources, upgrade sanitary sewer lagoons, installation of fire protection infrastructure and upgrading of fire protection equipment, expansion of planning and regulatory capabilities, and education and outreach are a priority for the city.

City of Harvey Project 1: Construct flood control measures and drainage improvements.

Description/Benefit		Construction of detention/retention ponds, floodwalls, berms, revetments or bioengineered bank-stabilization techniques to slow runoff of overland flooding from heavy rains and snowmelt, and flood waters from riverine flooding. Detention/retention ponds provide controlled release of water and reduce/eliminate areas and structures from being inundated with flooding. <ul style="list-style-type: none">• Intersection of Brewster Street and 30th Ave NE, and the immediate surrounding area• Immediate area in and near convergence of Divine Street, Riverview Drive, Advent Street and Judy Blvd.• Intersection of Brewster Street and 6th St E.• Alder Ave (underpass)• Improve storm water lagoons located adjacent to Harvey Dam					
Hazards Addressed		Communicable Disease, Flood (riverine and overland), Severe Summer Weather, Severe Winter Weather					
Affected Jurisdiction(s)		City of Harvey					
Project Status		New					
Priority		Medium					
Responsible Agency		City Council, Public Works					
Partners		County Commission, Emergency Management, Emergency Services, NDDes					
Completion Timeframe		2 to 3 years			Cost	Project-specific	
Funding Source		Local, state and federal grants.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	4	4	5	4	3	4	29
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Public works studies and identifies project scope and parameters. Approval by city council.	

City of Harvey Project 2: Establish and implement vector control protocol and application system.

Description/Benefit		Control vector population and prevent spread of disease. <ul style="list-style-type: none">• Harvey Underpass: Seal off underpass to control pigeon populations and eliminate risk of disease.• Install mosquito barricade west of the city					
Hazards Addressed		Communicable Disease, Drought, Flood (overland and riverine), Severe Summer Weather					
Affected Jurisdiction(s)		City of Harvey					
Project Status		New					
Priority		High					
Responsible Agency		City Council, Public Health					
Partners		Emergency Management, Emergency Services, Medical Services Providers, NDDDES, NDDH, Social Services					
Completion Timeframe		1 to 2 years			Cost	Project-specific	
Funding Source		Local, state, federal grants. Extension Service, FEMA, NDDH, Public Health, Regional Council.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	4	4	4	31
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element Utilized			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Creation of system by city and county emergency management. Approval by city council.	

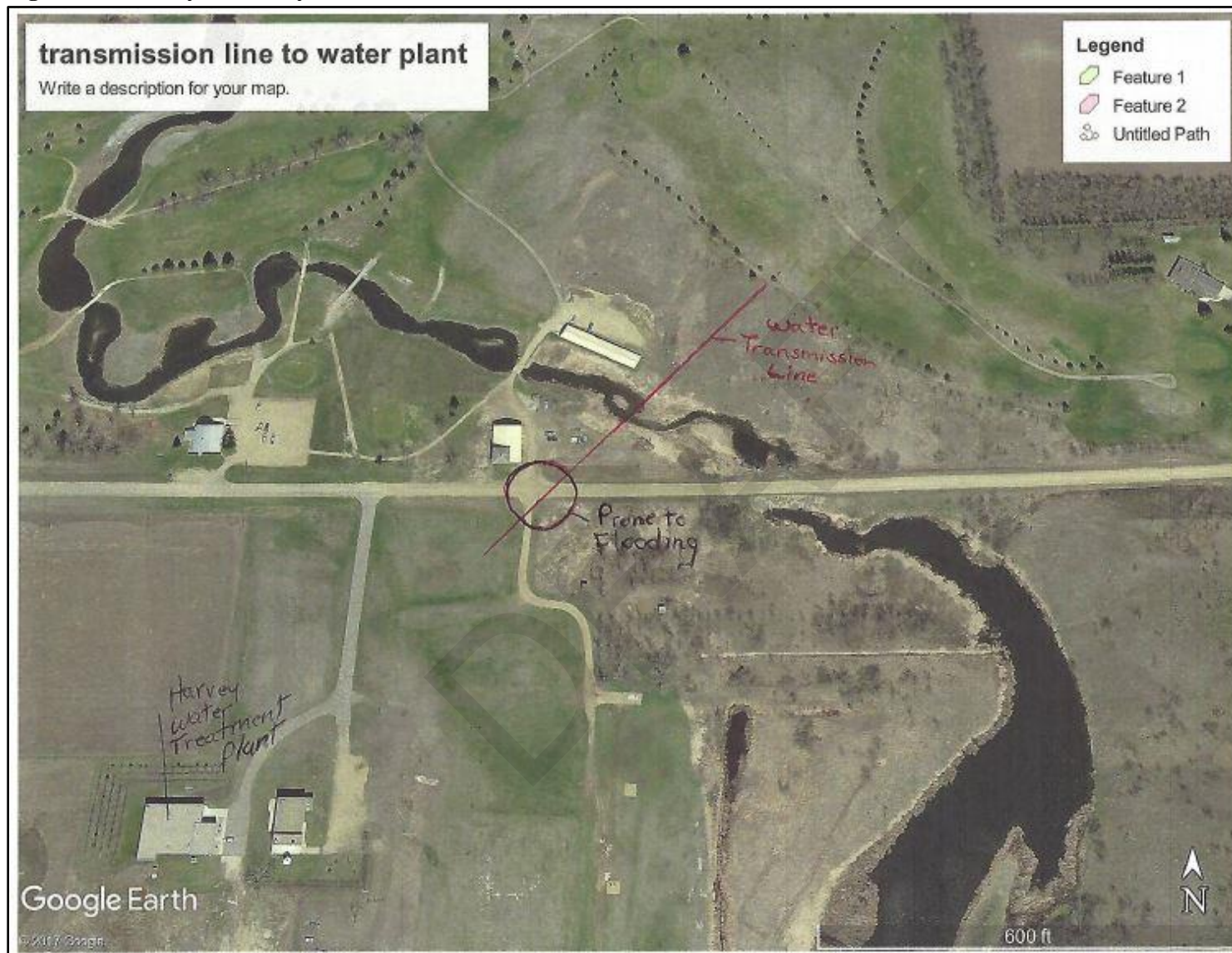
City of Harvey Project 3: Study existing traffic control signage and signals, and create traffic signal improvement plan.

Description/Benefit		Ensure safety at high-traffic intersections and corridors reducing or eliminating traffic accidents, fatalities and injuries. Assists emergency services in maintaining access and controlling traffic during emergencies. <u>Areas of focus</u> <ul style="list-style-type: none">• Intersection of U.S. Highway 52 and N.D. Highway 91/7th St. West• Intersection of U.S. Highway 52 and 30th Ave NE/Brewster St. West• Community swimming pool					
Hazards Addressed		Flood (overland and riverine), Hazardous Material Release, Severe Summer Weather, Severe Winter Weather, Transportation Accident (all)					
Affected Jurisdiction(s)		City of Harvey					
Project Status		New					
Priority		High					
Responsible Agency		City Council, Public Works					
Partners		Emergency Management, Emergency Services, NDDOT					
Completion Timeframe		3 to 5 years			Cost	Project-specific	
Funding Source		Local, state, federal grants. NDDOT, Regional Council.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	5	4	4	32
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element Utilized			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Request for money to be allocated and spent for study. Recommendations approved by the city council.	

City of Harvey Project 4: Reroute water transmission line from water wells to water treatment plant to eliminate or reduce water outages from flooding.

Description/Benefit		The main water transmission line from the water wells to the city water plant crosses the Sheyenne River bottom. When flooding occurs, the road is eroded to the water line causing disruption to the transmission line. When the transmission line is disrupted, the city water plant cannot receive water to be treated and delivered to city residents. Figure 8.7.2 on the following page illustrates the water delivery system and the problem areas for the city of Harvey.					
Hazards Addressed		Communicable Disease, Flooding (overland), Severe Summer Weather, Severe Winter Weather (all)					
Affected Jurisdictions		City of Harvey					
Project Status		New					
Priority		High					
Responsible Agency		City Council, Public Works					
Partners		Emergency Management, Public Health, Regional Council, SWC					
Completion Timeframe		10+ years			Cost	TBD	
Funding Source		Local, state, federal grants. FEMA, Public Utilities, Regional Council, RD. Local utility fee or sales tax.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	4	5	3	4	30
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city council	

Figure 8.7.2 – City of Harvey Water Transmission Line



Source: City of Harvey Public Works

Wells County Project AT-3: Upgrade and expand early warning system(s).

Description/Benefit		Coverage of current outdoor early warning system/sirens does not provide coverage to an adequate geographic expanse of the county. Upgrade existing manually-activated sirens to dispatch-activated sirens. Install new dispatch-activated sirens where necessary. There are no existing outdoor early warning sirens for the county outside incorporated cities. Purchase NOAA weather radios for rural communities. <ul style="list-style-type: none">• Upgrade: City of Fessenden (keep existing in same location), City of Sykeston• New: City of Bowdon, City of Fessenden (inside public school), City of Hurdsville• NOAA Weather Radios: City of Cathay, City of Hamberg; Heimdal (unincorporated) <i>The city of Harvey has ordered new sirens which will be installed sometime in 2017.</i>					
Hazards Addressed		Flood, Hazardous Material Release, Severe Summer Weather, Wildland Fire (All)					
Affected Jurisdiction(s)		Wells County and incorporated jurisdictions					
Project Status		Ongoing					
Priority		High					
Responsible Agency		City Councils, Emergency Management					
Partners		County Commission, Emergency Services, FEMA, NDDDES, NWS					
Completion Timeframe		1 to 2 years		Cost	Up to \$25,000 per siren, plus installation		
Funding Source		9-1-1 funding. State Homeland Security Grant Program. City and county general fund.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element		Process for Integration		
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment		Approval by city councils. Approval by county commission.		

Wells County Project AT-4: Install digital fire index signage at strategic points in the county.

Description/Benefit		Improve public awareness and education of North Dakota Fire Danger index through installation of fire index signs. The fire danger index from the state provides an indication of rural fire potential for grasslands, and its ability to spread. Upgrade: Manual fire index sign to a digital sign in the city of Harvey. New Digital Signs: City of Fessenden outside fire hall, Intersection of U.S. Highway 52 and N.D. Highway 200					
Hazards Addressed		Hazardous Material Release, Severe Summer Weather, Urban Fire/Structure Collapse, Wildland Fire, Windstorm					
Affected Jurisdiction(s)		Wells County and incorporated jurisdictions					
Project Status		New					
Priority		Medium					
Responsible Agency		Emergency Management, Emergency Services					
Partners		County Commission, County Highway Dept., NDDDES, NDDOT, NWS, USFS					
Completion Timeframe		2 to 3 years			Cost	\$15,000 to \$30,000 per sign	
Funding Source		Local, state, federal grants. U.S.F.S.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	5	4	4	32
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element		Process for Integration		
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment		Approval by city councils. Approval by county commission.		

Wells County Project AT-7: Install permanent generators and upgrade existing permanent or portable generators, at critical facilities and infrastructure.

Description/Benefit		Upgrade existing generators or install new generators to establish permanent source of backup power to maintain continued operation of the following critical facilities and infrastructure: <u>Upgrade</u> <ul style="list-style-type: none">Wells County Shop (Fessenden and Harvey) <u>Install new</u> <ul style="list-style-type: none">City of Bowdon: Water pump station, fire station (sized for construction of new fire hall)City of Cathay: Fire hall, lift station and pumphouseCity of Fessenden: Fessenden-Bowdon Public School, lift stations, city shop, city hall/fire department/police department, pump houseCity of Harvey: Armory/city hall/police station, B.M. Hanson Elementary, fire station, Harvey High School, Harvey Ambulance HallCity of Hurdsfield: Lift stationCity of Sykeston: Lift station, fire hall, water tower for recirculation pump					
Hazards Addressed		All hazards					
Affected Jurisdiction(s)		Wells County and incorporated jurisdictions					
Project Status		Ongoing					
Priority		High					
Responsible Agency		County Commission, City Councils, Emergency Management					
Partners		County Highway Dept., Emergency Services, Medical Services Providers, Public Utilities					
Completion Timeframe		2 to 3 years			Cost	\$30,000 to \$60,000	
Funding Source		Public Utilities, RD. FEMA Pre-Disaster Mitigation Grant Program (PDM). State Homeland Security Grants.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	5	4	4	32
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element Utilized			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.	

Wells County PR-2: Update/expand existing or create new planning and regulatory capabilities to address development.

Description/Benefit	Build the planning and regulatory capability of incorporated jurisdictions by updating existing and/or expand and create new plans, policies, and ordinances. To ensure new and existing structures adhere to building standards to withstand impacts from oil and gas, and renewable energy development may lead to economic and population growth. <ul style="list-style-type: none">• Specific research should be conducted to address abandoned/blighted properties through zoning and other regulations.• Updating of emergency plans is a priority.• Specific regulations should be developed for museums and historic buildings to address mitigation. A list of plans, policies, codes and ordinances either in place or lacking in Wells County and incorporated jurisdictions can be found in Chapter 7.2 – Wells County Capability Assessment.						
Hazards Addressed	All						
Affected Jurisdiction(s)	Wells County and incorporated jurisdictions						
Project Status	Ongoing and Continue/New						
Priority	High						
Responsible Agency	City Councils, County Commission, Planning & Zoning						
Partners	Emergency Management, Emergency Services, County Highway Dept., NDAC, NDDH, NDDES, NDLC, Public Health, RD						
Completion Timeframe	2 to 5 years			Cost	\$0 to \$10,000		
Funding Source	Local budgets. Local, state and federal grants. Private sector.						
Values: 1 is low (negative impact and/or too costly) – Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	3	3	4	5	30
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized		Plan Element			Process for Integration		
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy		Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.		

8.7.4 Mitigation Capability Assessment

Capability for mitigation is divided into four categories: administrative and technical, education and outreach, financial, and planning and regulatory. Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. **Tables comparing the mitigation capabilities of the city of Harvey with all other jurisdictions in The Planning Area can be found in Chapter 7, County Mitigation Capability Assessment.**

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

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

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

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

8.7.5 Integration of Mitigation Plan into Planning Mechanisms

Integration of the plan into current planning mechanisms is critical in mitigation to communicate the needs of each jurisdiction to achieve an all-inclusive mitigation strategy. The process for integration of the mitigation plan is included after each mitigation project, which shows the planning mechanism utilized, the plan element used for integration and the process for integration.

8.7.6 Plan Maintenance

An important aspect of any useable plan is the maintenance and upkeep of the document. At any given time, planning, risk analysis, updating the situation assessment, research, coordinating, disaster response or other activity is occurring. Plan maintenance ensures the plan will remain useful in the county for many years. A mitigation action progress report form to conduct plan maintenance is in Chapter 10 of this plan.

8.8 City of Hurdsfield

The following profile includes information specific to the city of Hurdsfield for mitigation planning purposes. The information included is as follows:

- Profile and Inventory;
- Risk Assessment;
- Hazard Scoring Notes;
- Mitigation Projects, and
- Capabilities for Mitigation.

Integration into Planning Mechanisms

The process for integration of the mitigation plan into existing planning mechanisms is discussed at the bottom of each mitigation project in section 8.8.4, section 8.8.5 and in Chapter 6, Mitigation Strategy.

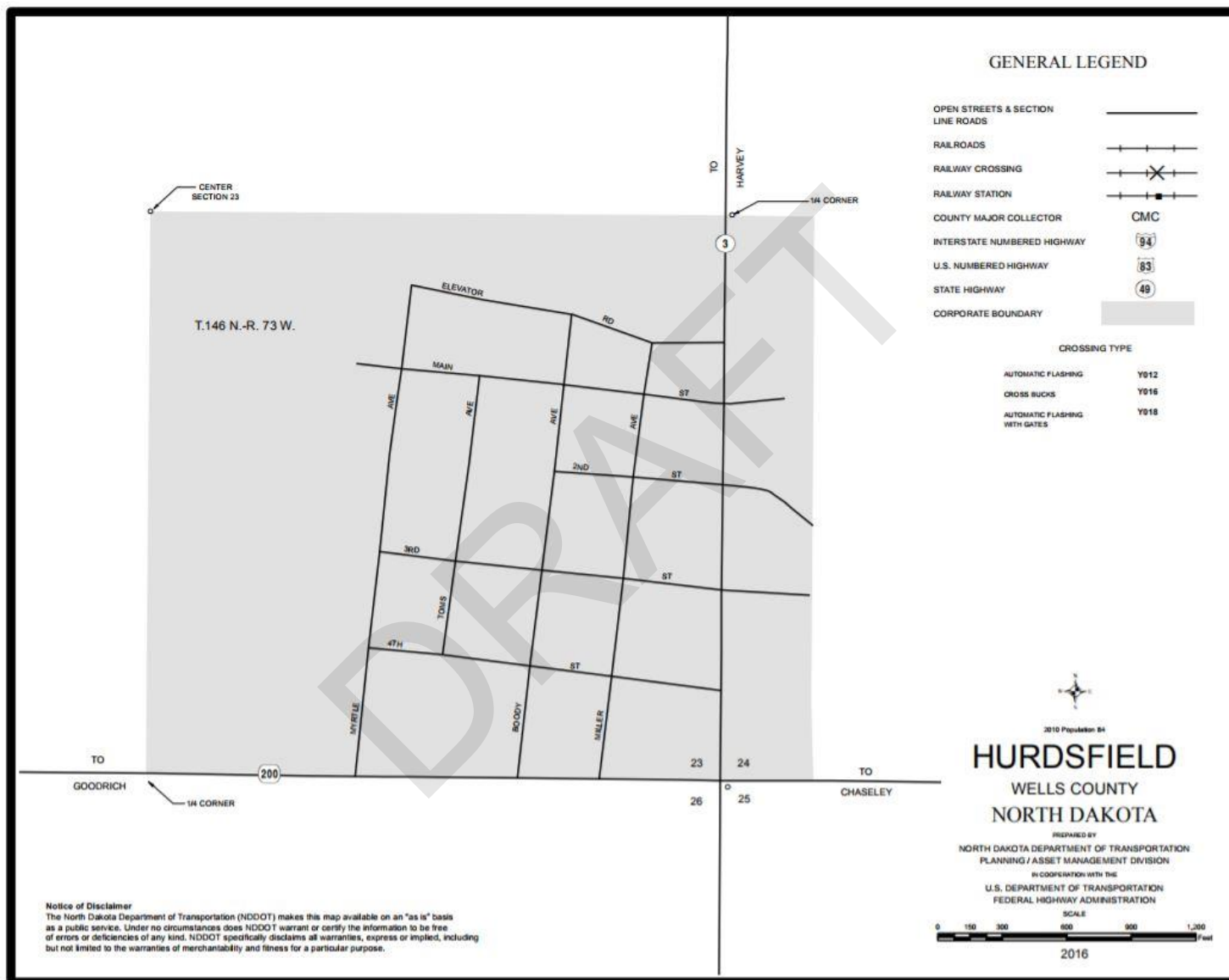
Plan Maintenance

Plan maintenance is shown in section 8.8.6.

Critical Facilities and Infrastructure

Figure 8.8.1 is a map of the city of Hurdsfield illustrating the location of critical facilities and infrastructure.

Figure 8.8.1 – City of Hurdsfield Base Map



Source: N.D. Dept. of Transportation

8.8.1 Profile and Inventory

The location, total population, vulnerable populations, housing units and household size, businesses, critical facilities and infrastructure, new and future development, services, jurisdictional buildings, emergency response services and utilities are shown for the city of Hurdsfield. Detailed narratives follow each section heading to profile the city.

Detailed information on public buildings, services provided, emergency response services and utilities can be found in Chapter 4, Profile and Inventory.

Location

The city of Hurdsfield is in southwest Wells County located at the intersection of N.D. Highway 3 and N.D. Highway 200. The city is located approximately 27 miles southwest of the city of Fessenden, the county seat, and approximately 22 miles south of the city of Harvey, the largest city in The Planning Area.

Population

Per the 2010 U.S. Decennial Census the city of Hurdsfield contains 84 people. The 2011 to 2015 American Community Survey 5-Year Estimate recorded a population of 58 people, a decrease of 26 people, or 31.0 percent from 2010.

Vulnerable Populations

Per the 2010 U.S. Decennial Census, the population of the city of Hurdsfield consists of 15 individuals under the age of 20, and 28 individuals age 65 and older, representing 17.9 percent and 33.3 percent of the population, respectively.

There is not a public school located in the city.

There are no age-restricted and senior housing developments located in the city.

Housing Units and Household Size

The 2011 to 2015 American Community Survey 5-Year Estimate shows there is a total of 69 housing units in the city consisting of 55 single-family homes, eight multifamily homes and six mobile homes.

Per the 2010 U.S. Decennial Census, there are 44 households in the city of Hurdsfield resulting in an average household size of 1.91 people.

Businesses

Businesses located in the city of Hurdsfield include: Dairy King, Kingdom Construction, Weckerly Farms, Freight Solutions, Hefty Seed, Hurdsfield Café, Kline Ranch and independent truck drivers.

New and Future Development

Development over the last five years in the city of Hurdsfield include: removal of abandoned/blighted single-family homes, construction of new single-family homes, a new roof on the community center, renovated city park with new equipment and Hefty Seed added several new commercial and storage buildings.

Future development anticipated in the next 5 years include: new main street commercial building for Heft Seed, new lift station for the sanitary sewer system, new roof on the city hall/library and installation of a tornado siren.

8.8.1 Risk Assessment and Hazard Scoring Notes

Table 8.8.1 summarizes the risk assessment scoring of the city of Hurdsfield. The risk assessment and hazard scoring notes for each hazard specific to the city are shown after Table 8.8.1. Risk assessment notes for impact, frequency, likelihood and vulnerability ubiquitous for jurisdictions in The Planning Area are found in Chapter 5, Threat and Hazard Identification Assessment in each respective hazard profile.

Table 8.8.1 – City of Hurdsfield Jurisdiction Risk Assessment Scoring Summary

Risk Assessment			Jurisdiction:	City of Hurdsfield		
<u>Hazard</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<u>Total</u>
Communicable Disease	2	2	2	3	1	8
Dam Failure	NA	NA	NA	NA	NA	NA
Drought	3	3	3	3	2	10
Flood	3	2	2	3	1	9
Hazardous Material Release	2	2	2	2	1	7
Homeland Security Incident	2	2	2	2	1	7
Severe Summer Weather	4	3	4	3	1	13
Severe Winter Weather	4	3	4	3	1	13
Transportation Accident	2	2	2	2	1	7
Urban Fire/Structure Collapse	2	2	3	2	1	8
Wildland Fire	2	2	3	2	1	8
Windstorm	3	3	3	3	1	11

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

Table 8.6.2 – City of Hurdsfield Jurisdiction Risk Assessment

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Communicable Disease	<ul style="list-style-type: none"> Evacuation (localized) Mass Casualties 	<ul style="list-style-type: none"> Annual occurrences of influenza and other disease. 	<u>More likely</u> <ul style="list-style-type: none"> High elderly population Agriculture economy 	<u>More vulnerable</u> <ul style="list-style-type: none"> Inadequate drainage in certain areas of the city Agriculture economy Presence of abandoned buildings 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> District Health conducting education and outreach 	<u>Less vulnerable</u> <ul style="list-style-type: none"> District Health conducting education and outreach 	
Dam Failure	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> NA 	See Chapter 7
Drought	<ul style="list-style-type: none"> Increased Fire Potential Loss of Economy (decline in hunting activity) 	<ul style="list-style-type: none"> Annual periods of dry conditions 10-year cycle Drought of 1988 and 1989 2008 had dry conditions Burn bans implemented annually 	<u>More likely</u> <ul style="list-style-type: none"> Overdue for drought based on wet/dry cycle 	<u>More vulnerable</u> <ul style="list-style-type: none"> High elderly population 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Modern agricultural practices and no-till farming will decrease severity and help limit impact 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Modern agricultural practices and no-till farming will decrease severity and help limit impact 	
Flood	<ul style="list-style-type: none"> Blocked roads Limited access for emergency services Property damage Flooding (street & structure) 	<ul style="list-style-type: none"> Multiple instances of blocked roads and overland flooding in the city during heavy rain events or spring snow melt 	<u>More likely</u> <ul style="list-style-type: none"> Inadequate drainage in certain areas of the city 	<u>More vulnerable</u> <ul style="list-style-type: none"> Inadequate drainage in certain areas of the city 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Residents clear drains 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Some drain tile in the area 	

Table 8.6.2 – City of Hurdsfield Jurisdiction Risk Assessment - Continued

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Hazardous Material Release	<ul style="list-style-type: none"> Evacuation (localized)/Shelter-in-Place Explosion Human Injury/Death Increased fire potential 	<ul style="list-style-type: none"> No major incidents reported in city limits 	<u>More likely</u> <ul style="list-style-type: none"> Farmers hauling more chemicals used and stored locally 	<u>More vulnerable</u> <ul style="list-style-type: none"> Presence of chemical/fertilizer plant in city limits 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> No elevator 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Railroad inactive Truck route 	
Homeland Security Incident	<ul style="list-style-type: none"> Evacuation (full) 	<ul style="list-style-type: none"> Annual occurrences of localized vandalism 	<u>More likely</u> <ul style="list-style-type: none"> No local law enforcement 	<u>More vulnerable</u> <ul style="list-style-type: none"> High elderly population No local law enforcement 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Sparse population Inactive railroad 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Sparse population Inactive railroad 	
Severe Summer Weather	<ul style="list-style-type: none"> Loss of power/downed lines Blocked roads Sewer Backup 	<ul style="list-style-type: none"> Multiple storms annually 	<ul style="list-style-type: none"> Climatic patterns of the area will result in several storms per year 	<u>More vulnerable</u> <ul style="list-style-type: none"> Lack of local alerting Lack of storm shelter with generator 	See Chapter 7
				<u>Less vulnerable</u> <ul style="list-style-type: none"> Advanced weather forecasting/warning Reverse 911 	
Severe Summer Weather	Severe Winter Weather	<ul style="list-style-type: none"> Loss of power/downed lines Blocked roads for emergency services general economic activity Sewer Backup 	<ul style="list-style-type: none"> Multiple storms (around 3 to 5) annually Major storm with power outages in surrounding area Christmas 2016 	<ul style="list-style-type: none"> Climatic patterns of the area will result in several storms per year 	See Chapter 7
				<u>Less vulnerable</u> <ul style="list-style-type: none"> Advanced weather forecasting/warning Reverse 911 	

Table 8.6.2 – City of Hurdsfield Jurisdiction Risk Assessment - Continued

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Transportation Accident	<ul style="list-style-type: none"> Blocked Roads Human Injury/Death 	<ul style="list-style-type: none"> No major accidents in the last 15 years 	<u>More likely</u> <ul style="list-style-type: none"> N.D. Highway 3 and N.D. Highway 200 	<u>More vulnerable</u> <ul style="list-style-type: none"> N.D. Highway 3 and N.D. Highway 200 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Increased education and awareness 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Increased education and awareness Traffic control signage No school or elevator 	
Urban Fire/Structure Collapse	<ul style="list-style-type: none"> Property Damage Human Injury/Death Loss of Potable Water 	<ul style="list-style-type: none"> Small fires reported once every couple of years 	<u>More likely</u> <ul style="list-style-type: none"> Presence of buildings with outdated electrical Older structures 	<u>More vulnerable</u> <ul style="list-style-type: none"> Presence of buildings with outdated electrical Older structures 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Increased education and awareness 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Sparse population 	
Wildland Fire	<ul style="list-style-type: none"> Delayed Emergency Response 	<ul style="list-style-type: none"> Controlled burns out of control approximately 50 percent of time 	<u>More likely</u> <ul style="list-style-type: none"> Dry conditions (when present) 	<u>More vulnerable</u> <ul style="list-style-type: none"> Lack of fire break around city 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Farmers have supply of water on site 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Locals clear excess vegetation 	
Windstorm	<ul style="list-style-type: none"> Loss of power/downed lines Blocked roads for emergency services and general economic activity Sewer Backup 	<ul style="list-style-type: none"> Multiple storms annually Straight-line winds event occurred in 2015 	<ul style="list-style-type: none"> Climatic patterns of the area will result in several storms per year Flat terrain and constant strong wind gusts 	<u>More vulnerable</u> <ul style="list-style-type: none"> Healthy urban canopy Flat terrain and open topography Lack of official storm shelter 	See Chapter 7

8.8.3 Mitigation Strategy

The Eddy and Wells Counties Multi-Jurisdictional Multi-Hazard Plan Update includes a mitigation strategy consisting of six goals in Chapter 6. The following problem statement and mitigation projects address the mitigation needs of the city of Hurdsfield. It should be noted that some mitigation projects that pertain to all jurisdictions are included to encourage county-wide collaboration.

Problem Statement

The city of Hurdsfield can be impacted by communicable disease, drought, flood (overland and riverine), hazardous material release, severe summer weather, severe winter weather, urban fire/structure collapse, wildland fire, and windstorm. The city experiences overland flooding causing damage to property, and critical facilities and infrastructure due an inadequate storm water drainage system. Economic loss to the agriculture and livestock industry occurs on a frequent basis from natural hazards. The city lacks backup generators for critical facilities and infrastructure, does not have an official storm shelter, and has an outdated early warning system. The city is at risk to wildland fire due to surrounding topography, vegetation, and agriculture practices. Local emergency services need upgraded equipment. The city lacks funding for mitigation projects. With little to no capabilities to accomplish major projects independently, the city is dependent on outside sources for mitigation.

Improved drainage, installation of permanent backup power sources, upgrade sanitary sewer lagoons, installation of fire protection infrastructure and upgrading of fire protection equipment, expansion of planning and regulatory capabilities, and education and outreach are a priority for the city.

Wells County Project AT-3: Upgrade and expand early warning system(s).

Description/Benefit		Coverage of current outdoor early warning system/sirens does not provide coverage to an adequate geographic expanse of the county. Upgrade existing manually-activated sirens to dispatch-activated sirens. Install new dispatch-activated sirens where necessary. There are no existing outdoor early warning sirens for the county outside incorporated cities. Purchase NOAA weather radios for rural communities. <ul style="list-style-type: none">• Upgrade: City of Fessenden (keep existing in same location), City of Sykeston• New: City of Bowdon, City of Fessenden (inside public school), City of Hurdsville• NOAA Weather Radios: City of Cathay, City of Hamberg; Heimdal (unincorporated) <i>The city of Harvey has ordered new sirens which will be installed sometime in 2017.</i>					
Hazards Addressed		Flood, Hazardous Material Release, Severe Summer Weather, Wildland Fire (All)					
Affected Jurisdiction(s)		Wells County and incorporated jurisdictions					
Project Status		Ongoing					
Priority		High					
Responsible Agency		City Councils, Emergency Management					
Partners		County Commission, Emergency Services, FEMA, NDDDES, NWS					
Completion Timeframe		1 to 2 years			Cost	Up to \$25,000 per siren, plus installation	
Funding Source		9-1-1 funding. State Homeland Security Grant Program. City and county general fund.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.	

Wells County Project AT-7: Install permanent generators and upgrade existing permanent or portable generators, at critical facilities and infrastructure.

Description/Benefit	Upgrade existing generators or install new generators to establish permanent source of backup power to maintain continued operation of the following critical facilities and infrastructure: <u>Upgrade</u> <ul style="list-style-type: none">Wells County Shop (Fessenden and Harvey) <u>Install new</u> <ul style="list-style-type: none">City of Bowdon: Water pump station, fire station (sized for construction of new fire hall)City of Cathay: Fire hall, lift station and pumphouseCity of Fessenden: Fessenden-Bowdon Public School, lift stations, city shop, city hall/fire department/police department, pump houseCity of Harvey: Armory/city hall/police station, B.M. Hanson Elementary, fire station, Harvey High School, Harvey Ambulance HallCity of Hurdsfield: Lift stationCity of Sykeston: Lift station, fire hall, water tower for recirculation pump						
Hazards Addressed	All hazards						
Affected Jurisdiction(s)	Wells County and incorporated jurisdictions						
Project Status	Ongoing						
Priority	High						
Responsible Agency	County Commission, City Councils, Emergency Management						
Partners	County Highway Dept., Emergency Services, Medical Services Providers, Public Utilities						
Completion Timeframe	2 to 3 years				Cost	\$30,000 to \$60,000	
Funding Source	Public Utilities, RD. FEMA Pre-Disaster Mitigation Grant Program (PDM). State Homeland Security Grants.						
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	5	4	4	32
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element Utilized			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.	

Wells County Project AT-8: Create and establish permanent county-wide maintenance system for drainage ditches and storm water systems to reduce or eliminate occurrences of overland flooding.

Description/Benefit		Create county-wide drainage ditch/storm water maintenance system to control flow of runoff to eliminate blocked roads, maintain access for city residents and emergency services, and continued operation of public infrastructure.					
Hazards Addressed		Communicable Disease, Drought, Flood (Overland), Severe Summer Weather, Severe Winter Weather, Wildland Fire, Windstorm					
Affected Jurisdiction(s)		Wells County and incorporated jurisdictions					
Project Status		New					
Priority		Medium					
Responsible Agency		City Councils, County Commission, County Highway Dept., Public Works					
Partners		Emergency Services, NDDH, Public Health, SWC, USDA, Water District					
Completion Timeframe		1 to 2 years			Cost	Staff-time	
Funding Source		Local budgets. State and federal grants.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	4	5	3	31
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element Utilized			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.	

Wells County PR-2: Update/expand existing or create new planning and regulatory capabilities to address development.

Description/Benefit		Build the planning and regulatory capability of incorporated jurisdictions by updating existing and/or expand and create new plans, policies, and ordinances. To ensure new and existing structures adhere to building standards to withstand impacts from oil and gas, and renewable energy development may lead to economic and population growth. <ul style="list-style-type: none">• Specific research should be conducted to address abandoned/blighted properties through zoning and other regulations.• Updating of emergency plans is a priority.• Specific regulations should be developed for museums and historic buildings to address mitigation. A list of plans, policies, codes and ordinances either in place or lacking in Wells County and incorporated jurisdictions can be found in Chapter 7.2 – Wells County Capability Assessment.					
Hazards Addressed		All					
Affected Jurisdiction(s)		Wells County and incorporated jurisdictions					
Project Status		Ongoing and Continue/New					
Priority		High					
Responsible Agency		City Councils, County Commission, Planning & Zoning					
Partners		Emergency Management, Emergency Services, County Highway Dept., NDAC, NDDH, NDDES, NDLC, Public Health, RD					
Completion Timeframe		2 to 5 years		Cost	\$0 to \$10,000		
Funding Source		Local budgets. Local, state and federal grants. Private sector.					
Values: 1 is low (negative impact and/or too costly) – Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	3	3	4	5	30
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element		Process for Integration		
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment		Approval by city councils. Approval by county commission.		

Wells County Project I-3: Upgrade existing or construct new storm shelters/community safe rooms.

Description/Benefit	Provide safe area of refuge for permanent residents and temporary populations a seasonal/recreational population from severe weather. Reduce/eliminate loss of life from hazards and man-made threats. Upgrade existing shelters to be fully ADA compliant and pet-friendly. Construct new storm shelters/community safe room in jurisdictions currently lacking a storm shelter/safe room. Emergency Management should contract American Red Cross to set up tour for designation of facilities in each jurisdiction. More information on community shelters can be found through the following link: https://www.fema.gov/media-library/assets/documents/5090 <ul style="list-style-type: none">• Wells County: Location in south-central portion of the county for use by rural residents/farmers. This area of the county has a strong population base and needs protection from severe weather.• Cities of Bowdon, Cathay, Hurdsfield and Sykeston• City of Fessenden/Wells County: Wells County Fair Grounds						
Hazards Addressed	All						
Affected Jurisdiction(s)	Wells County and incorporated jurisdictions						
Project Status	New						
Priority	High						
Responsible Agency	Emergency Management						
Partners	County Commission, City Councils, Emergency Services, NDDes, Red Cross						
Completion Timeframe	3 to 5 years			Cost	\$75,000 to \$150,000		
Funding Source	Local, state and federal grants. FEMA Pre-Disaster Mitigation Grant Program (PDM).						
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	4	4	33
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized		Plan Element			Process for Integration		
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy		Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.		

8.8.4 Mitigation Capability Assessment

Capability for mitigation is divided into four categories: Administrative and Technical, Education and Outreach, Financial, and Planning and Regulatory. Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. **Tables comparing the mitigation capabilities of the city of Hurdsfield with all other jurisdictions in The Planning Area can be found in Chapter 7, County Mitigation Capability Assessment.**

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

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

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

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

8.8.5 Integration of Mitigation Plan into Planning Mechanisms

Integration of the plan into current planning mechanisms is critical in mitigation to communicate the needs of each jurisdiction to achieve an all-inclusive mitigation strategy. The process for integration of the mitigation plan is included after each mitigation project, which shows the planning mechanism utilized, the plan element used for integration and the process for integration.

8.8.6 Plan Maintenance

An important aspect of any useable plan is the maintenance and upkeep of the document. At any given time, planning, risk analysis, updating the situation assessment, research, coordinating, disaster response or other activity is occurring. Plan maintenance ensures the plan will remain useful in the county for many years. A mitigation action progress report form to conduct plan maintenance is in Chapter 10 of this plan.

8.9 City of Sykeston

The following profile includes information specific to the city of Sykeston for mitigation planning purposes. The information included is as follows:

- Profile and Inventory;
- Risk Assessment;
- Hazard Scoring Notes;
- Mitigation Projects, and
- Capabilities for Mitigation.

Integration into Planning Mechanisms

The process for integration of the mitigation plan into existing planning mechanisms is discussed at the bottom of each mitigation project in section 8.9.4, section 8.9.5 and in Chapter 6, Mitigation Strategy.

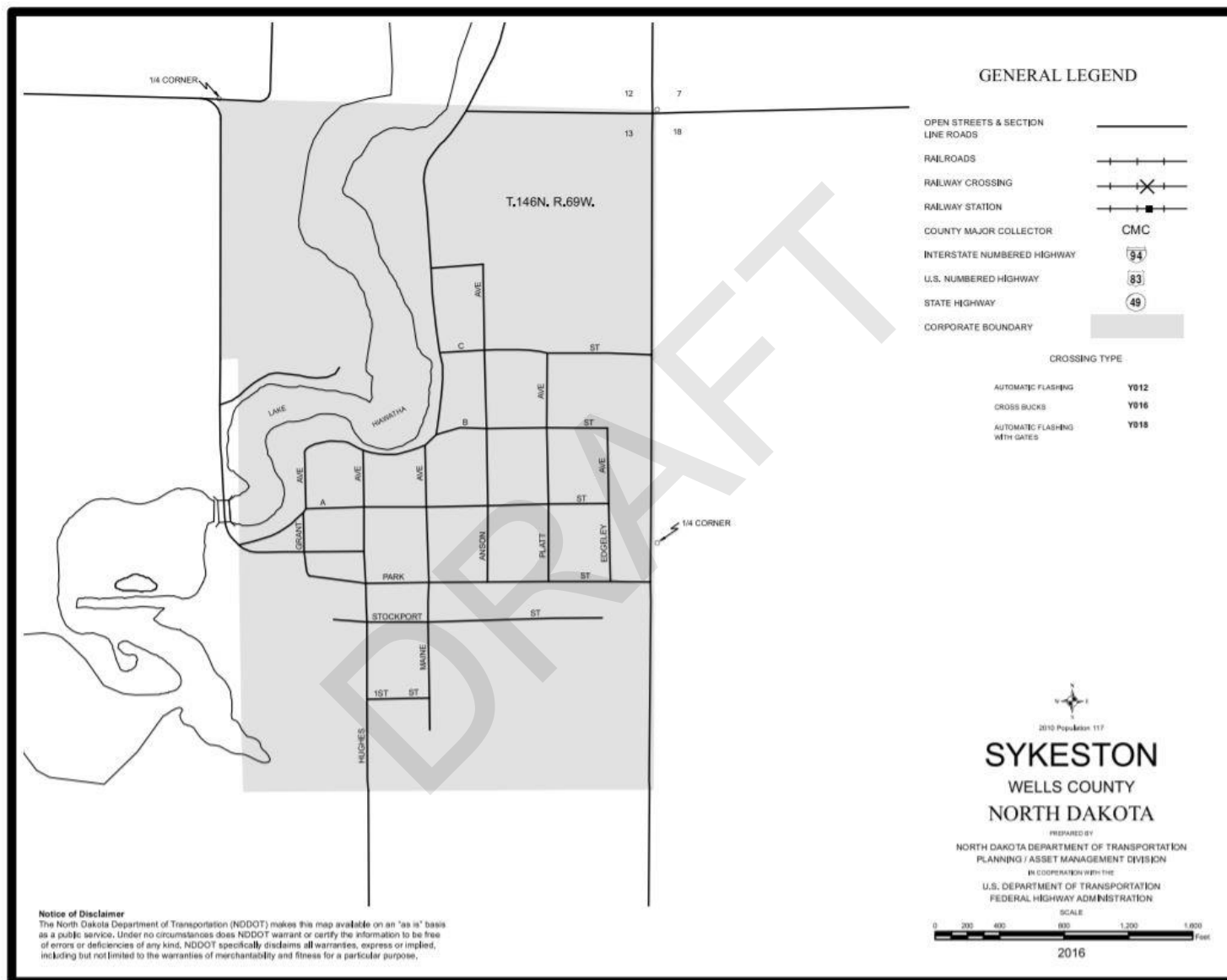
Plan Maintenance

Plan maintenance is shown in section 8.9.6.

Critical Facilities and Infrastructure

Figure 8.8.1 is a map of the city of Sykeston.

Figure 8.9.1 – City of Sykeston Base Map



Source: N.D. Dept. of Transportation

8.9.1 Profile and Inventory

The location, total population, vulnerable populations, housing units and household size, businesses, critical facilities and infrastructure, new and future development, services, jurisdictional buildings, emergency response services and utilities are shown for the city of Sykeston. Detailed narratives follow each section heading to profile the city.

Detailed information on public buildings, services provided, emergency response services and utilities can be found in Chapter 4, Profile and Inventory.

Location

The city of Sykeston is in southeast Wells County located at the intersection of U.S. Highway 52, N.D. Highway 30 and N.D. Highway 200. The city is located approximately 24 miles southeast of the city of Fessenden, the county seat, and approximately 40 miles southeast of the city of Harvey, the largest city in The Planning Area. The city of Carrington in neighboring Foster County is located 13 miles to the east.

Population

Per the 2010 U.S. Decennial Census the city of Sykeston contains 117 people. The 2011 to 2015 American Community Survey 5-Year Estimate recorded a population of 116 people, a decrease of one person, or 0.9 percent from 2010.

Vulnerable Populations

Per the 2010 U.S. Decennial Census, the population of the city of Sykeston consists of 15 individuals under the age of 20, and 34 individuals age 65 and older, representing 12.8 percent and 29.1 percent of the population, respectively.

There is not a public school located in the city.

There are no age-restricted and senior housing developments located in the city.

Housing Units and Household Size

The 2011 to 2015 American Community Survey 5-Year Estimate shows there is a total of 81 housing units in the city consisting of 72 single-family homes, nine multifamily homes and no mobile homes.

Per the 2010 U.S. Decennial Census, there are 65 households in the city of Sykeston resulting in an average household size of 1.80 people.

Businesses

Businesses located in the city of Sykeston include: Miller Elevator Company, Country Face, Thomas Auto Repair, R & S Grain, and the post office.

New and Future Development

New development over the last five years consisted of the removal of several abandoned single-family homes. No future development is planned or proposed at the time of this plan.

8.9.1 Risk Assessment and Hazard Scoring Notes

Table 8.9.1 summarizes the risk assessment scoring of the city of Sykeston. The risk assessment and hazard scoring notes for each hazard specific to the city are shown after Table 8.9.1. Risk assessment notes for impact, frequency, likelihood and vulnerability ubiquitous for jurisdictions in The Planning Area are found in Chapter 5, Threat and Hazard Identification Assessment in each respective hazard profile.

Table 8.9.1 – City of Sykeston Jurisdiction Risk Assessment Scoring Summary

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

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

Table 8.9.2 – City of Sykeston Jurisdiction Risk Assessment

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Communicable Disease	<ul style="list-style-type: none"> Evacuation (localized) Mass Casualties 	<ul style="list-style-type: none"> Annual occurrences of influenza and other disease. 	<u>More likely</u> <ul style="list-style-type: none"> High elderly population Agriculture economy 	<u>More vulnerable</u> <ul style="list-style-type: none"> High elderly population Presence of abandoned buildings No clinic 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> City sprays for mosquitos No school 	<u>Less vulnerable</u> <ul style="list-style-type: none"> City sprays for mosquitos No school 	
Dam Failure	<ul style="list-style-type: none"> City won't be directly impacted, but nearby recreation area would be washed out and lake would drain. Loss of Economy 	<ul style="list-style-type: none"> Never an occurrence In 2009 and 2011, substantial flooding from spring melt threatened the integrity of the Harvey Dam 	<u>More likely</u> <ul style="list-style-type: none"> Presence of Harvey Dam Heavy snowfall/heavy rains resulting in substantial spring melt 	<u>More vulnerable</u> <ul style="list-style-type: none"> Presence of Harvey Dam Heavy snowfall/heavy rains resulting in substantial spring melt 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Emergency Action Plan 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Emergency Action Plan 	
Drought	<ul style="list-style-type: none"> Increased Fire Potential Loss of Economy (decline in hunting activity) 	<ul style="list-style-type: none"> Annual periods of dry conditions 10-year cycle Drought of 1988 and 1989 2008 had dry conditions Burn bans implemented annually 	<u>More likely</u> <ul style="list-style-type: none"> Overdue for drought based on wet/dry cycle 	<u>More vulnerable</u> <ul style="list-style-type: none"> High elderly population 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Modern agricultural practices and no-till farming will decrease severity and help limit impact 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Modern agricultural practices and no-till farming will decrease severity and help limit impact 	

Table 8.9.2 – City of Sykeston Jurisdiction Risk Assessment - Continued

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Flood	<ul style="list-style-type: none"> Blocked roads Property damage Flooding (street & structure) Sewer Backup 	<ul style="list-style-type: none"> Major flooding in 2009 and 2011 	<u>More likely</u> <ul style="list-style-type: none"> Inadequate drainage in certain areas of the city Old sewer system Adjacent to Pipestem Creek 	<u>More vulnerable</u> <ul style="list-style-type: none"> Storm water line draining water to the west of the city is slow and plugged Old sewer system Adjacent to Pipestem Creek 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> NFIP No critical facilities 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Some drain tile in the area 	
Hazardous Material Release	<ul style="list-style-type: none"> Evacuation (localized)/Shelter-in-Place Explosion Human Injury/Death Increased Fire Potential 	<ul style="list-style-type: none"> No major incidents reported in city limits 	<u>More likely</u> <ul style="list-style-type: none"> Farmers hauling more chemicals used and stored in city limits N.D. Highway 200 No truck route 	<u>More likely</u> <ul style="list-style-type: none"> Farmers hauling more chemicals used and stored in city limits N.D. Highway 200 No truck route 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> No railroad 	<u>Less vulnerable</u> <ul style="list-style-type: none"> No railroad 	
Homeland Security Incident	<ul style="list-style-type: none"> Evacuation (full)/Shelter-in-Place Increased Fire Potential 	<ul style="list-style-type: none"> No incidents reported 	<u>More likely</u> <ul style="list-style-type: none"> No local law enforcement 	<u>More vulnerable</u> <ul style="list-style-type: none"> High elderly population No local law enforcement N.D. Highway 200 Farm chemical storage in city limits 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Sparse population No railroad 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Sparse population No railroad No school Low population 	

Table 8.9.2 – City of Sykeston Jurisdiction Risk Assessment – Continued

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Severe Summer Weather	<ul style="list-style-type: none"> Blocked roads Downed Trees Loss of power/downed lines Sewer Backup 	<ul style="list-style-type: none"> Multiple storms annually 	<ul style="list-style-type: none"> Climatic patterns of the area will result in several storms per year 	<u>More vulnerable</u> <ul style="list-style-type: none"> High youth and elderly population Power outage will cause sewer backups 	See Chapter 7
				<u>Less vulnerable</u> <ul style="list-style-type: none"> Advanced weather forecasting/warning Reverse 911 	
Severe Winter Weather	<ul style="list-style-type: none"> Loss of power/downed lines Blocked roads for emergency services and general economic activity Delayed Emergency Response Downed Trees Sewer Backup 	<ul style="list-style-type: none"> Multiple storms (around 3 to 5) annually 1997 storm resulted in power outage of one week Major storm with power outages in surrounding area Christmas 2016 	<ul style="list-style-type: none"> Climatic patterns of the area will result in several storms per year 	<u>More vulnerable</u> <ul style="list-style-type: none"> High youth and elderly population Power outage will cause sewer backups Lack of shelter with generator Flat terrain 	See Chapter 7
				<u>Less vulnerable</u> <ul style="list-style-type: none"> Advanced warning Reverse 911 	
Transportation Accident	<ul style="list-style-type: none"> Delayed Emergency Response HAZMAT Release 	<ul style="list-style-type: none"> 5 accidents in the last 15 years 	<u>More likely</u> <ul style="list-style-type: none"> N.D. Highway 200 More truck traffic in city 	<u>More vulnerable</u> <ul style="list-style-type: none"> N.D. Highway 200 No truck route 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Increased education and awareness 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Increased education and awareness No school No railroad 	

Table 8.9.2 – City of Sykeston Jurisdiction Risk Assessment - Continued

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capability
Urban Fire/Structure Collapse	<ul style="list-style-type: none"> Property Damage Human Injury/Death Loss of Potable Water for fire suppression 	<ul style="list-style-type: none"> Small fires reported once every couple of years 	<u>More likely</u> <ul style="list-style-type: none"> Presence of buildings with outdated electrical Older structures 	<u>More vulnerable</u> <ul style="list-style-type: none"> Presence of buildings with outdated electrical Older structures Lack of generator at fire hall 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Increased education and awareness 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Sparse population 	
Wildland Fire	<ul style="list-style-type: none"> Delayed Emergency Response/strain on local volunteers Loss of Power Depletion of Potable Water 	<ul style="list-style-type: none"> Controlled burns out of control approximately 50 percent of time 	<u>More likely</u> <ul style="list-style-type: none"> Dry conditions (when present) Overgrown vegetation around community 	<u>More vulnerable</u> <ul style="list-style-type: none"> Lack of fire break Large tree row around west side of city Many FD volunteers live out of town 	See Chapter 7
			<u>Less likely</u> <ul style="list-style-type: none"> Farmers have supply of water on site Less CRP 	<u>Less vulnerable</u> <ul style="list-style-type: none"> Emergency siren Availability of water from Pipestem Creek 	
Windstorm	<ul style="list-style-type: none"> Loss of power/downed lines Blocked roads Sewer Backup 	<ul style="list-style-type: none"> Multiple storms annually Straight-line wind storm 2014/2015 	<ul style="list-style-type: none"> Climatic patterns of the area will result in several storms per year 	<u>More vulnerable</u> <ul style="list-style-type: none"> Healthy urban canopy Flat terrain and open topography Lack of shelter with generator High elderly population 	See Chapter 7
				<u>Less vulnerable</u> <ul style="list-style-type: none"> Emergency siren CodeRED 	

8.9.3 Mitigation Strategy

The Eddy and Wells Counties Multi-Jurisdictional Multi-Hazard Plan Update includes a mitigation strategy consisting of six goals in Chapter 6. The following problem statement and mitigation projects address the mitigation needs of the city of Sykeston. It should be noted that some mitigation projects that pertain to all jurisdictions are included to encourage county-wide collaboration.

Problem Statement

The city of Sykeston can be impacted by communicable disease, drought, flood (overland and riverine), hazardous material release, severe summer weather, severe winter weather, urban fire/structure collapse, wildland fire, and windstorm. Blocked roads from flooding, severe summer weather and severe winter weather limit access for emergency services. Economic loss to the agriculture and livestock industry occurs on a frequent basis from natural hazards. The city lacks backup generators for critical facilities and infrastructure and does not have an official storm shelter. Local emergency services need upgraded equipment. The city lacks funding for mitigation projects. With little to no capabilities to accomplish major projects independently, the city is dependent on outside sources for mitigation.

Improved drainage, installation of permanent backup power sources, upgrading of fire protection equipment, expansion of planning and regulatory capabilities, and education and outreach are a priority for the city.

Wells County Project AT-3: Upgrade and expand early warning system(s).

Description/Benefit		Coverage of current outdoor early warning system/sirens does not provide coverage to an adequate geographic expanse of the county. Upgrade existing manually-activated sirens to dispatch-activated sirens. Install new dispatch-activated sirens where necessary. There are no existing outdoor early warning sirens for the county outside incorporated cities. Purchase NOAA weather radios for rural communities. <ul style="list-style-type: none">• Upgrade: City of Fessenden (keep existing in same location), City of Sykeston• New: City of Bowdon, City of Fessenden (inside public school), City of Hurdsville• NOAA Weather Radios: City of Cathay, City of Hamberg; Heimdal (unincorporated) <i>The city of Harvey has ordered new sirens which will be installed sometime in 2017.</i>					
Hazards Addressed		Flood, Hazardous Material Release, Severe Summer Weather, Wildland Fire (All)					
Affected Jurisdiction(s)		Wells County and incorporated jurisdictions					
Project Status		Ongoing					
Priority		High					
Responsible Agency		City Councils, Emergency Management					
Partners		County Commission, Emergency Services, FEMA, NDDDES, NWS					
Completion Timeframe		1 to 2 years			Cost	Up to \$25,000 per siren, plus installation	
Funding Source		9-1-1 funding. State Homeland Security Grant Program. City and county general fund.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.	

Wells County Project AT-7: Install permanent generators and upgrade existing permanent or portable generators, at critical facilities and infrastructure.

Description/Benefit	Upgrade existing generators or install new generators to establish permanent source of backup power to maintain continued operation of the following critical facilities and infrastructure: <u>Upgrade</u> <ul style="list-style-type: none">Wells County Shop (Fessenden and Harvey) <u>Install new</u> <ul style="list-style-type: none">City of Bowdon: Water pump station, fire station (sized for construction of new fire hall)City of Cathay: Fire hall, lift station and pumphouseCity of Fessenden: Fessenden-Bowdon Public School, lift stations, city shop, city hall/fire department/police department, pump houseCity of Harvey: Armory/city hall/police station, B.M. Hanson Elementary, fire station, Harvey High School, Harvey Ambulance HallCity of Hurdsfield: Lift stationCity of Sykeston: Lift station, fire hall, water tower for recirculation pump						
Hazards Addressed	All hazards						
Affected Jurisdiction(s)	Wells County and incorporated jurisdictions						
Project Status	Ongoing						
Priority	High						
Responsible Agency	County Commission, City Councils, Emergency Management						
Partners	County Highway Dept., Emergency Services, Medical Services Providers, Public Utilities						
Completion Timeframe	2 to 3 years				Cost	\$30,000 to \$60,000	
Funding Source	Public Utilities, RD. FEMA Pre-Disaster Mitigation Grant Program (PDM). State Homeland Security Grants.						
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	5	4	4	32
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element Utilized			Process for Integration	
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment			Approval by city councils. Approval by county commission.	

Wells County PR-4: Encourage jurisdictions to review local flood ordinances to meet or exceed minimum federal and state requirements and comply with the NFIP (once enrolled), and enroll in the Community Rating System.

Description/Benefit		To ensure Wells County and incorporated jurisdictions meet or exceed the NFIP to prepare for enrollment in the NFIP.					
Hazards Addressed		Flood (overland and riverine)					
Affected Jurisdiction(s)		The cities of Fessenden, Harvey and Sykeston. Wells County and the cities of Bowdon, Cathay, Hamberg, Hurdsfield (once enrolled).					
Project Status		Ongoing and Continue/New					
Priority		High					
Responsible Agency		City Councils, County Commission, Emergency Management, Planning & Zoning					
Partners		Emergency Services, NDAC, NDDES, NDLC, SWC					
Completion Timeframe		4 to 5 years			Cost	\$0 to \$1,000	
Funding Source		Local staff-time. SWC.					
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element Utilized			Process for Integration	
National Flood Insurance Program			Capability Assessment, Hazard History, Risk Assessment			Approval and adoption by county commission and city councils.	

Wells County Project I-3: Upgrade existing or construct new storm shelters/community safe rooms.

Description/Benefit	Provide safe area of refuge for permanent residents and temporary populations a seasonal/recreational population from severe weather. Reduce/eliminate loss of life from hazards and man-made threats. Upgrade existing shelters to be fully ADA compliant and pet-friendly. Construct new storm shelters/community safe room in jurisdictions currently lacking a storm shelter/safe room. Emergency Management should contract American Red Cross to set up tour for designation of facilities in each jurisdiction. More information on community shelters can be found through the following link: https://www.fema.gov/media-library/assets/documents/5090 <ul style="list-style-type: none">• Wells County: Location in south-central portion of the county for use by rural residents/farmers. This area of the county has a strong population base and needs protection from severe weather.• Cities of Bowdon, Cathay, Hurdsfield and Sykeston• City of Fessenden/Wells County: Wells County Fair Grounds						
Hazards Addressed	All						
Affected Jurisdiction(s)	Wells County and incorporated jurisdictions						
Project Status	New						
Priority	High						
Responsible Agency	Emergency Management						
Partners	County Commission, City Councils, Emergency Services, NDDes, Red Cross						
Completion Timeframe	3 to 5 years			Cost	\$75,000 to \$150,000		
Funding Source	Local, state and federal grants. FEMA Pre-Disaster Mitigation Grant Program (PDM).						
Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	4	4	33
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element		Process for Integration		
See Chapter 7, Table 7.5 – Utilization of Planning Mechanisms in Wells County Mitigation Strategy			Capability Assessment, Hazard History, Risk Assessment		Approval by city councils. Approval by county commission.		

8.9.4 Mitigation Capability Assessment

Capability for mitigation is divided into four categories: Administrative and Technical, Education and Outreach, Financial, and Planning and Regulatory. Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. **Tables comparing the mitigation capabilities of the city of Sykeston with all other jurisdictions in The Planning Area can be found in Chapter 7, County Mitigation Capability Assessment.**

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

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

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

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

8.9.5 Integration of Mitigation Plan into Planning Mechanisms

Integration of the plan into current planning mechanisms is critical in mitigation to communicate the needs of each jurisdiction to achieve an all-inclusive mitigation strategy. The process for integration of the mitigation plan is included after each mitigation project, which shows the planning mechanism utilized, the plan element used for integration and the process for integration.

8.9.6 Plan Maintenance

An important aspect of any useable plan is the maintenance and upkeep of the document. At any given time, planning, risk analysis, updating the situation assessment, research, coordinating, disaster response or other activity is occurring. Plan maintenance ensures the plan will remain useful in the county for many years. A mitigation action progress report form to conduct plan maintenance is in Chapter 10 of this plan.

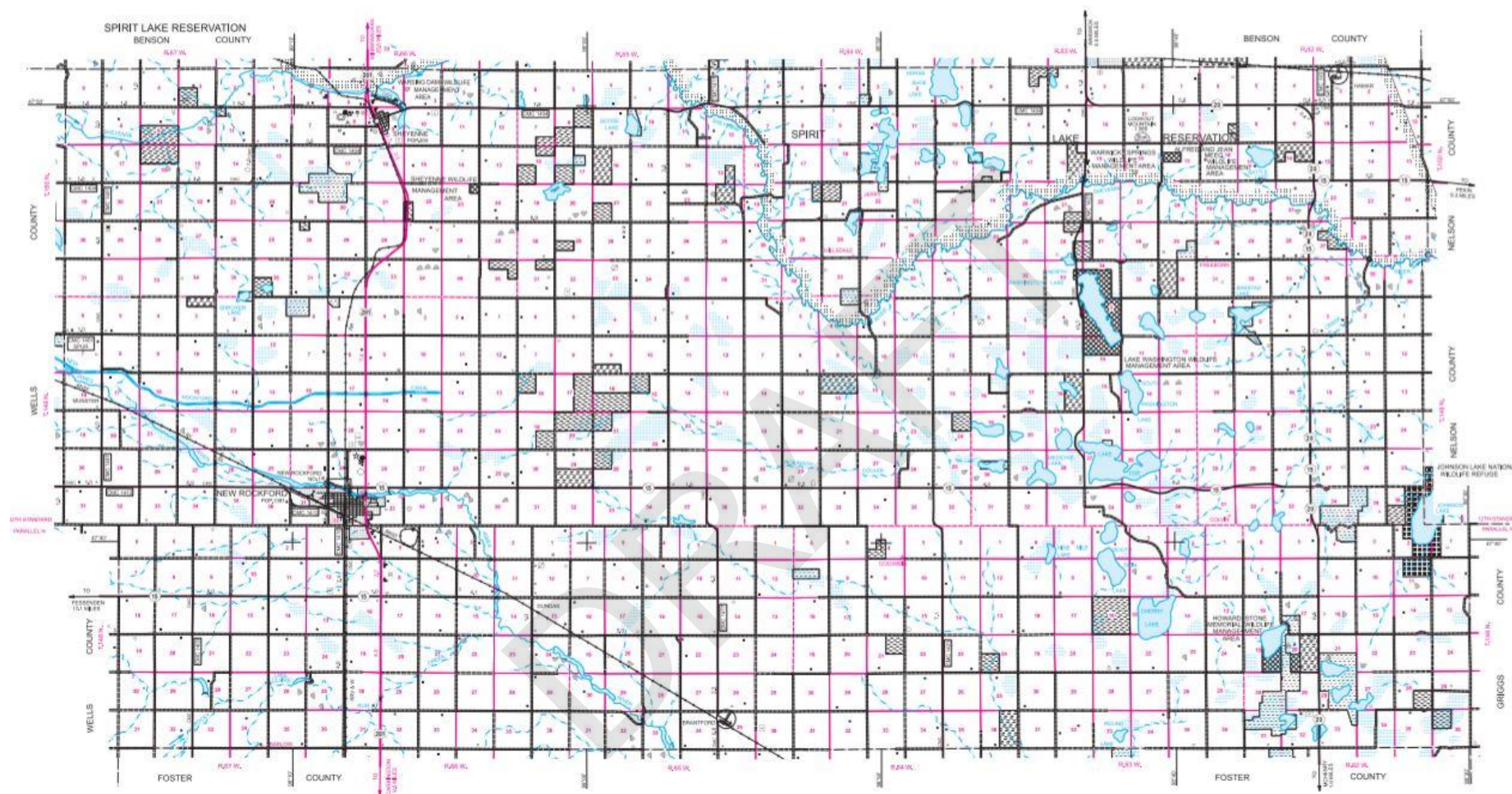
9. Maps

Maps are visual illustrations that assist in mitigation by providing details of the inventory of the counties, where critical facilities and infrastructure are located, geographic coverage of emergency services, and each incorporated jurisdiction. Maps are drawings, depictions, and illustrations and are commonly referred to as figures in planning documents.

Maps of Eddy & Wells Counties and incorporated jurisdictions shown in this chapter are as follows:

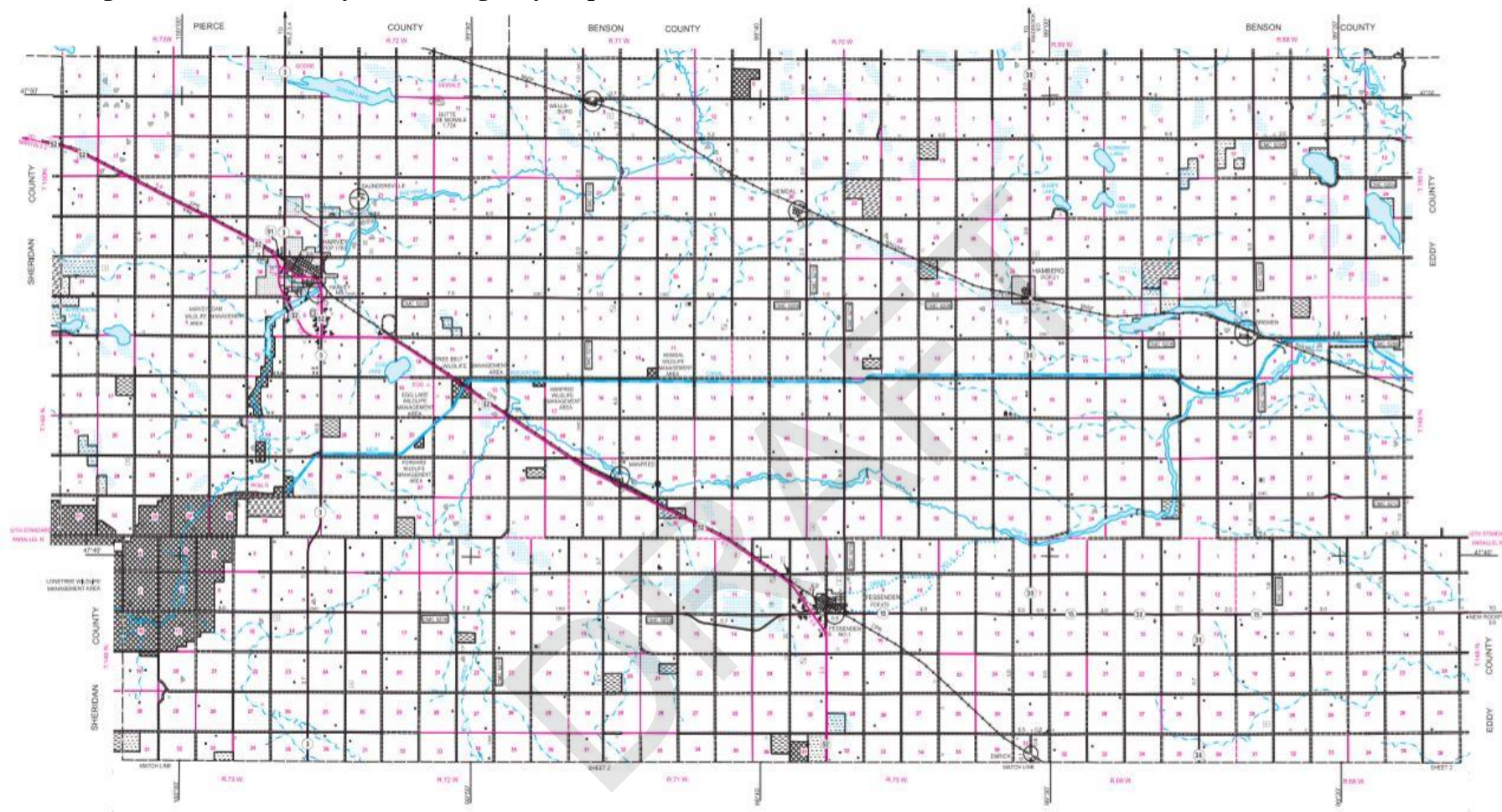
- Figure 9.1 – Eddy County General Highway Map
- Figure 9.2 – Wells County General Highway Map – Sheet 1
- Figure 9.3 – Wells County General Highway Map – Sheet 2
- Figure 9.4 – Wells County Fire Departments/Districts Map
- Figure 9.5 – Bowdon Rural Fire Department Map
- Figure 9.6 – Cathay Fire Protection District Map
- Figure 9.7 – Fessenden Fire Protection District Map
- Figure 9.8 – Goodrich Fire Protection District Map
- Figure 9.9 – Harvey Fire Protection District Map
- Figure 9.10 – Maddock Fire Protection District Map
- Figure 9.11 – New Rockford Rural Fire Department Map
- Figure 9.12 – Sheyenne Rural Fire Department Map
- Figure 9.13 – Sykeston Fire Protection District Map

Figure 9.1 – Eddy County General Highway Map



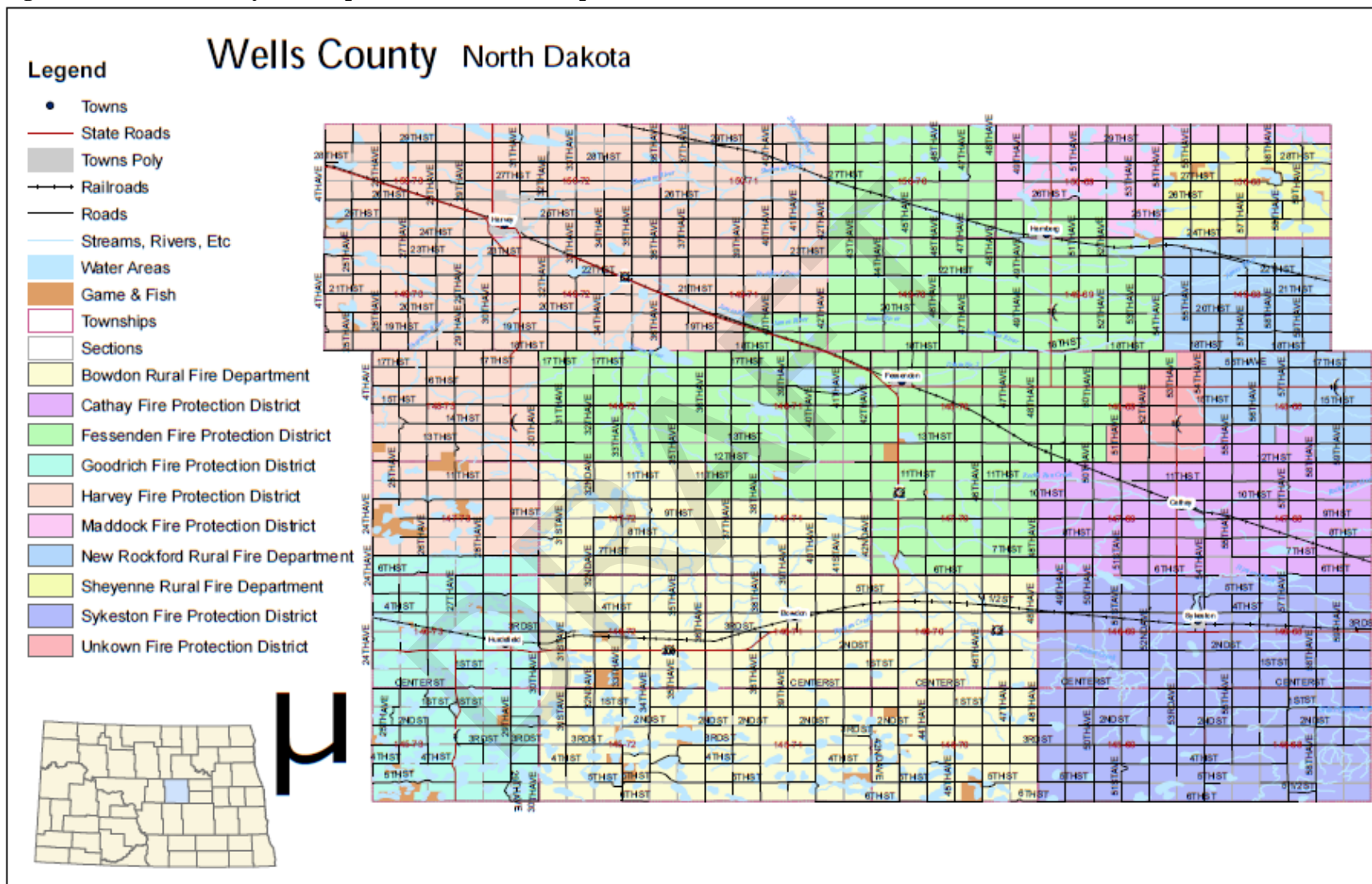
Source: N.D. Dept. of Transportation

Figure 9.2 – Wells County General Highway Map – Sheet 1



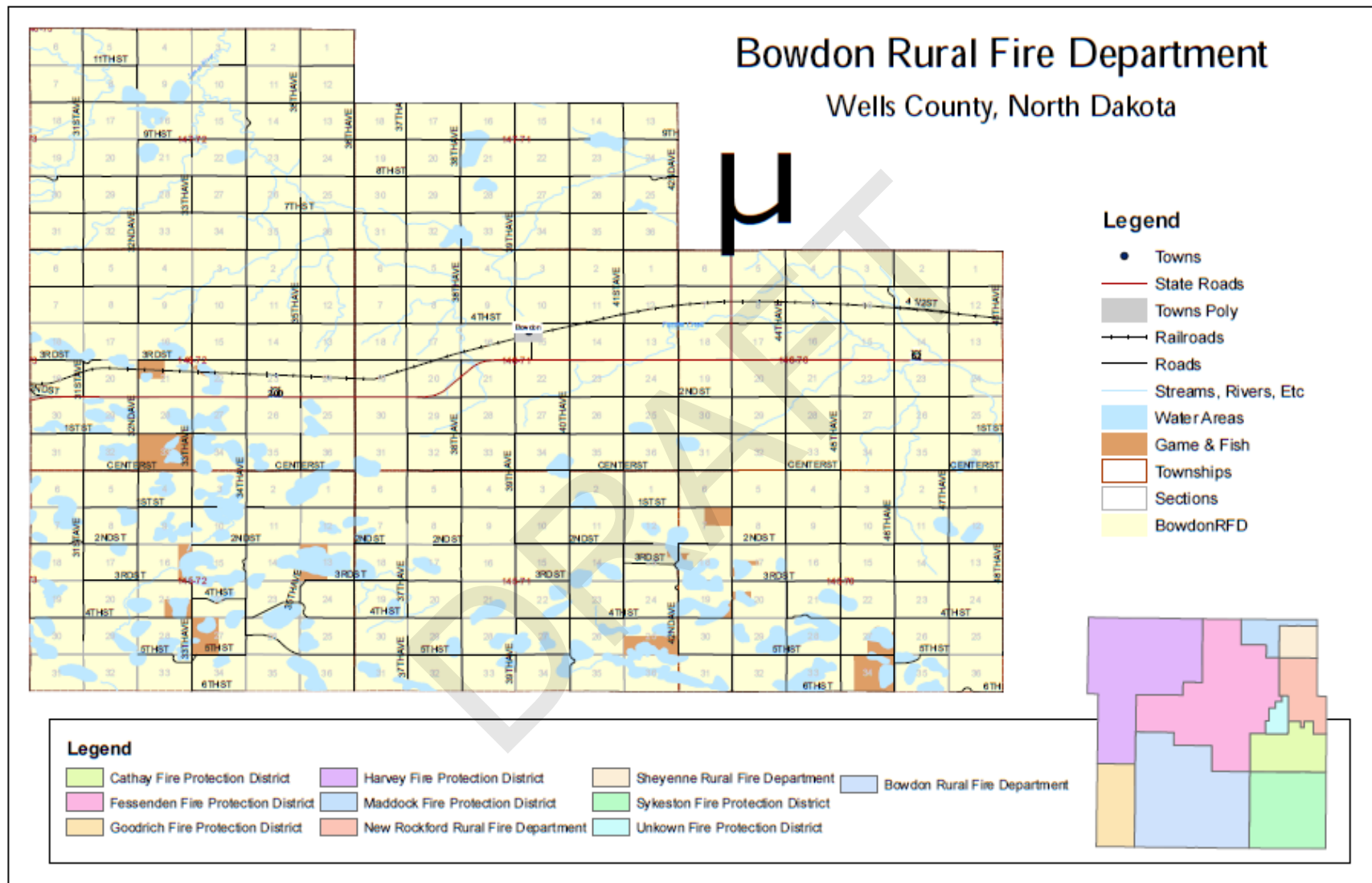
Source: N.D. Dept. of Transportation

Figure 9.4 – Wells County Fire Departments/Districts Map



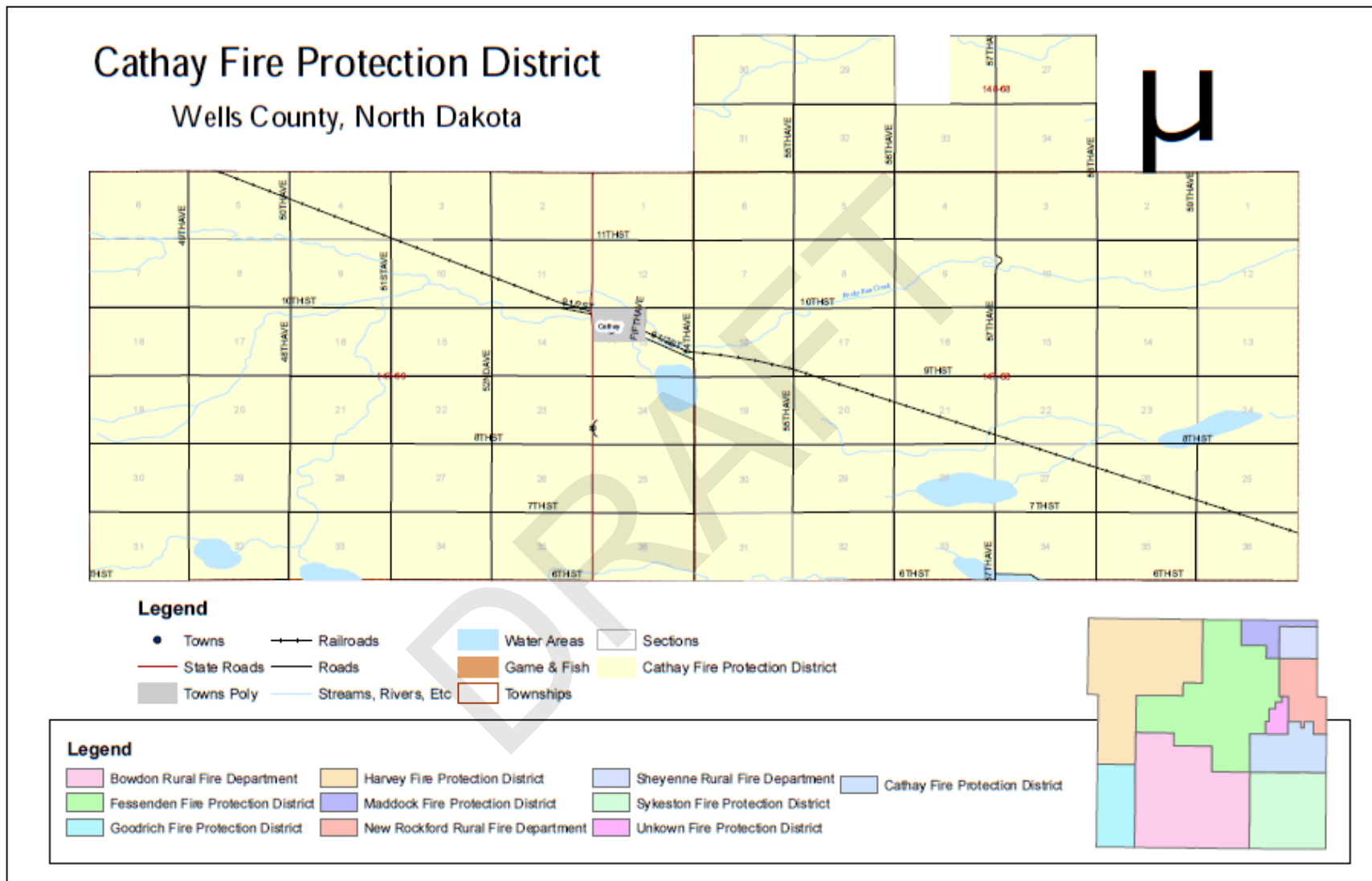
Source: 2010 Eddy & Wells Counties MHMP

Figure 9.5 – Bowdon Rural Fire Department Map



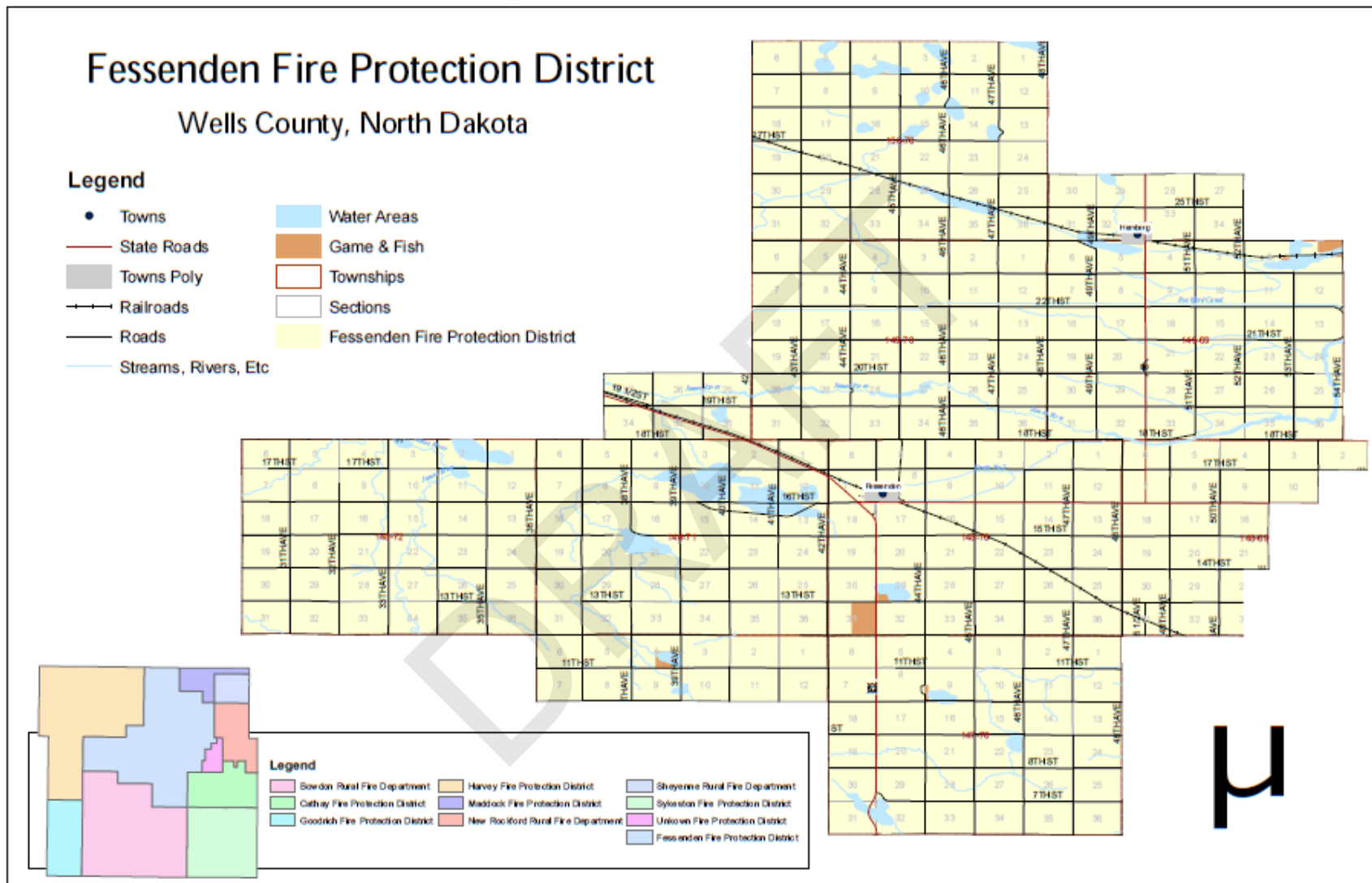
Source: 2010 Eddy & Wells Counties MHMP

Figure 9.6 – Cathay Fire Protection District Map



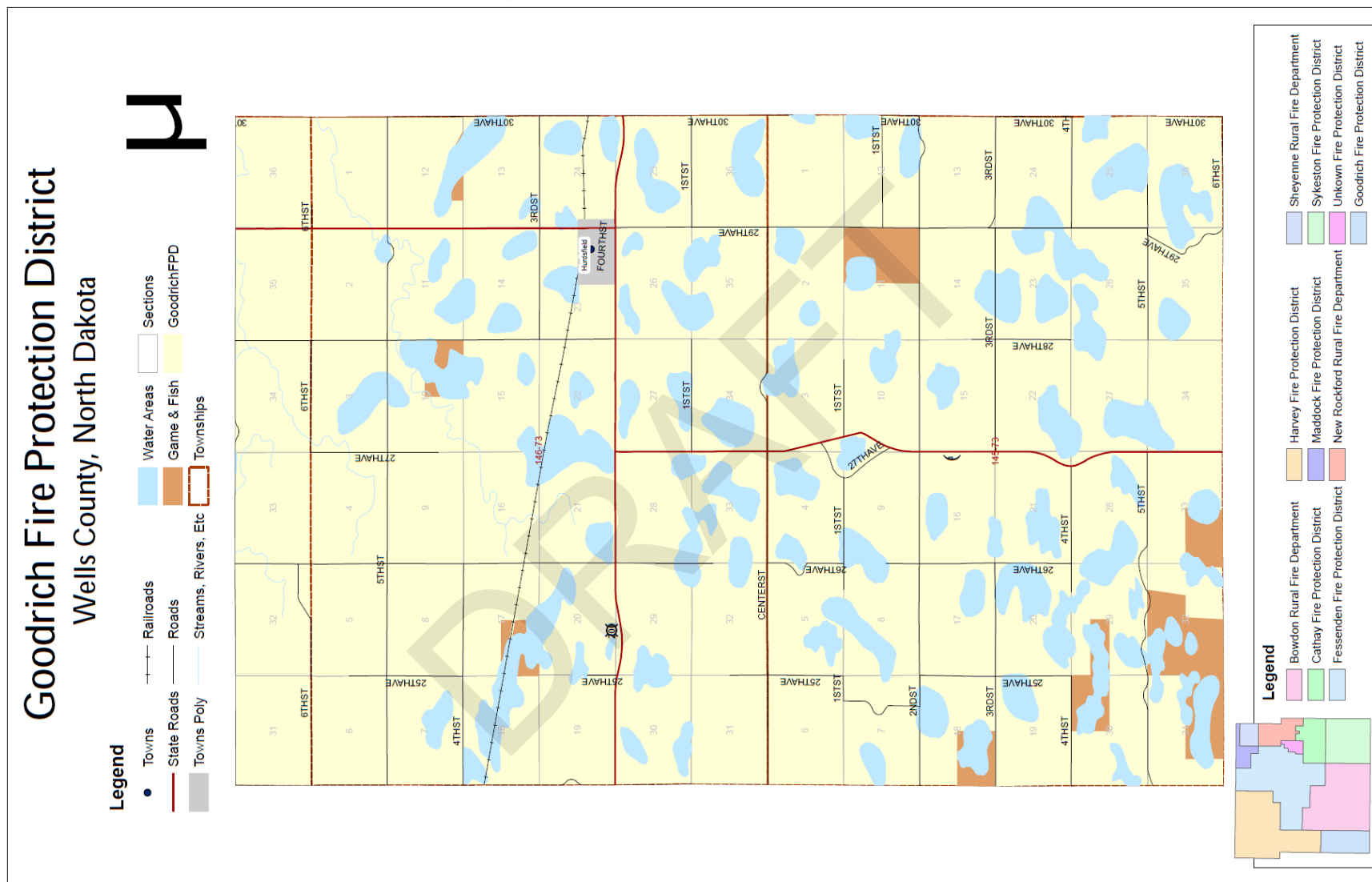
Source: 2010 Eddy & Wells Counties MHMP

Figure 9.7 – Fessenden Fire Protection District Map



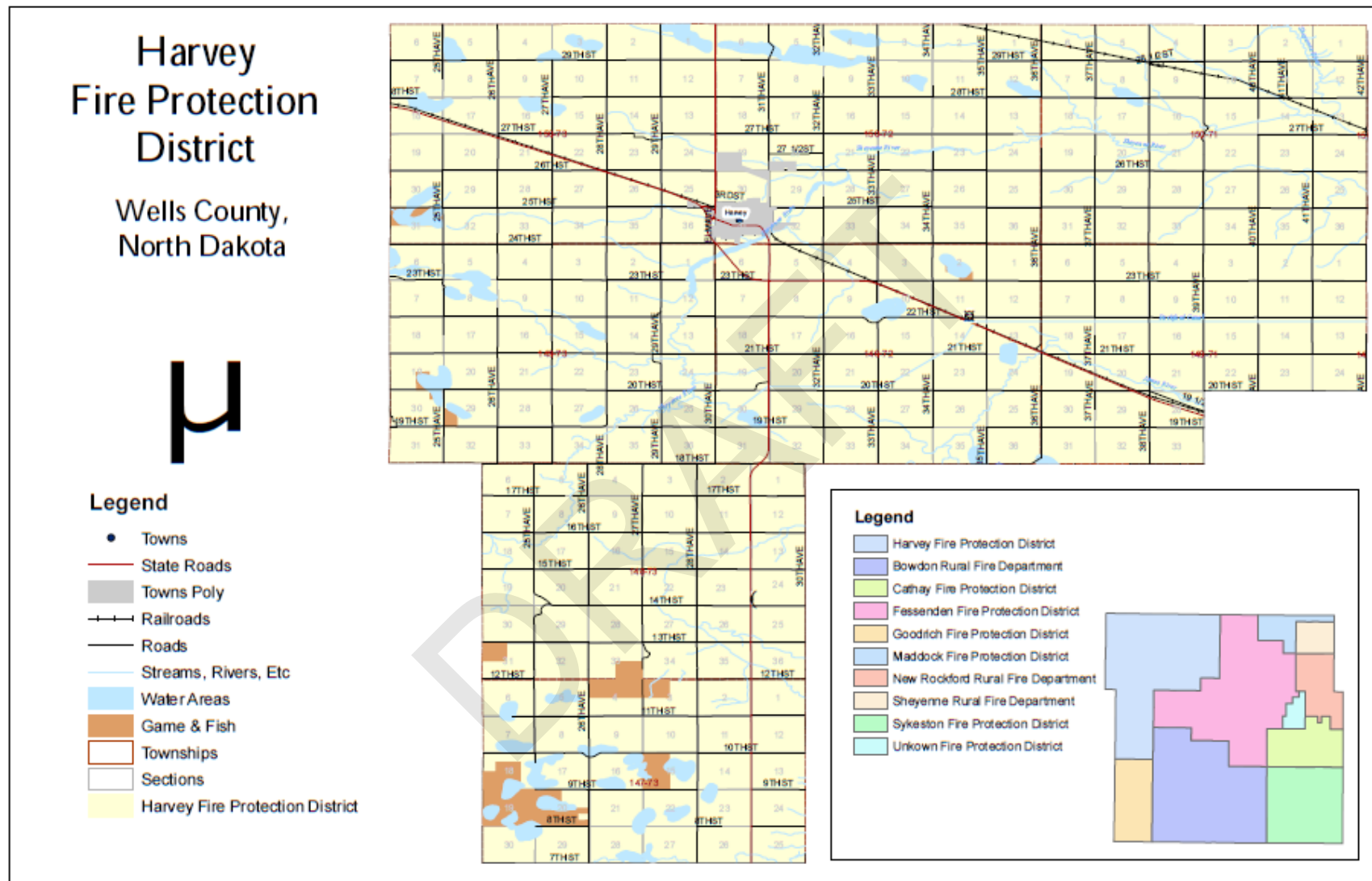
Source: 2010 Eddy & Wells Counties MHMP

Figure 9.8 – Goodrich Fire Protection District Map



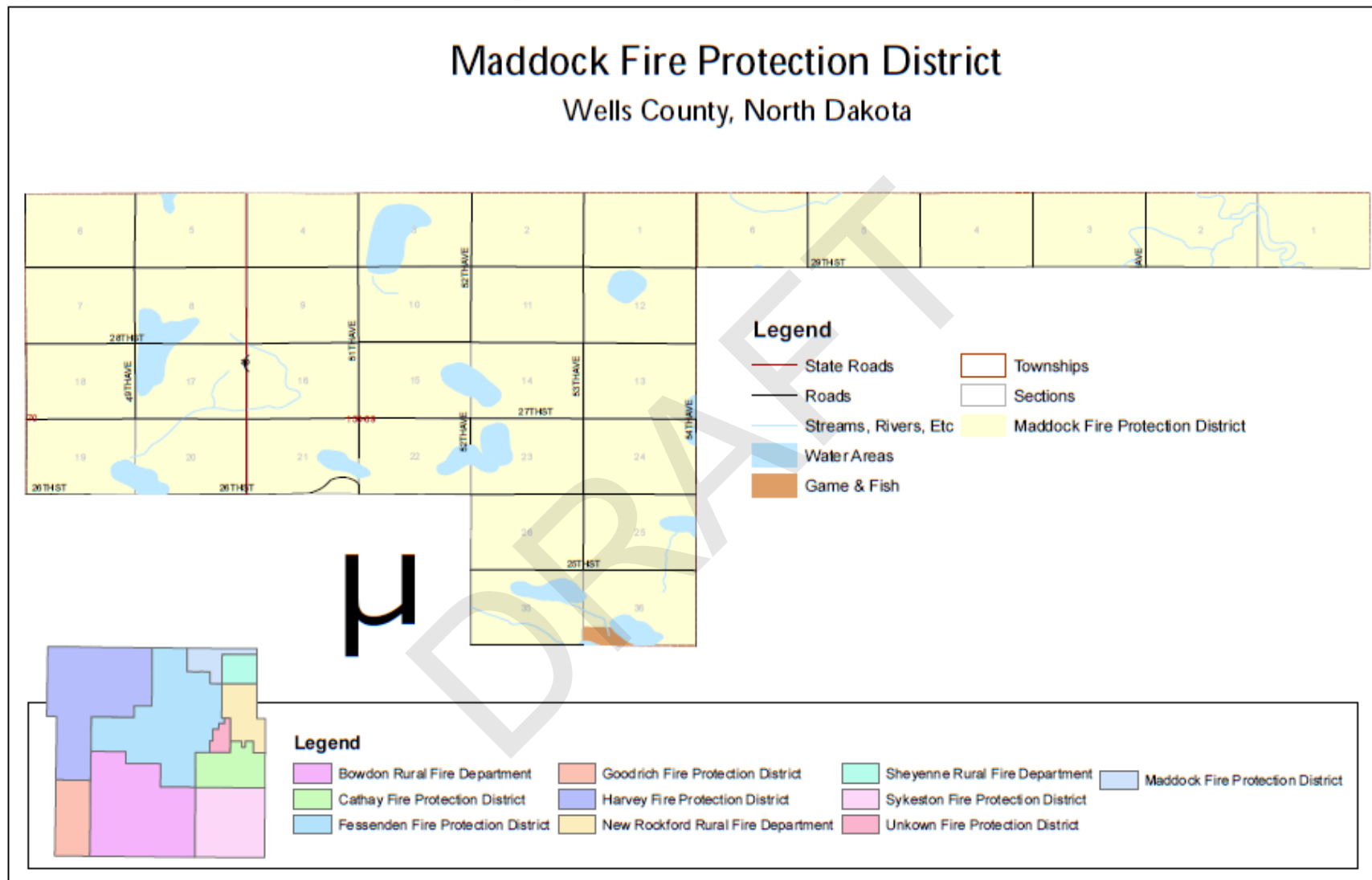
Source: 2010 Eddy & Wells Counties MHMP

Figure 9.9 – Harvey Fire Protection District Map



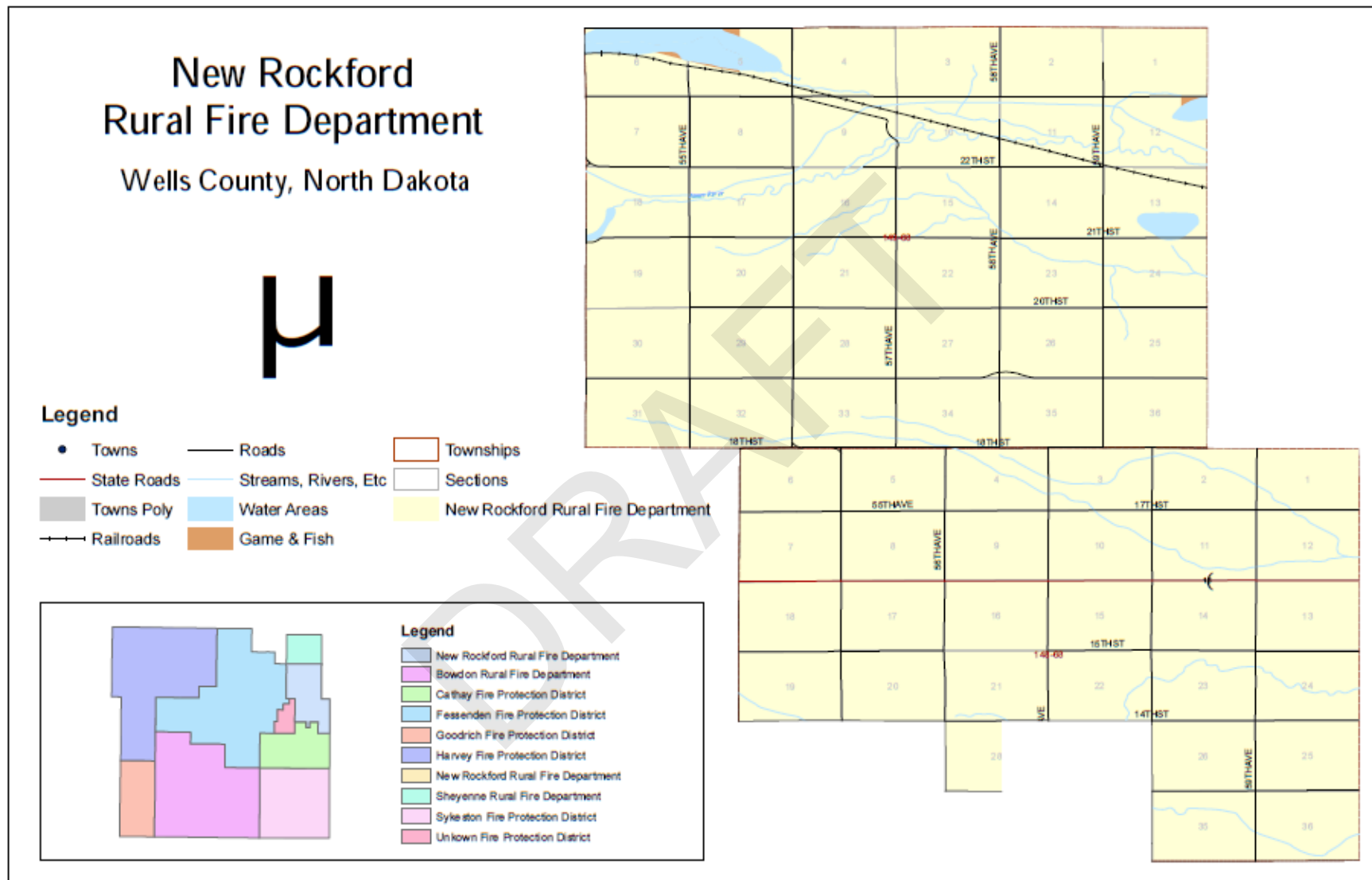
Source: 2010 Eddy & Wells Counties MHMP

Figure 9.10 – Maddock Fire Protection District Map



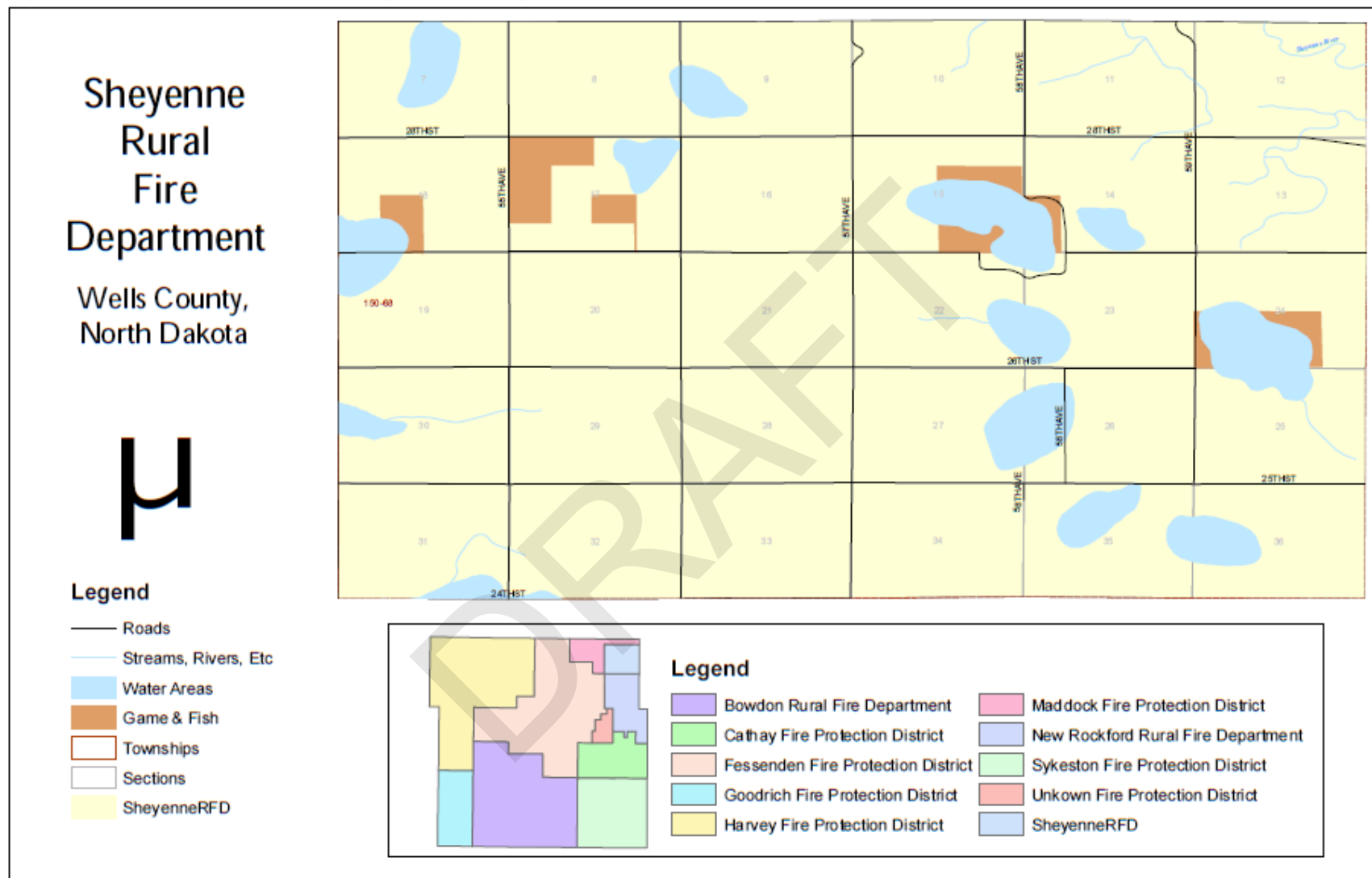
Source: 2010 Eddy & Wells Counties MHMP

Figure 9.11 – Maddock Fire Protection District Map



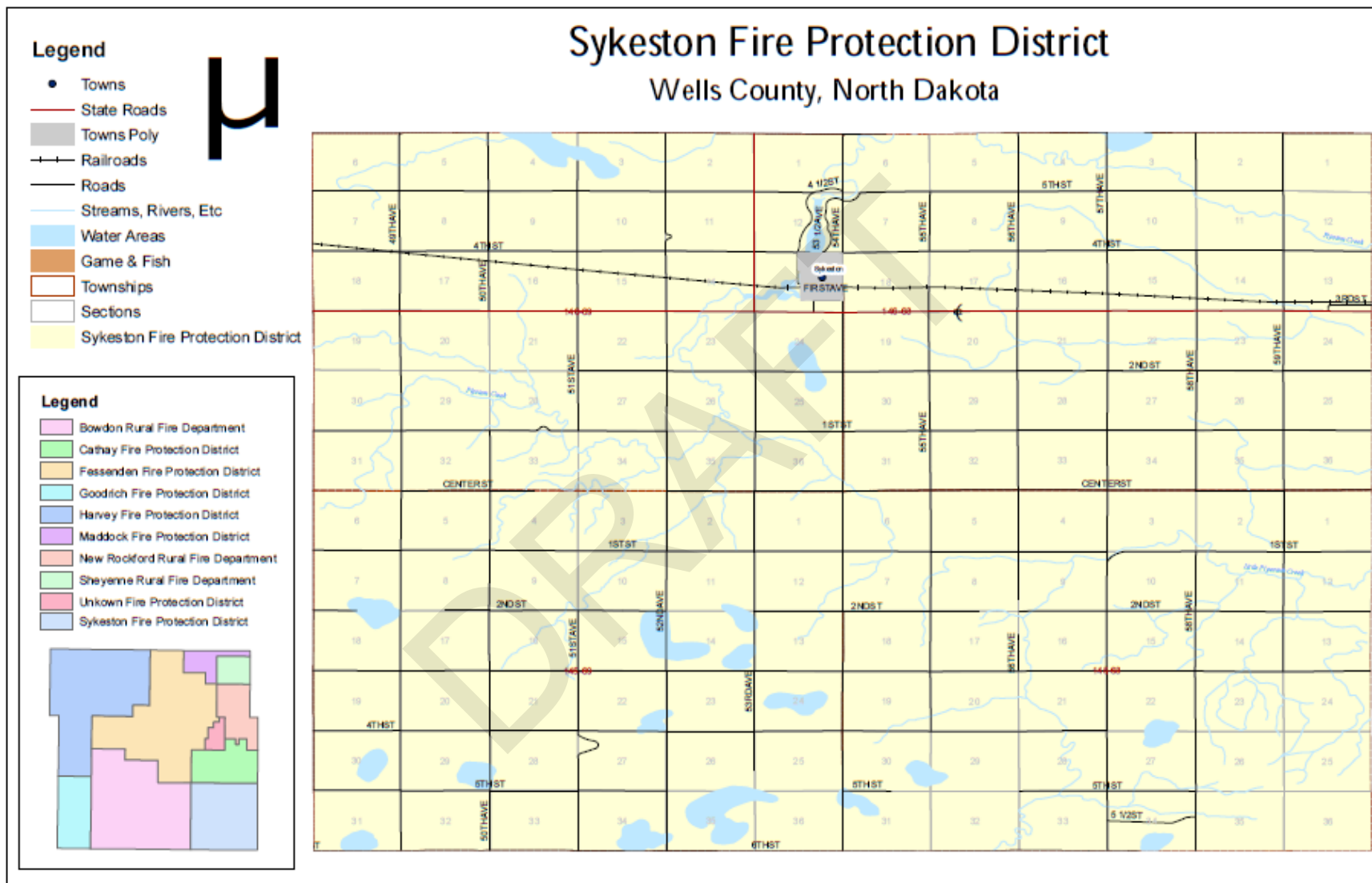
Source: 2010 Eddy & Wells Counties MHMP

Figure 9.12 – Sheyenne Rural Fire Department Map



Source: 2010 Eddy & Wells Counties MHMP

Figure 9.13 – Sykeston Fire Protection District Map



Source: 2010 Eddy & Wells Counties MHMP

10. Plan Maintenance

Mitigation planning for The Planning Area is continuous. An important aspect of any useable plan is the maintenance and upkeep of the document. At any given time planning, risk analysis, updating the risk assessment, research, coordinating, disaster response or other activity is occurring. Thus, ensuring the plan will remain useful is critical.

Plan Monitoring

The Planning Area's emergency managers and the LEPCs are responsible for monitoring, evaluating and updating the plan. All disaster and emergency incidents will be evaluated for general and specific hazard history and mitigation strategy recommendations to be added to the plan.

The plan will be updated and submitted to the N.D. Dept. of Emergency Services and FEMA within five years to assure the county maintains a FEMA-approved mitigation plan.

Plan Evaluation

At its February meeting each year, each county commission, city council/commission and emergency response entity will review actions taken on mitigation projects and losses due to hazards in the past year.

A Mitigation Action Progress Report Form for reporting of annual mitigation actions taken and losses due to hazards is included in this chapter for Eddy County and Wells County. The annual reports are due back to each respective emergency manager by March 15.

The comments about the plan, project implementation, and information will be shared through each jurisdiction's minutes, and these minutes will be sent to county emergency management. The emergency manager will share this information with the Eddy County Commission and Wells County Commission. The fire departments, law enforcement departments, public health department, and emergency medical services will be encouraged to constantly inform emergency management of incidents as they occur so that the data can be considered immediately to better understand the risks in the county and enable accurate updating of hazard information.

Public Involvement

The public will be informed of the opportunity to comment on plan updates through the advertising of the jurisdiction meetings. The plan will be available to the public at the Eddy County Courthouse, Wells County Courthouse and at the city halls in each of the jurisdictions. During plan updates, the plan will also be on the emergency management website for each county. The public is encouraged to share input on the plan.

10.1 Eddy County, N.D. Mitigation Action Progress Report Form

The Mitigation Action Progress Report Form is shown below. The form is part of the annual review of hazard impacts, mitigation projects and reporting of data to the emergency manager. Please complete to maintain the mitigation plan for Eddy County. Include date and location of incident(s).

Return to: Eddy County Emergency Manager
524 Central Avenue
New Rockford, ND 58356

Due: March 15

List injuries or property losses due to hazards in past year:

List new vulnerable areas that need to be addressed:

Identify what actions on jurisdiction's mitigation projects were taken in past year:

If no action, why:

First & Last Name	
Title & Jurisdiction Represented	
Date (MM/DD/YYYY)	
Contact Info (Email & Phone)	

10.2 Wells County, N.D. Mitigation Action Progress Report Form

The Mitigation Action Progress Report Form is shown below. The form is part of the annual review of hazard impacts, mitigation projects and reporting of data to the emergency manager. Please complete to maintain the mitigation plan for Wells County. Include date and location of incident(s).

Return to: Wells County Emergency Manager
600 Railway St. N, Suite 114
Fessenden, ND 58438

Due: March 15

List injuries or property losses due to hazards in past year:

List new vulnerable areas that need to be addressed:

Identify what actions on jurisdiction's mitigation projects were taken in past year:

If no action, why:

First & Last Name	
Title & Jurisdiction Represented	
Date (MM/DD/YYYY)	
Contact Info (Email & Phone)	