

MEADE COUNTY

South Dakota



Natural Hazard Mitigation Plan Expiration: xx/xx/xxxx

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I. INTRODUCTION

Changes/Revisions to Introduction: The entire format of the plan has been changed. More details on the purpose, use, scope, definition of what mitigation is, have also been added. The City of Box Elder which resides in both Meade and Pennington Counties was added to this update.

INTRODUCTION

Meade County recognizes that it is vulnerable to natural and man-made hazards which have the potential to damage and/or destroy the built environment within the County's borders; the County also acknowledges that potential risk to people, property, infrastructure, and the economy exists. Historically, natural hazards have resulted in disasters which have inflicted costly damage to property, infrastructure, and residents. While disasters cannot always be prevented, effective mitigation planning reduces risk or potential risk, and thus also reduces the costs associated with response and recovery. Hazard mitigation is an effort to make communities more resilient through comprehensive planning efforts that engage stakeholders, decision makers, local leaders, and local governments; resulting in cost-savings for taxpayers by reducing the need to rebuild or remediate damaged property and infrastructure. The planning process includes 1) identification of hazards, 2) analyzing risks associated with the hazards identified, and 3) developing a mitigation strategy to reduce or eliminate risks identified.

AUTHORITY

In October of 2000, the Disaster Mitigation Act (DMA2K) was signed to amend the 1988 Robert T. Stafford Disaster Relief and Emergency Assistance Act. Section 322 of the Disaster Mitigation Act requires that local governments, as a condition of receiving federal disaster mitigation funds, have a natural hazard mitigation plan in place. The plan must:

1. Identify hazards and their associated risks and vulnerabilities.
2. Develop and prioritize mitigation actions; and
3. Encourage cooperation and communication between all levels of government and the public.

To be eligible for FEMA's Hazard Mitigation Assistance (HMA) grant programs, the Disaster Mitigation Act of 2000 (DMA 2000) requires that local governments have a FEMA-approved mitigation plan in place. In the mitigation plan, local jurisdictions must demonstrate that proposed mitigation projects have a basis in a solid planning process where the unique risks and capabilities of each community are assessed. Mitigation plans must be updated every five years to demonstrate that progress has been made toward meeting the community's mitigation goals and to ensure that the plan continues to be an effective mitigation tool that meets the needs of the County and the communities located within.

Purpose

The purpose of this plan is to fulfill federal, state, and local hazard mitigation planning responsibilities consistent with the Federal Emergency Management Agency's guidelines. This plan will promote mitigation measures; implement short/long range strategies that minimize suffering, loss of life, damage to infrastructure, and damage to property; eliminate or minimize conditions which would have an undesirable impact on the citizens, economy, environment, and the well-being of the County. This plan will educate and facilitate communication with the public, build public and political support for mitigation activities, and develop implementation and planning requirements for hazard mitigation projects.

Plan Use

This plan should be used to help local elected and appointed officials; plan, design, implement policies, programs, and projects that will help reduce their community's vulnerability to natural hazards. The plan

should also be used to facilitate inter-jurisdictional coordination and collaboration related to natural hazard mitigation planning and implementation. Finally, when adopted, the plan will bring communities in compliance with the Disaster Mitigation Act of 2000.

Scope

1. Provide opportunities for public input and encourage participation and involvement regarding the mitigation plan.
2. Identify hazards and vulnerabilities within the county and local jurisdictions.
3. Combine risk assessments with public and emergency management ideas.
4. Develop goals based on the identified hazards and risks.
5. Review existing mitigation measures for gaps and establish projects to sufficiently fulfill the goals.
6. Prioritize and evaluate each strategy/objective.
7. Review other plans for cohesion and incorporation with mitigation planning.
8. Establish guidelines for updating and monitoring the plan.
9. Present the plan to Meade County and the participating jurisdictions for adoption.

Local Goals

- Protection of life to the extent possible through mitigation planning efforts
- Protection of critical facilities and public infrastructure to the extent possible through mitigation planning efforts
- Protection of private property to the extent possible through mitigation planning efforts
- Promote continuity among all levels of government (federal, state, county, city) by connecting mitigation planning efforts to existing local planning activities
- Protection of the economy, businesses, industry, education opportunities, and the cultural fabric of a community to the extent possible through mitigation planning efforts
- Protection of natural resources and the environment, to the extent possible through mitigation planning efforts.

Goals of Mitigation Programs as Established by FEMA

- Eliminate or reduce the long-term risk to human life and property from identified natural and man-made hazards
- Aid both the private and public sectors in understanding the risks they may be exposed to and exploring mitigation strategies to reduce those risks
- Avoid risk of exposure to identified hazards
- Minimize the impacts of those risks when they cannot be avoided
- Mitigate the impacts of damage as a result of identified hazards
- Accomplish mitigation strategies in such a way that negative environmental impacts are minimized
- Provide a basis for funding of projects outlined as hazard mitigation strategies
- Establish a regional platform to enable the community to take advantage of shared goals, resources, and the availability of outside resources

WHAT IS HAZARD MITIGATION?

Hazard mitigation is defined as any cost-effective action(s) that has the effect of reducing, limiting, or preventing vulnerability of people, property, and the environment to potentially damaging, harmful, or costly hazards. Hazard mitigation measures fall into three categories:

- Keep the hazard away from people, property, and structures.
- Keep people, property, and structures away from the hazard.
- Reduce the impact of the hazard on the victims.

Hazard mitigation measures must be practical, cost effective, and environmentally and politically acceptable. Actions taken to limit the vulnerability of society to hazards must not in themselves be more costly than the value of anticipated damages.

Mitigation actions should be incorporated into the activities associated with comprehensive and capital improvements planning with consideration given to areas with the greatest vulnerability to natural hazards. Capital investments whether for homes, roads, public utilities, pipelines, power plants, or public works, determine to a large extent the nature and degree of hazard vulnerability of a community. Once a capital facility is in place, it becomes more difficult to correct any errors in location or construction with respect to hazard vulnerability. It is for these reasons that zoning and other ordinances, that manage development in high vulnerability areas and building codes, ensure that new buildings and infrastructure are built to avoid or withstand the damaging forces of hazards. These actions are useful mitigation approaches local governments can implement.

Previously, mitigation measures have been the most neglected programs within emergency management. Since the priority to implement mitigation activities is generally low in comparison to the perceived threat, some important mitigation measures take time to implement. Mitigation success can be achieved when accurate information is portrayed through complete hazard identification and impact studies and followed by effective mitigation management. Hazard mitigation is key in eliminating long-term risk to people and property from hazards and their effects.

This plan evaluates hazards, risks, and vulnerabilities within the jurisdictional area of the entire county. The plan supports, aids, identifies, and describes mitigation projects for each of the local jurisdictions who participated in the plan update. The suggested actions and plan implementation for local governments could reduce the impact of future natural hazards. Reducing the impact of natural hazards can prevent such occurrences from becoming disastrous but will only be accomplished through coordinated partnership with emergency managers, political entities, public works officials, community planners and other dedicated individuals working to implement this program.

Meade County Profile

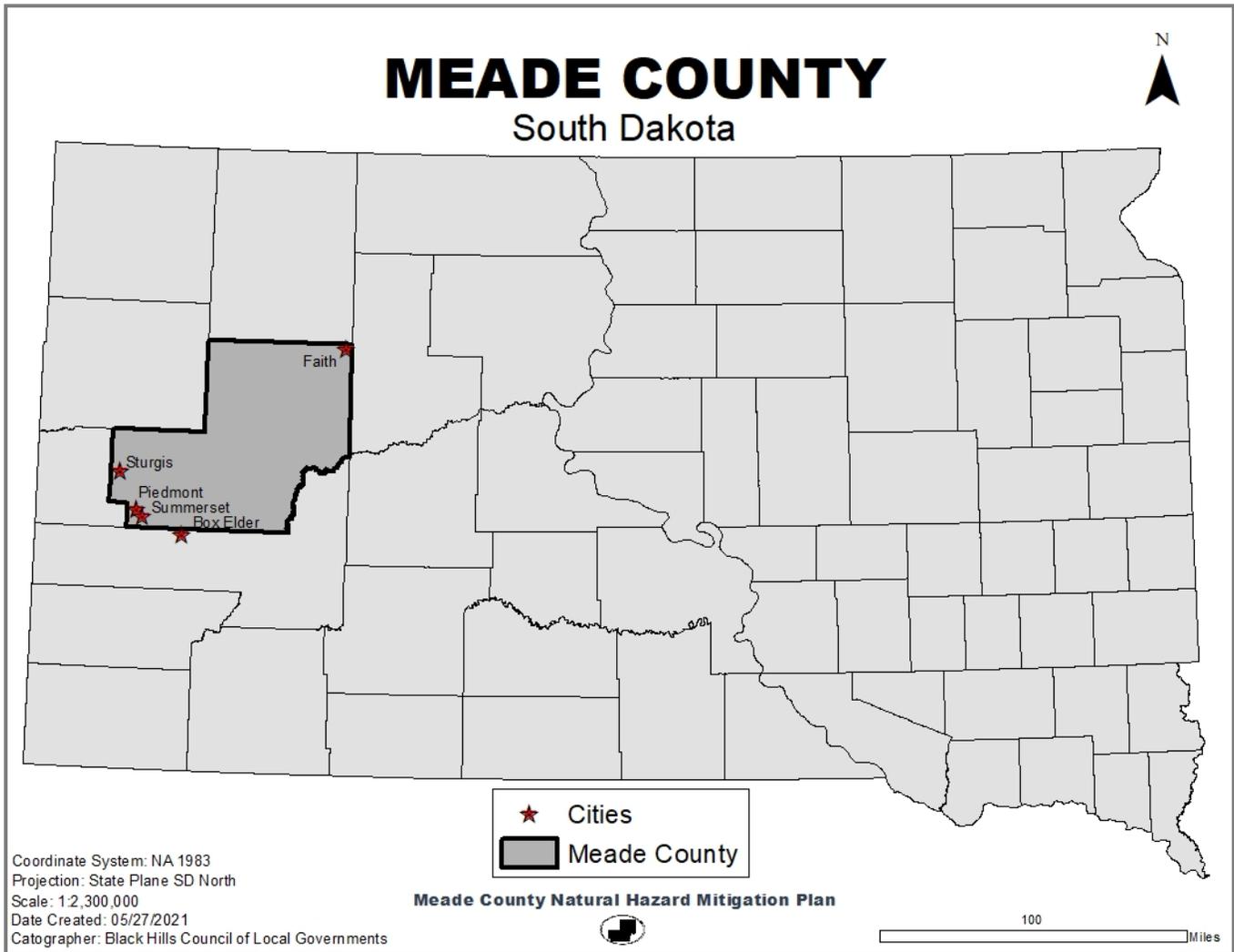


Figure 1.1 Location of Meade County, South Dakota.

Geographical Background

The county is mostly on Cretaceous plateaus, except for the southwestern Black Hills area which are uplifts of Cenozoic formations. The county contains parts of the Great Plains and Black Hills, giving some variance in the landscape and soil types. The area also yields several buttes, most famous is Bear Butte. Most of the drainage for this area flows into the Cheyenne and Belle Fourche Rivers. Drainage also occurs at the Sulphur, Red Owl, Box Elder, Bear Butte, Elk, and Whitewood Creeks. Meade County does not contain any natural lakes, only small earthen dams. The northern area of Meade County is made up of silty soils, with

areas of clayey soils on the foot slopes and uplands¹. In the southern section of the county, the soils are also primarily silty soils overlaying shale and sandstone. These soil types are well-drained, which lead to moderately slow water permeability. The greatest concern with these types of soils is moisture and blowing soils². In addition, these soils increase the likeliness of flash flooding events due to the low permeability. In the area of the Black Hills, the soil types range from sandstone, limestone, siltstone, and shale. The Black Hills area's largest concern is erosion. The Black Hills serves primarily timber production, woodlands, recreation, and wildlife.

Interstate 90 runs along the southwest section of Meade County. The interstate connects the cities of Sturgis, Box Elder, Piedmont, and Summerset. According to SDDOT's *Vehicle Miles Travelled 2019 Report*, of the 12,751 miles of I-90 that runs through the county, there was approximately 89,896,903 vehicle miles travelled³. *The Meade County Transportation Plan* states that the county has around 1,870 miles of road, 149 of which are paved. The State and U.S highways that run through Meade County are US 14, US 14A, US 212, SD 34, SD 79, and SD 73. Meade County also has approximately 30 miles of rail line. The County also has two municipal airports near Faith and Sturgis, as well as Ellsworth Air Force Base along the border of Pennington County and Meade County.

The Williston Basin Pipeline runs along I-90 through Meade County. The underground pipeline was placed in 1954, supplying homes and businesses along I-90 with natural gas. Meade County's major utility systems are Black Hills Power, Grand Electric Cooperative, Butte Electric Cooperative, West River Electric Association, and Faith Municipal Electric.

The county also has several water and sanitary districts throughout the County. The cities of Box Elder, Sturgis, and Faith all have municipal water systems. Summerset and Piedmont maintain distribution lines but receives bulk purchase water from Black Hawk Water User District. The cities of Box Elder, Sturgis, Summerset, and Faith have municipal wastewater treatment systems. The City of Piedmont does not have a municipal wastewater treatment system, with all residents are on individual septic systems.

Population Demographics

Meade County continues to see a steady increase in population. Much of the population growth is occurring along the I-90 corridor. The 2010 census reported the County had a population of 25,434 and has had an increase of 11% by 2019. Population estimates for 2019 were 28,332, a density of 8.16 people per square mile. The projected population for the county in 2025 is expected to increase by 3.7% to 29,380⁴. The County however feels the projection to be low.

Within Meade County there are five incorporated communities, Box Elder, Faith, Piedmont, Sturgis (county seat), and Summerset. The Census population estimates for 2019 are: Box Elder (10,119 *inside Meade 3,308); Faith (411); Piedmont (903); Sturgis (6,922); and Summerset (2,660)⁵.

There are thirteen unincorporated communities: Black Hawk, Elm Springs, Howes, White Owl, Union Center, Red Owl, Enning, Mud Butte, Opal, Tilford, Stoneville, Marcus, and Plainview. Besides the unincorporated communities, Meade County is comprised of eight townships: Dakota, Eagle, Elm Springs, Howard, Lakeside, Smithville, Union, Upper Red Owl. Three areas of unorganized territory: Belle Fourche-Cheyenne Valley, North Meade, and Southwest Meade⁶.

¹ Meland, *Soil Survey of Meade County, Northern Part, South Dakota*, 2-12

² Ollila, *Soil Survey of Meade County, South Dakota, Southern Part*, 2-13

³ South Dakota Dept. of Transportation. *2019 Vehicle Miles Travelled (VMT)*, n.p.

⁴ EMSI: Labor Market Analytics, *Meade County*, n.p.

⁵ U.S. Census Bureau. *2019 City and Town Population Totals: 2010-2019; Incorporated places and minor civil divisions*, n.p.

⁶ U.S. Census Bureau. *2019 City and Town Population Totals: 2010-2019; Incorporated places and minor civil divisions*, n.p.

The County is predominately white at 90.5%, with 4.4% Hispanic, 3.2% Native American, 2% Black, and 1% Asian. The 2019 estimates the median household income for the county is \$60,578, with a poverty rate of 6.9%, compared to 11.9% for the state of South Dakota⁷.

*The City of Box Elder is located mainly in Pennington County and was included in the Pennington County Natural Hazard Mitigation Plan.

Economic Profile

Meade County is showing significant growth in all industries. In the last five years all industries have had a positive percent change. The top three employers in the county are government, construction, and health care/social services. While agriculture is 13th on the list of top industries, the industry is still twice as high as the national average. Agriculture in the area has shown an increase of 37% since 2015⁸.

The population over 65 years is 14.1%, but the county is on par with the National average of people those 65 and over. As of 2019, 64.5% of people between the ages of 16-64 worked. 7.5% work from home. 92.5% commute to work. The median travel time to work was 20 minutes⁹.

The Black Hills area receives roughly 14.5 million visitors each year, mostly in the summer months, making tourism sectors such as retail trade, accommodation, and food service industries very important to the County¹⁰. Meade County is unique in that every year in August, the annual Sturgis Motorcycle Rally is held. The average attendance for 2016-2020 was 476,600. Historically anniversary years have a much higher attendance. The 60th anniversary in 2000 saw attendance of 633,000. The 75th anniversary in 2016 saw attendance of 739,000. While 2020 was also an anniversary year, due to Covid-19, the numbers were only 445,000. The average traffic count from 2016-2020 was 480,064. In 2020, the vehicle traffic count was 462,182 in the city of Sturgis. Again, anniversary years have a much higher traffic count¹¹.

Climate

Due to the size and different elevations in Meade County the weather averages can vary from place to place. The general weather for the area varies from 74°F to 87°F in the summer months to 15°F to 26°F for the winter months¹². The hottest month is July, and the coldest month is January. The annual precipitation estimates, 1981-2010, for the county is 18.47 inches per year, with May being the month with greatest rainfall¹³.

Transportation

Transportation planning for streets and roads begins with understanding the relationship between land use and road network. Streets and roads balance functions of mobility and land access. On one side, such as interstate highways, mobility is the primary function of the network. On the other side, such as local roads, land access to farms and residences is the primary service. In between these two extremes, mobility and land access varies depending on the function of the road network.

Functional classification is the process of grouping streets and roads into classes according to the function they are intended to provide. Listed below is Meade County's functional classification system as identified in the *Meade County Comprehensive Plan* and *Meade County Transportation Plan*. The following generally recognized hierarchy of road classifications will be used to assist in the development of intermediate and long-range transportation needs.

⁷ U.S. Census Bureau. *2019 American Community Survey 5-Year Estimates*, n.p.

⁸ EMSI: Labor Market Analytics, *Meade County*, n.p.

⁹ U.S. Census Bureau. *2019 American Community Survey 5-Year Estimates*, n.p.

¹⁰ South Dakota Dept. Tourism, *Research and Reports*, n.p.

¹¹ Sturgis Rally and Events Department, *2020 City of Sturgis Rally Stats*, n.p.

¹² NOAA: National Centers for Environmental Information, *Climate at a glance: County time series*, n.p.

¹³ NOAA: National Centers for Environmental Information, *Past Precipitation: Monthly Precip. Ave.*, n.p.

Arterials - serve as primary circulation routes. Meade County has classified the arterials as either urban or rural arterials. These roads generally carry the majority of traffic volume within the county. Their basic function is to facilitate movement of medium and long distance, high-speed traffic between regions and communities with a minimum of impediments. Since arterials serve for traffic movement between regions and sub-areas, all direct access to abutting property should be restricted. Further, parallel service roads should be added, where appropriate, to maintain traffic carrying capabilities of the thoroughfare.

Collectors - form an intermediate category between arterial and local roads. Collectors serve as a link between arterial and local roads by "collecting" traffic from local roads and transferring it to arterial roads. Collectors are classified in Meade County into urban or rural collector categories.

Local Streets - primarily provide access to abutting properties. They are not designed to carry large amounts of through traffic and are primarily characterized by short trip length and low traffic flow.

National Flood Insurance Program Participation

Meade County and four jurisdictions participate in the National Flood Insurance Program (NFIP): Box Elder, Piedmont, Sturgis, and Summerset. Only one jurisdiction does not participate in the NFIP: Faith. Table 1.1 lists population, latitude and longitude, elevation, and NFIP status of communities within the county. NFIP status, as of December 2020, was provided by the South Dakota State NFIP Coordinator. Table 1.2 lists the townships and populations for the county, and the unorganized territories and populations for the county.

Meade County Municipalities Overview				
Cities/Towns	Pop. Est. 2019	Location	Elevation	NFIP
Box Elder	10,119 (in Meade 3,308)	44° 05' 15" N, 103° 06' 19" W	3,034 ft	yes
Faith	411	45° 01' 09" N, 102° 02' 01" W	2,532 ft	no
Piedmont	902	44° 13' 56" N, 103° 23' 19" W	3,497 ft	yes
Sturgis	6,922	44° 24' 34" N, 103° 31' 05" W	3,425 ft	yes
Summerset	2,660	44° 13' 22" N, 103° 23' 30" W	3,664 ft	yes

Table 1.1 Meade County Municipalities Overview, including participation in National Flood Insurance Program (NFIP). (Meade County. *Google Earth*, earth.google.com/web), (U.S. Census Bureau. *2019 City and Town Population Totals: 2010-2019; Incorporated Places and Minor Divisions*).

Townships and Unorganized Territories			
Townships			
Townships	Pop.	Townships	Pop.
Dakota	32	Lakeside	57
Eagle	18	Smithville	10
Elm Springs	28	Union	18
Howard	13	Upper Red Owl	23
Unorganized Territories			
Unorganized Territories	Pop.	Unorganized Territories	Pop.
Belle Fourche-Cheyenne Valleys	2,000	Southwest Meade	11,474
North Meade	455		

Table 1.2 Listing of Meade County's Townships and Unorganized Territories. (U.S. Census Bureau. *2019 City and Town Population Totals: 2010-2019; Incorporated Places and Minor Divisions*)

II. PREREQUISITES

Changes/Revisions to Planning Process: Box Elder was added to this plan, it was not included in previous plan. The plan has been reformatted and rewritten from the previous plan.

ADOPTION BY THE LOCAL GOVERNING BODY

The local governing body that oversees the update of the *Meade County Natural Hazard Mitigation Plan* is the Meade County Commission. The Commission has tasked the Meade County Emergency Manager with the responsibility of ensuring that the plan is compliant with Federal Emergency Management Agency (FEMA) Guidelines and corresponding regulations.

MULTI JURISDICTIONAL PLANNING PARTICIPATION AND ADOPTION

This multi-jurisdictional plan serves the entire geographical area located within the boundaries of Meade County, South Dakota. Meade County has five incorporated municipalities. All the municipalities located within Meade County elected to participate in the planning process and the update of the existing *Meade County Natural Hazard Mitigation Plan*. The participating local jurisdictions include the following municipalities: Box Elder, Faith, Piedmont, Sturgis, and Summerset. A new participant is the City of Box Elder. Box Elder is located in both Meade and Pennington County, and in the past has only participated in Pennington County's Hazard Mitigation Plan. This time due to the multi-county location and fast-paced development trends, Box Elder elected to participate in Meade County's Plan.

The *Meade County Natural Hazard Mitigation Plan* will be adopted by resolution by the participating incorporated municipalities and the Meade County Commission. The Resolutions of Adoption are included as supporting documentation for the Plan. The dates of adoption by resolution for each of the jurisdictions are summarized in Table 2.1.

Dates of Plan Adoption by Jurisdiction	
Jurisdiction	Date of Adoption
Box Elder	
Faith	
Piedmont	
Summerset	
Sturgis	
Meade County	

Table 2.1. Participating jurisdictions date of Meade County Hazard Plan adoption date.

All of the participating jurisdictions were involved in the plan update. Participants updated their information and provided feedback on new developments and changes since the last update. The local jurisdictions have also presented the Resolution of Adoption to their councils and passed the resolutions upon FEMA approval of the plan. The resolutions are included in Appendix H. Table 2.2 shows the "participation" of local jurisdictions who intended to adopt the plan.

Participation of Local Jurisdictions						
Nature of Participation	Meade County	Box Elder	Faith	Piedmont	Sturgis	Summerset
Attended Meetings or work sessions (a minimum of 2 meetings will be considered satisfactory).	<input checked="" type="checkbox"/>					
Submitted inventory and summary of reports and plans relevant to hazard mitigation.	<input checked="" type="checkbox"/>					
Submitted Risk Assessment Worksheet.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Submitted description of what is at risk (including local critical facilities and infrastructure at risk from specific Hazards) Worksheet 3A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Submitted a description or map of local land-use patterns (current and proposed/expected).	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Developed goals for the community.	<input checked="" type="checkbox"/>					
Developed mitigation actions with an analysis/explanation of why those actions were selected.	<input checked="" type="checkbox"/>					
Prioritized actions emphasizing relative cost-effectiveness.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Reviewed and commented on draft plan.	<input checked="" type="checkbox"/>					
Hosted opportunities for public involvement (allowed time for public comment at a city council meeting during public comment period)	<input checked="" type="checkbox"/>					

Table 2.2. Local jurisdictions participation requirements met. At least seven of the participation requirements must be met for the jurisdiction to have participated for adoption of plan.

III. PLANNING PROCESS

Changes/Revisions to Planning Process: The planning process was modified to a one-on-one approach with the County and Cities after lack of participation at the group stakeholder meetings. BHCLG found it important to address the County Commission, City Councils, and Town Boards individually by hosting work sessions with city/county staff followed by providing an overview of the Hazard Mitigation Plan and planning process at the public meetings for each jurisdiction. The County and each jurisdiction had a city staff member from each adopting body as main point of contact.

DOCUMENTATION OF THE PLANNING PROCESS

“An open and public involvement process is essential to the development of an effective plan.” Requirement 201.6(b).

The initial information meeting was held at the Meade County Administrative Office on November 24, 2020, during the regular County Commission meeting to inform the public about the required plan update and discuss the process for completing the update. The County also discussed and approved the contract for Black Hills Council of Local Governments (BHCLG) to complete the plan update. The Meade County Emergency Manager and Meade County Department of Equalization and Planning worked with the BHCLG to organize resources.

On February 9th, BHCLG met with the City of Faith during their monthly City Council meeting. During the meetings, BHCLG discussed the process of the plan update. Both BHCLG and City of Faith, decided to do one-on-one meetings for the plan update, due to the distance between City of Faith and the other jurisdictions.

A stakeholders meeting was held on March 2nd, 2021, to discuss hazards in Meade County. Representatives from a range of different institutions and businesses were invited to participate in the Mitigation Planning Session. A public notice was published in the local newspaper and posted on Meade County’s website and social media pages. The stakeholders list was formulated with assistance of Meade County Department of Equalization and Planning, Meade County Emergency Manager, and guidance from FEMA’s Local Mitigation Planning Handbook. A list of organizations invited can be found in Appendix A. Invitations were sent out via email. Invitees were contacted and ask to provide an email for their invitation to be sent to. All participants can be found in Appendix A. Municipalities were asked to complete a hazard identification, inventory assets, estimated loss, and risk assessment for their jurisdiction using FEMA worksheets. Municipalities were also asked to start working on identifying priorities for mitigation projects and assist with corrections and updates to the previous plan.

On April 8th, jurisdictions and several federal and state agencies were invited to participate in a mitigation meeting specifically held to address Wildland Urban Interface and the concerns of all of the different groups tasked with wildfire mitigation. Each agency provided an overview of mitigation projects past, present, and planned/not started in Meade County. Participants included USFS, Meade County FireWise, SD Wildland Fire, BLM, City of Summerset Police, South Dakota Office of Emergency Management, South Dakota Resource Conservation and Forestry, and NRCS. A list of those invited and those in attendance can be found in Appendix A. An additional meeting was requested by participants to provide updates to the County’s Community Wildfire Protection Plan.

The Department of Equalization and Planning was invited to a meeting on April 20th. The meeting involved gathering additional information on hazards in the county, building permitting processes, floodplain administration process, and to speak to the department about mitigation efforts that have taken place in the County since the previous plan update. The meeting also addressed the County’s plans to update their Comprehensive Plan. The discussion focused of the importance of both Comprehensive Plans and Hazard Mitigation working together. Participants can be found in Appendix A.

On May 18th, 2021, Wildland Fire CWPP Meeting was held. The meeting once again involved participants from USFS, South Dakota Wildland Fire, Natural Resources Conservation Service, South Dakota Office of Emergency Management, Bureau of Land Management, Meade County representatives, and the City of Box Elder. The meeting focused on items needed for an update of the Meade County Community Wildfire Protection Plan (CWPP). It was suggested to have the CWPP become a part of the *Meade County Natural Hazard Mitigation Plan*, however, several agencies explained that a CWPP was needed for funding applications. At this time, it was decided that due to lack of data, such as updated GIS layers needed to create a better understanding of risk areas for the CWPP. The CWPP wouldn't be updated at this time but would like to see an update in the future. Project areas were identified for wildfire treatment, as well as issues the county and communities face such as ingress/egress, water sources, and roadways.

On June 3rd, 2021, BHCLG met with the City of Summerset at their regularly scheduled Council Meeting. During the meeting, the City was given a brief summary of the purpose of hazard mitigation and how the city can participate in the plan update. The city was asked to look over previous goals and issues that were listed in the previous plan and comment on completion of projects. The City was also asked to complete a hazard identification, inventory assets, estimated loss, and risk assessment for their jurisdiction using FEMA worksheets and begin to think of projects for the hazard mitigation plan.

On June 7th, 2021, BHCLG met with the City of Sturgis at their regularly scheduled Council Meeting. BHCLG gave an overview of the Hazard Mitigation Plan and process. BHCLG and the Council agreed to setup a work session with the city to review projects from the previous plan and to create a list of projects for the City of Sturgis to be added to the plan update.

BHCLG met with the Piedmont Board of Trustees on June 15th, 2021, to discuss the purpose and process of the mitigation plan. BHCLG discussed the Hazard Mitigation Plan and process. The city was asked provide information on risk assessment, critical facilities, inventory of assets. The city was asked for any updates on issues and projects from the previous plan and asked to begin to think of new projects for the city.

Work Sessions took place on July 8th with Faith, July 13th with Sturgis, and July 16th with Box Elder, BHCLG met with representatives of the cities to discuss project updates from the previous plan and to also discuss any new mitigation project needs. During these meetings, the cities were able to create a list of mitigation projects that the city would like to be added to this plan.

On July 20, 2021, BHCLG met with the City of Box Elder's City Council at their City Council Meeting to inform the council on the mitigation plan update. BHCLG explained the benefits of adopting a plan in both Pennington County and Meade County. The update also informed the council of previously meeting with City staff to create a mitigation strategy for Box Elder, along with some project ideas. The council was informed that the draft of the plan would be completed soon for review and comments.

BHCLG met with Meade County July 21, 2021, for a work session. During this work session the discussion was aimed at gathering information to address critical infrastructure and structure risk in the County, specifically those located in areas of hazard such as flooding and wildfire. During the meeting some potential projects were also mentioned that the County can work towards.

On July 21st, 2021, the second Sturgis Work Session was held. This meeting was a continuation of the July 13th work session. The focus of this meeting was working with Sturgis to create mitigation projects. Discussion on the three-mile joint jurisdiction with the County and the City's unofficial levee system took place with ideas on how to address concerns the City has with both issues.

All adopting jurisdictions were invited to all community meetings. Mitigation Planning Stakeholders and Fire meetings were intended to involve all jurisdictions and the County. The City of Faith was invited to partake in all meetings; however, it was discussed with the City that due to the distance, BHCLG would work with Faith on an individual basis. BHCLG met with each jurisdiction's City Council to better educate the municipalities on their individual responsibilities to the planning process and also to ensure that entire councils were being made aware of the mitigation planning process and provided plenty of opportunities to

discuss mitigation strategies that best meet the needs of constituents. All jurisdictions were also invited to request one on one work sessions for mitigation projects.

Meeting dates are summarized in the following list:

- November 24, 2020 -Meade County Commission (initial meeting)
- February 9, 2021 - Faith Council Meeting (initial meeting)
- March 2, 2021 - Stakeholders Meeting at Meade County Commission Chambers
- April 8, 2021 - Wildland Fire WUI Meeting at Meade County Commission Chambers
- April 20, 2021 – Equalization and Planning Department at Meade County Admin. Building
- May 12, 2021 - Box Elder Meeting at BHCLG Office
- May 18, 2021 - Wildland Fire CWPP Update Meeting
- June 3, 2021 - Summerset City Council Meeting (plan update)
- June 7, 2021 - Sturgis City Council Meeting (plan update)
- June 15, 2021 - City of Piedmont Board of Trustees (plan update)
- July 8, 2021 – City of Faith Work Session
- July 13, 2021 - City of Sturgis Work Session
- July 16, 2021 – City of Box Elder Work Session
- July 20, 2021 - City of Box Elder City Council Meeting (plan update)
- July 21, 2021 – Meade County Work Session
- July 21, 2021 – City of Sturgis Work Session 2

The meeting minutes, sign in, and notices/agendas (when applicable) from each of the meetings are included as Appendix A. A list of commissioners, council members, and public officials involved in the plan are listed in tables 3.1-3.6.

**Note: commissioners and council members as well as other elected and non-elected officials of the cities and counties change often. The names listed below are the most recent office/position holders.

Meade County Commissioners and Public Officials Involved in the Plan	
Ted Seaman	Commissioner-Chairman
Rob Bradley	Commissioner-Vice Chairman
Talbot Wieczorek	Commissioner
Doreen Allison Creed	Commissioner
Richard Liggett	Commissioner
Jerry Derr	Commission Assistant/HR Director
Kevin Forrester	Auditor
Nick Broyles	Highway Superintendent
Michele Bordewyk	State's Attorney
Lara Anderson	Register of Deeds
Susan Boadwine	Treasurer
Rhea Crane	Director of Equalization and Planning
Bill Rich	Deputy Director of Planning
Marlo Kapsa	Planner/GIS Specialist
Max Rooke	Planner/GIS Specialist
Doug Huntrods	Emergency Manager *no longer EM
Jill Edson	Appraiser
Jordan Neeb	Administrative Assistant
Lucas Neeb	Highway Technology Assistant
Scott Tegethoff	Assistant Highway Superintendent
Lisa Parks	Veteran Admin Support/FireWise

Table 3.1 Meade County officials involved in the 2021 Meade County Hazard Mitigation Plan Update.

City of Box Elder Council Members and Public Officials Involved in the Plan	
Larry Larson	Mayor
John Talich	Council Member
James Brown	Council Member
Jeff Hollinshead	Council Member
Micheal Knight	Council Member
Rick Davis	Council Member
Rob Griffith	Council Member
Matthew Naasz	City Attorney
Nicole Schneider	Finance Officer/Administration
Jermery Washington	City Clerk
Bob Kaufman	Engineer
Nathan Gjovik	Assistant City Engineer
Doug Curry	Public Works
Lauralee Patton	Planner/Code Enforcement
Nick Dierks	GIS Specialist
Jason Dubbs	Police Chief
Chris Mason	Assistant Public Works Director - Operations
Jimmy Dettman	Marketing and Events Director
Mike Dubka	Street Superintendent
Josh Sadler	Water and Sewer Superintendent

Table 3.2 City of Box Elder officials involved in the 2021 Meade County Hazard Mitigation Plan Update.

City of Faith Council Members and City Officials Involved in the Plan	
Glen Haines	Mayor
Debbie Brown	Finance Officer
Jeffrey Brown	Council Member
Calvin Chapman	Council Member
Dianne Hellekson	Council Member
Rachel Shalla	Council Member
Nathan Stern	Council Member
Rick Trainor	Council Member
Dave Gebhart	Municipal Airport Manager
Cheryl Laurenz-Bogue	City Attorney
Fred Hulm	Fire Chief
Matthew Schackow	Police Chief
Jon Collins	Utility Manager

Table 3.3 City of Faith officials involved in the 2021 Meade County Hazard Mitigation Plan Update.

City of Piedmont Council Members and Public Officials Involved in the Plan	
Phil Anderson	Board President
Diana Evans	Finance Officer
Phil Aitken	Treasurer
Steve Heilman	Treasurer
Jack Parks	Treasurer
Kim Plymate	Treasurer
Talbolt Wieczorek	City Attorney

Table 3.4 City of Piedmont officials involved in the 2021 Meade County Hazard Mitigation Plan Update.

City of Sturgis Council Members and Public Officials Involved in the Plan	
Mark Carstensen	Mayor
Daniel Ainslie	City Manager
Fay Bueno	Finance Officer
Jason Anderson	Council Member
Mike Bachand	Council Member
Rhea Crane	Council Member
Steve Keszler	Council Member
Terry Keszler	Council Member
David Martinson	Council Member
Ron Waterland	Council Member
Beka Zerbst	Council Member
Roger Burnham	Municipal Airport Manager
Greg Barnier	City Attorney
Corina Tibbits	Building Inspector
Scott Lensegrav	Fire Chief
Marty Plaggermeyer	Street Superintendent
Rick Bush	Public Works Director
Dave Smith	Code Enforcer
Geody VanDeWater	Police Chief
Christina Steele	Planning Director
Liz Wunderlich	City Engineer
Dustin Williams	Staff Engineer
Christina Steele	Public Information Officer

Table 3.5 Meade County officials involved in the 2021 Meade County Hazard Mitigation Plan Update.

City of Summerset Council Members and Public Officials Involved in the Plan	
Melanie Torno	Mayor
Lisa Schieffer	City Administrator
Candace Scaley	Finance Officer
David Butler	Commissioner
Clyde Hirsch	Commissioner
Michael Kitzmiller	Commissioner
Stephanie McCoy	Commissioner
Michael Wheeler	City Attorney
Dan Anderson	Code Enforcer
Donald Allen	Police Chief
Tanner Fenenga	Public Work Director
Johnathan Ambrose	Sewer Superintendent

Table 3.6 City of Summerset officials involved in the 2021 Meade County Hazard Mitigation Plan Update.

SELECTION OF THE PLANNING TEAM [§201.6(c)(1)]

The plan shall document the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

BHCLG led the process of updating the Meade County Natural Mitigation Plan. BHCLG is one of six planning and development districts in the State of South Dakota and has a staff with over 35 years of collective experience in writing and updating natural hazard mitigation plans. BHCLG's first step was to review the existing plan and the gap reports prepared by the SDOEM to ensure that any gaps or insufficiencies could be addressed in the plan update. After the initial review of the plan, it was decided that a complete rewrite of the plan was necessary to ensure that the requirements outlined in FEMA's plan review

guide were included in the plan. After reviewing the plan, BHCLG staff met with the County Commissioners at a regular commission meeting to discuss the process that would be used to update the plan and to address the need for enhanced mitigation planning efforts in Meade County. The County Commission delegated the Meade County Emergency Manager, Meade County Planning and Equalization Department and Meade County HR staff as the points of contact to assist with the development of the plan update. After the initial meeting, a stakeholder’s meeting was held to engage numerous partners to assist in providing BHCLG with the necessary information needed to establish a meaningful mitigation strategy. The public was invited to attend along with numerous state and federal agencies, engineering firms, universities, water and sanitary districts, and municipalities. There were zero attendees from the public, but a great showing from the federal agencies, especially those entities with a stake in properly managed WUI areas, along with representation from a few of the local jurisdictions. Due to the lack of public participation at the stakeholder’s meeting, it was suggested to hold meetings at each of the city council meetings for participating municipalities. Participating municipalities were also instrumental in leading the discussions at their local city council meetings. Additional work sessions were scheduled with the municipalities that needed additional time to talk about unique and varied risks. A special meeting was held specifically for the fire groups including USFS, BLM, USDA, NRCS, Meade County Firewise, and SD Wildland Fire. Between meetings BHCLG collected and reviewed numerous technical documents, maps, and ordinances, weather history, completed projects, and previous mitigation efforts to ensure that mitigation planning was being properly integrated with all other planning mechanisms within the County.

The local representatives for each jurisdiction and the County are listed below in table 3.7. The planning team was tasked with collecting and sharing information with the full board/councils; and providing comments back to Black Hills Council of Local Governments to be included in the plan. Additionally, the plan representatives were tasked with completing the worksheets #1, #2, #3a, #3b, and #4 and submitting them to BHCLG. BHCLG staff led the mitigation discussion at the local levels and discussed project ideas with each respective council. Those representatives are listed by jurisdiction:

Plan Representatives	
Meade County	Doug Huntrods, Emergency Manager *no longer EM
Meade County	Rhea Crane, Equalization and Planning Director
Meade County	Bill Rich, Equalization and Planning
Meade County	Marlo Kapsa, Equalization and Planning
Meade County	Max Rooke, Equalization and Planning
Meade County	Jerry Derr, HR
Meade County	Jordan Neeb, HR Assistant
Meade County	Lucas Neeb, Highway Technology Assistant
Box Elder	Nicole Schneider, City Administrator/Finance Officer
Box Elder	Lauralee Patton, Planning
Faith	Debbie Brown, Finance Officer
Piedmont	Diana Evans, Finance Officer
Sturgis	Dave Smith, Director of Planning and Permitting/EM
Summerset	Lisa Schieffer, City Administrator

Table 3.7 Participating Plan Representatives and title.

PUBLIC INVOLVEMENT [§201.6(b)(1)]

The public was provided several opportunities at City Council meetings to comment on the plan during the drafting stage of the plan update. State law requires that public meetings allow for public comment during the meetings as described in SDCL 1-25-1.

...The public body shall reserve at every regularly scheduled official meeting a period for public comment, limited at the public body's discretion, but not so limited as to provide for no public comment. At a minimum, public comment shall be allowed at regularly scheduled official meetings which are designated as regular meetings by statute, rule, or ordinance.

It was during this legally required public comment period that the public was allowed to provide comments. Mitigation Planning was listed on the required notices for the City Council and County Commission meetings. Notices for public meetings require a minimum of time, date, and location, and were posted in accordance with SDCL 1-25.1.1:

1-25-1.1. ...Each political subdivision shall provide public notice, with proposed agenda, that is visible, readable, and accessible for at least an entire, continuous twenty-four hours immediately preceding any official meeting, by posting a copy of the notice, visible to the public, at the principal office of the political subdivision holding the meeting. The proposed agenda shall include the date, time, and location of the meeting. The notice shall also be posted on the political subdivision's website upon dissemination of the notice if a website exists. For any special or rescheduled meeting, the information in the notice shall be delivered in person, by mail, by email, or by telephone, to members of the local news media who have requested notice. For any special or rescheduled meeting, each political subdivision shall also comply with the public notice provisions of this section for a regular meeting to the extent that circumstances permit.

During the Council Meeting for the City of Summerset held on June 3rd, 2021, several members of the public had made comments on two issues facing the city, involving the Sun Valley Estates Subdivision. Residents commented on past flooding issues that occurred with groundwater that had flooded several homes that were originally build on a dry creek bed. The stated issue was not drainage but groundwater flooding that occurs during heavy rain events such as those from 2019. A second issue that was of concern were several residents on the eastern side of I-90 were requesting secondary ingress and egress. The purposed road would connect the Sun Valley subdivisions to the Wonderland Homes subdivision. This road would allow and alternative access to I-90. At this time there are many homes that only have one way in and one way out. The public stressed the need to have a secondary access in case of emergency such as flooding or fire event. During this meeting, the City was already looking into options for secondary access.

Although during the meetings there was only one event of public comment on the plan update, discussion took place among the council members, engineers, finance officers, city engineers and/or attorneys (when relevant), fire specialists and city staff and was documented in the meeting minutes of the local jurisdictions and published in the paper or record for each entity as required by law.

After the draft of the plan was complete, the plan was posted on the Meade County's Website for public review and comment. Notice was also posted on Meade County's Facebook page with a link to the plan on the County's website. The Cities of Box Elder and Summerset also posted links to the plan on their Facebook pages. The administrators for the Facebook pages reported the post reached 682 people, 35 were engaged (opened the link to the Plan), no one commented on the post and 1 person liked the post. The comments received have been addressed. Administrators of the social media pages provided screen shots of the Facebook post and they have been included in Appendix C.

Notice was also emailed to all the participants and to the emergency managers in the neighboring counties of: Butte, Haakon, Lawrence, Pennington, Perkins, and Ziebach. A copy of the email is included in Appendix D. Everyone who received an email notice of the plan draft was allowed two weeks to respond to the plan author, and 32 days to provide comments on the draft. The table 3.8 below documents who the email was sent to.

Neighboring Emergency Managers			
Neighboring County	Emergency Manager	Email Address	Response Received
Butte	Fred Lamphere	Fred.lamphere@buttesd.org	No
Haakon	Lori Quinn	Haakemgr@gwtc.net	No
Lawrence	Paul Thomson	pthomson@lawrence.sd.us	No
Pennington	Dustin Willett	Dustin.willett@pennco.org	No
Perkins	Kelly Serr	Serr.perkinscoso@sdplains.com	No
Ziebach	Charles Red Crow	Acs01d@gmail.com	No

Table 3.8 Listing of all neighboring county emergency managers and received responses.

TECHNICAL REVIEW OF EXISTING DOCUMENTS [§201.6(b)(3)]

The planning process shall include the review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

In the process of the plan update, a review and incorporation of existing plans, studies, reports, and technical information was completed. Each community was asked to provide a list of existing documents that they have available. Additionally, the 2016 Plan was used as a resource for the new plan because most of the natural hazard profile research had already been completed when it was drafted. In addition to the 2016 Plan, the plan author reviewed several other existing documents including but not limited to:

- *South Dakota State Hazard Mitigation Plan (2019)*
- *Meade Transportation Plan (2016)*
- *Meade County Community Wildfire Protection Plan (2009)*
- *Meade County Local Emergency Operations Plan (2018)*
- *Meade County Natural Hazard Mitigation Plan (2009, 2016)*
- *Meade County Stormwater Management Plan (2017)*
- *Meade County Building Code (Last update as of 2020)*
- *Meade County 5-Year Highway and Bridge Improvement Plan (2021-2025)*
- *Meade County Comprehensive Plan (2016)*
- *Meade County Ordinances (Last update as of 2020)*
- *Meade County Soil Studies (1978, 1985)*
- *Meade County High Risk Dam Reports (2018)*
- *South Dakota Forest Action Plan (2020 revision)*
- *Project Proposal Conservation Implementation Strategy (Revised 2021)*
- *Pennington County Natural Hazard Mitigation Plan (2018)*
- *Lawrence County Natural Hazard Mitigation Plan (2019)*
- *Butte County Natural Hazard Mitigation Plan (2019)*
- *Perkins County Natural Hazard Mitigation Plan (2016)*
- *USGS Karst Map and Expansive Soils*
- *Geophysical Investigation on abandoned gypsum mine, SD (2021)*
- *West Dakota Water Development District Missouri River Report (2020)*
- *Hydrological Study of Black Hills (2002)*
- *Ground-Water Resources in the Black Hills Area, South Dakota (2003)*

Meade County currently does not have zoning. Floodplain management is handled by the Meade County Office of Equalization and Planning. Meade County is currently in the process of updating their subdivision Ordinance 20 and have future plans to update Ordinances 10, 34, and 33. Meade County also has the intention to begin updates to their Comprehensive Plan in the coming year. A summary of the technical review and incorporation of existing plans is included in Table 3.9.

REVIEW OF THE 2016 PLAN

Each section of the 2016 plan was reviewed. With the reformatting of the plan, much of the information was relevant, but additional detail was collected. Specific areas that needed improvement or changes include the planning process, mitigation strategy, risk assessment, and existing planning documents and technical documents. Each of the jurisdictions and the County was provided information on previous risks, concerns, and projects from the 2016 plan. They were asked to review the information and asked to provide updates of completed projects and new risks or concerns within their jurisdiction.

Record of Review (Summary)					
Existing Program/Policy/Technical Docs	Box Elder	Faith	Piedmont	Sturgis	Summerset
Comprehensive Plan	✓	NA	✓	✓	✓
Growth Management Plan	NA	NA	NA	NA	NA
Flood Damage Prevention Ordinance	✓	NA	✓	✓	✓
Floodplain Management Plan	NA	NA	NA	NA	NA
Flood Insurance Studies/Engineering studies	✓	NA	NA	✓	NA
Hazard Vulnerability Analysis	NA	NA	NA	NA	NA
Emergency Operations Plan	NA	NA	NA	✓	NA
Zoning Ordinance	✓	NA	✓	✓	✓
Building Code	✓	NA	✓	✓	✓
Drainage Ordinance	NA	NA	NA	NA	✓
Critical Facilities maps	NA	NA	NA	NA	NA
Existing Land Use maps	✓	NA	✓	✓	✓
Elevation Certificates	NA	NA	NA	✓	NA
State Hazard Mitigation Plan	NA	NA	NA	NA	NA
County 5-Year Bridge/Hwy Improvements Plan	NA	NA	NA	✓	NA
Drainage Studies	✓	NA	NA	✓	NA
Transportation Plan	✓	NA	NA	NA	NA
Crash Zone Map	✓	NA	NA	NA	NA
Subdivision Ordinance	✓	NA	NA	✓	NA
Engineering Reports (Landslides)	NA	NA	NA	✓	NA
Engineering Reports (Flooding)	✓	NA	NA	✓	NA
Sturgis Rally Traffic Plan	NA	NA	NA	✓	NA
Engineering Reports (Drainage/Stormwater)	NA	NA	NA	✓	✓
Fire Prevention Ordinance	NA	NA	NA	✓	NA
City Flood Maps	NA	NA	NA	✓	NA
USGS Groundwater Study	NA	NA	NA	NA	✓
Flood Damage Reduction System Report	NA	NA	NA	✓	NA
Air Installment Compatible Use Zone Study	✓	NA	NA	NA	NA
Curb and Gutter Plan	NA	NA	NA	✓	NA
Stormwater Best Practices Manual	NA	NA	NA	✓	NA
NA	jurisdiction does not have this program/policy/technical document				
O	jurisdiction has the program/policy/technical document, but did not review/incorporate it in the mitigation plan				
C	the jurisdiction is regulated under the County's policy/program/technical document				
✓	jurisdiction reviewed the program/policy/technical document				

Table 3.9 List of technical documents reviewed and incorporated into this Mitigation Plan Update.

IV. RISK ASSESSMENT

Change/Revisions to Risk Assessment: The risk assessment was completely reformatted. Additional specific information was collected for hazards as provided by the jurisdictions and county. Due to additional information the following hazards were added or expanded upon dam failure, extreme temperatures, flash flooding, hail, geological hazards, high/severe winds, and lightning. Removed: hazardous materials, as this has not been evaluated through this plan but rather is addressed in the County’s Hazmat Plan. Renamed: ‘windstorms and tornados’ to ‘thunderstorm winds’ and ‘tornados’. Additional specific information was collected for hazards as provided by the jurisdictions and County.

IDENTIFYING HAZARDS [§201.6(c)(2)(i)]

The planning process shall include an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and non-profit interests to be involved in the planning process.

Every possible hazard or disaster was evaluated and then the disasters were placed in three separate columns depending on the likelihood of the disaster occurring in the planning jurisdiction. Table 4.1 was derived from the FEMA worksheets provided in the planning handbook for mitigation planning. Hazards that occur at least once a year or more were placed in the High Probability column; hazards that may have occurred in the past or could occur in the future but do not occur on a yearly basis were placed in the low probability column; and hazards or disasters that have never occurred in the area before and are unlikely to occur in the planning jurisdiction any time in the future were placed in the Unlikely to Occur column. While man-made hazards were listed on the worksheets and discussed briefly during the completion of the worksheets, it was decided to eliminate man-made hazards from the Plan because those types of hazards are difficult to predict and assess due to wide variations in the types, frequencies, and locations. Types and scopes of manmade hazards are unlimited.

Natural Hazards Categorized by Likelihood of Occurrence		
High Probability	Low Probability	Unlikely to Occur
Drought	Aircraft Accident	Avalanche
Extreme Cold	Biological	Coastal Storm
Extreme Heat	Civil Disorder	Hurricane
Flood	Dam Failure	Volcanic Ash
Freezing Rain/Sleet/Ice	Earthquake***	Volcanic Explosion
Hail	Ice Jam	Tsunami
Heavy Rain	Radiological	
Heavy Snow	***Earthquakes are marked with an asterisk because they occur but are so small that the effects are minimal. Thus, mitigation measures specifically for earthquakes are not a priority. ** Utility interruptions are not a natural hazard but often occur as a result of natural hazards such as ice storms and strong winds.	
Landslide		
Lightning		
Rapid Snow Melt		
Strong Winds		
Subsidence		
Thunderstorm		
Tornado		
Transportation		
Utility Interruption**		
Wildfire		

Table 4.1 FEMA Assessing Risks list of hazards. (Mitigation Planning Workshop for Local Governments Student Manual May 2004. SM 4-14.)

The majority of natural hazards in the County have a similar likelihood of occurring anywhere in the County. Areas which are in floodplain will have a higher likelihood of flooding. The western part of Meade County has a higher likelihood of wildfire. Certain soil types in some areas also have a higher likelihood of landslides and subsidence. Only the natural hazards from the High Probability and Low Probability Columns will be further evaluated throughout this plan. All manmade hazards and hazards in the Unlikely to Occur column will not be further evaluated in the plan. Table 4.2 below identifies the hazards that will be addressed in the plan throughout the planning process. Hazards were identified for this plan in several ways including: observing development patterns, input from jurisdictions, public meetings, planning work sessions, previous disaster declarations, consulting the *State Hazard Mitigation Plan* and research of the history of hazard occurrences located within Meade County.

Jurisdiction Identified Hazards					
Natural Hazards Identified	Box Elder	Faith	Piedmont	Sturgis	Summerset
Dam Failure	NA	NA	NA	L	NA
Drought	H	H	H	H	H
Earthquake	L	L	L	L	L
Extreme Cold	H	H	H	H	H
Extreme Heat	H	H	H	M	H
Flood	H	L	M	H	M
Hail	H	M	H	H	H
Heavy Rain	H	M	H	H	H
Ice Jam	NA	NA	NA	M	NA
Landslides	L	L	L	M	L
Lightning	H	M	H	H	H
Heavy Snow	H	H	H	H	H
Strong Winds	H	H	H	H	H
Tornados	M	H	M	M	M
Wildfire	M	M	H	M	H
NA	Not applicable; not a hazard to the jurisdiction				
L	Low risk; little damage potential (minor damage to less than 5% often jurisdiction)				
M	Medium risk; moderate damage potential (causing partial damage 5-10% of the jurisdiction, and irregular occurrence)				
H	High risk; signification risk/major damage potential (ex. destructive, damage to more than 10% of the jurisdiction and/or regular occurrence)				
O	Jurisdiction did not fill out risk assessment worksheet				

Table 4.2 Natural Hazards identified by each jurisdiction.

Significant Hazard Occurrences

The Stafford Act has two types of disaster declarations: emergency declarations and major disaster declarations. These two types allow the President to provide supplemental federal disaster assistance. Table 4.3 shows for the last ten years, there have been a total of seven federal disaster declarations that included Meade County since 2010.

Federal Disaster Declarations	
Incident Date	Types of Disasters
01/20/2010 – 01/26/2010	Severe Winter Storm
10/03/2013 – 10/16/2013	Severe Winter Storm, Snowstorm, and Flooding
12/24/2016 – 12/26/2016	Severe Winter Storm
05/26/2019 – 06/07/2019	Severe Storm and Flooding
06/30/2019 – 07/21/2019	Severe Storms, Tornados, and Flooding
09/09/2019 – 09/26/2019	Severe Storms, Tornados, and Flooding

Table 4.3 Listing of federal disaster declarations from 2010 to March 2021.

Natural Hazards in the Plan Jurisdiction

Descriptions of the natural hazards likely to occur in the planning jurisdiction are listed in Appendix E.

The National Oceanic Atmosphere Administration (NOAA) was used to research natural hazards and disasters that have occurred within the last 10 years within the geographic location covered under the Meade County Plan. A summary of the findings for significant hazard occurrences from the past 10 years is provided in Table 4.4:

Significant Hazard Occurrences 2010-2020		
Type of Hazard	# of days with an event Since 2010	Source
Blizzard	13	NOAA
Cold/Wind Chill	5	NOAA
Wildfire/Forest Fire	28	NOAA, Wildland Fire
Flash Flood	13	NOAA
Flood	18	NOAA
Heavy Rain	3	NOAA
Heavy Snow	18	NOAA
Hail	112	NOAA
Lightning	0	NOAA
Tornado	3	NOAA
Temperature Extremes	5	NOAA
Winter Storm/Winter Weather	103	NOAA
Thunderstorm and High Wind	174	NOAA

Table 4.4 List of significant hazards from 2010-2020. (NOAA: National Center for Environmental Information, *Storm Event Database*), (Information was taken from NOAA and South Dakota Wildland Fire: Historic Fires.) A complete listing of all hazards can be found in Appendix B.

Most of the hazard events listed were obtained using NOAA website. The data provided spans between January 1950 to September 2020, as reported by the National Weather Service. Data collection and processing procedures have changed over time, creating incomplete data. The data provided helps illustrate the hazards Meade County faces. For a more comprehensive collection of the hazards in the County, other sources in the communities and state were consulted.

The NOAA website's documented hazard events are believed to be incomplete, so to get an accurate picture of the County, additional sources were referenced when appropriate. Obviously, with such a high number of occurrences it is reasonable to expect that at least some property or crop damage was sustained in the communities during some of the occurrences, even though the damage may not have been reported or recorded. It is possible that such damage was not reported because it was believed to be insignificant at the time, or because those responsible for reporting such information did not report to the proper agencies. Unfortunately, the total damage for each event is not available, but hopefully soon a method for collecting this data will evolve so that it can be made available to local governments for mitigation planning.

An example of a probable hazard with incomplete data is lightning. Lightning is reported as only having two occurrences in the NOAA database for weather events. Lightning is a common occurrence in Meade County, with numerous storm events each year producing lightning. Lightning has been reported as the cause of numerous fires in this region and is especially dangerous during drought years.

HAZARD PROFILE [§201.6(c)(2)(ii)]

Requirement §201.6 (c)(2)(i): [The risk assessment shall include a] description of the type of the... location and extent of all-natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

Geographic location of each natural hazard is addressed in the updated plan. Most hazards identified have the potential of occurring anywhere in the County with the exception of wildfire, flooding and subsidence, which are localized hazards. Previous occurrences are listed individually by the type of hazard and by location in the following tables. Table 4.5 identifies the Latitude and Longitude of the local jurisdictions along with the population, elevation, and number occupied homes.

Communities within the County				
City	Population	Location	Elevation	Occupied Units
Box Elder	10,119 (*3,308)	44° 05' 15" N, 103° 06' 19" W	3,034 ft	3,220
Faith	411	45° 01' 09" N, 102° 02' 01" W	2,532 ft	150
Piedmont	902	44° 13' 56" N, 103° 23' 19" W	3,497 ft	396
Sturgis	6,922	44° 24' 34" N, 103° 31' 05" W	3,425 ft	61
Summerset	2,660	44° 13' 22" N, 103° 23' 30" W	3,664 ft	2,987

Table 4.5. Population, location, elevation, and occupied units for each of the adopting jurisdictions in Meade County. *Population located within Meade County. ((Meade County. *Google Earth*, earth.google.com/web), (U.S. Census Bureau. *2019 City and Town Population Totals: 2010-2019; Incorporated Places and Minor Divisions*).

Additionally, the extent (i.e., magnitude or severity) of each hazard, information on previous occurrences of each hazard, and the probability of future events (i.e., chance or occurrence) for each hazard are addressed below. Due to the extremely long nature of listing all hazards in the last 69 years, the complete history can be found in Appendix B.

DAM FAILURE

Dam Failure is usually associated with intense rainfall or a prolonged flood condition, but it can also occur in any weather condition. The risk for Dam failure in Meade County is low. Dam failure can be caused by a variety of sources including faulty design, construction and operational inadequacies, intentional breaches, or a flood event larger than the design. The greatest threat from dam failure is to people and property in areas immediately below the dam since flood discharges decrease as the flood wave moves downstream. In the Northern Great Plains, projected future weather patterns call for more intense rain events, which could lead to a higher risk of dam failure from flooding¹⁴.

The degree and extent of damage depends on the size of the dam and circumstances of the failure. A large dam failure might bring about considerable loss of property, destruction of cropland, roads, utilities, loss of income, environmental devastation and even loss of life.

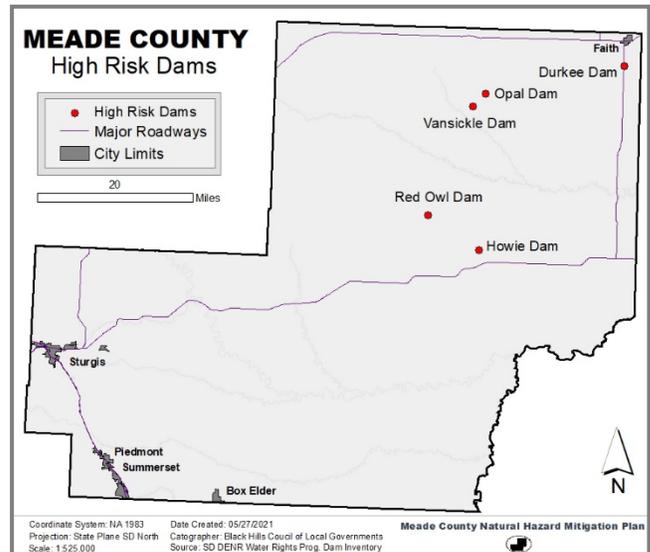


Figure 4.1. High risk dams in Meade County. Data provided by South Dakota DANR Water Rights Program Dam Inventory, 2021.

¹⁴ USGCRP, *Climate Science Special Report: Fourth National Climate Assessment, Volume 1*, n.p.

Small dam failure can also have consequences such as a loss of irrigation water for a season and extreme financial hardship for many farmers.

Meade County has a total of 181 dams that are in the Water Rights Program Dam Inventory. The South Dakota DANR Water Rights Program provided a list of the dams in Meade County that are large enough to fall under South Dakota’s Safety of Dams Rules. The National Inventory of Dams uses five classifications of hazard potential for dams: low, significant, high, undetermined, and not available. The classification of high hazard potential is used for dams whose failure operation could lead to loss of life. Dams with a classification of High Risk are required to have inspections every five years. Those with hazard potential classification of significant could result in economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns, but with no probable loss of life. Low hazard potential dams are those that result in no probable loss of life and low economic and environmental loss.

Meade County has a total of five High Risk dams: C. Vansickel, Durkee, Howie, Opal and Red Owl. Table 4.6 shows information taken from the latest inspection report. The Red Owl dam is the only dam owned and maintained by Meade County. The dam sits close to several properties in the unincorporated community of Red Owl. The dam is an earthen dam and is currently used for recreation. The Opal and Durkee dams are owned by the State. In the *Opal Dam Report* from 2010, there was mention of five different residential properties located downstream from the dam. The dam also had the primary spillway completely replaced in 1993.

High-Risk Dams in Meade County					
	Rating	Date of Inspection	Date Complete	Maximum Storage	Owner
C. Vansickel Dam	Poor	11/06/2018	1936	161 acre-ft	Private
Rating Reason:	Numerous trees growing on the upstream slope, erosion on embankment, inadequate spillway capacity.				
Durkee Dam	Fair	10/11/2018	1938	1867 acre-ft	State
Rating Reason:	Sinkhole noted to the right of spillway. Not large enough to warrant a poor rating but could become a more significant concern is left unaddressed. Post-inspection owner expressed they have started planning to repair the sinkhole.				
Howie Dam (White Owl Lake)	Fair	09/04/2018	1948	306 acre-ft	Private
Rating Reason:	Presence of erosion and tree/bush growth on the downstream slope of embankment.				
Opal Dam	Fair	11/06/2018	1937	558 acre-ft	State
Rating Reason:	Brush growing on the embankment and in the spillway approach channel and minor cracking and spalling o the primary spillway structure.				
Red Owl	Fair	09/04/2018	1937	260 acre-ft	County
Rating Reason:	Trees and brush growing on the embankment and vehicle tracks located on the north slope of spillway channel.				
Classification Definitions					
Satisfactory	No existing or potential deficiencies are recognized				
Fair	No existing dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydraulic and/or seismic events may result in a dam safety deficiency				
Poor	A dam safety deficiency is recognized for loading conditions which may realistically occur. Remedial action is necessary				
Unsatisfactory	A dam safety deficiency is recognized that requires immediate or emergency remedial action				
Not Rated	This dam has not been inspected or have been inspected but not rated				

Table 4.6. List of High-Risk Dams in Meade County. Data provided by South Dakota DANR Water Rights Program.

Dams outside of the County could also present a hazard. Northwest of Meade County in Butte County is the Belle Fourche (aka Orman) Dam. It is currently owned by the Bureau of Reclamation. The Belle Fourche Dam was constructed in 1911. The latest posted inspection was August 11, 2017. The storage capacity is

246,000 acre-feet. If failure were to occur the dam would have the potential to cause flooding in northwestern Meade County.

In addition to dams, levees could also pose a threat. Meade County has only one U.S Army Corp of Engineers certified levee, which is located in the City of Sturgis. The levee was completed in 1980. The levee is inspected yearly by the Corp of Engineers, which involves inspection of the creek bed for any needed maintenance. Maintenance is the responsibility of the City of Sturgis. More information on the Deadman Gulch Levee can be found in the Unique or Varied Risks section of this plan.



DROUGHT

Meade County is classified as continental which produces low precipitation, hot summers, and cold winters. Most of the county falls in the Köppen climate type of BSk (Cold semi-arid)¹⁵. This type of climate also often produces extreme variants of both precipitation and temperatures. Semi-arid conditions prevail in the western portion of the state. This combination of hot summers and limited precipitation in a semi-arid climatic region places South Dakota in a potential position of suffering a drought in any given year.

In the Northern Great Plains Region, it is predicted that there will be more extreme precipitation events over time. While more extreme precipitation is predicted, these events will be more spread out, with little to no precipitation between the events, causing drought conditions. There is also a high probability of more extreme temperatures in coming years. Higher temperatures will affect the evaporation rates impacting the soil moisture and streamflow, increasing issues during drought conditions. There is also future potential for less snowpack in the region, that will also affect South Dakota's economy which is closely tied to agriculture and only magnifies the potential loss which could be suffered by the state's economy during drought conditions¹⁶.

Streams in the Black Hills serve as the primary recharge of aquifers for much of Western South Dakota. According to the USGS, the water resources have added stress with an increase of population and development. The water supply during periods of severe drought are at higher risk. The Black Hills area, in 1980, saw drought conditions that caused reduced stream flow, causing shortage of water in the area¹⁷.

Figure 4.2 shows the drought conditions from 2015 to present. In the past 5 years, there has been roughly three years of drought conditions in the county. The risk for drought in Meade County is high. Figure 4.4 shows the complete drought history for the county from 1895 to 2020. The history shows the fluctuating nature of wet years and dry years in the county through the years. It is highly probable that there can be a drought in any given year. Meade County has experienced many droughts throughout history, which can last for months or over the course of several years. The National Integrated Drought Information System reports the projected long-term drought status of a majority Meade County as neither wet or dry, except for a small patch of abnormally dry and abnormally wet in the southern parts of the county, Figure 4.3 shows the long-term drought conditions as of March 21, 2021. The long-term drought information is derived from several different methodologies, including, PDSI, Z-index, 6- month, 1-year, 2-year, and 5-year SPI estimates¹⁸.

¹⁵ Peel, MC, *Köppen-Geiger climate classification – 2007*.

¹⁶ USGCRP, *Climate Science Special Report: Fourth National Climate Assessment, Volume 1*

¹⁷ Driscoll et. al. Hydrology of the Black Hills area, South Dakota

¹⁸ National Integrated Drought Information System. *Drought Conditions for Meade County: Historical Conditions for Meade County*

Drought Category System	
DO – Abnormally Dry	
<ul style="list-style-type: none"> • Grain and pasture growth is stunted 	
D1 – Moderate Drought	
<ul style="list-style-type: none"> • Topsoil is dry; grain crop yields decline • Pasture and water supplies decline; cattle industry under stress 	
D2 – Severe Drought	
<ul style="list-style-type: none"> • Planting begins early; irrigation use increases • Hay is short; cattle sales are early 	
D3 – Extreme Drought	
<ul style="list-style-type: none"> • Row crop loss is significant • Producers haul water for cattle and provide supplemental feeding; cattle sales increase 	
D4 – Exceptional Drought	
<ul style="list-style-type: none"> • Row crop loss is significant; producers are selling livestock herds; market price fall • Epizootic hemorrhagic disease spreads: wildlife populations decline; recreational fishing and hunting are affected • Extremely low flow and river debris impair navigation of major rivers; commercial barge traffic slows; water use restrictions are implemented 	

Table 4.7 U.S. Drought Monitor – Drought 5-Category System. (National Integrated Drought Information System. *Drought Conditions for Meade County: Historical Conditions for Meade County*)

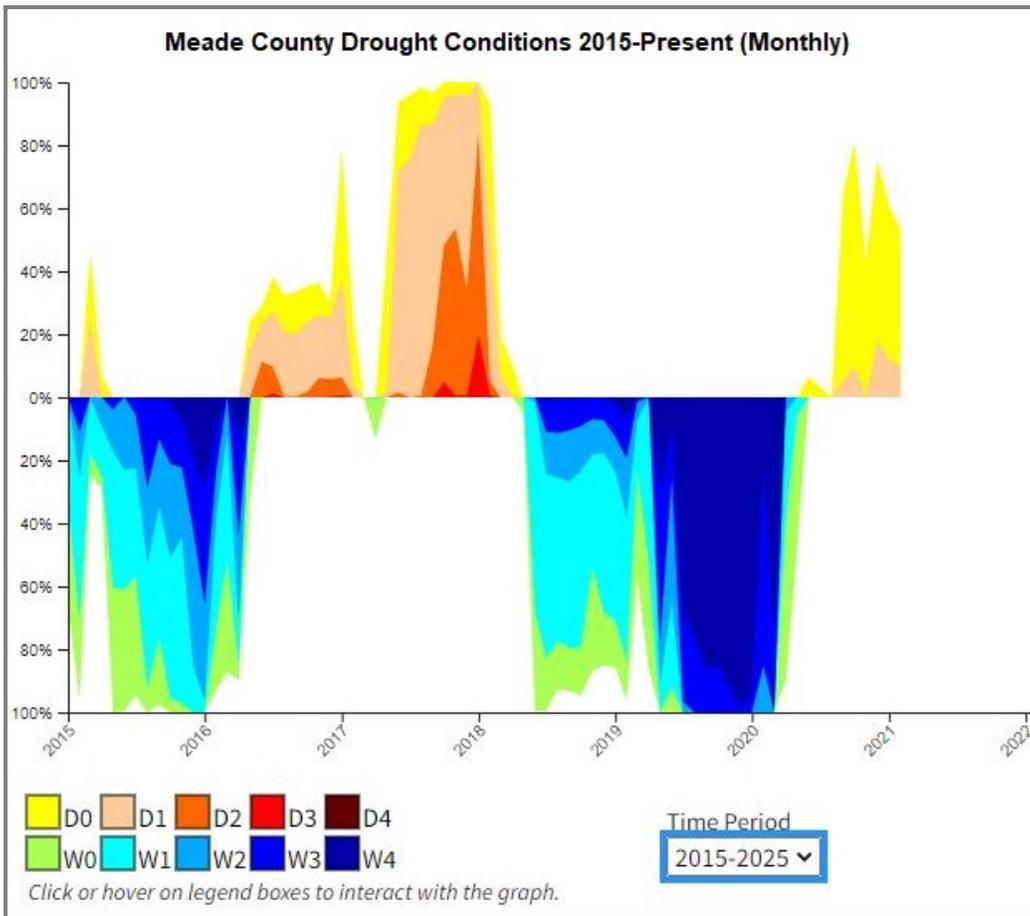


Figure 4.2. Meade County drought conditions from 2015- 03/21/2021. (National Integrated Drought Information System)

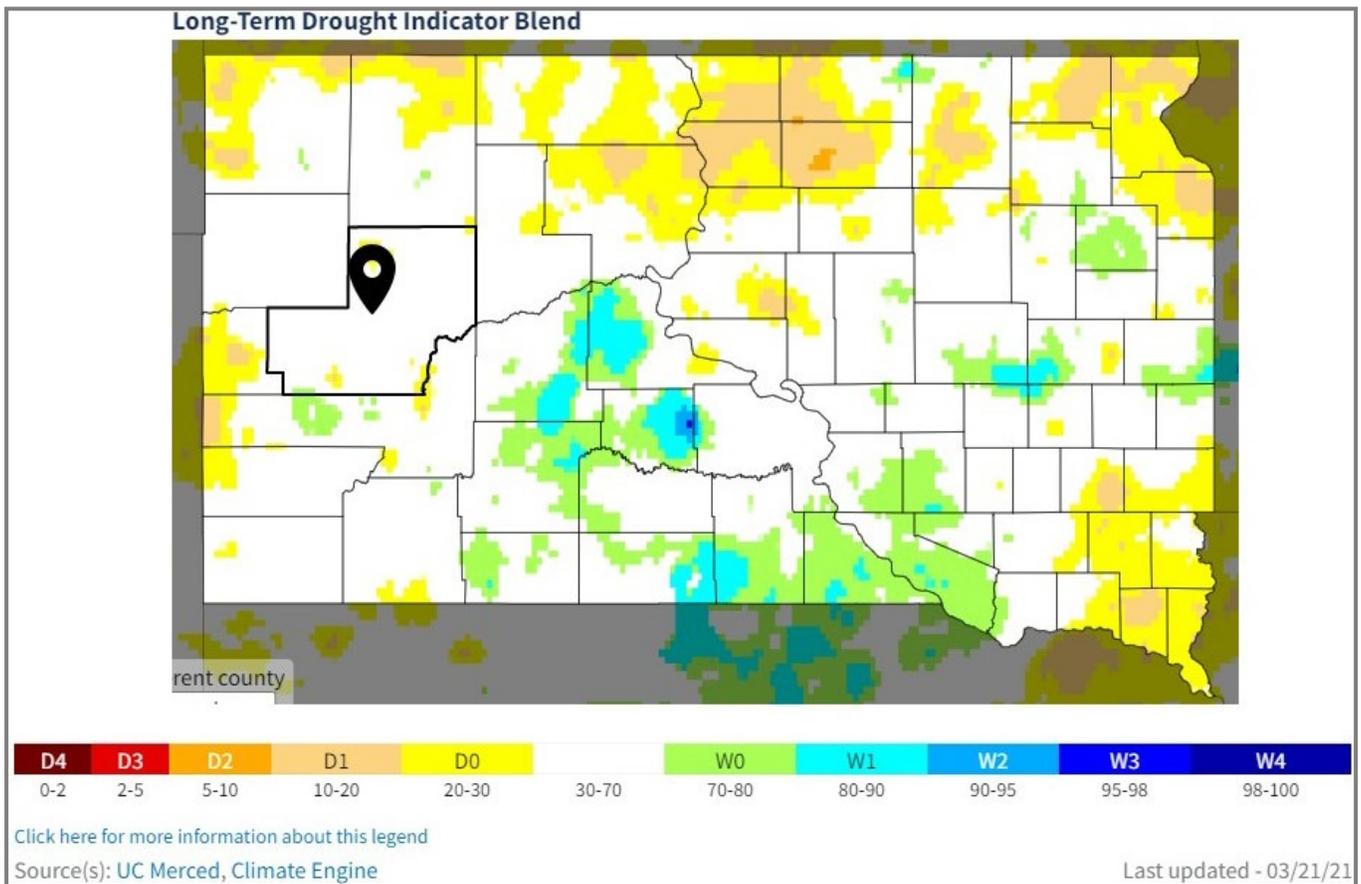


Figure 4.3. Meade County's long-term drought indicator blend. Accessed 03/21/2021. ((National Integrated Drought Information System. *Drought Conditions for Meade County: Long-term Drought Indicator.*)

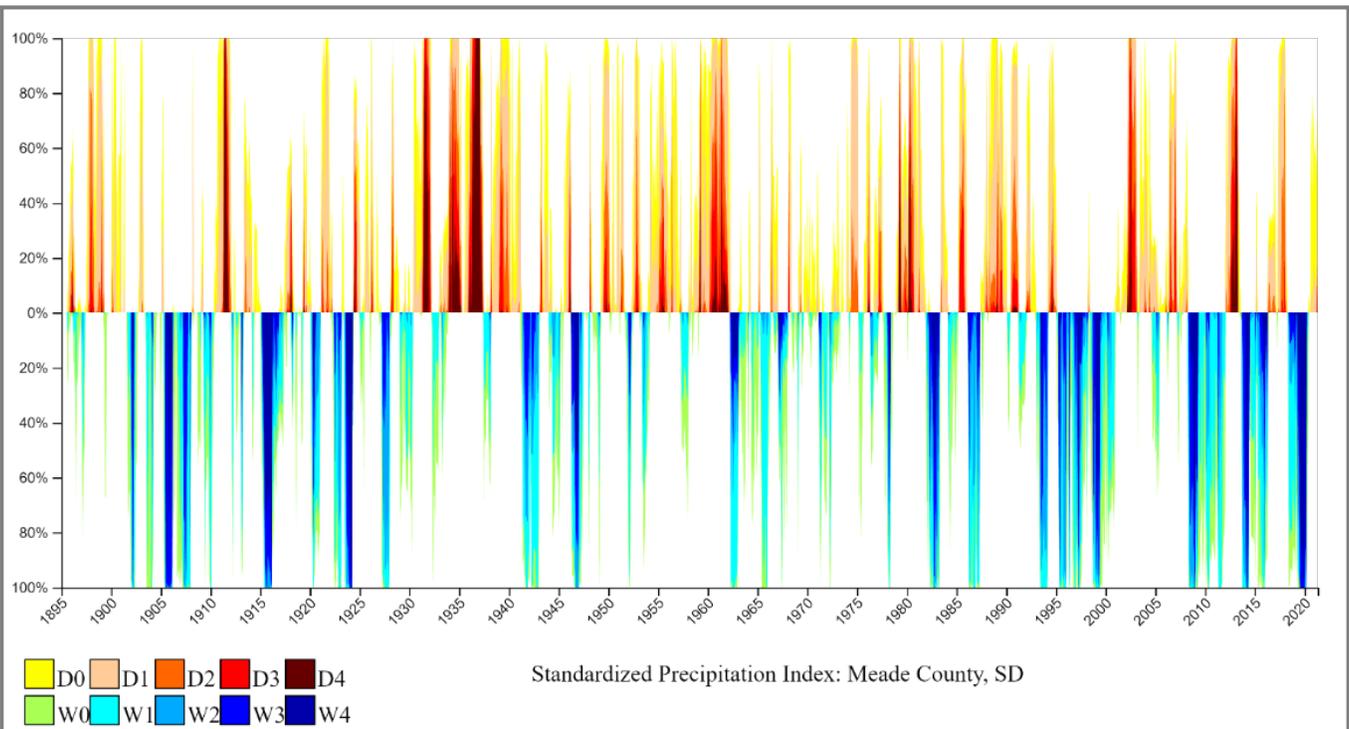


Figure 4.4. Meade County's drought conditions from 1895 to 2020. Accessed 03/21/2021. ((National Integrated Drought Information System. *Drought Conditions for Meade County: Historical Conditions for Meade County.*)

EXTREME TEMPERATURE

The NOAA Storm Database reports 5 occurrences of extreme cold/cold windchills and one occurrence of heat in Meade County since 1997. Resulting in a probability of future occurrence of 26% in any year ($6/23=0.26$). It is likely that extreme temperatures have only been documented in recent years. It is also possible that people in the area have adapted to this type of extreme temperatures and thus such weather events are not reported as often as they occur. It is predicted that the Northern Great Plains will see an increase of extreme temperatures, specifically extreme heat, which can influence human health, fires, drought, and precipitation. There is expected to be an increase of heat wave frequencies and a decrease of cold wave frequencies in coming years¹⁹.

The location for extreme temperatures is not specifically identified by jurisdiction due to the vast area across the State of South Dakota affected by extreme temperatures. Below are some examples of events of extreme temperatures; a listing of all events can be found in Appendix B.

In Meade County, there have been several cases recorded of extreme cold. Since 2016, there has been only two recorded cases which took place in December of 2016. The temperature highs were below 0°F and dropped from -15°F to -39°F, wind chill in the area created conditions as low as -45°F. No damages or deaths were reported because of these temperatures.

On January 1st, 2018, the county saw temperatures -15°F to -45°F in some areas. Wind chills were -35°F to -50°F.



FLASH FLOOD

There are many factors that can affect flooding. These include deforestation, urbanization, dams, floodwater management activities, and different agricultural practices. The NOAA storm database does not have documentation of occurrences prior to 1996. This is possibly due to lack of reporting that occurred prior to that time. Since 1996 there have been 18 occurrences of flash floods in Meade County. It is possible to make a general statement about probability by dividing the number of occurrences by the number of years, $18/24=0.75$, for a 75% chance in a year. However, this does run the risk of overstating the probability of flash flood occurrence each year. Precipitation in future projections for the Northern Great Plains of the United States is projected to be less frequent, but more extreme. Extreme precipitation is often associated with Flash Flood events. Precipitation amounts vary from season to season. Over the past decades, general precipitation has increased throughout the United States. The season with the greatest increase of precipitation was fall, which has had an increase of 15% since the twentieth century. While the winter months and summer months have shown a negative percent change over time, in some areas of Meade as much as -5% to -10%²⁰.

According to NOAA, of the 18 recorded flash flooding incidents, 35% have occurred in or around the Sturgis area. Historical records suggest that this area is of concern for flooding. In Meade County, since 1996, there has been a total of \$4,421,000 of damage to property, and \$10,000 of damage to crops due to flash flooding. These totals are believed to be higher than recorded by NOAA.

Historical Events:

In 1907, a major flood event occurred west of Piedmont, when Elk Creek flooded and killed a woman and two children.

Historically one the costliest reported incidents occurred at Ellsworth Air Force Base area which experienced \$1,000,000 worth of damages on August 17, 2007, caused by heavy rain which produced 1-2 inches of rain

¹⁹ USGCRP, *Climate Science Special Report: Fourth National Climate Assessment, Volume 1*, n.p.

²⁰ USGCRP, *Climate Science Special Report: Fourth National Climate Assessment, Volume 1*, n.p.

and 4 inches of hail that fell in less than 30 minutes. Homes, highways, and streets received damages. More information about this event and other flash flood occurrences can be found in Appendix B.

Recent Events:

Some of the most notable and recent flash flooding events occurred late May 2019 in the Sturgis area. On May 26, 2019, the Black Hills experienced record setting flooding due to heavy rains. In the Sturgis area, several roadways were inundated including 7th Street, 9th Street, 15th Street, Racoon Road, and Sly Street. In addition, crossings across Bear Butte Creek and Deadman Gulch were inundated. Less than a week later, on May 31, 2019, the area was hit again with heavy rain causing flash flooding to inundate and wash-out roadways along the same streets with the addition to South Dakota Highway 34, Fort Meade Way, and Pleasant Valley Drive. Finally, on July 4th, 2019, a severe thunderstorm hit the area causing flash flooding along Bear Butte Creek thru out Sturgis to Fort Meade. Highway 34, and the 7th St. bridge were flooded. Sly Street crossing, West Woodland Dr. and Blanche St. were damaged, as well as the other crossing over Bear Butte Creek in Sturgis. The Sturgis City Park was also completely underwater. The grand total reported damages for these events was \$2,239,000.



Flooding is a temporary overflow of water onto lands not normally covered by water producing measurable property damage or forcing evacuation of people and resources. Floods can result in injuries and even loss of life when fast flowing water is involved. Six inches of moving water is enough to sweep a vehicle off of a road. Disruption of communication, transportation, electric service, and community services, along with contamination of water supplies, transportation accidents are very possible. It is predicted that extreme precipitation events will increase by 8% to 16% in the coming decades. With an increase of extremity, the impacts caused by rain fall, such as flooding, are expected to also increase. The *South Dakota State Hazard Mitigation Plan*, states that the special flood hazard areas are expected to increase nationwide was much as 40%-50% over the next 100 years. This is attributed not only to increase of precipitation but also the increased urbanization of areas.

Numerous flood events have occurred in Meade County. Full flood history can be found in Appendix B. The NOAA Storm Database reports 31 occurrences of flooding in Meade County over 24 years, from 1996 to 2020, resulting in probability of future occurrence of 129% in any year ($31/24=1.29$). The NOAA storm database does not have documentation of occurrences prior to 1996. This is likely due to lack of reporting that occurred prior to that time. While this information is valuable in showing the likelihood of future flood events, the information collected from the NOAA website appears to be incomplete. For the years shown, there has been an estimated cost of property damage of \$886,000 and \$1,000,000 of crop damage. It also does not document any flood events prior to 1996. It would be reasonable to assume that damage was caused in each event listed but for whatever reason was not reported in dollars lost or damaged.

Historical Events:

A flood on June 4, 2008, caused over \$1,000,000 in crop damage and \$500,000 in property damage. The areas of Howes and Bear Butte experienced 2-3 inches of rain in 18 hours, which flooded Southern Meade County. The following day an additional 1-2 inches of rain aided the flooding. Houses, highways, and streets were damaged, and several stock dams failed.

Recent Events:

In 2019, Meade saw several flooding events from March to July. On March 18, 2019, areas along the Cheyenne River saw minor flooding from Wasta to Lake Oahe due to snow melt. From May 20-22, 2019, western South Dakota experienced a prolonged period of precipitation, including rain and snow mist, creating record setting temperatures and precipitation. Rain and snowmelt flooded creeks, rivers, and low-lying areas. Several roads were inundated. On May 27th, additional rain added to already wet conditions in Western South Dakota. Four inches were observed near Faith. From May 31st to June 1st, flooding conditions continued with new precipitation records met from the previous week across Western South Dakota, leading

to widespread road flooding. On July 5th, severe thunderstorms caused flooding in the southern part of Meade County. Sturgis experienced one to two inches of already saturated ground, in addition to quarter sized hail, creating flooding conditions.

GEOLOGICAL

Geological hazards in Meade County are low. While data on earthquakes can be easily found, records of landslides and subsidence incidents are limited. Mentioned events reveal that there is a potential for geological hazards in Meade County.

Areas east of the Rocky Mountains experience infrequent earthquakes. The rare earthquakes that do occur are often of a low magnitude and rarely result in major damages, like that seen on the western coast of the United States²¹. Meade County is also susceptible to earthquakes, although the occurrence is extremely rare. Fig 4.5 shows there have been two recorded earthquakes that have occurred in Meade County. In 1942 an earthquake with a magnitude of 3 took place in the southern area of Sturgis and in 1966 an earthquake with a magnitude of 4.1 took place north of Piedmont. The event caused noticeable shaking of indoor items and rattling, but no significant damage.

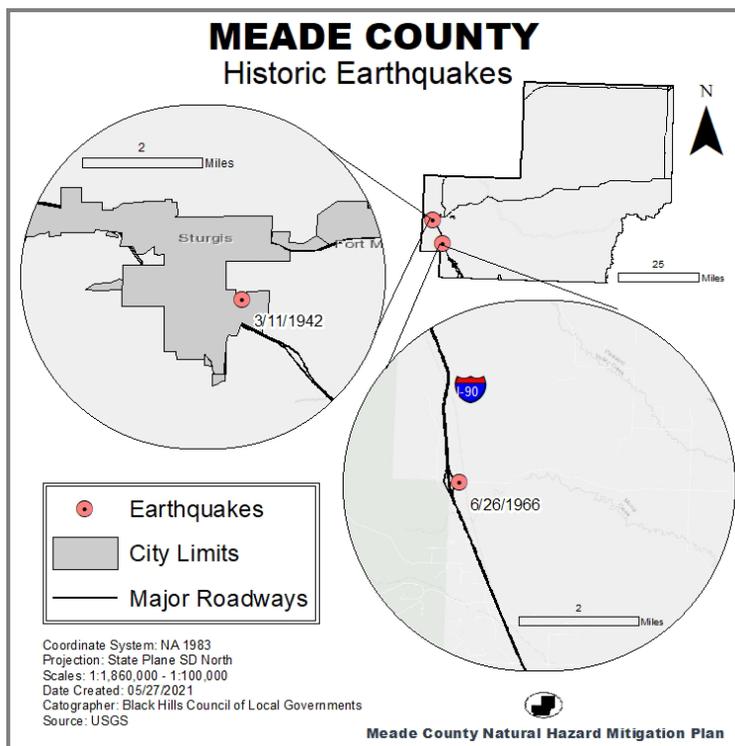


Figure 4.5. Historic earthquakes in Meade County. (USGS. Information by region – South Dakota: All Earthquakes 1900 – Present. n.p.)

Landslides tend to occur after bouts of heavy rainfall or rapid snow melt. Areas that have been impacted by wildfire, have a higher probability of having landslides due to the lack of vegetation to take in precipitation. Landslides have the potential to happen in Meade County. The *South Dakota Hazard Mitigation Plan* states, areas most prone to landslides are places where previous landslides have occurred, bases of steep slopes, bases of drainage channels, and developed hillsides using leach-field systems. Meade County has had a few areas of concern for landslides. There were issues of landslide areas along I-90 in Meade County. According to the SDDOT areas along I-90, Blucksberg and Sturgis I-90 west bound were aligned around and over a large existing landslide area. SDDOT explains that the area was repaired somewhere in the late 1990's/early 2000s at Blucksberg and West of Whitewood. The areas along I-90 have been mitigated and are no longer a concern. The Meade County Highway Department provided engineering reports on areas with landslide events at the roadways at Bear Butte Road, New Underwood Road, and Elk Valley Road. The New Underwood Road had a slide in 2013 and was mitigated by re-routing the road from the slide location.

In 2018, approximately 300 feet of a slope on Elk Vale Road had slope instability. The road had previously been regraded and had underdrain placements, which were done to address previous instability on the road embankment. The area had also previously had observations of standing and running water at the base of the embankment. The slide was repaired, along with an installation of a French Drain System.

In 2019, Bear Butte Road had roughly 100 feet of slope on the western side of the road showing signs of slope instability. The cause was mainly attributed to a drainage pipe leak. The drainage in the area was repaired and the slope is reported as currently being stable.

²¹ USGS. (2018). *East vs West Coast Earthquakes*. n.p.

An area in Sturgis along Sly Hill Road, which eventually turns into Beat Butte Road when it leaves city limits, has also experienced landslide conditions. The City of Box Elder also faces an issue with slumping in several areas on Radar Hill. More information on this area can be found in the Unique and Varied Risk Section of this plan.

Subsidence is the sinking of the earth’s surface, usually caused by groundwater withdraw, drainage of soils, underground mining, and natural collapse. Sinkholes, a type of subsidence, are most common along areas of karst terrain. Figure 4.6 shows Meade County’s karst terrain of carbonates and evaporites located in the western section of the county. A dome of Paleozoic and Cretaceous carbonate rocks is formed around the Black Hills. Evaporites from the Spearfish Formation are present all along the I-90 corridor. Current known areas of historical mining are in Tilford and Black Hawk areas. Since 2016, there has been one reported issue with subsidence in the county in the Hideaway Hills Subdivision. Due to ongoing litigations, mitigation strategies for this specific area will not be addressed in this plan.

Expansive Soils are a concern for the County. According to the South Dakota Hazard Mitigation Plan, expansive soils are present in all states in the United States and can cause billions of dollars of damage each year. The *Meade County Ordinance 20* states that, “if the property proposed for development involves areas where, in the view of the planning board, the soils characteristics, terrain, natural and man-made drainage, geology, ground cover or its location impose unusual requirements, the planning board may request supplementary data to demonstrate the feasibility of subdividing the land.”

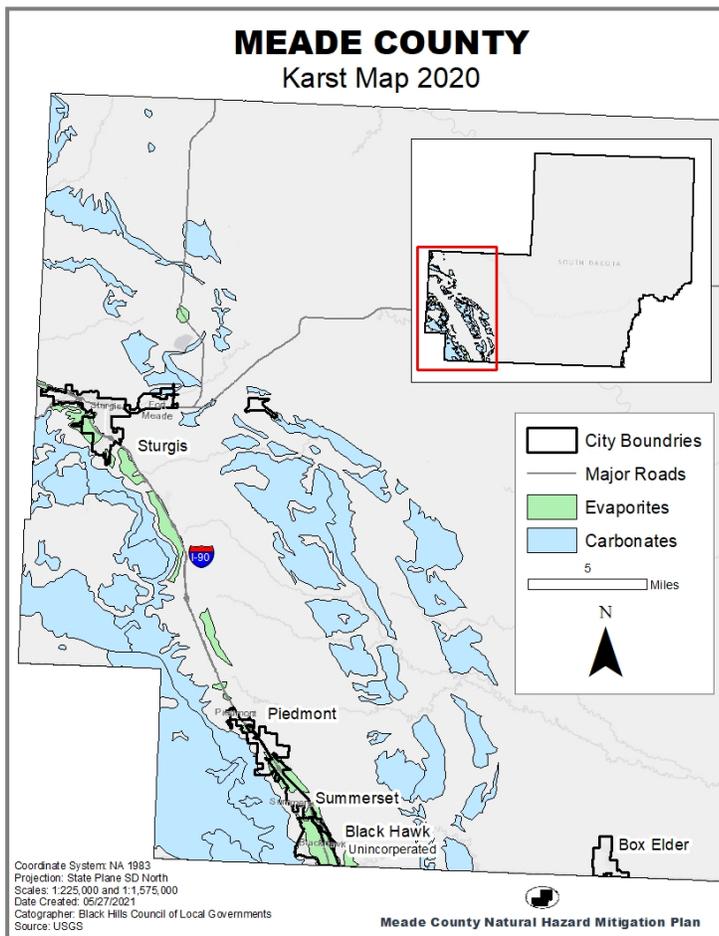


Figure 4.6. Karst map of Meade County along I-90. (USGS. *Karst Map of Continental United States – 2020*. n.p.)

HAIL

The *South Dakota Hazard Mitigation Plan* rates summer storms vulnerability in Meade County as very high. Summer storms in Meade County often are accompanied by bouts of hail. Hail occurrences are common in Meade County and a full history by location throughout the county can be found in Appendix B. The NOAA Storm Database reports 320 reported occurrences for hail in Meade County over 65 years, from 1955 to 2020, resulting in probability of future occurrence of 492% in any year ($320/65=4.923$). NOAA reports since 1955 there has been a total of \$3,622,500 in property damages and \$110,500 in crop damages. With most of the damage costs being reported after 1996. It is possible that such damage was not reported because it was believed to be insignificant at the time, or because those responsible for reporting such information did not report to the proper agencies. Unfortunately, the total damages for each event are not available but hopefully soon a method for collecting this data will evolve so that it can be made available to local governments for mitigation planning.

Warmer weather accompanied by wet conditions often lead to severe storms. With current models showing expected warmer temperatures and higher rates of evaporation it is likely that hail events will also increase. No information was found in regard to know how or if the size of hail would be impacted²².

Since 2016 there were two cases of reported property damage on July 6th, 2016, totaling \$13,000. The damage took place in Sturgis causing broken home windows, siding damage, and denting cars. A complete history of all hail events can be found in Appendix

HIGH/SEVERE WIND

Severe wind events are common in western South Dakota. Several times a year the residents of Meade County can expect to experience strong winds more than 40 mph. Gusts of wind in excess of 85 mph have also been recorded for the area. The NOAA Storm Database reports 171 occurrences of high/strong wind in Meade County since 1996. No information is reported in NOAA's database for Meade County prior to 1996. From 1996 to 2020, there were 171 occurrences resulting in probability of future occurrence of 112.5% in any year ($171/24=1.125$). High wind history for Meade County can be found in Appendix B. It is currently unknown if predicted future weather conditions will have any effect on the intensity or frequency of severe winds²³.

Historical Events

November 18th, 2015, a fast-moving cold front crossed the region, bringing wind gusts to 80 mph across much of western and south-central South Dakota. The strongest wind gusts were generally during the late morning and early afternoon hours.

Recent Events

Since 2016, there have been 23 days of high/severe wind in Meade County. Gusts for these events range from 60-70 mph. Wind events tend to be county wide.

LIGHTNING

The extent or severity of lightning can range from significant to insignificant depending on where it strikes and what structures are hit. Water towers, cell phone towers, power lines, trees, and common buildings and structures all have the possibility of being struck by lightning. Wildfires in the County have also been reported to starting due to lightning strikes, such as the Ricco Fire in 2005 which burned 3959 acres around the Black Hills National Forest. In 2001, lightning ignited several fires on July 7 and 8. No structures or crops were damaged, however, over 100 acres of mainly forests and shrubs were burned. People who leave shelter during thunderstorms to watch or follow lightning also have the possibility of being struck by lightning. The lightning history shows since 2016 only two occurrences listed on the NOAA website. Since lightning is common in this region of the United States and in Meade County, it is evident that the information reported in the NOAA website is inaccurate and incomplete. Since little to no information was provided, a table showing location, date, time, and magnitude was not included in the plan. It is reasonable to believe that lightning can occur anywhere in the County and has 100% chance of occurrence in any given year. With future weather predictions expecting an increase of intensity and frequency of storms, it is expected that occurrences of lightning will also increase²⁴.

The City of Box Elder reported two known incidents of lightning. In July 2018 and the summer of 2019, the city's Well #5 was hit by lightning taking out the control system for the well.

²² USGCRP, *Climate Science Special Report: Fourth National Climate Assessment, Volume 1*, n.p.

²³ FEMA. *Assessing Future Conditions: Meeting FEMA's State Mitigation Plan Requirements*. n.p.

²⁴ USGCRP, *Climate Science Special Report: Fourth National Climate Assessment, Volume 1*, n.p.



THUNDERSTORM WINDS

Thunderstorm wind occurrences in the County are also very common. Thunderstorms in Meade County usually occur in the summer months but have occurred as early as April. Over the years, these events have caused a reported grand total of \$2,811,000 in property damage and \$505,000 in crop damage. The NOAA Storm Database reports 486 occurrences of thunderstorm wind in Meade County over 57 years, from 1963 to 2020, resulting in probability of future occurrence of 853% in any year ($486/57=8.53$). History of thunderstorm winds in Meade County can be found in Appendix B. Meade County is expected to see an increase of intense summer storms, which is projected to increase the frequency of thunderstorms and thunderstorm winds. It is unknown if the increase of summer storms will have any increase on the intensity of the winds²⁵.

Historical Events

On August 1, 2000, a thunderstorm hit the foothills of the northern Black Hills, with downburst winds estimated to reach 90 to 110mph. The high winds accompanied by golf ball sized hail caused damages to roofs and siding. The storm hit one week prior to the annual Sturgis Motorcycle Rally, so many visitors were in the area. The storm caused vehicles, campers, motorcycles, and camping equipment to be damaged. Reports say that no trees fell on campers, but several were inches from falling on occupants. Meade County shows a total of 2 injured from the storm. In the area a man had been taken to the hospital after his camper flipped over on the interstate. The City of Sturgis most severe damage was to vendor's stalls set up for the Sturgis Rally. One man in Sturgis was injured as he tried to protect his stall. The winds threw him into metal scaffolding. Winds were reported 60mph reaching gusts of 70mph, between Sturgis and Rapid City. The total damage costs reported were \$500,000.

Recent Events

On July 18, 2016, a line of storms throughout the county produced strong winds and tennis ball sized hail, which resulted in the several damaged vehicles. In June of 2020, a large storm system created high winds up to 90 mph, causing downed power poles, trees, and minor property damage.



TORNADOS

All of Meade County is susceptible to summer storms. Warning time for summer storms is normally several hours, sufficient for relocation and evacuation if necessary. However, tornados may occur with little or no warning. The NOAA Storm Database reports 28 occurrences of tornados in Meade County over 70 years, from 1950 to 2020, resulting in probability of future occurrence of 40% in any year ($28/70=0.4$). Documentation of tornado activity in Meade County can be found in Appendix B. The future predictions of tornado activity for Meade County are expected to increase in frequency. Precipitation is anticipated to become more intense, bringing in a likelihood of more severe summer storms. While the frequency is expected to increase, there is no evidence to suggest that the extent or intensity will increase²⁶.

Historical Events

On May 11, 1991, an F3 tornado hit Meade County, causing \$2,750,000 in reported property damages. May 5, 2010, a EF2 touched down near Plainview causing \$100,000 in property damages. The tornado moved twenty-two miles toward Faith. It damaged a manufactured home, tearing off the roof and blowing over the walls. Several abandoned structures were also severely damaged.

²⁵ FEMA. *Assessing Future Conditions: Meeting FEMA's State Mitigation Plan Requirements*. n.p.

²⁶ USGCRP, *Climate Science Special Report: Fourth National Climate Assessment, Volume 1*, n.p.

Recent Events:

Since 2016, there has been one tornado in Meade County, in July 2016. The area in the past has had several tornados, ranging from EF1 to EF3. In 2016 an EF1 tornado touched down in Meade County near White Owl. The tornado caused damage to buildings and tossed equipment at two ranches in the area. This storm also produced large hail and high winds. During this storm, widespread power outages were reported.

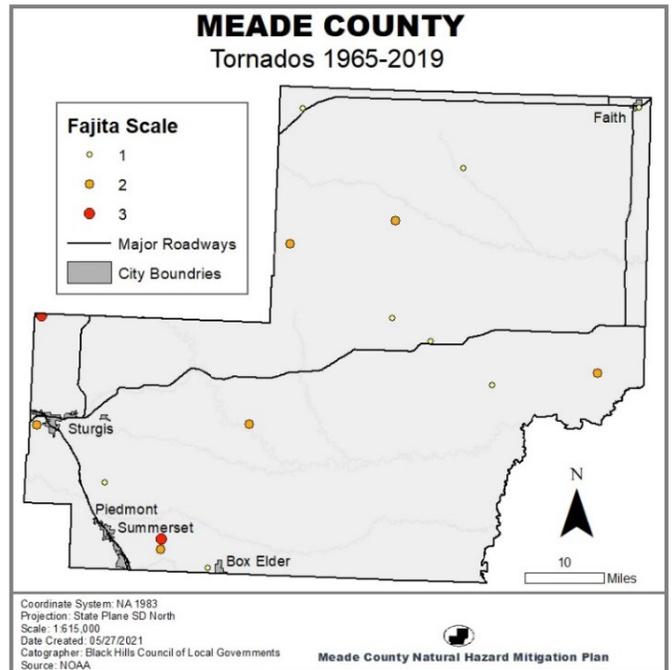


Figure 4.7. Tornados in Meade County from 1965-2019. (NOAA: National Centers for Environmental Information. SRVGIS.)

WILDFIRES

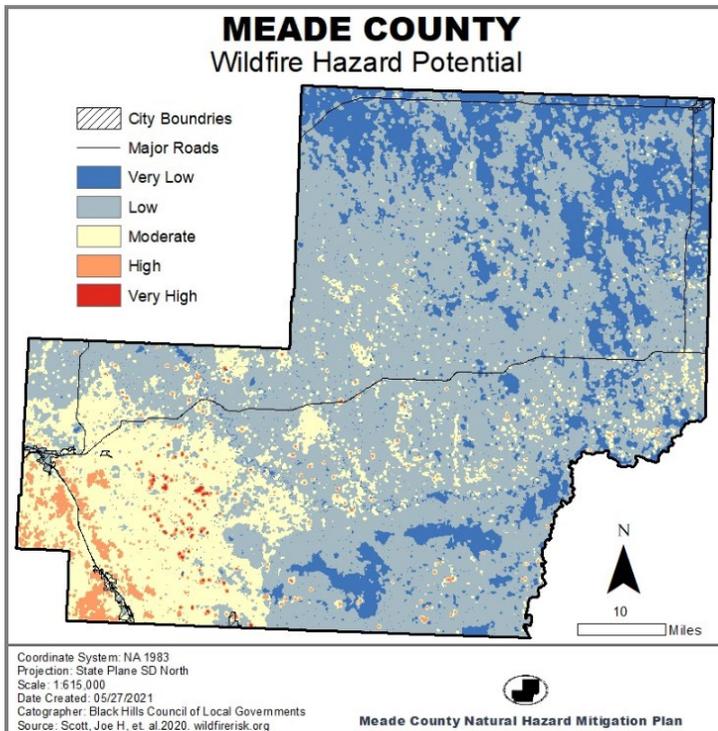


Figure 4.8. Yearly probability of wildfires in Meade County. (Scott, Joe H. et al. *Wildfire Risk to Communities: Spatial datasets of landscape-wide wildfire risk components for the United States.*)

According to NOAA, since 2000 there has only been two reported wildfires in Meade County, which is grossly under reported. To attempt to get a more complete picture of the wildfire impact in Meade, the South Dakota data was compiled from several agencies. The risk for wildfire is high in Meade County. The State Fire Marshall’s Office was contacted, and the Chief Deputy Fire Marshal provided a report of fire incidents in Meade County from 2009 to 2019. The reports were created by data provided by local fire departments and volunteer fire departments. These reports are also not complete and not broken down by specific fire event type. However, to understand the possible fire event hazard in the County, the following data is provided. From 2009 to 2019 there was a total of 254 structural fires, 89 vehicular fires, and 514 other fires. The total dollar loss for Meade County was \$6,504,073.00. The report also listed a casualty summary, showing 1 civilian injury and 11 fire service injuries: 1 civilian and 1 fire service fatality.

USGS - GeoMAC has kept records of federal fire occurrences from 1980 to 2016, Figure 4.8. The database was no longer supported after 2016, however, to get a better picture of wildfire threats to the county the data was used. Federal lands

report a total of 156 wildfire events from 1980 to 2016, creating a probability of 486% (175/36=4.86) of a wildfire occurring in the county’s federally owned lands. Nearly all of the reported fires ranged in class A which is an acreage of 0.0-0.2 and class B 0.3-9.9 acres. The largest fire reported, the White Owl fire, was by the Bureau of Land Management which started 8/3/2006 and lasted until 8/11/2006, affecting 21,314 acres.

The United States Forest Service provided information on large fires in the Black Hills area from 1880 to 2018. According to the data, some of the more recent large fires were the Ricco Fire (2005) which burned east of Piedmont a total of 3959 acres, East Ridge (2006) which burned west of Piedmont and Summerset a total of 3204 acres, and Boxelder (2007) which burned in the southwest corner of the county 319 acres. According to the *South Dakota Forest Action Plan*, fire frequency varies throughout the Black Hills, but historic records would suggest that wildfires are more frequent in the southern, more dry areas of the Black Hills, and less frequent in the northern hills which tend to be more wet.

To help assess the risk of wildfire, the *Forest Service Research Data Archive* created a model for the United States wildfire risk. Using vegetation and wildland fuels data from LANDFIRE 2014, an annual probability model for wildfire was used. The model used remote sensing from vegetative states in 2014 as a base for the data. Figure 4.8 shows wildfire hazard potential for potential wildfires that may be difficult to control. This figure is meant to aid in showing areas where fuel treatment may be needed. Figure 4.9 the model shows the annual probability of wildfire.

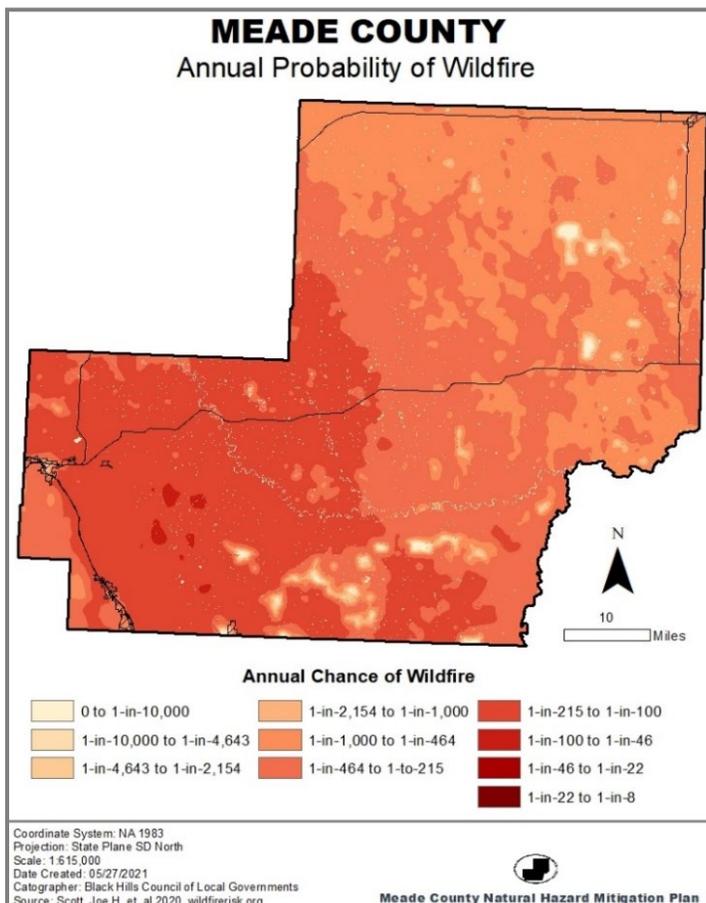


Figure 4.9. Yearly probability of wildfires in Meade County. (Scott, Joe H. et al. *Wildfire Risk to Communities: Spatial datasets of landscape-wide wildfire risk components for the United States.*)

Several factors can influence the intensity and spread of wildfires including fuels, topography, weather conditions, and development. With a predicted decrease of precipitation, and expected higher frequency of drought conditions, wildfire events intensity and frequency are expected to increase²⁷. Meade County faces two types of wildfire threat, forest fire from the Black Hills Forest and prairie fires. The greatest threats from wildfire are loss of property and life. The Wildland Urban-Interface (WUI), figure 4.10, shows areas of concern as it is the area where man-made fuels, such as homes and structures, meet with natural fuels, vegetation. According to the *Meade County Community Wildfire Protection Plan*, the communities along the I-90 corridor are at higher risk for wildfire due to the proximity to the Black Hills Forest and the Hog Back, specifically the area on the eastern side of I-90 from Sturgis to Blackhawk. The Piedmont Valley separates the main Black Hills area from the Hog Back. This section of the Hog Back is privately owned and is being quickly developed for housing. An additional threat to this area is an active railroad line that runs through the Piedmont Valley, which could pose a threat for ignition of a wildfire. Populated areas of Meade County have a 97% higher likelihood of wildfire compared to other counties in South Dakota²⁸. The County is also 97% more likely to have homes at risk than other counties in South Dakota²⁹. A majority of the high risk area is located in the Southwestern section of the County. This area of the county also falls into a section of the Black Hills Forest Fire Protection District, an area where ponderosa pine and grasslands in the Black

²⁷ FEMA. *Assessing Future Conditions: Meeting FEMA’s State Mitigation Plan Requirements.* n.p.

²⁸ USDA Forest Service. *Wildfire Risk to Communities: Meade County Wildfire Likelihood.* n.p.

²⁹ USDA Forest Service. *Wildfire Risk to Communities: Meade County Risk to Homes.* n.p.

Hills have a higher potential to have a wildfire, anytime of year. This is especially true during years of little to no snow cover. The district is located on the entire western side of I-90 in Meade County.

Meade County lacks a current map of the Wildland Urban-Interface. The most current and accurate information was taken from 2010, based on development and population at that time³⁰. During meetings with Wildfire groups and Meade County, it was discussed that one of the main reasons for a lack of WUI map was that the County does not currently have a structures layer for GIS, or a means to keep one up-to-date. Figure 4.8 shows wildfires from 1980 – 2016, as well as the WUI from 2010. From the figure we can see that while less intense, there is a much higher frequency of wildfires occurring near on in the Black Hills National Forest. More importantly, fires are occurring very near to the WUI from 2010. There is expected to be a greater WUI area with the increase of development happening in this section of the county.

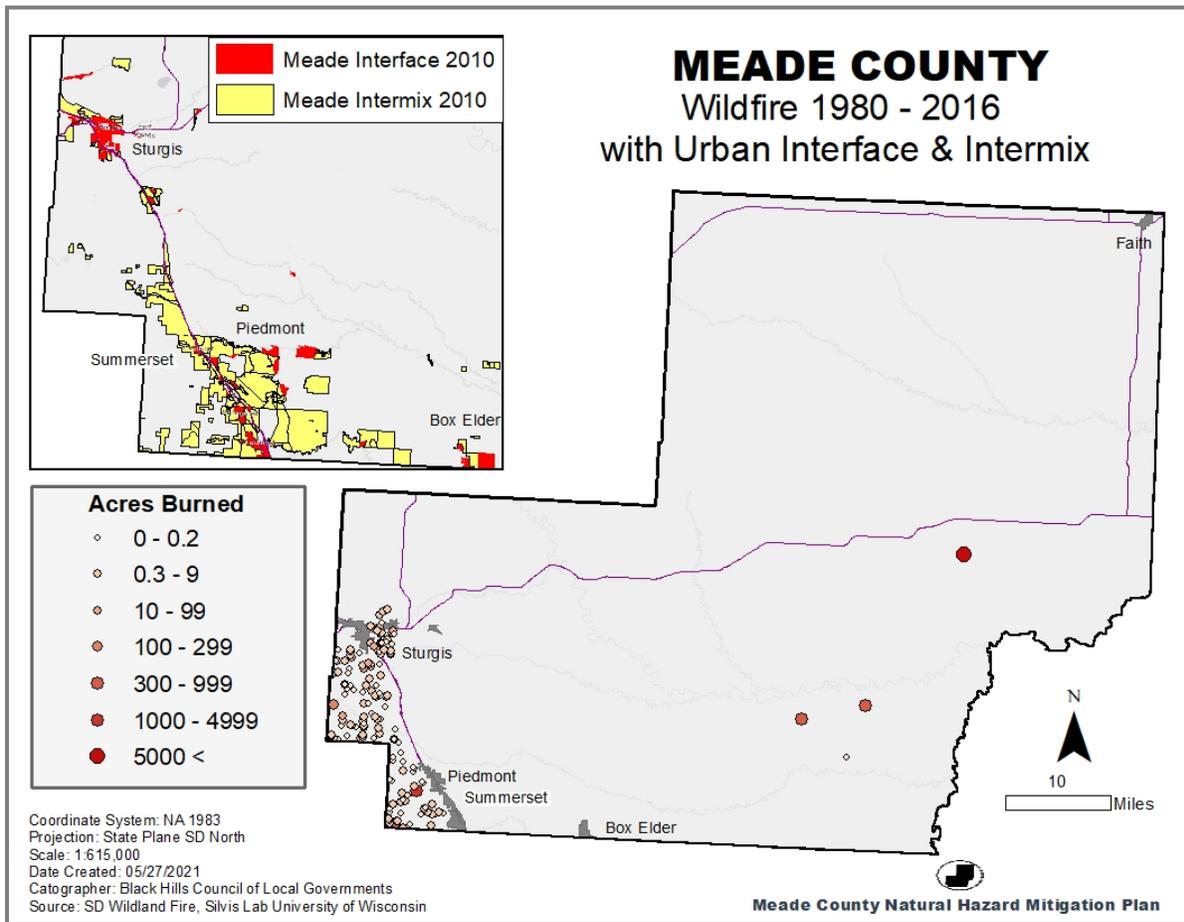


Figure 4.10. Meade County's historical fires from 1980-2016. Fires are shown by acres burned. The most current wildland urban interface map for Meade County, 2010. (*Wildland-Urban Interface (WUI) Change 1990-2010.*)

WINTER STORMS

Winter storms in Meade County are not unusual. These storms usually take place from November until April. The snow and high winds created by winter storms often create hazardous driving conditions and result in the closure of the interstate. While such storms would be considered extreme in many parts of the Country, the consistent nature of such weather hazards are expected in this area. Thus, planning and response

³⁰ *Wildland-Urban Interface (WUI) Change 1990-2010.*

mechanisms for blizzards, snow and ice storms are vital and are routine procedures in Meade County due to the common nature of such storms.

Winter storms in South Dakota are known to cover large geographical areas. Often an entire county or multiple counties can be affected by a single storm. All of the storms, identified in Appendix B, were considered to have occurred countywide. Due to the multiple categories that NOAA has for winter weather, the probability of winter storms combines several hazard events. The NOAA Storm Database reports 129 occurrences of winter storms, 53 occurrences of winter weather, 2 occurrences of ice storms, in Meade County over the past 14 years, from 1996 to 2020, resulting in probability of future occurrence of 1314% in any year ($184/14 = 13.14$). This probability statistic does not include the occurrences of blizzards. Due to the more extreme nature and risk of blizzards, they were calculated separately. The NOAA Storm Database reports 33 occurrences of blizzards in Meade County over 14 years, from 1996 to 2020, resulting in probability of future occurrence of 235% in any year ($33/14=2.35$). It is projected that over time, winter storms throughout South Dakota will increase in frequency. The intensity of future events, however, is unknown³¹. Snow coverage of the North Great Plains has seen little to no overall change. The greatest trends seen since the 1960s have been an increase of snow coverage in the fall and a decrease of snow in the spring. Spring snow melt is important for water supply in the Northern Great Plains. However, since 1980 there has been a decline, associated with warm springs in the area. Drier winters also lead to several issues such as drought and wildfire³².

Information is being reported and recorded more accurately now than in previous decades, which is most likely a result of technology, internet, and a coordinated and focused effort to share information between agencies and local governments and track weather and climate patterns. NOAA's reported cost summary for all combined winter storm events totals to \$8,395,000.

Historical Events

On November 13, 1996, freezing rain coated power lines and roads throughout western South Dakota. Over 300 distribution poles were downed at a cost of over \$300,000. In and around Rapid City area, over 40 car accidents were reported, resulting in the hospitalization of four people with serious to critical injuries.

On January 01, 2006, freezing rain fell during much of the afternoon and early evening across northwest South Dakota before precipitation changed to snow and ended overnight. The heaviest amounts of freezing rain were reported across northern Meade, where a ¼ to ½ inch of ice accumulated. Grand Electric Cooperative reported the most damage along and north of U.S. Highway 212 in northern Meade, where 68 telephone poles were downed by the ice and 800 customers lost power, some for several days. Damage was estimated at approximately \$100,000.

A historical winter event that is still fresh in people's minds was the blizzard of 2013. The storm occurred from October 3rd to October 5th, created a record setting snowfall that lasted for almost 48 hours. The plains received a reported 1-2 feet of snow, and the 3-5 feet over the northern and central Black Hills. Blowing and drifting snow now created zero visibility on October 4th. Heavy snow caused several downed trees and power lines, creating prolonged power outages. Several structures including businesses, a middle school, and a community center had their roofs collapse due to the heavy snow. Livestock and bison perished from hypothermia, suffocation, or drowning. The Animal Industry Board reported 21,000 cattle, over 1,300 sheep, 400 horses, and 40 bison deaths because of the storm. It was also estimated that the removal of trees and debris would cost several million dollars.

Recent Events

On November 28, 2016, the area was hit with a low-pressure system which lasted for roughly 48 hours. The Black Hills area experienced 12 to 24 inches of snow. The remainder of the county experienced 3 to 7 inches. The poor visibility brought from the storm caused the closure of I-90 for 12 hours. An early storm in October

³¹ FEMA. *Assessing Future Conditions: Meeting FEMA's State Mitigation Plan Requirements*. n.p.

³² USGCRP, *Climate Science Special Report: Fourth National Climate Assessment, Volume 1*, n.p.

2019 brought 8 to 12 inches of snow in the area, and wind gusts of 35 to 45 mph cause blowing and drifting conditions. The gusts caused several high-profile vehicles to tip over along Interstate 90 east of Rapid City.

On December 26, 2016, a blizzard resulted in the death of one person, who died while trying to walk home after driving off the road. It created 4 to 12 inches of snow, high wind, thunder, and hazardous driving conditions. The storm created the closure of I-90 for a prolonged period.

Early spring winter storms are common in Meade County. On April 13, 2018, the conditions of several inches of snow and 50 mph wind gusts once again closed I-90 for around 24 hours. On March 13, 2019, again I-90 was closed for more than 36 hours. On April 10, 2019, another blizzard hit the area, creating a few inches to two feet of snow in some areas. The storm created hazardous blowing and drifting conditions.

ASSESSING VULNERABILITY: OVERVIEW

Requirement §201.6(c)(2)(ii): [The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.

The following paragraphs summarize the description of the jurisdiction's vulnerability to each hazard and the impact of each hazard on the jurisdiction.

Blizzards are characterized by high winds, blowing snow, cold temperatures, and low visibility. Blizzards create conditions such as icy roads, closed roads, downed power lines and trees. Meade County's population is especially vulnerable to these conditions because people tend to leave their homes to get places such as work, school, and stores rather than staying inside. Traffic is one of the biggest hazards in Meade County during a blizzard because people often get stuck, stranded, and lost when driving their vehicles, which usually prompts others such as family and or emergency responders to go out in the conditions to rescue them.

Dam Failure can be caused by overtopping, foundation defects, cracking, inadequate maintenance and upkeep, and piping. Meade County has a total of 181 dams. Most of these dams are in areas that if failure occurred would cause little damage to property. Meade County is mostly comprised of grasslands for grazing. However, five of the dams in Meade County are classified as high-risk. High-risk dams have the risk of not only property damage, but more importantly loss of life. The classification is based on the potential of downstream consequences of the dam failing, not the condition of the dam. It is due to this reason that these dams are required to have an emergency action plan in the event of a failure. The Meade County Emergency Manager provided the *Master Dam Plan*, which involves activating all known warning systems, and evacuations of areas, homes, and businesses around threat of water. In addition, there is a requirement by the state of South Dakota, that all high-risk dams are inspected every five years. The last recorded year of inspection for all 5 of Meade County's high-risk dams was in 2018.

Drought can be defined as a period of prolonged lack of moisture. High temperatures, high winds, and low relative humidity all result from. A decrease in the amount of precipitation can adversely affect stream flows and reservoirs, lakes, and groundwater levels. Water shortages can affect supplies for domestic, municipal, industrial, agricultural, and recreational uses. Crops and other vegetation are harmed when moisture is not present within the soil. With lower levels of moisture caused by drought, the chances of wildfires increase.

Earthquakes occur in the area; they have not had a great enough magnitude or intensity in the past 10 years to be reported. The magnitude and intensity of an earthquake is measured by the Richter scale and the Mercalli scale. Meade County has had two recorded earthquakes, one of which had a magnitude of 4. A magnitude of 4 would have caused noticeable shaking, but with little to minimal damage done. While earthquakes are not a common occurrence, it would be reasonable to expect that a large earthquake would have comparative impact on Meade County as it would anywhere else.

Expansive Soils are located throughout Meade County. The expanding and shrinking of soils can cause damage to structures. Often seen are damages to foundations, floors, and basements, but can also affect all areas of a structure. This hazard often occurs over long periods of time as soils expand and shrink repeatedly. Damages from expansive soils can often be mistaken as natural aging damage of structures.

Extreme Cold temperatures often accompany a winter storm, so you may have to cope with power failures and icy roads. Whenever temperatures drop below normal and as wind speed increases, heat can leave your body more rapidly. These weather-related conditions may lead to serious health problems. Extreme cold is a dangerous situation that can bring on health emergencies in susceptible people, such as those without shelter or who are stranded, or who live in a home that is poorly insulated or without heat. Exposure is the biggest threat/vulnerability to human life; however, incidences of exposure are isolated and thus unlikely to happen en masse.

Extreme Heat has caused worldwide catastrophic crop damage, thousands of deaths from hyperthermia, and widespread power failures due to increased use of air conditioning. Loss of power and crop and livestock damage are the largest vulnerability to the county during extreme heat. Both influence quality of life, however, neither are detrimental to the existence of the population of Meade County.

Flooding can result in injuries and even loss of life when fast flowing water is involved. Six inches of moving water is enough to sweep a vehicle off a road. Disruption of communication, transportation, electric service, and community services, along with contamination of water supplies and transportation accidents are very possible.

NFIP: [§201.6(c)(2)(ii)]

Approximately 1.6% of Meade County is located within the 100-year floodplain. Currently 157 properties in Meade County, 12 in Meade County, 71 in Box Elder, 2 in Piedmont, and 72 in Sturgis participate in the NFIP program. Communities are encouraged to participate in the National Flood Insurance Program.

CRS Program:

Meade County participates in Community Rating System (CRS) program. Meade County's entry date for CRS program was on October 01, 2015. The county as of 2021 has a rating of 9, which gives participants a 5% premium discount. Some of the activities the county does for the CRS program are: maintaining elevation certifications, floodproofing certifications for buildings in Special Flood Hazard Area (SFHA), provide basic flood information to inquirers (FIRM information, historical flood information); conducting outreach programs; having the public library maintain flood protection materials; conducting annual review and update of information on flood protection; enforcing floodplain ordinance, maintaining flood hazard boundary maps, and flood insurance studies.

Of the jurisdictions participating in NFIP, none of them are enrolled in the CRS program.

Other mitigation activities have included:

1. Complete in 2020, the City of Sturgis's Flood Plain Administrator provided information on mitigation activities. In the area of 7th St. and Woodland Dr. which had experienced damages due to flooding, the city had added on armoring to the areas that had been damaged. By doing this it will add protection of the sanitary sewer that runs about 10 feet away from the top of the Bear Butte Creek bank, in the event of future flooding issues. In addition, FEMA

mitigation grants were used for the placement of articulated block on the channel slopes.

2. Once or twice a year Meade County's Floodplain Administrator holds classes focused on issues that citizens may need to address. Different subjects are chosen depending on need, ex. Flood Zone AO issue, or how to get your home out of a floodplain with LOMA. In addition, these classes also address any flood insurance updates. Notification of classes are sent to property owners, contractors, surveyors, engineer, bankers, realtors, mortgage companies, etc.
3. Sturgis also actively works to educate the public on floodplain development within Sturgis, with information about floodplain development on the city's website. Sturgis is also currently working to setup a partnership with the US Army Corps of Engineers Silver Jackets program in creating 3-D mapping of Sturgis.
4. Meade County Equalization and Planning Department has been working hard in recent years to clearly plot the County's drainage easements. The previous information on drainage easements in the county were lacking information.

Meade County's Floodplain Ordinance 9 restricts development in special flood plain hazard areas. Any development or construction in these areas must follow strict guidelines and be signed off by the Floodplain Administrator. All building permits are checked to see if the area for the permit is located in a floodplain. According to the county's floodplain administrator, Meade County is a member of the CRS program and requires FEMA approval for any floodplain development. The County's building code also requires that those areas outside of the FEMA designated Special Flood Hazard area that are still prone to flooding, are required to have a 2-foot elevated building pad. Areas in the flood type AE are not available for development. *Meade County's Ordinance 34* states, any area with historical evidence of flooding is also not permitted to have a basement. In addition, a minimum floor elevation of 1-foot above the 100-year flood plain must be established for any buildings or structures. Medium, modified high or high-density subdivisions must, at their own cost, hire a registered engineer to have an approved Floodplain Development Permit.

These are just a few examples of how having a qualified Flood Plain Administrator is a mitigation activity in itself. Requiring that new construction meets the flood plain ordinance and having someone to enforce those requirements is essential to mitigation planning and helps reduce the risk of natural weather events becoming natural disasters.

Freezing Rain/Ice Storms may cause build up on power lines, poles, trees, and structures. The additional weight can often cause weak structures to cave in and cause tree branches and power lines to break and fall. Meade County and the local jurisdictions within are susceptible to these conditions due to the types of structures and surfaces that exist in the county that cannot be protected from freezing rain. Traffic on the roads and highways tend to be the biggest hazard during freezing rain conditions because vehicles often slide off the road, which prompts emergency responders and others to have to go out on rescue missions in the adverse conditions.

Hail causes damage to property such as crops, vehicles, windows, roofs, and structures. Meade County and its local jurisdictions are vulnerable to hail, like most other areas in the South Dakota, due to the nature of the hazard. Mitigating for hail is difficult and is usually found in the form of insurance policies for structures, vehicles, and crops.

Heavy Rain can cause damage to property such as homes and roads. Heavy rain in Meade County can cause road inundation in low-laying areas. Roads and bridges can be washed out, thus causing traffic hazards for travelers and commuters. All areas of the county are vulnerable when heavy rains occur. Storm sewers are built for the typical storm and therefore do not accommodate for excessive or heavy rains.

High/Severe Wind can cause damage to property, injury, or death. High winds can cause downing of trees and powerlines, building collapse, and flying debris. Western South Dakota is susceptible to high wind events. High wind warning is issued for sustained winds reaching 40mph or greater, or if gusts of 58 mph or greater are predicted. *Meade County's Ordinance 34* states that design requirements must be able to sustain 90 mph winds and 115 mph 3 second wind gusts.

Ice Jams cause damage to bridges, roads, and culverts due to water currents pushing large chunks of ice under or through small openings. Areas near the Cheyenne River have a history of flooding caused by ice jams. This part of the county is mostly grazing land and sparsely developed.

Landslides are caused by the movement of earth downslope. Areas where old landslides have occurred often include, steep slopes, bases of drainage channels, and developed hillsides. The *South Dakota Hazard Mitigation Plan* shows that there are many areas in Meade County that are moderately to highly susceptible to landslides.

Lightning often strikes the tallest objects within the area. Most injuries from lightning occur near the end of thunderstorms. Individuals who sought shelter leave those areas prior to the entire completion of the thunderstorm. Believing it is safe to freely move around, concluding lightning strikes catch them off guard. In towns, trees and poles often receive the most strikes. In rural areas, shorter objects are more vulnerable to being struck. Electrical lines and poles are also vulnerable because of their height and charge. In addition, many streetlights function with sensors. Since thunderstorms occur primarily during hours of darkness, lightning strikes close to censored lights cause the lights to go out, causing a potential hazard for drivers. Flickering lights and short blackouts are not at all uncommon in the county. One of lightning's dangerous attributes includes the ability to cause fires. The entire county is vulnerable to lightning strikes and subsequent fires.

Severe Winter Storms have a high risk of occurrence. Heavy snow can immobilize transportation, down power lines and trees, and cause the collapsing of weaker structures. Livestock and wildlife are also very vulnerable during periods of heavy snow. Most storms can be considered to have occurred countywide. Due to the multiple occurrences of winter storms each year, an exhaustive compilation is not possible. The greatest danger during winter weather is traveling. Many individuals venture out in inclement weather. Reasons include the necessity of getting to work, going to school, going out just to see how the weather is, and to rescue stranded persons.

Subsidence is a hazard that has a high probability of occurring in localized areas, but overall a low probability of occurring in a majority of the county. Subsidence can cause damage to property, structures, infrastructures, and loss of life. Areas that are most susceptible to subsidence are those within containing evaporites and carbonates near the I-90 corridor.

Thunderstorms cause lightning and large amounts of rain in a small timeframe. The entire county experiences thunderstorms on a regular basis and is only vulnerable when weather events outside the norm occur. Specific vulnerabilities are further identified in the paragraphs for "Lightning" and "Heavy Rains".

Tornados present significant danger and occur most often in South Dakota during the months of May, June, and July. The greatest period of tornado activity (about 82% of occurrence) is from 11 am to midnight. Within this time frame, most tornados occur between 4 pm and 6 pm. The annual risk for intense summer storms

is very high. Often associated with summer storms are utility problems. Electric services have been working to bury powerlines in the county.

Wildfires occur primarily during drought conditions. Wildfires can cause extensive damage, both to property and human life, and can occur anywhere in the county. Even though wildfires can have various beneficial effects on wilderness areas for plant species that are dependent on the effects of fire for growth and reproduction, large wildfires often have detrimental atmospheric consequences, and too frequently wildfires may cause other negative ecological impacts. Current techniques may permit and even encourage fires in some regions as a means of minimizing or removing sources of fuel from any wildfire that might develop. The *Meade County Building Code* also states that no building shall exceed 40 feet in height, for life saving reasons due to fire. The *Meade County Community Wildfire Protection Plan* states the primary vegetation that affects the wildfires in Meade County are grasses, Ponderosa Pine and White Spruce. Moisture amounts have the biggest impact on fire situations. During wet years, fire danger is low. More controlled burns are conducted and less mishaps occur. During dry years, severe restrictions are placed on any types of burns. For information on dealing with open/controlled burning within the county, see SDCL 34-29B and 34-35. SDCL 7-8-20(18), which gives Meade County Commission the authority to prohibit opening burning. Any location within the county that falls in the Black Hills Forest Fire Protection District must have a burn permit issued by South Dakota Wildland Fire, however this rule excludes any jurisdictions within the jurisdiction³³.

While wildfires can occur anywhere in the county, historically a majority of fires occur near the Black Hills forested areas. The Black Hills National Forest makes up a large portion of land area west of Interstate 90 and abuts residential areas in the Piedmont Valley. The *Meade County Comprehensive Plan* encourages development along I-90 to help stop sprawl and to preserve agricultural land. A majority of the development is along the I-90 corridor, adding on to the wildland-urban interface (WUI). WUI considerations are very important in this area that is largely developed with single-family residential uses. With increased development along this area the risk of wildfire damage increases. Fifty-four percent of Meade County's populated areas are exposed to threat of wildfire from an indirect source; embers or home-to-home ignition³⁴. An issue that faces Meade County is the lack of an updated and maintained WUI map to help identifying areas of high risk.

Meade County has a strong collaboration between the different fire agencies on the federal, state, county, and local levels. All agencies are making efforts to work together to identify areas of treatment. South Dakota Wildland Fire works with all agencies in tracking different projects that take places in the region. Some of the struggles the fire agencies face, are the restrictions of borders between federal, state, county, local, and private. However, each group is working to best reduce the risk of wildfires in the area.

Meade County Ordinance 20 requires subdivisions with a primary access road greater than 1320 feet or having a total of 20 platted lots off a dead-end road have a second access street compliant with *Meade County's Ordinance 10*. In addition, any subdivision with 20 platted lots or greater must also have a secondary access road spaced at least 1,000 feet from the primary road access, or an access that enters onto a different county road. Previously the county had allowed for development without secondary or emergency accesses, that resulted in subdivisions without alternative routing. Lack of secondary access and emergency routes in older subdivisions are still an issue in the county, especially those in forested areas. Several of the jurisdictions face this problem as well.

South Dakota Wildland Fire commented that one of the big issues for those responding to fires is the lack of water supply. Many developed areas lack hydrants or wells. Due to this many responders are in the habit of always taking water tankers to fire sites. Fire responders also run into issues with narrow roadways, limited access to areas, road topography, and lack of weight limits signage on bridges. *Meade County Ordinance 20, Section 6.2 Fire Prevention* lists some preventative measures such as access roads and street plans must be compatible with prevention, emergency routes must be provided and marked, all

³³ South Dakota Wildland Fire. *Burn Permits*.

³⁴ USDA Forest Service. *Wildfire Risk to Communities: Meade County Exposure Risk*.

subdivision intended for multiple buildings must have a water supply as stated in Ordinance 33, fire hydrants will be placed no more than in 500 feet intervals for high and modified density subdivisions.

Wildfire Agencies Past and Planned Future Project Areas

Fire groups from federal, state, and local agencies have been working to help mitigate wildfire around the WUI. Some of the issues that the different agencies face are that the WUI areas are often on private land, which all agencies excluding Meade County FireWise and NRCS, can't do any treatments. Despite this, the fire groups have a healthy relationship in trying to work toward treating areas of threat in their own jurisdictions. One of the more difficult issues faced with collaboration is that different agencies receive funding at different times, making it difficult to work on specific areas together at the same time. Wildfire agencies explained that they have also struggled in the past to get public response to education outreach for wildfire safety. This was especially concerning with the number of new homeowners in the WUI area.

United States Forest Service: The United States Forest Service has been working on clearing fuels in different areas of the Black Hills, with work done in areas of Lawrence County and of Meade County. Areas that have been addressed in Meade County are scattered throughout with a majority of the thinning projects located around Beaver Park. The USFS's future plans hope to involve more clearing fuels in both Meade and Lawrence County. The Meade County areas proposed are USFS lands from around the Tilford area to north of the City of Sturgis. An attached map of past and potential future projects can be found in Appendix F.

Bureau of Land Management: The Bureau of Land Management in the last 10 years has worked in the Fort Meade Recreation Area, completing 1,654 acres of mechanical treatments and around 4,000 acres of prescribed burning. Currently there are no additional mechanical treatments planned, but prescribed burning as a maintenance tool for treatment will be continued, and is planned for the next 3-5 years.

USDA Natural Resource Conservation Services: The USDA Natural Resources Conservation Services (NRCS) has been working with private land owners for mitigation treatments. In 2020, the NRCS decided to go with a more area specific approach to treatments, where previously projects were done where ever they came up. Due to privacy issues additional information on treated areas was not made available. In the *Project Proposal Conservation Implementation Strategy Plan* NRCS, lists several areas of focused future treatments. One of the highest priorities being the Deerview Road area, located east of Piedmont and I-90. This area is being prioritized due to the increased development and high fire occurrences in the last 20 years. Other areas listed for treatment focuses on Pleasant Valley Road area south of Sturgis and Avalanche Road area north of Sturgis. NRCS also has future plans to work on outreach programs such as hosting workshops, sending mails, placing newspaper ads, and providing tours of conservation practices.

South Dakota Wildland Fire Division: The South Dakota Wildland Fire Division provided a map of areas of past, present, and future fuel reduction treatments in Meade County. Those projects in Meade County fall just west or east of the I-90 corridor, the map can be found in Appendix F.

Meade County FireWise Program: Meade County works with the FireWise program help reduce risk of wildland fire by educating the public and reduction of hazardous fuels for landowners as part of a cost share for qualifying properties. The program also provides free fire risk assessments for property owners located in the WUI. In addition to this Meade County has recently expanded their chipping program, which will have reduced rates for developments wanting to partake in the program. The County's FireWise program has treated 311.26 acres from 2015 to 2020, including 91 treated properties and 158 directly protected structures A map of the treatment areas can be found in Appendix F. While FireWise does try to target areas that are in high-risk areas, the program doesn't have any specific area for future projects and will treat and provide education to any interested landowner.

ADDRESSING VULNERABILITY: REPETITIVE LOSS PROPERTIES

Requirement §201.6(c)(2)(ii): [The risk assessment] must also address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged by floods.

Repetitive loss properties are those for which two or more losses of at least \$1,000 each have been paid under the National Flood Insurance Program (NFIP) within any 10-year period since 1978. The State NFIP Coordinator provided information. As of March 2021, the following NFIP participants and repetitive loss can be found on table 4.8. FEMA's new database does not provide specific addresses anymore, so the data only shows grand totals by county and jurisdiction. The list that was provided lists the County and each jurisdiction's participants and total losses paid out.

NFIP Participants Policy Information				
	Policy in Force	Insurance in Force	Paid Losses	Total Losses Paid
Meade County	12	\$3,017,500	12	\$35,287.27
Box Elder	71	\$6,775,000	23	\$138,990.38
Piedmont	2	\$425,000	0	0
Sturgis	72	\$11,823,100	10	\$17,493.97
Summerset	Not Reporting	Not Reporting	Not Reporting	Not Reporting

Table 4.8. NFIP participants information for policies in force, insurance, no of paid losses total losses paid and repetitive losses, March 2021.

Jurisdictions with Repetitive Loss		
	Meade County	Box Elder
Repetitive Loss Buildings (Total)	3	6
Repetitive Loss Buildings (Insured)	0	1
Repetitive Loss (Total)	5	8
Repetitive Loss (Insured)	0	2
Repetitive Loss Payments (Total)	\$28,626.70	\$104,702.46
Repetitive Loss Payments (Insured)	0	\$28,387.49
Insured Buildings with 2-3 Losses	0	1
Insured Buildings with 4 or More Losses	0	0

Table 4.9. Jurisdictions with repetitive loss, March 2021.

ASSESSING VULNERABILITY: IDENTIFYING STRUCTURES

Requirement §201.6(c)(2)(ii)(A): The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard area...

One of the purposes of this plan is identifying critical facilities and determining to what extent these structures are vulnerable to natural hazards. In the event of a disaster, Meade County and participating entities want to ensure they have the ability to prevent further loss of life by generator powered critical facilities and shelters. Table 4.10-4.16 lists of the inventory assets for each community including critical facilities, vulnerable population, economic assets, and historic assets that would cause the greatest distress in the county if destruction occurred. The information provided in Tables 4.10-4.16 was originally taken from the Inventory Assets Worksheet #3B that was given to all the plan participants to fill out. The participants were asked to think of structures that would cause the most devastation to their communities if the structures were to be lost in a natural hazard event, “In other words, list those structures that you cannot live/operate without.” Plan participants were then instructed to determine value of those structures. Most of the values provided are the insured values from the insurance policies. The plan author acknowledges that determining what is “critical” can mean something different to every community and that the information provided in the table is not comprehensive. However, the information provided by the plan participants in their emailed responses was used as a baseline and can be supplemented in future years during the annual plan review and/or during the 5-year update. By using information provided by the representatives from each community it also helps establish a sense of ownership in the mitigation plan.

Meade County Inventory Assets									
Name of Asset	Critical Facility	Vulnerable Pop.	Economic	Historic	Size (sq ft)	Replacement Value	Content Value	Function Use	Capacity/ Occupancy
Court House	✓				20,434	\$6,300,000	\$150,000	-	-
Erskine Building	✓				-	\$11,400,000	\$500,000	-	-
Extension Building	✓				-	\$540,000	\$35,000	-	-
Highway Shop – Elm Springs	✓				-	\$39,000	\$20,000	-	-
Highway Shop – Hereford	✓				-	\$38,000	\$20,000	-	-
Highway Shop – Marcus	✓				-	\$34,000	\$20,000	-	-
Highway Shop – Opal	✓				-	\$58,000	\$20,000	-	-
Highway Shop – Piedmont	✓				-	\$92,000	\$20,000	-	-
Highway Shop – Red Owl	✓				-	\$45,000	\$20,000	-	-
Highway Shop – Sturgis	✓				-	\$530,000	\$650,000	-	-
Highway Shop – Union Center	✓				-	\$44,000	\$20,000	-	-
Law Enforcement Center	✓				-	\$6,100,000	\$60,000	-	-
Maintenance Building	✓				-	\$452,000	\$75,000	-	-
Communications 18-27	✓				-	\$25,000	-	-	-

Communications 21-28	✓				-	\$62,000	-	-	-
Emergency Warning Sirens (EWS) E01	✓				-	\$31,000	-	-	-
EWS E02	✓				-	\$31,000	-	-	-
EWS E03	✓				-	\$31,000	-	-	-
EWS F04	✓				-	\$31,000	-	-	-
EWS P05	✓				-	\$31,000	-	-	-
EWS P06	✓				-	\$31,000	-	-	-
EWS P16	✓				-	\$31,000	-	-	-
EWS P17	✓				-	\$31,000	-	-	-
EWS S07	✓				-	\$31,000	-	-	-
EWS S08	✓				-	\$31,000	-	-	-
EWS S09	✓				-	\$31,000	-	-	-
EWS S10	✓				-	\$31,000	-	-	-
EWS S11	✓				-	\$31,000	-	-	-
EWS S12	✓				-	\$31,000	-	-	-
EWS S13	✓				-	\$31,000	-	-	-
EWS S18	✓				-	\$31,000	-	-	-
EWS S19	✓				-	\$31,000	-	-	-
EWS W14	✓				-	\$31,000	-	-	-
EWS W15	✓				-	\$31,000	-	-	-

Table 4.10 Critical infrastructure for Meade County as of 2021. Information was provided by Meade County.

Meade County Bridges and Culverts Inventory				
Location	Critical Facility	Type	Condition	Replacement Value
11 S 0.6 W Tilford	✓	Bridge	Fair	\$857,000
8.4E & 12.3S Sturgis	✓	Bridge	Poor	\$598,000
12E & 12.5S Sturgis	✓	Bridge	Good	\$630,000
13E & 2.1S Sturgis	✓	Bridge	Fair	\$499,000
16E & 17.7S Sturgis	✓	Bridge	Fair	\$614,000
7E 3N Bear Butte	✓	Bridge	Good	\$1,018,000
11.9E 0.4N Piedmont	✓	Bridge	Good	\$966,000
19E & 3.3S Sturgis	✓	Bridge	Fair	\$769,000
13S & 20.4E Sturgis	✓	Bridge	Fair	\$1,109,000
14S & 21.8E Sturgis	✓	Bridge	Fair	\$408,000
14S 21.9E Sturgis	✓	Bridge	Fair	\$663,000

13S & 22.2E Sturgis	✓	Bridge	Fair	\$639,000
24E & 13.8S Sturgis	✓	Bridge	Fair	\$499,000
24E & 13.5S Sturgis	✓	Bridge	Poor	\$688,000
3 W Hereford	✓	Bridge	Good	\$1,879,000
29E & 3.8N Sturgis	✓	Bridge	Fair	\$711,000
29E & 3.4N Sturgis	✓	Bridge	Fair	\$563,000
9S2 W Mud Butte	✓	Bridge	Good	\$769,000
7S & 0.2W Mud Butte	✓	Bridge	Fair	\$507,000
2S Mud Butte	✓	Bridge	Fair	\$408,000
5S Mud Butte	✓	Bridge	Fair	\$408,000
17N New Underwood	✓	Bridge	Fair	\$2,535,000
3.2 N Penn. Co Ln	✓	Bridge	Good	\$1,513,000
5 E of Hereford	✓	Bridge	Fair	\$2,802,000
3.2N & 35E Sturgis	✓	Bridge	Poor	\$896,000
8.2 N 1.0 E Fairpoin	✓	Bridge	Fair	\$805,000
7W & 9.8S Maurine	✓	Bridge	Fair	\$933,000
12.5 S Jct US 212	✓	Bridge	Poor	\$805,000
7.5 S Jct US 212	✓	Bridge	Fair	\$499,000
11.8 S US 212	✓	Bridge	Poor	\$396,000
9S & 1.5W Maurine	✓	Bridge	Fair	\$504,000
4.5 S 3 W Elm Spring	✓	Bridge	Good	\$996,000
1.9W 3.8N Elm Spring	✓	Bridge	Fair	\$2,514,000
1.8W 4N Elm Spring	✓	Bridge	Poor	\$459,000
0.1M1.S Red Owl	✓	Bridge	Fair	\$805,000
2S & 6.2E Union Center	✓	Bridge	Poor	\$408,000
3E & 15.6S Maurine	✓	Bridge	Fair	\$735,000
4.3S & 1.2E Elm Spring	✓	Bridge	Fair	\$1,668,000
0.5S & 3.3E Red Own	✓	Bridge	Fair	\$589,000
2.0E 8.7S Elm Springs	✓	Bridge	Fair	\$920,000
9S 5E Maurine	✓	Bridge	Poor	\$987,000
21.1W & 13.9S Faith	✓	Bridge	Poor	\$544,000
0.5N Opal School	✓	Bridge	Poor	\$408,000
1.8E 1.7S Opal	✓	Bridge	Fair	\$744,000
5E & 5.8N Red Owl	✓	Bridge	Fair	\$905,000
9S 8.5E Maurine	✓	Bridge	Fair	\$751,000
14.0E & 5.2N Union Center	✓	Bridge	Poor	\$408,000
14S & 15.3W Faith	✓	Bridge	Good	\$704,000
0.5W 0.1N Marcus	✓	Bridge	Fair	\$607,000

13N & 18.4E Union Center	✓	Bridge	Fair	\$1,194,000
7.9W & 23.7S Faith	✓	Bridge	Fair	\$507,000
12S & 6.1W Faith	✓	Bridge	Fair	\$396,000
12S & 5.2W Faith	✓	Bridge	Fair	\$832,000
8N 1E Plainview	✓	Bridge	Fair	\$1,209,000
12S 1W Faith	✓	Bridge	Fair	\$607,000
1E & 4.6N Sturgis	✓	Box Culvert	Good	\$380,000
8.0E & 9.5N Sturgis	✓	Box Culvert	Good	\$270,000
0.4S 2.5E Piedmont	✓	Box Culvert	Good	\$380,000
0.2S 2.7E Piedmont	✓	Box Culvert	Fair	\$320,000
0.2S 3.1E Piedmont	✓	Box Culvert	Good	\$320,000
11.7E & 8.3S Sturgis	✓	Box Culvert	Good	\$320,000
13.1E & 4 Sturgis	✓	Box Culvert	Good	\$370,000
0.4S 7.5E Piedmont	✓	Box Culvert	Good	\$380,000
3.8E 0.1S Black Hawk	✓	Box Culvert	Good	\$390,000
5.3S Bear Butte	✓	Box Culvert	Poor	\$280,000
6.0E Black Hawk	✓	Box Culvert	Good	\$380,000
17.7E 8.5S Sturgis	✓	Box Culvert	Good	\$330,000
11.9E 1.4S Piedmont	✓	Box Culvert	Good	\$330,000
34.5E & 17.7N Sturgis	✓	Box Culvert	Poor	\$280,000
3S & 3.4E Union Center	✓	Box Culvert	Good	\$330,000
9S 1E Maurine	✓	Box Culvert	Good	\$290,000
1.8E 6.2S Opal	✓	Box Culvert	Fair	\$340,000
3.5N & 5E Red Owl	✓	Box Culvert	Good	\$270,000
10W & 11.1S Faith	✓	Box Culvert	Good	\$270,000
6S & 9.9W Faith	✓	Box Culvert	Fair	\$320,000
14.2S & 4W Faith	✓	Box Culvert	Good	\$320,000

Table 4.11 Bridges and Culverts for Meade County as of 2021. Information was provided by Meade County.

City of Box Elder Inventory Assets									
Name of Asset	Critical Facility	Vulnerable Pop.	Economic	Historic	Size (sq ft)	Replacement Value	Content Value	Function Use	Capacity/ Occupancy
Well House #8	✓	✓			80	\$20,000	\$28,820	Pumps potable drinking water to community	0
Ghere Water Tank	✓	✓			7500	\$880,863	N/A	Stores 1.5M gal. of potable drinking water	0
Ghere Pumphouse	✓	✓			65	\$20,000	\$430,366	Pumps water from aquifer to 1.5M gal. storage tank	0
Ghere Reservoir and Fence	✓	✓			N/A	\$23,719	N/A	Secures 1.5M gal. storage tank	0
Emergency Warning Siren	✓	✓			170	\$12,723	\$24,637	Provides emergency notifications to community	0
Well House #4	✓	✓			300	\$31,830	\$116,699	Pumps water from aquifer to supply potable drinking water to community	0
Water Fill Station	✓	✓			170	\$12,723	\$14,268	Provides potable drinking water in bulk to community	0
Water Tower (Patriot Drive)	✓	✓			767	\$822,198	N/A	Stores 250K gal. of potable drinking water	0
West Lift Station w/ Generator	✓	✓			478	\$20,699	\$50,855	Pumps wastewater (sewer) from lower to higher elevations to wastewater treatment plant	0
660K Gal. Water Tank	✓	✓			N/A	\$503,928	N/A	Stores 660K gal. of potable drinking water	0
Water Booster Building	✓	✓			300	\$20,000	\$10,609	Houses water booster station components	0
Well House #6	✓	✓			317	\$179,456	\$150,707	Pumps water from aquifer to supply potable drinking water to community	0
1M Gallon Water Tank	✓	✓			N/A	\$663,063	N/A	Stores 1M gal. of potable drinking water	0
City Hall w/ Generator	✓	✓			26,000	\$4,053,664	\$253,353	Houses all admin. offices and police dept. and event center	45-250
Well House Northern Lights	✓	✓			370	\$20,000	\$445,601	Pumps water from aquifer to supply potable drinking water to community	0
1.5M gal. Water Tank Northern Lights	✓	✓			N/A	\$1,328,101	N/A	Stores 1.5M gal. of potable drinking water	0
Public Works Shop	✓	✓			6,800	\$218,545	\$169,615	Houses public works offices, maintenance shop, and equipment	22
Public Works Storage Shop	✓	✓			840	\$21,771	\$15,450	Equipment storage for public works	0

Table 4.12 Critical infrastructure for the City of Box Elder as of 2021. Information was provided by the City of Box Elder.

City of Faith Inventory Assets									
Name of Asset	Critical Facility	Vulnerable Pop.	Economic	Historic	Size (sq ft)	Replacement Value	Content Value	Function Use	Capacity/ Occupancy
Water tower	✓				N/A	\$1,609,000 (both tank and storage tank)	N/A	35,000 gallon potable drinking water to community	N/A
Water Storage Tank	✓				N/A	\$1,609,000 (both tank and storage tank)	N/A	Stores 156,000 gal. of potable drinking water	N/A
Electrical Lines/Poles/ Transformers	✓				N/A	\$2,072,000	N/A	Electrical service to City	N/A
Telecommunications Phone/Broadband	✓				N/A	\$1,200,000	N/A	Phone and broadband service to the city	N/A
Siren	✓				N/A	\$30,000	N/A	Provides emergency notification to community	N/A
Shop Building	✓				N/A	\$750,000	N/A	Houses all equipment used to restore electric, water, or telecom	N/A
Faith Community Center	✓				N/A	\$2,000,000	N/A	Houses admin. offices, Community Center, an area that can be set up with cots	N/A
Faith Public Safety	✓				N/A	\$2,000,000	N/A	House's ambulance and fire trucks and has generator for the building so it can be setup as command center	N/A

Table 4.13 Critical infrastructure for the City of Faith as of 2021. Information was provided by the City of Faith; replacement values are estimates as given by the City.

City of Piedmont Inventory Assets									
Name of Asset	Critical Facility	Vulnerable Pop.	Economic	Historic	Size (sq ft)	Replacement Value	Content Value	Function Use	Capacity/ Occupancy

Table 4.14 Critical infrastructure for the City of Piedmont was not provided.

City of Sturgis Inventory Assets									
Name of Asset	Critical Facility	Vulnerable Pop.	Economic	Historic	Size (sq ft)	Replacement Value	Content Value	Function Use	Capacity/ Occupancy
Public Works	✓				35750	\$11,000,000	\$25,000,000	N/A	N/A
9 th St Bridge	✓				200 ft	\$1,000,000	N/A	N/A	N/A
Sewer Treatment	✓				12000	\$8,000,000	\$500,000	N/A	N/A
Hospital	✓				5.1 acre	\$10,000,000	N/A	N/A	N/A
Water Well	✓				1656	N/A	N/A	N/A	N/A
Elementary School	✓				71575	N/A	N/A	N/A	N/A
Middle School	✓				79159	N/A	N/A	N/A	N/A
Fire Ambulance Hall	✓				15280	N/A	N/A	N/A	N/A
High School	✓				161,675	N/A	N/A	N/A	N/A
City Hall	✓				N/A	\$1,500,000	N/A	N/A	N/A
Liquor Store	✓				N/A	\$1,400,000	N/A	N/A	N/A
City Auditorium	✓				N/A	\$50,000	N/A	N/A	N/A
Community Center	✓				N/A	\$300,000	N/A	N/A	N/A
Banner Poles	✓				N/A	\$90,000	N/A	N/A	N/A
Airport (Fuel System)	✓				N/A	\$25,000	N/A	N/A	N/A

Table 4.15 Critical infrastructure for the City of Sturgis as of 2021. Information was provided by the City of Sturgis.

City of Summerset Inventory Assets									
Name of Asset	Critical Facility	Vulnerable Pop.	Economic	Historic	Size (sq ft)	Replacement Value	Content Value	Function Use	Capacity/ Occupancy
Sewer Plan Main Building	✓				3,628	\$293,290	\$817,296	N/A	2
UV building	✓				294	\$34,917	\$48,448	N/A	0
SBR Greenhouse	✓					\$484,100	-	N/A	0
Maintenance Building	✓				4800	\$250,000	\$263,000	N/A	2
Plant Lift Stations	✓				-	\$258,373	-	N/A	0
Recreational Dr. Lift Station	✓				-	\$216,475	-	N/A	0
WWTP effluent filter	✓				-	\$1,879,750	-	N/A	0
Sun Valley Lift Station	✓				-	\$208,960	-	N/A	0
City Hall	✓				-	\$742,630	150,000	N/A	15

Table 4.16 Critical infrastructure for the City of Summerset as of 2021. Information was provided by the City of Summerset.

ASSESSING VULNERABILITY: ESTIMATING POTENTIAL LOSSES

Requirement §210.6(c)(2)(ii)(B): [The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate...

The following information shows information of the County and Cities structure vulnerabilities. Inconsistencies and missing information result from lack of existing mechanisms, plans, and technical documents available to the communities. Each of the communities provided the best available data considering the lack of resources in which to access the information. The City of Box Elder and City of Sturgis' representatives collected the data for their community to the best of their ability. The remaining jurisdictions were aided by BHCLG in collecting the data. The information provided in the following tables for the remaining jurisdictions was taken from parcel information from April 2021, provided by Meade County Equalization and Planning Department. The County provided their own information for vulnerable structures using information provided from the Equalization and Planning Department and the State of South Dakota. The County does not have a structures layer for their GIS to know exact locations of structures that may lay in areas of risk. The information provided is based on parcel information from the Equalization Department. The information did not specify the number of people per structure. Additionally, parcels that were classified as tax exempt did not provide data as to whether there were any structures. The cities were asked to provide any structures that were on tax exempt plats.

This section of the plan in the previous plan was scarce and did not address potential dollar losses. Participating communities were requested to provide more complete data during the 2019 update; however, many of them struggled to provide the information requested.

Meade County Estimated Potential Dollar Losses to Vulnerable Structures							
	Land Value	Building Value	# of Buildings	County Bridges	State Structures	City Structures	Railroad Structures
Total	\$1,211,418,794	\$1,608,857,722	19,040	85	76	9	2

Table 4.17 Vulnerable structures and value, values include incorporated and unincorporated areas of Meade County. Data provided from Meade County 2021 and State of South Dakota.

Meade County Estimated Potential Dollar Losses to Vulnerable Structures Floodplain						
	Flood Zones					
	A	AE	AO	D	X	Total
Land Value	\$9,046,570	\$14,579,215	\$4,454,935	\$698,383,428	\$484,900,349	\$1,211,364,497
Building Value	\$10,071,412	\$37,566,178	\$13,238,657	\$234,509,496	\$1,313,285,776	\$1,608,671,499
# of Buildings	379	517	253	2,585	15,285	19,019
County Bridges	8	1	0	67	9	39
County Box Culverts	3	0	0	18	12	33
State Structures	10	4	0	20	42	76
City Structures	0	4	0	0	5	9
Railroad Structures	0	2	0	0	0	2

Table 4.18 Floodplain vulnerable structures and value, values include incorporated and unincorporated areas of Meade County. Data provided from Meade County 2021 and State of South Dakota. Floodplain data based on FEMA FIRM Maps.

Meade County Estimated Potential Dollar Losses to Vulnerable Structures Subsidence						
Karst Zones	Wildfire					
	Land Value	Building Value	# of Buildings	County Bridges	State Structures	City Structures
Carbonates	\$51,930,234	\$97,280,390	1051	1	1	0
Evaporates	\$85,189,965	\$285,510,541	3020	0	21	2

Table 4.19 Subsidence vulnerable structures and value, values include incorporated and unincorporated areas of Meade County. Data provided from Meade County 2021 and State of South Dakota. Karst areas from USGS.

Meade County Estimated Potential Dollar Losses to Vulnerable Structures Wildfire						
WUI Zones	Wildfire					
	Land Value	Building Value	# of Buildings	County Bridges	State Structures	City Structures
High Density Interface	\$60,723,412	\$115,232,796	2540	0	0	0
Medium Density Interface	\$128,433,477	\$466,415,218	5231	0	1	1
Low Density Interface	\$14,731,611	\$38,875,378	584	2	3	0
High Density Intermix	\$110,101	\$37,149	26	0	0	0
Medium Density Intermix	\$47,562,553	\$175,641,910	1702	0	0	0
Low Density Intermix	\$150,821,748	\$395,526,596	4187	4	3	0
Very Low Density - Vegetation	\$673,829,167	\$272,617,822	3542	57	21	1
Very Low Density - No Vegetation	\$24,837,876	\$20,104,915	337	3	3	0
Uninhabited/Water	\$110,324,551	\$84,405,938	891	19	45	4

Table 4.20 Wildfire vulnerable structures and value, values include incorporated and unincorporated areas of Meade County. Data provided from Meade County 2021 and State of South Dakota. WUI zones based on 2010 WUI from Silvis Lab Wisconsin University.

Box Elder Estimated Potential Dollar Losses to Vulnerable Structures									
Type of Structure	Number of Structures			Value of Structures			Number of People		
	# in City	# in HA	% in HA	\$ in City	\$ in HA	% in HA	# in City st. 2019	# in HA	% in HA
Residential	2,643	417	17%	\$376,518,682	\$15,358,400	5%	10,119	-	-
Commercial	138	39	29%	\$70,982,174	\$4,348,500	6%	-	-	-
Industrial	110	66	60%	\$11,438,300	\$2,180,800	19%	-	-	-
Agricultural	42	18	44%	\$2,072,315	\$517,100	25%	-	-	-
Religious	-	-	-	-	-	-	-	-	-
Government	-	-	-	-	-	-	-	-	-
Education	6	-	-	-	-	-	-	-	-
Utilities	-	-	-	-	-	-	-	-	-
Total	2,939	540	-	\$461,011,471	\$22,404,800	-	10,119	-	-

Table 4.21 Vulnerable structures and value. Hazard specific numbers are for Flooding/Flash Flooding. All other hazards, excluding geological, would include all structures in the city. Data provided by the City of Box Elder as of 07/2021.

Faith Estimated Potential Dollar Losses to Vulnerable Structures									
Type of Structure	Number of Structures			Value of Structures			Number of People		
	# in City	# in HA	% in HA	\$ in City	\$ in HA	% in HA	# in City est. 2019	# in HA	% in HA
Residential	196	-	-	\$9,242,515	-	-	411	-	100%
Commercial	54	-	-	\$4,149,993	-	-	-	-	-
Industrial	-	-	-	-	-	-	-	-	-
Agricultural	-	-	-	-	-	-	-	-	-
Religious	5	-	-	-	-	-	-	-	-
Government	6	-	-	-	-	-	-	-	-
Education	1	-	-	-	-	-	-	-	-
Utilities	2	-	-	-	-	-	-	-	-
Total		-	-	\$13,392,508	-	-	411	-	100%

Table 4.22 Hazards have equal chance of happening anywhere in the city. Source Meade County Tax Parcels 04/2021.

Piedmont Estimated Potential Dollar Losses to Vulnerable Structures									
Type of Structure	Number of Structures			Value of Structures			Number of People		
	# in City	# in HA	% in HA	\$ in City	\$ in HA	% in HA	# in City est. 2019	# in HA	% in HA
Residential	348	183	53%	\$47,035,062	\$17,646,330	38%	902	-	100%
Commercial	34	19	56%	\$3,515,720	\$1,992,407	67%	-	-	-
Industrial	-	-	-	-	-	-	-	-	-
Agricultural	9	1	-	\$97,018	-	-	-	-	-
Religious	3	2	-	-	-	-	-	-	-
Government	5	2	-	-	-	-	-	-	-
Education	1	1	-	-	-	-	-	-	-
Utilities	4	1	-	-	-	-	-	-	-
Total	404	-	-	\$50,647,800	\$19,638,737	-	902	-	100%

Table 4.23 Vulnerable structures and value. Hazard specific numbers are for Flooding/Flash Flooding. All other hazards, excluding geological, would include all structures in the city. Due to proximity to Black Hills Forest and Hogback all structures are included in Wildfire. Source Meade County Tax Parcels 04/2021.

Sturgis Estimated Potential Dollar Losses to Vulnerable Structures									
Type of Structure	Number of Structures			Value of Structures			Number of People		
	# in City	# in HA	% in HA	\$ in City	\$ in HA	% in HA	# in City est. 2019	# in HA	% in HA
Residential	2324	372	16%	\$317,000,000	\$50,000,000	16%	6,922	845	13%
Commercial	450	87	19%	\$101,000,000	\$19,700,000	19%	-	-	-
Industrial	49	-	-	\$12,300,000	-	-	-	-	-
Agricultural	4	-	-	-	-	-	-	-	-
Religious	20	7	10%	-	-	-	-	-	-
Government	30	4	<13%	-	-	-	-	-	-
Education	15	1	13%	-	-	-	-	-	-
Utilities	15	-	-	-	-	-	-	-	-
Total	2907	471	-	\$431,000,000	\$69,700,000	-	6,922	845	13%

Table 4.24 Vulnerable structures and value. Hazard specific numbers are for Flooding/Flash Flooding. All other hazards, excluding geological, would include all structures in the city. Data provided by the City of Sturgis as of July, 2021.

Summerset Estimated Potential Dollar Losses to Vulnerable Structures									
Type of Structure	Number of Structures			Value of Structures			Number of People		
	# in City	# in HA	% in HA	\$ in City	\$ in HA	% in HA	# in City est. 2019	# in HA	% in HA
Residential	854	72	8%	\$173,147,227	\$14,570,588	8%	2660	-	100%
Commercial	96	12	13%	\$31,797,234	\$2,446,701	8%	-	-	-
Industrial	-	-	-	-	-	-	-	-	-
Agricultural	-	-	-	-	-	-	-	-	-
Religious	-	-	-	-	-	-	-	-	-
Government	3	-	-	-	-	-	-	-	-
Education	1	-	-	-	-	-	-	-	-
Utilities	1	2	-	-	-	-	-	-	-
Total	955	86	-	\$204,944,461	\$17,017,289	-	2660	-	100%

Table 4.25 Vulnerable structures and value. Hazard specific numbers are for Flooding/Flash Flooding. All other hazards, excluding geological, would include all structures in the city. Due to proximity to Black Hills Forest and Hogback all structures are included in Wildfire. Source Meade County Tax Parcels 04/2021.

ASSESSING VULNERABILITY: ANALYZING DEVELOPMENT TRENDS

Requirement §201.6(c)(2)(ii)(C): [The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

The land use and development trends for each jurisdiction were identified by representatives from each of the jurisdictions. Based on census data, all the communities, excluding Faith, have been experiencing growth over the last 10 years. Faith has seen a 2% decrease in the last 10 years, while the southwestern part of the county, near the Black Hills area, has seen a boom in growth³⁵. From 2010 to 2019 there has been an increase in Meade County’s population of 11%. It is projected that by 2025 there will be an increase of 3.7%³⁶.

The County approves all building permits located outside of the incorporated cities. From January 2016 to April 2021, there has been a total of 1531 of all building permit types within the County. From 2016 to 2021 there has been an increase of building permits for new residential properties of 55%. From January to April of 2021, an average of 40% all building permits requested were for new homes. In Meade County from January 2016 to April 2021, there has been a total of 498 new residential and new commercial building permits.

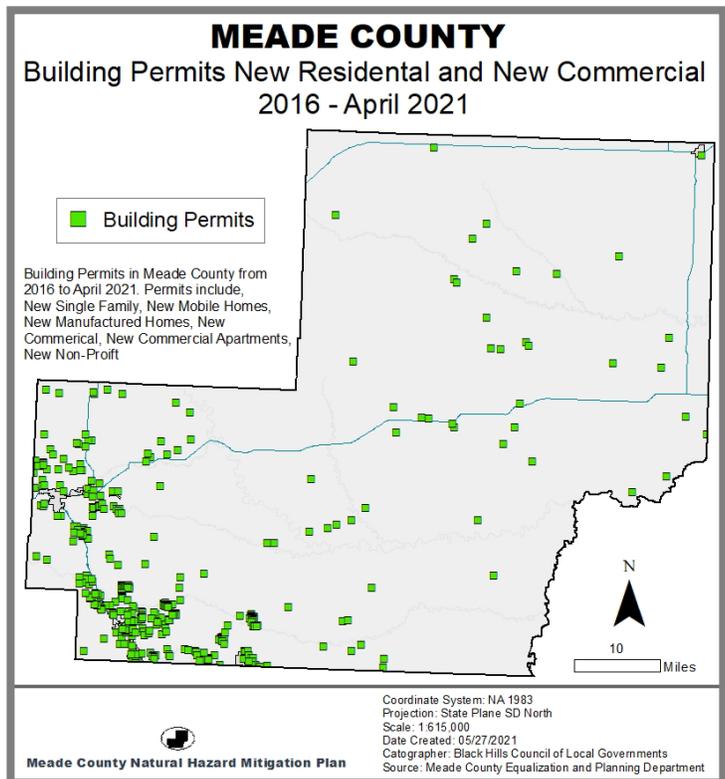


Figure 4.11 Meade new residential and new commercial building permits general location from 2016 to 2021.

The jurisdictions residential and commercial building permits from 2016 to 2021 are: Box Elder (residential 599, commercial 20), Faith (residential 7 (mobile homes), commercial 1), Sturgis (residential 456,

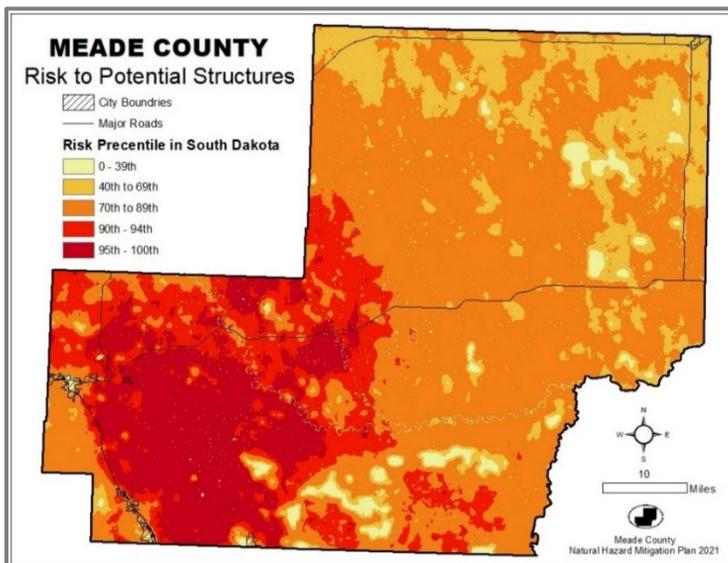
³⁵ U.S. Census Bureau. 2019 *City and Town Population Totals: 2010-2019; Incorporated Places and Minor civil Divisions*

³⁶ Emsi: Labor Market Analytics. *Meade County, SD*.

commercial 67), Summerset (residential 52, commercial 5). Piedmont has had no new residential or commercial permits. The City of Piedmont is encouraging development of commercial areas.

The Department of Equalization and Planning’s Deputy Director of Planning is the Floodplain Administrator. All incorporated communities, excluding the City of Faith, have adopted floodplain management ordinances. Of the incorporated counties that have floodplain ordinances each has its own floodplain administrator; Box Elder’s Planning and Zoning Director, Summerset’s Emergency Management Commissioner; Piedmont’s Finance Officer, and Sturgis’s City Engineer.

The county does not have zoning, but employs other land development regulations, like subdivision and floodplain development ordinances to regulate development. The county is currently working to update their subdivision Ordinance 20 and road Ordinance 10. Any construction that takes place in the unincorporated parts of the county requires a building permit. All jurisdictions in the county, excluding Faith, have their own building code. In the county, anyone who intends to build (or having something built) is required to go to the Equalization Office to apply for a building permit. Those that wish to apply for a permit are required to fill out a Building Permit Application. The completed application is then reviewed by the Meade County Equalization and Planning Department. The staff then checks, using Beacon and *IWORQ*, the purposed lot for different items such as being in a floodplain, known expansive soils, other known geological hazards. For any application that falls under any special area is required to submit additional engineering reports to mitigate any known issues. Proposed developments in flood hazard areas shall comply with the National Flood Insurance Program and associated regulatory agencies and *Meade County Ordinance 9*.



Major development in Meade County is happening along the I-90 corridor. According to Meade County’s Department of Equalization and Planning, the areas of Pleasant Valley, Elk Vale, south of Elk Creek, Peaceful Pines, and south of Buffalo Chip have seen a lot of development. The U.S. Department of Agriculture and Natural Resources provided modeling of wildfire risk to potential structures, using data from LANDFIRE 2014. This model, *Risk to Homes in Wildfire Communities*, compares the wildfire risk to existing structures to new structures that could be constructed. In the model, jurisdictions were also given a percentile rating within the state for risk to potential structures from wildfires; Blackhawk (unincorporated) 91%, Box Elder (Pennington County and Meade County) 97%, Faith 65%, Piedmont, 98%, Sturgis 70%, and Summerset 94%³⁷.

Figure 4.12. Risk to potential percentile structures. Wildfire risk is based on potential structures in an area with already existing structures. (Scott, Joe H. et al. Wildfire Risk to Communities: Spatial datasets of landscape-wide wildfire risk components for the United States.)

³⁷ Scott, Joe H. et al. Wildfire Risk to Communities: Spatial datasets of landscape-wide wildfire risk components for the United States.

UNIQUE OR VARIED RISK ASSESSMENT

Requirement §201.6(c)(2)(iii): For multi-jurisdictional plans, the risk assessment must assess each jurisdiction's risks where they vary from the risks facing the entire planning area.

After conducting the risk assessment for each jurisdiction, it was concluded that most areas of the county have a similar chance of a natural hazard occurrence in their area. The exception being those areas in the WUI, near to the Black Hills National Forest, have a higher chance of wildfire. The cities of Box Elder and Sturgis have threats of landslides. Also, cities with a large floodplain have a higher chance of flooding, such as Box Elder, Piedmont, and Sturgis. To better examine the flood risk in communities, Flood Factor, was used as a reference. Flood Factor uses a First Street Foundation Modeling method which shows specific locations risk of flooding from rain, rivers, tides, and storm surge. The model was created using decades of peer-reviews, climatology models, hydrology, and statistics³⁸. The unique risk for each jurisdiction is listed below.

Box Elder:

The City of Box Elder is located within two counties, Pennington County and Meade County. Box Elder previously only participated in the *Pennington County Natural Hazard Mitigation Plan*. With this update, Box Elder has been added to the *Meade County Natural Hazard Mitigation Plan*. Box Elder did not have any previous goals and projects to update. In this plan the City of Box Elder was assessed in entirety, not just the part of the city that lies within Meade County.

The *City of Box Elder's Comprehensive Plan* states that residential development should be focused in areas suitable for development, not on lands impacted by floodways, noise, excessive traffic, hazardous materials, slope stability issues, and hazardous soils. The city has extensive floodplain areas. The City of Box Elder's *Flood Damage Prevention Ordinance Title 151.040* states that the Floodplain Administrator is the Planning Director. *Box Elder's Title 15 Chapter 151 City Flood Damage Prevention* requires any construction in the floodplain is mitigated to protect against health, safety, damage, and to ensure that there is no alteration to existing waterways and floodplains. All building permits are checked to see if the location is in the floodplain. Development in the floodplain requires approval of a Floodplain Development Permit, and is reviewed by the Floodplain Administrator, who makes a recommendation to the Planning Commission based on the findings. The Planning Commission reviews and then makes its recommendation to City Council, who ultimately will approve, approve with conditions, or deny the permit. City and public utility projects are exempt from Floodplain Development Permits, provided that any underground or overhead utilities cause no change in ground surface elevations in the Special Flood Hazard Areas. For any floodplain development, the City requires a minimum of; elevation to mean sea level for any new or substantially improved structures, elevation to mean sea level of any nonresidential structure to also be flood-proofed; certification of a professional engineer or architect on nonresidential flood-proofing, and written description from professional engineer of any natural drainage alteration or relocations that could occur.

The City of Box Elder has Special Floodplain Hazard Areas along the Highway 1416 corridor, and areas south of the Ellsworth Airforce Base as seen in figure 4.13. The portion of Box Elder that resides in Meade County is labeled as Not Printed on the *FEMA Firms Maps*. According to the *Flood Insurance Study: Pennington County, South Dakota and Incorporated Areas Vol. 1* states that there are two tributary watercourses, Box Elder Creek and Box Elder Creek East and West Tributaries, that flow southeasterly through the community. These tributaries are crossed by several highways, railroads, and city streets. The most historic event occurred in 1972, a major flooding event that occurred in Pennington County. In Box Elder, 51 homes were flooded and 13 were destroyed, and 72 flooded mobile homes and 46 destroyed. The study from 2013 expressed that

³⁸ First Street Foundation. *First Street Foundation Flood Model 2020 Methodology Overview*

while these areas don't have a habitual history of serious flooding, the area could become problematic if floodplain development continues. Box Elder does have several mobile home parks located in the Special Floodplain Hazard Area, which were completed before 1974 when the *Flood Insurance Rate Maps* were effective. The mobile home parks are permitted to accept new homes only on completed lots which were grandfathered in. Any added homes must comply with a one-foot elevation certification. No expansions to the mobile home parks located in the floodway are permitted.

The Box Elder City Engineer reported 20 known properties that have experienced flooding issues in the past. There are also flooding issues on the South Ellsworth Road which impact the Prairie View Estates, which has in the past been isolated due to flood water topping the culvert on Box Elder Creek. An emergency access road was constructed to allow residents access. Due to the temporary nature of emergency access, maintaining the temporary access, following major storm events, was a major challenge. According to the *Box Elder Transportation Plan 2014*, the City lacks connectivity. The plan also states that the floodplain, railroad, interstate, and Ellsworth Airforce Base hazard zones are barriers of land development and transportation connectedness throughout the city. The City requires any new subdivisions to have secondary access.

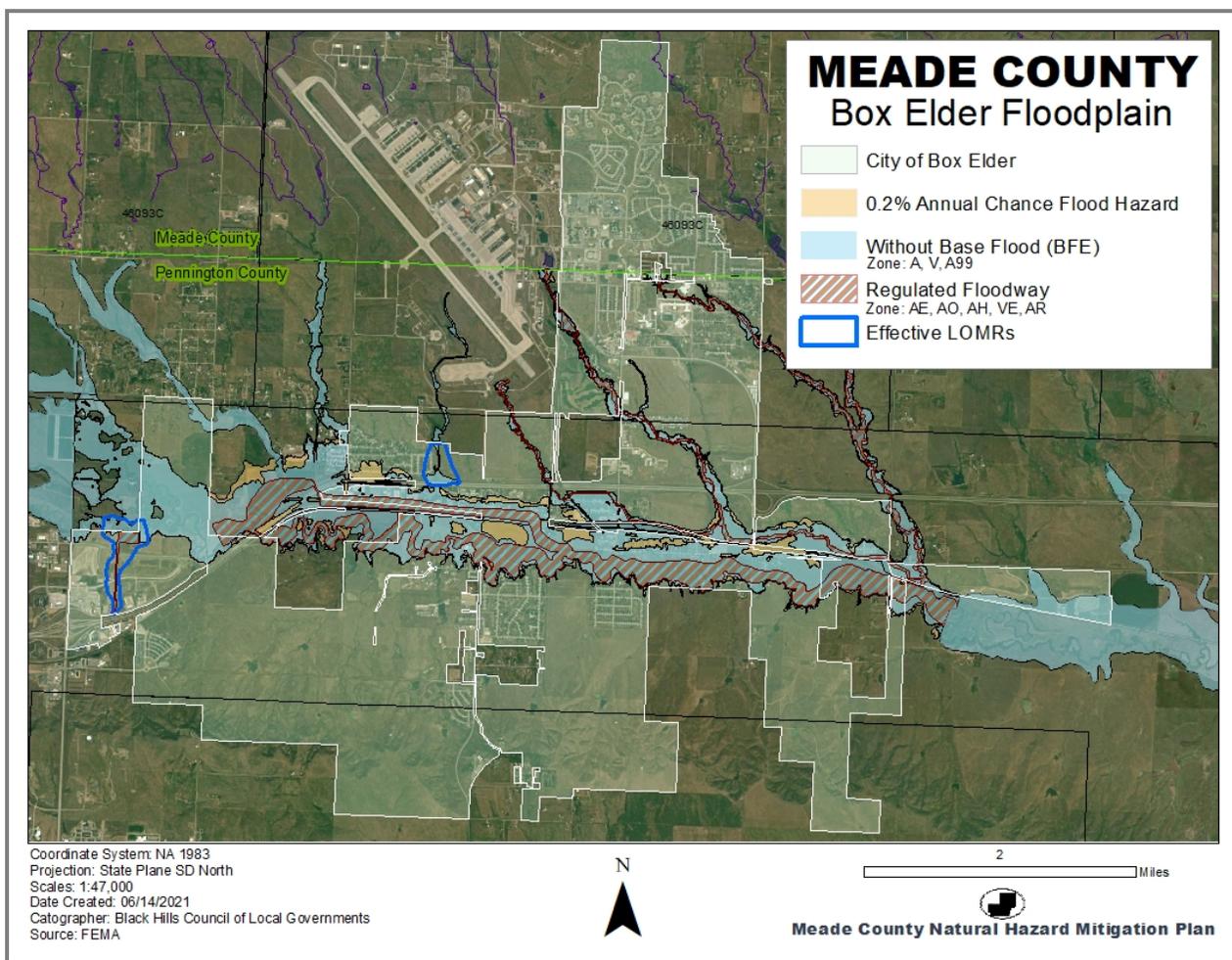


Figure 4.13. Floodplain for the City of Box Elder, as of 6/15/2021. (FEMA. *NFHL ArcGIS Viewer*)

The Flood Factor model estimates that there are 20% of properties in Box Elder at risk for flood, with a prediction that over the next 30 years there will be an increase of 1.6%. The model also estimates a total of 485 properties have a 0.2% chance of some water reaching the structure³⁹.

³⁹ Flood Factor. *Summary*. Box Elder

The Thunderbird Subdivision has had several issues with inadequate stormwater drainage. The *Thunderbird Subdivision Drainage Study* was done in 2017 to study the issues. Due to a lack of yard grading, poor ditch maintenance, high ground water, the natural drainage flow in the area of the Thunderbird Subdivision has been significantly altered by the development of the area. According to the engineering report, it doesn't appear that the post-development water flow paths had been considered during the designing of the subdivision. The subdivision was developed in Pennington County and was later annexed by the City of Box Elder. The study also mentioned an area referred to as Phase 9, that was for future expansion. Due to the potential of additional drainage issues if future development occurred, the property was purchased by the South Dakota Ellsworth Development Authority.

Box Elder has had issues with lightning strikes in the past. In the summers of 2018 and 2019, the city's production Well #5 was hit, causing a loss of the control system. The City explained that they have three production wells, that when one goes down it puts strain on the other wells, especially during the summer months. In the event of an emergency the back-up is to interconnect with Rapid City Water. During 2018, a lightning event caused the system to require the back-up for around a month. The 2019 lightning event hadn't done as much damage and didn't require a back-up. The City explained they are currently working to add another well to the city.

The *City of Box Elder's Comprehensive Plan* notes that high straight-line winds are a known hazard in the city, and as such mentions the need to ensure that architecture, landscaping, and site layout are designed to handle the wind issues. The *Box Elder Building Code 150.03.580* addresses wind loads, stating that wind codes are based upon the occupancy category of the building under design following guidance from Chapters 26-30 of the American Society of Engineers 7-10, but that buildings shall at a minimum be designed to occupancy category II having an ultimate wind speed velocity of 115 mph. For mobile homes, the building code refers to HUD guidelines for construction and safety.

Radar Hill in Box Elder has concerns of instability. In 2011, the State Department of Transportation re-aligned Radar Hill Road to go around the hill rather than over, due to the soil instability. After the re-alignment, the road had no visible signs of sluffing. In 2017, the State Dept. of Transportation and the City of Box Elder worked together to stabilize the road. According to Box Elder engineers, the road at present doesn't have any major concerns. However, the city did mention that in 2018 the road was repaired where there was a large dip in the road due to either settlement of soils or movement. The eastern side of Radar Hill has several areas of sluff scaring showing evidence of historic movement of the hill. The engineer also explained that sluffing isn't uncommon in that area, and historical scaring can be seen in aerial photos.

Another concern on Radar Hill is a water tower that sit on top eastern part of the hill. The surrounding area that the water tower sits on shows evidence of sluffing plains. The tank that was constructed in 1963, was placed on Radar Hill in 2007. During the installation of the water tower, the tower's legs were placed approximately 8 feet into the ground. The concern is that the steel legs could be corroding under the ground. This water tower and infrastructure is not owned by the city, but the city provides water to the tower for the subdivision of Valley Heights, which is outside city limits. The water tower currently sits on property owned by the City of Box Elder. The capacity of the water tower is 150,000 gallons. The failure of the tower has the potential to affect an estimated 300 homes. In addition, failure could also affect the Radar Hill Rd which sits below the water tower.

Some properties in the Creekside Estates, which sit right next to the Box Elder Creek, are experiencing erosion of their backyards due to the proximity to the creek. The City explained that this property is not located in the floodway.

Box Elder also is unique in that it sits next to the Ellsworth Air Force Base as well and is in close proximity to the Rapid City Regional Airport. Due to the Ellsworth Air Force Base, the City of Box Elder has incorporated into their planning accident potential zones. *Box Elder's Zoning Title 15* explains these zones, which fall at the end of the runways have a higher probability for aircraft accidents, which places land restrictions to prevent concentrations of people and limited resident density. The *Air Installation Compatible Use Zone 2008*, states in crash data from 1968 to 1995, that 27.4% of crashes happen in the CZ zone, 3,000 feet from the runway, 10.1% at the APZ 1, 5,000 feet from runway, and 5.6% in the APZ 2, 7,000 feet from runway.

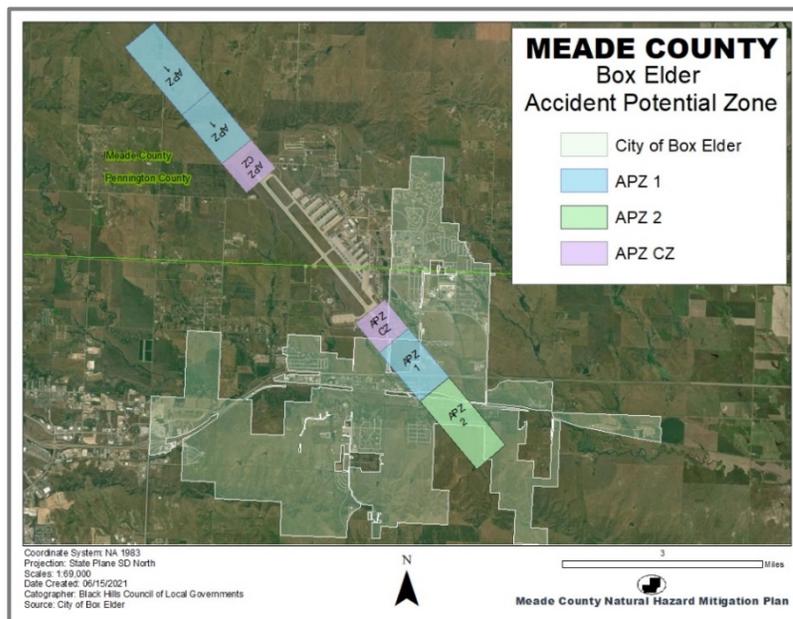


Figure 4.14. Accident Potential Zone for the City of Box Elder.

Faith:

Faith is unique in that it has its own municipal electric and telephone service, which means the City of Faith has an even greater responsibility for mitigation planning to ensure that its municipal services remain operational during and after severe weather events. The City has mentioned that there are two areas in the city where relocating of powerlines underground would be beneficial. Including lines running along Fourth Street from Fifth Ave West to Third Ave East for 2,384 feet, And a line from First St down southerly First Ave West to the corporate limits. The city had also mentioned in the previous plan the prospect of exploring their own water system, as they currently purchase bulk water from the Tri-County Water System. The City explained that this is no longer an option. The city in an attempt to dig a deep well encountered oil, which won't allow for any deep drinking water wells in the City of Faith.

Severe summer and winter storms are a concern for Faith. In Jan of 2010, Faith experienced a winter storm that left the city without power for four days and on the fourth day the city ran out of water. The city was able to provide aid and assistance to residents during this time. Since the last update, the medical clinic and ambulance building now have generators. The city has one lift station and in the previous plan it was noted that this lift station should be added to the list of facilities in need of a generator. However, during the Faith work session the representatives stated that the lift station is rarely used, and this is not a priority. The police station still has access to a generator. Other critical facilities such as the school and City Hall/Community Center lack backup power. The city had looked into the possibility of adding the City Hall/Community Center to the Ambulance Building's Generator, but it turned out to be too costly.

Tornados are a concern for the City of Faith. Since the last update, the City of Faith had been exploring getting a saferoom (changed to storm shelter) and is still looking at options for a storm shelter. The city does not currently have any designated storm shelter in town. K-12 students according to the superintendent, when in session, are able to shelter in the inside classrooms away from the window and outside rooms because the walls are cement. The City is also lacking in a completed warning siren system. Faith currently has two sirens in town, one of which only works half of the time. The city explained that there are several areas of town that can't hear the sirens when they go off. The school is one of the areas that can't hear the sirens.

High/Severe Winds are also a concern for the City. Faith has no building code, except for *Ordinance 179* that state the minimum building restrictions on residential lots, which deals with setbacks.

Faith is also susceptible to wild grass fires. The City's plan in the instance of wild grass fire is to blade and disk around the city to protect life, infrastructure, and property. The city currently owns one blade and if more aid is needed will seek assistance from local farmers. The city's *Ordinance §92.01* prohibits bonfires, burning, causing or permitting to be burned upon any private or public property dirt, filth, manure, garbage, sweepings, leaves, ashes, paper, waste, or rubbish of any kind. The ordinance also prohibits the dense growth of weeds and grasses to maturity, requiring proper trimming and mowing to reduce fire hazards.

The City of Faith is not located in a floodplain, Figure 4.15. The city does not have a Floodplain Ordinance and as such has no Floodplain Administrator. According to Flood Factor, there are 11 properties with a 0.2% of water reaching their building for this year, in 15 years and in 30 years. The property number and percentage remain the same. The City of Faith expressed that they have not experienced any drainage, flooding, or flash flooding issues.

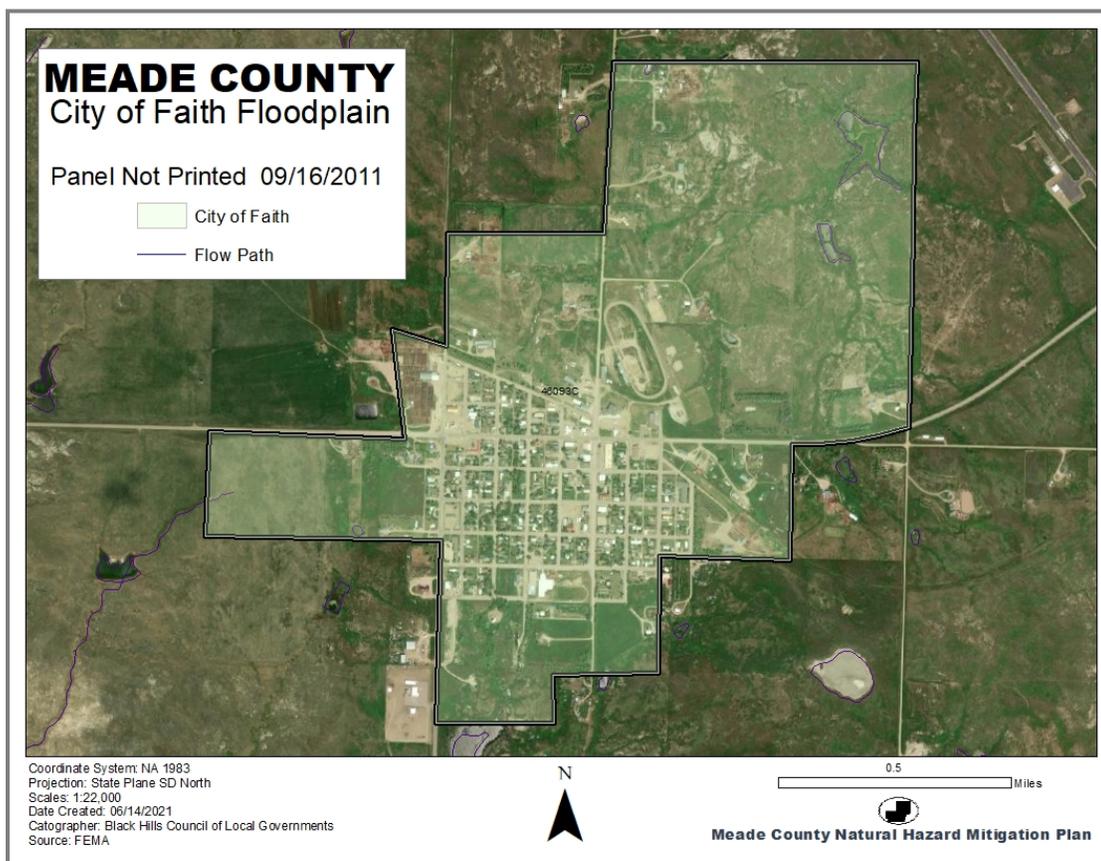


Figure 4.15. Floodplain for the City of Faith, as of 6/15/2021. (FEMA. NFHL ArcGIS Viewer)

Piedmont:

The City of Piedmont has areas of regulatory floodplain located at the town center, Figure 4.16 shows the floodplain for Piedmont. According to Flood Factor, 26% of properties in Piedmont are at risk for flooding. The model projects that this percentage will decrease 0.97% in the next 30 years. The model estimates a total of 103 properties with a 0.2% chance of water reaching a structure⁴⁰. Piedmont's *Flood Damage Prevention and Planning Title 18 Ordinance 18.13*, designates the city's Finance Officer as the Floodplain Administrator. No new construction is permitted in zones A1-30 and AE flood zones, under the condition that any construction will not affect the water surface elevation of the base flood and more than one foot in the community. The

⁴⁰ Flood Factor. *Summary*. Piedmont

application for any building permit in the floodplain require elevation to mean sea level for any new or substantially improved structures, elevation to mean sea level of any nonresidential structure to also be flood-proofed; certification for a professional engineer or architect on nonresidential flood-proofing, and written description from professional engineer of any natural drainage alteration or relocations that could occur, availability of alternative locations, relationship of the proposed use to the comprehensive plan for proposed area.

The 2016 Meade County Natural Hazard Mitigation Plan noted that the primary concern for Piedmont was flooding. There was one mobile home that was acquisitioned due to flooding. The City's Board of Trustees commented that the City had not had any major issues due to the flooding of 2019. The City felt that the floodplain may need to be re-evaluated due the high amount of development in the surrounding area. The City is still continuing to work towards creating a stormwater management plan to address some drainage issues. One of the primary areas of concern was Park Street.

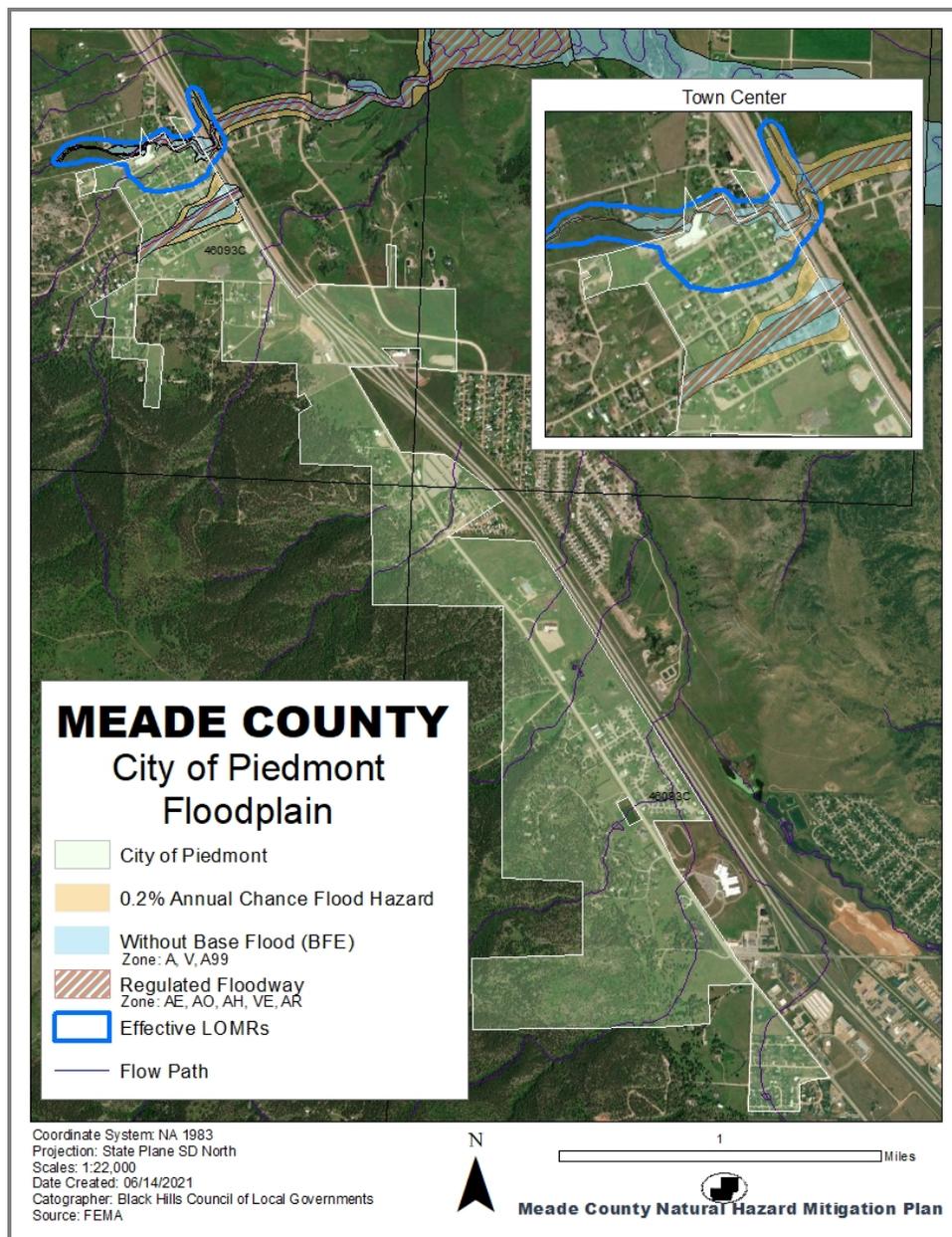


Figure 4.16. Floodplain for the City Piedmont, as of 6/15/2021. (FEMA. NFHL ArcGIS Viewer)

Piedmont residents still all remain on individual septic systems. The city is continuing research on developing a public sewer system for the community. The previous plan had mentioned the city wanted to obtain more warning sirens. When asked the City replied that they had full coverage.

Most of Piedmont sits in the Black Hills Forest Fire Protection District. Burning permits for the City were previously handled by South Dakota Wildland Fire but as of 2021 are now the responsibility to the City to permit. As of writing this plan, the City Board is currently working with the Fire Board to work on the criteria for permitting process for burn permits. Wildfire is a concern, especially in areas on the edge of the Black Hills. The City identified an area of concern on Mohawk Drive that has only one access. The road has an estimated 10 homes that in the event of a fire would only have one escape route.

Sturgis:

One of the major concerns for Sturgis is flooding. Approximately 20% of the city is located within the special flood hazard area (SFPA). Flood Factor predicts that the City of Sturgis has an estimated 43% of properties at risk from flooding, and in the next 30 years there will be increase of 0.4% more homes at risk⁴¹. Sturgis is located within the flood drainages of Bear Butte Creek, Dolan Creek, and Vanocker Creek. The City is still working with Bureau of Land Management to clean vegetation in the creek, to address stormwater issues. The City is also working with USGS to add 3 new gauges in Sturgis to track water on Vanocker, Deadman, and Bear Butte Creeks.

Figure 4.17 shows the floodplain for the City of Sturgis. The city has historically been prone to flooding events. To help reduce flood losses, the City has a *Flood Damage Prevention Ordinance 34*. The methods used help to reduce flood losses that restrict or prohibit uses that are dangerous to health, safety, or property in times of flood, require that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction, control the alteration of natural floodplains, stream channels, and natural protective barrier, which are involved in the accommodation of flood waters. The City of Sturgis's *Flood Damage Prevention Ordinance Chapter 43.02.01* states, the City Manager or his/her designee the Floodplain Administrator, which for the City of Sturgis the City Engineer serves as the Floodplain Administrator. The city also publicizes helpful information about Floodplain Development on their website for the public, including threats of flooding, FIRM maps, NFIP program, and Stormwater design criteria. The website also posts that all proposed building projects located within the SFPA, must obtain a floodplain development permit, including such items as placement of fill, grading, remodeling of existing structures, new house construction, placement of any storage sheds, and fences. The City also stresses that even if a building permit is not required, a floodplain development permit is required for any work in the SFHA.

The City of Sturgis is continuing work to address flood and drainage throughout the city, especially the area of Moose-Drive and the Dolan Creek Watershed. Sturgis is subject to heavy runoff from snowmelt and spring rains causing flash flooding, which causes damage to streets, bridges, and utilities. The previous plan made note of ongoing plans to address drainage issues for the Vanocker Creek Watershed. In 2015 two reports were released for 1st street and Anna Street, which both locations had issues with storm sewer drainage. According to the City of Sturgis' Public Works Department, in 2020, the Vanocker Canyon Storm-Sewer project was completed. This project provided improved drainage on 1st Avenue. The city also plans to add a retention pond in the future. Anna Street had a concrete drainage canal added which carries water towards the north and into Deadman Canal.

Sturgis also recently completed their *Stormwater Design Policy* which states that stormwater runoff will be analyzed and must comply with the City's MS4 guidelines, SD DANR SWPPP guidelines, and the state drainage law. In addition, the City of Sturgis in partnership with the Army Corps of Engineers also recently put in an application with the Silver Jackets Grant Program to remap the

⁴¹ Flood Factor. *Summary*. Sturgis

city with 3-D mapping. The City also recently completed, in partnership with South Dakota School of Mines, a manual for *Green Stormwater Best Practices*, which gives several examples of using greenways to help address stormwater issues. During work sessions it was also mentioned that it would be beneficial for the City of Sturgis and Meade County to work together to adopt an updated 3-mile jurisdiction agreement. This would help aid Sturgis with their Stormwater projects during future growth of the area. There was previously an agreement, but it applied only to plats and is currently expired.

The damage from the 2019 flooding events were evident in Sturgis. One area was the 7th Street crossing which was severely damaged in the 2019 floods and the boxes were removed. The City's consultant has designed a vented low water crossing which will consist of 3 concrete boxes. The low water crossing will still flood in a 100 year storm but will be passable most of the time. As of August 2021, the project is waiting FEMA approval of a mitigation grant.

Another area that received damage due to the flooding of 2019 was Woodland Dr. This street was originally designed under the floodplain model and was repaired. The channel was regraded, and the bike path that had also washed out was replaced. As of October 2020, reconstruction at the intersection of 7th and Woodland Drive was completed. The City was able to be reimbursed for a portion of the project by FEMA. The mitigation grant also allowed for the placement of articulated block on the channel slopes, which will protect the sanitary sewer located 10 feet away from the top of the creek bank. As part of the project, FEMA required a new survey to be completed after the placement, which was completed.

The City of Sturgis is also responsible for maintenance of the Deadman Gulch levee. The *Inspection Report from the U.S. Army Corps of Engineers* can be found in appendix B. The City of Sturgis is also responsible for the maintenance of the Deadman Gulch. The Army Corps of Engineers completes annual inspections of the levee. The City staff are working with the Corps to update the Operation and Maintenance Manual and address issues noted in the annual inspection report. The engineer is also working on submitting addendums to update the *Operation and Maintenance Manual* for the levee.

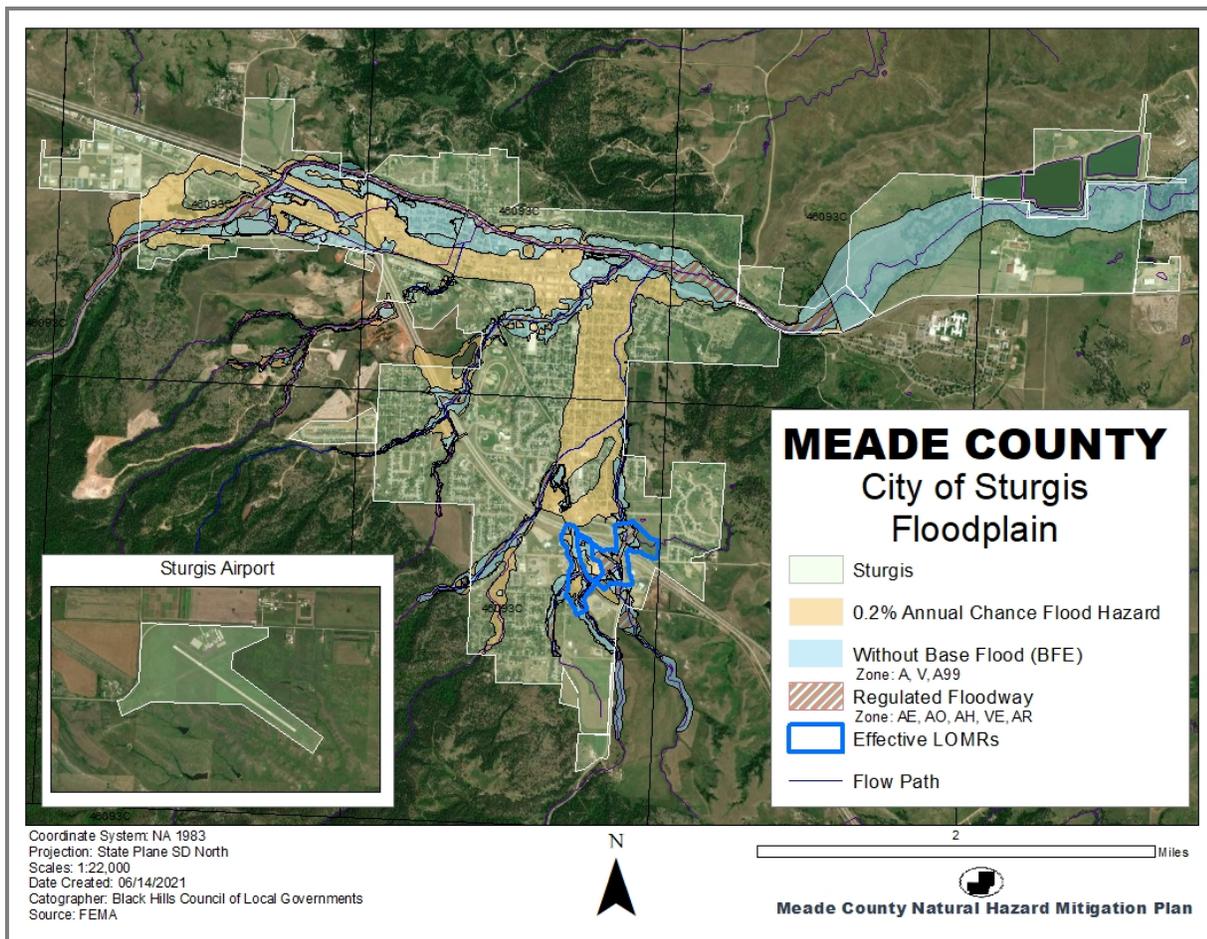


Figure 4.17. Floodplain for the City of Sturgis, as of 6/15/2021. (FEMA. NFHL ArcGIS Viewer)

In May of 2009, a landslide occurred on Sly Hill Rd in Sturgis. According to the engineer report, the area had experienced heavy snow fall and spring rain which created unstable soil conditions. The soil types identified in the colluvium were boulders of sandstone, silt, and clay. Two borings were taken on Sly Hill Rd in 2014, finding from surface to 7' sandy clay with intermix of sandstone gravel, 7' to 26' silty clay with shale, and presence of gypsum, 26' to 41' sandstone. The area was repaired using a ground-anchor retaining wall. This area also revealed Native American artifacts, and rock art. The project was completed by Dec of 2009. During the repair, the road remained closed, causing residents a 10-mile detour to get into Sturgis. The area also had inclinometers installed to monitor any movement.

The Sly Hill Road is primarily located within the City of Sturgis; however, the top of the hill is owned by the County, where it becomes Bear Butte Road. The Sly Hill Rd is an unpaved road. According to Meade County, conversations were had as to the cost benefit of the road, considering the geological issues. The engineers report states that alternate routes have also been discussed but also prove to be challenging due to steep grading and federal lands permissions. The roadway sits above the Woodle Field, an athletic field owned by the Meade School District. No residential properties sit below Sly Hill Road.

In 2013 and 2014 the Sly Hill area had minor movement. The area of the slide was near the top of Sly Road, near the City limits. The area had previously been supported by a sandstone retaining wall, which the age is unknown. The retaining wall has deteriorated and fallen off. Areas of tension in the soils behind the slide was also found. According to the Sturgis Public Works Department the area was repaired using concrete fill. Inclinometers were used to observe, but at this time are no longer monitored. The City of Sturgis explained that the road is currently stable, but one concern is

that there is no drainage for the road. According to Sturgis and Meade County, no private residents have encountered any landslide conditions.

While most of the Black Hills area sees a huge influx of summer visitors, the City of Sturgis is unique in that for one week in August the city brings in anywhere from 400,000-600,000 people for the Sturgis Motorcycle Rally. The greatest threats during this time of year are thunderstorms, high winds, hail, and tornados. Many Sturgis Rally visitors only means of shelter are tents and motorcycles. In the past mentionable events have been strong winds, which caused damage to temporary structures, and thunderstorms which could be dangerous for visitors in campgrounds. One of the campgrounds, Buffalo Chip, explained that they don't have shelters for large numbers of people in the event of extreme weather. The City of Sturgis also does not have shelters for the large influx of people. The City has a Sturgis Rally Traffic Plan. During work sessions, it was mentioned that many of the larger campgrounds are not within City limits.

Parts of the city are located in the Black Hills Forest Fire Protection District. The city's *Ordinance Title 9*, states that any person wanting to have open fires or burns within city limits, or one mile of city limits must submit a written request to the Sturgis City Manager, who will allow or deny the permit. Controlled burn permit requests require the Fire Chief to advise the City Manager on issuing the permit. The city also does not permit any outside burning, open fires, and recreational fires during periods of poor air quality, drought, dryness, and high fire danger rating. The city is working with different agencies primarily on thinning projects in the wildland urban interface. As stated in the wildfire section of this plan, one of the greatest challenges facing the city are areas that could benefit from thinning, are often located on private land. Sturgis stated to their knowledge all roads within city limits are able to handle firetrucks and there are no roads that would restrict fire equipment. Sturgis also requires that subdivisions provide secondary access but stated that the Vernon Heights could be evaluated to see if another access point would be needed.

Summerset:

The City of Summerset, according to the FEMA firms maps has only one small section of the most southern point of the city with a floodplain. Flood Factor estimates a total of 276 properties with a 0.2% chance of some water reaching their building⁴². This amount is predicted to remain the same in the next 30 years. Summerset's *Ordinance 150.25* designates the Floodplain Administrator is the Emergency Management Commissioner.

The City reports that there is currently an underground flooding issue in the northern section of the city at the Sun Valley Estates subdivision. The previous *Meade County Natural Hazard Plan 2016* had made mention of a drainage project at the Sun Valley Estates. The city explained that the drainage project was completed, but that the subdivision now faces new flooding issues. In 2020, the USGS completed its *Hydrogeology and Groundwater Flow in Alluvial Deposits* report, focusing on the northern section of Summerset, Sun Valley Estates. This area was originally developed on unconsolidated deposits, and due in-part to development of the surrounding area, in times of increased precipitation underground flooding occurs. In 2019, the area saw greater than normal precipitation causing this area of the city to have damaged stormwater systems, sewer infrastructure, and damages to homes with basements. Areas with the greatest damage were those along Steamboat Rd and the west side of Sun Valley Dr. The City has mentioned that somewhere between 20-30 homes had seen significant impact from flooding. It was reported that during the flooding, homeowners need to run pumps in their basements 24/7 due to incoming groundwater, which puts strain on the drainage system. Summerset has the USGS monitor three wells that are 15 feet deep to check the levels of water.

The previous plan update had stated that Summerset was looking into areas that may need warning sirens. The City stated that at this time they are fully covered but will need to consider Sirens would need to be reevaluated as the city continues to grow.

⁴² Flood Factor. *Summary*. Summerset

Summerset also faces a high chance of Wildfire. The City of Summerset's *Ordinance 96.11* states that the City does not allow any outside burning when the South Dakota grasslands fire danger is very high or extremely for the city. The City sits against the Black Hills National Forest and is located in a wildfire urban interface. One of the greatest threats currently is the lack of secondary access. The Sun Valley Estates subdivision currently only has only one access. As of writing this plan, the city is currently looking into creating a secondary access in this area.

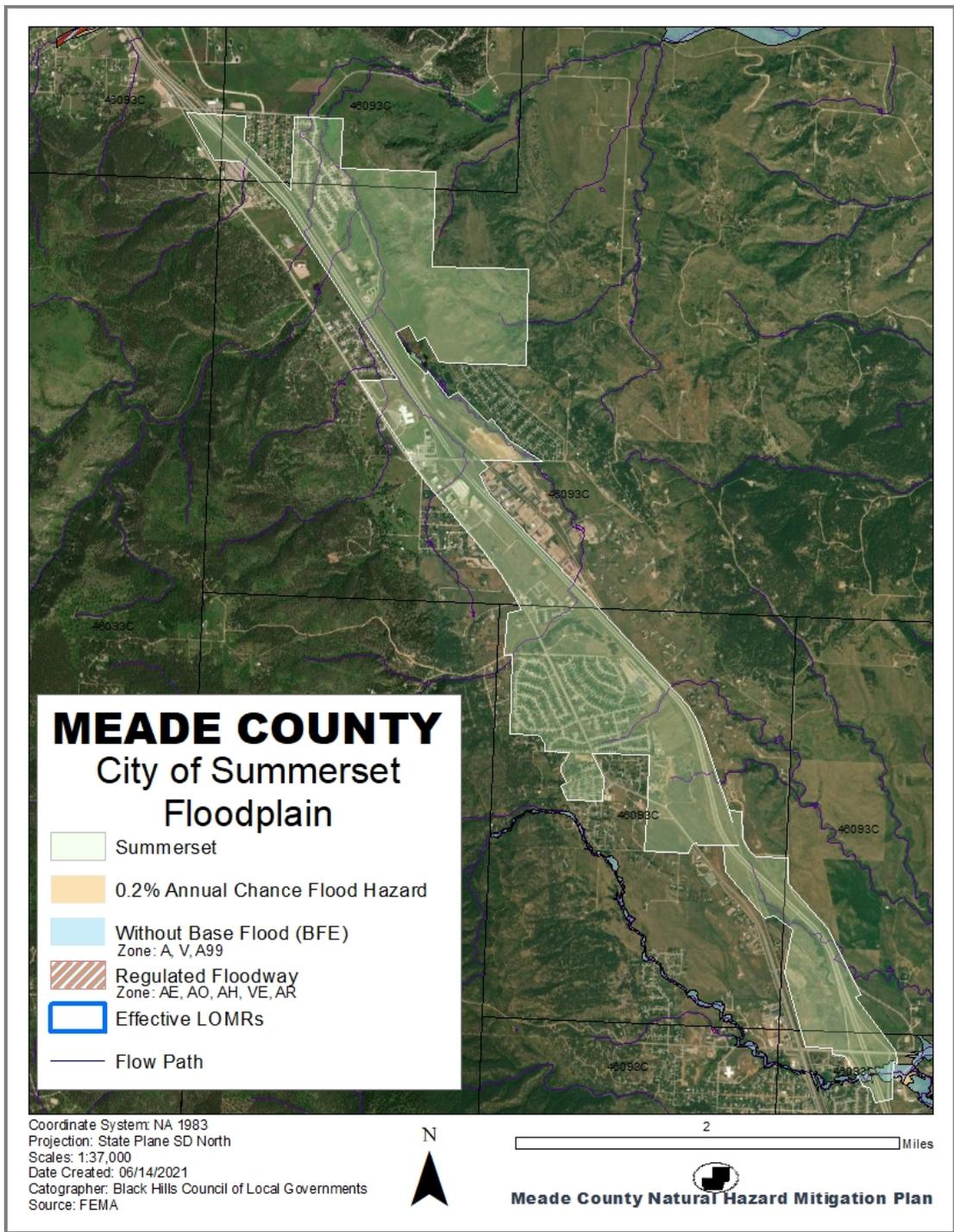


Figure 4.18. Floodplain for the City of Summerset, as of 6/15/2021. (FEMA. NFHL ArcGIS Viewer)

V. MITIGATION STRATEGY

Changes/Revisions: The mitigation strategy has been completely reformatted to include specific goals, objectives, and projects for not only the County but also each Jurisdiction. Goals and projects from the previous plan have been addressed in other sections of this plan. Goals and projects that were completed have been removed from the list. The previous plan format looked at five broad goals. This reformatting looks at specific hazard goals and mitigation projects.

MITIGATION REQUIREMENTS

Requirement §201.6(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Requirement §201.6(c)(3)(ii): [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard with particular emphasis on new and existing buildings and infrastructure.

MITIGATION OVERVIEW

The State Hazard Mitigation Plan addresses several mitigation categories including warning and forecasting, community planning, and infrastructure reinforcement. After meetings with the local jurisdictions and opportunities for public input, a series of mitigation goals were established to best aid the County in reducing the impact of hazards. Projects previously identified in the plan were discussed to determine which of the projects had enough merit to be included in the updated plan and to determine if the projects meet the hazard mitigation needs of the County and jurisdictions. These projects were evaluated based on a preliminary evaluation of cost/benefit and priority based on either historical damages or anticipated damage. A *high* priority classification means that the project should be implemented as soon as possible and would minimize losses at a very efficient rate. A *moderate* classification means that the project should be carefully considered and completed after the high priority projects have been completed. A *low* priority means that the project should not be considered in the near future. However, it is a potential solution and should not be eliminated until further evaluation can be completed. Such projects may be completed considering failures of all other projects striving toward the same goal.

A timeframe for completion, oversight, funding sources, and any other relevant issues were addressed. These implementation strategies are geared toward the specific goal and area. Often, these projects will not encounter any resistance from environmental agencies, legal authorities, and political entities. Where these are a concern, address is made.

MEADE COUNTY

Meade County – Dam Failure

Goal 1: Reduce impact of possible Dam Failure in Meade County

Project 1: Continue 5-year inspections of High-Risk Dams in Meade County

Priority	Funding Source	Timeframe	Oversight
High	State DANR Resources/Staff	Ongoing	County

Project 2: Evaluate the possibility of relocating structures located within the downstream hazard area of High-Risk Dams.

Priority	Funding Source	Timeframe	Oversight
Low	County; State; Federal	1-5 years	County

Meade County – Drought

Goal 1: Reduce impact of drought in Meade County

Project 1: Continue monitoring drought conditions throughout the County.

Priority	Funding Source	Timeframe	Oversight
High	NA	Ongoing	County, State

Project 2: Consider exploration of secondary water source

Priority	Funding Source	Timeframe	Oversight
High	County; State, Federal	1-5 years	County, West Dakota Water District, State, Federal

Project 3: Consider adopting water conservation policy during extreme drought conditions

Priority	Funding Source	Timeframe	Oversight
High	NA	1-5 years	County

Meade County - Flooding Hazards

Goal 1: Reduce impact of flooding in Meade County

Project 1: Continue enforcing Floodplain Ordinance 9

Priority	Funding Source	Timeframe	Oversight
High	NA	Ongoing	County

Project 2: Ensure that the county has at least two staff formally trained in floodplain administration.

Priority	Funding Source	Timeframe	Oversight
High	County; Federal	1-2 years	County

Project 3: Coordination and Cooperation with municipalities when approving development within the 3-mile jurisdiction boundaries to alleviate flooding issues caused by ground and surface water drainage.

Priority	Funding Source	Timeframe	Oversight
High	NA	1 year	County

Project 4: Adopt development regulations that are cohesive with municipalities and enforce existing Ordinances to ensure uniformity in development standards.

Priority	Funding Source	Timeframe	Oversight
High	County; City	1-5 years, ongoing	County

Meade County - Geological Hazards

Goal 1: Reduce impact of geological hazards

Project 1: Establish (and enforce) definitive criteria for Geotech report requirements for new development.

Priority	Funding Source	Timeframe	Oversight
High	No cost other than County time, resources	1-2 years, ongoing	County

*Notes:

Project 2: Maintain GIS files showing areas known to have expansive soils and evaporite and carbonate mineral deposits and restrict new development in those areas.

Priority	Funding Source	Timeframe	Oversight
High	County; State, Federal	1-5 years	County

*Notes:

Project 3: Create and maintain maps and data on areas prone to landslides and restrict new development in those areas.

Priority	Funding Source	Timeframe	Oversight
Med	County; State; Federal	1-5 years, ongoing	County

Project 4: Reevaluate areas with known geological risk and consider planning for acquisition or relocation of structures located within risk boundaries.

Priority	Funding Source	Timeframe	Oversight
High	County; State, Federal	1-5 years	County

*Notes:

Meade County - Summer Storm Hazards

Goal 1: Reduce impact of severe summer storms in the County

Project 1: Continue maintenance of warning systems throughout Meade County.

Priority	Funding Source	Timeframe	Oversight
High	County; State, Federal	ongoing	County

Project 2: Continue enforcement of building codes.

Priority	Funding Source	Timeframe	Oversight
High	County resources; staff time	Ongoing	County

Project 3: Continue to enforce Ordinance 20 and Ordinance 34.

Priority	Funding Source	Timeframe	Oversight
High	County resources; staff time	Ongoing	County

Project 4: Research and consider adopting mobile home ordinance to ensure HUD wind standards on newly placed mobile homes.

Priority	Funding Source	Timeframe	Oversight
High	County resources, staff time	1-2 years	County

Meade County - Wildfires

Goal 1: Reduce impact of Wildfire in Meade County

Project 1: Continue to participate in the FireWise Communities Program and encourage other communities within the county to participate.

Priority	Funding Source	Timeframe	Oversight
High	County; State; Federal	Ongoing	County

*Notes: The County actively works with FireWise programs to help reduce wildfire fuels on private property.

Project 2: Continue collaborative efforts with USFS, SD Wildland Fire, NRCS, USDA, FireWise and private landowners to continue wildfire mitigation projects and treatments throughout the County.

Priority	Funding Source	Timeframe	Oversight
High	County; State, Federal	Ongoing	County

*Notes: Work with USFS, SD Wildland Fire, NRCS, BLM, and FireWise to continue wildfire mitigation.

Project 3: Continue to enforce burn bans during periods of drought to reduce the risk of wildland fires.

Priority	Funding Source	Timeframe	Oversight
High	County	Ongoing	County

*Notes: County will continue to monitor periods of drought and establish burn bans when necessary.

Project 4: Create and maintain GIS structure layers.

Priority	Funding Source	Timeframe	Oversight
High	County; State; Federal	1-3 years	County

Project 5: Create and maintain WUI map for Meade County

Priority	Funding Source	Timeframe	Oversight
High	County, State, Federal	1-5 years	County

Project 6: Require secondary access and egress for all subdivisions and identify subdivisions that have access/egress limitations and establish a plan to correct deficiencies.

Priority	Funding Source	Timeframe	Oversight
High	County, State, FEMA	Ongoing	County

*Notes: Continue to ensure new developments have secondary access. Evaluate other areas in the County in need of secondary access.

Project 7: Work with BLM to update County's Community Wildfire Protection Plan

Priority	Funding Source	Timeframe	Oversight
High	County, Federal	1-5 years	County

* BLM has potential grant for CWPP

Project 8: Identify access routes in the WUI to determine if reinforcement of existing roads or adding fire lines is needed/necessary.

Priority	Funding Source	Timeframe	Oversight
High	County, State, Federal	1-5 years, ongoing	County

Project 9: Identify additional water sources for filling pumper trucks/tankers

Priority	Funding Source	Timeframe	Oversight
Med	County, State, Federal	1-5 years	County

Meade County - Winter Storm Hazards

Goal 1: Reduce impact of Winter Storms

Project 1: Equip critical facilities and/or winter storm shelters with generators.

Priority	Funding Source	Timeframe	Oversight
Med	County, State, Federal	1-5 years	County

Project 2: Continue enforcement of Ordinance 34.

Priority	Funding Source	Timeframe	Oversight
High	NA	Ongoing	County

City of Box Elder

Goal 1: Reduce impact of flooding in the City of Box Elder

Project 1: Acquire flood prone properties and repetitive loss properties located in the floodway.

Priority	Funding Source	Timeframe	Oversight
High	City; State; FEMA	2-10 years, ongoing	City

*Notes: Currently the city has 20 homes that are located in the floodway that have experienced flooding in the past.

Project 2: Add secondary access to the Prairie View Subdivision

Priority	Funding Source	Timeframe	Oversight
High	City; State; FEMA	3-5 years	City

* Notes: Prairie View Subdivision currently has only one access that has flooded in the past, leaving residents isolated. Temporary access was used but needed constant maintenance.

Project 3: Conduct hydrologic studies to identify, prioritize, and replace undersized culverts

Priority	Funding Source	Timeframe	Oversight
High	City; State; FEMA	1-5 years	City

* Notes: City may have areas that culverts need assessed

Goal 2: Reduce impact of Summer Storms in the City of Box Elder

Project 1: Equip Well #5 system with a backup generator and automatic transfer switch

Priority	Funding Source	Timeframe	Oversight
Med	City; State; FEMA	1-5 years	City

*Notes: Well #5 has past history of repetitive lightning strikes causing loss of power

Project 2: Construct a storm shelter or retrofit an existing building to be used as a storm shelter

Priority	Funding Source	Timeframe	Oversight
High	City; State; FEMA	3-5 years	City

* Notes: The City currently has no designated storm shelter

Goal 3: Reduce impact of Geological Hazards in the City of Box Elder

Project 1: Relocation/demolition of water tower on Radar Hill; construct new storage facility on stable site.

Priority	Funding Source	Timeframe	Oversight
High	City; State; FEMA	1-5 years	City

*Notes: Privately owned water tower is currently located on hill with evidence of sluffing. The tower's legs are currently buried, and the foundation of the tower is currently unknown. There is a threat of failure.

Project 2: Acquire properties experiencing creek bed erosion

Priority	Funding Source	Timeframe	Oversight
Low	City; State; FEMA	As requested by property owners	City

* Notes: Some homes are experiencing erosion of yards due to close proximity to the creek

City of Faith

Goal 1: Reduce the impact of severe winter and summer storms on the community.

Project 1: Construct a storm shelter or retrofit an existing building to be used as a storm shelter

Priority	Funding Source	Timeframe	Oversight
High	City; State; FEMA	1-5 years	City

*Notes: The previous plan had an objective for a saferoom for the city. With a clearer distinction between saferooms and storm shelters the City of Faith has adjusted the wording from saferoom to storm shelter. The city is still currently active in looking into a storm shelter.

Project 2: Secure funding for sirens at location that lack access to early warning systems

Priority	Funding Source	Timeframe	Oversight
High	City; State; FEMA	1-5 years	City

*Notes: The city currently has two sirens in town. According to the city one of the sirens doesn't work properly. There are parts of town that can't hear the sirens, including the school.

Project 3: Equip the City Hall/Community Center and School with backup generators to ensure services can continue during power outages.

Priority	Funding Source	Timeframe	Oversight
Med	City; State; FEMA	1-5 years	City

*Notes: From previous plan the medical clinic and ambulance building have acquired generators. The police station, while it doesn't have one, still has access to one if needed.

Goal 2: Reduce the impact of high/severe winds

Project 1: Research and consider adopting mobile home ordinance to ensure mobile homes meet HUD wind load standards.

Priority	Funding Source	Timeframe	Oversight
Med	No cost, City resources and staff time	1-2 years	City

*Notes: Faith currently lacks ordinance for mobile homes, which currently without allow mobile homes that may not meet high wind standards to be placed in the city.

City of Piedmont

Goal 1: Reduce the impact of severe winter and summer storms on the community.

Project 1: Construct a storm shelter or retrofit an existing building to be used as a storm shelter

Priority	Funding Source	Timeframe	Oversight
High	City; State; FEMA	1-5 years	City

Project 2: Equip critical facilities with backup generators to ensure services can continue during power outages.

Priority	Funding Source	Timeframe	Oversight
Med	City; State; FEMA	1-5 years	City

Goal 2: Reduce impact of flooding in the City of Piedmont

Project 1: Acquire, relocate, or elevate flood prone properties and repetitive loss properties located in the floodway.

Priority	Funding Source	Timeframe	Oversight
High	City; State; FEMA	2-10 years	City

Goal 3: Reduce the impact of Wildfire on the community.

Project 1: Evaluate additional access on Mohawk Drive

Priority	Funding Source	Timeframe	Oversight
Med	City; Private; State; FEMA	1-5 Years	City

Project 2: Continue work on adopting ordinance for Burn Permits for locations inside the Black Hills Fire Protection District

Priority	Funding Source	Timeframe	Oversight
High	City	Ongoing	City

*Notes: City is actively working to adopt an ordinance for burn permits. The permits are no longer provided by SD Wildland Fire for anyone located within Piedmont.

City of Sturgis

Goal 1: Reduce impact of flooding in the City of Sturgis

Project 1: Acquire, relocate, or elevate flood prone properties and repetitive loss properties located in the floodway.

Priority	Funding Source	Timeframe	Oversight
High	City; State; FEMA	2-10 years	City

*Notes: City is actively working to promote clear the floodway of structures and to promote a greenway.

Project 2: Increase capacity for storm sewers throughout the city.

Priority	Funding Source	Timeframe	Oversight
High	City; State; FEMA	2-5 years	City

Project 3: Address overall stormwater plan and funding sources

Priority	Funding Source	Timeframe	Oversight
High	City; County	1-5 years	City

Project 4: Work with Meade County on adopting an updated 3-Mile Jurisdiction Agreement

Priority	Funding Source	Timeframe	Oversight
High	City; County	1 year	City

*Notes: Current 3-Mile Agreement is expired and only addresses plats. Often developments are approved by the County outside the City limits of Sturgis but the County has different requirements for groundwater permitting, eventually these developments end up getting annexed into the City due to lack of resources to manage their drinking water services resulting in the City having entire subdivisions within their boundaries that have been developed by a different standard. Some of these developments have caused flooding issues within the City limits due to lesser design standards.

Goal 2: Reduce the impact of severe winter and summer storms on the community.

Project 1: Ensure siren coverage as new development is added

Priority	Funding Source	Timeframe	Oversight
High	City; State; FEMA	Ongoing	City

Project 2: Equip the City Hall and Community Center with backup generators to ensure services can continue during power outages.

Priority	Funding Source	Timeframe	Oversight
Med	City; State; FEMA	3-5 years	City

*Notes: City Hall and Community Center does not currently have a generator. It was noted that these two structures are currently located within the 500-year floodplain and may not be eligible for FEMA Mitigation Assistance.

Project 3: Research and consider adopting a mobile home ordinance to ensure HUD wind load standards.

Priority	Funding Source	Timeframe	Oversight
Med	City	1-5 years	City

*Notes: Research possible ordinance options to ensure that mobile homes placed in Sturgis fit the HUD standard for high wind loads.

Goal 3: Reduce the impact of Geological Hazards on the community.

Project 1: Work with County on strategy to mitigate risk of Sly Hill Rd

Priority	Funding Source	Timeframe	Oversight
Low	City; State; FEMA	As needed	City/County

*Notes: The concern is due to the geology of the Sly Hill could potentially have a future event. The road also lacks drainage. There is contention over the authority over this road. There is currently no plan or strategy of mitigating the risk.

Goal 4: Reduce the impact of Wildfire on the community.

Project 1: Evaluate additional access at Vernon Heights

Priority	Funding Source	Timeframe	Oversight
Med	City; State; FEMA	1-5 years	City

*Notes: City mentioned that Vernon Heights may need evaluated for additional access for evacuation in the event of wildfire.

City of Summerset

Goal 1: Reduce impact of flooding in the City of Summerset

Project 1: Ensure Floodplain Administrator is trained.

Priority	Funding Source	Timeframe	Oversight
High	City; FEMA	6 months	City

Project 2: Continue monitoring water levels for the Sun Valley underground water flooding.

Priority	Funding Source	Timeframe	Oversight
High	City; FEMA	ongoing	City

*Notes: City currently monitors 3 wells to check underground water levels.

Project 3: Look into working with USGS on drilling deeper wells and flood monitoring warning system for Sun Valley underground flooding.

Priority	Funding Source	Timeframe	Oversight
High	City; FEMA	6 months	City

*Notes: City wants to look into installing flood warning monitors for the Sun Valley flooding.

Goal 2: Reduce the impact of severe winter and summer storms on the community.

Project 1: Ensure siren coverage as new development is added

Priority	Funding Source	Timeframe	Oversight
High	City; State; FEMA	Ongoing	City

*Notes: City is currently covered, but as new developments are added sirens may need to be added.

Project 2: Equip the Wastewater Treatment Plant, City Hall, and Maintenance Building with backup generators to ensure services can continue during power outages.

Priority	Funding Source	Timeframe	Oversight
Medium	City; FEMA	2-5 years	City

*Notes: Critical facilities secondary power.

Project 3: Construct a storm shelter or retrofit an existing building to be used as a storm shelter

Priority	Funding Source	Timeframe	Oversight
Medium	City; State; FEMA	2-5 years	City

*Notes: The City of Summerset does not currently have a designated storm shelter.

Goal 3: Reduce the impact of Wildfire on the community.

Project 1: Evaluate additional access at Sun Valley Subdivision

Priority	Funding Source	Timeframe	Oversight
Med	City; Private; State; FEMA	1-5 Years	City

*Notes: City is working with developer to potentially have an extension on Glenwood Drive for a secondary access to Sun Valley Subdivision.

PRIORITIZATION OF MITIGATION ACTIVITIES

Requirement 201.6(c)(3)(iv) & Requirement 201.6 (c)(3)(iii)

The County and the jurisdictions had specific goals in mind that they were trying to achieve to mitigate risks. Those communities prioritized projects based on the number of people who would benefit from the project and also by the estimated or approximate total project cost. Some projects may be too large of an undertaking and therefore those projects were moved down the priority list. The plan participants were instructed that a complete Benefit Cost Analysis would be required at the time of application and the plan author advised that specific details of each project could be analyzed in closer detail during the application period.

NATIONAL FLOOD INSURANCE PROGRAM PARTICIPATION

Requirement: §201.6(c)(3)(ii): [The mitigation strategy] must also address the jurisdiction’s participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate.

Meade County participates in the National Flood Insurance Program. There is one community, Faith, that does not participate in NFIP. According to the DFIRM published October 19, 2010, the non-participating communities are zoned entirely A and X. All of the other jurisdictions participate in NFIP. Those who participate include Box Elder, Piedmont, Sturgis, Summerset, and Meade County. The county will continue to participate and ensure compliance of the participating local jurisdictions located within the flood plain.

Meade County NFIP Participation	
Participants	Non-participants
Meade County	Faith
Box Elder	
Piedmont	
Sturgis	
Summerset	

Table 5.1 NFIP participants for the County and Jurisdictions.

The Meade County Equalization and Planning Office maintains the flood zone maps and utilizes DFIRMS for all planning mechanisms occurring in the county, specifically development of new homes and businesses and all new construction.

IMPLEMENTATION OF MITIGATION ACTIONS

Requirement: §201.6(c)(3)(iii): [The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

Upon adoption of the updated plan, each jurisdiction will become responsible for implementing its own mitigation actions. Those who do not participate or adopt the plan will be required to coordinate all mitigation actions with the County. The planning required for implementation is the sole responsibility of the local jurisdictions that have participated in the plan update. Some municipalities have indicated that they do not have the financial capability to move forward with projects identified in the plan at this time, however, they will consider applying for funds through the State and Federal Agencies once such funds become available. If and when the municipalities are able to secure funding for the mitigation projects, they will move forward with the projects identified.

VI. PLAN MAINTENANCE PROCESS

MONITORING, EVALUATING, AND UPDATING THE PLAN

Requirement §201.6(c) (4)(i): [the plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

Meade County and all of the participating local jurisdictions thereof will incorporate the findings and projects of the plan in all planning areas as appropriate. Periodic monitoring and reporting of the plan is required to ensure that the goals and objectives for the *Meade County Natural Hazard Mitigation Plan* are kept current and that local mitigation efforts are being carried out.

During the process of implementing mitigation strategies, the County or communities within the county may experience lack of funding, budget cuts, staff turnover, and/or a general failure to implement projects. These scenarios are not in themselves a reason to discontinue and fail to update the Natural Hazard Mitigation Plan. A good plan needs to provide for periodic monitoring and evaluation of its successes and failures and allow for appropriate changes to be made.

Annual Reporting Procedures

The plan shall be reviewed annually, as required by the County's Emergency Manager, or as the situation dictates such as following a disaster declaration. The Meade County Emergency Manager will review the plan annually in June and ensure the following:

1. The County Elected body will receive an annual report and/or presentation on the implementation status of the plan;
2. The report will include an evaluation of the effectiveness and appropriateness of the mitigation actions proposed in the plan; and
3. The report will recommend, as appropriate, any required changes or amendments to the plan.
4. The report will include budget needs for any upcoming projects that require local match.

Five Year Plan Review

Every five years the plan will be reviewed, and a complete update will be initiated. All information in the plan will be evaluated for completeness and accuracy based on new information or data sources. New property development activities will be added to the plan and evaluated for impacts. New or improved sources of hazard related data will also be included.

In future years, if the county relies on grant dollars to hire a contractor to write the mitigation plan update, the County will initiate the process of applying for and securing such funding in the third year of the plan to ensure the funding is in place by the fourth year of the plan. The fifth year will then be used to write the plan update, which in turn will prevent any lapse in time where the county does not have a current approved plan on file.

The goals, objectives, and mitigation strategies will be readdressed and amended as necessary based on new information, additional experience, and the implementation progress of the plan. The approach to this plan update effort will be essentially the same as the one used for the original plan development.

The County's Emergency Manager will meet with the County Commission and Plan Participants for review and approval prior to final submission of the updated plan.

Plan Amendments

Plan amendments will be considered by the Meade County's Emergency Manager, during the plan's annual review, to take place in June. All affected local jurisdictions (cities, towns, and counties) will be required to hold a public hearing and adopt the recommended amendment by resolution prior to considerations by the steering committee.

INCORPORATION INTO EXISTING PLANNING MECHANISMS

Requirement: §201.6(c)(4)(ii): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.

Meade County and all jurisdictions, except for the City of Faith, have their own comprehensive plans. The City of Faith does not have the resources, staff, funding, or need for such planning mechanisms. The County and the jurisdictions will consider the mitigation requirements, goals, actions, and projects when it considers and reviews the other existing planning documents such as the comprehensive plans. Mitigation projects will be considered and prioritized in conjunction with non-mitigation projects, such as water and wastewater infrastructure improvements, new constructions of schools, libraries, parks, roads, etc.

The City of Faith cannot incorporate the requirements of the mitigation plan into other planning mechanisms because they do not have any other planning mechanisms that currently exist. Absence of such mechanisms creates a problem for the local jurisdictions because ideas, projects, and actions identified as a result of the Plan update process often never move forward because they are forgotten about, and no mechanism exists to initiate the process of completing such projects. Thus, the City of Faith identified one unrelated mechanism: municipalities are required by State law to prepare budgets for the upcoming year and typically consider any expenditure for the upcoming year at that time. South Dakota Codified Law 9-21-2 provides that:

The governing body of each municipality shall, no later than its first regular meeting in September of each year or within ten days thereafter, introduce the annual appropriation ordinance for the ensuing fiscal year, in which it shall appropriate the sums of money necessary to meet all lawful expenses and liabilities of the municipality....an annual budget for these funds shall be developed and published no later than December thirty-first of each year.

Potential Funding Sources

Although all mitigation techniques will likely save money by avoiding losses, many projects are costly to implement. The Potential Funding Sources section was included so that the local jurisdictions can work towards securing funding for the projects. Inevitably, due to the small tax base and small population for some of the participating jurisdictions they may not have the ability to generate enough revenue to support anything beyond the basic needs of the community, which is why many of the mitigation actions are focused around planning mechanisms such as enforcing ordinances that do not cost anything.

The Meade County jurisdictions will continue to seek outside funding assistance for mitigation projects in both the pre- and post-disaster environment. Primary Federal and State grant programs have been identified and briefly discussed, along with local and non-governmental funding sources, as a resource for the local jurisdiction

Federal

The following federal grant programs have been identified as funding sources which specifically target hazard mitigation projects:

Title: Natural Hazard Mitigation Program
Agency: Federal Emergency Management Agency

Through the Disaster Mitigation Act of 2000, Congress approved the creation of a national program to provide a funding mechanism that is not dependent on a Presidential Disaster Declaration. The Natural Hazard Mitigation (PDM) program provides funding to states and communities for cost-effective hazard mitigation activities that complement a comprehensive mitigation program and reduce injuries, loss of life, and damage and destruction of property.

The funding is based upon a 75% Federal share and 25% non-Federal share. The non-Federal match can be fully in-kind or cash, or a combination there of. Special accommodations will be made for “small and impoverished communities”, who will be eligible for 90% Federal share/10% non-Federal.

FEMA provides BRIC grants to states that, in turn, can provide sub-grants to local governments for accomplishing the following eligible mitigation activities: State and local hazard mitigation planning, technical assistance (e.g. risk assessments, project development), mitigation projects, acquisition or relocation of vulnerable properties, Hazard retrofits, Minor structural hazard control or protection projects, and community outreach and education (up to 10% of State allocation).

Title: Flood Mitigation Assistance Program
Agency: Federal Emergency Management Agency

FEMA’s Flood Mitigation Assistance program (FMA) provides funding to assist states and communities in implementing measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the National Flood Insurance Program (NFIP). FMA was created as part of the National Flood Insurance Reform Act of 1994 (42 USC 4101) with the goal of reducing or eliminating claims under the NFIP.

FMA is a Natural Hazard grant program and is available to states on an annual basis. This funding is available for mitigation planning and implementation of mitigation measures only and is based upon a 75% Federal share/25% non-Federal share. States administer the FMA program and are responsible for selecting projects for funding from the applications submitted by all communities within the state. The state then forwards selected applications to FEMA for an eligibility determination. Although individuals cannot apply directly for FMA funds, their local government may submit an application on their behalf.

Title: Hazard Mitigation Grant Program
Agency: Federal Emergency Management Agency

The Hazard Mitigation Grant Program (HMGP) was created in November 1988 through Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act. The HMGP assists states and local communities in implementing long-term mitigation measures following a Presidential disaster declaration.

To meet these objectives, FEMA can fund up to 75% of the eligible costs of each project. The state or local cost-share match does not need to be cash; in-kind services or materials may also be used. With the passage of the Hazard Mitigation and Relocation Assistance Act of 1993, federal funding under the HMGP is now based on 15% of the federal funds spent on the Public and Individual Assistance programs (minus administrative expenses) for each disaster.

The HMGP can be used to fund projects to protect either public or private property, so long as the projects in question fit within the state and local governments overall mitigation strategy for the disaster area and comply with program guidelines. Examples of projects that may be funded include the acquisition or relocation of structures from hazard-prone areas, the retrofitting of existing structures to protect them from future damages; and the development of state or local standards designed to protect buildings from future damages.

Eligibility for funding under the HMGP is limited to state and local governments, certain private non-profit organizations or institutions that serve a public function, Native-American tribes, and authorized tribal organizations. These organizations must apply for HMPG project funding on behalf of their citizens. In turn, applicants must work through their state since the state is responsible for setting priorities for funding and administering the program.

Title: Public Assistance (Infrastructure) Program, Section 406

Agency: Federal Emergency Management Agency

FEMA's Public Assistance Program, through Section 406 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, provides funding to local governments following a Presidential Disaster Declaration for mitigation measures in conjunction with the repair of damaged public facilities and infrastructure. The mitigation measures must be related to eligible disaster related damages and must directly reduce the potential for future, similar disaster damages to the eligible facility. These opportunities usually present themselves during the repair or replacement efforts.

Proposed projects must be approved by FEMA prior to funding. They will be evaluated for cost effectiveness, technical feasibility, and compliance with statutory, regulatory, and executive order requirements. In addition, the evaluation must ensure that the mitigation measures do not negatively impact a facility's operation or risk from another hazard.

Public facilities are operated by state and local governments, Native-American tribes or authorized tribal organizations and include:

- Roads, Bridges & Culverts
- Draining & Irrigation Channels
- Schools, City Halls & Other Buildings
- Water, Power & Sanitary
- Airports & Parks

Private nonprofit organizations are groups that own or operate facilities that provide services otherwise performed by a government agency and include, but are not limited to the following:

- Universities and Other Schools
- Custodial Care & Retirement Facilities
- Volunteer Fire & Ambulance
- Power Cooperatives & Utilities
- Hospitals & Clinics
- Museums & Community Centers

Title: SBA Disaster Assistance Program

Agency: US Small Business Administration

The SBA Disaster Assistance Program provides low-interest loans to businesses following a Presidential disaster declaration. The loans target businesses to repair or replace uninsured disaster damages to property owned by the business, including real estate, machinery and equipment, inventory, and supplies. Businesses of any size are eligible, along with non-profit organizations' loans can be utilized by their recipients to incorporate mitigation techniques into the repair and restoration of their business.

Title: Community Development Block Grants

Agency: US Department of Housing and Urban Development

The Community Development Block Grant (CDBG) program provides grants to local governments for community and economic development projects that primarily benefit low- and moderate-income people. The CDBG program also provides grants for post-disaster hazard mitigation and recovery following a Presidential Disaster Declaration. Funds can be used for activities such as acquisition,

rehabilitation or reconstruction of damaged properties and facilities and for the redevelopment of disaster areas.

Title: Consolidated Water Facilities Construction Program
Agency: Department of Agriculture and Natural Resources (DANR)

The CWFCP program provides grants to local governments for drinking water and waste water infrastructure projects that provide safe drinking water and sanitary sewer service to residents. Grants up to \$2,000,000 are awarded to eligible applicants. Cities, Counties, Water Districts, Sanitary Districts, and Rural Water Districts are eligible to apply. CWFCP funds are typically awarded at a percentage of total project cost and often paired with loans from DANR's SRF Loan program.

Title: State Revolving Loan Fund (DWSRF and CWSRF)
Agency: Department of Agriculture and Natural Resources (DANR)

The SRF program provides low interest loans with extended terms to local governments for drinking water and wastewater infrastructure projects that include rehabilitation or replacement of existing infrastructure. Loans are awarded on ability to debt service and are sometimes given in the form of principle forgiveness. Cities, Counties, Water Districts, Sanitary Districts, and Rural Water Districts are eligible to apply. SRF funds are awarded quarterly.

Local

Local governments depend upon local property taxes as their primary source of revenue. These taxes are typically used to finance services that must be available and delivered on a routine and regular basis to the general public. If local budgets allow, these funds are used to match Federal or State grant programs when required for large-scale projects.

Non-Governmental

Another potential source of revenue for implementing local mitigation projects are monetary contributions from non-governmental organizations, such as private sector companies, churches, charities, community relief funds, the Red Cross, hospitals, Land Trusts, and other non-profit organizations.

CONTINUED PUBLIC PARTICIPATION/INVOLVEMENT

Requirement: §201.6(c)(4)(iii): [the plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.

During interim periods between the five-year update, efforts will be continued to encourage and facilitate public involvement and input. The plan will be available for public view and comment at the Meade County's Equalization and Planning Department located in the Meade County Erskine Office Building and the Black Hills Council of Local Governments office. Comments will be received in writing, by letter or by e-mail.

All ongoing workshops and trainings will be open to the public and appropriately advertised. Ongoing press releases and interviews will help disseminate information to the general public and encourage participation.

As implementation of the mitigation strategies continues in each local jurisdiction, the primary means of public involvement will be the jurisdiction's own public comment and hearing process. State law, as it applies to municipalities and counties, requires this as a minimum for many of the proposed implementation measures. Effort will be made to encourage cities, towns, and counties to go beyond the minimum required to receive public input and engage stakeholders.

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