

Fallon County



Pre-Disaster Mitigation Plan

12/14/2021



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1.0 Introduction

1.1 Purpose

Fallon County first created a Pre-Disaster Mitigation (PDM) Plan in 2005, in response to the Disaster Mitigation Act. The Disaster Mitigation Act (DMA) of 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act and requires that all local governments have an approved and formally adopted hazard mitigation plan in place, to be eligible to receive Hazard Mitigation Grant Program (HMGP) funds and other types of disaster and mitigation funding. Fallon County with the support of Great West Engineering has developed this Update of the 2013 PDM plan to continue promoting preparedness and resiliency against hazards countywide.

The purpose of this update of the Pre-Disaster Mitigation Plan is to:

- Serve as a consolidated, comprehensive source of hazard information for the County.
- Educate the communities, including County leaders and residents, on their vulnerabilities.
- Fulfill federal, state, and local hazard mitigation planning responsibilities.
- Prioritize and promote cost-effective mitigation solutions.
- Support requests for grant funding.
- Encourage long-term community resiliency.

Mitigation planning helps promote a broader understanding of the hazards threatening the residents of the County and provides a clear, focused vision when pursuing future mitigation grant funding. Also, by elevating the discussion about mitigation in the minds of County officials and residents, the County will create more opportunities for disaster mitigation beyond just grant funding and federal or state programs.

With this Plan Update, the County will have an updated understanding of the hazards currently threatening their residents, property, and County assets. With that understanding, the County can properly prioritize mitigation projects, determining who is responsible for achieving those projects and how they will be funded.

1.2 Authority

The Fallon County PDM Plan update has been developed pursuant to the requirements in the Interim Final Rule for hazard mitigation planning and the guidance in the State and Local Plan Interim Criteria under DMA 2000.

This plan has been adopted by the Fallon County Board of Commissioners; the signed resolution is provided in Appendix A. By adopting this plan, the County maintains their eligibility for mitigation grants through the Hazard Mitigation Grant Program. The County has the authority to practice hazard mitigation and promote community resiliency against hazards.

2.0 Community Profile

Fallon County is located in southeast Montana and is approximately 1,623 square miles in size. The county is comprised of two incorporated communities, Town of Plevna and the City of Baker, the County seat. Willard, Ollie, and Webster are all unincorporated communities within the County. Bordering to the

east is the State of North Dakota, to the south is Carter County, to the west is Custer County, and directly to the north is Wibaux County. Prairie County borders the very northwest portion of Fallon County.

2.1.1 Population

The population of Fallon County is 3,049 according to the 2020 Census, which was an increase of 5.5 percent since the 2010 Census. Of the total County population, 66 percent live in Baker and 5 percent live in Plevna. The remaining 29 percent live in the unincorporated areas of the County.

Table 1 – County, State, and National Population Trends

Year	Fallon Co. Population	% Change from Previous Census	State of Montana Population	% Change from Previous Census	United States Population	% Change from Previous Census
2020	3,049	5.5%	1,084,225	9.5%	331,449,281	7.3%
2010	2,890	1.9%	989,415	9.7%	308,745,538	9.7%
2000	2,837	-8.6%	902,195	12.9%	281,421,906	13.2%

Notes:

¹. Data retrieved from the U.S. Census Bureau

The population of Fallon County is mainly rural in nature with the closest urban centers being Billings, Montana (225 miles), Rapid City, South Dakota, (215 miles) and Bismarck, North Dakota (200 miles). The gender distribution in Fallon County is fairly even, with 51 percent male and 49 percent female. The county's median age is 39.3 years. The elderly (65 years and older) account for 17 percent of the County's population.

In Fallon County the estimated average number of persons per household is 2.12, with a total number of households at 1,334. Seventy-two percent of the housing units in the County are owner occupied and the remainder are rental units. The population density in Fallon County is much lower than the statewide average, with 1.8 persons per square mile compared to the 6.8 persons per square mile in the State.

Vulnerable populations are defined as persons that require special care or assistance during or after a disaster. Vulnerable populations include elderly in nursing homes and/or senior centers, children in schools and/or daycares, handicapped and disabled, and homebound persons. By being able to identify vulnerable populations, it aids in assisting emergency personnel in the event of a disaster.

Table 2 – Vulnerable Populations in Fallon County

Structure	Capacity	Notes
Elderly Nursing Homes/Senior Center		
Nursing Home	40 beds (25 acute care and swing and 15 licensed nursing home beds)	Part of the Hospital Complex
Prairie Manor	14 Apartments	Owned by Mark Stromberg of Belgrade, MT
Parkview I and II	24 Rooms	Rooms consist of 1 and 2 beds
Assisted Living – Quality Personal Care Center	21 Beds	
Schools		

Structure	Capacity	Notes
Baker High School	163 Students	Spring, 2011
Lincoln School	136 Students	Spring, 2011
Longfellow School	106 Students	Spring, 2011
Plevna School	80 students enrolled in 2010/11 year	K – 12
Daycares		
Bright Beginnings	Licensed for 25 children	
Kim Ridenhower	Licensed for 6 – 8 children	
Toybox Daycare	Licensed for 30 children	

2.1.2 Economics

According to 2019 Census estimates, Fallon County has a median household income of \$64,545, above the average statewide medium household income of \$54,970.

Table 3 – Median Household Income for Fallon County and Surrounding Counties

Median Household Income	
Fallon County	\$64,545
Powder River County	\$54,427
Carter County	\$48,000
Custer County	\$52,965

Notes:

1. Data retrieved from the U.S. Census Bureau, based on the 2019 estimate

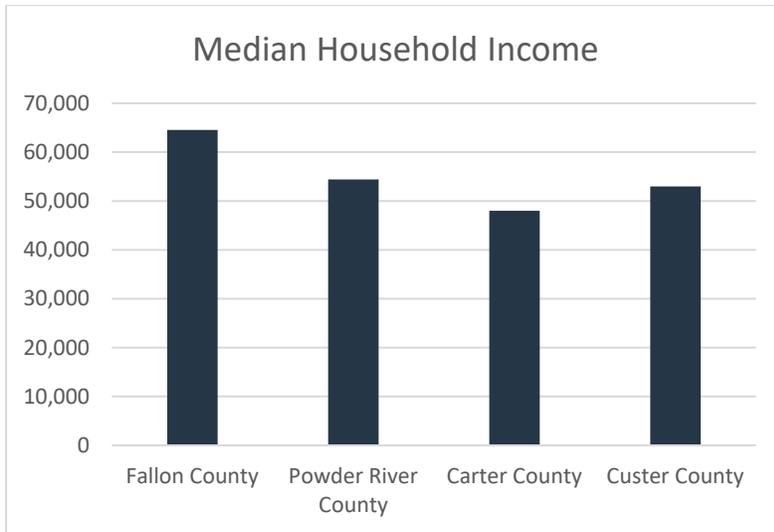


Figure 1 – Median Household Income Chart of Fallon County and Surrounding Counties

Employment and Labor Market: According to the Montana Department of Labor, Fallon County had 1,600 persons employed as of June 2021. The unemployment rate for that month was 2.7 percent.

Table 4 – Unemployment Rate of Fallon County and Surrounding Counties

Area	Year	Period	Labor Force	No. of Employed	No. of Unemployed	Unemployment Rate
Fallon County	2021	June	1,645	1,600	45	2.7%
Powder River County	2021	June	981	952	29	3.0%
Carter County	2021	June	608	588	20	3.3%
Custer County	2021	June	6,239	6,012	227	3.6%

Notes:

1. Data retrieved from the Montana Department of Labor

In 2018, the per capital personal income for Fallon County was estimated at \$49,509 according to the Montana Department of Labor. Neighboring counties of Powder River, Carter, and Custer had per capita personal income of \$32,479, \$44,358, and \$44,689, respectively.

Table 5 – Per Capital Personal Income and Total Personal Income of Fallon County

	Year	Period	Income	Population
Per Capital Income	2018	Annual	\$49,509	2,920
Total Income	2018	Annual	\$144,567,000	2,920

Notes:

1. Data retrieved from the Montana Department of Labor

According to the Montana Department of Labor, as of the 1st Quarter of 2021, mining, retail, and health care/social assistance employed the highest number of people in the County, as seen in Table 6 below. Mining provided the largest average weekly wage and accommodation provided the smallest.

Table 6 – Industry Breakdown of Fallon County

Industry	No. of Employees	Average Weekly Wages	Total Wages
Mining, Quarrying, and Oil Extraction	201	\$1,742	\$4,552,625
Retail Trade	154	\$440	\$880,160
Health Care and Social Assistance	109	\$782	\$1,108,417
Transportation and Warehousing	90	\$1,431	\$1,674,517
Construction	85	\$925	\$1,022,399
Accommodation and Food Services	71	\$290	\$267,757
Other Services, Except Public Administration	50	\$354	\$229,932
Specialty Trade Contractors	48	\$937	\$584,987
Food Services and Drinking Places	45	\$296	\$173,090
Truck Transportation	41	\$1,419	\$756,072
Finance and Insurance	35	\$1,070	\$486,728
Wholesale Trade	32	\$1,182	\$491,819
Membership Associations and Organizations	26	\$176	\$59,488
Accommodation	26	\$280	\$94,667
Heavy and Civil Engineering Construction	26	\$1,006	\$340,104
Merchant Wholesalers, Durable Goods	24	\$1,026	\$320,051
Agriculture, Forestry, Fishing, and Hunting	21	\$596	\$162,603
Professional and Technical Services	20	\$847	\$220,206
Information	15	\$734	\$143,221
Administrative and Waste Services	13	\$346	\$58,478
Animal Production and Aquaculture	13	\$586	\$99,106
Construction of Buildings	11	\$680	\$97,308
Real Estate and Rental and Leasing	10	\$307	\$39,950
Manufacturing	10	\$779	\$101,228
Utilities	7	\$1,527	\$138,950
TOTAL	1,190	\$937	\$14,494,565

Notes:

1. Data retrieved from the Montana Department of Labor

Fallon County's economic base is dependent upon agriculture and oil and gas production. Major employers are the Fallon Medical Complex, Fallon County, Baker Schools, Denbury Offshore, LLC and Williston Basin.

2.1.3 Land Use

According to the Soil Survey, completed by the Natural Resources Conservation Service (NRCS) range land makes up about 46 percent of the land in Fallon County and crop land makes up 25 percent. Range is defined as land on which is predominately grasses, grass like plants, forbs, or shrubs, which is mainly used for grazing of livestock. Crop land in Fallon County consists of spring wheat, winter wheat, barley, grass-legume hay, and pasture.

Land in Fallon County is predominately privately owned belonging to individuals, farms and ranches, oil companies, and Burlington Northern Santa Fe Railroad. The largest public landowner in Fallon County is the Bureau of Land Management (BLM) with 115,261 surface acres. In addition, the BLM manages 254,410 subsurface acres in the county. The State of Montana owns 70,753 acres that are scattered across the county.

According to the 2017 Census of Agriculture, of the 1,037,152 acres in Fallon County, 902,019 acres is dedicated to farming. There are a total of 289 farms within the County and the average farm size is 3,121 acres.

Natural gas was accidentally discovered in Fallon County in 1915, during an attempt to drill for water. Since that time, the production of gas and oil are a main source of revenue for the County. According to the 2020-2021 Treasure State Journal, in 2019, Fallon County produced 3,613,161 barrels of oil and 5,616,016 million cubic feet (MMCF) of natural gas. This accounts for 17 percent of the total oil produced in Montana, and 23 percent of total natural gas production.

2.1.4 Critical Facilities

Critical facilities are facilities that are essential to the health and welfare of the population. These facilities include medical, fire, transportation, communication, and utility systems.

The 9-1-1 Dispatch Center for Fallon County is located in the County-City Courthouse in the City of Baker. This dispatch center serves Fallon, Carter, Prairie, and Wibaux County. Due to the large geographical area it serves, there is concern about the operation of the dispatch center in the event of a disaster. If the dispatch center were damaged by a disaster many people could lose access to emergency services in the area.

Health and Medical Service Programs: Fallon County has one hospital which includes a clinic, hospital, nursing home, and attached apartments. According to the Fallon County Growth Policy, "services available at the clinic and hospital include acute care/hospital care, 24 hour emergency room care with an 18 member ambulance staff, out-patient surgery, a skilled nursing home, swing bed/long term care, home health services and Life Line." The volunteers rely on the fire department for assistance because of the shortage. It may be a consideration in the future to have a full time staff member.

Emergency Medical Services: Fallon County has a 24 hour a day, seven days a week, E 9-1-1 and dispatch service that serves Fallon, Carter, Prairie, and Wibaux Counties. The facility is owned and operated by Fallon County.

Fallon County has three volunteer fire departments, one in Baker, one in Plevna and a Rural Fire Department for the remainder of the County. The Baker Fire Department is comprised of 28 volunteers and has just recently built a new fire department building in the City of Baker. This building is equipped with two Class “A” pumpers, wild land units, five tankers and one light rescue truck.

The Plevna Fire Department is comprised of about 24 volunteers. Their firefighting equipment includes one class “A” pumper, two tankers, one command vehicle, and eleven wild land trucks.

Solid Waste Disposal: The City of Baker and the Town of Plevna have solid waste dump sites. All other communities in Fallon County do not have solid waste disposal sites or garbage pickups. All solid waste is hauled either privately or via contract service to the Baker Landfill site.

Sewage and Wastewater Treatment and Disposal: Baker and Plevna have a wastewater treatment system that include facultative lagoons. Residents in the remainder of the county utilizes individual septic systems for wastewater treatment.

Drinking Water: Both Baker and Plevna provide their residents with drinking water system. Baker also has a bulk water station to serve homeowners and ranchers outside the City. Residents in the remainder of the County obtain water via private wells or cisterns.

Educational Institutions: Fallon County is comprised of four K–12 schools which are located in Baker and Plevna.

Utilities: Montana Dakota Utilities is the main provider of electricity and natural gas in Fallon County. Basic television service available in the area is Mid Rivers Cable and Satellite television.

Table 7 – Critical Facilities in Fallon County

Description	Insured Value	Notes
New Fire Station in Baker	\$2,149,000	Insured Value per City of Baker – New station was built in 2010.
Fire Station in Plevna	\$413,662	Insured Value per Insurance Agency.
Ambulance Barn	\$52,020	Insured Value per Fallon County Clerk and Recorder, 2011
County-City Courthouse and Dispatch Center	\$6,242,400	Insured Value per Fallon County Clerk and Recorder, 2011
Baker City Shop and Equipment	\$48,140	Insured Value per City of Baker. Includes 3 city shops, and 1 office building.
Baker Water Wells and Pumphouse	\$578,198	Insured Value per City of Baker. Includes 5 pumphouses,
Plevna Water System – Pump House and Personal Property	\$115,880	Insured Value per Town of Plevna. Plevna has one pumphouse and 3 wells. Distribution system is not insured.
Hospital Complex	\$12,000,000	Insured value per Fallon Medical Complex. Insured value includes hospital, clinic, and nursing home.

Description	Insured Value	Notes
Health Department	\$8,250,000	Insured value per Fallon Medical Complex. Insured value includes hospital dietary.
Highway 12 bridge East of Baker, Over Railroad, 2 Miles SE of Baker	\$2,051,000	Estimated replacement value per MDT
Highway 12 bridge 3 miles West of Baker, Over Red Butte Creek	\$25,000	Estimated replacement value per MDT
Highway 12 bridge 5 miles West of Baker, Over Timber Creek	\$671,000	Estimated replacement value per MDT
Highway 7 Bridge North of Baker, Over Sandstone Creek	\$875,000	Estimated replacement value per MDT
Baker Lake Overflow Bridge	\$230,000	Estimated replacement value per MDT
Highway 12 bridge East of Plevna	\$1,276,000	Estimated replacement value per MDT
Airport in Baker	\$156,060.00	Insured Value per Fallon County Clerk and Recorder, 2011
Baker High School	\$14,611,130	Insured Value per School Clerk
Lincoln School	\$3,204,977	Insured Value per School Clerk
Longfellow School	\$11,213,341	Insured Value per School Clerk
Plevna School	\$4,262,000	Insured Value per Plevna Schools which is for classrooms and supplies for K – 12.
Cabin Creek Junction Substation (MDU)	\$3,817,118	Insured Value Per MDU Resources Group, Inc.
Baker Junction (MDU)	\$8,499,012	Insured Value Per MDU Resources Group, Inc.
Diamond Willow Windfarm Substation	\$3,713,570	Insured Value Per MDU Resources Group, Inc.
Diamond Willow Windfarm I turbines	\$36,667,176	Insured Value Per MDU Resources Group, Inc.
Diamond Willow Windfarm II turbines	\$22,870,904	Insured Value Per MDU Resources Group, Inc.
Transmission Lines	\$1,300,000	Owned by Montana Dakota Utilities Self Insured (original cost listed)

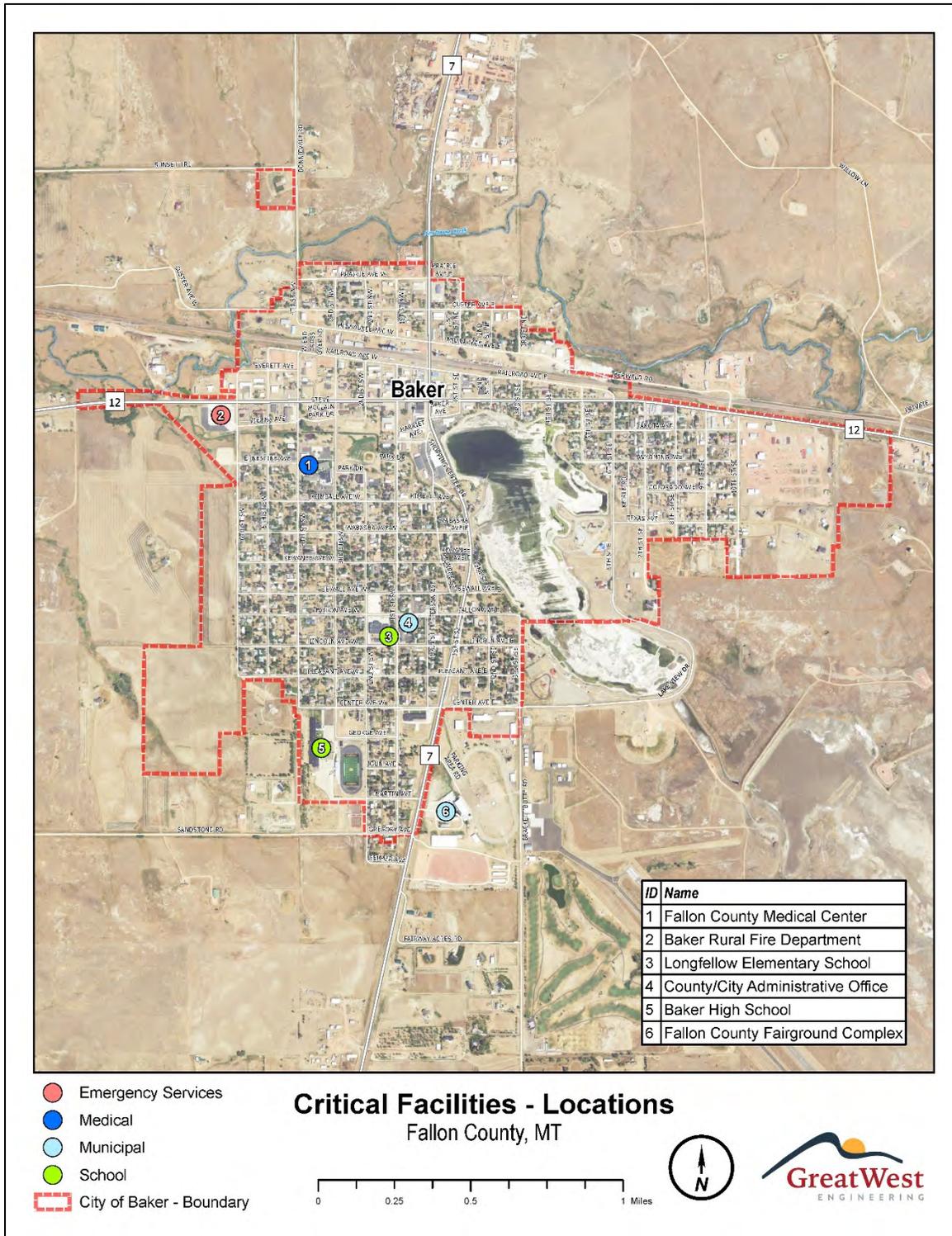


Figure 2 – Critical Facilities in Fallon County

2.1.5 Transportation

Vehicle transportation is the primary source of transportation in Fallon County. Two major State Highways intersect in the City of Baker. Highway 7 runs north and south, connecting Baker with Wibaux to the north and Ekalaka to the south. State Highway 12 connects Baker to Miles City/Plevna from the west and North

Dakota to the east. There is also a network of county roads that follow section lines that are used mainly by local residents. Many of the roads are used to access oil and gas development and private ranches.

A spur of the Burlington Northern Santa Fe Railroad (BNSF) passes through Fallon County from the west to the east following Highway 12 as it crosses the center of the County and passes through Plevna and Baker. BNSF primarily carries coal through the County to facilities in North Dakota.

According to the Federal Aviation Administration (FAA) there is only one airport in Fallon County, which is located one mile southeast of Baker. It is identified by the FAA as BHK. This public airport does not have regularly scheduled commercial air service, however, has a Fixed Base Operator and numerous private aircraft that services the oil and gas industry.

Major materials hauled through the County by rail freight include coal, 72.3 percent, farm products, 11.7 percent, petroleum and coal products, 6.8 percent, waste and scrap, 2.8 percent, lumber and wood, 1.9 percent and other, 4.5 percent.

2.1.6 Natural Climate

The climate of Fallon County is consistent with much of eastern Montana. Average precipitation in January is 0.44 inches and in June it is 3.01 inches. Average annual temperatures range from 17^o Fahrenheit (F) in January to 74^o F in July. Extreme weather conditions consist of severe thunderstorms, snowstorms, windchills, cold temperature, and ice.

According to the Community Wildfire Protection and Pre-Disaster Plan of 2005, “monthly snowfall records have been kept at the Baker weather station since 1948. The largest amount of snowfall in a single month occurred in April 1963, with 23 inches. The most snowfall on record for one winter occurred in the winter of 1966-67, with 52 inches. The snow during this winter was distributed over the months of November through May with no one month exceeding 16 inches. The winter of 1980-81 holds the record for least snowfall among the years for which records were complete, at 8 inches. The average annual snowfall is 33.1 inches.

Table 8 – Baker, MT Monthly Climate Summary, 9/28/1922 to 06/30/2013

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temp (°F)	28.1	31.3	42.5	57.7	66.1	75.9	88.9	86.3	73.7	58.2	43.7	32.4	57.1
Average Min. Temp (°F)	6.0	9.3	20.1	32.7	41.47	50.9	59.3	56.6	44.6	32.4	19.1	10.1	31.9
Average Precipitation (in.)	0.44	0.35	0.60	1.27	2.08	3.01	1.79	1.26	1.35	0.97	0.45	0.41	13.97
Average Snowfall (in.)	5.0	3.8	5.0	2.8	0.8	0.1	0.0	0.0	0.3	1.5	3.4	4.9	27.5
Average Snow Depth (in.)	4	4	2	0	0	0	0	0	0	0	1	2	1

Notes:

1. Percent of possible observations for period of record
2. Maximum temperature: 1%, Precipitation: 99.4%, Snowfall: 96.8%, Snow depth: 90.9%
3. Data retrieved from Western Regional Climate Center

2.1.7 Climate Change

Many aspects of hazard planning are made difficult by the unpredictability of the weather events that often cause the hazards. Thus, climate change is important to understand as part of hazard planning, as it has the potential to exacerbate the existing challenges. Explained in detail in the Montana MHMP, “The U.S. Environmental Protection Agency published an article on Climate Change and Montana (EPA, 1997) which indicated that climate change poses risk to human health and important economic resources such as agriculture, forestry and water resources.” Hazards described in Section 4.0 are assuming existing conditions, and it should be noted if climate change were to continue as it has the last decade, all hazards could intensify in magnitude, and become more frequent.

2.1.8 Future Development

At this time, development is not anticipated to have a significant impact to future hazard assessments or planning. In ten years, according to the Census, the population of Fallon County increased by 159 people. As part of this plan update other County plans were reviewed in order to create coordination and to help promote disaster resiliency as development occurs. Those planning mechanisms and are listed in Section 3.4.

3.0 Planning Process

3.1 Local Emergency Planning Committee

The Local Emergency Planning Committee (LEPC) is a designated committee responsible for emergency planning at the County level. The committee is comprised of County Commissioners, firefighters, City of Baker officials, representatives from Montana Department of Transportation (MDT), emergency responders etc. The Fallon County LEPC has 40 members. As part of this plan update all members were invited to the two official LEPC planning meetings which were scheduled outside of the LEPC’s regularly scheduled meeting time and date. A full list of the organizations and members involved in the planning process is shown in Table 9 below.

Table 9 – Stakeholders

Name	Organization	Position
Dale Butori	Fallon County DES	DES/911 Coordinator
Mindi Murnion	Fallon County Public Health	Public Health Specialist
Carla Brown	Council on Aging	Council on Aging
Jeff Gates	Montana DES	District Field Officer
Aaron Skogen	Baker Schools	Superintendent
Brian Hilldabrand	MT Dept. of Transportation	
David Espeland	Fallon Medical Complex	CEO
Rod Moris	City of Baker	Public Works
Kevin Dukart	City of Baker	City Manager
Steve Zachmann	City of Baker	Mayor
Don Schillinger	Fallon County	Superintendent of Schools
Roy Rost	Fallon County	Commissioner
Steve Baldwin	Fallon County	Commissioner
Kevin Braun	Fallon County	Commissioner

Name	Organization	Position
Duane Brockel	Local HAM Radio	
Brenda Hoeger	Fallon County Dispatch	Supervisor
Kalyn Bohle	Plevna Fire Dept.	Fire Chief
Tom Bruha	Baker Fire Dept.	Fire Chief
Marry Grube	Fallon County	Assistant Planner
Rich Menger	Fallon County	Sanitarian
Dean Wang	Baker of Baker	Owner/President
Jade Boggs	The Insurance Store	Owner insurance store
Judy McWilliams	FMC	Infection control
Lisa Mitchell	Fallon County EMS	Director
Michelle Smith	Fallon Medical Center	Nurse
Tammy Reitz	American Red Cross	Red Cross
Randy Hoenke	Fallon County	Fire Warden
Mike Reddick	Baker Police Dept.	Chief
Justin Lacroix	Baker Police Dept.	Lieutenant
Andrea Koenisfield	KFLN/KJJM Radio	Manager
Tenton Harbaugh	Fallon County Sheriff's Office	Sheriff
Nic Eisele	Fallon County Sheriff's Office	Under Sheriff
Shyla Hadly	Fallon County Fairgrounds	Manager
Kenny Schell	Reynold's Supermarket	Owner
Carrie Haar	Fallon Medical Complex	FNP/Health Officer
Darryl Espeland		
Dustin Davis	Fallon County IT	Department Head
Bobby Weedimar	Fallon County Road Dept.	Forman
Darcy Wassmann	Fallon County	Attorney
Jessica Dinardi		(former) County Planner

While input from stakeholders was always welcomed, the main planning team responsible for the writing of the update included the County DES Coordinator, Dale Butori, and the contractor from Great West Engineering.

3.2 Planning Team Meetings

The planning team for the update held their kickoff meeting on May 27th, 2021. From that point forward, not including regular LEPC meetings, the planning team met on a monthly basis to discuss any project or planning issues. Meeting minutes from each planning meeting can be found in Appendix B.

3.3 Public Outreach

Inviting the public to participate in the planning process is a critical element of pre-disaster mitigation. The strategy to obtain public input in this specific planning process was based on lessons learned in previous PDM planning cycles. At the very first LEPC meeting on the plan update, public outreach was discussed with the group. This included not only the lessons learned from past planning projects but also how it

should be approached for this plan update. Based on the feedback from the LEPC members, it was apparent that in the past public meetings have not been well attended and did not generate needed input. Therefore, for this plan update, in addition to the regular public meetings, an online and hardcopy community survey was developed in an effort to reach a wider population. The online survey was publicized in the newspaper and the link was posted on the County DES Facebook starting in September of 2021. The newspaper article and the Facebook post also explained that hard copies of the Survey could be found at the County Clerk and Recorder’s Office. The survey results were reviewed and aligned with the Planning Team’s prioritization of hazards and mitigation. All survey results are included in Appendix C.

The Planning Team would like to have more input from the public regarding Hazard Mitigation going forward, and will advertise select LEPC meetings ahead of time, and encourage public attendance.

3.4 Other Planning Documents Review

The County has several other existing planning documents that were reviewed in order to incorporate applicable information and guidance into this plan update. A summary of the County’s other planning documents that were reviewed for this project are shown below in Table 10.

Table 10 – All Available Documents Reviewed

Existing Plans & Regulations	Document Use
Upper & Lower Baker Lake Dam Emergency Action Plan	Data for Dam Failure Section
Fallon County Flood Insurance Study 1988	Flooding Information
2018 State of Montana Multi-Hazard Mitigation Plan	All hazards, and Mitigation Strategy
2005 Community Wildfire Protection and Pre-Disaster Mitigation Plan	All hazards
2013 Fallon County Pre-Disaster Mitigation Plan	All hazards, Mitigation Strategy
2017 Fallon County Growth Policy	Community Profile/ Identified as a Planning Mechanism to include more hazard mitigation in the form of Policy and Zoning

Montana Hazard Mitigation Plan and Statewide Hazard Assessment (2018 Update)

The Multi-Hazard Mitigation Plan (MHMP) and Statewide Hazard Assessment is the State of Montana’s primary hazard mitigation document. The 2018 plan was updated in a manner similar to local mitigation plans but contains a statewide hazard assessment and mitigation strategies.

The hazard assessments in the state plan were used to provide a context for the hazards identified in the update of the County’s plan. The state mitigation strategy was examined to determine if any specific mitigation steps had a direct effect upon the County and if those mitigation steps should be incorporated into the County plan update.

The hazards and the assessments identified by the state plan that were of interest to the County included:

- Severe Weather Events
- Wildland and Rangeland Fire
- Drought
- Dam Failure
- Transportation and Hazardous Material Incidents
- Terrorism, Violence, Civil Unrest, and Cyber Security
- Flooding

Other hazard planning documents available for Fallon County include, Fallon County Library Disaster Plan, South Sandstone Creek Emergency Plan, Montana Hazmat Response Plan, Bison Pipeline Emergency Information Book, and the Fallon County Courthouse Emergency Procedures and are available from the Fallon County DES Office

2017 Fallon County Growth Policy: The 2017 County Growth Policy contains narrative explaining that development within the Special Flood Hazard Area (SFHA) is restricted by the Floodplain Ordinance, which is included in the Fallon County Subdivision Regulations.

4.0 Hazard Profiles and Risk Assessment

The Hazard Profile and Risk Assessment chapter provides a detailed description of the hazards in Fallon County. This Hazard Assessment section examines natural and man-made hazards that could impact the residents of the county and contains estimates of potential losses for each hazard where data are available.

This chapter identifies the following:

- Hazards to which Fallon County are susceptible
- Updated documentation of historical occurrences of these hazards from 2013
- What effects the hazards can have on the County’s physical, social, and economic assets
- Which areas of the County are most vulnerable to damage from these hazards
- Estimated costs of damage from previous occurrences within the County

Hazards in the County were identified through meetings and discussions with community members (County Commissioners, City officials, public surveys, and the County DES Coordinator) as well as the review of past disasters, planning documents, other plans, newspapers, and the State of Montana Multi-Hazard Mitigation Plan and Statewide Hazard Assessment.

According to records kept by FEMA, since 2000, there have been eight federal disaster declarations that have affected Fallon County, listed below in Table 11.

Table 11 – Fallon County Federal Disaster Declarations since 2000

Year	Disaster Number	Disaster Name
2000	1350	Severe Winter Storms
2000	1340	Wildfires
2005	3253	Hurricane Katrina Evacuation
2008	1767	Severe Winter Storm
2011	1996	Severe Storms and Flooding

2016	4275	Tornado
2020	3476	Covid-19
2020	4508	Covid-19 Pandemic

In the State and Local Mitigation Planning-How to Guide, FEMA identifies eleven major hazards to be considered in the development of a Pre-Disaster Mitigation Plan. Of these eleven major hazards, Fallon County identified seven natural and man-made hazards that have the greatest potential to affect people, environment, economy, and property of the county. These hazards are listed in Table 12, with the current ranking as well as the ranking listed in the 2013 PDM.

There are many hazards listed in the guide that are not addressed in this Update. The hazards listed below were not applicable to the County, and therefore left out of the plan due to negligible risks.

- Landslide and Avalanche
- Volcanic Ash
- Disease (Public Health, Agriculture and Wildlife)
- Earthquake

Risk assessments were completed using the Calculated Priority Risk Index (CPRI) methodology, qualitative analysis based on the experience of the planning team and LEPC and finally, analysis using GIS data if available. The CPRI ranking is also listed in Table 12, for each hazard and was used by the Planning team to rank each hazard. The CPRI, originally developed by the University of Minnesota, ranks the hazards based on four categories, probability, magnitude/severity, warning time, and duration, then applies a weighted factor to each. The planning team evaluated the ranking after the CPRI was calculated and agrees with the ranking, and hazard scores. A full description of the CPRI calculation, as well as the full matrix completed by the planning team can be found in Appendix D. In 2013, the CPRI was not utilized when ranking hazards, and is a primary reason for the changes to ranking, that and for recent occurrences like the 2016 Tornado.

Table 12 – Fallon County Hazards

2021 Ranking	Hazard	CPRI Ranking	2013 Ranking
1	Severe Winter/Summer Weather:		
	Hail	3.45	5
	High Winds	3.05	
	Tornado	2.65	
	Severe Winter:	2.70	
2	Wildland and Rangeland Fire	3.15	2
3	Drought	3.10	3
4	Dam Failure ¹	2.80	4
5	Transportation and Hazardous Material Incidents	2.75	1
6	Terrorism, Violence, Civil Unrest, and Cyber Security ²	2.0	NA
7	Flooding	1.85	4

Notes:

1. Dam failure was included as part of flooding in the 2013 plan but is now profiled separately.
2. Terrorism, Violence, Civil Unrest, and Cyber Security were not profiled as a hazard in 2013 Plan.

The Spatial Hazard Events and Losses Database for the United States (SHELDUS) was utilized at the county level to assess risk and vulnerability of specific hazards. The database covers natural hazards such as thunderstorms, floods, wildfires, tornadoes, heavy rainfall, hail, etc. The database is updated frequently, with the most recent update on November 20th, 2020. Where available, SHELDUS data is presented for each hazard including both frequency of occurrence and loss data.

It should be noted that the risk assessments presented in this plan are a general representation of risk and are only as accurate as the data that are available. Even when data are available, the best methodology for assessing risk can carry inherent issues. For example, when evaluating structures impacted by a hazard, the CAMA parcel dataset is used, but does not spatially recognize where the structure is, and therefore does not account for the structure itself being outside the hazard area. Despite the structure not being separated spatially, the actual value of the land and the structure is differentiated in the data.

Below is a narrative for each hazard, historic occurrence, probability, magnitude, vulnerability, area of impact and potential loss estimates, if available.

4.1 Severe Weather

Severe Weather events can occur at all times of the year and are common for Fallon County. They can occur quickly or last several days. Modeling after the Montana State MHMP hazard listing, severe summer and winter weather have been combined into one hazard profile and includes many subcategories. Severe weather hazards include heavy snow, thunderstorms, tornadoes, hailstorms, and high winds.

Severe Winter Weather:

Winter storms and blizzards follow a seasonal pattern that begins in the late fall and lasts until early spring. These storms have the potential to destroy property and kill livestock and people. Winter storms can be categorized as sleet, ice storms, freezing rain, heavy snowfall, or blizzards. Severe winter storms create conditions that disrupt essential regional systems such as public utilities, transportation routes, and communication systems. Motorists can become stranded and subjected to extreme temperatures. Access to medical attention can also be compromised.

Severe Summer Weather:

A thunderstorm, also known as an electrical storm, a lightning storm, thundershower, or simply a storm, is a form of weather characterized by the presence of lightning and its acoustic effect on the Earth's atmosphere known as thunder. Thunderstorms are usually accompanied by strong winds, heavy rain and sometimes snow, sleet, hail, or no precipitation at all. Those which cause hail to fall are known as hailstorms. Thunderstorms may line up in a series or rain band, known as a squall line.

Thunderstorms can generally form and develop in any geographic location, perhaps most frequently within areas located at mid-latitude when warm moist air collides with cooler air. Thunderstorms are responsible for the development and formation of many severe weather phenomena. Thunderstorms, and the phenomena that occur along with them, pose great hazards to populations and landscapes. Damage that results from thunderstorms is mainly inflicted by downburst winds, large hailstones, and flash flooding caused by heavy precipitation. Stronger thunderstorm cells are capable of producing tornadoes and waterspouts.

Tornadoes are defined as a violently rotating column of air, commonly called a funnel cloud, that comes in contact with the ground. Tornadoes typically come from a severe thunderstorm and can have concentrated wind speeds of 300 mph or more.

High wind or Microbursts are common with severe weather events; but they can also happen as isolated events. High winds typically develop with strong pressure gradients and gusty frontal passages. These winds are common in Eastern Montana and can cause damage.

Hail ranked the highest on the CPRI largely due to the frequency of the event, as well as the subsequent damage caused. Hail develops when supercooled water droplets collect a layer of ice and continue to grow, sustained by the updraft. Once the hail stone can no longer be held by the updraft, it falls to the ground. Hail one inch in diameter is considered “severe” by the National Weather Service.

4.1.1 Historic Occurrences

Severe weather in summer and winter is generally expected in Fallon County. In 2016, there was an EF 3 tornado, matching the strongest tornado ever recorded in the State. Recorded weather events between 7/19/1952 – 3/30/2021 on the National Climate Data Center (NCDC) website include the following:

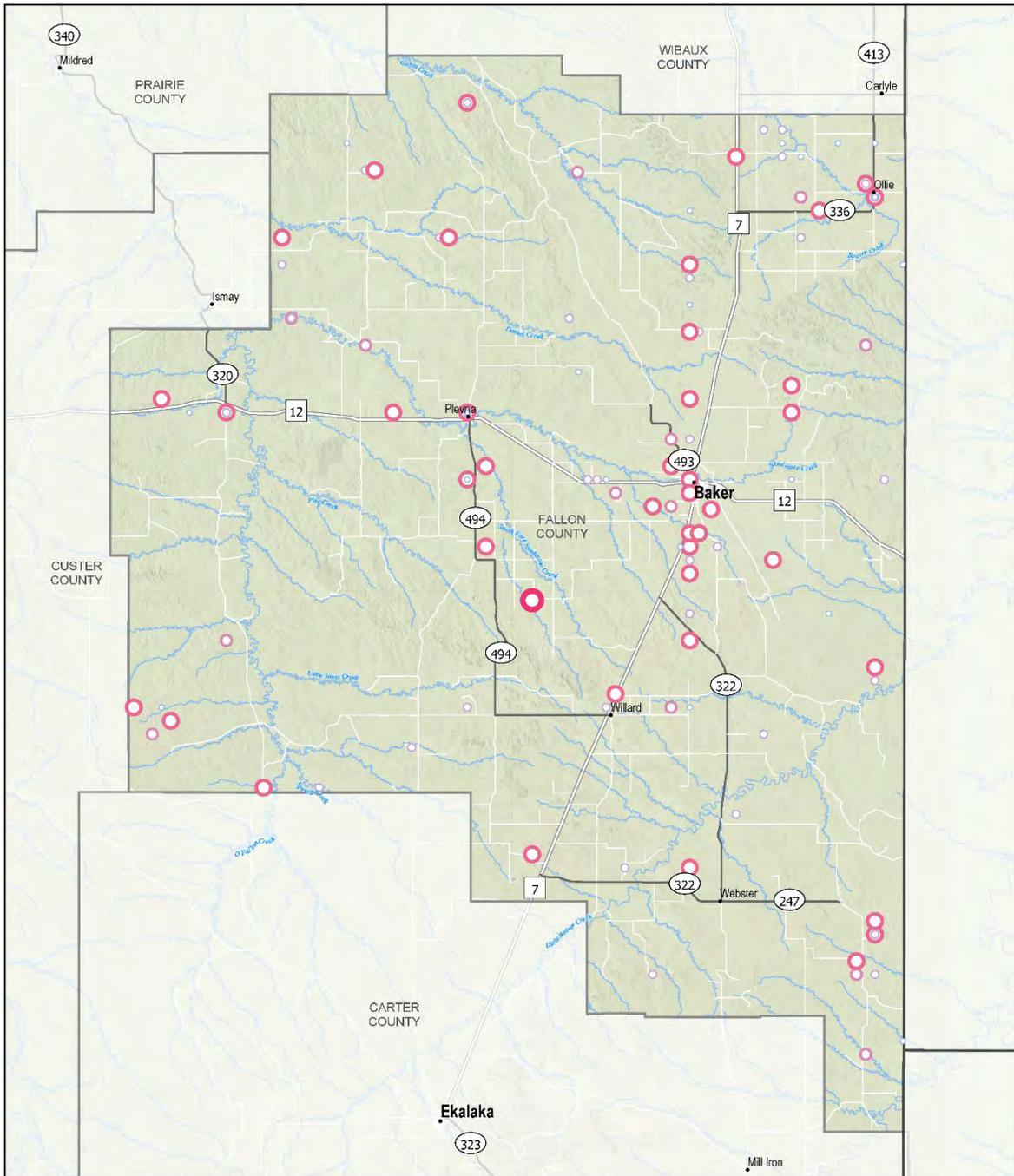
Table 13 – Recorded Weather Events in Fallon County

Type	# of Events	Notes
Blizzard	19	
Extreme Cold/Wind Chill	4	
Flooding	15	Includes flash floods
Funnel Cloud	12	No known damaged reported
Hailstorm	167	4 inch golf balls were recorded on July 11, 1981.
Heavy Rain	5	
Heavy Snow	15	
High Wind	52	
Ice Storm	3	
Thunderstorm with Wind	88	A recorded magnitude of 86 kts on June 1, 2005.
Tornado	14	In 2016, an F3 tornado was reported, with estimated damage of over \$1million. Tornado in Montana’s History. F2 reported on June 7, 1999 and July 25, 2001.
Winter Storm	22	

Notes:

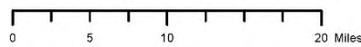
1. Data retrieved from NCDC
2. Only reflects data found in the NCDC database

Figures 3 and 4 show previous occurrences of both Hail and Tornadoes within Fallon County according to data provided by NWS.



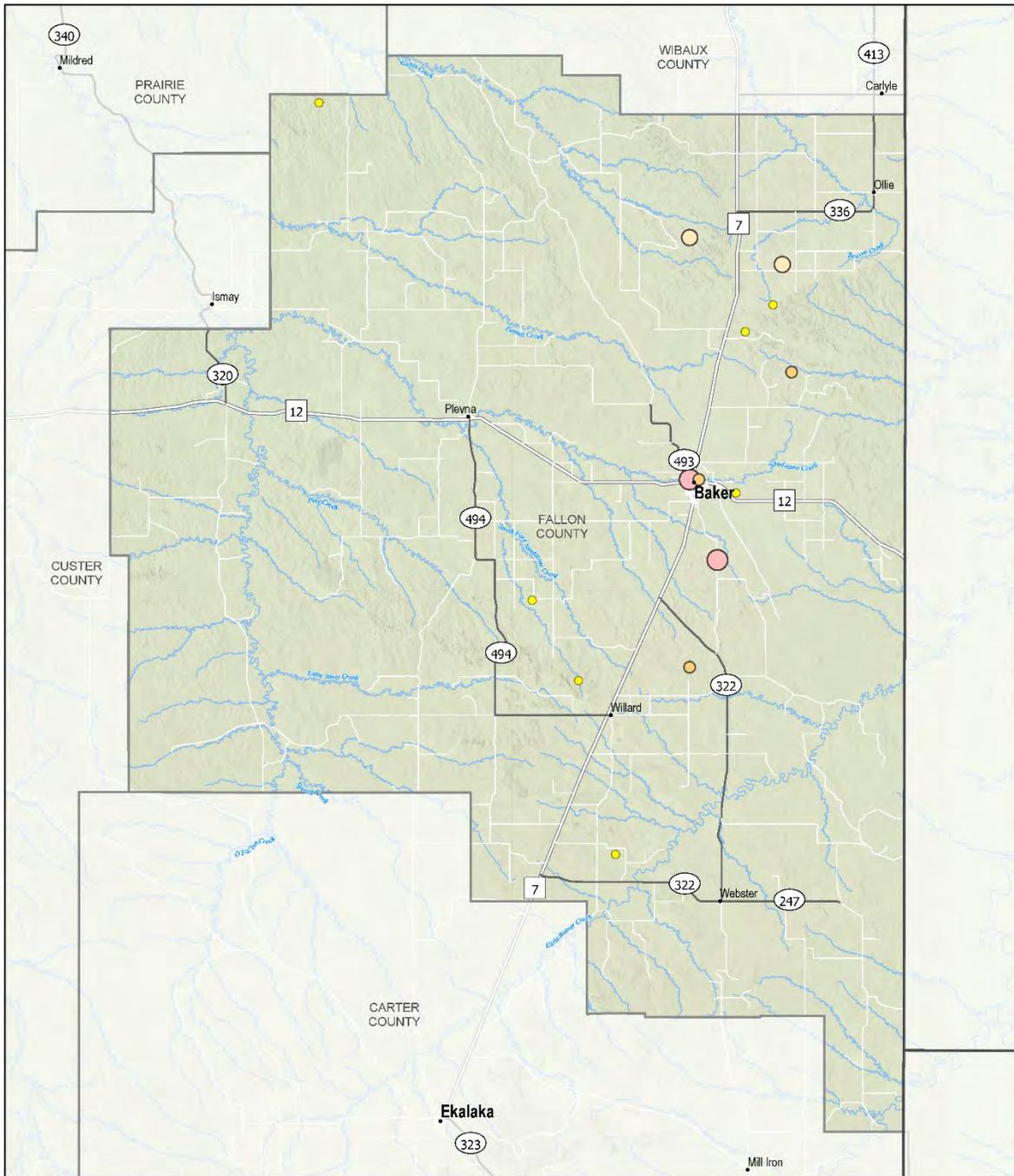
- Hail Events**
- Super Hailstorm >3 inches
 - Destructive >1.5 inches
 - Severe >1 inch
 - Significant > .75 inch
 - Potentially Damaging <.74 inch

Hail Event Locations & Severity Fallon County, MT



**Hail event data was provided by Esri's Federal User Community & NWS*

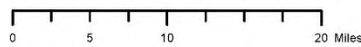
Figure 3 – Hail Event Locations and Severity in Fallon County



Tornado Occurrences (1952-2019)

- Incredible Damage
- Devastating Damage
- Severe Damage
- Considerable Damage
- Moderate Damage
- Light Damage

Tornado Event Locations & Severity Fallon County, MT



*Tornado event data was provided by Esri's Federal User Community & NWS

Figure 4 – Tornado Event Locations and Severity in Fallon County

On May 21, 2008, Governor Brian Schweitzer requested that the President issue a major disaster declaration due to severe storm/snowfall, ice, and high winds during the period of May 1- 2, 2008 in southeast Montana. Subsequently, President Bush declared that a major disaster existed in the State, making Public Assistance available for emergency work and the repair and replacement of facilities damaged by the severe winter storm in Carter, Custer, Fallon, and Powder River Counties. The primary impact of the storm was to utilities. This event had a total damage of \$4,357,468 which included labor from Southeast Electric Coop of 5,050 hours.



Figure 5: Home destroyed from the 2016 Tornado in Baker

According to the 2018 State of Montana MHMP, in 2016 six people were injured, and a number of homes were damaged in June of that year after an EF3 tornado touched down in Baker. The tornado lasted about 10 minutes and travelled approximately half a mile. At least six homes were destroyed and more than 50 were damaged. Estimated damages were more than \$1 million.

4.1.2 Probability and Magnitude

Based on the Calculated Priority Risk Index, the probability and magnitude of severe weather are listed below in Table 14.

Table 14 – Probability and Magnitude of Severe Weather in Fallon County

Hazard	Probability	Magnitude/Severity
Severe Winter Weather	Likely	Limited

Hazard	Probability	Magnitude/Severity
Severe Summer Weather	-	-
Hail	Highly Likely	Catastrophic
High Winds	Highly Likely	Critical
Tornado	Possible	Critical

As seen in the provided data, severe weather is common in Fallon County and the occurrence of such events is common throughout the year. Whether it is blizzards, thunderstorms, or another form of severe weather, these events will continue to occur and cause damage and threaten lives.

4.1.3 Vulnerability and Area of Impact

Severe weather events can cause agricultural loss, loss of utilities and telecommunications, property damage, and injuries, and possibly fatalities. The threat of severe weather in Fallon County is assumed to be uniformly applied across the County. Table 15 summarizes the data from the Spatial Hazard Events and Losses Database for the United States (SHELDUS) from the period of 1979 to 2019.

Table 15 – Potential Loss Impacts from Severe Weather in Fallon County

Begin Date	Hazard Type	State	County	Injuries	Fatalities	Property Damage	Crop Damage
Jul. 1979	Tornado	MT	Fallon	0	0	\$50,000	\$0
Jul. 1981	Hail	MT	Fallon	0	0	\$50,000	\$50,000
Aug. 1981	Wind - Hail	MT	Fallon	0.3	0	\$5,000	\$50,000
Sept. 1982	Winter Weather	MT	Fallon	0	0	\$2,777.78	\$2,777.78
Sept. 1983	Winter Weather – Severe Storm/Thunderstorm	MT	Fallon	0	0	\$1,315.79	\$131.58
Apr. 1984	Winter Weather - Wind	MT	Fallon	0	0	\$35,714.29	\$35.72
Feb. 1988	Wind	MT	Fallon	0	0	\$89.29	\$0
Dec. 1988	Wind	MT	Fallon	0	0	\$7,142.86	\$714.29
Feb. 1989	Winter Weather	MT	Fallon	0	0	\$87,719.30	\$87.72
Apr. 1989	Winter Weather	MT	Fallon	0	0	\$128.21	\$0
Jul. 1990	Hail	MT	Fallon	0	0	\$5,000	\$50,000
Nov. 1990	Wind	MT	Fallon	0	0	\$13,513.51	\$0
Aug. 1992	Winter Weather	MT	Fallon	0	0	\$877.19	\$0
Sept. 1992	Wind - Severe Storm/Thunderstorm	MT	Fallon	0	0	\$1,666.67	\$0
Oct. 1992	Winter Weather	MT	Fallon	0	0	\$217.39	\$0
Dec. 1992	Winter Weather	MT	Fallon	0	0	\$200	\$0
Aug. 1993	Hail	MT	Fallon	0	0	\$5,500	\$5,500
Aug. 1993	Severe Storm/Thunderstorm	MT	Fallon	0	0	\$500	\$500
Dec. 1993	Winter Weather	MT	Fallon	0	0	\$7,142.86	\$0

Begin Date	Hazard Type	State	County	Injuries	Fatalities	Property Damage	Crop Damage
Feb. 1994	Winter Weather	MT	Fallon	0	0	\$8,771.93	\$0
Jan. 1995	Winter Weather	MT	Fallon	0	0	\$156.25	\$0
Jul. 2000	Wind - Severe Storm/Thunderstorm	MT	Fallon	0	0	\$1,500	\$0
Jun. 2016	Tornado	MT	Fallon	7	0	\$1,500,000	\$0
Jul. 2016	Hail	MT	Fallon	0	0	\$1,000,000	\$0
TOTAL				7.3	0	\$2,784,933.32	\$159,747.09

Notes:

1. Data retrieved from SHELUDS

Winter storms can have a number of potential effects to residents in Fallon County. These include loss of human life and other human risks – hypothermia, stranded motorists, heart attack from over exertion, damage to electric transmission facilities and power outages, livestock and crop loss, road closures, business interruption, vehicle accidents, overtime for law enforcement and emergency personnel, structural damage to buildings, water and sewer lines. These impacts can be very costly to rural and emergency services, county resources, private individuals and businesses, insurance groups and government assistance programs.

According to the 2018 State of Montana Multi-Hazard Mitigation Plan, between 1880 to 2017, Montana had seven deaths and at least 77 injuries from tornados. In the past 60 years, severe summer weather has caused \$51.5 million in property damage and \$26.3 million in crop damage.

4.2 Wildland and Rangeland Fire

Wildland and rangeland fires are described as “any fire occurring in grassland, forestland, or other vegetation types found in rural or wilderness areas, regardless of ignition sources, damages or benefits. Three factors influence extreme wildland fire behavior: weather, topography, and fuel. These components affect and increase the likelihood of a fire starting, the speed and direction at which a fire will travel, the intensity at which it burns, and the ability to control and extinguish it.” (MT MHMP, 2018)

The vegetation of Fallon County is mainly mixed-grass prairie and a few trees, with the exception of small timbered tracts, scattered pine on some of the uplands, and various trees and shrubs along drainages. Dryland crops cover approximately 241,326 acres of land and over 45,000 acres are in the Conservation Reserve Program. There is a 250 acre patch of timber eight miles south of Plevna and 10 to 20 miles south of Plevna is a timbered section of land.

Fallon County has five unique wildfire severity factors that include: presence of hydrocarbons, wind, low precipitation, limited access to water, and amount of acreage enrolled in the Conservation Reserve Program.

4.2.1 Historic Occurrences

In conjunction with the 2005 Pre-Disaster Mitigation Plan, a Community Wildlife Protection Plan (CWPP) was completed for the County. According to the CWPP, wildfire history was gathered using local histories, county commissioners, the public, fire chiefs, the fire warden, the county dispatch center, the National Fire Incident Reporting System (NFIRS) database, USDA disaster declarations, FEMA disaster declarations, the Bureau of Land Management (BLM), the Department of Natural Resources and Conservation (DNRC), the National Climate Data Center (NCDC), and SHELUDS.

The following was taken from excerpts of an August 11, 1910 letter of Theodore R. Bergstrom in Homesteading in Fallon County, "This afternoon we have been fighting prairie fires and nothing else. Burned a lot of hay in bunches, one wagon and rack, and one mower." "Fires at that time were as numerous as times were hard" states the Plevna, Montana-75 Years history referring to 1927 and the Great Depression years.

The County Fire Warden and fire chiefs were queried about the average number of fires per year and average fire size. The fire chiefs have been in their positions many years and the fire warden although younger, has years of experience serving on the Plevna Department as a volunteer fireman. Together they estimated that they respond to approximately 100 fire calls a year. The most frequent fire size is less than 10 acres and the average fire size was estimated at approximately 60 acres. The County Dispatch Center was able to research records for call outs for the past several years. The dispatch center provided the following information.

Table 16 – Fire Callouts Reported by County Dispatch

Calendar Year	Department			
	Plevna-all	Plevna-Rural	Baker	Baker Rural
	Number of Callouts			
2013			8	40
2014			13	26
2015		4	15	34
2016		7	19	59
2017		6	12	39
2018		12	13	40
2019	7	7	13	39
2020	11	11	6	28
2021	18	18	8	41

Notes:

1. Data retrieved from: Dispatch Center Supervisor, and Incident Reports from Departments

There are reports of the DNRC assisting Fallon County in 1991 on the 1,083-acre grass and timber Palm Rach fire. There are also records of the DNRC assisting on the 2,500-acre Miles City Creek fire in 2000. There are no additional records of the DNRC assisting in fire containment in Fallon County.

According to the CWPP, the 1999 20-acre Lawrence Fire is the only fire on record occurring on BLM lands in Fallon county.

The NFIRS reported nine fires in 2003 with a total loss of \$14,400. One was a building fire, five were other fires, one was a severe weather or natural disaster call, and two were false calls. Three fires were reported in 2004, one building fire and two other fires. Total loss was \$8,100. NFIRS data was provided by Mike Stotts, Montana Department of Justin).

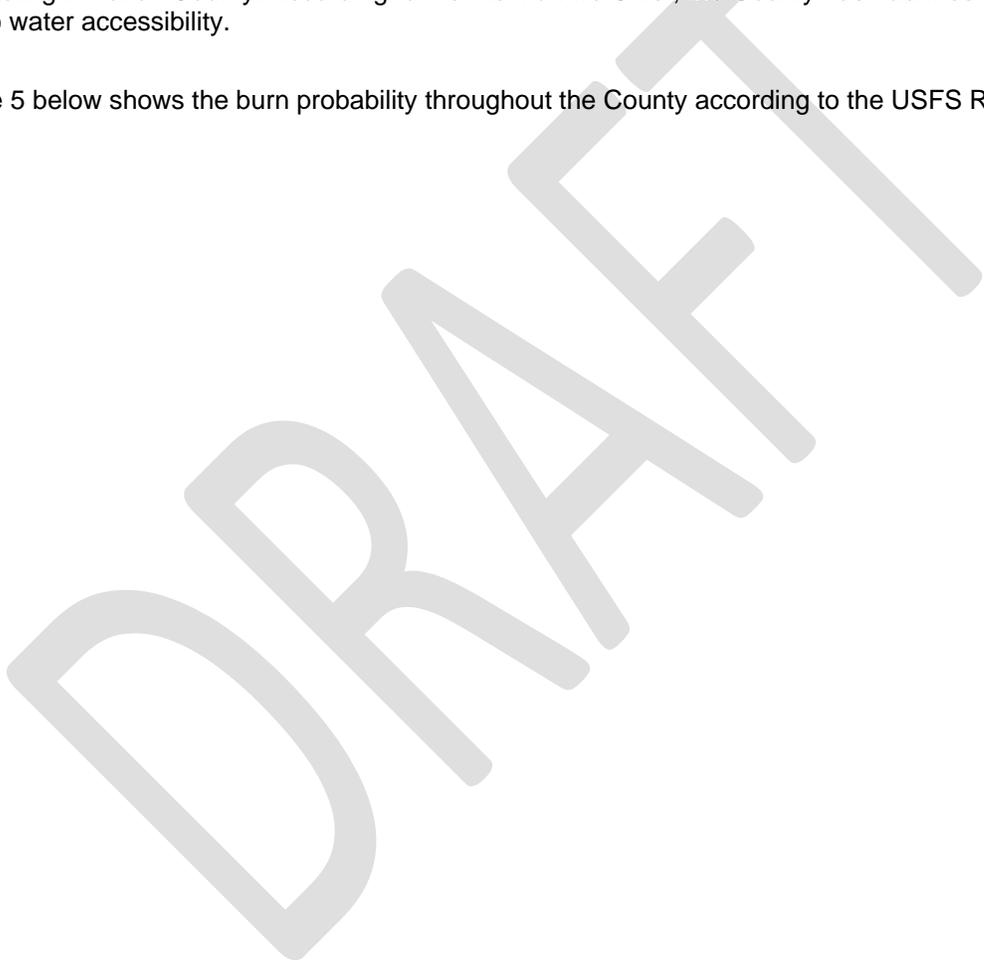
The SHELDUS database has two reports of wildfires in Fallon County. The fires occurred in August and September of 1994. No injuries or fatalities occurred, but property damage totaled \$8,772 and crop damage at \$877.

4.2.2 Probability and Magnitude

The planning team ranked the probability of wildland and rangeland fire occurring in Fallon County as “Highly Likely” with critical magnitude/severity and limited economic impact.

The presence of hydrocarbons offers the possibility of leaks, fires, and explosions which would require the fire departments assistance. Though oil well blowouts, leaks, and fires at manufacturing facilities are not likely, they remain an ever-present possibility. Fighting hydrocarbon fires requires specialized knowledge and experience and presents unique safety issues. According to the City of Baker Fire Chief, winds remain at an almost constant across the county; averaging 25 mph. Wind can dry vegetation throughout the year as well as increase fire severity and spread. Considering Fallon County’s limited precipitation and recent drought, the risk of fire has greatly increased. Under these dry conditions the potential exists for large fires with rapid spread. Finding adequate water sources for fire suppression is changing in Fallon County. According to the Plevna Fire Chief, the County has had fires rapidly spread due to water accessibility.

Figure 5 below shows the burn probability throughout the County according to the USFS Region 1 data.



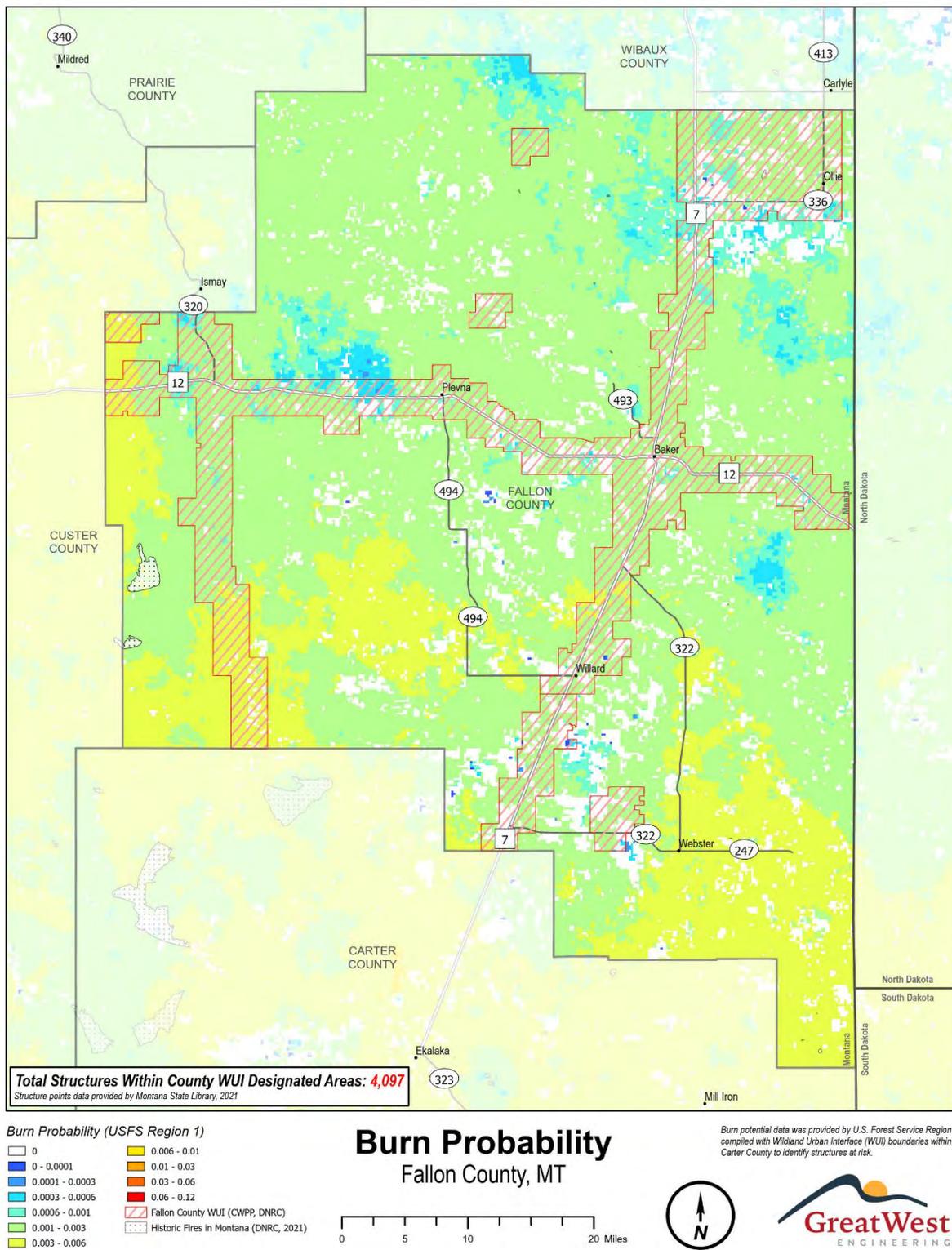


Figure 6 – Burn Probability in Fallon County

4.2.3 Vulnerability and Area of Impact

Fallon County wildland fires are mostly caused by lightning strikes. Other sources of fire ignition are roads/vehicles, railroad, powerlines, oil field activities, farm equipment, recreationalist, and fireworks.

Potential losses due to wildland fire include losses to crop and rangeland, livestock, homes and other infrastructure, and human life.

The Wildland Urban Interface is defined as the area where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuel. The WUI Boundary is outlined on Figure 5. Using the State of Montana's Computer Aided Mass Appraisal (CAMA) database, there are 4,097 structures within Fallon County that lie within the WUI boundary.

4.3 Drought

Drought is an extended period of time defined by a deficiency in precipitation, which occurs usually for an entire season or longer. Drought is a normal, recurrent feature of climate, and occurs in virtually all climatic zones, but the characteristics can vary from one region to another. Drought can diminish natural stream flow, damage crops and other ground cover, deplete soil and reduce subsoil moisture.

Indirect effects of drought are plant and low forest fuel moistures which increase the potential for wildland and rangeland fires. Insect infestation and plant disease increase with drought and can cause damage to the agricultural economy.

4.3.1 Historic Occurrences

Research shows that there has not been another drought in the U.S. as extensive and prolonged as the drought in the 1930's. Other dry periods not as prolonged as the 1930, included drought in the middle 1950's, early 1960's, mid- 1970's, and the 1980's. According to the National Integrated Drought Information System, Fallon County is currently experiencing its third driest year to date in 127 years recorded, with 5.15 inches less precipitation than the norm.

Fallon County has been in severe or extreme drought 10 to 15 percent of the time in the years 1895 – 1995, based on the Palmer Drought Severity Index.

In what is referred to as the drought of 2017, 22 percent of the state of Montana was in severe or exceptional drought. Fallon County was in severe drought.

In the summer of 2021, the National Weather Service declared it the 7th driest year to date in the past 127 years for Fallon County. Montana Governor Greg Gianforte issued an executive order declaring a statewide drought emergency, stating "these alarming drought conditions are devastating our ag producers, challenging our tourism industry and could bring a severe wildfire season."

4.3.2 Probability and Magnitude

The Planning team ranked drought as "Highly Likely" with critical magnitude/severity and economic impact.

Based on historic events, and the current conditions, Fallon County will continue to have a high probability of drought in the future. According to the National Integrated Drought Information System, 100 percent of the County is currently in a classified extreme drought, and 42.85 percent is classified as being in an exceptional drought. In an extreme drought, crops are not harvestable, the winter pasture is often

opened for grazing, and the soil develops large cracks. Cattle can also have very little water and farmers are forced to bring in water for them, buy supplemental feed, cull their cattle stock, and sell early. In an exceptional drought, pasture loss is often widespread, and crops are destroyed.

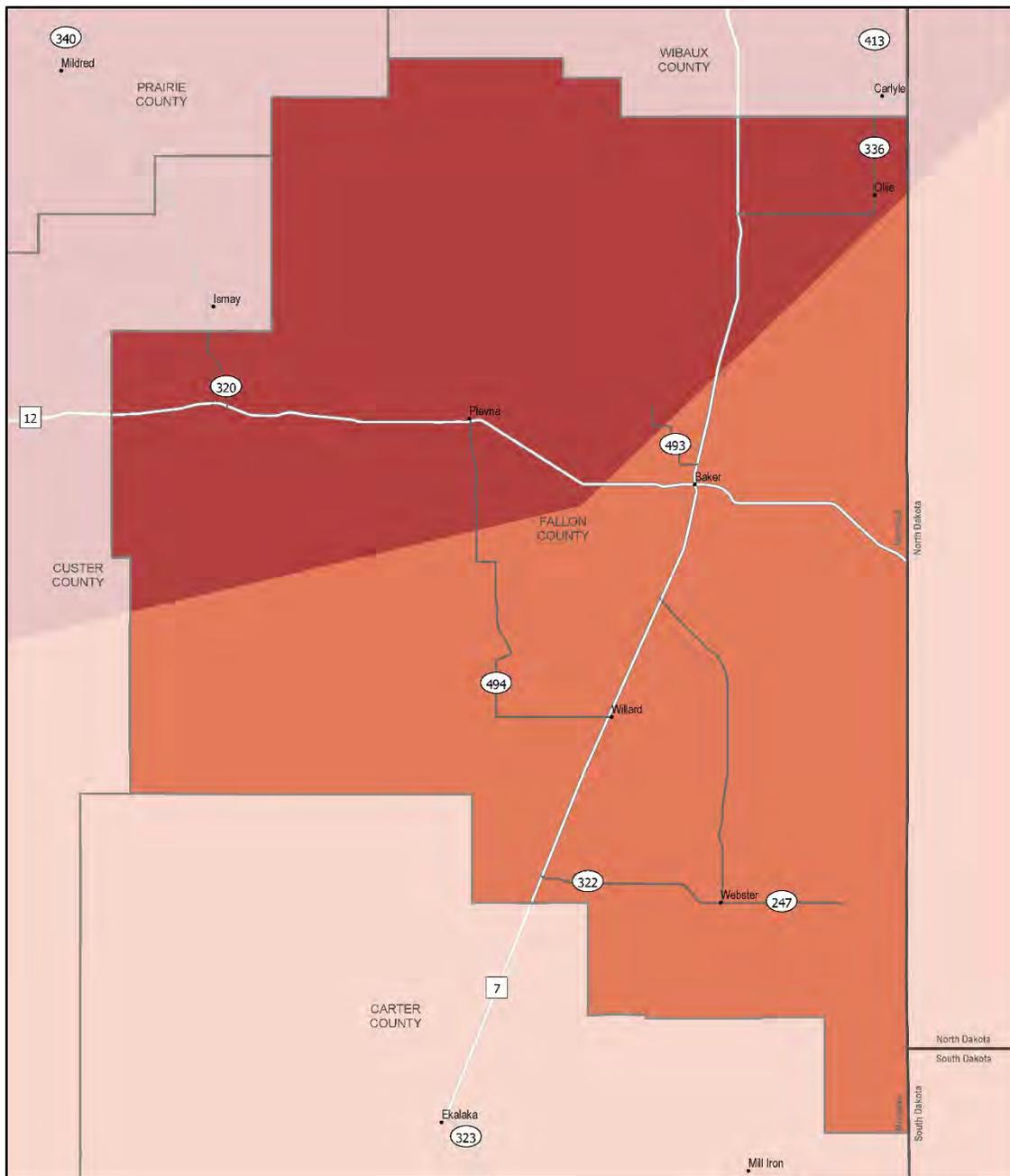
Definitions of various drought levels according to the U.S Drought Monitor are outlined below in Table 17.

Table 17 – Drought Level Definitions

Drought level	Description
D0 - Abnormally Dry	Soil moisture is low; dryland crop germination is poor; pastures are dry. Fire danger increases. Streamflow is low, affecting recreational fishing.
D1 – Moderate Drought	Producers feed livestock supplemental hay; crops are stressed, and growth is poor. Fire restrictions are implemented.
D2 – Severe Drought	Hay and crop yields are low; hay quality is poor; subsoil moisture is nonexistent. Fire county and danger are high; air quality is poor, with dust and smoke. Livestock ponds are low or dry; water quality is monitored; wells are stressed.
D3 – Extreme Drought	Crops are no harvestable; winter pasture is opened for grazing; soil has large cracks; fields are bare. Cattle have very little water; producers are hauling water and buying supplemental feed, culling cattle, and selling early. Fire restrictions increase.
D4 – Exceptional Drought	Pasture loss is widespread; crops are destroyed. Property is closed for hunting. Fire risk is extremely high; fires are widespread.

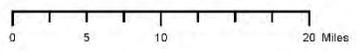
Notes:

¹. Data retrieved from: <https://www.drought.gov/states/montana/county/fallon>



- Current Drought Conditions**
- Abnormally Dry
 - Drought - Moderate
 - Drought - Severe
 - Drought - Extreme
 - Drought - Exceptional

Drought Severity
Fallon County, MT



Drought intensity data was provided by NOAA's National Integrated Drought Information System (NIDIS). Data shown refers to current conditions as of August 30, 2021.

Figure 7 – Fallon County Drought Severity Map

4.3.3 Vulnerability and Area of Impact

The side effects of drought include reduced crop yield, diminished rangeland, lower livestock productivity, increased insect and plant disease damage, increased fire hazards, impacts on surface and groundwater, and damage to wildlife and fish habitat. Economically, drought reduces income for farmers and ranchers, income for local retailers, increased credit risk for financial institutions, can reduce the County work force and cause out-migration. The vulnerability to drought is expected to be uniform across the County.

Table 18 – Potential Loss Impacts from Drought in Fallon County

Year	Hazard Type	State	County	Crop Indemnity Payment
1989 to 2000	Drought	MT	Fallon	\$877,412.00
2001	Drought	MT	Fallon	\$68,797.00
2002	Drought	MT	Fallon	\$1,418,024.00
2003	Drought	MT	Fallon	\$120,316.00
2004	Drought	MT	Fallon	\$1,916,389.00
2005	Drought	MT	Fallon	\$5,996.00
2006	Drought	MT	Fallon	\$285,371.00
2007	Drought	MT	Fallon	\$20,556.00
2008	Drought	MT	Fallon	\$460,187.00
2009	Drought	MT	Fallon	\$33,837.00
2010	Drought	MT	Fallon	-
2011	Drought	MT	Fallon	\$855.54
2012	Drought	MT	Fallon	\$2,811,001.87
2013	Drought	MT	Fallon	-
2014	Drought	MT	Fallon	\$42,484.80
2015	Drought	MT	Fallon	\$200,103.59
2016	Drought	MT	Fallon	\$1,225,713.44
2017	Drought	MT	Fallon	\$2,618,593.38
2018	Drought	MT	Fallon	\$6,545.00
2019	Drought	MT	Fallon	\$109.00
Total				\$12,112,291.62

Notes:

¹: Data retrieved from SHEL DUS

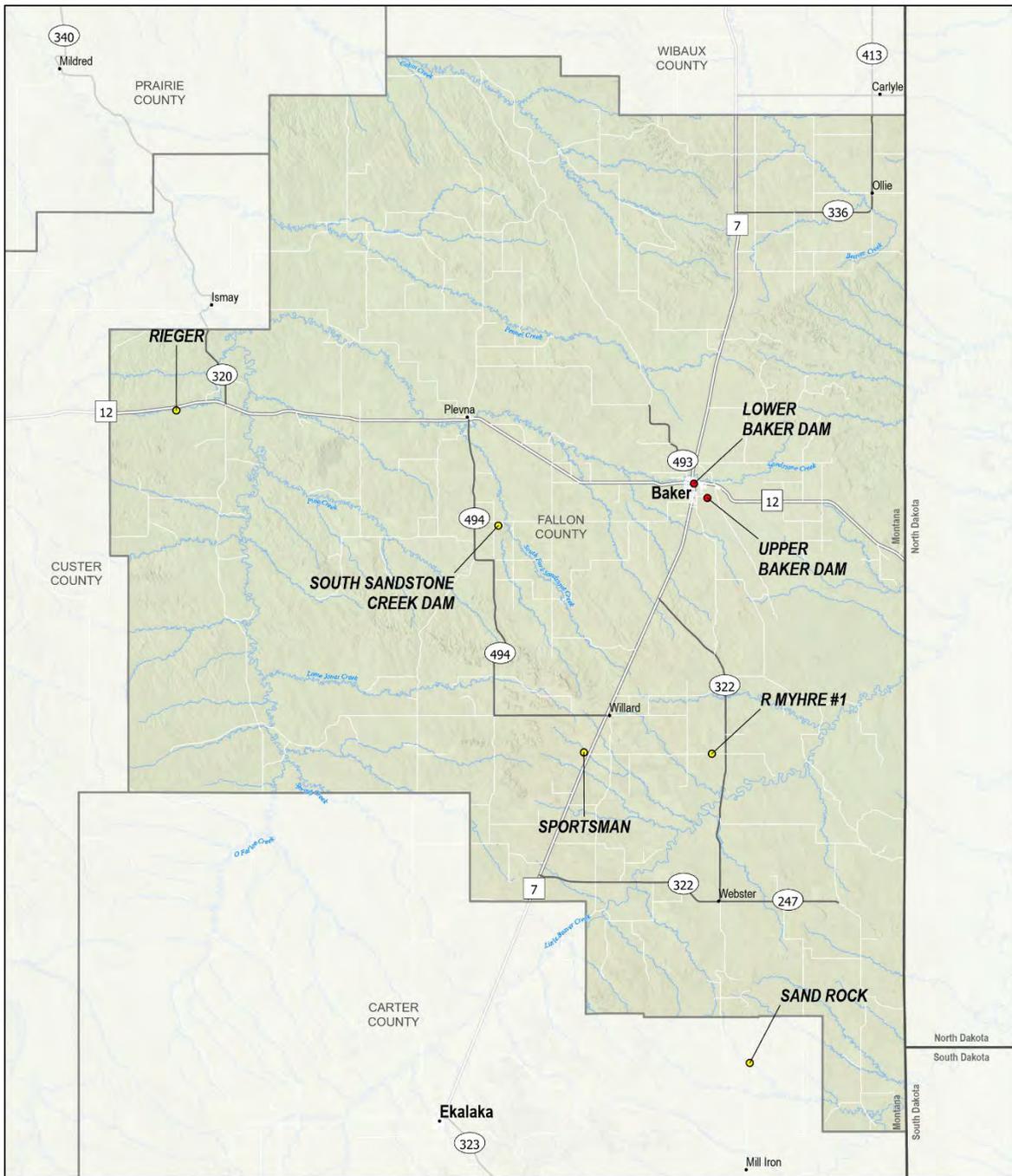
According to the 2018 State Plan, from 1989 to 2014, Fallon County has been ranked among the top four Counties with the highest insurance claims related to Drought. In 2004, total drought insurance claims in the county were \$1,916,447 and in 2012 totaled \$2,808,571.

4.4 Dam Failure

Fallon County has a total of 37 dams. They are classified as two high hazard dams, four significant dams, and 31 low hazard dams. Information on dams is presented visually on the National Inventory of Dams website, maintained, and published by the Army Corps of Engineers (USACE). Classification of dams is based on the potential loss of life, and property damage in the event of a dam failure. Upper Baker Dam and Lower Baker Dam are both considered to be high hazard dams, according to the USACE and are located in Baker, MT. Both dams have Emergency Action Plans as required by their hazard classification. The Lower Baker Dam was built in 1930, and is 23 feet in height, and stores 1,100 acre feet of water. The Upper Baker Dam was built in 1975, is 20 feet in height, and stores 200 acre feet of water.

The locations of high and significant hazard dams are shown in Figure 7 below.

DRAFT



Dam Failure - Risk Classification Fallon County, MT

- Dam Hazard (ACE, 2020)**
- High Risk
 - Significant Risk

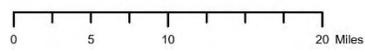


Figure 8 – Dam Failure Risk Classification for Fallon County

4.4.1 Historic Occurrences

There have been no recorded instances of dam failure in Fallon County.

4.4.2 Probability and Magnitude

Dam failure is ranked as an “Unlikely” event having catastrophic magnitude/severity and economic impact, according to the CPRI.

According to the Upper Baker Dam EAP, there are no indications of dam instability and the dam appears to be in good condition.

The magnitude of a dam failure would be catastrophic. Based on the analysis done as part of the Upper Baker Dam EAP, the following critical points are listed below with the associated flood depths.

Table 19 – Flood Depths at Critical Points

Critical Point	Arrival Time ¹ . (minutes)	Maximum Water Depth (ft.)
Highway 7	30	6.2
Bank of Baker	39	5.2
Lower Baker Dam	42	3.4
Superior Care Assisted Living Facility	60	2.0
Highway 12	60	4.0
Roy's Motel	64	3.0
Baker Fire Station	66	4.4
Sagebrush Inn and Red Roof Inn & Suites	65	3.4

Notes:

1. Estimated time of arrival for breach to travel from dam to downstream locations
2. Basis for computation of inundated area and flooding depth
3. Breach inundation study completed by HDR – August 2019
4. Hydraulic model used: HEC-RAS 5.0.6 routing TR-60 (peak discharge); TR-66 (hydrograph)

4.4.3 Vulnerability and Area of Impact

Based on the EAP, the evacuation area for Upper Baker dam extends for approximately nineteen and one-half (19.5) miles along a tributary of Sandstone Creek. Currently, it is estimated that there are more than 65 homes or structures in the vicinity of Baker that could be potentially affected by flooding due to problems occurring at the dam. For full inundation area, inundation maps can be found in Appendix F.

4.5 Hazardous Material Incidents and Transportation Accidents

Fallon County has two major highways that intersect in the City of Baker, as well as a BNSF railway, an airport, and pipelines that help transport people and goods. Hazardous materials and transportation accidents are combined as one hazard as they often occur simultaneously. This transportation network is vital to the economy in Fallon County, but also creates the additional hazard of a hazardous material incident as hazardous materials are constantly being transported through the County.

Hazardous materials are chemical substances, which if released or misused can pose a threat to the environment or health. Hazardous materials come in the form of explosives, flammable and combustible substances, poisons, and radioactive materials. These substances are most often released as a result of transportation accidents or because of chemical accidents in plants (Montana MHMP, 2018).

The hazard is defined by the type of hazardous material and the exposure potential. There are several fixed facilities within Fallon County that include non-mobile machinery, tank batteries, oil and gas wells, manufacturing plants, compressor stations, anhydrous ammonia facilities, the wastewater treatment facility in Baker, and smaller facilities such as gas stations, farm and ranch supply facilities. There are four railroad crossings in the City of Baker and three in the Plevna area. According to the U.S Freight Railroad Industry, “one train can carry as much freight as several hundred trucks”, 104.62 million tons of freight originated, terminated, or passed through Montana which is an equivalent of about 5.8 million large trucks.

4.5.1 Historic Occurrences

According to the 2018 Montana Multi-Hazard Mitigation Plan, “as many as 500,000 products pose physical or health hazards and can be defined as “hazardous chemicals”. In Montana over a 10-year period, 2008 to 2017, 501 hazardous material releases were reported. Of these, 40 percent were from fixed facilities and 23 percent were from mobile facilities.

Table 20 – Hazardous Material Incidents in Fallon County, 2008-2021

Date	Type of Incident	Incident Cause	Incident Location	Nearest City	County	State
7/15/2008	Fixed	Natural phenomenon	Shell Oil Road	Baker	Fallon	MT
5/22/2009	Railroad Non-Release	Other	Highway 12	Plevna	Fallon	MT
6/11/2009	Storage Tank	Equipment Failure	Not provided	-	Fallon	MT
7/7/2009	Pipeline	Other	Well No. 24-10 in Section 10, T8N - R59E	Baker	Fallon	MT
6/27/2018	Storage Tank	Equipment failure	Oil field tank battery 15 miles NW of Baker	Baker	Fallon	MT
11/22/2010	Mobile	Transport accident	Highway 12, between MM 54 and 55	-	Fallon	MT
3/16/2011	Pipeline	Flood	Field storage line in rural SE Montana	Baker	Fallon	MT
3/17/2011	Pipeline	Equipment failure	NE Corner of the NE Corner	Baker	Fallon	MT
3/20/2011	Pipeline	Other	Sandstone Creek	Baker	Fallon	MT
12/13/2011	Pipeline	Unknown	SE Quarter of the NE Quarter, Section 6 Township 10N 58E	-	Fallon	MT
8/5/2012	Railroad	Derailment	Mile Post 1029	Plevna	Fallon	MT
3/26/2014	Fixed	Equipment failure	NW of the NE of Section 18	Baker	Fallon	MT
4/15/2016	Pipeline	Equipment failure	Not provided	Baker	Fallon	MT
2/20/2019	Pipeline	Equipment failure	Baker Station	Baker	Fallon	MT

Notes:

1. Data retrieved from NRC

Table 21 – Fallon County Crash Data: Injury Severity

Injury Severity	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Fatality	1	0	0	0	0	0	0	0	0	0
Serious Injury	0	0	1	3	0	0	0	0	1	5
Other Injury	4	3	9	4	2	6	5	5	5	5
No Injury	8	8	5	11	3	12	8	12	5	1
Unknown/Other	13	35	35	18	28	5	15	18	14	0
TOTAL	26	46	50	36	33	23	28	35	25	11

Notes:

¹. Data retrieved from MDT

Table 22 – Fallon County Crash Data: Crash Severity

Injury Severity	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Fatal Crash	1	0	0	0	0	0	0	0	0	0
Serious Injury Crash	0	0	1	2	0	0	0	0	1	4
Other Injury Crash	4	3	4	3	2	4	3	4	3	3
No Injury Crash	12	35	34	23	23	10	17	22	15	1
Unknown/Other Crash	6	0	0	3	0	0	0	0	0	0
TOTAL	23	38	39	31	25	14	20	26	19	8

Notes:

¹. Data retrieved from MDT

The first recorded incident of a hazardous material spill in Fallon County occurred in 1993, when the overflow of a storage tank caused a large, fixed facility spill. In August 2012, a train west of Plevna derailed and eight cars carrying alcohol caught fire. BNSF reported a fifteen car derailment with fourteen carrying denatured alcohol, a fuel additive. Fortunately, no lives or property were threatened by the incident. Six of the rail cars exploded, and fire crews were rushed to put out the grass fires.



Figure 9 – Image of the Plevna Train Derailment and Fire, August 2012

According to the Pipeline Safety Program, between 2001 and 2010, there have been 16 reported incidents, with the closest one to Fallon County in Alzada, Carter County, where there was a material/welding/equipment failure of the Belle Fouche Pipeline Company. The incident cost \$7,786 however, there were no injuries or fatalities. Statewide during the reporting period, there were 2 fatalities and 5 injuries. Property damage was \$7,473,336.

Oil and gas well blowouts and explosions are another concern to Fallon County residents. A well blowout is caused by loss of control of the well that could cause a fire or explosion. Well pressure is controlled by drilling mud and secondarily by blow out preventers required by the state for all drilling according to the previous plan. In neighboring North Dakota, there was an explosion in July 2011, and it continued to burn for several days. The cause was described as such in the Dickinson Press “They were pulling drill pipe out of the hole during the very last step of drilling the well,” when the explosion occurred”.



Figure 10 – Image of the Explosion from Dickinson Press, July 28, 2011

4.5.2 Probability and Magnitude

Based on past occurrences and the transportation network, the probability of a hazardous materials incident is ranked as “possible”. While the magnitude of such an occurrence would depend on the

hazardous material and the amount spilled, the planning team felt that the corresponding magnitude/severity and economic impact could be critical.

The highways through Fallon County are the primary source of transportation for privately own vehicles. Factoring in severe weather either in winter or summer, vehicle accidents are likely.

The magnitude/severity for a pipeline spill is limited with critical economic impact. Pipelines in Fallon County are shown in Figure 10.

The Montana Department of Transportation does not record traffic in Fallon County. However, traffic is recorded in the neighboring counties of Wibaux and Custer. According to the recorder for Wibaux County in 2010 the traffic was 67.67 percent passenger cars, 3.81 percent small trucks, and 27.39 percent large trucks. With these statistics, it is suggested that a small percentage of large trucks are traveling the arterial highways and therefore, the likelihood of a large scale hazardous material vehicle accident involving hazardous materials is low.

There is one small airport in Baker that is City/County owned. According to statistics of a 12 month period ending in September 2010, there is an average of 135 aircraft operations per week completed at the Baker Airport. Seventy five percent are local general aviation, 20 percent are transient general aviation, 4 percent is air taxi, and less than 1 percent is military.

4.5.3 Vulnerability and Area of Impact

While there is no data that specifically targets the vulnerability of transportation or hazardous materials incidents in the County, a GIS analysis was conducted to make a reasonable estimate. The analysis used the existing highways, railways, pipeline alignments and any toxic release facilities and using a 0.25 square mile buffer, recorded all property information within that 0.25 mi² to estimate the vulnerability, and potential losses. Figure 10 below displays the results of the analysis, including the total property value within the hazardous corridor of \$244,610,054.

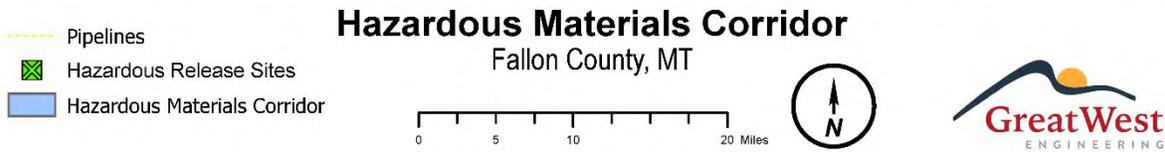
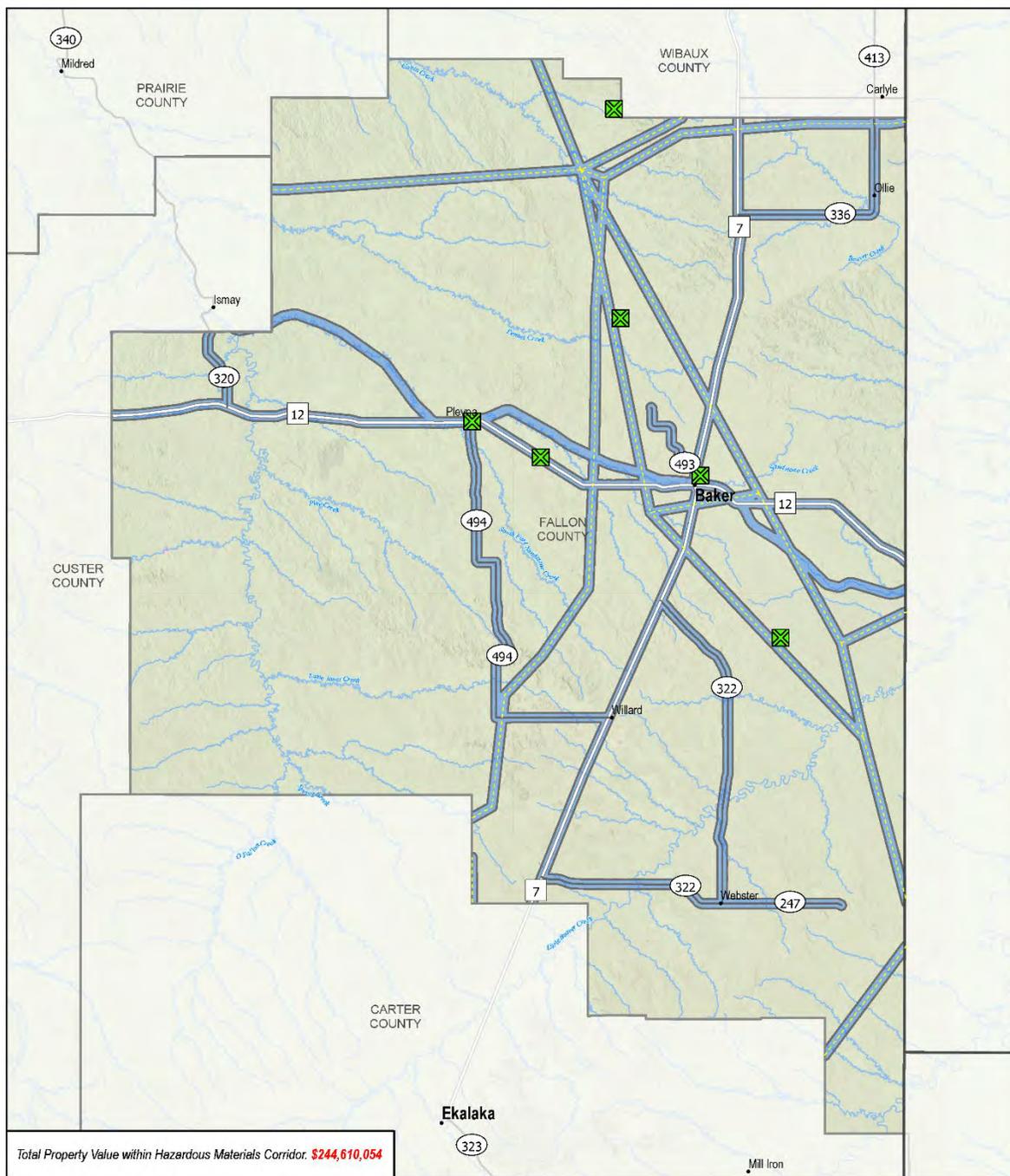


Figure 11 – Hazardous Materials Corridor in Fallon County

Table 23 summarizes the damage data reported by the Federal Railroad Administration Office of Safety Analysis from the period of 1977 to 2010.

Table 23 – Railroad Accidents in Fallon County

Date	Cause	Equipment Damage	Track Damage	Speed	No. of Cars Derailed
8/12/1977	Human Error	\$1,730	\$3,600	4 mph	3
12/1/1977	Equipment	\$90,265	\$18,200	42 mph	24
8/12/1978	Track	\$100	\$13,860	25 mph	3
7/20/1996	Equipment	\$5,800	\$12,215	33 mph	1
11/12/1998	Equipment	\$560,000	\$505,000	40 mph	28
1/16/1998	Equipment	\$4,500	\$0	40 mph	1
8/11/2010	Equipment	\$21,000	\$0	10 mph	1

Notes:

1. Data retrieved from safetydata.fra.dot.gov

4.6 Terrorism, Violence, Civil Unrest, and Cyber Security

The following section references the 2018 State of Montana Multi-Hazard Mitigation Plan. Terrorism is defined in the Code of Federal Regulations as “the unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives”. Targets are often selected due to their visibility (i.e., airports, cities, major events, etc.) and where the terrorist can avoid detection before or after the attack. Bombing has been the most common form of terrorism in the United States. Other possible methods of terrorism include attacks on transportation routes, driving vehicles into large crowds, or deployment of chemical/biological weapons. Energy development in eastern Montana has made terrorism, violence, and civil unrest an emerging hazard in Montana.

Another common form of terrorism within the U.S. is lone gunman shootings (active shooters). In the U.S., this form of terrorism has occurred in schools, movie theaters, concert venues, and other locations. Active shooters often select their location for a specific purpose, rather than a random opportunity. As of 2018 there have been no active shooter incidents in Montana.

Cyberterrorism is the use of information technology by terrorist groups and individuals to further their agenda. This can include use of information technology to organize and execute attacks against networks, computer systems and telecommunications infrastructure, or for exchanging information or making threats electronically. Some examples of cyber terrorism include, hacking into computer systems, introducing viruses into networks, website defacing, or terroristic threats made through electronic communication.

4.6.1 Historic Occurrences

There are no historic occurrences of terrorism, violence, or civil unrest in Fallon County. Terrorism, violence, and civil unrest are not common hazards effecting Montana, though labor strikes, threats of terrorism, and large scale violence have occurred several times in other locations in the state.

The last declared disaster of this kind was reported in January of 2006 due to a prisoner escape in the City of Helena. There have been no declared disaster of this kind in Fallon County.

4.6.2 Probability and Magnitude

The probability of terrorism, violence, civil unrest, or a cyber breach affecting Fallon County directly is difficult to determine. The State of Montana is not considered a specific target for terrorist threats/attacks, nor is it of high risk for civil unrest. As with any area, Fallon County is at risk of a shooting by a disgruntled person, employee, or student. A large scale attack cannot be ruled out, so a small probability exists.

Terrorism and cyberterrorism are considered emerging hazards with little to no history in the region. However, incidents are increasing throughout the world; as such, the probability of terrorism, violence, and cyberattacks in Fallon County is ranked as "Possible". As of 2018, less than one incident occurs every 10 years but greater than one incident every 100 years in Montana.

4.6.3 Vulnerability and Area of Impact

The origins and potential targets for civil unrest and terrorism are challenging to predict. Locations of these attacks can occur anywhere but often occur at symbols that threaten terrorist groups. Common targets are government buildings, universities, medical clinics, and population concentrations. Other targets include businesses, computer processors, and critical infrastructure.

The greatest risk of civil unrest and terrorism is human lives. Looting can also be linked to these incidents. Therefore, these incidents place both population and property at risk.

Traditionally, Montana has attracted extremist groups due to its low population and large geographic size. According to the Southern Poverty Law Center (SPLC, 2018), an organization committed to tracking hate groups in the U.S., the number of anti-government groups in Montana plateaued in 2017 while the number of anti-Muslim groups surged. Seven identified hate groups reported in Montana, including several anti-Muslim factions and two white nationalist factions. In Montana, hate groups include the American Freedom Party, Pioneer Little Europe, and ACT for America.

Internet fraud and healthcare scams are two common forms of cyberterrorism. Internet fraud is the use of internet services or software to defraud victims or to otherwise take advantage of them; for example, stealing personal information, via the internet, that leads to identity theft. Healthcare scams are similar to internet frauds, though often specifically target to senior citizens, and do not require use of the internet. Scammers will call as healthcare or Medicare representatives to gain access to their personal or contact information.

4.7 Flooding

"A flood is a natural event for rivers and streams due to excess water from snowmelt, rainfall, and storm surge that accumulates and overflows onto the banks and adjacent floodplains. Flash floods are events "occurring with little or no warning where the water levels rise at an extremely fast rate." (FEMA, *Understanding Your Risks*).

According to the Montana MHMP, the types of floods that affect Montana include regional floods, flash floods, ice-jam floods, and dam-failure floods. Dam failure is categorized in this plan as its own hazard and described in Section 4.4.

Fallon County has three perennial streams, Little Beaver, Sandstone, and O'Fallon Creek and several minor streams. Baker Lake is a large lake within the City Limits of Baker.

4.7.1 Historic Occurrences

According to the 1988 Fallon County Unincorporated Areas Flood Insurance Study (FIS) Report, Fallon County experienced a significant flood event in 1955. This flood was caused by a sudden rainstorm that produced four inches of precipitation in a 24-hour period. The flood was estimated to be around the 2 percent Annual Chance (50-year) flood event. This storm caused considerable damage to the Baker Lake shore and the channel area below the lake through town. The damage to the Baker Lake drainage area was estimated to be greater than \$36,000. After this flood event, the Baker Watershed Dam was installed to ensure a flood of this magnitude would produce only minor flood issues in the drainage.

The 1955 flood also caused damage on Sandstone Creek. According to residents, Sandstone Creek overtopped State Highway 7 north of Baker by approximately two feet and was at the low chord of the BNSF railroad bridge at the northwest corner of Baker. The flooding on Sandstone Creek was estimated to be potentially greater than the 1 percent Annual Chance (100-year) flood event.

Also mentioned in the 1988 FIS Report, was a runoff event in 1982. A rainstorm produced about 3.8 inches of precipitation over a five day period. This created approximately one foot of flow over the spillway on Baker Lake and caused some minor flooding through town. Sandstone Creek did not experience significant flows during this event.

Due to excessive snow and rainfall in 2011, Fallon County and several other counties in eastern Montana declared a Disaster. During the May 18, 2011 Disaster Emergency Services Committee meeting, Chuck Lee, the DES Coordinator for Fallon County cited the flood conditions found in Table 24.

Table 24 – Fallon County Flood Conditions, May 2011

Location	Condition
Ismay Road South	Closed due to substantial flooding.
Dye Bridge at Camp Creek Trail	Bridge closed due to flood damage.
City of Baker 2 nd Cell Lagoon	Sandstone Creek very close to corroding enough soil to empty the 2 nd cell lagoon. If the 2 nd cell lagoon fails, the 1 st cell, containing raw sewage, will enter into the creek.
City Bridge	Northeast corner is corroding away.
Pond below Coral Creek Landfill	Pond is beginning to run over the banks, creating a hazard from the landfill seepage.

Notes:

¹. Information from DES Coordinator Chuck Lee



Figure 12 – 2011 Spring Floods in Fallon County

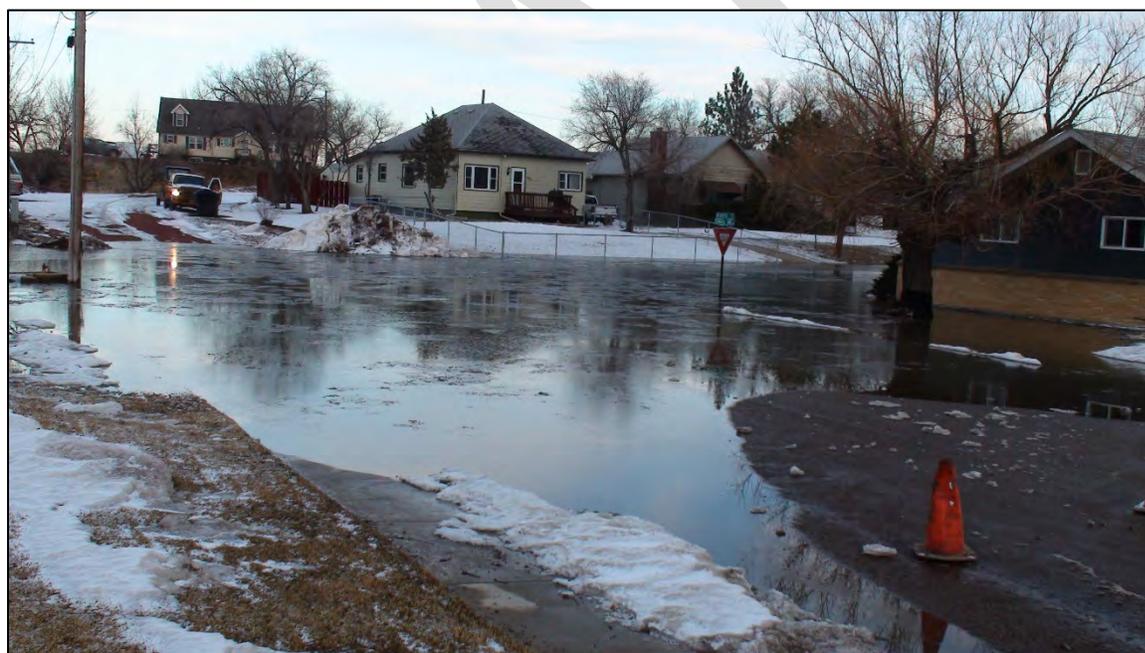


Figure 13: Flooded streets in Baker, MT

In 2014, rapid ice-melt caused flooding in the City of Baker. Seen in Figure 12 is an intersection inundated with water.

According to the 2017 Fallon County Growth Policy, the last FEMA declaration in Fallon County was in 2011. USDA declared Fallon County a disaster for flooding incidents that occurred in 1997, 1998, 1999, 2001, and 2002. (Disaster Declaration Summary, 1998 – 2004, USDA Farmers Home Administration).

4.7.2 Probability and Magnitude

Flooding in Fallon County typically occurs during periods of heavy rainfall or snowmelt, with less than 24-hours of warning. Using the CPRI, the Planning Team noted the probability of flooding occurring in Fallon County as a “Possibility” with limited magnitude/severity and economic impact. Table 25 shows the Discharges as listed in the FIS Study (1988) with corresponding Probability of Exceedance. In general, flood hazard is defined by the 1% annual exceedance event, but the 0.2% can also be considered.

Table 25 – Summary of Discharges by Probability

Location	Probability of Exceedance			
	10% 10-year event	2% 50-year event	1% 100-year event	0.2% 500-year event
Sandstone Creek				
Approximately 12,000 feet upstream of the confluence with Red Butte Creek	2,160	5,000	6,490	10,500
Approximately 160 feet downstream of Baker Lake Tributary	2,160	4,840	6,230	10,000
Approximately 190 feet upstream of Baker Lake Tributary	2,120	4,740	6,100	9,800
At State Highway 7 including Northwestern Tributary	2,040	4,470	5,760	9,470
Just below Bone Pile Coulee	2,130	4,520	5,790	9,430
Just below Unnamed Southeastern Tributary	1,520	3,230	4,160	6,860
Just above Unnamed Southeastern Tributary	810	1,870	2,480	4,340
Approximately 4,100 feet upstream of a service road	660	1,660	2,180	3,650
Baker Lake Tributary				
At U.S. Highway 12	160 ¹	310 ¹	390 ¹	700 ¹
Northern Tributary				
Approximately 800 feet upstream of the mouth	730	1,350	1,650	2,430
Approximately 1,120 feet upstream from Route 493	730	1,340	1,625	2,355
Northeastern Tributary				
Approximately 970 feet upstream of the mouth	210	430	525	755
Approximately 300 feet downstream of Unnamed Eastern Tributary	170	350	420	590
Approximately 440 feet upstream of Unnamed Eastern Tributary	75	170	210	290
Approximately 900 feet upstream from the intersection of Route 639 and 609	50	90	110	150
Approximately 2,430 feet upstream from the intersection of Route 639 and 609	20	35	40	60
Unnamed Tributary to Northeastern Tributary				
Approximately 600 feet upstream from the mouth	105	195	235	340

Location	Probability of Exceedance			
	10% 10-year event	2% 50-year event	1% 100-year event	0.2% 500-year event
Unnamed Tributary to Sandstone Creek				
At mouth	730 ¹ .	1,410 ¹ .	1,730 ¹ .	2,570 ¹ .

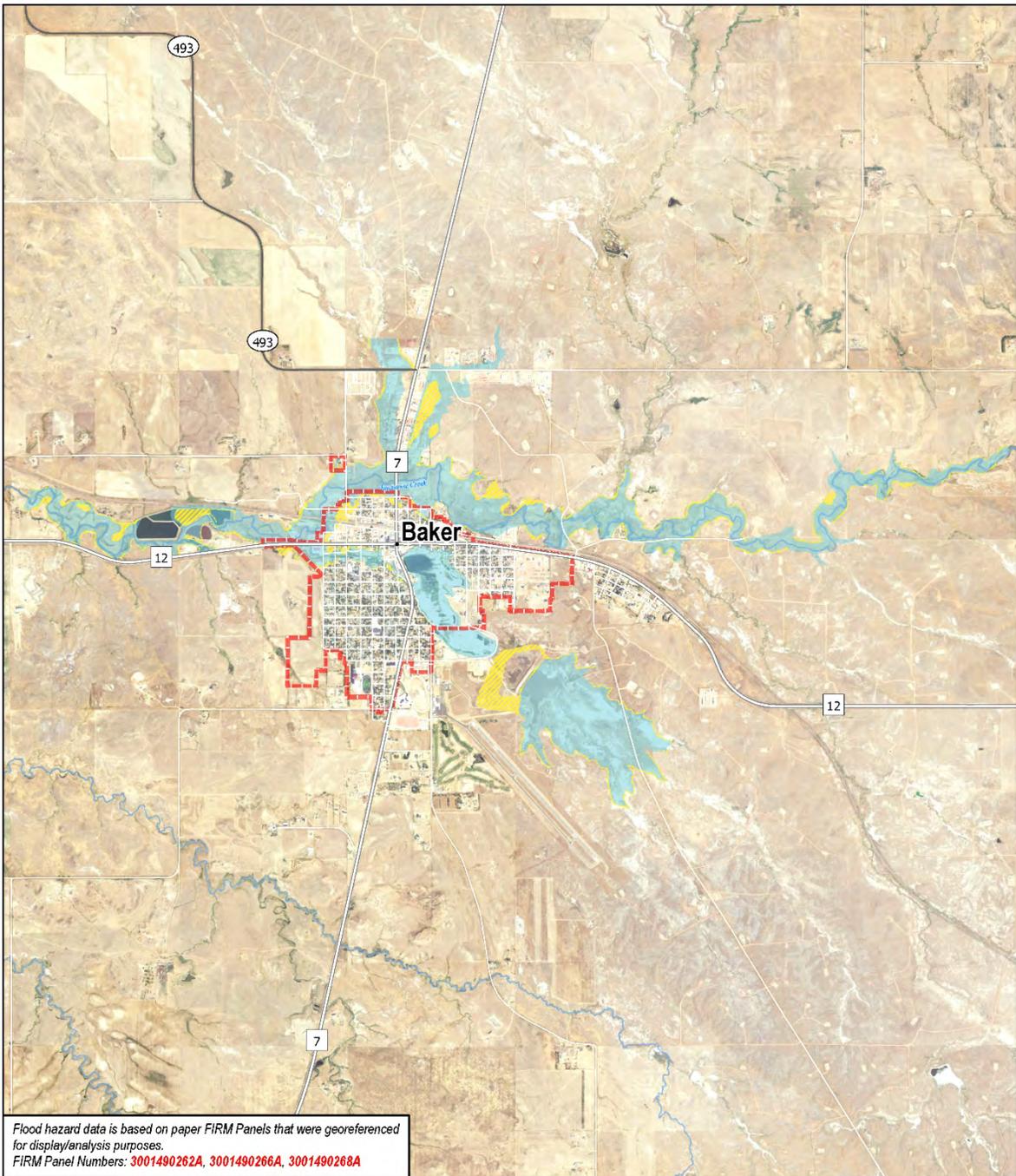
Notes:

¹. Not adjusted for overflow from Sandstone Creek

4.7.3 Vulnerability and Area of Impact

As part of the 1988 Flood Insurance Study done in Fallon County, Flood Insurance Rate Maps (FIRMs) were developed in the County and focused primarily on the area around the City of Baker. The regulatory FIRM panel is a map prepared by FEMA which indicates the area of the 1% Annual Chance (AC) flood designation, which applies to the area that has a 1% chance on average of flooding in any given year. The 1% AC flood is also referred to as the base flood, a national standard that has been adopted for the National Flood Insurance Program (NFIP). The regulatory floodplains were digitized for this assessment and shown below in Figure 12.

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Flood Hazard Areas - Baker Fallon County, MT

- City of Baker - Boundary
- Zone AE (1% AC)
- Zone X (0.2% AC)

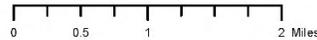


Figure 14 – Regulatory Floodplain in Fallon County

Fallon County and the City of Baker participate in the National Flood Insurance Program. There are a few households within the City of Baker that have Flood Insurance. No repetitive loss structures have been identified in Fallon County.

Below, Table 26 shows potential flood loss on properties located in the 0.2% AC floodplain in Fallon County. The values are based on Cadastral data, and the analysis involved intersecting the Cadastral layer in GIS, with the Zone X, or “significant hazard” flood zone which is shown in Figure 12.

Table 26 – Estimated Property Values within “Significant Hazard” Flood Zone

Parcels in Fallon County	Estimated Value based on Appraisal
Completely within the 0.2% AC floodplain	\$1,644,518
Parcels completely or partially within 0.2% AC Floodplain	\$32,190,236

Notes:

¹. Only parcels with structures were accounted for in the analysis, but the exact spatial location of the structure was not taken into account.

The 2011 flooding resulted in damage to County roads and bridges. The County documented approximately \$550,000 in damages that were reimbursed by FEMA.

According to SHELDUS data, from 1960-2019, flooding has caused \$3,813,259 in property damage and \$35,229 in crop loss.

Table 27 below summarizes some of the potential losses that might occur from flooding in Fallon County

Table 27 – Potential Loss Impacts from Flooding in Fallon County

Type	Description	Notes
Agriculture	Total crop loss, loss of livestock, reduced production	SHELDUS Data indicates costs of \$877,193 for a single incident in 1989. Another for crop damage due to flooding was reported in 1994 of \$192,237. Total crop damage, as of 2019, is \$35,229.
	Damage to equipment and buildings	
Residential	Potential loss or damage to homes	\$169,800 (median value of owner-occupied housing unit in the county in 2019)
Businesses	Damage to buildings or other assets such as railroad track, interruptions to business	
Highway	Potential for inundation, weather-related accidents	Both major highways, 7 and 12, could be affected
Roads, Culverts, and Bridges	Washouts and road damage, road closed and potential with emergency service response	Costs could include road surface, culverts, and bridges.
Emergency Services	Potential for difficulties in reaching people in need if roads are out	Potentially incur damage to facilities such as fire department ambulance barn.

5.0 Mitigation Strategy

This section highlights the mitigation efforts from the past, and present, that are meant to reduce the effects of natural and manmade hazards to the residents and assets of Fallon County. Included in this section is a review of the past mitigation actions, as well as new mitigation actions being proposed as part of this update.

The approach taken to mitigation was to first review the previous goals and objectives, and ongoing mitigation actions, then identify future mitigation needs. Other critical considerations with regards to mitigation included the capability of the County to achieve mitigation, and an evaluation of the capacity and effectiveness of risk mitigation.

Goals represent the broad vision of mitigating hazards, and are usually policy-type, long term statements describing the desired outcome. Objectives are strategies or implementation steps taken to achieve the mitigation goals, as defined by FEMA. The plan goals and objectives are reviewed in Section 5.1.

5.1 Review of Previous Mitigation Plan Goals and Actions

The 2013 Mitigation Plan identified seven (7) goals for reducing impact of potential disaster events. These included:

1. Mitigate future flood damage
2. Minimize potential losses from severe weather
3. Monitor drought conditions
4. Upgrade dispatch service
5. Prevent community losses from wildfires
6. Improve rural water access
7. Improve technology use and efficiency

Specific mitigation actions were developed to achieve the 2013 plan's goals. Those actions were targeted to reduce losses related to flooding, severe weather, drought, wildfire, water access, and technology. The actions and their status as of November 2021 are listed below in Table 28.

Table 28 – 2013 Plan Mitigation Actions and Status

Hazard	Objective	Status
Mitigate Future Flood Damage	<p>Ensure new construction and development does not put property at flood risk:</p> <ul style="list-style-type: none"> • Enforce existing floodplain regulations in the Baker area. • Make information about floodplain requirements available to the public. • Develop a joint written floodplain policy for the City and County to ensure consistent handling of floodplain activities. • Participate in the Nation Flood Insurance Program. 	<ul style="list-style-type: none"> • Completed. Enforcement of regulations is continual. • Completed. Handouts were created, and information posted on County website • Not implemented. There has not been an official written policy although coordination is ongoing. • City of Baker and Fallon County are participants in the NFIP

Hazard	Objective	Status
	Protect property and infrastructure from flooding: <ul style="list-style-type: none"> • Develop a plan for maintenance of the Baker Lake spillway. • Replace City shop bridge. • Submit a proposal to the EPA to develop a drainage plan for the City of Baker. • Monitor and provide input to joint effort with the City of Baker and MDT of HWY 7 south storm water system project. • Remote monitoring system for Baker Lake. 	<ul style="list-style-type: none"> • Implemented; NRCS is also responsible, coordination is ongoing • Not implemented. • Not implemented. • Ongoing • Not implemented – no longer needed, will remove action
Minimize Potential Losses from Severe Weather	Warn citizens ahead of summer storms: <ul style="list-style-type: none"> • Install a siren in Plevna. • Determine location and install additional sirens in Baker. • Purchase and distribute weather radios. 	<ul style="list-style-type: none"> • Implemented • Implemented • Implemented
	Provide education about summer storms: <ul style="list-style-type: none"> • Offer a session for the community on recognizing severe weather and behaving safely in severe weather. 	<ul style="list-style-type: none"> • Implemented
	Improve weather information across the County: <ul style="list-style-type: none"> • Request more advanced technology to provide more timely and accurate weather coverage of the County. 	<ul style="list-style-type: none"> • Implemented; installed cameras and viewers on website
	Improve county response to winter storms: <ul style="list-style-type: none"> • Warn citizens ahead of winter storms. • Obtain back-up power source for Plevna in the event of a winter storm power outage. • Alleviate powerline breakage in populated areas such as the Town of Baker and Plevna. • Alleviate drifting snow across high traffic areas, such as main highways entering and leaving both the Town of Baker and Plevna. 	<ul style="list-style-type: none"> • Implemented • Implemented • Implemented; Coordinated with Montana Dakota Utilities • Not implemented
Monitor Drought Conditions	Monitor drought conditions: <ul style="list-style-type: none"> • Install remote drought monitoring equipment to gather data and document situation. 	<ul style="list-style-type: none"> • Implemented; Ongoing
Upgrade Dispatch Service	Operate the dispatch function even if present locations becomes inoperable: <ul style="list-style-type: none"> • Establish back up Emergency Operations Center in Plevna. 	<ul style="list-style-type: none"> • Not Implemented
Prevent Community	Obtain appropriate training for firefighters: <ul style="list-style-type: none"> • In addition to basic wildland fire fighting courses, host a course in 	<ul style="list-style-type: none"> • Implemented & Ongoing

Hazard	Objective	Status
Losses from Wildfires	<p>cooperation with oil produces on responding to hydrocarbon incidents.</p> <ul style="list-style-type: none"> Establish an all-hazard training facility to train on oil/gas fires, wildfires, structure fires, vehicle fires, hazmat fires and spills, and rescues. Obtain assistance from oil companies to equip and build the facility. Maintain an adequate number of trained volunteer firefighters that can fight timber fires by working with adjacent counties on mutual aid calls and with the DNRC to create opportunities for Fallon County fire fighters to receive assignments to other fires outside the County. 	<ul style="list-style-type: none"> Not Implemented; could not get funding. Implemented
	<p>Ensure firefighters are properly equipped:</p> <ul style="list-style-type: none"> Work closely with the oil companies to train and equip individuals in the specialized area of response of hydrocarbon incidents. Equip wildland fire apparatus with wildland monitor guns. Switch all equipment to DNRC Standards. Improve SCBA discipline and training for fire fighters. 	<ul style="list-style-type: none"> Implemented Implemented in Plevna Implemented Implemented
	<p>Warn members of the public about wildland fires that may be approaching and other disasters:</p> <ul style="list-style-type: none"> Recruit and retain firefighters. Develop an annual recruitment plan for each department that includes some or all of the following: coverage in the local media, handout materials, tours, visit to schools, and mentoring. Develop community and county recognition program for length of service and special acts. 	<ul style="list-style-type: none"> Implemented Implemented Implemented
	<p>Implement plans to relocate and construct a new Baker Fire Department:</p> <ul style="list-style-type: none"> Select final location. Construct new facility. 	<ul style="list-style-type: none"> Complete
	<p>Raise public awareness about fire danger and fire prevention:</p> <ul style="list-style-type: none"> Place fire danger signs in Plevna and Baker. Provide an opportunity to recharge fire extinguishers and combine this 	<ul style="list-style-type: none"> Implemented in Baker only. Implemented

Hazard	Objective	Status
	with education on requirement for farm equipment and other vehicles.	
	Raise awareness and understanding of defensible space: <ul style="list-style-type: none"> Complete a demonstration project to create defensible space between CRP land and/or timber for a rural residence. Conduct a tour of the project in cooperation with the Fallon County Conservation District following completion. 	<ul style="list-style-type: none"> Not yet Implemented
Improve Rural Water Access	Reduce time spent to bring water to incidents: <ul style="list-style-type: none"> Purchase and install in-ground water storage tanks countywide. Cover areas without an option for dry hydrants. Proceed with installation of dry hydrants in previously identified locations. Continue to maintain water resources in remote locations. 	<ul style="list-style-type: none"> Complete Not Implemented – no longer warranted, and no funding Complete, and ongoing
Improve Technology Use and Efficiency	Improve response to and data collection about incidents: <ul style="list-style-type: none"> Request on-site training in use of NFIRS. Assign incident reporting to one individual in each department. Retrieve and analyze data at the end of each fire season. Develop GIS capability and fire/fuel map layers. Obtain handheld GPS units for department's vehicles. Obtain navigation systems for each ambulance to ensure shortest response time. 	<ul style="list-style-type: none"> Complete Complete Complete Complete Complete Complete

5.2 Mitigation Strategy

The planning team reassessed existing goals and revised the list for reducing the impact of identified hazards in the County. Four goals have been added since the 2013 plan, based both past mitigation efforts and on the identified hazards in this update. Table 29 identifies the list of updated goals targeting specific hazards and notes which goals are new. These goals are meant to be reached through the implementation of objectives that are realistic and achievable within the resources and authorities available to each jurisdiction.

Table 29 – Mitigation Goals and Objectives

Goal	Objective
1. Mitigate future flood damage	1.1 Reduce losses to private property from flooding.
	1.2 Improve public safety during a flood event.

Goal	Objective
2. Reduce community losses from wildfires ¹	2.1 Increase resources in rural parts of the County
	2.2 Promote training for specialized hydrocarbon hazards
3. Reduce the impacts of severe weather, and drought ²	3.1 Improve communications to warn and educate public about severe weather
	3.2 Implement a water usage plan to minimize impact of Drought
4. Minimize the impacts from a hazardous materials release, and transportation accidents ³	4.1 Implement public outreach and education projects to reduce impacts from hazardous material incidents and derailments.
	4.2 Increase the capabilities of responders during an event
5. Minimize impacts from Communicable Diseases ³	5.1 Slow the spread of communicable disease
	5.2 Increase PPE supplies
6. Reduce the impacts of dam failure ³	6.1 Continue maintenance on dam to minimize likelihood of failure
	6.2 Enhance Emergency Service capabilities to better respond in the event of a dam failure
7. Minimize impacts from Terrorism, Cyber Attacks, and Acts of Violence ³	7.1 Enhance law enforcement and IT capabilities to respond and reduce the impacts.
	7.2 Train staff at facilities such as schools to prepare for potential incidents.

Notes:

1. Slight rewording on existing goal
2. Slight rewording on existing goal, and combined with Drought goal
3. New, 2021 Goals

5.3 Cost-Benefit Analysis and Prioritization of Mitigation

A project planning scoring matrix was the methodology used by the planning team to estimate the efficiency of proposed mitigation projects. This methodology allowed the team to assess the costs and benefits and inherent tradeoffs of potential projects. Section 201.6.c.3iii of 44CFR requires the prioritization of the mitigation plan to emphasize the extent to which benefits are maximized according to a cost/benefit analysis of the proposed projects and their respective costs.

Mitigation actions were prioritized as being “high”, “medium”, or “low” priority. Tasks designated as a “high priority” will be considered first for implementation by the County followed by medium and low priority actions. Table 31 lists the County selected mitigation actions and their respective priority. Within the scoring matrix, each action was divided into four categories, described below:

- **Estimated Cost:** A “high” score represents an implementation cost greater than \$500,000; a “medium” score represents a project cost between \$100,000 and \$500,000; and “low” represents a cost less than \$100,000.
- **Population Benefit:** A “high” score represents greater than 50 percent of County residents benefitting from the mitigation action; “medium” score represents 20 to 50 percent of County residents would benefit; and a “low” score represents less than 20 percent of residents would benefit.
- **Property Benefit:** A “high” score represents that greater than \$500,000 worth of property is protected due to mitigation implementation; a “medium” score represents \$100,000 to \$500,000 worth of property is protected; and “low” score represents less than \$100,000 worth of property is protected.

- **Feasibility:** A “high” score represents that the technology is available and implementation is likely; a “medium” score represents that technology may be available and implementation could be difficult; a “low” score represents no technology available and implementation is unlikely.

The priority was determined by calculating the total score of each project. Table 30 outlines the scoring used in the planning project matrices. The cost-benefit scoring matrix for each mitigation action can be found in Appendix E.

Table 30 – Planning Project Scoring Matrix

Score	Estimated Cost	Population Benefit	Property Benefit	Feasibility
High	1	3	3	3
Medium	2	2	2	2
Low	3	1	1	1

Based on the goals and objectives listed in Table 29 mitigation actions were developed by the planning team. The mitigation actions consist of prioritized actions which are meant to prevent or reduce losses from future disasters. Unless otherwise noted, all actions are new to this update, since most mitigation actions listed in the 2013 plan were implemented. The updated mitigation actions were scored and prioritized using the cost-benefit analysis described above. Table 31 lists the mitigation actions selected by the Planning Team numbered with the corresponding objective as the first two digits.

Table 31 – Mitigation Implementation Plan

Goal #1: Mitigate Future Flood Damage						
Priority	Action	Jurisdiction	Hazard	Schedule of Completion	Potential Funding Sources ¹	Notes
High	1.1.1 Educate the public on flood hazards, and flood protection measures.	Fallon County	Flooding	2025	City and County Resources, HMGP	
Medium	1.2.1 Evaluate options for making Monroe Street safer during flood events.	City of Baker	Flooding	2023	HMGP, BRIC	
Medium	1.2.2 Conduct routine channel cleanout from dam spillway to 6 th West	City of Baker/ Fallon County	Flooding	2022	HMGP, NRCS	This is in cooperation with NRCS
Goal #2: Reduce Community Losses from Wildfire						
Priority	Action	Jurisdiction	Hazard	Schedule of Completion	Potential Funding Sources ¹	Notes
Medium	2.1.1 Install water tanks and dry hydrants in rural parts of the County.	Fallon County	Wildfire	2024	HMGP, DNRC	
High	2.2.1 Continue working with Oil & Gas companies to train and equip individuals in the specialized areas of response of hydrocarbon incidents.	Fallon County	Wildfire	2023	HMGP, BRIC	This has been an ongoing effort since the last plan (2013)
Goal #3: Reduce the Impacts of Severe Weather, and Drought						
Priority	Action	Jurisdiction	Hazard	Schedule of Completion	Potential Funding Sources ¹	Notes
High	3.1.1 Expand awareness and participation in the Community Notification System.	Fallon County/City of Baker	Severe Weather	2022	HMGP, BRIC	Technology is in place, but citizens must enroll in the program
High	3.1.2 Create community outreach programs on how to prepare for severe weather and tornadoes	Fallon County	Severe Weather	2022	HMGP, BRIC	
High	3.2.1 Create a policy to adjust water usage in the City of Baker.	City of Baker	Drought	2023	City and County Resources	

High	3.2.2 Limit Oil & Gas water usage	Fallon County	Drought	2022	City and County Resources	
High	3.2.3 Participate in drought programs implemented through DNRC, NRCS.	Fallon County	Drought	2022	County, BRIC, DNRC, HMGP	
Goal #4: Minimize the Impacts from a Hazardous Materials Release, and Transportation Accidents						
Priority	Action	Jurisdiction	Hazard	Schedule of Completion	Potential Funding Sources ¹	Notes
High	4.2.1 Provide adequate training for emergency responders to respond to a hazardous materials incident.	Fallon County	Hazardous Materials Release	2023	HMGP	
Medium	4.1.1 Educate public near hazardous material facilities or corridors on how to limit exposure during an incident.	Fallon County	Hazardous Materials Release	2023	City and County Resources	
Medium	4.2.2 Pursue funding for hazardous-materials (HAZ-MAT) supplies.	Fallon County	Hazardous Materials Release	2022	HMGP	
Goal #5: Minimize the Impacts from Communicable Diseases						
Priority	Action	Jurisdiction	Hazard	Schedule of Completion	Potential Funding Sources ¹	Notes
High	5.1.1 Train and collaborate with public health emergency response team on how to slow down the spread through procedural policies.	Fallon County	Communicable Disease	2022	County Resources	
High	5.2.1 Purchase additional back-up Personal Protection Equipment (PPE).	Fallon County	Communicable Disease	2022	County Resources	
Goal #6: Reduce the Impacts of Dam Failure						
Priority	Action	Jurisdiction	Hazard	Schedule of Completion	Potential Funding Sources ¹	Notes
High	6.1.1 Continue coordination with NRCS regarding the Dam Maintenance.	Fallon County / City of Baker	Dam Failure	2023	City and County Resources	

High	6.2.1 Conduct and participate in dam exercises with emergency response partners.	Fallon County / City of Baker	Dam Failure	2022	City and County Resources	
High	6.2.2 Identify residences with the highest risk and provide information about dam failure and provide information from dam failure exercises.	Fallon County/ City of Baker	Dam Failure	2022	City and County Resources	
Goal #7: Minimize Impacts from Terrorism, Cyber Attacks, and Acts of Violence						
Priority	Action	Jurisdiction	Hazard	Schedule of Completion	Potential Funding Sources ¹	Notes
Medium	7.1.1 Create a plan for if/when the system gets compromised (i.e. redundant systems or, cloud backup).	Fallon County	Terrorism, Cyber Attacks, and Acts of Violence	2024	HMGP, BRIC	
High	7.1.2 Encourage or provide training on Cyber threats.	Fallon County	Terrorism, Cyber Attacks, and Acts of Violence	2023	City and County Resources	
High	7.2.1 Continue training and awareness on active shooters in critical facilities.	Fallon County, City of Baker	Terrorism, Cyber Attacks, and Acts of Violence	2022	City and County Resources	

Notes:

¹. Funding sources are fully explained in Section 5.4

5.4 Capabilities and Resources

Depending on the specific objective, the implementation of the goals would rely on organizations such as:

- County and Town Floodplain Coordinators
- US Forest Service
- State of Montana
- Fallon County Commission
- Town Councils
- Utility Companies
- Transportation Companies
- Private Property Owners
- Fallon County Fire Departments
- Bureau of Land Management
- School District

In addition to local resources, there are many State and Federal programs that can help financially support Mitigation in Fallon County. The most relevant and likely grant programs are described below.

FEMA - Hazard Mitigation Grant Program (HMGP)

The key purpose of HMGP is to ensure that the opportunity to take critical mitigation measures to reduce the risk of loss of life and property from future disasters is not lost during the reconstruction process following a disaster. HMGP is available when authorized under a Presidential major disaster declaration, in the areas of the state or territory requested by the Governor. The amount of HMGP funding available to the Applicant is based upon the total Federal assistance to be provided by FEMA for disaster recovery under the Presidential major disaster declaration. The maximum grant award cannot exceed 75% of the project cost.

FEMA – Building Resilient Infrastructure & Communities (BRIC)

The BRIC program is a FEMA pre-disaster mitigation program that replaces the existing Pre-Disaster Mitigation (PDM) program. Eligible applicants include states that have had a major disaster declaration in the past seven years. Municipalities and counties are qualified sub-applicants, and up to 75% of the cost of eligible activities is reimbursable from BRIC funding. Small, impoverished communities are eligible for an increase in cost-share up to 90% federal / 10% non-federal. The definition of a small, impoverished community is a community with a population of 3,000 or less and an average annual per capita annual income not exceeding 80% of the national per capita income, based on the best available data.

Economic Development Administration (EDA) – Public Works and Economic Adjustment Assistance Programs

EDA's Public Work Program helps distressed communities to revitalize, expand, and upgrade their physical infrastructure to attract new industry, encourage business expansion, diversify local economies, and generate or retain long-term, private-sector jobs, and investment. The program's award ceiling is \$30-million. The program does require a dollar-for-dollar non-federal match.

USDA Rural Development – Community Facilities Program (CF)

The CF program provides affordable funding to develop essential community facilities in rural areas. An essential community facility is defined as a facility that provides an essential service that supports the orderly development of the community in a primarily rural area. The current interest rate (fixed) for the fourth quarter of Fiscal Year 2020, effective through September 30, is 2.25%. The maximum term is 40-years. Grant funding is also available to communities with low median household incomes

(MHI) on a graduated scale. The lower the MHI, the larger the grant up to 75% of the proposed project cost. However, grant awards are typically limited to \$50-thousand or less.

Montana Board of Investments – INTERCAP

INTERCAP is a variable rate loan program that municipalities and counties can use for a wide variety of uses, including purchasing equipment, real property improvements, planning, grant writing, and infrastructure, including levees. The maximum term is 15-years, and the current interest rate is 2.5%.

Coal Severance Tax Loan

The Montana DNRC administers the Montana Coal Severance Tax (CST) loan program. CST loans can be used for nearly any type of public infrastructure project, including levees. The current interest rate is 3% (fixed), with a maximum term of 20-years. Eligible applicants include municipalities, counties, and water and special districts.

6.0 Plan Implementation and Maintenance

This updated plan will be implemented by the Fallon County Commission and the City of Baker Council. They are also responsible, alongside the DES Coordinator, for ensuring that the plan is kept current, by meeting annually to evaluate and update the plan as needed. Comments and updated information on the Fallon County Pre-Disaster Mitigation Plan can be submitted at any time to the following:

Fallon County Disaster and Emergency Services Coordinator
Dale Butori
10 W Fallon Ave
P.O. Box 1061
Baker, MT 59324

Aside from the annual review, there are other triggers that may instigate a review or update of plan listed below:

1. The occurrence of a major disaster either in Fallon County or nearby.
2. The passage of 5 years.
3. A change in State or Federal regulations with which the county must comply.

Following is a schedule that demonstrates the aspects of the plan that will be reviewed following 1) a disaster, 2) annually, 3) passage of 5 years.

Table 32 – Review Schedule

Plan Aspect	Post-Disaster	Annually	Every 5 Years
Disaster Emergency Committee meeting on the past year's activities, problems, and input process		X	X
Planning Process			X
Organization Responsibilities			X
Integration of other County and State Plans	X	X	X
Integration of Local Plans		X	X
Economic Data			X
Population Data			X
Hazard Profiles/Addition of new Hazards	X		X

Plan Aspect	Post-Disaster	Annually	Every 5 Years
Hazard Assessment Methodology			X
History and Disaster Declarations	X	X	X
New Study Data		X	X
GIS Data		X	X
State Structure Data			X
Data Limitations			X
Qualitative Hazard Assessment			X
Goals, Objectives, and Potential Actions		X	X
Funding Sources		X	X
State Capabilities		X	X
Local Capabilities		X	X
Plan and Project Coordination		X	X
Project Prioritization	X	X	X
Plan Evaluation Process		X	X
Project Monitoring		X	X

When a review or update of the plan is triggered by one of the three situations listed above, the plan will also be evaluated by the County Commissioners and the Fallon County DES Coordinator for effectiveness and comprehensiveness. Review criteria will include, but not limited to:

- Whether any potential hazards have developed that were not addressed in the plan,
- Whether any disasters have occurred which were not addressed in the plan,
- Whether any unanticipated development has occurred that could be vulnerable to natural disasters, and
- Whether any additional project ideas have been developed.

If a natural disaster should occur in Fallon County, the County Commissioners and the Fallon County DES Coordinator should meet following the disaster to review the incident. Upon review of this report, any changes needed to this Pre-Disaster and Mitigation Plan will be recommended to the County Commission and made by the County DES Coordinator.

In the absence of a major natural disaster, the Planning Team will meet annually to review this Plan and recommend any needed changes. In the interim, the County DES Coordinator will maintain a file into which comments or input on changes to the plan can be kept.

If a change in State or Federal regulations with which the county must comply significantly changes this Pre-Disaster and Mitigation Plan, the County DES Coordinator will hold an LEPC meeting. At this meeting they will inform the committee of the new requirement and determine whether changes to the plan are warranted.

Every five years, an updated plan will be submitted to the Montana Disaster Emergency Services and subsequently to the Federal Emergency Management Agency (FEMA) for approval.

6.1 Incorporation into Other Planning Mechanisms

Fallon County has several plans that could benefit from the language, hazard data and projects presented in in this Update. Those include the Fallon County Growth Policy, Capital Improvement Plan and the Floodplain Ordinance.

7.0 References

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United States Coast Guard, National Response Center: <https://nrc.uscg.mil/>

PHMSA Pipeline Safety Program: <http://prmis.phmsa.dot.gov/comm/reports/safety>

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