

Annex F. Town of Morrison

F.1 Background and Planning Process

This Annex was updated during the development of the 2021 Jefferson County Hazard Mitigation Plan. The Town of Morrison fully participated in the 2021 update process as described in Section 3. The Town had previously participated in the 2016 Jefferson County Hazard Mitigation Plan and has been active in implementing that plan as described in Section F.9. A review of jurisdictional priorities found no significant changes in priorities since the last update. Individuals who participated in the update process and represented the Town on the Planning Team are listed in Appendix B.

More details on the planning process and how the jurisdictions, special districts, and stakeholders participated, as well as how the public was involved, can be found in Chapter 3 of the Base Plan.

F.2 Community Profile

Figure F-1 shows a map of the Town of Morrison.

F.2.1 History

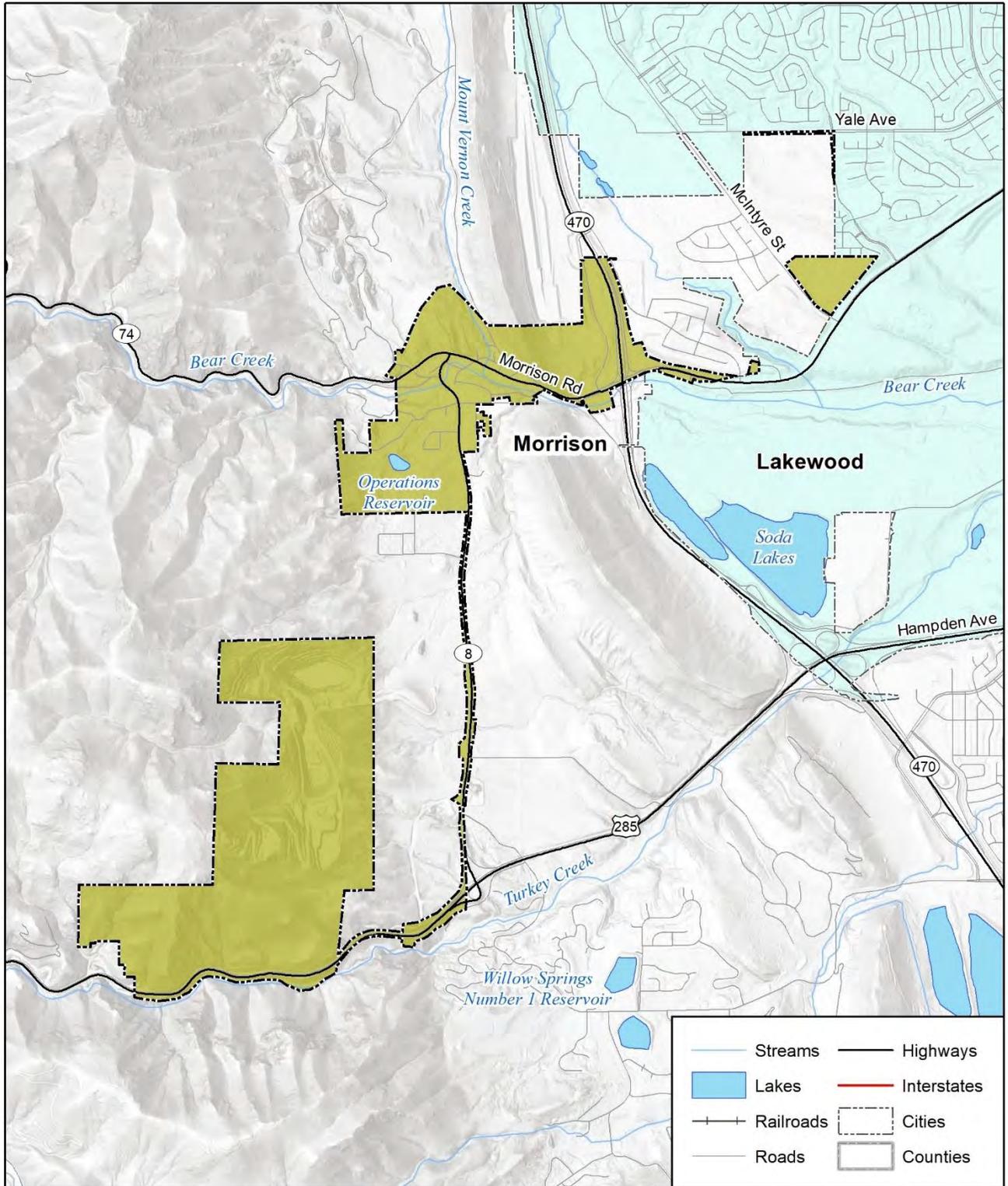
The area around Morrison began to be settled in 1860 and was originally known as Mt. Morrison. The settlement had a population of between two and twenty five people who were mainly located near the confluence of Mount Vernon and Bear Creeks. The area grew quickly after the Civil War and became a center for coal mining, rock quarries, timbering, and other mineral extraction services that were needed to meet the construction and building needs of the growing Denver area. By 1880 the population in and around Morrison had grown to 750.

The physical setting of the town is dominated by two creeks and spectacular land forms associated with hogbacks and sandstone formations which separate Morrison from the Great Plains to the east. In the late 1800s and early 1900s, the close proximity to Denver and the beauty of the area started to attract tourists from Denver. At the time, the Denver South Park and Pacific Railroad later named the Colorado and Southern Railway connected Mt. Morrison to downtown Denver. Transporting visitors to the activities and sights around Morrison, as well as moving freight, coal, stone, lumber, cement, and gypsum back to the burgeoning City of Denver. At its peak in 1913, the Colorado and Southern Railway ran four daily roundtrips to and from Morrison.

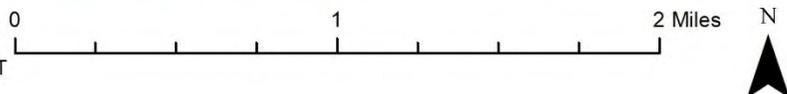
Bear Creek flows through the center of downtown Morrison. It provides water for Denver, Englewood, and Morrison, as well as towns upstream, and has been a primary attraction for residents and visitors alike. It has also been the source of much destruction. A wide bench carved by Bear Creek near the hogback first attracted George Morrison's attention as a potential townsite. The creek also provided a passable route to move people and supplies into the goldfields to the west.

As was common with many of Colorado's early mountain communities, Morrison's population declined sharply at the turn of the 20th Century. Morrison was incorporated in 1906 and by 1910 the Town's population had dropped to 250. As road and highway connections to Morrison were constructed to accommodate automobile and truck traffic, rail services declined and scheduled rail service ended in 1925. Rail services were abandoned following a series of disastrous floods in the 1930s. Morrison's population grew slowly from 1910 to the 1980s when it topped out at just over 500. Morrison is unique in terms of population change since World War II. While most Front Range and foothills communities have mushroomed in growth, the Town's population numbers have declined to approximately 428 (Census 2010), and have remained relatively unchanged for over a quarter of a century.

Figure F-1 Town of Morrison



Map compiled 2/2021;
intended for planning purposes only.
Data Source: Jefferson County, CDOT



F.2.2 Population

The U. S. Census Bureau's estimated 2019 population of Morrison was 415. The following tables and graphs summarize key demographic and social characteristics of the Town of Morrison based on the U.S. Census Bureau's American Community Survey, 5-Year Estimates, 2015-2019.

Table F-1 Morrison Demographic and Social Characteristics

Morrison	2015	2019	% Change
Population	394	415	5.33%
Median Age	60.7	63.5	4.6%
Total Housing Units	133	107	-19.5%
Housing Occupancy Rate	94.0%	94.4%	0.4%
% of Housing Units with no Vehicles Available	1.6%	1.0%	-37.5%
Median Home Value	\$385,900	\$541,700	40.4%
Unemployment Rate	4.7%	2.1%	-55.3%
Mean Travel Time to Work (minutes)	31.9	27.9	-12.5%
Median Household Income	\$59,583	\$105,536	77.1%
Per Capita Income	\$33,080	\$40,900	23.6%
% of Individuals Below Poverty Level	9.3%	3.2%	-65.6%
% Without Health Insurance	10.8%	4.0%	-63.0%
# of Households	125	101	-19.2%
Average Household Size	2.0	2.8	38.2%
% of Population Over 25 with High School Diploma or Higher	91.6%	95.2%	3.9%
% of Population Over 25 with Bachelor's Degree or Higher	33.8%	34.0%	0.6%
% with Disability	14.1%	11.2%	-20.6%
% Speak English less than "Very Well"	3.7%	1.7%	-54.1%

Source: U.S. Census Bureau, American Community Survey, 5-Year Estimates 2015-2019

Table F-2 Morrison Demographic & Social Characteristics Compared to the County & State

Demographic & Social Characteristics (as of 2019)	Morrison	County	Colorado
Median Age	63.5	40.3	36.7
Housing Occupancy Rate	94.4%	96.4%	90.0%
% of Housing Units with no Vehicles Available	1.0%	3.9%	5.1%
Median Home Value	\$541,700	\$397,700	\$343,300
Unemployment	2.1%	3.6%	4.3%
Mean Travel Time to Work (minutes)	27.9	28	25.8
Median Household Income	\$105,536	\$82,986	\$72,331
Per Capita Income	\$40,900	\$44,119	\$38,226
% of Individuals Below Poverty Level	3.2%	7.1%	10.3%
% Without Health Insurance	4.0%	5.5%	7.6%
Average Household Size	2.8	2.40	2.56

Demographic & Social Characteristics (as of 2019)	Morrison	County	Colorado
% of Population Over 25 with High School Diploma or Higher	95.2%	94.5%	91.7%
% of Population Over 25 with bachelor's degree or Higher	34.0%	45.2%	40.9%
% with Disability	11.2%	10.0%	10.6%
% Speak English less than "Very Well"	1.7%	3.0%	5.8%

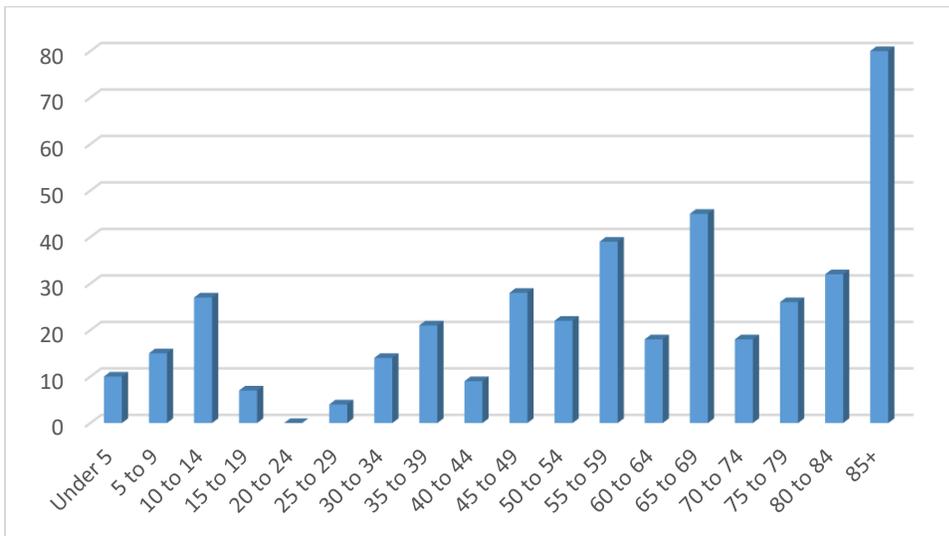
Source: U.S. Census Bureau, American Community Survey, 5-Year Estimates 2015-2019

Table F-3 Morrison Demographics by Race and Sex

Morrison	Population	%
Total Population	415	
Male	171	41.2%
Female	244	58.8%
White, not Hispanic	383	92.3%
Hispanic or Latino	20	4.8%
Black	4	1.0%
Asian	5	1.2%
American Indian and Alaska Native	1	0.2%
Native Hawaiian and Other Pacific Islander	0	0.0%
Some other race	0	0.0%
Two or more races	2	0.5%

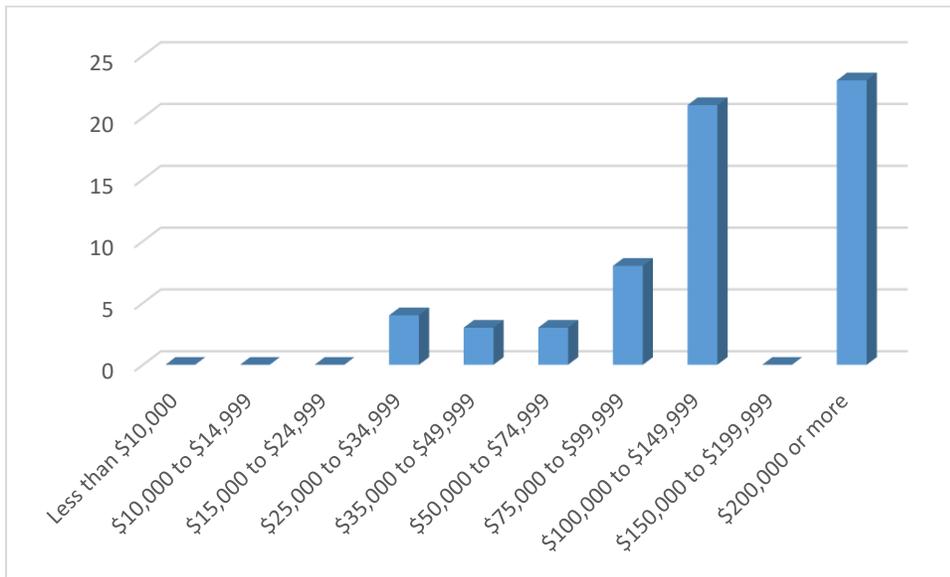
Source: U.S. Census Bureau, American Community Survey, 5-Year Estimates 2015-2019

Figure F-2 Morrison Population by Age



Source: U.S. Census Bureau, American Community Survey, 5-Year Estimates 2015-2019

Figure F-3 Morrison Income Distribution



Source: U.S. Census Bureau, American Community Survey, 5-Year Estimates 2015-2019

F.2.3 Social Vulnerability

Social vulnerability scores for the Town of Morrison can be seen in Figures 2-2 through 2-6 in Section 2 of the Base Plan. The Town of Morrison’s overall social vulnerability is lower than the County as a whole, although it ranks above average in housing and transportation vulnerability. However, the Town ranks below average for household composition and disability vulnerability. As shown in Figure F-2 above, Morrison has a relatively large percentage of older residents, who often need additional help following a disaster. Resources and measures to reduce the social determinants of disasters may be most effectively allocated to these areas. Moreover, it is critical that the Town analyze the individual social vulnerability indicators that make those parts of the community stand out. Through ongoing evaluation, the Town of Morrison will be able to more effectively reduce local social vulnerability and increase their resilience to hazard events. For more discussion of Social Vulnerability, see Section 2.3 of the Base Plan.

F.2.4 Growth and Development Trends

Table F-4 shows the various types and amounts of housing units in the Town of Morrison based on data from the American Community Survey Five Year Estimates for 2015-2019. As shown in the table, most housing units (83.2%) are single family homes (1-unit detached) in Morrison.

Table F-4 Town of Morrison Types and Total Housing Units

Type of Housing Units	Total	%
Total housing units	107	
1-unit detached	89	83.2%
1-unit attached	0	0.0%
2 units	2	1.9%
3 or 4 units	15	14.0%
5 to 9 units	0	0.0%
10 to 19 units	0	0.0%
20 or more units	1	0.9%
Mobile home	0	0.0%
Boat, RV, van, etc.	0	0.0%

Source: U.S. Census Bureau, American Community Survey, 5-Year Estimates 2015-2019

Table F-5 illustrates how Morrison’s population and number of housing units have declined slightly between 2000 and 2019. Over the last half century, Morrison’s population has remained relatively static, and community feedback received to date supports maintaining the existing small population.

Table F-5 Morrison’s Change in Population and Housing Units, 2010-2019

2000 Population	2019 Population	Percent Change 2010-2019	2010 # of Housing Units	2019 # of Housing Units	Percent Change 2010-2019
430	415	-3.5%	136	107	-2.1%

Source: American Fact Finder, www.census.gov

F.2.5 Natural, Cultural, and Historic Resources

Assessing the vulnerability of Morrison to disaster also involves inventorying the natural, historical, and cultural assets of the area. This step is important for the following reasons:

- The community may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- If these resources are impacted by a disaster, knowing so ahead of time allows for more prudent care in the immediate aftermath, when the potential for additional impacts are higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, such as wetlands and riparian habitat, which help absorb and attenuate floodwaters.

Natural Resources

Natural resources of importance around the area of Morrison include nearby open space, Red Rocks Park and the Bear Creek corridor. For information about natural resources in Jefferson County, which includes Morrison see Section 4.2.3 of the Base Plan.

Historic and Cultural Resources

Table F-6 lists the 12 properties in Morrison that are on the National Register of Historic Places and/or the Colorado State Register of Historic Properties; for more information about these registers, see Section 4.2.3 of the Base Plan.

Table F-6 Morrison’s Historic Properties/Districts in National and State Registers

Property Name	Register	Listed Date
Bear Creek Canyon Scenic Mountain Drive	National	11/15/1990
Bradford House III Archeological Site	National	4/8/1980
Bradford, Robert Boyles, Property	National	2/2/2015
Craig, Katherine, Park	National	6/30/1995
Dinosaur Ridge	State	3/10/1993
District No. 17 – Medlen School	State	4/14/2015
District No. 17 School--Medlen School	National	4/14/2015
Fort, The	National	7/14/2006
LoDaisKa Site	National	9/25/2003
Morrison Historic District	National	9/28/1976
Morrison Schoolhouse	National	9/4/1974
Red Rocks Park District	National	5/18/1990

Sources: Directory of Colorado State Register Properties, www.coloradohistory-oahp.org/programareas/register/1503/cty/jf.htm; National Register Information System, www.nr.nps.gov/

It should be noted that the Morrison Historic District incorporates many historic properties. Seventy buildings and sites were listed as part of the District, which encompasses the downtown area and some buildings on the neighboring streets. Some of these structure date to the founding of the town in 1872.

The National Park Service administers two programs that recognize the importance of historic resources, specifically those pertaining to architecture and engineering. While inclusion in these programs does not give these structures any sort of protection, they are valuable historic assets. There are currently no Historic American Building Survey (HABS) or Historic American Engineering Record (HAER) buildings in the Town of Morrison, although there are 19 in the Morrison vicinity.

It should be noted that as defined by the National Environmental Policy Act (NEPA), any property over 50 years of age is considered a historic resource and is potentially eligible for the National Register. Thus, in the event that the property is to be altered, or has been altered, as the result of a major federal action, the property must be evaluated under the guidelines set forth by NEPA. Structural mitigation projects are considered alterations for the purpose of this regulation.

F.3 Hazard Identification and Risk Assessment

A hazard identification and vulnerability analysis was completed for the Town of Morrison using the same methodology as in the base plan. The information to support the hazard identification and risk assessment for this Annex was collected through a Data Collection Guide.

Each participating jurisdiction was in support of the main hazard summary identified in the base plan; however the hazard summary for each jurisdictional annex may vary slightly due to specific hazard risk and vulnerabilities unique to that jurisdiction. This helps to differentiate the jurisdiction's risk and vulnerabilities from that of the overall County.

Table F-7 lists the significance of each hazard for the Town of Morrison based on the updated risk assessment and planning team input. The highest risk hazards were determined to be flood and severe winter storm.

Table F-7 Town of Morrison – Hazards Summary

Hazard	Frequency of Occurrence	Spatial Extent	Potential Magnitude	Significance
Avalanche	Unlikely	Limited	Negligible	Low
Cyber Attack	Limited	Occasional	Negligible	Low
Dam Failure	Unlikely	Limited	Limited	Medium
Drought	Likely	Extensive	Negligible	Low
Earthquake	Unlikely	Extensive	Negligible	Medium
Erosion and Deposition	Occasional	Limited	Negligible	Low
Expansive Soils	Unknown	Limited	Negligible	Low
Extreme Temperatures	Unlikely	Extensive	Negligible	Low
Flood	Likely	Significant	Catastrophic	High
Hailstorm	Likely	Extensive	Negligible	Medium
Landslide, Debris flow, Rockfall	Likely	Limited	Negligible	Low
Lightning	Likely	Limited	Negligible	Medium
Pandemic	Extensive	Unlikely	Catastrophic	High
Severe Winter Storms	Likely	Extensive	Negligible	High
Subsidence	Unlikely	Limited	Negligible	Low
Tornado	Occasional	Extensive	Limited	Low
Wildfire	Likely	Significant	Negligible	Medium
Windstorm	Likely	Extensive	Limited	Low to Medium
<p>Geographic Extent</p> <p><u>Negligible:</u> Less than 10 percent of planning area or isolated single-point occurrences</p> <p><u>Limited:</u> 10 to 25 percent of the planning area or limited single-point occurrences</p> <p><u>Significant:</u> 25 to 75 percent of planning area or frequent single-point occurrences</p> <p><u>Extensive:</u> 75 to 100 percent of planning area or consistent single-point occurrences</p> <p>Potential Severity/Magnitude</p> <p><u>Negligible:</u> Less than 10 percent of property is severely damaged, facilities and services are unavailable for less than 24 hours, injuries and illnesses are treatable with first aid or within the response capability of the jurisdiction.</p> <p><u>Limited:</u> 10 to 25 percent of property is severely damaged, facilities and services are unavailable for between 1 and 7 days, injuries and illnesses require sophisticated medical support that does not strain the response capability of the jurisdiction, or results in very few permanent disabilities.</p> <p><u>Critical:</u> 25 to 50 percent of property is severely damaged, facilities and services are unavailable or severely hindered for 1 to 2 weeks, injuries and illnesses overwhelm medical support for a brief period of time, or result in many permanent disabilities and a few deaths.</p> <p><u>Catastrophic:</u> More than 50 percent of property is severely damaged, facilities and services are unavailable or hindered for more than 2 weeks, the medical response system is overwhelmed for an extended period of time or many deaths occur.</p>		<p>Probability of Future Occurrences</p> <p><u>Unlikely:</u> Less than 1 percent probability of occurrence in the next year, or has a recurrence interval of greater than every 100 years.</p> <p><u>Occasional:</u> Between a 1 and 10 percent probability of occurrence in the next year, or has a recurrence interval of 11 to 100 years.</p> <p><u>Likely:</u> Between 10 and 90 percent probability of occurrence in the next year, or has a recurrence interval of 1 to 10 years</p> <p><u>Highly Likely:</u> Between 90 and 100 percent probability of occurrence in the next year, or has a recurrence interval of less than 1 year.</p> <p>Overall Significance</p> <p><u>Low:</u> Two or more of the criteria fall in the lower classifications or the event has a minimal impact on the planning area. Also used for hazards with a minimal or unknown record of occurrences and impacts or for hazards with minimal mitigation potential.</p> <p><u>Medium:</u> The criteria fall mostly in the middle ranges of classifications and the event's impacts on the planning area are noticeable but not devastating. Also used for hazards with a high impact rating but an extremely low frequency.</p> <p><u>High:</u> The criteria consistently fall along the high ranges of the classification and the event exerts significant and frequent impacts on the planning area. Also used for hazards with a high psychological impact or for hazards that the jurisdiction identifies as particularly relevant.</p>		

F.4 Community Asset Inventory

Table F-8 shows the total number of improved parcels, properties, and their improvement and content values for the Town of Morrison. See Section 4.2 of the Base Plan for details and methodology.

Table F-8 Morrison’s Property Inventory

Property Type	Improved Parcels	Buildings	Improved Value	Content Value	Total Value
Commercial	20	36	\$6,526,206	\$6,526,206	\$13,052,412
Exempt	6	6	\$9,920,151	\$9,920,151	\$19,840,302
Industrial	2	2	\$482,576	\$482,576	\$965,152
Mixed Use	8	9	\$2,197,352	\$2,197,352	\$4,394,704
Residential	119	135	\$46,271,710	\$23,135,855	\$69,407,565
Total	155	188	\$65,397,995	\$42,262,140	\$107,660,135

Source: Jefferson County Assessor’s Office

Table F-9 is a detailed inventory of assets identified by the Town’s planning team. This inventory includes critical facilities. For more information about how “critical facility” is defined in this plan, see Section 4.3 Vulnerability Assessment.

Table F-9 Morrison’s Assets

Name of Asset	Replacement Value (\$)	Hazard Specific Info
Historic Business District	Unknown	Loss of sales tax/employment
Town Shops/Equipment	\$200,000	Recovery activity – flood
Wastewater Treatment Plant	\$5-7 Million	Downstream impacts
Police Garage		
Morrison Natural History Museum		
3 Town buildings	\$200,000	Flood damage
Town Hall/Courthouse	\$900,000	Court activities/Large meeting area
Town Water Diversion Structure (Bear Creek)	\$200,000	Drinking Water Supply
Water Treatment Plant	\$1,930,000	Drinking Water Supply

Many of the facilities listed above are also in GIS databases provided by the Town of Morrison and Jefferson County. Critical facility counts and types are shown in Table F-10 and in the map in Figure F-3. Shelters may be in facilities such as schools or recreation centers and are not indicated on the map. Bridges are also not indicated on the map.

Table F-10 Summary of Morrison’s Critical Facilities in GIS

FEMA Lifeline	Count
Communications	8
Energy	0
Hazardous Materials	3
Health and Medical	1
Safety and Security	2
Transportation	8
Total	22

Source: Jefferson County Assessor (October 2015) HSIP Freedom 2015 and HAZUS 2.2

F.5 Vulnerability Assessment

This section details vulnerability to specific hazards, where quantifiable, and where it differs from that of the overall County. The results of detailed GIS analyses used to estimate potential for future losses are presented here, in addition to maps of hazard areas. For a discussion of the methodology used to develop the loss estimates refer to Section 4.3 of the Base Plan.

F.5.1 Dam Failure/Incidents

Past Events

Based on a search of the National Performance of Dams database there have been thirteen incidents in Jefferson County since 1952, but none of those incidents directly impacted the Town of Morrison.

Dams of Concern

Table 4-11 in Section 4.3.3 of the Base Plan lists dams of concern for Jefferson County. Dams upstream of the Town of Morrison are shown in Table F-11.

Morrison has two high hazard dams whose failure could impact life and/or property. Note: Hazard class does not indicate dam condition, it merely indicates risks in case of failure. A high hazard dam poses risk to both life and property, a significant hazard dam only poses a risk to property. See discussion the Section 4 of the Base Plan. Both dams have been given a satisfactory rating by the State Engineer.

Table F-11 Dams of Concern to Town of Morrison

Dam Name	Stream	Storage Capacity (Acre-Feet)	Emergency Action Plan?	Hazard Rating
Bergen East	Weaver Gulch	706	Yes	High
Morrison Raw Water	Bear Creek	29	Yes	High

Source: National Inventory of Dams, NHD

Non-Failure Dam Incidents

As discussed in Section 4.3.3 of the Base Plan, the Colorado Department of Natural Resources, Dam Safety Division, has a statewide database that identifies the potential for non-failure dam inundation to show potential areas of flooding where outlet capacity exceeds the downstream channel capacity. The dams at the highest risk of non-failure inundation are shown in Table 4-14 of the Base Plan. The ranking shown in the table represents the likelihood of hazardous conditions existing below the dams during a worst case, maximum outlet release scenario. Dams are ranked as high, moderate, or low likelihood for outlet releases to cause conditions that could require an emergency response to reduce potential downstream consequences. The ranking is based on a statewide database of high hazard dams that includes 441 high hazard dams that have been analyzed by the Colorado DNR for this aspect of dam incident flooding. The high, moderate, or low designations were assigned by DNR by dividing the total number of ranked dams across the state into thirds. Should there be a need to relieve pressure on the dam (e.g., if there was excess inflow from high rains or snowmelt) releases from the dams ranked as high

or moderate may result in downstream flooding. The Bergen East Dam referenced above has been identified as also having risk of non-failure inundation.

Table F-12 Dams with Risk of Non-Failure Inundation

Dam ID	Dam Name	Outlet Description	Max Outlet Release Capacity (cfs)	Ranking	Outlet Release Hazard Rating
090104	Bergen East	12" CIP	45	157	Moderate

Source: State of Colorado Department of Natural Resources, Dam Safety Division

No low head dams have been identified in the Town of Morrison.

Estimating Potential Losses

Table F-13 shows that Morrison has 6 parcels (3.8% of total) that are potentially exposed with a total value of \$2.9 Million. Of the parcels exposed, 5 are residential properties potentially exposing 10 residents to dam inundation hazards.

Table F-13 Dam Inundation Risk

Property Type	Improved Parcels	Buildings	Improved Value	Content Value	Total Value	Population
Commercial	1	1	\$211,534	\$211,534	\$423,068	
Residential	5	5	\$1,639,997	\$819,999	\$2,459,996	10
Total	6	6	\$1,851,531	\$1,031,533	\$2,883,064	10

Source: Jefferson County Assessor, National Inventory of Dams, NHD

Critical Facilities

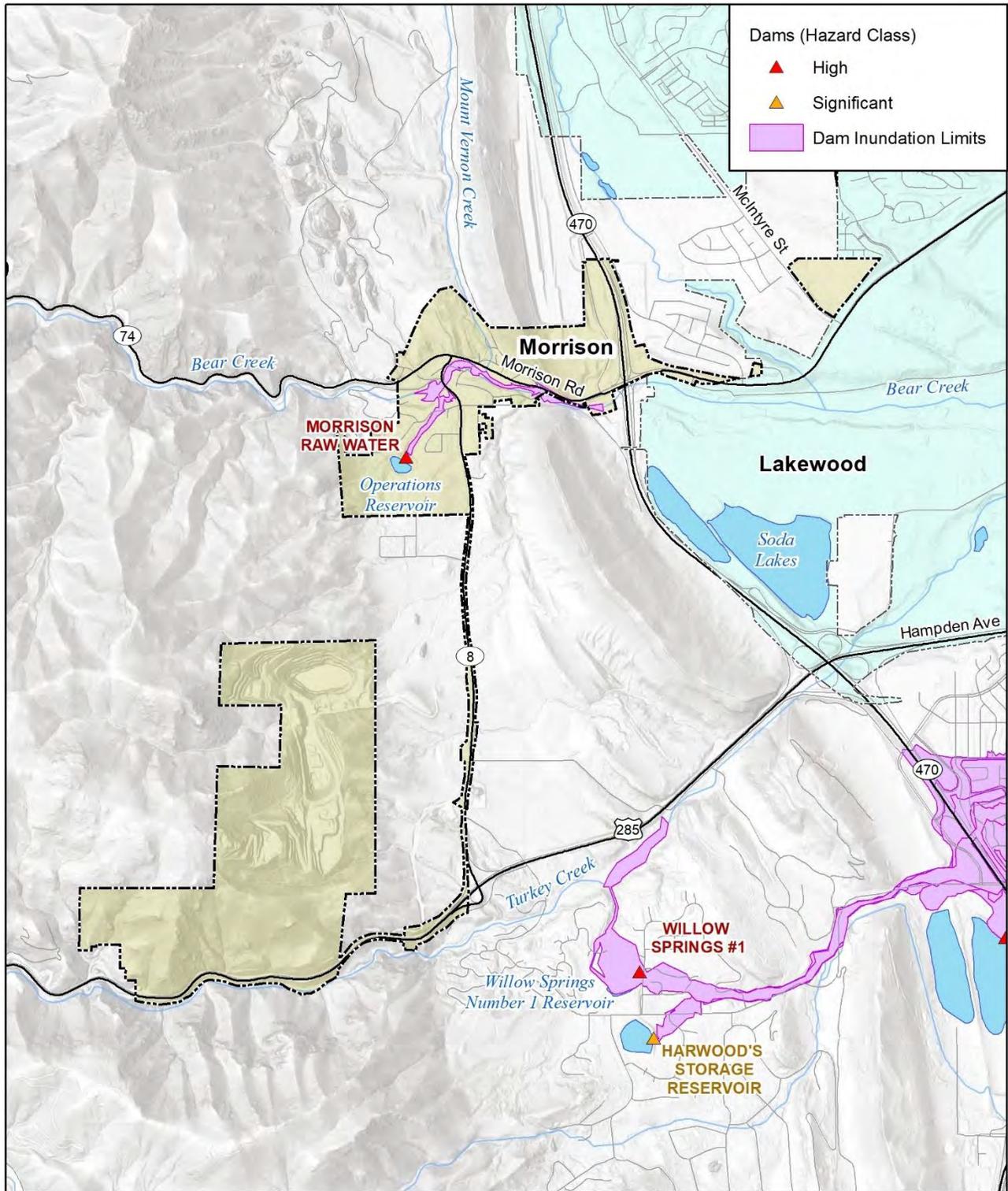
There are 4 critical facilities identified in areas at risk of dam inundation in the Town of Morrison, shown in Table F-14.

Table F-14 Critical Facilities Potentially at Risk of Dam Inundation, by FEMA Lifeline

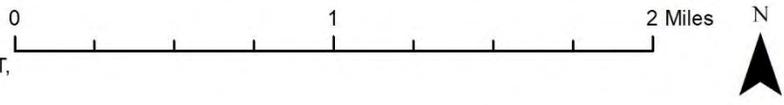
FEMA Lifeline	Critical Facility Type	Count
Communications	Land Mobile Private Towers	1
Transportation	Bridge	3
Total		4

Source: National Inventory of Dams, HIFLD and CERC

Figure F-4 Dam Inundation Areas in the Town of Morrison



Map compiled 2/2021;
intended for planning purposes only.
Data Source: Jefferson County, CDOT,
Colorado DWR Dam Safety



F.5.2 Flood

Past Events

1896 Flooding

A cloudburst in Bear Creek Canyon brought a solid wall of water through the Town of Morrison. The flood was 200 feet wide and 15 feet deep. It caused over \$6 million in damages (1999 dollars). 27 people lost their lives. Most of those who lost their lives were Denverites camping in the canyon. All bridges across Bear Creek were washed away, trees were uprooted, and long stretches of railroad track were washed out. This flood was one of the deadliest floods in Colorado history.

Multiple Floods - 20th Century

There have been multiple major floods during the 20th century on both the Bear and Mount Vernon Creek. These floods have caused extensive damage to property and infrastructure. Roads and bridges were damaged. Significant losses were suffered by local residents and businesses. Multiple deaths and injuries were reported. The Town has been subject to severe and repetitive floods. See the flood hazard profile in the Base Plan for descriptions of these events. Figure F-5 depicts Bear Creek flood levels on the wall of a store in Morrison between Market Street and Mount Vernon Street downstream of the Mount Vernon Creek confluence with Bear Creek. The “Historic High Water Mark” depicts the level of the September 2, 1938 flood that peaked around 7 p.m.

Figure F-5 1938 Flood High Water Mark between Market Street and Mount Vernon Street



2013 Storms and Flooding

From September 9 - 15, 2013, very heavy rains created massive flooding along Bear Creek and Mt. Vernon Creek through Morrison. Bear Creek peaked at a flow of about 3,200 cfs in Morrison as reported by the Division of Water Resources, which is likely a 10 to 15-year storm event. The Bear Creek at Morrison gaging station recorded a 3' rise in water surface. Upstream of Highway 8 near Morrison Park, the Bear Creek flooding caused damages to the channel banks and trail. Downstream of the Highway 8 crossing, an existing sewer main below the Canon Street bridge was threatened and the Ward Ditch diversion dam and adjacent concrete bike path were undermined. The State Engineers' Office was concerned that the Evergreen dam located upstream of Morrison would exceed its capacity. As a result, for several days Morrison was under an evacuation alert status.

Estimating Potential Losses

Figure F-6 depicts the FEMA flood zones (1% annual chance and 0.2% annual chance) as well as all the at-risk properties in Morrison.

Table F-15 shows the parcels and buildings values at risk to the 1% annual chance flood. For this analysis, content values were estimated based on prevailing land use and a multiplier was applied to building and content values to estimate losses to each. See Section 4 Hazard Profiles for details on methodology. According to the analysis, 60 buildings (21 of which are residential) are at risk, totaling \$5.2 million of damage to buildings and contents. This represents 32% of the buildings in the Town. Note that this analysis does not account for properties which may have been built in accordance with local floodplain regulations and mitigated to the 1% annual chance flood.

Table F-15 Town of Morrison Properties At-Risk to 1% Annual Chance Flood

Property Type	Improved Parcels	Buildings	Improved Value	Content Value	Total Value	Estimated Loss (25%)	Population
Commercial	18	31	\$5,632,583	\$5,632,583	\$11,265,166	\$2,816,292	
Mixed Use	7	8	\$2,167,342	\$2,167,342	\$4,334,684	\$1,083,671	
Residential	12	21	\$3,457,540	\$1,728,770	\$5,186,310	\$1,296,578	43
Total	37	60	\$11,257,465	\$9,528,695	\$20,786,160	\$5,196,540	43

Source: Wood analysis of Jefferson County Assessor's Data

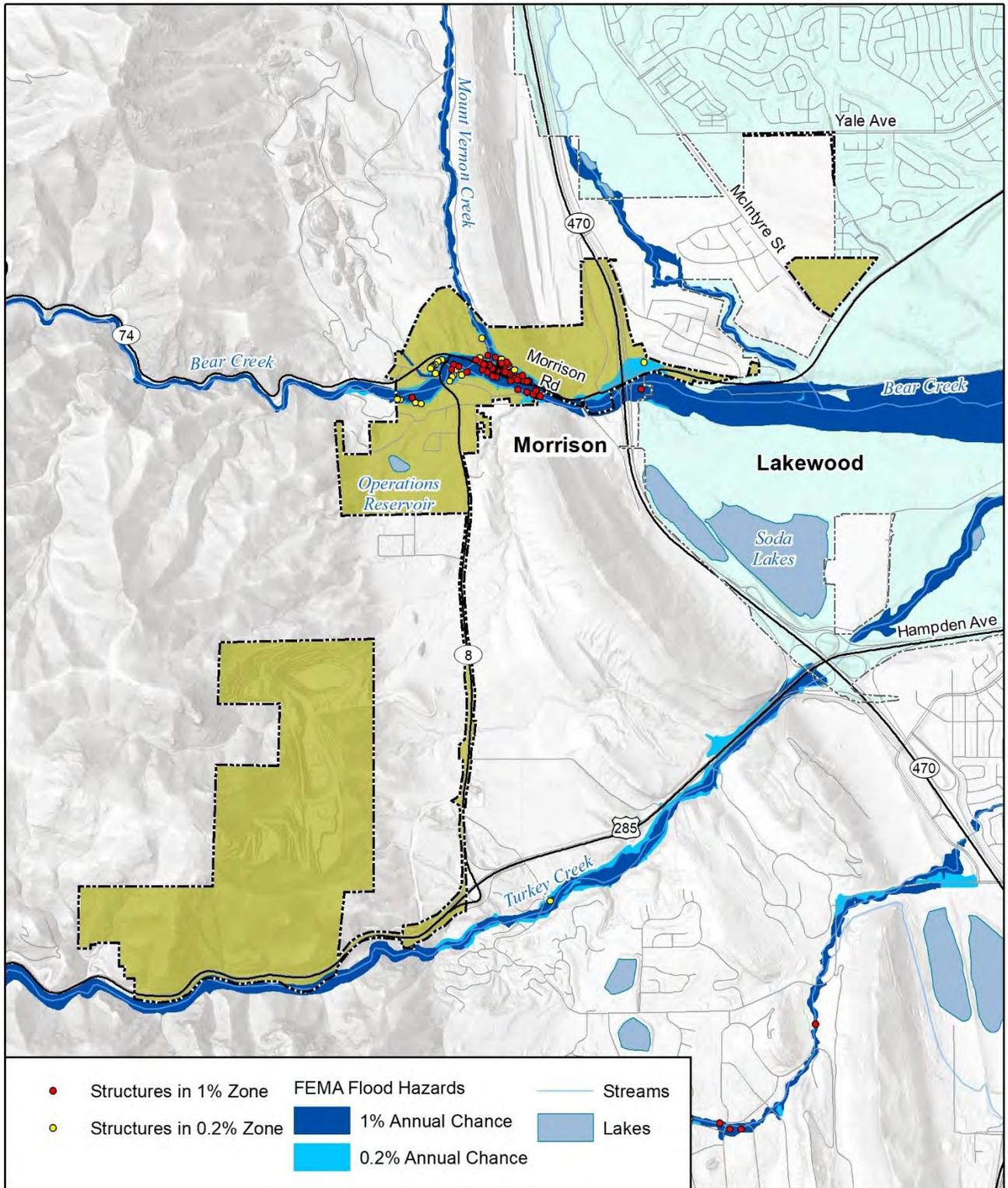
Table F-16 shows the parcels and buildings at risk to the 0.2% annual chance flood. According to the analysis, 25 buildings (19 of which are residential) are at risk, totaling \$2.1 million of damage to buildings and contents over and above the 1% scenario.

Table F-16 Town of Morrison Buildings At-Risk to 0.2% Annual Chance Flood

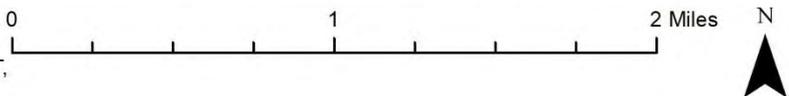
Property Type	Improved Parcels	Buildings	Improved Value	Content Value	Total Value	Estimated Loss (25%)	Population
Commercial	1	3	\$467,746	\$467,746	\$935,492	\$233,873	
Exempt	2	2	\$139,723	\$139,723	\$279,446	\$69,862	
Mixed Use	1	1	\$30,010	\$30,010	\$60,020	\$15,005	
Residential	17	19	\$4,776,486	\$2,388,243	\$7,164,729	\$1,791,182	39
Total	21	25	\$5,413,965	\$3,025,722	\$8,439,687	\$2,109,922	39

Source: Wood analysis with Jefferson County Assessor's Data

Figure F-6 Town of Morrison Flood Hazard and At-Risk Properties



Map compiled 4/2021;
intended for planning purposes only.
Data Source: Jefferson County, CDOT,
FEMA NFHL 1/15/2021



Critical Facilities

There are six critical facilities in the 1% annual chance flood zone (Table F-17), with an additional three additional critical facilities in the 0.2% annual chance flood zone (Table F-18). Together this represents 40% of the Town’s critical facilities.

Table F-17 Morrison Critical Facilities in 1% Annual Chance Floodplain

FEMA Lifeline	Critical Facility Type	Count
Communications	Land Mobile Private Towers	3
Transportation	Bridge	3
Total		6

Source: HIFLD and CERC

Table F-18 Morrison Critical Facilities in 0.2% Annual Chance Floodplain

FEMA Lifeline	Critical Facility Type	Count
Communications	Land Mobile Private Towers	1
Transportation	Bridge	2
Total		3

Source: HIFLD and CERC

The Town of Morrison has participated in the National Flood Insurance Program (NFIP) since 1982. NFIP insurance data shows that as of January 2021 there are 8 flood insurance policies in force in the Town providing \$2.7 million of coverage. There have been 8 historical claims for flood losses, totaling \$1,231. There are no repetitive loss structures or severe repetitive loss structures as defined by the NFIP. In addition to participating in the NFIP, Arvada is also a Community Rating System (CRS) participant and currently a Class 8 CRS community.

F.5.3 Geologic Hazards

Morrison has some limited exposure to geologic hazards including slope failure, dipping bedrock and slope failure. These hazard areas mainly affect the eastern portions of the Town. See the maps in Figure F-7 and Figure F-8. Specific structures at risk from specific geologic hazards are detailed in Table F-19 and Table F-20. Methodology for this table can be found in Section 4.3.4 Estimating Potential Losses.

Table F-19 Town of Morrison Slope Failure Risk

Property Type	Improved Parcels	Buildings	Improved Value	Content Value	Total Value
Exempt	1	1	\$25,264	\$25,264	\$50,528
Mixed Use	3	3	\$519,540	\$519,540	\$1,039,080
Residential	4	4	\$724,480	\$362,240	\$1,086,720
Total	8	8	\$1,269,284	\$907,044	\$2,176,328

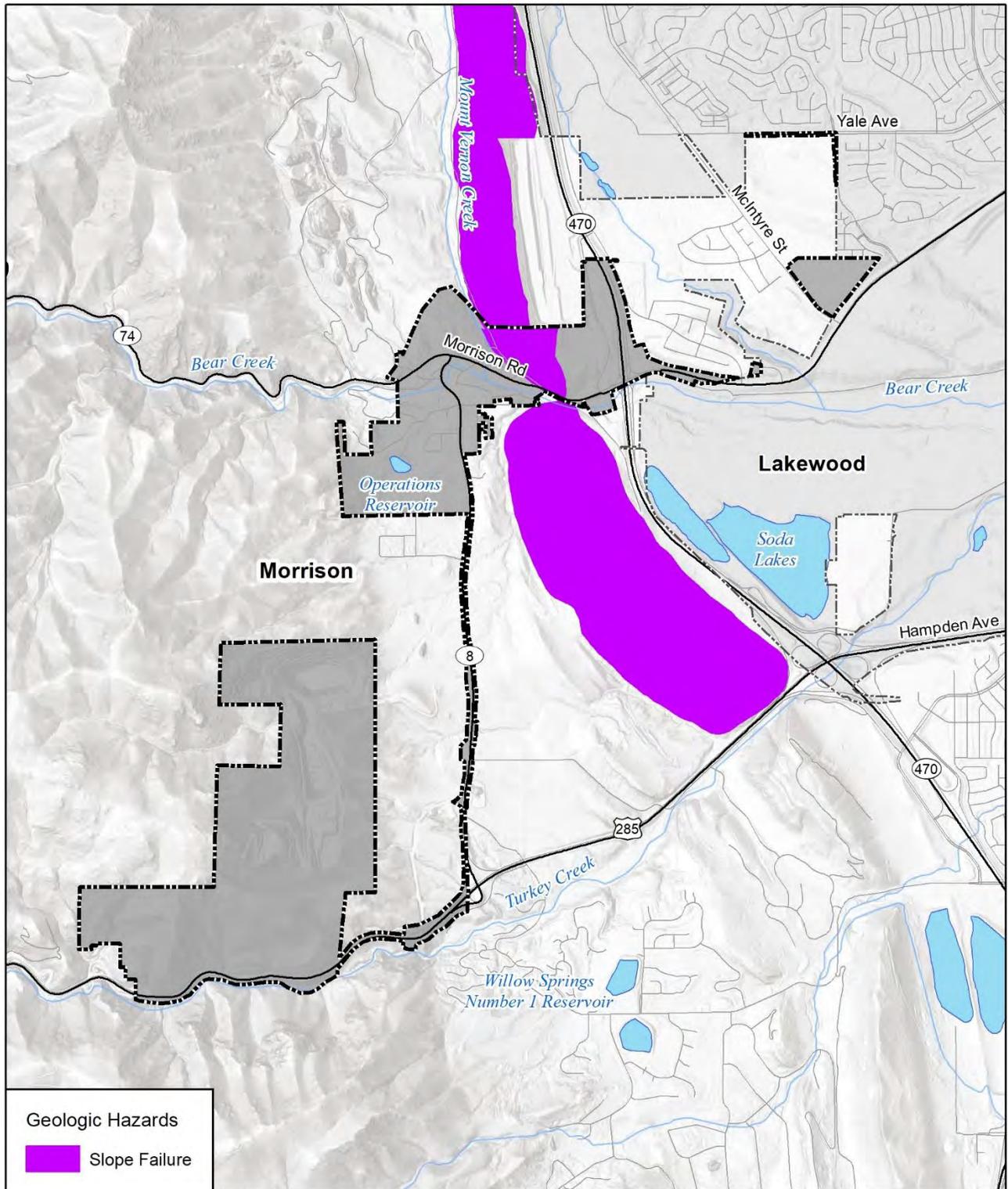
Source: Wood analysis of Jefferson County Assessor’s Data

Table F-20 Town of Morrison Dipping Bedrock Risk

Property Type	Improved Parcels	Buildings	Improved Value	Content Value	Total Value
Commercial	1	1	\$840,839	\$840,839	\$1,681,678
Exempt	3	3	\$8,979,349	\$8,979,349	\$17,958,698
Industrial	1	1	\$72,577	\$108,866	\$181,443
Total	5	5	\$9,892,765	\$9,929,054	\$19,821,819

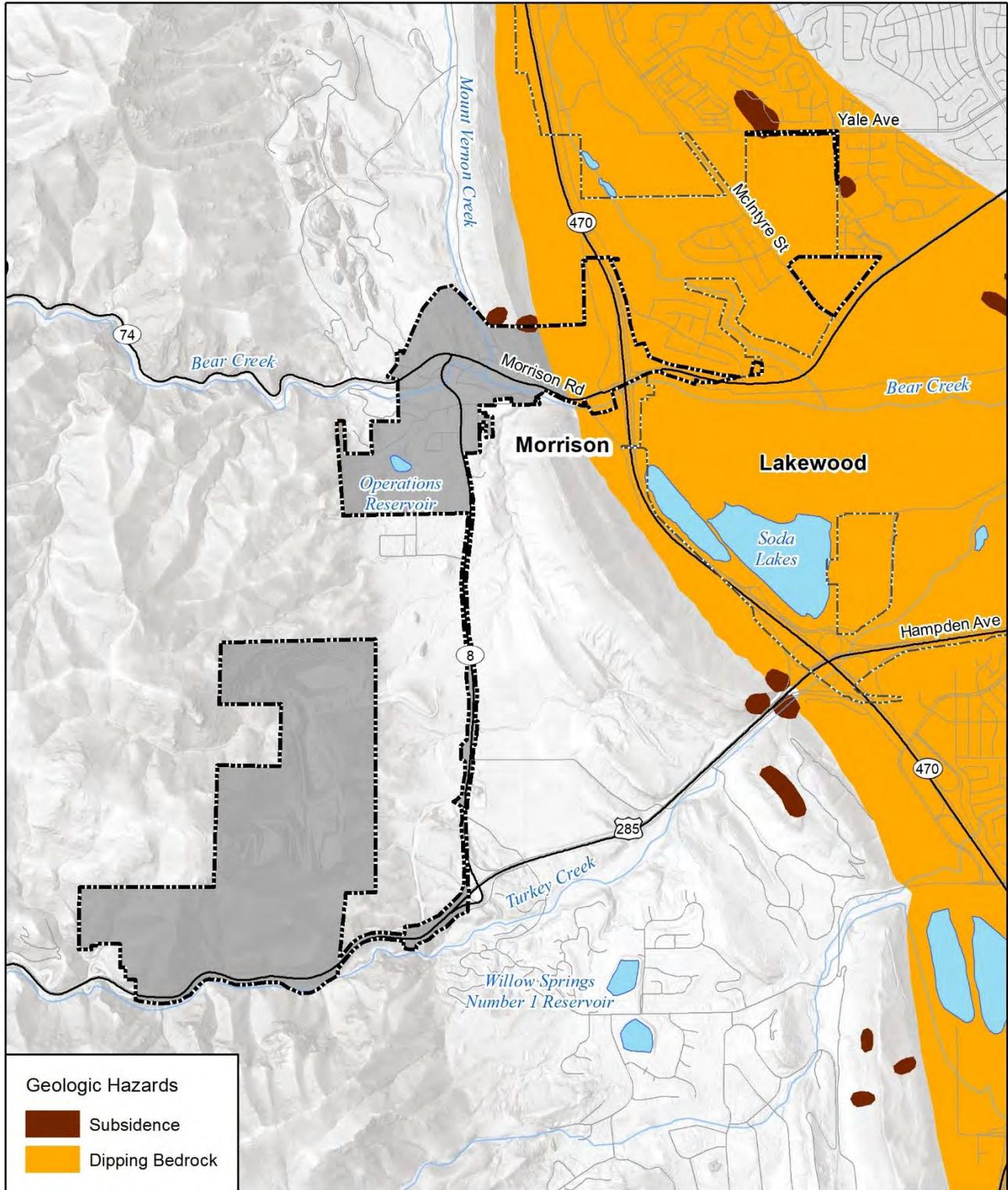
Source: Wood analysis of Jefferson County Assessor’s Data

Figure F-7 Town of Morrison Landslide & Rockfall Risk Map



Map compiled 2/2021;
intended for planning purposes only.
Data Source: Jefferson County, CDOT

Figure F-8 Town of Morrison Areas at Risk of Subsidence and Dipping Bedrock



Geologic Hazards
 Subsidence
 Dipping Bedrock

Map compiled 2/2021;
intended for planning purposes only.
Data Source: Jefferson County, CDOT

0 1 2 Miles



According to a Geological Society of America report the town’s raw water pipeline was affected by a landslide in the past; the point of damage was mitigated, but additional mitigation is needed.

Morrison’s proximity to the Golden Fault as a potential, though unlikely, earthquake source makes it vulnerable to earthquake damage. Morrison’s downtown historic district has a number of un-reinforced masonry buildings that are particularly vulnerable to earthquake shaking.

F.5.4 Wildfire

Estimating Potential Losses

Parcel analysis was conducted using GIS to analyze where parcels, buildings counts, property types and content values intersected with the wildfire hazards zones defined by the Colorado Forest Atlas, from highest to lowest risk. In addition to parcel data, an address point layer was also used to estimate building locations. Results are shown in Table F-21 - Table F-23. Based on this analysis Golden has 112 structures at risk of wildfire, 82 of which are at moderate risk. Residential property types have the greatest number of parcels at risk of wildfire, in addition there are 208 residents exposed to wildfire risk.

Table F-21 Moderate Wildfire Risk, By Property Type

Property Type	Improved Parcels	Buildings	Improved Value	Content Value	Total Value	Population
Commercial	5	5	\$14,962,510	\$14,962,510	\$29,925,020	
Exempt	1	2	\$18,084,856	\$18,084,856	\$36,169,712	
Industrial	6	6	\$604,500	\$906,750	\$1,511,250	
Mixed Use	1	1	\$779,340	\$779,340	\$1,558,680	
Residential	68	68	\$36,620,694	\$18,310,347	\$54,931,041	152
Total	81	82	\$71,051,900	\$53,043,803	\$124,095,703	152

Source: Colorado Forest Atlas & Jefferson County Assessor’s Office data

Table F-22 Low Wildfire Risk, By Property Type

Property Type	Improved Parcels	Buildings	Improved Value	Content Value	Total Value	Population
Residential	2	2	\$179,353	\$89,677	\$269,030	4
Total	2	2	\$179,353	\$89,677	\$269,030	4

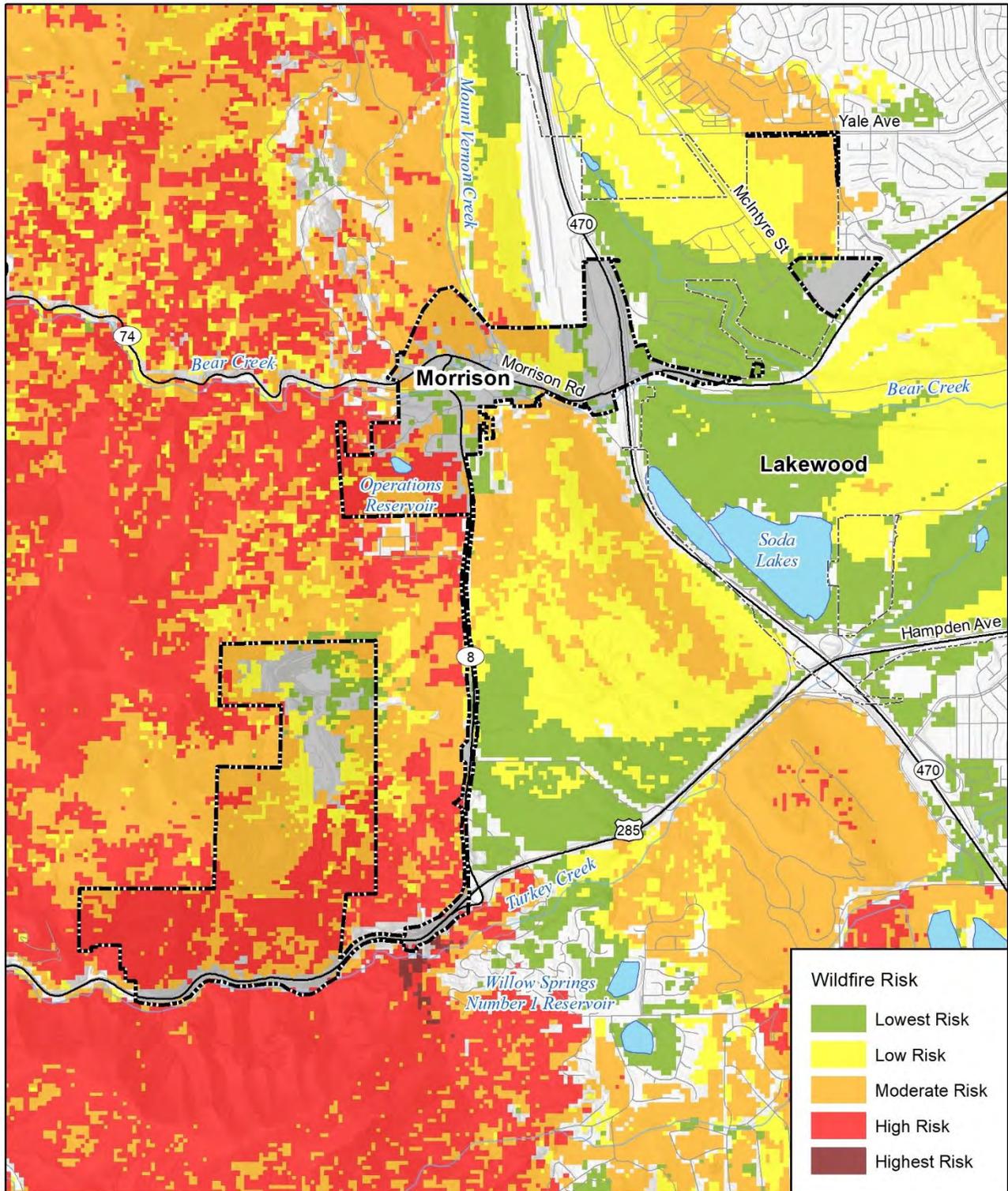
Source: Colorado Forest Atlas & Jefferson County Assessor’s Office data

Table F-23 Lowest Wildfire Risk, By Property Type

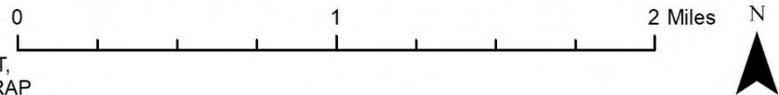
Property Type	Improved Parcels	Buildings	Improved Value	Content Value	Total Value	Population
Commercial	1	1	\$211,534	\$211,534	\$423,068	
Exempt	2	2	\$863,450	\$863,450	\$1,726,900	
Residential	25	25	\$9,211,055	\$4,605,528	\$13,816,583	52
Total	28	28	\$10,286,039	\$5,680,512	\$15,966,551	52

Source: Colorado Forest Atlas & Jefferson County Assessor’s Office data

Figure F-9 Town of Morrison Wildfire Hazard Map



Map compiled 2/2021;
intended for planning purposes only.
Data Source: Jefferson County, CDOT,
Colorado State Forest Service COWRAP



Critical Facilities

The Town of Morrison has a total of 2 critical facilities at low risk to wildfire. The following table shows the results of the GIS analysis and is organized by wildfire risk and Lifeline. Refer to section 4.3.16 of the Base Plan for more information on the methodology of the GIS analysis.

Table F-24 Town of Morrison Critical Facilities At-Risk to Wildfire by Type

Wildfire Risk	FEMA Lifeline	Critical Facility Type	Count
Low	Communications	Land Mobile Private Towers	1
	Transportation	Bridge	1
Total			2

Source: HIFLD and CERC

F.5.5 Other Hazards

In the case of other hazards that are not specific to geography such as drought, hailstorms, winter storms, lightning, tornado, and windstorm the entire building inventory and population in the Town is potentially exposed. That is the reason for the asset inventory provided in Section 1.3. It should be noted that no hazard in this plan is expected to cause widespread impacts to this inventory. Morrison’s location at the base of the foothills makes it more prone to high wind events than other communities in this plan.

Past Events

1913 Winter Storm Blizzard – A severe snow event in the winter of 1913 caused a complete shutdown of the town as well as Turkey and Bear Creek Canyons. Food items and mail had to be delivered to residents by pack mule and horseback while medical supplies, food and other critical items were brought in by rail and then relayed up the canyons by private contractors.

2006 Winter Storm Blizzard – A slow moving low pressure system moved from the Desert Southwest and into Southeastern Colorado. As a result, a deep upslope flow developed along the Front Range and Northeast Plains of Colorado. Strong winds and heavy snow brought blizzard conditions to the Interstate 25 Corridor, from the Wyoming state line south to Colorado Springs. Storm totals generally ranged from 2 to 4 feet in and near the Front Range Foothills and Palmer Divide. Schools in Morrison were closed, and businesses in the town suspended their business to dig out from the storm, causing a loss of business and sales tax revenue. The Town of Morrison was given aid in the amount of \$8,000 to offset snow removal costs.

F.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. Morrison’s regulatory, administrative, and technical, and fiscal mitigation capabilities are summarized in Section 2.7 of the Base Plan. Additional details on specific capabilities are discussed below.

National Flood Insurance Program

The Town of Morrison joined the National Flood Insurance Program (NFIP) on December 1, 1982. The NFIP allows private property owners to purchase affordable flood insurance and enables the community to retain its eligibility to receive certain federally backed monies and disaster relief funds. Morrison’s initial Flood Insurance Rate Map became effective on 5/15/85. The most current Digital Flood Insurance Rate Maps were updated and became effective on 2/5/2014. As of January 2021, there were 8 NFIP policies in force in Golden, with a total coverage \$2,756,300; this represents a decrease of 4 policies and \$166,300 in coverage since 2015. In Golden, there have been 8 historical claims for flood losses totaling \$1,231. At the time this plan was developed there were no repetitive or severe repetitive loss structures as defined by the NFIP.

The Town also joined the Community Rating System (CRS) on October 1, 1996. The CRS is a voluntary program for NFIP-participating communities. It provides flood insurance discounts to policyholders in

communities that provide extra measures of flood above the minimum NFIP requirements. As of January 2021, Morrison had a CRS class rating of 8 (one a scale of 1-10, 1 being the best). This rating has improved from a class 9 in 2015, and provides a 5 percent discount for policyholders within a special flood hazard area (SFHA) and a 5 percent discount for those outside of an SFHA.

Community Rating System Categories

The Community Rating System (CRS) categorizes hazard mitigation activities into six categories. These categories, and applicable Morrison activities, are described below. Note: some of the activities are appropriate to multiple categories. For purposes of simplicity, they are only included in the category deemed most appropriate based on the definitions and examples provided in the *CRS Coordinator's Manual*.

Preventive

Preventive activities keep problems from getting worse. The use and development of hazard-prone areas is limited through planning, land acquisition, or regulation. They are usually administered by building, zoning, planning, and/or code enforcement offices.

Town of Morrison Comprehensive Plan (2015)

The Town's comprehensive plan is a guide to help the Town make decisions and establish its future direction. The goals and policies contained within the plan cover a broad range of subject matter related to services, issues, and geographic areas within Morrison. Combined, these elements serve to direct future policy decisions to preserve vital community attributes and service levels and manage growth.

The following excerpts are goals and related polices that are relevant to this hazard mitigation plan.

- **Goal SA-1:** Preserve significant natural, cultural, and agricultural resources within the planning area and maintain the rural character of Morrison.
 - **Policy SA-1:** Identify and encourage the preservation and enhancement of agricultural lands, scenic view corridors, wildlife habitat, and geologic rock formations.
- **Goal A-1:** Grow with the intention of maintaining Morrison's small town atmosphere.
 - **Policy A2:** Adequate public facilities and services should be available to serve current and future residents in a cost-effective, efficient manner. Development should occur where it can be served by Town infrastructure.
- **Goal D-1:** Create and plan for the future public recreational opportunities for both residents and day visitors to improve tourism and support existing retail businesses.
 - **Policy D-3:** Parks, trails, and open space shall be designed and constructed concurrently with new development. In addition, new parks and trails shall be multi-purpose and enhance the area's quality of life and small town character.
- **Goal D-2:** Preserve, protect, and enhance significant open spaces, natural and wildlife habitat.
 - **Policy D-4:** Protect and enhance significant wildlife habitat, vegetation communities, geologic features, viewsheds, agricultural land, and natural areas.
- **GOAL 1:** Complete the Town reservoir and water treatment improvements in order to take full advantage of the Town's current water rights.
 - **Policy I-1:** Develop a water system capable of providing an adequate year-round water supply in dry years and for future residential and commercial growth by creating storage and treatment facilities.
 - **Policy I-3:** Assure that businesses comply with regulations governing water and wastewater usage as well as solid waste storage and disposal.
- **Goal J-1:** Promote the conservation of natural resources and the efficient use of energy while encouraging sustainable development practices.
 - **Policy J-7:** Create and adopt natural hazard regulations in order to guide development.

- **GOAL 1:** Continue to ensure adequate flood, police, fire, and emergency protection for Morrison residents and property by collaborating with other agencies during major events and relocating some Town facilities out of the floodplain.
 - **Policy K-1:** Continue to expand the positive working relationship with Denver’s Theatres and Arenas, Bandimere Speedway, the Jefferson County Sheriff’s Office, the Colorado State Patrol, the West Metro Fire Protection District, and other entities associated with public safety and emergency response in the area.
 - **Policy K-2:** Continue to participate in the federal flood insurance program and work to maintain and improve its working relationship with the Urban Drainage and Flood Control District.

Municipal Code

Title 10, Chapter 3: Floodplain Damage Prevention (Ord. 407, 1-7-2014)

10-3-1 Statutory Authorization

The legislature of the state of Colorado has, in title 29, article 20 of the Colorado Revised Statutes, delegated the responsibility of local governmental units to adopt regulations designed to minimize flood losses. Therefore, the Board of Trustees of the Town of Morrison, Colorado, does hereby adopt the following floodplain management regulations.

10-3-3 Statement of Purpose

It is the purpose of this chapter to promote the public health, safety and general welfare and to minimize public and private losses due to flood conditions in specific areas by provisions designed:

- To protect human life and health.
- To minimize expenditure of public money for costly flood control projects.
- To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public.
- To minimize prolonged business interruptions.
- To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, and streets and bridges located in areas of special flood hazards.
- To help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future flood blight areas.
- To ensure that potential buyers are notified that property is in an area of special flood hazard.
- To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.

Other Regulations

Title 10, Chapter 1: Zoning Regulations

The zoning code is enacted for the purpose of promoting the health, safety, morals, convenience, order, prosperity and welfare of the present and future inhabitants of the town by lessening of congestion in the streets and roads, securing safety from fire and other dangers, providing adequate light and air; the classification of land uses and the distribution of land development and utilization, avoiding undue congestion of population, facilitating the adequate provision of transportation, water, schools, sewer and other public requirements; and by other means in accordance with a master plan and the zoning map adopted herewith.

Title 10, Chapter 5: Land Disturbance Regulations

This section of municipal code governs land development and the possible resultant erosion. The clearing, stripping and grading of land for nonagricultural uses can cause accelerated, localized erosion rates with subsequent deposition and damage to off-site properties and receiving drainageways. Erosion and sedimentation are natural processes whose intensity, when increased by development, can destroy the environmental, aesthetic and economic values of other properties, streams and lakes. The purpose of a land disturbance permit process is to reduce erosion and sedimentation.

Title 10; Chapter 6 Storm Drainage Regulations

Due to its general terrain and geographical location, the Town is particularly subject to damage from storm waters which, from time to time, overflow from existing water courses and drainage facilities. Presently existing storm drainage facilities, as well as future storm drainage facilities, require continuous operation, maintenance, renewal and replacement. Each owner of a lot or parcel of real property within the Town to the extent that he makes use of, and is served by, the Town's storm drainage facilities by contributing to those facilities storm water runoff beyond that amount (both in terms of peak rates and volumes) of storm water which would occur if that real property were undeveloped in its natural state, should pay for the use and the availability of use of such facilities.

Public Information

Public information activities advise property owners, potential property owners, and visitors about the hazards, ways to protect people and property from the hazards, and the natural and beneficial functions of natural resources (e.g., local floodplains). They are usually implemented by a public information office.

- Distribution of flood related info
- Wildfire precaution
- Potable water conservation
- Morrison and Jeffco Emergency Management Office worked together on the installation of an emergency warning alert siren/voice message system in the Town to provide alerts related to flash flooding, wind related emergencies, hazmat incidents etc. The equipment was installed at the Town public workshops and will afford protection to most at risk residential and commercial areas of the Town. Activation to be provided by Jeffco Sheriff's Office.

F.6.1 Opportunities for Enhancement

Based on the capability assessment, Morrison has several existing mechanisms in place that already help to mitigate hazards. There are also opportunities for the Town to expand or improve on these policies and programs to further protect the community. Table 2-15 in the Base Plan shows the potential financial benefits from increasing the Town's Community Rating System class. Other future improvements may be the incorporation of risk and hazard information into future comprehensive plan updates.

F.7 Plan Implementation and Maintenance

Morrison has developed a Plan Maintenance and Implementation Strategy outlining their method and schedule for keeping the plan current. The Implementation Strategy below also includes a discussion of how the Town will continue public participation in the plan maintenance process.

F.7.1 Implementation and Maintenance of the 2016 Hazard Mitigation Plan

The Town of Morrison recognizes and acknowledges the importance of hazard mitigation and has worked to integrate and incorporate hazard information into existing planning mechanisms.

F.7.2 Monitoring, Evaluation and Updating the Plan

The information contained within this plan, including results from the Vulnerability Assessment, and the Mitigation Strategy will be used by the Town to help inform updates and the development of local plans, programs and policies, as described in Section 6 of the Base Plan.

The 2008 Town of Morrison Comprehensive Plan sets forth policies related to creating and adopting natural hazard regulations in order to guide development. The next full update of the Town's Plan should also cross-reference the 2015 Jefferson County Hazard Mitigation Plan to reinforce the goals and recommendations specified within this document.

The Town Administrator will be responsible for monitoring, evaluating, and updating this plan using the process outlined in Section 6 of the Base Plan. Arvada The Town Administrator will also be responsible for representing the Town on future Jefferson County HMPC meetings, and for coordination with town staff and departments during plan updates. The Town, Police Department, and Fire District will meet at a minimum annually to discuss items that need to be updated and look at progress of action items. All items with budgetary requirements would need to be approved by Town Council.

The Town of Morrison will also continue to involve the public in mitigation, as described in Section 6.4 of the Base Plan. This will include posting information on the website and utilize marketing and communications to get information to citizens and businesses.

F.8 Mitigation Strategy

The Town of Morrison has adopted the hazard mitigation goals and objectives developed by the Planning Team and described in Section 6.2 of the Base Plan.

The Town had six mitigation actions in the 2016 Plan, and has completed one of them:

- Multi-Jurisdictional Storm Ready Program Participation

The remaining actions have been carried over into the 2021 Plan, along with seven new actions.

F.8.1 National Flood Insurance Program

Recognizing the importance of the National Flood Insurance Program (NFIP) in mitigating flood losses, the Town of Morrison will place an emphasis on continued compliance with the NFIP. As an NFIP participant, the Town has and will continue to make every effort to remain in good standing with NFIP. This includes continuing to comply with the NFIP's standards for updating and adopting floodplain maps and maintaining and updating the floodplain zoning ordinance as well as review of any potential development in special flood hazard areas.

F.8.2 Mitigation Actions

The local planning team identified and prioritized the following mitigation actions for the Town of Morrison based on the risk assessment. Information on how each action will be implemented and administered, such as ideas for implementation, responsible agency, potential funding, estimated cost, and timeline also are included.

Many of these mitigation actions are intended to reduce impacts to existing development as well as future development. These actions include those that promote wise development and hazard avoidance, such as building code, mapping, and zoning improvements, and continued enforcement of floodplain development regulations. Actions that protect critical infrastructure note which lifeline category is protected using the following abbreviations:

COM: Communications

ENG: Energy

FWS: Food, Water, Sheltering

HAZ: Hazardous Waste

H&M: Health & Medical

S&S: Safety & Security

TRN: Transportation

Table F-25 Town of Morrison Mitigation Action Plan

Number	Title and Description	Hazards Mitigated	Related Goals & Lifelines	Lead Agency & Partners	Cost Estimate & Potential Funding	Priority	Timeline	Status & Implementation Notes
Morrison 1	Relocation of Town Shops. Morrison town shops are located adjacent to Bear Creek in a flood zone. Equipment necessary for flood recovery is stored in these shops. Relocation to safer location would protect equipment from damage/loss due to flash flooding. Benefits include building and equipment costs.	Flood	2; FWS, S&S	Town Administrator - Town of Morrison	\$50,000 plus site acquisition and development costs Town general fund, Jefferson County Open Space	High	Listed on town capital improvements 5 year plan	Not Started. This action has not been implemented, but continues to be a priority for the Town of Morrison. A parcel has been identified for purchase, and funding for the land and structure are included in the Town's 5-year capital plan. The Town has received a BRIC award for mitigation project scoping, and this project will be included in the scoping report, improving funding eligibility.
Morrison 2	Continue to Implement Sound Floodplain Management Practices through Participation in the National Flood Insurance Program. The Town of Morrison participates in the National Flood Insurance Program and the Community Rating System. The Town implements sound floodplain management practices, as stated in the flood damage prevention ordinance. This includes ongoing activities such as enforcing local floodplain development regulations, including issuing permits for appropriate development in Special Flood Hazard Areas and ensuring that this development is elevated to or above the base flood elevation. This project also includes periodic reviews of the floodplain ordinance to ensure that it is clear and up to date. Floodplain managers will remain current on NFIP policies, and are encouraged to attend appropriate training and consider achieving Certified	Flood	2; FWS	Floodplain Engineer: Charles Weiss, Bowman Consulting	Low Covered in existing budget	Medium	Ongoing	Annual Implementation. The Town's Comprehensive Plan will be updated in 2021, information from the 2016 HMP and this HMP Update once adopted, will contribute to the CP update. This will further Morrison's ongoing goal to implement and improve floodplain management practices. In 2017 the Town's GIS database was updated, and now includes current layers for the location of existing critical infrastructure.

Number	Title and Description	Hazards Mitigated	Related Goals & Lifelines	Lead Agency & Partners	Cost Estimate & Potential Funding	Priority	Timeline	Status & Implementation Notes
	<p>Floodplain Manager (CFM) status. Other activities that could be included in this effort are:</p> <p>Ensure that stop work orders and other means of compliance are being used as authorized by each ordinance;</p> <p>Suggest changes to improve enforcement of and compliance with regulations and programs;</p> <p>Participate in Flood Insurance Rate Map updates by adopting new maps or amendments to maps;</p> <p>Promote and disperse information on the benefits of flood insurance, with assistance from partners such as the County, Mile High Flood District, and Colorado Water Conservation Board. Evaluate activities that will improve Community Rating System ratings that may further lower the cost of flood insurance for residents</p>							Development plans that are submitted to the Town are reviewed for compliance to the Town's Floodplain and Storm Drainage Regulations.
Morrison 3	<p>Mitigation Project Scoping Report. Morrison has a significant exposure to damage from hazards such as flooding and fire, as well as exposure to earthquake and soil issues. To aid in the identification and prioritization of future mitigation projects, a Mitigation Project Scoping Report will be prepared. The benefit to preparation of this scoping report is substantial and could help to identify projects that and mitigate the risk associated with these events, and help to avoid predicted losses. This proposed project aligns with the goals of the Town's Comprehensive Plan and FEMA Mitigation Strategies.</p>	Earthquake, Erosion, Expansive Soils, Flood, Subsidence, Wildfire	2; TBD	Town Manager	\$56,000; FEMA BRIC Grant, Town general fund	High	Scheduled to begin Fall of 2021.	New in 2021
Morrison 4	<p>Critical Infrastructure Master Plans and Bridge Assessments. This project will Update the Water and Wastewater Master Plan, develop a new Stormwater Master Plan, and a new Transportation Master Plan. Morrison completed the preparation of a Water and Wastewater Master Plan in 2017. This plan will need to be updated in 2023. In addition,</p>	Flood, Wildfire	1,2,3; FWS	Town Manager	\$450,000; FEMA BRIC Grant, Town General Fund	Medium	Scheduled to begin Fall of 2022.	New in 2021

Number	Title and Description	Hazards Mitigated	Related Goals & Lifelines	Lead Agency & Partners	Cost Estimate & Potential Funding	Priority	Timeline	Status & Implementation Notes
	Morrison will prepare a Stormwater Master Plan and a Transportation Master Plan that includes bridge condition assessments, in order to identify local facility/road location, status, maintenance needs, capacity and deficiencies. The benefit to the preparation of these reports is substantial, they will improve the town's resiliency and will identify resilient infrastructure projects that help to mitigate the nearly \$53 million in predicted losses.							
Morrison 5	Critical Infrastructure Bridge Projects. Morrison completed the preparation of a Bridge Assessment in 2019. This report provided information on two bridges in the Town that require repair: the Morr-Canon Street Bridge and the Morr-South Park Avenue Historic Bridge. The Morr-Canon Street Bridge is also listed as structurally deficient. The Spring Street Bridge and the Middle Street Alley Bridge have also been assessed for repair/ replacement. The town of Morrison will begin assessing and affecting repair/ replacement to these bridges that provide critical access for emergency vehicles both in responding in a timely manner to incidents such as ambulance calls, to larger events such as wildland fire and these facilities provide access for a large percentage of the town's residents. Morrison bridges that require repair in order to maintain access for approximately 50% of the population and their replacement/repair will improve fire access to wildland urban interface fire risk areas.	Wildfire	2,3; TRN	Town Manager	\$1.51 million; FEMA BRIC Grant, Town General Fund	High	Fall 2023	New in 2021
Morrison 6	Water Treatment Plant Upgrades. Morrison completed the preparation of a Water and Wastewater Master Plan in 2017. This Plan provided information on the Morrison's water and wastewater systems, and identified system needs in order to improve the town's resiliency through improving existing systems, adding redundancy, and improving storage volume	Cyber, Drought, Flood, Winter Storm, Wildfire	2; FWS	Town Manager	\$5,000,000; FEMA BRIC Grant, Town General Fund	Medium	2025	New in 2021

Number	Title and Description	Hazards Mitigated	Related Goals & Lifelines	Lead Agency & Partners	Cost Estimate & Potential Funding	Priority	Timeline	Status & Implementation Notes
	needed for potable water and firefighting. Identified upgrades to the Town Water Treatment Plant include membrane and pretreatment upgrades, addition of altitude valves, analysis/repair of existing distribution system, rehabilitation of the interconnection meter vault, MCMD Storage Tank rehabilitation, rockfall mitigation along the raw water pipeline, and MCMD Bear Creek Diversion abandonment. This will help protect the Town from economic losses associated with system failure, and failure to provide adequate potable water and inability to treat wastewater has wide implications, including potential closure of a large assisted living facility, along with schools, Town Hall and other local businesses. Residents depend on these services, which benefit the entire population and visitors, which drive the town's economy. The avoided losses are difficult to evaluate, but they would likely be equivalent to the \$51 million of projected loss associated with wildfire predicted in the 2016 HMP.							
Morrison 7	Wastewater Treatment Plant Upgrades. Morrison completed the preparation of a Water and Wastewater Master Plan in 2017. This Plan provided information on the Morrison's water and wastewater systems, and identified system needs in order to improve the town's resiliency through improving existing systems, adding redundancy, and improving storage volume needed for potable water and firefighting. Identified upgrades to the Town Wastewater Treatment Plant include site preparation, SBR concrete basin and equipment, filtration unit, screw press solids dewatering facility, yard piping, sewage pump and electrical controls. . This will help protect the Town from economic losses associated with system failure, and failure to provide adequate potable water and inability to treat	Cyber, Drought, Flood, Winter Storm, Wildfire	2; FWS	Town Manager	\$5,000,000; FEMA BRIC Grant, Town General Fund	Medium	2025	New in 2021

Number	Title and Description	Hazards Mitigated	Related Goals & Lifelines	Lead Agency & Partners	Cost Estimate & Potential Funding	Priority	Timeline	Status & Implementation Notes
	wastewater has wide implications, including potential closure of a large assisted living facility, along with schools, Town Hall and other local businesses. Residents depend on these services, which benefit the entire population and visitors, which drive the town's economy. The avoided losses are difficult to evaluate, but they would likely be equivalent to the \$51 million of projected loss associated with wildfire predicted in the 2016 HMP.							
Morrison 8	New Municipal Building. Morrison's Town Hall and Police Department are currently situated in the historic downtown area, and is within 1% Annual Chance floodplain, less than 500' from a regulatory floodway. This location has presented challenges for the Town and critical first responder services and equipment are not readily accessible in all conditions. The need for relocation has been identified as a priority by the Town's governing body, in order to maintain the Town's continuity of government during periods of flooding and other catastrophic events. In times of flooding, services to residents can be interrupted should the building become inundated or inaccessible. The relocation of the Town's fundamental operations to a new building will not only provide a safe place for day to day operations for Town staff and equipment, but can act as an emergency/evacuation shelter in times of catastrophic flooding. This protects the Town's fleet assets valued at \$100,000 and building contents valued at \$400,000, and avoids the potential for loss of life (priceless value) and property if first responders are unable to respond to threats in a timely and effective manner. The town is partnering with Jeffco Open Space to augment parking at this facility to add additional parking for Jeffco's Mt. Falcon Open Space, which will directly improve Open Space access for emergency response.	Dam Failure; Flood	2,3; COM, FWS, S&S	Town Manager	\$10 million; Town's General Fund	High	2023	New in 2021. The project is included in the Town's 2021 five-year Capital Improvements Plan.

Number	Title and Description	Hazards Mitigated	Related Goals & Lifelines	Lead Agency & Partners	Cost Estimate & Potential Funding	Priority	Timeline	Status & Implementation Notes
Morrison 9	<p>Pedestrian Safety Projects. Upon completion of the Transportation Master Plan, which will scrutinize roadways and other aspects of the Town's transportation system, the Town anticipates the addition of a trail along SR8 to provide pedestrian access from the Post Office to the existing Mt. Falcon trail. Currently, elementary students walk along the side of the highway, and are not protected from vehicles traveling at a high rate of speed. The project could result in a wide trail, that could also be used by emergency vehicles or as a detour should the highway become obstructed. Because this project provides protection to young pedestrians, it is difficult to assess avoided loss, because it could involve avoiding loss of a priceless young life. Adding an ancillary emergency detour route, which could be used to access the school, is also an important aspect of this project.</p>	Life Safety	1,2,3;	Town Manager	\$200,000; Town's General Fund	Medium	2024	New in 2021