



Hazard Mitigation Plan

**Storey County
2020**

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List of Acronyms

AIDS	acquired immunodeficiency syndrome
BLM	United States Bureau of Land Management
PW	Public Works
CIA	Central Intelligence Agency
CDC	Centers for Disease Control and Prevention
CFR	Code of Federal Regulations
County	Storey County
CWPP	Community Wildfire Protection Plan
DHS	Department of Homeland Security
DMA 2000	Disaster Mitigation Act of 2000
DOJ	Department of Justice
DOT	United States Department of Transportation
EHS	Extremely Hazardous Substance
EMPG	Emergency Management Planning Grant
EPA	United States Environmental Protection Agency
EPCRA	Emergency Planning and Community Right to Know Act
FBI	Federal Bureau of Investigation
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Maps
FMA	Flood Mitigation Assistance
GIS	Geographic Information System
HAZUS-MH	(abbreviation for HAZ ards U nited S tates) is a geographic information system-based natural hazard loss estimation software package developed and freely distributed by the Federal Emergency Management Agency
HMGP	Hazard Mitigation Grant Program
HMP	Hazard Mitigation Plan
HUD	Housing and Urban Development
I-80	Interstate 80
IOM	Institute of Medicine
IPCC	Intergovernmental Panel on Climate Change
LEPC	Local Emergency Planning Committee
M	Magnitude
MMI	Modified Mercalli Intensity
mph	miles per hour
NOAA	National Oceanic and Atmospheric Administration
NCDC	National Climatic Data Center

List of Acronyms

NDEM	Nevada Division of Emergency Management
NDEP	Nevada Division of Environmental Protection
NDF	Nevada Division of Forestry
NDOT	Nevada Department of Transportation
NDRCS	Nevada Department of Resource Conservation Services
NERMP	Nevada Earthquake Risk Mitigation Plan
NFIP	National Flood Insurance Program
NBMG	Nevada Bureau of Mines & Geology
NRC	National Response Center
NV	Nevada
NVHHS	Nevada Department of Health and Human Services
NWS	National Weather Service
OPHIE	Nevada Division of Public and Behavioral Health Office of Public Health Informatics and Epidemiology
PDM	Pre-Disaster Mitigation
POC	Point of Contact
RFC	Repetitive Flood Claims
SARS	Severe Acute Respiratory Syndrome
SCFPD	Storey County Fire Protection District
SERC	State Emergency Response Commission
SFHA	Special Flood Hazard Area
SR	State Route
SRL	Severe Repetitive Loss
Stafford Act	Robert T. Stafford Disaster Relief and Emergency Assistance Act
State	State of Nevada
TRI	Tahoe-Reno Industrial Center
UNR	University of Nevada Reno
USC	United States Code
USDA	US Department of Agriculture
USFS	United States Forest Service
USGS	United States Geological Survey
WMD	Weapons of Mass Destruction

Across the United States, natural and human-caused disasters have led to increasing levels of death, injury, property damage, and interruption of business and government services. The toll on families and individuals can be immense, and damaged businesses cannot contribute to the economy. The time, money, and effort to respond to and recover from these emergencies or disasters divert public resources and attention from other important programs and problems. With numerous Federal declarations in recent history, Storey County, Nevada, recognizes the consequences of disasters and the need to reduce the impacts of natural and human-caused hazards.

The elected and appointed officials of the County also know that with careful selection, mitigation actions in the form of projects and programs can become long-term, cost-effective means for reducing the impact of natural and human-caused hazards. Applying this knowledge, the Storey County Hazard Mitigation Planning Committee prepared the *Storey County Hazard Mitigation Plan*. With the support of various County officials, the State of Nevada, and the United States Department of Homeland Security/Federal Emergency Management Agency (FEMA), this plan is the result of several months' worth of work to create a hazard mitigation plan that will guide the County toward greater disaster resistance in full harmony with the character and needs of the community and region.

People and property in the County are at risk from a variety of hazards that have the potential for causing widespread loss of life and damage to property, infrastructure, and the environment. The purpose of hazard mitigation is to implement actions that eliminate the risk from hazards or reduce the severity of the effects of hazards on people and property. Mitigation is any sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event. Mitigation encourages long-term reduction of hazard vulnerability. The goal of mitigation is to save lives and reduce property damage. Mitigation can reduce the enormous cost of disasters to property owners and all levels of government. In addition, mitigation can protect critical community facilities, reduce exposure to liability, and minimize community disruption. Preparedness, response, and recovery measures support the concept of mitigation and may directly support identified mitigation actions.

The *Storey County Hazard Mitigation Plan* has been updated in compliance with Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act or the Act), 42 U.S.C. 5165, enacted under Sec. 104 the Disaster Mitigation Act of 2000 (DMA 2000), Public Law 106-390 of October 30, 2000. Since the first plan was adopted in 2006, many mitigation actions have been completed and the status of actions from the 2015 plan are contained in Appendix F. This updated plan identifies on-going and new hazard mitigation actions intended to eliminate or reduce the effects of future disasters throughout the County.

This section provides an overview of the Disaster Mitigation Act of 2000 (DMA 2000; Public Law 106-390), the adoption of the updated *Storey County Hazard Mitigation Plan* (HMP) by the local governing body, and supporting documentation for the adoption.

1.1 DISASTER MITIGATION ACT OF 2000

The DMA 2000 was passed by Congress to emphasize the need for mitigation planning to reduce vulnerability to natural and human-caused hazards. The DMA 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act; 42 United States Code [USC] 5121-5206 [2008]) by repealing the act’s previous Mitigation Planning section (409) and replacing it with a new Mitigation Planning section (322). In addition, Section 322 provides the legal basis for the Federal Emergency Management Agency’s (FEMA’s) mitigation plan requirements for mitigation grant assistance.

To implement the DMA 2000 planning requirements, the Federal Emergency Management Agency (FEMA) published an Interim Final Rule in the *Federal Register* on February 26, 2002. This rule (44 Code of Federal Regulations [CFR] Part 201) established the mitigation planning requirements for states, tribes, and local communities. The planning requirements are described in detail in Section 2 and identified in their appropriate sections throughout this Plan. In addition, a crosswalk documenting compliance with 44 CFR is included as Appendix H.

1.2 ADOPTION BY THE LOCAL GOVERNING BODY AND SUPPORTING DOCUMENT

The requirements for the adoption of an HMP by the local governing body, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 REQUIREMENTS: PREREQUISITES
Adoption by the Local Governing Body
Requirement §201.6(c)(5): [The local hazard mitigation plan shall include] documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commissioner, Tribal Council).
Element
Has the local governing body adopted the plan?
Is supporting documentation, such as a resolution, included?
<i>Source: FEMA, March 2008.</i>

Storey County, to be referred to as Storey County or the County throughout this plan, is the jurisdiction represented in this HMP. This HMP meets the requirements of Section 409 of the Stafford Act and Section 322 of the DMA 2000. The local governing body of Storey County (Storey County Commissioners) adopted this HMP on [Date]. The signed resolution is provided in Appendix A.

While the HMP is focused on community members and property, it also includes strategies for broader community risk reduction. The HMP attempts to account for these risk concerns and address the needs of each participating stakeholder. It is designed to integrate with other planning efforts and neighboring mitigation plans within the region.

In addition to this HMP, the Carson Water Subconservancy District (CWSD) has developed a standalone annex that identifies unique capabilities, risks, and mitigation strategies to lead their mitigation programs. CWSD also participated in the development of the County HMP. Refer to Annex A for CWSD-specific details.

This section provides an overview of the County's HMP. This includes a review of the purpose and authority of the HMP and a description of the document.

2.1 PLAN PURPOSE AND AUTHORITY

The DMA 2000, also referred to as the 2000 Stafford Act amendments, was approved by Congress on October 10, 2000. On October 30, 2000, the President signed the bill into law, creating Public Law 106-390. The purposes of the DMA 2000 are to amend the Stafford Act, establish a national program for pre-disaster mitigation, and streamline administration of disaster relief.

The HMP meets the requirements of the DMA 2000, which calls for all communities to prepare hazard mitigation plans. By preparing this HMP, the County is eligible to receive Federal mitigation funding after disasters and to apply for mitigation grants before disasters strike. This HMP starts an ongoing process to evaluate the risks different types of hazards pose to the County, and to engage the County and the community in dialogue to identify the steps that are most important in reducing these risks. This constant focus on planning for disasters will make the County, including its residents, property, infrastructure, and the environment, much safer.

The local hazard mitigation planning requirements encourage agencies at all levels, local residents, businesses, and the non-profit sector to participate in the mitigation planning and implementation process. This broad public participation enables the development of mitigation actions that are supported by these various stakeholders and reflects the needs of the entire community.

States are required to coordinate with local governments in the formation of hazard mitigation strategies, and the local strategies combined with initiatives at the state level form the basis for the State Mitigation Plan. The information contained in HMPs helps states to identify technical assistance needs and prioritize project funding. Furthermore, as communities prepare their plans, states can continually improve the level of detail and comprehensiveness of statewide risk assessments.

For FEMA's Pre-Disaster Mitigation (PDM) grant program and Hazard Mitigation Grant Program (HMGP), a local jurisdiction must have an approved HMP to be eligible for PDM and HMGP funding for a Presidentially declared disaster after November 1, 2004. Plans approved any time after November 1, 2004, will allow communities to be eligible to receive PDM and HMGP project grants.

Adoption by the local governing body demonstrates the jurisdiction's commitment to fulfilling the mitigation goals and objectives outlined in the HMP. Adoption legitimizes the updated HMP and authorizes responsible agencies to execute their responsibilities. The resolution adopting this HMP is included in Appendix A.

2.2 STAFFORD ACT GRANT PROGRAMS

The following grant programs require a State, tribe, or local entity to have a FEMA-approved State or Local Hazard Mitigation Plan.

Hazard Mitigation Grant Program (HMGP): HMGP provides grants to states, tribes, and local entities to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce the loss of life and property as a result of natural disasters and to enable mitigation measures to be implemented during the immediate recovery from disaster. Projects must provide a long-term solution to a problem: for example, elevation of a home to reduce the risk of flood damages as opposed to buying sandbags and pumps to fight the flood. In addition, a project's potential savings must be more than the cost of implementing the project. Funds may be used to protect either public or private property or to purchase property that has been subjected to, or is in danger of, repetitive damage. The amount of funding available for the HMGP under a particular disaster declaration is limited. The program may provide a State or tribe with up to 20 percent of the total disaster grants awarded by FEMA. The cost-share for this grant is 75/25 percent (Federal/non-Federal).

Pre-Disaster Mitigation (PDM) Program: PDM provides funds to states, tribes, and local entities, including universities, for hazard-mitigation planning and the implementation of mitigation projects before a disaster event. PDM grants are awarded on a nationally competitive basis. Like HMGP funding, a PDM project's potential savings must be more than the cost of implementing the project. In addition, funds may be used to protect either public or private property or to purchase property that has been subjected to, or is in danger of, repetitive damage. Congress appropriates the total amount of PDM funding available on an annual basis. The cost-share for this grant is 75/25 percent (Federal/non-Federal).

Flood Mitigation Assistance (FMA): The FMA program provides funds on an annual basis so that measures can be taken to reduce or eliminate risk of flood damage to buildings insured under the National Flood Insurance Program (NFIP). FMA provides up to 75% Federal funding for a mitigation activity grant and/or up to 90% Federal funding for a mitigation activity grant containing a repetitive loss strategy.

Repetitive Flood Claims (RFC): The RFC program provides funds on an annual basis to reduce the risk of flood damage to individual properties insured under the NFIP that have had one or more claim payments for flood damages. RFC provides up to 100% Federal funding for eligible projects in communities that qualify for the program.

Severe Repetitive Loss (SRL): The SRL program provides funds on an annual basis to reduce the risk of flood damage to residential structures insured under the NFIP that have had one or more claim payments for flood damages. SRL provides up to 75% Federal funding for eligible projects in communities that qualify for the program.

2.3 PLAN ORGANIZATION

The remainder of this HMP consists of the following sections.

- ***Section 3 - Community Description***

Section 3 provides a general history and background of the County and historical trends for population, demographic, and economic conditions that have shaped the area. Trends in land use and development are also discussed.

- **Section 4 - Planning Process**

Section 4 describes the planning process, identifies Planning Committee members, and the key stakeholders within the community and surrounding region. In addition, this section documents public outreach activities and the review and incorporation of relevant plans, reports, and other appropriate information.

- **Section 5 - Risk Assessment and Vulnerability Assessment**

Section 5 describes the process through which the Planning Committee identified and compiled relevant data on all potential natural and human-caused hazards that threaten the County and the immediately surrounding area. Information collected includes historical data on hazard events that have occurred in and around the County and how these events impacted residents and their property.

The descriptions of hazards that could affect the County are based on historical occurrences and best available data from agencies such as FEMA, the U.S. Geological Survey (USGS), and the National Weather Service (NWS). Detailed hazard profiles include information on the probability/frequency, magnitude, onset, duration, location, and impact of each hazard as well as vulnerability for future hazard events. It also identifies potentially vulnerable assets such as people, housing units, critical facilities, infrastructure and lifelines, hazardous materials locations, and commercial facilities. Data was compiled and analyzed using GIS to determine specific areas of vulnerability. The resulting information identifies the full range of hazards that the County could face and potential impacts, damages, and losses.

- **Section 6 - Capability Assessment**

Section 6 provides an overview of the County's resources in the following areas for addressing hazard mitigation activities:

- Plans and policies (e.g., policies restricting development in hazard zones; strategies or operational plans to address hazards and threats)
- Staff and equipment capability (e.g., engineers and geospatial professionals; damage assessment tool, sandbagging machine)
- Fiscal capability (e.g., fees, grants)

- **Section 7 - Mitigation Strategy**

Section 7 describes the Planning Committee's list of mitigation goals, objectives, and actions based upon the findings of the risk assessment and the capability assessment. Based upon these goals and objectives, the Planning Committee reviewed and prioritized a comprehensive range of appropriate mitigation actions to address the risks facing the community. Such measures include preventive actions, property protection techniques, natural resource protection strategies, structural projects, emergency services, and public information and awareness activities.

- **Section 8 - Plan Maintenance**

Section 8 describes the Planning Committee's formal plan maintenance process to ensure that the HMP remains an active and applicable document. The process includes monitoring, evaluating, and updating the HMP; implementation through existing planning mechanisms; and continued public involvement.

- ***Section 9 - References***

Section 9 lists the reference materials used to prepare this HMP.

- ***Appendices***

The appendices include the Adoption Resolution, maps, Planning Committee meetings, public involvement process, plan maintenance documents, updates on the 2015 mitigation actions, and the FEMA crosswalk tool.

- ***Annexes***

Carson Water Subconservancy District (CWSD) Annex is included as an annex to the County's HMP. CWSD has developed a standalone annex that identifies unique capabilities, risks, and mitigation strategies to lead their mitigation programs. CWSD also participated in the development of the County HMP.

This section describes the history, location, and geography of the County as well as its government, demographic information, and current land use and development trends.

3.1 HISTORY, LOCATION, AND GEOGRAPHY

As shown in Appendix B (Figure B-1), Storey County is in northwestern Nevada, approximately 14 miles east of Reno, 237 miles east of San Francisco, and 441 miles northwest of Las Vegas. The County is bordered on the west and north by Washoe County, Nevada, and on the east and south by Lyon County, Nevada. The Truckee River Basin and Carson River Basin along with associated streams are the primary drainage systems within Storey County. The major transportation route to Virginia City, Storey County seat, is State Route 341, intersecting U.S. 395 near Reno via Geiger Grade and U.S. 50, southwest in Carson City. Interstate 80 (I-80) is 23 miles to the northwest in Reno. With 264 square miles of total land area, Storey County accounts for less than one-quarter of 1 percent of the State's total land area. This makes Storey County the smallest county in Nevada. Storey County was created in 1861 and named for Captain Edward Farris Storey, who was killed in 1860 in the Pyramid Lake Indian War. Although it is among the smallest counties in the State, it was the most populous county in Nevada when it was established in 1861.

The attraction to Storey County started in 1859 when miners discovered the largest deposit ever found of gold and silver in Virginia City, called the Comstock Lode. Between 1859 and 1878 the Comstock Lode yielded about \$400 million in silver and gold. Mining has continued since then to the present but certainly nowhere near the yields of its heyday in the late 1800s. In the fall of 1859, Virginia City had a population of between 200 to 300 people. After the Comstock Lode discovery in early 1860, approximately 10,000 people moved to the area. The peak population for the Virginia City/Gold Hill area was in 1875 topping at around 25,000 people. The political ramifications of this significant economic and population escalation resulted in the creation of the Nevada Territory, carved from the Utah Territory, by President Buchanan on March 2, 1861. Between 2000 and 2010, the county grew 18 percent from 3,399 to 4,010 residents. The 2010 Census indicates that Virginia City has a population of 1,049, with 222 residents in Gold Hill, 1,233 residents in Virginia City Highlands, 1,289 residents in Lockwood/River District, and 750 residents in Mark Twain. The American Community Survey (ACS), the Census Bureau's population estimates program, estimates Storey County's 2017 population at 3,891 residents, a roughly 3% decrease from the 2010 Census. However, the Nevada State Demographer forecasts Storey County's 2020 population at 4,369 residents and projects a population in the county of 4,591 residents by 2023.

Beginning with the Comstock Lode, many historic events have occurred in this area, one of which was the arrival in late 1861 of Samuel Clemens, who worked as a reporter for the *Territorial Enterprise* for 21 months and left as Mark Twain. Occurring in 1862 in the Virginia City area was the organization of the San Francisco Stock Exchange Board, the first mining exchange in the United States. The old Geiger Grade Toll Road, which was constructed to link Virginia City with immigrant trails and supply routes crossing the Truckee River, created the site that would become Reno in 1868. Storey County continues to attract more than 1.6 million tourists annually. Complementing its mining history and established tourism draw, Storey County's growing industrial sector has begun to play an equally important role in strengthening its future economic outlook.

Storey County has built a reputation on always doing things big—one of the biggest gold and silver discoveries in history and home to the United States’ largest industrial park, the Tahoe-Reno Industrial Center (TRI). This 107,000-acre center, located east of Sparks off I-80, has approximately 11 million square feet of industrial space now in use by almost 130 companies. Numerous and varied commercial companies have already located there and more are choosing the locale. Also located in the TRI area are three sophisticated power plants: NV Energy, Barrick Mines, and Naniwa (a power plant that provides additional power support during peak hours). Companies at TRI have facilities in both manufacturing and distribution and span multiple industries, some of which include power generation, biofuels, oil and gas, technology, and medicine. The TRI is estimated to bring an additional 15,000 people into Storey County each day. See Section 3.4 for development trends.

As could be expected with the extent of mining in the area, the major geophysical feature of the County is its mountainous topography. At an elevation of 6,200 feet, Virginia City, the County seat, is located on the steep eastern slope of Mt. Davidson which has an elevation from ranging 4,000 to 7,838. The majority of the land developed over the past 40 years has been on the perimeter of the County, primarily in the level areas adjacent to Lyon County and along the riparian zone of the Truckee River. Although a considerable amount of developable land exists in the interior of the County, the mountainous terrain and lack of adequate road networks have combined to restrict development. As such, the development trend of the past 40 years is being encouraged to continue.

3.2 GOVERNMENT

The Storey County Board of Commissioners consists of three elected members. Each Commissioner is required to reside in one of three districts, which are equally divided among the County’s population based on the census. Storey County does not have any incorporated jurisdictions. Population districts, such as the one described above regarding the members of the Board of Commissioners, serve a variety of means. For example, the County Master Plan identifies eight districts for their planning purposes. As the County continues to grow and the infrastructure expands the population districts will expand and develop as well and at some point will require an official delineation of the population districts within Storey County. Currently each Commissioner is elected by all residents of the County to serve a 4-year term and to discuss and determine all issues on a countywide basis. The Board of Commissioners meets each first and third Tuesday of the month and holds additional meetings when necessary. As the County’s governing board, the Commission has vast responsibilities spanning from budgeting to policy enactment and enforcement. Below are some of the many services the Storey County Commissioners provide to the residents and businesses of the County:

- Approve all County department budgets and monitor their performance
- Set the tax rate countywide, as well as water and sewer rates in Virginia City and Gold Hill
- Establish and monitor the policies and ordinances that run the County government

Key Officials

Commissioner 1	Administrative Officer	District Attorney
Commissioner 2	Assessor	Emergency Manager
Commissioner 3	Clerk/Treasurer	Fire Chief
	Communications Director	IT Director
	Community Services Officer	Justice of the Peace
	Community Development Director	Public Works
	Comptroller	Recorder
	County Manager	Sheriff

County Departments/Divisions

Assessor	District Attorney	Recorder
Clerk/Treasurer	Emergency Management	Senior Services
Commissioners/Human Resources	Fire Protection District	Sheriff's Department
Communications	Information Technology	
Community Development	Justice Court	
Community Services	Planning	
Comptroller	Public Works	

3.3 DEMOGRAPHICS

According to the Nevada State Demographer, the County's population is estimated at 4,369 for 2020. This estimate is a roughly a 9 percent increase from the 2010 U.S. Census population of 4,010. The Nevada State Demographer estimates the County will grow at a rate of roughly 1.7% annually based on a 5-year estimate. This is approximately the same as the projected 5-year average state population growth of 1.5% from 2019 to 2023. In addition to those living in Virginia City, an estimated 1.6 million people visit the county for tourism each year.

According to the American Community Survey 2017 estimates, approximately 12 percent of the total population was under 18 years, and 35.7 percent of the total population was 62 years and over. The county's unemployment rate was 4.4 percent in 2018 with a median household income of \$63,607 in 2017 (NV Department of Employment 2018). The employment of the County primarily consists of manufacturing, construction, transportation, warehousing, and utilities. See below for the largest employment sectors in the County (Bureau of Labor Statistics 2018).

Table 3-1: Employment by Private Sector of County Labor Force

Industry	Nevada (Annual Average Employment, 2018)	Storey County (Annual Average Employment, 2018)
Agriculture, forestry, fishing, and hunting	4,787	47
Mining, quarrying, and oil and gas extraction	14,549	82
Utilities	4,080	N/A
Construction	89,125	1,025
Manufacturing	55,405	9,399
Wholesale trade	37,232	124
Retail Trade	147,650	N/A
Transportation, warehousing, utilities	65,456	4,248
Information	15,646	N/A
Finance and insurance	35,940	N/A
Real estate and rental and leasing	27,363	N/A
Professional and technical services	59,489	N/A
Management of companies and enterprises	26,796	N/A
Administrative and waste services	104,452	1,067
Educational services	13,459	N/A
Health care and social assistance	125,577	N/A
Arts, entertainment, and recreation	33,004	26
Accommodation and food services	319,047	26
Other services, except public administration	34,964	136
Unclassified	2,061	N/A

Note: N/A – Not available

Source: Bureau of Labor Statistics, 2018.

3.4 LAND USE AND DEVELOPMENT TRENDS

The majority of the land developed in Storey County during the past 40 years has been on the perimeter of the County, primarily in the level areas adjacent to Lyon County and along the riparian zone of the Truckee River (Appendix B, Figure B-2). Storey County’s Master Plan (2016) examines the development of eight primary population areas:

- **Comstock:** This area encompasses four historic communities, including Virginia City, the Divide, Gold Hill, and American Flat in the southernmost portion of Storey County. Each community is unique, ranging from the high-density, mixed-use environment of Virginia City to the sparsely populated rural area of American Flat. The Comstock Historic District has undergone a pattern of degradation from development and mining and has experienced periods of volatility in the tourism industry. The County is working to continue expanding tourism while supporting historic structure rehabilitation and preservation.
- **Highlands:** Located along the western County boundary approximately two miles north of Virginia City, the Highlands area is composed mostly of residential communities surrounded by remote undeveloped lands. There are currently no commercial uses, and it is anticipated that the area will remain exclusively a rural-residential estate community. Residents draw their water from private, domestic wells, and water availability is one of the primary concerns in the Highlands.
- **Mark Twain:** The area is composed of a residential community surrounded by remote, undeveloped lands near the southern boundary of Storey County. The community abuts Lyon County, where urban growth is sprawling and transforming the area into a bedroom community of Carson City, Reno, and Sparks. A primary concern is that available water in the area will not support such a growing population. Additionally, the Mark Twain Estates watershed has been identified as one of the more flood prone areas in the County, and area residents experience recurring issues of flooding at roadway crossings as well as property damage from area ditches during severe storm events.
- **McCarran:** This area houses the TRI and is dedicated to manufacturing, utility power production, warehousing and distribution, and other heavy and light industrial and commercial uses.
- **Lockwood-Mustang:** The Lockwood-Mustang area is a mixed-use community along the south banks of the Truckee River at the far north end of Storey County. The community of Lockwood consists of single-family residences, commercial, and public uses. Mustang is an emerging industrial center serving Northern Nevada. Commercial and industrial uses in the area have steadily increased, a trend which is expected to continue over the coming years. Parts of Lockwood and the Rainbow Bend residential area are in a FEMA designated flood zone. The area experiences frequent flooding in the winter and spring months from the Truckee River.
- **Lagomarsino:** The Lagomarsino area is largely undeveloped and situated within the northwestern area of the County between the Highlands, Lockwood, McCarren, and the Storey-Washoe County boundary. The area has high industrial use, as well as utility transmission systems, and rural uses. A large aggregate quarry mine operates one mile south of Lockwood and west of the Lockwood Regional Landfill.
- **Northeast:** The East Slope area is a remote undeveloped area within the northeast part of Storey County, south of Painted Rock and eastward to the Storey-Lyon County boundary. The area deals with issues related to access and water rights for agricultural land.
- **Painted Rock:** The Painted Rock Area is sparsely populated and dominated by agriculture and wild lands located partially along the south banks of the Truckee River at the far northeastern portion of Storey County. It includes approximately 20 single-family homes and

several crop producing farms and cattle ranches. The area has the potential to become a mixed-use community serving the housing needs of nearby businesses in McCarran. Access to the area is a key concern, with local roads, bridges, and other such infrastructure being problematic. The bridge crossing the Truckee River, for example, is the only practical access to this area and is below the FEMA 100-year base flood elevation.

State Route 439, known as USA Parkway, connects I-80 to US Highway 50, provides access from McCarran, where the TRI area is located, and proceeds south to the County line with Lyon County in the area of the Ramsey/Weeks cutoff in Silver Springs. This road has multiple benefits—the most important benefit being direct access for emergency workers to traverse their response area north/south or to quickly reach wildfires occurring within the interior of the County. The secondary benefit is that it eliminates the commute route through Reno for many of the workers in the TRI making the development only 15 minutes away from the residential communities along Highway 50.

This section provides an overview of the planning process; identifies Planning Committee members and key stakeholders; documents public outreach efforts; and summarizes the review and incorporation of existing plans, studies, and reports used in the development of this HMP. Additional information regarding the Planning Committee and public outreach efforts is provided in Appendices C and D.

The requirements for the planning process, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements: Planning Process

Documentation of the Planning Process

Requirement §201.6(b): In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

1. An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;
2. An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and nonprofit interests to be involved in the planning process; and
3. Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

Requirement §201.6(c)(1): [The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

Element

- Does the new or updated plan provide a narrative description of the process followed to prepare the plan?
- Does the new or updated plan indicate who was involved in the planning process? (For example, who led the development at the staff level and were there any external contributors such as contractors? Who participated on the plan Committee, provided information, reviewed drafts, etc.?)
- Does the new or updated plan indicate how the public was involved? (Was the public provided an opportunity to comment on the plan during the drafting stage and prior to the plan approval?)
- Does the new or updated plan indicate that an opportunity was given for neighboring communities, agencies, businesses, academia, nonprofits, and other interested parties to be involved in the planning process?
- Does the updated plan document how the planning team reviewed and analyzed each section of the plan?
- Does the planning process describe the review and incorporation, if appropriate, of existing plans, studies, reports, and technical information?
- Does the updated plan indicate for each section whether or not it was revised as part of the update process?

Source: FEMA, March 2008.

4.1 OVERVIEW OF PLANNING PROCESS

The first step in the planning update process was to establish a Planning Committee composed of existing County agencies and other stakeholders. Joe Curtis, Emergency Manager, and Cherie Nevin served as the primary Points of Contact (POC) for the County and the public. Ecology and Environment, Inc. assisted the County in updating this HMP.

Each section of the previous HMP was reviewed for content and the Planning Committee revised every section of the plan. The HMP primarily followed the same outline as the 2015 plan update, with the exceptions of Section 5 (risk assessment) and Section 6 (vulnerabilities), which were combined to better aid in readability and the review process.

During the 5 years since the previous plan was adopted, plan maintenance was performed during the 4th year through the Storey County Local Emergency Planning Committee (LEPC), referred

herein as LEPC or Planning Committee. All information on mitigation action accomplishments and new public input was derived during the planning process.

The following table provides the new section format and provides details on the update.

Table 4-1. Plan Outline and Update Effort

Plan Section	Update Effort	What Changed
Section 1 – Official Record of Adoption	Minor Revision	The process for plan adoption remains the same. Minor edits were made to reflect the current plan.
Section 2 - Background	Minor Revision	The plan organization sections were modified to reflect the current plan.
Section 3 – Community Description	Moderate Revisions	This section was updated to include new planning areas and land use maps. It was expanded to include land use and development trends per the County’s new planning areas discussed in the 2016 Master Plan.
Section 4 – Planning Process	Moderate Revisions	This section details the current plan’s planning process, public, and stakeholders outreach efforts.
Section 5 – Risk Assessment and Vulnerability Assessment	Major Revisions	The risk assessment was revised to reflect the results of the 2020 planning process. The individual hazard sections were revised to update historical information and current risks and vulnerabilities. New analysis of vulnerabilities to residential, non-residential, critical facilities, and hazardous materials locations was included based on updated mapping efforts and the most recent data available. The risk and vulnerability assessments were combined in the plan update to aid in readability and review.
Section 6 – Capability Assessment	Major Revisions	An updated local mitigation capability assessment was included.
Section 7 – Mitigation Strategy	Major Revisions	The goals and actions were reviewed and updated. The 2015 mitigation actions were reviewed, and progress was documented. New mitigation actions were added. Completed or cancelled mitigation actions were deleted.
Section 8 – Plan Maintenance	Minor Revision	This section was modified to remain consistent with the current plan.
Section 9 – Reference	Moderate Revisions	This section added references for new and/or updated references.
Appendices	Major Revisions	This section was modified to remain consistent with the current plan.

Table 4-1. Plan Outline and Update Effort

Plan Section	Update Effort	What Changed
Annexes	Major Revisions	This section was added to include the Carson Water Subconservancy District (CWSD) Annex.

Once the Planning Committee was formed, the following five-step planning process took place during the 9-month period between July 2019 to March 2020.

- **Organize resources:** The Planning Committee identified resources, including County staff, agencies, local community members, and relevant data which could provide technical expertise and historical information needed in the development of the HMP.
- **Assess risks and vulnerabilities:** The Planning Committee identified the hazards specific to the County and developed the risk assessment and vulnerability assessment for the identified hazards. The Planning Committee reviewed the assessment prior to and during the development of the mitigation strategy.
- **Assess capabilities:** The Planning Committee reviewed current administrative, technical, legal and regulatory, and fiscal capabilities to determine whether existing provisions and requirements adequately address relevant hazards.
- **Develop a mitigation strategy:** After reviewing the risks posed by each hazard, the Planning Committee worked to develop a comprehensive range of potential mitigation goals, objectives, and actions. Subsequently, the Planning Committee identified and prioritized the actions to be implemented.
- **Monitor progress:** The Planning Committee developed an implementation process to ensure the success of an ongoing program to minimize hazard impacts to the County.

4.2 HAZARD MITIGATION PLANNING COMMITTEE

4.2.1 Formation of the Planning Committee

As previously noted, the planning process began in July 2019. Joe Curtis and Cherie Nevin utilized the Local Emergency Planning Committee (LEPC) as the advisory body, known as the Planning Committee, which included staff from relevant County agencies and community organizations. The Planning Committee member list is included in Table 4-2, and the Planning Committee meetings are described in section 4.2.2. Several additional participants, including neighboring stakeholders, contributed throughout the planning process that are not included in the Planning Committee roster. A list of these participants can be found in Appendix D, along with meeting summaries.

In addition, the Carson Water Subconservancy District (CWSD) participated in the development of the County HMP. CWSD has developed a standalone annex that identifies unique capabilities, risks, and mitigation strategies to lead their mitigation programs. Deborah Neddenriep, Water Resource Specialist II, represented CWSD throughout the planning process and development of CWSD’s annex.

Table 4-2. Storey County Hazard Mitigation Planning Committee

Name	Department	Participation
Chair: Joe Curtis	Emergency Management	Co-Chair of the Committee, chaired meetings, provided input on the risk assessment, vulnerability analysis, capabilities assessment, mitigation strategies, and provided public outreach. Reviewed materials and drafts throughout the planning process.
Cherie Nevin	Community Services	Co-Chair of the Committee, chaired meetings, provided input on the risk assessment, vulnerability analysis, capabilities assessment, mitigation strategies, and provided public outreach. Reviewed materials and drafts throughout the planning process.
Austin Osborne	County Manager	Attended meetings, provided input on the risk assessment, vulnerability analysis, capabilities assessment, and mitigation strategies. Reviewed materials and drafts throughout the planning process.
Jeff Nevin	Fire Protection District	Attended meetings, provided input on the risk assessment, vulnerability analysis, capabilities assessment, and mitigation strategies. Reviewed materials and drafts throughout the planning process.
Roy Thomsen	Fire Protection District	Jeff Nevin participated on behalf of the Fire Protection District.
Jason Wierzbicki	Public Works	Attended meetings, provided input on the risk assessment, vulnerability analysis, capabilities assessment, and mitigation strategies. Reviewed materials and drafts throughout the planning process.
James Deane	Storey County Information Technology	Attended meetings, provided input on the risk assessment, vulnerability analysis, capabilities assessment, and mitigation strategies. Reviewed materials and drafts throughout the planning process.

Table 4-2. Storey County Hazard Mitigation Planning Committee

Name	Department	Participation
Martin Avezedo	Community Development	Attended meetings, provided input on the risk assessment, vulnerability analysis, capabilities assessment, and mitigation strategies. Reviewed materials and drafts throughout the planning process.
Gerald Antinoro	Storey County Sheriff	LEPC member.
John Michael Mendoza	Storey County Sheriff's Office	LEPC member.
Dave Ballard	Storey County Communications	Attended meetings, provided input on the risk assessment, vulnerability analysis, capabilities assessment, and mitigation strategies. Reviewed materials and drafts throughout the planning process.
Jay Carmona	Storey County Commissioner	Attended meetings and provided input on the risk assessment
Hugh Gallagher	Storey County Comptroller	Attended meetings and provided input.
Todd Hess	Storey County Schools	LEPC member.
Stacy York	Storey County Senior Center	Attended meetings, provided input on the risk assessment, vulnerability analysis, capabilities assessment, and mitigation strategies. Reviewed materials and drafts throughout the planning process.
Melanie Keener	Storey County	LEPC member.
Janell Woodward	NV Division of Emergency Management	Attended meetings, provided input on the risk assessment, vulnerability analysis, capabilities assessment, and mitigation strategies. Reviewed materials and drafts throughout the planning process.
Chris Smallcomb	National Weather Service	Attended meetings, provided input on the risk assessment, vulnerability analysis, capabilities assessment, and mitigation strategies. Reviewed materials and drafts throughout the planning process.

Table 4-2. Storey County Hazard Mitigation Planning Committee

Name	Department	Participation
Lauren Staffen	Carson City Health and Human Services	Attended meetings, provided input on the risk assessment, vulnerability analysis, capabilities assessment, and mitigation strategies. Reviewed materials and drafts throughout the planning process.
Jeanne Freeman	Carson City Health and Human Services	Attended meetings, provided input on the risk assessment, vulnerability analysis, capabilities assessment, and mitigation strategies. Reviewed materials and drafts throughout the planning process.
Brian Edwards	Food Bank of Northern Nevada	LEPC member.
Liz Breeden	NV Energy	Attended meetings, provided input on the risk assessment, vulnerability analysis, capabilities assessment, and mitigation strategies. Reviewed materials and drafts throughout the planning process.
Dan Hiles	Barrick	Attended meetings, provided input on the risk assessment, vulnerability analysis, capabilities assessment, and mitigation strategies. Reviewed materials and drafts throughout the planning process.
Tom Becht	Walmart	LEPC member.
Stephanie Houghton	Walmart	Attended meetings, provided input on the risk assessment, vulnerability analysis, capabilities assessment, and mitigation strategies. Reviewed materials and drafts throughout the planning process.
Jill Hemenway	American Red Cross	LEPC member.

4.2.2 Planning Committee Meetings & Monthly Progress

- **July 2019**

During the kick-off meeting at the Virginia City Conference Center, the Planning Committee reported on recent and ongoing activities, discussed the hazard mitigation planning process, the public outreach process, and the steps involved in updating the HMP and achieving the County’s goals. The planning process was discussed including the purpose of the plan and the plan tasks, goals, and actions. The Committee received instructions on the risk and vulnerability assessment

and were sent a Hazard Ranking Worksheet after the meeting for completion and submission. The exercise identified the specific hazards that the Planning Committee wanted to address in the HMP. The Planning Committee used the hazards identified and completed a Hazard Ranking Worksheet. The exercise used averages to prioritize the hazards based on probability/frequency, magnitude, onset, and duration. See Appendix D for agenda, handouts, sign-in sheet, and meeting summary.

- ***October 2019***

The Planning Committee met at the Virginia City Conference Center and discussed the results of the hazard rating exercise and validated hazard rankings for the plan. The meeting served to form mitigation goals and objectives, introduce the capabilities assessment, and brainstorm mitigation actions the County intends to take within the next five years to decrease risk to hazards. The Planning Committee completed a workshop exercise to brainstorm mitigation strategies and following the workshop were sent the Capabilities Assessment Worksheet and the Mitigation Action Worksheet for completion and submission. The Planning Committee also was tasked with providing an update and input as to the status of the 2015 HMP's mitigation actions. See Appendix D for agenda, handouts, sign-in sheet, and meeting summary.

- ***November 2019***

The Planning Committee met at the Virginia City Conference Center. A draft HMP was presented and submitted to the Planning Committee for review and comment. The Planning Committee discussed data gaps, provided additional information where applicable, verified the contents of the draft HMP, and discussed individual follow-up meetings to address specific sections of the HMP. See Appendix D for agenda, handouts, sign-in sheet, and meeting summary.

- ***January 2020***

The final HMP was submitted and presented, which incorporated all comments received during the planning process and review of the draft HMP. The Planning Committee discussed next steps in the planning process, including State and FEMA review. See Appendix D for agenda, handouts, sign-in sheet, and meeting summary. Following the meeting, the plan was provided to the NV State Hazard Mitigation Officer for review.

4.3 PUBLIC INVOLVEMENT

Various stakeholders, as well as the public, were invited to participate in the Planning Committee meetings and HMP process.

Questionnaire

The County distributed a hazard mitigation questionnaire via Survey Monkey. The survey went out on August 21, 2019 to the public. This provided 155 responses and greatly increased public involvement from the very few survey responses received during the 2015 HMP process. The questionnaire can be found in Appendix C.

Public Awareness

Planning Committee meeting agendas were posted as required by the Nevada Open Meeting Law, and the public was welcome and invited to attend. Additionally, the draft HMP was distributed to the public via the County's website and social media to solicit feedback for incorporation in the final HMP. No public comments were received during the 30-day public comment period.

Notice to Stakeholders

The County emailed notification regarding the update of the HMP and solicited feedback from the following entities: FEMA, Nevada Department of Emergency Management, Nevada Department of Environmental Protection, National Weather Service, Storey County Sheriff's Office, Storey County Community Development, Storey County Communications, Storey County Commissioners, Storey County Information Technology, Storey County Comptroller, Storey County Schools, Storey County Community Relations, Storey County Fire Protection District, Storey County Manager, Storey County Public Works, Storey County Senior Center, Carson City Health and Human Services, Wal-Mart, NV Energy, Food Bank of Northern Nevada, American Red Cross, Barrick, and other stakeholders expressing interest in participating. The County received feedback from these stakeholders throughout the planning process, including comments on the draft HMP. The County incorporated the feedback received into the final HMP.

4.4 INCORPORATION OF EXISTING PLANS AND OTHER RELEVANT INFORMATION

During the planning process, the Planning Committee reviewed and incorporated information from existing plans, studies, reports, and technical reports into the HMP. A synopsis of the sources used follows.

- ***State of Nevada Enhanced Hazard Mitigation Plan, 2018.*** This plan, prepared by the State of Nevada, was used to ensure that the County's HMP was consistent with the State's plan.
- ***Storey County Master Plan, 2016:*** The Land-Use Element provides information on existing land use and future development trends.
- ***Storey County Zoning Plan, 2012:*** Land-Use Element provides information on future land use and provides flood plain zoning.
- ***Storey County Continuity of Operations Plans (COOPs), anticipated July 2020:*** These plans address emergencies from an all-hazards approach and ensure critical functions continue. COOPs for individual departments are currently being reviewed and updated, with an expected completion date of July 2020.
- ***The Quad County Emergency Coordination Plan, 2013:*** This plan outlines roles and responsibilities for agency coordination and cooperation in order to prepare for and respond to emergencies.
- ***The Hazardous Materials Emergency Response Plan, 2012:*** This plan specifically addresses emergency response to situations involving hazardous materials.

- ***Storey County Historical Structure Study, 2011:*** This plan provides information on historically significant structures including the Courthouse. The Master Plan (2016) also provides information on historic sites.
- ***Storey County International Building Code (IBC), 2018:*** Storey County adopted in 2018.
- ***Storey County Comprehensive Flood Control Plan, 2011:*** This plan provides information on flooding locations and specific mitigation recommendations.
- ***The Carson River Watershed Floodplain Management Plan, 2018:*** This plan provides flood history, risk, and strategies related to the Carson River Watershed.
- ***The Dayton Valley Area Drainage Master, 2019:*** This study examines flooding hazards in Lyon County and Storey County to develop an understanding of existing conditions and to develop mitigation solutions.
- ***Flood Insurance Study, Storey County, Nevada, Unincorporated Areas, Revised 2010, FEMA Community Number – 320033:*** This study provides historical and detailed information regarding flood hazards throughout Storey County.
- ***Nevada Community Wildfire Risk/Hazard Assessment Project, Storey County, Updated 2013; and the Landscape-Scale Wildland Fire Risk/Hazard/Value Assessment for Storey County, 2009:*** These reports were prepared specifically for the communities within Storey County, Nevada, identified in the 2001 *Federal Register* list of communities that are located in the vicinity of Federal lands most vulnerable to the threat of wildfire.

The following FEMA guides were also consulted for general information on the HMP process:

- ***How-To Guide #1: Getting Started: Building Support For Mitigation Planning (FEMA 2002c)***
- ***How-To Guide #2: Understanding Your Risks – Identifying Hazards and Estimating Loss Potential (FEMA 2001)***
- ***How-To Guide #3: Developing the Mitigation Plan: Identifying Mitigation Actions and Implementing Strategies (FEMA 2003a)***
- ***How-To Guide #4: Bringing the Plan to Life: Implementing the Hazard Mitigation Plan (FEMA 2003b)***

A risk assessment includes the identification and screening of each hazard and subsequent profiling of each hazard. Hazard identification is the process of recognizing the natural and human-caused events that threaten an area. Natural hazards result from unexpected or uncontrollable natural events of sufficient magnitude. Human-caused hazards result from human activity and include technological hazards and terrorism. Technological hazards are generally accidental or result from events with unintended consequences, for example, an accidental hazardous materials release. Terrorism is defined as the calculated use of violence or threat of violence to attain goals that are political, religious, or ideological in nature.

Even though a particular hazard may not have occurred in recent history in the study area, all hazards that may potentially affect the study area are included in the screening process. The hazards that are unlikely to occur or for which the risk of damage is accepted as being very low, are eliminated from consideration.

All identified hazards are profiled by describing hazards in terms of their nature, history, magnitude, frequency/probability, onset, and duration. Hazards are identified through the collection of historical and anecdotal information, review of existing plans and studies, and preparation of hazard maps of the study area. Hazard maps are used to determine the geographic extent of the hazards and define the approximate boundaries of the areas at risk.

The 2020 update of the vulnerability assessment replaces the version published in 2015. It meets the requirements of FEMA, which publishes standards to guide this work and provide quality and consistency. The vulnerability assessment predicts the extent of exposure that may result from a hazard event of a given intensity in a given area and the presence of critical infrastructure/assets.

Together these assessments can be used to identify and prioritize potential mitigation measures by allowing communities to focus attention on areas with the greatest risk and vulnerability to damage.

5.1 HAZARD IDENTIFICATION

The requirements for hazard identification, as stipulated in DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements: Risk Assessment – Overall

Identifying Hazards

§201.6(c)(2)(i): [The risk assessment shall include a] description of the type of all natural hazards that can affect the jurisdiction.

Element

Does the new or updated plan include a description of all the types of natural hazards that affect the jurisdiction?

Source: FEMA, March 2008.

The first step of the hazard analysis is the identification and screening of hazards. During the first HMP meeting, the Planning Committee reviewed the current HMP and the State’s identified hazards from the State of Nevada Enhanced Hazard Mitigation Plan. Participants were asked to rank hazards on a scale of 1 (lowest concern) to 5 (highest concern) based on four key attributes:

- **Probability/Frequency:** The likelihood of the hazard occurring and how often the hazard has resulted in an emergency or disaster.
- **Magnitude:** Areas potentially impacted, the overall impacts, and the chance of one hazard triggering another hazard, thus causing a cascading effect.
- **Onset:** The time between recognition of an approaching hazard and when the hazard begins to affect the community.
- **Duration:** The length of time the hazard remains active, the length of time emergency operations continue after the hazard event, and the length of time that recovery will take.

During a Committee meeting the members were tasked to prioritize the hazards by their total impact in the community. An exercise requiring the committee to complete a form which tabulated their ratings of each hazard was accomplished. The exercise formula took into account the historical occurrence of each respective hazard, the potential area of impact when the disaster does occur, and the magnitude. Table 5-1 below outlines the scoring criteria.

It is important to note that hazards of the same magnitude and the same frequency can occur in similar sized areas; however, the overall impact to the areas would be different because of population densities and property values in the areas impacted.

Table 5-1. Vulnerability Ratings Rubric

		Probability/ Frequency	Magnitude	Onset	Duration
Lowest	1	Highly unlikely (less than every 25 years)	No injuries or deaths expected, minimal property damage	Greater than 30 days of warning	Only brief moments
	2	Fairly unlikely (10-25 years)	Between 1 and 5 injuries or deaths, minor property damage	5-30 days of warning	1-24 hours
	3	Moderate (5-10 years)	Between 5 and 25 injuries or deaths, moderate property damage	1-5 days of warning	Days to weeks
	4	Likely (1-5 years)	Between 25 and 50 injuries or deaths, severe property damage	1-10 hours of warning	Weeks to months
Highest	5	Highly likely (once per year)	Greater than 50 injuries or deaths, catastrophic property damage	No warning	Months to years

Following the individual hazard ranking activity, the results were aggregated to show an average score for the all participants. The Planning Committee determined that 10 hazards pose a threat to the County: wildland fire, earthquake, hazardous materials event, flood, severe weather, terrorism, caving ground (mine collapse), drought, epidemic, and avalanche. Hail and thunderstorm, severe winter storm, and severe windstorm were combined for profiling purposes. The aggregate results were shared with the Planning Committee, and the final rankings were adopted as the official rankings for the HMP and are available in Table 5-2.

Table 5-2. Storey County 2020 Hazard Rankings

<i>Hazard Type</i>	<i>Probability/ Frequency (1=lowest, 5=highest)</i>	<i>Magnitude (1=lowest, 5=highest)</i>	<i>Onset (1=slowest, 5=fastest)</i>	<i>Duration (1=shortest, 5=longest)</i>	<i>Average</i>	<i>Rank</i>
Wildland Fire	4.13	3.81	4.38	4.00	4.08	1
Earthquake	2.81	4.13	4.81	3.38	3.78	2
Hazardous Materials Event	3.13	3.00	4.88	3.25	3.56	3
Flood	3.63	3.38	3.81	3.13	3.48	4
Severe Weather (Snow, Ice, Wind, Hail)	3.75	3.00	3.31	3.13	3.30	5
Terrorism	1.38	3.81	5.00	3.00	3.30	5
Caving Ground (Mine Collapse)	2.13	2.88	4.94	2.63	3.14	7
Drought	3.94	2.13	1.88	4.44	3.09	8
Epidemic	1.81	2.81	3.25	3.44	2.83	9
Avalanche	1.50	2.06	4.19	1.88	2.41	10

The remaining hazards excluded through the screening process were considered to pose no threat to life and property in the County due to the low likelihood of occurrence or the low probability that life and property would be significantly affected. Should the risk from these hazards increase in the future, the HMP can be updated to incorporate a vulnerability analysis for these hazards.

5.2 HAZARD CONSIDERATIONS

While this risk assessment profiles individual hazards, it is important to understand that the region’s exposure to hazards and how the County and its partners reduce their vulnerability to hazards requires a systems-thinking approach. Factors that may influence the region’s approach to reducing risks and vulnerabilities include the feasibility of mitigation, project changes in future conditions, and the potential for hazards to cause cascading impacts.

5.2.1 Mitigation vs. Adaptation vs. Preparedness

Mitigation plans address the need to reduce the risks associated with hazards. However, not all risks can always be reduced. In instances when mitigation actions are too expensive or otherwise unfeasible, other approaches, such as adaptation or preparedness actions, may need to be taken.

The terms mitigation, adaptation, and preparedness often are confused, but each term refers to a different method that communities can use to address risks associated with hazards, as defined below.

- **Mitigation:** Mitigation is an effort to reduce loss of life and property by lessening the impact of disasters. The process of hazard mitigation planning involves community efforts to identify risks and vulnerabilities associated with natural, technological, and human-caused disasters and develop long-term strategies for risk reduction. The goal of a mitigation program is to reduce or avoid costs associated with disaster response and recovery.
- **Adaptation:** Changing climate conditions will affect the frequency and magnitude of natural hazards, such as flooding and wildland fires. The concept of climate adaptation encompasses the responses of communities to a changing climate. The Intergovernmental Panel on Climate Change (IPCC) defines climate adaptation as adjustments in human and natural systems, in response to actual or expected changes in climate, that moderate harm or take advantage of beneficial opportunities (IPCC 2001). Climate adaptation in many cases includes broader strategies such as studies and policy changes aimed at altering how a community develops in the future to take into consideration expected climate conditions.
- **Preparedness:** The Department of Homeland Security and FEMA define preparedness as a continuous cycle of planning, organizing, training, equipping, exercising, evaluating, and taking corrective action in an effort to ensure effective coordination during response to a disaster or other incident (Department of Homeland Security 2012). Preparedness strategies are actions that increase the capacity of an agency, community, or individual to respond after a disaster occurs to protect lives and property. In instances where the risks of a hazard cannot be mitigated or adapted to, preparedness activities enable communities to respond to disaster.

5.2.2 Future Conditions

Potential impacts of future climate conditions include increased average temperatures, decreased snow accumulation, and increased peak stream flow. The increasing average temperature is expected to be more pronounced during summer months, and decreased summer precipitation is expected to accompany this shift. The frequency and magnitude of extreme precipitation events is also expected to increase, particularly in the winter. In short, what is currently viewed as a 100-year event, may soon be reconsidered as a 50-year event or even a 10-year event. This would place further stress on storm drainage systems and natural stream systems, placing Storey County communities at an increased risk for flooding.

Changing precipitation and average temperatures may impact potable water availability. If snowmelt shifts to earlier in the spring and summers become longer, hotter, and drier, regional needs for water storage may grow. Decreased water availability combined with increased demand may exacerbate water shortage concerns.

Finally, changing climate conditions can impact ecosystems, with complicated feedbacks that may affect ecosystem services that local communities rely on for water quality and overall well-being.

Changes in development patterns also affect the vulnerability of communities to hazards. As the neighboring counties and cities expand, future development is more likely to creep into Storey County. Commercial and industrial uses also have steadily increased in the area, a trend which is

expected to continue over the coming years. These development trends add to increased risk and vulnerability, which will need to be taken into consideration when planning and constructing new homes, businesses, and infrastructure. Development also increases stormwater runoff and alters drainage patterns.

5.2.3 Cascading Impacts

Hazards do not occur in a vacuum, and the occurrence of one hazard has the potential to cause multiple other hazards and adverse effects. Accordingly, the County and its partners have attempted to take the risk assessment one step further by identifying the potential cascading, or secondary, impacts that may be generated by a hazard. In better understanding these cascading impacts, the region will be better prepared to holistically address risks and vulnerabilities.

5.3 PLANNING FOR RISK AND VULNERABILITY

The risk and vulnerability assessments discussed in this section were developed through a combination of stakeholder feedback and comprehensive geospatial analyses. The combined findings shaped a risk-driven planning process that resulted in mitigation strategies focused on the real risks and vulnerabilities faced by Storey County.

5.3.1 Stakeholder Feedback

As part of the hazard ranking activity identified in Section 5.1, the Planning Committee provided insights regarding the risk assessment portion of the HMP. As part of the hazard ranking activity, participants were asked to consider each hazard based on the following attributes:

- **Geographic Scope:** Locations most likely to be impacted by the hazard.
- **Health Impacts:** Potential short- and long-term human health complications related to the hazard.
- **Displacement:** The hazard's likelihood to cause the displacement of County residents or visitors.
- **Economic Impacts:** The potential economic and financial losses related to the hazard.
- **Environmental Impacts:** The potential impacts that may adversely affect natural systems.
- **Structural Impacts:** The scale and scope of potential building and infrastructure damages related to the hazard.
- **Critical Services:** The departments and functions most likely to be impacted following the hazard.
- **Cascading Effects:** Potential secondary hazards caused by the onset of the initial hazard in question.

5.3.2 Geospatial Analyses

Numerous risk assessments are supported by maps and tables generated through comprehensive geospatial analyses. A series of processes were performed to identify areas in which local critical

facilities intersect with mapped hazards and estimate the potential economic losses associated with such losses. This project relied heavily upon publicly available data developed by FEMA, the USGS, other Federal agencies, State agencies, and Storey County. The data represents some of the best data available in the United States for hazard information. Table 5-3 indicates the data sources used to estimate hazard risks.

Table 5-3. GIS Data Sources

Data Grouping	Specific Data Files
Hazard Data	Seismic Ground Motion Hazards with 2 Percent Probability
	Seismic Ground Motion Hazards with 10 Percent Probability
	Flood Hazard
	Wildfire Hazard Potential
	HazMat
Critical Facilities Data	Bridges
	Energy Infrastructure
	Fire Stations
	Government Buildings
	Health Facilities
	Reclamation
	Sheriff’s Office
	Storey County Schools
	Water/Sewer Facility
	Water Tank/Well
Base Map Data	Arterials and Highways
	Waterways and Streams
	County Administrative Lines
	Land Uses

5.4 VULNERABILITY ASSESSMENT

The requirements for a vulnerability assessment, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements: Assessing Vulnerability, Overview

Assessing Vulnerability: Overview

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

Element

- Does the new or updated plan include an overall summary description of the jurisdiction's vulnerability to each hazard?
- Does the new or updated plan address the impact of each hazard on the jurisdiction?

Source: FEMA 2008.

A vulnerability assessment estimates the extent of exposure that may result from specific hazard events of a given intensity in the HMP's planning area. The assessment provides quantitative and qualitative data to identify and prioritize mitigation actions (identified in Section 7). To improve the readability of the HMP, vulnerability assessments have been incorporated into each hazard profile within Section 5.5 below.

5.4.1 Identifying Critical Infrastructure

The recommendations for a vulnerability assessment, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 Recommendations: Assessing Vulnerability, Identifying Structures

Assessing Vulnerability: Identifying Structures

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

Element

- Does the new or updated plan describe vulnerability in terms of the types and numbers of existing buildings, infrastructure, and critical facilities located in the identified hazard areas?
- Does the new or updated plan describe vulnerability in terms of the types and numbers of future buildings, infrastructure, and critical facilities located in the identified hazard areas?

Source: FEMA 2008.

DMA 2000 Recommendations: Assessing Vulnerability, Estimating Potential Losses

Assessing Vulnerability: Estimating Potential Losses

Requirement §201.6(c)(2)(ii)(B): [The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate.

Element

- Does the new or updated plan estimate potential dollar losses to vulnerable structures?
- Does the new or updated plan reflect changes in development in loss estimates?
- Does the new or updated plan describe the methodology used to prepare the estimate?

Source: FEMA 2008.

A critical facility is defined as a public or private facility that provides essential products and services to the general public, such as preserving the quality of life in the County and fulfilling important public safety, emergency response, and disaster recovery functions. Similar to critical facilities, critical infrastructure is defined as infrastructure that is essential to preserve the quality of life and safety in the County.

GIS data from Federal, State, and local databases was used to inform the vulnerability assessment and identify critical infrastructure. Section 5.3.2 discusses the sources and types of data used in the HMP. Data collection for the vulnerability assessment was complicated by availability of critical infrastructure data and valuation data; therefore, the list included in the HMP may be incomplete. In particular, data on private investment in infrastructure in the TRI is currently missing. However, the importance of the TRI, both in terms of economic value and as a location of hazardous materials, has been considered throughout the planning process. Storey County is committed to continuing to refine and build on the list of critical infrastructure over the next five years to improve the data provided in the next plan update.

The County’s critical facilities are listed in Table 5-4. Mapping of critical facilities and hazardous materials locations was undertaken to analyze risks and vulnerabilities (Appendix G). However, these maps are not for public distribution due to security concerns. Some facilities in neighboring Counties were included in Table 5-4, since Storey County relies on these facilities. For example, nearby healthcare facilities such as Carson Tahoe Regional Medical Center, Renown Regional Medical Center, Renown South Meadows Medical Center, Saint Mary’s Regional Medical Center, Northern Nevada Medical Center, and Carson Valley Medical Center, were included. However, due to the lack of availability regarding valuation data of these healthcare facilities, the estimated value of the aforementioned facilities are not included in the estimated value in Table 5-4.

Table 5-4. Critical Facilities and Infrastructure

Category	Type	Number	Estimated Value (millions of \$)
Critical Facilities	Sheriff stations, public safety, and other County buildings	11	14.6
	Fire stations (including 3 stations in nearby Counties)	6	7.9
	Public primary and secondary schools	5	25.4
	Shelters - Senior centers (Virginia City and Lockwood) and high school (valuation included in school category above)	2	1

Table 5-4. Critical Facilities and Infrastructure

Category	Type	Number	Estimated Value (millions of \$)
	Nearby healthcare facilities (Carson Tahoe Regional Medical Center, Renown Regional Medical Center, Renown South Meadows Medical Center, Saint Mary’s Regional Medical Center, Northern Nevada Medical Center, and Carson Valley Medical Center) and 2 nearby urgent care facilities	8	N/A
	Ambulance facilities	1	Included in Fire Station
	Communication towers (2 County-owned facilities and other State-owned, privately-owned, or leased, including Pond, Ophir, Eagle View, Highlands, TRI, Lockwood, and Virginia City)	2 (County-owned)	.1
Critical Infrastructure	Transportation (State and Federal highways, local roads, etc.)	N/A	1,730
	Nearby airport facilities (Washoe)	1	79.6
	Bridges (County only)	7	Included in Highway
	Utilities (water, wastewater, gas, electrical)	N/A	245.8

Source: Storey County Emergency Management

5.4.2 Asset Inventory

Local assets that may be affected by hazards include the County population, properties, and utilities and infrastructure. The County’s population is discussed in greater detail in Section 3.3, and the County’s future development trends are further discussed in Section 3.4. As noted in Section 5.4.1, valuation data may be incomplete or pose inaccuracies for the County’s critical infrastructure. The County will work to acquire additional data and validate existing data in future updates of the plan as this information becomes available.

5.4.3 Data Limitations

Due to a lack of data, numerous risk assessments relied on limited and/or qualitative analyses of risk. The risk assessments provided within this section used the best available data and methodologies to estimate risk. However, large gaps exist within the available datasets, and that

impacted the ability to provide, with full certainty, accurate estimations of several hazard concerns.

5.4.4 Repetitive Loss Properties

The requirements for a vulnerability assessment, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements: Assessing Vulnerability, Addressing Repetitive-Loss Properties

Assessing Vulnerability: Addressing Repetitive Loss Properties

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

Element

- Does the updated plan document how the planning team reviewed and analyzed this section of the plan and whether this section was revised as part of the update process?
- Does the new or updated plan describe vulnerability in terms of the types and numbers of repetitive loss properties located in the identified hazard areas?

Source: FEMA 2008.

FEMA's Severe Repetitive Loss (SRL) Program was designed in 2004 to provide funding to reduce or eliminate the long-term risk of flood damage to SRL structures insured under the National Flood Insurance Program (NFIP).

An SRL property is defined as a residential property that is covered under an NFIP flood insurance policy and:

- (a) That has at least four NFIP claim payments (including building and contents) over \$5,000 each, and the cumulative amount of such claims payments exceeds \$20,000; or
- (b) For which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

For both (a) and (b) above, at least two of the referenced claims must have occurred within any ten-year period and must be greater than 10 days apart. FEMA's Repetitive Flood Claims (RFC) grant program was authorized to assist States and communities in reducing flood damages to insured properties that have had one or more claims to the National Flood Insurance Program (NFIP).

The State is working with a variety of stakeholders to reduce the number of properties considered to be repetitive loss properties and to prevent severe repetitive loss properties from developing. Storey County has no repetitive loss properties. The current status of repetitive loss properties should be discussed during the annual review of this plan with the County's Floodplain Manager.

5.4.5 Exposure Assessment

Impacts associated with mappable hazards are indicated in the risk assessments identified in Section 5.5.

Note: Not all considered hazards can be mapped for vulnerability. Risk assessments for hazards that cannot be mapped rely upon qualitative data.

5.5 HAZARD PROFILES AND VULNERABILITY ASSESSMENTS

The requirements for hazard profile, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements: Risk Assessment – Profiling Hazards
Profiling Hazards Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.
Element
<ul style="list-style-type: none">■ Does the risk assessment identify the location (i.e., geographic area affected) of each natural hazard addressed in the plan?■ Does the risk assessment identify the extent (i.e., magnitude or severity) of each hazard addressed in the plan?■ Does the plan provide information on previous occurrences of each hazard addressed in the plan?■ Does the plan include the probability of future events (i.e., chance of occurrence) for each hazard addressed in the plan?
<i>Source: FEMA, March 2008.</i>

The specific hazards selected by the Planning Committee for profiling have been examined in a methodical manner based on the following factors:

- Nature
- History
- Location, extent, and probability of future events
- Vulnerability and cascading impacts

The hazards profiled for the County are presented in alphabetical order. The order of presentation does not signify the level of importance or risk. Very low hazards were not profiled.

5.5.1 Avalanche

<i>Hazard Type</i>	<i>Probability/ Frequency (1=lowest, 5=highest)</i>	<i>Magnitude (1=lowest, 5=highest)</i>	<i>Onset (1=slowest, 5=fastest)</i>	<i>Duration (1=shortest, 5=longest)</i>	<i>Average</i>	<i>Rank</i>
Avalanche	1.50	2.06	4.19	1.88	2.41	10

5.5.1.1 Nature

An avalanche is a mass of snow sliding down a mountainside. An avalanche occurs when gravitational pull exceeds the bonding strength of the snow cover. There are four factors that contribute to an avalanche; a steep slope, a snow cover, a weak layer in the snow cover, and a trigger. About 90 percent of all avalanches start on slopes of 30-45 degrees; about 98 percent of all avalanches occur on slopes of 25-50 degrees. Avalanches release most often on slopes above timberline, such as gullies, roads cuts, and small openings in the trees. Avalanches can also occur on small slopes well below timberline, such as gullies, road cuts, and small openings in the trees. Very dense trees can anchor the snow to steep slopes and prevent avalanches from starting; however, avalanches can release and travel through a moderately dense forest.

The vast majority of avalanches occur during and shortly after winter storms, during the winter and spring months between January and April. The most avalanche-prone months, in order, are February, March, and January. The avalanche danger increases with major snowstorms and periods of thaw. Duration of avalanche impacts is generally one to three days or less.

5.5.1.2 History

There are oral accounts of two avalanche events in the Geiger Grade area occurring approximately 50 to 100 years ago and of one in Virginia City within the past 10 years. The avalanche in Virginia City was described as moving a multi-thousand gallon water tank about 300 feet vertically down the hill to a nearby residence landing atop a privately owned garage. There were no injuries or fatalities reported in any of the three events. No additional events could be found in local or national databases.

5.5.1.3 Location, Extent, and Probability of Future Events

There are several factors that influence avalanche conditions and locations, with the main ones being slope angle, slope aspect, and terrain. Other factors include slope shape, vegetation cover, elevation, and path history. Avalanches usually occur on slopes 35 to 60 degrees; Virginia City is located on the eastern slope of Mt. Davidson, where the slope is at approximately 30 to 35 degrees. The sides of the Geiger Grade slope between Reno and Virginia City are approximately 45 or more degrees. An avalanche can occur on slopes of 25 to 35 degrees. At slope angles above 70 degrees, the snow tends to slough off and does not have the opportunity to accumulate. Avalanches can occur outside the optimum slope angle range but are not as common.

Slope aspect, also termed orientation, describes the direction a slope faces with respect to the wind and sun. Leeward slopes (slopes facing away from wind and snow) loaded by wind-transported snow are problematic because the wind-deposited snow increases the stress and enhances slab formation. Intense direct sunlight can weaken and lubricate the bonds between the

snow grains, weakening the snowpack. Shaded slopes are also potentially unstable because the weak layers may be held for a longer time in an unstable state. Virginia City's location on the eastern portion of Mt. Davidson is not considered a leeward slope but faces the east catching the daily rising sunlight.

The local terrain features determine an avalanche's path. The path has three parts: the starting zone, the track, and the run-out zone. The starting zone is where the snow breaks loose and starts sliding. It is generally near the top of a canyon, bowl, ridge, etc., with steep slopes between 25 and 50 degrees. Snowfall is usually significant in this area.

Most avalanches in a given path are relatively small and frequent, affecting only a small portion of the potential path area. Occasionally, much larger avalanches release which extend nearly to the observed limits of the path. These larger events are usually referred to as "10-year" events but in reality reflect an order of magnitude return period between 3 years and 30 years. On rare occasions, exceptionally large avalanches occur that extend well beyond the established boundaries of the paths. These avalanches, often referred to as "100-year" avalanches, are likely to affect all or most of the potential path area.

Avalanches usually occur on slopes 35 to 60 degrees and can occur on slopes of 25 to 35 degrees. The slope of Virginia City (30 to 35 degrees) indicates it is possible for an avalanche to occur there. The Geiger Grade slope (approximately 5 degrees) is significantly less likely to occur with any regularity. A design avalanche is defined as an avalanche occurring within an order of magnitude range between 30 years and 300 years. Statistically, design avalanches have a one percent probability of occurring during any given year, but could occur in consecutive years or many years apart.

5.5.1.4 Vulnerability and Cascading Impacts

Mountain communities are vulnerable to the effects of avalanches. When avalanche conditions are present, risks are highest for recreational users and others in backcountry areas who may trigger avalanches or be injured or killed by an avalanche. In addition to injuries and deaths, avalanches can damage or destroy property and utilities and cover roadways in snow. Transportation disruptions caused by avalanches or area closures due to avalanche risks can have economic impacts for recreation, tourism, and other businesses over a period of days to a week or more.

Cascading Impacts

- Utility failure
- Economic loss
- Fatalities
- Transportation accidents
- Floods and debris flows
- Water quality impacts

5.5.2 Caving Ground (Mine Collapse)

<i>Hazard Type</i>	<i>Probability/ Frequency (1=lowest, 5=highest)</i>	<i>Magnitude (1=lowest, 5=highest)</i>	<i>Onset (1=slowest, 5=fastest)</i>	<i>Duration (1=shortest, 5=longest)</i>	<i>Average</i>	<i>Rank</i>
Caving Ground (Mine Collapse)	2.13	2.88	4.94	2.63	3.14	7

5.5.2.1 Nature

The area around abandoned mine openings and open pits can be weak and cave-in without warning. Cave-ins are obviously dangerous. Areas that are likely to cave-in are often hard to detect. A minor disturbance, such as vibrations caused by walking or speaking, may cause a cave-in.

The top of a mine shaft is especially dangerous. The rock at the surface is often decomposed and timbers may be decayed or missing; therefore walking anywhere near a shaft opening should be avoided. The whole area is often ready and waiting to slide into the shaft, which can be hundreds of feet deep.

5.5.2.2 History

Through oral history there is community knowledge of two significant events where mine shafts that were filled during the 1920s significantly caved leaving large holes in the ground at two separate school locations, the first in 1991 at Gallagher Elementary School and then around 1994-1995 at the Virginia City High School. Additional caving events occurred along highways requiring the roads to be closed for repairs to be completed. The first occurred around 2000 and the second in 2006 with additional damage in 2015 along Highway 342 in lower Gold Hill about a quarter of a mile north of the county line; all events were as a result of flood waters or heavy rains collapsing previously covered mine shafts.

The Nevada Division of Minerals manages and collects data regarding abandoned mine hazards throughout the State. Due to budgetary restraints their database is maintained using an antiquated system and remains in a constant state of flux. They acknowledge that they have not been able to inventory all abandoned mine hazards in Storey County partly because they do not have access to events occurring on private property. Additionally, they do not specifically inventory events regarding subsidence or collapse of abandoned mine shafts such as the events described above.

5.5.2.3 Location, Extent, and Probability of Future Events

The Comstock Lode was the largest gold and silver deposit ever discovered in the State of Nevada and is located beneath Virginia City as well as extending below the interior of the County. By the late 1800s the Comstock Lode had ebbed. Then in the 1920s, with an abundance of abandoned mines and cars, it became common practice to fill the shafts of inactive mines with wrecked vehicles and other large discarded items. Over the last century filled shafts have settled or support timbers have collapsed causing a multitude of hazards to include sink holes. 1994 saw another gold boom with Nevada producing approximately 64% of the U.S.

production and 10% of the total world gold production (Nevada Division of Minerals, 1994; Price et al., 1995). Abandoned mines are located not only throughout the State of Nevada but there is a high concentration in and surrounding the Virginia City and Gold Hill areas. The deepest shafts of these mines measure 3,300 feet below the shaft’s collar.

In 2019, the Nevada Division of Minerals published a report on the physical hazards at abandoned mine lands. The report provides an update on the status of hazards at abandoned mine lands in the State. It indicates that as of December 31, 2017, the agency has discovered 219 sites with hazards at abandoned mines in Storey County. Of the identified sites, 202 (92 percent) sites were secured.

5.5.2.4 Vulnerability and Cascading Impacts

With the mining history past and present so densely concentrated in the Virginia City and Gold Hill areas, abandoned mines are acknowledged to be a current hazard and one that will persist well into the future. Without an in-depth study not only in Storey County but throughout the State of Nevada the vulnerability to life and property has not yet been fully defined but can only be speculated upon considering the deepest of the known shafts are measured at 3,300 feet.

Cascading Impacts	
•	Structural damage
•	Utility failure
•	Economic loss
•	Fatalities
•	Transportation accidents

5.5.3 Drought

Hazard Type	Probability/ Frequency (1=lowest, 5=highest)	Magnitude (1=lowest, 5=highest)	Onset (1=slowest, 5=fastest)	Duration (1=shortest, 5=longest)	Average	Rank
Drought	3.94	2.13	1.88	4.44	3.09	8

5.5.3.1 Nature

Drought is a temporary but recurrent feature of climate that occurs virtually everywhere, including in regions that normally receive little rainfall. Characteristics of drought can vary significantly from one region to another and, partly due to differences in impact, there are scores of definitions. Drought is often described simply as a period of deficient precipitation, usually lasting a season or more, resulting in extensive damage to agricultural crops with consequential economic losses. Water shortages can result for some activities, groups, or environmental sectors.

The onset and end of a drought are difficult to determine, and in contrast with quick and intense natural hazards such as tornadoes, the impact of drought is more of a slower “creeping hazard” and may be spread over a larger geographic area. The impact of a particular drought depends on numerous factors including duration, intensity, and geographic extent as well as regional water supply demands by humans and vegetation.

The negative effects of drought increase with duration. Lower than normal reservoir or river levels can impact recreational opportunities, fire suppression activities, and animal habitat. Patterns of human consumption can also be altered. Non-irrigated croplands are most susceptible to precipitation shortage. Rangeland and irrigated agricultural crops may not respond to moisture shortage as rapidly; however, yield during periods of drought can be substantially lower. During periods of severe drought, lower moisture in plant and forest fuels create an increased potential for devastating wildfires. An increase in insect infestation can be a particularly damaging impact from severe drought conditions.

The U.S. Drought Monitor product utilizes several indices along with data retrieved from various organizations and personnel directly involved in the field to create a graphical assessment of drought conditions. The five drought intensities or classifications offered by the authors of this product are: D0 Abnormally Dry, D1 Moderate Drought, D2 Severe Drought, D3 Extreme Drought and D4 Exceptional Drought. The National Weather Service will issue Drought Information Statements and brief water resource partners during periods of drought.

5.5.3.2 History

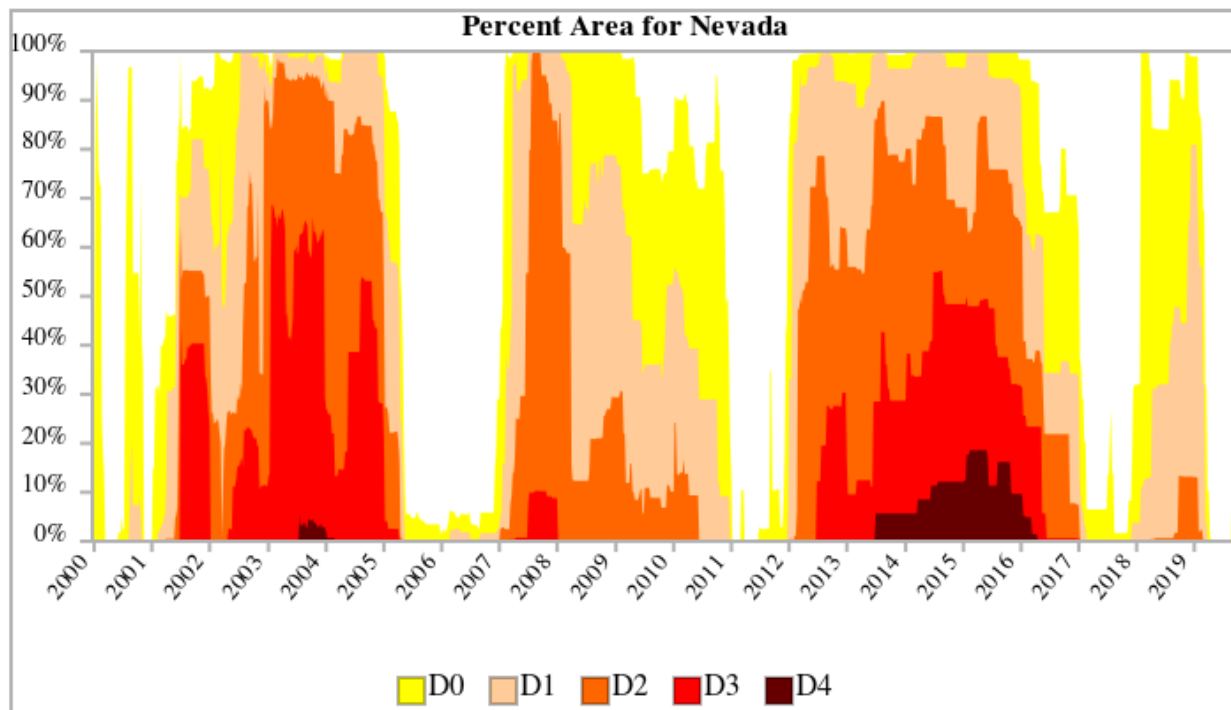
Increased wildfire risk, water shortages and an anomalous insect infestation have all been attributed to recent droughts. Storey County has experienced 6 drought periods of Drought Monitor classification D1 or higher since 2000. Maximum intensity of these droughts ranged from severe (D2) to extreme (D3) and averaged 16 months in duration. The longest drought in the period of record was from January 2007 to October 2010 (45 months). The 2007 and 2012 droughts have been the longest and most extreme since 2000. There is no regular pattern to drought occurrences in the County, though there have been long periods without drought, most notably the wet years of 2005-2006. It should be noted that the drought that began in 2012 has resulted in a United States Department of Agriculture (USDA) Drought Disaster Area Declaration for much of Nevada. Storey County is considered a “Contiguous County” in this declaration.

Following is a list of recent drought periods extracted from data supplied by the U.S. Drought Monitor.

Table 5-5: Droughts in Nevada

Drought Period	Duration of Drought	Maximum Intensity
3 April 2001 – 19 Mar 2002	11 months	Extreme (D3)
28 May 2002 – 24 Dec 2002	7 months	Severe (D2)
11 Feb 2003 – 30 Dec 2003	10 months	Severe (D2)
13 Apr 2004 – 18 Jan 2005	9 months	Extreme (D3)
23 Jan 2007 – 12 Oct 2010	45 months	Extreme (D3)
3 Jan 2012 – ongoing as of 2017	60 months	Exceptional (D4)

Figure 5.1 U.S. Drought Monitor: Nevada Drought Severity



5.5.3.3 Location, Extent, and Probability of Future Events

Droughts are a naturally-occurring cyclical part of the climate, and Storey County is highly susceptible to periods of dry conditions and drought. Based on recent cycles, Storey County can expect highly varying degrees and durations of drought to occur. The Southwest Climate Assessment report indicated that drought severity has increased across the Southwest U.S., including Nevada, and that the trend is likely to continue.

5.5.3.4 Vulnerability and Cascading Impacts

Storey County currently is completing a Water Resources Plan to study surface and groundwater resources, which will better inform on the County's vulnerability to drought. Storey County may be vulnerable to the effects of drought due to long-term declines in groundwater levels and decreased aquifer recharge during meteorological drought conditions. Industrial facilities and utilities that rely on surface water supplies for industrial processes may also experience operational disruptions if surface water levels decrease.

The economic impacts of drought can range from crop losses and increased costs incurred by farmers and ranchers who need to buy additional water or feed for livestock to economic losses for tourism, hospitality businesses, and residents due to water shortages. The effects of drought can last from one to several years, and the effects of drought are likely to be compounded the longer drought conditions last.

Cascading Impacts

- Communications disruptions
- Heat-borne diseases
- Insect infestation
- Water quality impacts
- Crop/forestry loss
- Utility failure
- Production loss
- Wildland fire

5.5.4 Earthquake

<i>Hazard Type</i>	<i>Probability/ Frequency (1=lowest, 5=highest)</i>	<i>Magnitude (1=lowest, 5=highest)</i>	<i>Onset (1=slowest, 5=fastest)</i>	<i>Duration (1=shortest, 5=longest)</i>	<i>Average</i>	<i>Rank</i>
Earthquake	2.81	4.13	4.81	3.38	3.78	2

5.5.4.1 Nature

An earthquake is a sudden motion or trembling caused by a release of strain accumulated within or along the edge of the earth’s tectonic plates. The effects of an earthquake can be felt far beyond the site of its occurrence. Earthquakes usually occur without warning and, after just a few seconds, can cause massive damage and extensive casualties. The most common effect of earthquakes is ground motion, or the vibration or shaking of the ground during an earthquake.

The severity of ground motion generally increases with the amount of energy released and decreases with distance from the fault or epicenter of the earthquake. Ground motion causes waves in the earth’s interior, also known as seismic waves, and along the earth’s surface, known as surface waves. There are two kinds of seismic waves. P (primary) waves are longitudinal or compressional waves similar in character to sound waves that cause back-and-forth oscillation along the direction of travel (vertical motion). S (secondary) waves, also known as shear waves, are slower than P waves and cause structures to vibrate from side to side (horizontal motion). There are also two kinds of surface waves: Raleigh waves and Love waves. These waves travel more slowly and typically are significantly less damaging than seismic waves.

In addition to ground motion, several secondary hazards can occur from earthquakes, such as surface faulting. Surface faulting is the differential movement of two sides of a fault at the earth’s surface. Displacement along faults, both in terms of length and width, varies but can be significant (e.g., up to 20 feet), as can the length of the surface rupture (e.g., up to 200 miles). Surface faulting can cause severe damage to linear structures including railways, highways, pipelines, and tunnels.

Earthquake-related ground failure due to liquefaction is another secondary hazard. Liquefaction occurs when seismic waves pass through saturated granular soil, distorting its granular structure and causing some of the empty spaces between granules to collapse. Porewater pressure may also increase sufficiently to cause the soil to behave like a fluid for a brief period and cause deformations. Liquefaction causes lateral spreads (horizontal movements of commonly 10 to 15 feet, but up to 100 feet), flow failures (massive flows of soil, typically hundreds of feet, but up to 12 miles), and loss of bearing strength (soil deformations causing structures to settle or tip). Liquefaction can cause severe damage to property.

The effects of earthquake waves at the surface can be measured using the Modified Mercalli Intensity (MMI) Scale, which consists of arbitrary rankings based on observed effects, or the Richter Magnitude Scale, a mathematical basis that expresses the effects of an event in magnitude (M).

5.5.4.2 History

Nevada is ranked third in the states having the highest number of large earthquakes. The Sierra Nevada-Great Basin seismic belt includes earthquakes along the eastern side of the Sierra Nevada and appears to be a northern continuation of the Eastern California seismic belt. The Central Nevada seismic belt, which trends north-south in the west-central part of the state, includes the largest historic earthquakes in Nevada in the 20th century. The County sits within both belts.

The figure below provides the major, historical earthquakes in the County.

Figure 5-2: Historic Earthquakes in Storey County		
Date	Magnitude	Near
March 15, 1860	7.0	Olinghouse fault
May 29, 1868	6.0	Virginia City.
December 26, 1869	6.7	Virginia City & Washoe Co.
December 27, 1869	6.1	After shock
April 24, 1914	6.4	Fernley or Wadsworth
June 25m 1933	6.0	Near Wabuska
February 1953	7.2	Stillwater (outside of County)

Source: NBMG 2010

5.5.4.3 Location, Extent, and Probability of Future Events

The location of damage from an earthquake would have the greatest impact in Virginia City with the highest population density and historical structures, many of which are unreinforced masonry. The maps in Appendix B (Figures B-3 and B-4) show M2 and M3 earthquakes in the County from 1960-2019 and map areas where seismic ground motion hazards show a 2 percent probability and a 10 percent probability of being exceeded in 50 years.

The Nevada Earthquake Safety Council, in part through the services of the Nevada Bureau of Mines and Geology (NBMG) and the Nevada Seismological laboratory, provides assistance of earthquake risk assessment and earthquake mitigation activities for the State of Nevada. The Planning Committee will utilize the Nevada Earthquake Risk Mitigation Plan (NERMP) for consideration in identifying Storey County policy and mitigation strategies.

The Executive Summary of the NERMP states that Nevada is earthquake country, ranking third in the nation in the number of major earthquakes. Since the 1850s, 62 earthquakes have occurred in Nevada that have had potentially destructive magnitudes of 5.5 (Richter Scale) or greater. Nevada is a national leader in population growth, and the risk of harm and loss from earthquakes increases proportionally with population and development. Earthquakes can be expected to continue to occur in Nevada and some of these will strike growing urban centers and communities.

The Nevada Bureau of Mines and Geology (2014) ranks Virginia City third among major state cities for probability of experiencing an earthquake with magnitude of 5.0 or greater. The extent & probability for the entire County is shown in the table below and provides the probability of earthquakes of various magnitudes occurring within 50 years within 50 kilometers.

Table 5-6: Earthquake Probability

County	% of Probability of magnitude greater than					Rank by Probability
	5.0	5.5	6.0	6.5	7.0	
Virginia City	>90	~80	70	50	12-15	3rd highest in the state of NV

Source: Bureau of Mines & Geology, UNR, Estimated Losses from Earthquakes Near NV Communities, 2014

5.5.4.4 Vulnerability and Cascading Impacts

Earthquakes have the potential to cause significant, widespread structural damage throughout the region. Many of critical facilities in Storey County are located in areas that may experience relatively high seismic ground motion hazards. Storey County has 310 unreinforced masonry buildings. Many of these are of an historic nature and make up the bulk of the tourist business district. The Virginia City fire station and courthouse are critical facilities and are unreinforced masonry. These facilities may experience peak ground acceleration with a 2% probability of exceedance in 50 years of greater than 48% gravity, which would be experienced as severe shaking likely to cause moderate or heavy damage to structures. For most critical facilities in the County, smaller earthquakes (resulting in peak ground acceleration with a 10% probability of exceedance in 50 years) could produce ground motion ranging from 32% to 64% gravity. These levels of peak ground acceleration would be experienced as strong to severe shaking and could cause light to heavy damage to structures.

Long-term impacts to the community following an earthquake may include displacement, disruption of government services, economic impacts, and health risks due to increased airborne particulate matter or contamination of water or soils from hazardous materials spills or releases of sewage. The severity and duration of these impacts would depend on the severity of the earthquake and damage to infrastructure and buildings across the region. A significant loss of population following an earthquake due to people relocating outside of the region could result in

an extended loss of revenue for local government and economic impacts resulting from a decrease in the workforce.

Cascading Impacts
<ul style="list-style-type: none"> • Surface faulting • Landslides/ground failure • Utility failure • Infrastructure failure • Conflagration • Food, water, medical supply shortages • Health impacts • Displacement/relocation of populations • Economic disruption

5.5.5 Epidemic

<i>Hazard Type</i>	<i>Probability/ Frequency (1=lowest, 5=highest)</i>	<i>Magnitude (1=lowest, 5=highest)</i>	<i>Onset (1=slowest, 5=fastest)</i>	<i>Duration (1=shortest, 5=longest)</i>	<i>Average</i>	<i>Rank</i>
Epidemic	1.81	2.81	3.25	3.44	2.83	9

5.5.5.1 Nature

A disease is a pathological (unhealthy or ill) condition of a living organism or part of the organism that is characterized by an identifiable group of symptoms or signs. Disease can affect any living organism, including people, animals, and plants. Disease can both directly (via infection) and indirectly (via secondary impacts) harm these living things. Some infections can cause disease in both people and animals. The major concern here is an epidemic, a disease that affects an unexpected number of people or sentinel animals at one time. (Note: an epidemic can result from even one case of illness if that illness is unheard of in the affected population, i.e., smallpox).

Of great concern for human health are infectious diseases caused by the entry and growth of microorganisms in man. Most, but not all, infectious diseases are communicable. They can be spread by coming into direct contact with someone infected with the disease, someone in a carrier state who is not sick at the time, or another living organism that carries the pathogen. Disease-producing organisms can also be spread by indirect contact with something a contagious person or other carrier has touched and contaminated, like a tissue, doorknob, or another medium (e.g., water, air, food).

During the first half of the twentieth century, optimism grew as steady progress was made against infectious diseases in humans via improved water quality and sanitation, antibiotics, and inoculations. The incidences and severity of infectious diseases such as tuberculosis, typhoid fever, smallpox, polio, whooping cough, and diphtheria were all significantly reduced during this period. This optimism proved premature, however, for a variety of reasons, including the following: antibiotics began to lose their effectiveness against infectious disease (e.g., *Staphylococcus aureus*); new strains of influenza emerged in China and spread rapidly around the globe; sexually transmitted diseases resurged; new diseases were identified in the U.S. and elsewhere (e.g., Legionnaires's disease, Lyme disease, toxic shock syndrome, and Ebola virus disease); acquired immunodeficiency syndrome (AIDS) appeared; and tuberculosis (including multidrug-resistant strains) reemerged (Schlipkötter and Flahault 2010).

In a 1992 report titled *Emerging Infections: Microbial Threats to Health in the United States*, the Institute of Medicine (IOM) identified the growing links between U.S. and international health and concluded that emerging infections are a major and growing threat to U.S. health. An emerging infectious disease is one that has newly appeared in a population or that has been known for some time but is rapidly increasing in incidence or geographical range. Emerging infectious diseases are a product of modern demographic and environmental conditions, such as global travel, globalization and centralized processing of the food supply, population growth and increased urbanization.

In response to the threat of emerging infectious diseases, the Centers for Disease Control and Prevention (CDC) launched a national effort to protect the U.S. public in a plan titled *Addressing Emerging Infectious Disease Threats*. Based on the CDC's plan, major improvements to the U.S. health system have been implemented, including improvements in surveillance, applied research, public health infrastructure, and prevention of emerging infectious diseases (Hughes 1998).

Despite these improvements, infectious diseases causing lower respiratory infections, diarrheal diseases, and tuberculosis are among the top ten leading causes of death in humans worldwide (World Health Organization 2018), and influenza and pneumonia are the eighth leading cause of death in the U.S. (CDC 2017a). Infectious diseases are still a threat to public health today as global interdependence and world travel continue to increase, and success in combatting these threats depends on an ongoing ability to adapt to and get ahead of these new challenges (Moren and Fauci 2013).

The CDC (2018) has established a national list of over 70 nationally reportable diseases. A reportable disease is one that, by law, must be reported by health providers to report to Federal, State or local public health officials. Reportable diseases are those of public interest by reason of their communicability, severity, or frequency. The long list includes, but is not limited to, the following:

- Anthrax
- Arboviral diseases (including Chikungunya and West Nile virus)
- Babesiosis
- Botulism
- Brucellosis
- Campylobacteriosis
- Chlamydia infection
- Cholera

- Cryptosporidiosis
- Cyclosporiasis
- Dengue virus infections
- Diphtheria
- Ehrlichiosis and anaplasmosis
- Giardiasis
- Gonorrhea
- *Haemophilus influenzae*, invasive disease
- Hansen's disease (leprosy)
- Hantavirus infection
- Hepatitis (A, B, C)
- HIV infection
- Legionellosis
- Listeriosis
- Lyme disease
- Malaria
- Measles
- Meningococcal disease
- Mumps
- Novel influenza A virus infections
- Pertussis
- Plague
- Poliovirus infection
- Rabies, human and animal
- Rubella
- Salmonellosis
- Severe Acute Respiratory Syndrome-associated coronavirus disease
- Shiga toxin-producing *Escherichia coli*
- Shigellosis
- Smallpox
- Spotted fever rickettsiosis
- Syphilis
- Tetanus
- Toxic shock syndrome
- Tuberculosis
- Tularemia
- Typhoid fever
- Vancomycin-resistant *Staphylococcus aureus*
- Varicella
- Vibriosis
- Viral hemorrhagic fever (including Ebola virus)
- Yellow fever
- Zika virus infection

Many other hazards, such as floods, earthquakes or droughts, may create conditions that significantly increase the frequency and severity of diseases. These hazards can affect basic services (e.g., water supply and quality, wastewater disposal, electricity), the availability and quality of food, and the public and agricultural health system capacities. As a result, concentrated areas of diseases may result and, if not mitigated right away, increase, potentially leading to large losses of life and damage to the economic value of the area's goods and services.

5.5.5.2 History

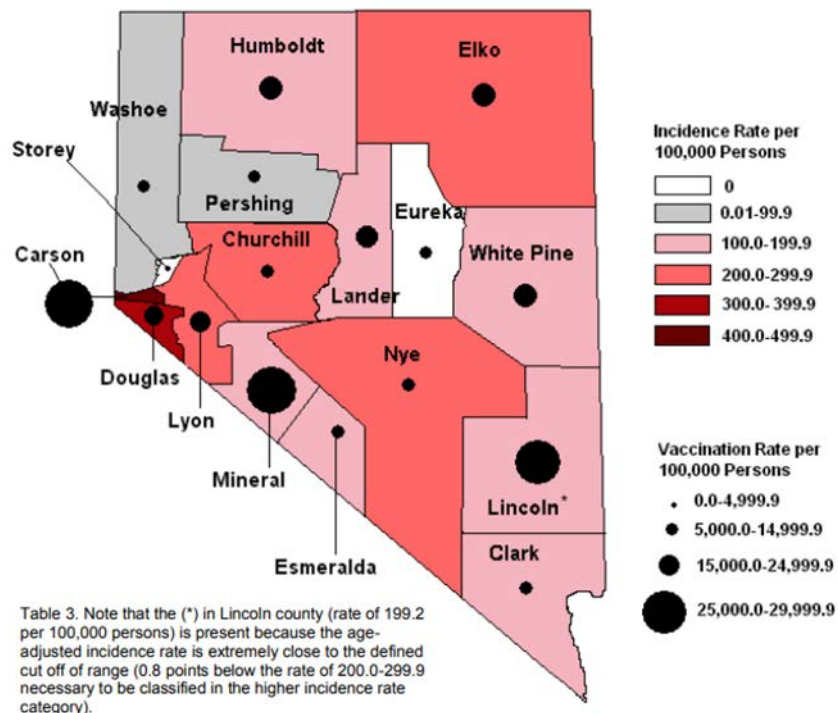
Throughout history epidemics have impacted human populations. The diseases detailed in this section highlight the high variability and potential burden of infectious diseases, both existing and emerging.

Influenza

The influenza pandemic of 1918 and 1919, known as the Spanish Flu, had the highest mortality rate in recent history for an infectious disease. At least 50 million persons were killed worldwide, some 675,000 of which were in the U.S. alone (CDC n.d., "Remembering the 1918 influenza pandemic").

In April 2009, a strain of influenza known as H1N1, or swine flu, was first recognized in Mexico and entered the U.S. in Southern California. H1N1 was recognized as a worldwide pandemic by the World Health Organization in May 2009. H1N1 varied from other influenzas in that it seemed to spare populations born before 1950 due to that group's prior exposure to similar strains (Skountzou et al. 2010). The CDC responded to the novel strain by inoculating the U.S. public through vaccinations. The state of Nevada saw 4,624 cases of H1N1 during the 2009 flu season. Although there were no cases of H1N1 in Storey County in 2009, neighboring and nearby counties (Washoe, Carson, Douglas, Lyon, and Churchill) had a combined total of 801 cases (OPHIE 2013). Carson City, Douglas County, and Churchill County had the highest rates of H1N1 in Nevada, as shown in Figure 5-8. While this H1N1 strain had a low mortality rate, the high variability and unpredictable nature of influenza viruses reinforces the need for sustained preparedness efforts (Jhung et al. 2011).

Figure 5-3: Age-Adjusted H1N1 Influenza Incidence and Vaccination by County, 2009-2010



Source: OPHIE . 2013. *H1N1 influenza incidence and vaccination rates in Nevada, 2009-2010* (K. Hobron, Arthur). http://dpbh.nv.gov/Programs/OPHIE/dta/Publications/OPHIE_-_Communicable_Disease_Reports.

West Nile Virus

In late August 1999, an epidemic of West Nile virus occurred in the New York City metropolitan area causing 62 cases and 7 deaths. The virus is transmitted by mosquitoes and has since become endemic to the United States. There were 2,097 cases and 146 deaths from West Nile virus in the U.S. in 2017, with 67 cases and 3 deaths in the state of Nevada (CDC 2017b). The majority of West Nile virus cases in Nevada occur in the northern part of the state. There were 40 cases in nearby counties of Washoe, Carson City, Douglas, Lyon, and Churchill in 2017, and 10 cases in 2018.

The 1999 epidemic represents the first time West Nile virus had been detected in the U.S. and serves as a reminder that with changes in climate and weather patterns, migration patterns of birds, and other unknown variables, existing or emerging infectious diseases can impact the U.S. at any time (Dalovisio 2003).

Severe Acute Respiratory Syndrome

Better known as SARS, Severe Acute Respiratory Syndrome is a respiratory illness caused by a coronavirus. According to the World Health Organization, SARS infected a total of 8,098 people in a 2003 outbreak and resulted in 774 deaths worldwide. In the United States, there were eight laboratory confirmed cases, with no deaths. All cases were travel-related, and there was no further spread of SARS within the U.S. SARS is thought to be transmitted by close person-to-

person contact and through respiratory droplets produced by coughing or sneezing (CDC n.d., “Basic information about SARS”).

In April 2004, the Chinese Ministry of Health reported nine cases of SARS with one death. Investigations showed the outbreak started as a result of laboratory exposure to the virus (CDC, n.d., “SARS update”). There have been no reports of SARS cases anywhere in the world since 2004, but the travel related nature of the illness demonstrates how quickly an infectious disease can be imported into the U.S. from abroad.

Norovirus

Among all age groups, norovirus is the leading cause of acute gastroenteritis, with 19-21 million cases annually. It contributes to 56,000-71,000 hospitalizations and 570-800 deaths each year. Norovirus is highly contagious and can be transmitted person-to-person or via contaminated food, water, surfaces, or objects. It is responsible for 58% of domestically-acquired foodborne illnesses. Norovirus is most common during the winter, but people can get it any time of the year. There can be up to 50% more norovirus illness in years that a new strain of the virus is circulating (CDC n.d., “Burden of Norovirus illness and outbreaks”).

Escherichia coli

Though many strains of *Escherichia coli*, or *E. coli*, bacteria are innocuous, others can cause illnesses including diarrhea, urinary tract infections, respiratory illness, and pneumonia. Some strains are known as “Shiga toxin-producing” *E. coli*, or STEC, because of the toxin they produce. The most well-known STEC associated with outbreaks in the U.S. is *E. coli* O157:H7 (CDC n.d., “E. coli questions and answers”).

In October 2010, a rare strain of *E. coli* O157:H7 associated with Gouda cheese caused a multistate outbreak. There were 38 total cases across 5 states, including 2 cases in Nevada. The CDC estimates there are 265,000 STEC infections in the United States annually (CDC n.d., “Multistate outbreak of E. coli O157:H7”).

Measles

Measles is a highly contagious virus that lives in the nose and throat mucus of an infected person and is transmitted by coughing and sneezing. Measles is so contagious that it can be spread to 90% of people who come into contact with someone infected with the virus (CDC n.d., “Measles”).

Reemergence of these once typical childhood diseases not only puts vulnerable populations at risk but also can have a significant financial impact on a community. One study estimated the cost of epidemiological intervention for a measles outbreak at nearly \$6,800 per case investigated, which did not account for outside medical costs to hospitals or absenteeism from work from those who are ill or caring for ill individuals (Khawja, Zucker, and Rosen 2014).

Pertussis

A respiratory illness commonly known as whooping cough, pertussis is a very contagious disease caused by bacteria called *Bordetella pertussis*. The bacteria releases toxins which cause airways to swell. Pertussis is most likely to be severe in infants and small children, and about half of babies younger than 1 year old who get pertussis need care in the hospital (CDC n.d., “Pertussis”). California recently experienced the first infant death in the state due to pertussis since 2016 (California Department of Public Health 2018). Nevada has had three pertussis

outbreaks since 2017, two of which occurred in the very rural area of Nye County. While studies show that immunity against pertussis wanes in those who are vaccinated, individuals who are unvaccinated or under-vaccinated remain at significantly higher risk of infection, which emphasizes the importance of maintaining vaccination rates for these types of infectious diseases (Phadke, Bednarczyk, Salmon, and Omer 2016).

Table 5-7: Recent Historic Disease Outbreaks in the State of Nevada

Date	Details
April 2009	H1N1 virus confirmed by the World Health Organization as a worldwide epidemic. There were 4,624 cases of H1N1 in Nevada, with 801 cases in counties (Washoe, Carson City, Douglas, Lyon, and Churchill) nearby Storey County.
February 2014	A canine positive for bat rabies resulted in a four-county (Carson City, Douglas, Lyon, and El Dorado) contact investigation. This investigation consisted of 47 individuals with potential exposure to rabies.
October 2015 – December 2015	Norovirus outbreak caused over 2,000 staffers, faculty, and students in the Washoe County School District to be sickened.
March 2017	A pertussis outbreak occurred in three counties (Carson City, Douglas, and Lyon). This outbreak lasted three months, consisted of 10 cases and over 100 contacts that required assessment and post exposure prophylaxis.
2017	There were 40 cases of West Nile virus near Storey County, in the counties of Washoe (6), Carson (4), Douglas (8), Lyon (12), and Churchill (10) during the 2017 mosquito season.
August 2017 – October 2017	Pertussis outbreak confirmed in Tonopah, Nevada. There were 28 cases total, with 99 contacts identified and investigated.
April 2018 – July 2018	Pertussis outbreak confirmed in Nye County. There were 19 cases total, with 70 contacts identified and investigated.
April 2018	1 confirmed measles case in Washoe County, which was the first measles case in Washoe County since 1999.
January 2017 – May 2018	Multistate <i>Salmonella</i> outbreak linked to Kratom usage with 199 cases nationally, with 2 cases in Nevada.
December 2018	1 confirmed measles case in Clark County, which was the first measles case in Clark County since 2015.
2018	There were 10 cases of West Nile virus near Storey, in the counties of Washoe (2), Carson City (1), Douglas (2), Lyon (3), and Churchill (2) during the 2018 mosquito season.

5.5.5.3 Location, Extent, and Probability of Future Events

An epidemic in the County would affect a regional response requiring coordination among Walker River Tribal Health Clinic, Hawthorne Army Depot, neighboring counties, State and Federal agencies. Segments of the population at highest risk for contracting an illness from a

foreign pathogen are the very young, the elderly, pregnant women, or individuals who currently experience respiratory or immune deficiencies. These segments of the population are present within Storey County.

The probability and magnitude of disease occurrence, particularly an epidemic, is difficult to evaluate due to the wide variation in disease characteristics, such as rate of spread, morbidity and mortality, detection and response time, and the availability of vaccines and other forms of prevention. A review of the historical record (see above) indicates that disease related disasters do occur in humans with some regularity and varying degrees of severity. There is growing concern, however, about emerging infectious diseases, decreasing vaccination rates, as well as the possibility of a bioterrorism attack. Another growing threat to health is climate change, which is expected to have a significant impact on vector-borne and waterborne infectious diseases worldwide (Shuman 2010). Continued improvement of syndromic disease surveillance capabilities will play an increasingly larger role in preparedness efforts as these changes occur.

Epidemics constitute a significant risk to the population of Nevada, particularly as it relates to the frequency in which the Storey County population interacts with visitors to Virginia City and the proximity of Reno's tourist population. Of highest concern is in the Reno area, in various entertainment venues, and Reno/Tahoe International Airport. The transient nature of the Washoe County population, coupled with dense population gatherings, increase the potential for an epidemic as well as for its spread into neighboring counties such as Storey.

Storey County also houses the United States' largest industrial complex, the Tahoe-Reno Industrial Center (TRI), in McCarran, Nevada. Currently, the complex brings approximately 8,000-10,000 people into the county each day, and the international nature of the businesses located in the TRI area increases the risk of importing travel-related infectious diseases to Storey County.

5.5.5.4 Vulnerability and Cascading Impacts

Infectious diseases have been known to spread quickly throughout communities. Due to the wide variation in disease characteristics, the warning time for a disease disaster can vary from no time to months, depending upon the nature of the disease. No warning time may be available due to an extremely contagious disease with a short incubation period, particularly if combined with a terrorist attack in a crowded environment.

Many diseases spread through close contact, meaning more densely populated areas are more prone to widespread outbreaks. Public gathering places where people may be together in close quarters, such as schools and childcare facilities, offices, and tourism events, provide more opportunities for diseases to pass from one person to another.

Outbreaks of infectious diseases most often affect pockets of vulnerable populations. A worst-case scenario could overwhelm local hospitals and medical facilities and require a surge response. However, there are agencies in place that have capabilities to prevent, detect, and respond to these types of diseases, such as the CDC and the Nevada Department of Health and Human Services (NVHHS).

Cascading Impacts

- Loss of revenues as a result of fear of infection or lack of workforce availability
- Bacterial mutations leading to antibiotic resistance
- Social unrest
- Transportation route closures and supply chain disruption
- Lack of food, water, and medical resources

5.5.6 Flood

<i>Hazard Type</i>	<i>Probability/ Frequency (1=lowest, 5=highest)</i>	<i>Magnitude (1=lowest, 5=highest)</i>	<i>Onset (1=slowest, 5=fastest)</i>	<i>Duration (1=shortest, 5=longest)</i>	<i>Average</i>	<i>Rank</i>
Flood	3.63	3.38	3.81	3.13	3.48	4

5.5.6.1 Nature

Flooding as defined by the NFIP is a general and temporary condition of partial or complete inundation of two or more acres of normally dry land area or of two or more properties from:

- Overflow of inland or tidal waters;
- Unusual and rapid accumulation or runoff of surface waters from any source;
- Mudflow, a river of liquid and flowing mud on the surfaces of normally dry land areas, as when earth is carried by a current of water; or
- Collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels that result in a flood as defined above.

Floodplains are lowlands adjacent to water bodies that are subject to recurring floods. Floods are natural events that are considered hazards only when people and property are affected.

Nationwide, floods result in more deaths than any other natural hazard. Physical damage from floods include the following:

- Inundation of structures, causing water damage to structural elements and contents.
- Erosion or scouring of stream banks, roadway embankments, foundations, footings for bridge piers, and other features.

- Impact damage to structures, roads, bridges, culverts, and other features from high-velocity flow and from debris carried by floodwaters. Such debris may also accumulate on bridge piers and in culverts, increasing loads on these features or causing overtopping or backwater effects.
- Destruction of crops, erosion of topsoil, and deposition of debris and sediment on croplands.
- Release of sewage and hazardous or toxic materials as wastewater treatment plants are inundated, storage tanks are damaged, and pipelines are severed.

Floods also cause economic losses through closure of businesses and government facilities; disrupt communications; disrupt the provision of utilities such as water and sewer service; result in excessive expenditures for emergency response; and disrupt the normal function of a community.

In Storey County, flooding is most commonly associated with unusually heavy rainfall and can be influenced by both frontal systems out of the Northern Pacific Ocean and tropical storms coming from the South. Due to the aridity of the County, the area is dry except during and shortly after these storms. When a major storm develops, water collects rapidly in a short period of time. As a consequence, flows are of the flash-flood type. Flash floods are generally understood to involve a rapid rise in water level, high velocity, and large amounts of debris, which can lead to significant damage that includes the uprooting of trees, undermining of buildings and bridges, and scouring of new channels. The intensity of flash flooding is a function of the intensity and duration of rainfall, steepness of the watershed, stream gradients, watershed vegetation, natural and artificial flood storage areas, and configuration of the streambed and floodplain.

In areas where alluvial fans are present, the flow paths of flash floods lack definition. Flow depths with alluvial fan flooding are generally shallow with damage resulting from inundation, variable flow paths, localized scour, and the deposition of debris.

Dam or canal failures involve unintended releases or surges of impounded water resulting in downstream flooding. The high-velocity, debris-laden wall of water released from dam failures results in the potential for human casualties, economic loss, lifeline disruption, and environmental damage. Failures may involve either the total collapse of a dam, or other hazardous situations such as damaged spillways, overtopping from prolonged rainfall, or unintended consequences from normal operations. Severe storms with unusually high amounts of rainfall within a drainage basin, earthquakes, or landslides may cause or increase the severity of the failure.

Factors causing failure may include natural or human-caused events, or a combination of both. Dam failures usually occur when the spillway capacity is inadequate and water overtops the dam. Piping, when internal erosion through the dam foundation occurs, is another factor in a dam failure. Structural deficiencies from poor initial design or construction, lack of maintenance or repair, or gradual weakening from aging are factors that contribute to this hazard.

5.5.6.2 History

Flooding typically occurs from November through March as a result of rain on frozen ground or on snow. According to the 1993 FEMA Flood Insurance Study, severe flooding along the Truckee River occurred during the following years: January 1874; January 1875; January 1886;

April-May 1890; February 1904; and February 1963. More recently, the County received a Federal declaration for severe storms and flooding along the Truckee River for the incident period of December 31, 2005 to January 4, 2006 and for winter flooding along the Truckee River and Carson River Basins in January 2017. Table 5-8 further documents major historical flood events in recent history.

Table 5-8: Historical Floods

Date	Location	Description
March 1995	Rainbow Bend subdivision and Six Mile Canyon	A flash flood down Long Valley Creek in Storey County flooded the Rainbow Bend subdivision and washed out three bridges over the creek. The water main to the subdivision was also washed out. The subdivision was evacuated. Also, Six Mile Canyon, between Virginia City and US Highway 50 was closed due to flash flooding.
February 1996	Lockwood	Lockwood in northern Storey County was the hardest hit; two bridges were washed out, stranding several people in their homes.
June 2000	Geiger Grade	Storey County Sheriff reported boulders washed onto Geiger Grade (State Route 341) with lots of hail.
August 2002	Virginia City Highlands	Heavy downpours caused flash flooding in the Virginia City Highlands. In 20 minutes, 1.23 inches of rain fell, washing out roads and delaying the transport of fire equipment.
August 2004	Patrick Area	Heavy rainfall left 6 inches of water covering part of I-80 3 miles east-northeast of Patrick. The Tracy Clark exit was impassable.
December 2005 – February 2006	Truckee River	Federal declaration for severe storms and flooding along the Truckee River for the incident period of December 31, 2005 to January 4, 2006.
July 2006	Between Lockwood and Patrick	Heavy rainfall caused flash flooding along I-80 between Lockwood and Patrick. Minor mudslides left 4 to 5 inches of debris on roads in the area.
Summers of 2014, 2015, 2016	Douglas, Lyon, Storey, and Washoe Counties	Flash flooding.
January 2017	Truckee River and Carson River Basins	Federal declaration from winter flooding due to severe winter storms, flooding, and mudslides. Estimated damages from the flood were \$12,521,184.

In addition to the major historical flood events listed in Table 5-8, Storey County has experienced several other notable flood events over the years according to local knowledge gathered throughout the planning process. Several spring runoff and summer flash flooding incidents occur every few years that originate in Ophir Canyon and Cedar Ravine, causing flooding of Taylor and Carson streets as well as other town streets. These events often require sandbagging to divert flooding that would cause damage to private properties. Other notable flooding events are as follows:

- In the mid-1980s, flooding caused a depression on the west side of Main Street in Gold Hill, near Crown Point Ravine. The event caused 4 feet of rock and mud to cover a portion SR 342, closing the road for a few days.
- Runoff from 6 Mile Canyon covered roads and impacted culverts in March 2005.
- In January 2007, flooding in the TRI area impacted railroad tracks near Waltham, as well as a natural gas pipeline.
- A flash flood affected the TRI area in June 2013. The flooding came from the east and impacted the intersection of Electric Avenue and Milan, damaging the culverts under the street. Flooding reached nearly 2 to 3 feet over the street in the area and damaged the Eagle Pitcher plant on USA Parkway.
- In July 2017, flash flooding down the hillsides impacted streets in Mark Twain.

There have been no Federal declarations for Storey County as a result of dam, ditch, or retention basin failure. However, there have been Federal declarations in adjacent Washoe County due to flooding events associated with the Truckee River Irrigation Ditch, which flows approximately 25 miles through Storey County.

5.5.6.3 Location, Extent, and Probability of Future Events

Floods are described in terms of their extent (including the horizontal area affected and the vertical depth of floodwaters) and the related probability of occurrence. Flood studies often use historical records, such as stream flow gages, to determine the probability of occurrence for floods of different magnitudes. The probability of occurrence is expressed as a percentage for the chance of a flood of a specific extent occurring in any given year.

Factors contributing to the frequency and severity of flooding include the following:

- Rainfall intensity and duration
- Antecedent moisture conditions
- Watershed conditions, including steepness of terrain, soil types, amount and type of vegetation, and density of development
- The existence of attenuating features in the watershed, including natural features such as swamps and lakes and human-built features such as dams
- The existence of flood control features, such as levees and flood control channels
- Velocity of flow

- Availability of sediment for transport, and the erodibility of the bed and banks of the watercourse

These factors are evaluated using (1) a hydrologic analysis to determine the probability that a discharge of a certain size will occur and (2) a hydraulic analysis to determine the characteristics and depth of the flood that results from that discharge.

The magnitude of flood used as the standard for floodplain management in the United States is a flood having a 1 percent probability of occurrence in any given year. This flood is also known as the 100-year flood or base flood. The most readily available source of information regarding the 100-year flood is the system of Flood Insurance Rate Maps (FIRMs) prepared by FEMA. These maps are used to support the NFIP. The FIRMs show 100-year floodplain boundaries for identified flood hazards. These areas are also referred to as Special Flood Hazard Areas (SFHAs) and are the basis for flood insurance and floodplain management requirements. The FIRMs also show floodplain boundaries for the 500-year flood, which is the flood having a 0.2 percent chance of occurrence in any given year.

As shown in Appendix B (Figure B-5), the principal source of flooding in Storey County is the Truckee River. The Truckee River is located along the northern border between Storey and Washoe Counties. Although the Truckee River generates a damaging flood roughly every ten years, the damage is usually in Washoe County. However, on those occasions when the damage flows into Storey County, residential and business structures near Lockwood are affected. The River runs through Storey County approximately 25 miles. The Largomarasino Canyon Creek is also a source of flooding during heavy rain fall. Development in this area should be regulated.

Flash floods have generally occurred along the Truckee River, affecting the communities of Lockwood and Patrick, causing minor mudslides and leaving 4 to 5 inches of debris on roads in the area as well as washing out several bridges over the years. In the southern portion of the County, flash floods have occurred down Long Valley Creek affecting the Rainbow Bend subdivision/Six-Mile Canyon area, washing out bridges and the water main for the subdivision, which required that the subdivision be evacuated. Flash floods have occurred in the Geiger Grade (the main road into Virginia City) where boulders were washed onto the road, and in the Virginia City Highlands area where in 20 minutes, 1.23 inches of rain fell, washing out roads and delaying the transport of fire equipment. Flash flooding occurred in the summers of 2014, 2015, and 2016, and Storey County received a Federal declaration for winter flooding of the Truckee River and Carson River Basins in 2017. Based on previous occurrences, Storey County can expect to experience a damaging flash flood every two years.

The Nevada Division of Water Resources lists 5 dams in Storey County. Of these dams, 1 is considered “high hazard,” 1 is considered “significant hazard,” and 3 are considered “low hazard.” A high-hazard designation is assigned to a dam if there is reasonable potential for loss of life and/or excessive economic loss. A significant designation is given when there is no reasonable potential for loss of life, but there is potential for appreciable economic loss. Lastly, a low-hazard designation is assigned when there is no reasonable potential for loss of life and the economic loss is minor. The ratings provided by the Nevada Division of Water Resources do not reflect the safety or condition of the dam; the ratings are determined at the time the dam design plans are reviewed. The hazard rating may be altered when downstream conditions change. The high-hazard dam is privately owned and not considered to pose a significant threat to life or

property and is owned by the Tahoe Reno Industrial Center located approximately 7 miles east of the Reno-Sparks area on I-80.

5.5.6.4 Vulnerability

Major floods can impact the community by displacing residents and business owners; damaging and disrupting infrastructure, including roads and bridges, water treatment facilities, and wastewater treatment facilities; and causing health risks due to contaminated public water supplies and private wells. Flooding in the County can result in the washout or flooding of roadways and infrastructure in waterways. Many critical facilities and hazardous material locations in the County are located within the 100-year or 500-year mapped floodplains and are vulnerable to the impacts of floods (Appendix G, Figure G-3). It is estimated that between 1995 and 2016, flash floods and riverine floods amounted to nearly \$1,000,000 in damages and 2 deaths.

Cascading Impacts
<ul style="list-style-type: none"> • Landslides, washouts, and erosion • Degraded water quality • Damage to fisheries • Increase in traffic accidents • Communications disruptions • Disruptions to wastewater services • Displacement of residents

5.5.7 Hazardous Materials Events

<i>Hazard Type</i>	<i>Probability/ Frequency (1=lowest, 5=highest)</i>	<i>Magnitude (1=lowest, 5=highest)</i>	<i>Onset (1=slowest, 5=fastest)</i>	<i>Duration (1=shortest, 5=longest)</i>	<i>Average</i>	<i>Rank</i>
Hazardous Materials Event	3.13	3.00	4.88	3.25	3.56	3

5.5.7.1 Nature

Hazardous materials may include hundreds of substances that pose a significant risk to humans. These substances may be highly toxic, reactive, corrosive, flammable, radioactive, or infectious. Hazard materials are regulated by numerous Federal, State, and local agencies including the U.S. Environmental Protection Agency (EPA), U.S. Department of Transportation (DOT), National Fire Protection Association, FEMA, U.S. Army, and International Maritime Organization.

Hazardous material releases may occur from any of the following:

- Fixed site facilities (such as refineries, chemical plants, storage facilities, manufacturing, warehouses, wastewater treatment plants, swimming pools, dry cleaners, automotive sales/repair, and gas stations)
- Highway and rail transportation (such as tanker trucks, chemical trucks, and railroad tankers)
- Air transportation (such as cargo packages)
- Pipeline transportation (liquid petroleum, natural gas, and other chemicals)

Unless exempted, facilities that use, manufacture, or store hazardous materials in the United States fall under the regulatory requirements of the Emergency Planning and Community Right to Know Act (EPCRA) of 1986, enacted as Title III of the Federal Superfund Amendments and Reauthorization Act (42 USC 11001–11050; 1988). Under EPCRA regulations, hazardous materials that pose the greatest risk for causing catastrophic emergencies are identified as Extremely Hazardous Substances (EHSs). These chemicals are identified by the EPA in the *List of Lists – Consolidated List of Chemicals Subject to the Emergency Planning and Community Right-to-Know Act (EPCRA) and Section 112 of the Clean Air Act*. Releases of EHSs can occur during transport to and from fixed site facilities. Transportation-related releases are generally more troublesome because they may occur anywhere, including close to human populations, critical facilities, or sensitive environmental areas. Transportation-related EHS releases are also more difficult to mitigate due to the variability of locations and distance from response resources.

In addition to accidental human-caused hazardous material events, natural hazards may cause the release of hazardous materials and complicate response activities. The impact of earthquakes on fixed facilities may be particularly serious due to the impairment or failure of the physical integrity of containment facilities. The threat of any hazardous material event may be magnified due to restricted access, reduced fire suppression and spill containment, and even complete cut-off of response personnel and equipment. In addition, the risk of terrorism involving hazardous materials is considered a major threat due to the location of hazardous material facilities and transport routes throughout communities and the frequently limited antiterrorism security at these facilities.

On behalf of several Federal agencies including the EPA and the DOT, the National Response Center (NRC) serves as the point of contact for reporting oil, chemical, radiological, biological, and etiological discharges into the environment within the United States.

5.5.7.2 History

Table 5-9 reports hazardous materials releases that have occurred within Storey County from 2009 through 2019. Information on hazardous materials releases was obtained from the Nevada Division of Environmental Protection’s Project Tracking Database. The database includes both Leaking Underground Storage Tank cases and Corrective Action (non-regulated) sites. The list provided in Table 5-9 includes open cases as well as closed cases.

Table 5-9: Hazardous Materials Release in County

Facility Name	Location	Date	Contaminant
Sierra Pacific Power Company	Tracy Power Station	December 2009	Other
Wal-Mart Distribution Center	2155 USA Parkway McCarran, NV	March 2010	Diesel
Werner Enterprises Mobile Source	2777 USA Parkway McCarran, NV	March 2010	Diesel
EP Minerals Mobile Source	Celetom Mine	August 2010	Diesel
Mars Petcare US, Inc.	500 Waltham Way McCarran, NV	November 2011	Diesel
Golden Gate/S.E.T. Petroleum Partners of Nevada	500 Ireland Drive McCarran, NV	July 2012	Diesel
Nevada Hydrocarbon, Inc.	2600 East Mustang Road Lockwood, NV	July 2012	Other
Tahoe-Reno Industrial Center, LLC	1800 USA Parkway McCarran, NV	December 2014	Motor Oil
Golden Gate/S.E.T. Petroleum Partners of Nevada	500 Ireland Drive McCarran, NV	June 2015	Other
Marten Transport Mobile Source	500 USA Parkway McCarran, NV	July 2015	Diesel
Golden Gate/S.E.T. Petroleum Partners of Nevada	500 Ireland Drive McCarran, NV	August 2015	Diesel
Chart Industries, Inc.	1995 Peru Drive McCarran, NV	July 2016	TPH
CEMEX Sierra Stone Quarry	3005 Canyon Way Lockwood, NV	February 2017	Diesel
Tesla Motors, Inc.	1 Electric Avenue McCarran, NV	March 2017	Other
Tesla Motors, Inc.	1 Electric Avenue McCarran, NV	July 2017	Solvents
Tahoe-Reno Industrial Center Shooting Area	A quarry off USA Parkway near the Tesla Gigafactory	August 2017	Other

Table 5-9: Hazardous Materials Release in County

Facility Name	Location	Date	Contaminant
Tesla Motors, Inc.	1 Electric Avenue McCarran, NV	September 2017	Diesel
Sierra Pacific Power Company	Tracy Power Station	April 2018	Other
Aqua Metals, Inc, 2500 Peru Drive, McCarran, Storey County, Nevada	2500 Peru Drive McCarran, NV	August 2019	Metals, Other
Welsco Drilling Corp. Mobile Release	Primary Street: SR 79 Bound: 6 Mile Canyon Road Mile Marker: 4	October 2018	Unknown, Diesel, Motor Oil
Gopher Rock and Gopher Construction, Trico Pit	At end of USA Parkway off I-80, exit 28, Waltham Way	October 2019	Diesel
Tesla Motors, Inc.	1 Electric Avenue McCarran, NV	November 2019	Other

Source: NV Division of Environmental Protection.

<https://ndep.nv.gov/environmental-cleanup/site-cleanup-program/site-cleanup-database>.

5.5.7.3 Location, Extent, and Probability of Future Events

In Storey County, a hazardous materials event is most likely to occur along the major transportation corridors, including State Route 341, the Geiger Grade, I-80, and railroad tracks. Trucks and rail cars that use these transportation corridors and railroad tracks commonly carry a variety of hazardous materials, including gasoline and other petroleum products, along with other chemicals known to cause human health problems. A growing concern for the possibility of hazardous material releases is from any number of businesses located at the Tahoe-Reno Industrial Center in McCarran just south of I-80. In the early stages of construction a fire station was built and is currently operational at the TRI complex. The Virginia City area has seen a rebirth in mining activity which makes the area at risk to mining hazardous materials releases.

Comprehensive information on the probability and magnitude of a hazardous material event along the transportation corridors is not available. Wide variations among the characteristics of hazardous material sources and among the materials themselves make such an evaluation difficult.

5.5.7.4 Vulnerability and Cascading Impacts

Hazardous materials incidents can be caused by several factors, including technological failures, natural hazards, such as earthquakes or floods, and human factors. The County maintains records of hazardous materials storage sites. Many critical facilities are in close proximity to hazardous

materials. Appendix G (Figures G-3 and G-4) maps the County’s vulnerabilities to hazardous materials events as a result of other hazards, such as wildfires and floods.

Cascading Impacts

- Long-term health and environmental costs
- Economic losses due disruption of normal business activities
- Contamination of water and air
- Possible injuries and/or deaths
- Conflagration

5.5.8 Severe Weather

<i>Hazard Type</i>	<i>Probability/ Frequency (1=lowest, 5=highest)</i>	<i>Magnitude (1=lowest, 5=highest)</i>	<i>Onset (1=slowest, 5=fastest)</i>	<i>Duration (1=shortest, 5=longest)</i>	<i>Average</i>	<i>Rank</i>
Severe Weather	3.75	3.00	3.31	3.13	3.30	5

5.5.8.1 Hazard Overview

While a considerable percentage of days in the region are characterized by tranquil weather, a number of high-impact severe weather types can occur. Low-frequency weather hazards can be particularly problematic from a preparedness standpoint due to complacency and people’s lack of experience with the phenomenon.

The following discussion of severe weather events starts with impacts from summer thunderstorms, transitioning into snow and wind from winter storms. Storey County faces additional weather hazards (e.g. dust storms, rare weak tornadoes) but the following are the most prominent with the highest economic and societal tolls.

Thunderstorms - Hail

Nature: Hail forms on condensation nuclei such as dust or ice crystals, when supercooled water freezes on contact. In clouds containing large numbers of supercooled water droplets, these ice nuclei grow quickly at the expense of the liquid droplets. The hail grows increasingly larger. Once a hailstone becomes too heavy to be supported by the storm’s updraft it falls out of the cloud. Hail is most common in mid-latitudes during spring and early summer where surface temperatures are warm enough to promote the instability associated with strong thunderstorms, but the upper atmosphere is still cool enough to support ice. Hailstones are usually from the size of a pea to the size of a golf ball. The National Weather Service in Reno issues Severe Thunderstorm Warnings for thunderstorms capable of producing high winds (above 58 mph) and/or large hail (above 1-inch diameter).

History: Large hail is relatively rare in Nevada. The State of Nevada Enhanced Hazard Mitigation Plan (2018) reports 2 large hail events between 1995 and 2016. There have not been

any deaths or injuries associated with these recorded hail events or any reportable damages. As reported by the National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center (NCDC), the June 2005 hail event in Storey County recorded “slushy” hail up to baseball size (2.75-inch diameter). It should be noted that often thunderstorms are the most common over high terrain and other remote areas of Nevada, leading to minimal actual reports of severe weather.

Location, Extent, and Probability of Future Events: Storey County is susceptible to hail events although it is infrequent. The reports noted above are extreme events, and Storey County is more likely to see hail size on the order of ½ to 1 inch in diameter, which typically results in minimal damage. Based on previous occurrences in nearby counties, Storey County can expect a large hail event to occur on the order of every 2 to 4 years.

Thunderstorms - High Winds & Lightning

Nature: Thunderstorms are formed from a combination of moisture, rapidly rising warm air, and a force capable of lifting air, such as warm and cold fronts or a mountain. Thunderstorms may occur alone, in clusters, or in lines. As a result, it is possible for several thunderstorms to affect one location in the course of a few hours. A thunderstorm can produce lightning, thunder, and torrential rainfall and may also lead to the formation of tornados, hail, downbursts, and microbursts of wind. Focusing on the wind threat from thunderstorms, downbursts are strong, straight-line winds created by falling rain and sinking rain that may reach speeds of 125 miles per hour (mph). Microbursts are more concentrated than downbursts, with speeds reaching up to 150 mph. Both downbursts and microbursts typically last 5 to 7 minutes. The National Weather Service issues Severe Thunderstorm Warnings for thunderstorms capable of producing high winds (above 58 mph) and/or large hail (above 1-inch diameter).

History: Strong winds from thunderstorms are common in Nevada, producing wind gusts above 40 mph, with gusts above 60 mph possible. However, there is only 1 report of thunderstorm, high wind, or lightning damage in Storey County from 1995 to 2016. Lightning is a common factor in new wildfire starts in Nevada, though no specific information is available for Storey County. As noted, often thunderstorms are the most common over high terrain and other remote areas of Nevada, leading to minimal actual reports of severe weather and lightning.

Location, Extent, and Probability of Future Events: Thunderstorms in Storey County tend to favor the high terrain, including the Virginia Range. Thunderstorm activity which would produce high winds and/or significant lightning generally occurs from June through August. During this timeframe it is not unusual to experience thunderstorm activity daily for up to a week at a time. In an average year 2 to 4 severe thunderstorm warnings for high winds are issued for portions of Storey County. Severe thunderstorm warnings are not issued solely for significant amounts of lightning, though the National Weather Service will issue Red Flag Warnings for fire partners when widespread dry thunderstorms are expected.

Thunderstorms – Flash Floods

Nature: Floods are rare but cause extremely high impact in the Sierra Nevada and Great Basin regions. Localized flash floods can occur in the summer, the result of intense thunderstorms producing copious rainfall in short periods of time. Moisture from the Southwest U.S. Monsoon can enhance the risk of flash flooding. These floods normally last on the order of an hour or two

but can still result in major impacts and damage. The National Weather Service issues Flash Flood Warnings when flash flooding is likely based on radar estimates of rainfall or has been reported from law enforcement or a spotter.

History: Fortunately, flash flooding events in Storey County are rare, but when they do happen, they create a high impact. From 1995 to 2016 there have been 7 instances of flash flooding in the County, amounting to roughly \$25,000 in damages. Most have taken place in August..

Location, Extent, and Probability of Future Events: Based on past frequencies, flash flooding from thunderstorms in the summer can occur about every 1 to 2 years. Narrow canyons and low-lying areas along roads are the most prone to flash flooding. Recently burned areas are especially prone to flash flooding and debris flows, which can result in significant damage to property.

Winter Storms – Heavy Snow

Nature: Winter snow storms are often large areas of low pressure originating from the Gulf of Alaska and then moving into the western United States. As the moist air masses push across the Sierra Nevada and other Great Basin mountains, the air masses cool and the water condenses as snow. Wind in combination with the snow can cause reduced visibilities and deep snowdrifts. In addition, heavy snow can cause avalanches in areas along steep terrain. In some instances, freezing rain occurs, when very cold inland arctic air becomes trapped under warm moist air. The National Weather Service issues winter storm watches/warnings/advisories for heavy snow and provides briefings to Emergency Managers when winter storms are forecast.

History: From 1995 through 2016, there have been 6 records of winter storms in Storey County, amounting to approximately \$450,000 in damages and 1 fatality. During this same period, the County experienced 107 incidents of heavy snow, causing roughly \$103,000 in damages. On these days, snow amounts of greater than 6 to 12 inches occurred, along with other winter storm hazards such as high winds, low visibility, and cold temperatures. Localized lake effect snows downwind of Pyramid Lake can produce heavy snow in eastern parts of Storey County including I-80 roughly every 1 to 2 years. FEMA Federal disaster declarations have been issued in the wake of several widespread winter storm events impacting Storey County, including February 2005 and January 2008.

Location, Extent, and Probability of Future Events: It is not uncommon for Storey County to experience snow with accumulations of 1 to 3 inches per winter storm, which can cause travel inconveniences but little in the way of long-lasting impacts. Storms like this normally happen 3 to 6 times each winter season, especially above 6,000 feet elevation. Larger storms, producing 6 inches or more, happen on average 2 to 3 times each winter season above 6,000 feet, less frequently below that elevation. Snowfall of this magnitude can impact critical transportation corridors including I-80 near the Tahoe-Reno Industrial Center and State Highway 341 leading to Virginia City. Every few years, particularly strong storms can produce high winds along with heavy snow creating life threatening blizzard conditions. Virginia City has an elevation of 6,200 feet; Gold Hill has an elevation of 5,843 feet; and Virginia City Highlands has an elevation of 5,990 feet. Winter storm hazards are likely to occur roughly 3 days each year.

Winter Storms – High Winds

Nature: The same winter storms described previously also produce periods of widespread high winds in the Sierra Nevada and Great Basin. These winds of 40 to 60 mph typically precede the snow portion of a winter storm by a day or so and are the most common from late fall through spring. Strong winds are the direct result of large differences in atmospheric pressure from the storm itself and the surrounding environment. Winds can be further enhanced in localized areas in the immediate lee of mountain ranges in what is called a downslope wind storm. Virginia City is located in such a place. Wind gusts in these situations can exceed 80 mph, reaching nearly 100 mph in the most extreme “once-in-a-decade” events. The National Weather Service issues high wind watches/warnings/advisories and provides briefings to Emergency Managers when high winds pose a threat.

History: From 1995 through 2016, there have been more than 500 incidents where winter weather produced high winds in Storey County. It is estimated that these events caused 1 fatality and over \$5,500,000 in damages. These wind events have been associated with damage to buildings, knocking over trees and power lines, and overturning large vehicles.

Location, Extent, and Probability of Future Events: High wind events with gusts above 60 mph are not uncommon in Storey County, especially along ridge tops above 6,000 feet and in the vicinity of Virginia City. In the strongest storms, winds are likely to gust above 80 mph, which can produce wind damage to structures and power infrastructure. Strong winds can also channel through the Truckee River drainage and impact eastern regions of the county around the Tahoe-Reno Industrial Center. Probability of a high wind day is 2% per day in each given year or 4 wind days per year on average.

5.5.8.2 Vulnerability and Cascading Impacts

The County’s primary vulnerability from severe weather is from power outages and impairment of transportation. Because nearly all social and economic activity is dependent on transportation, snow can have a serious impact. Road closures and hazardous conditions can delay or prevent emergency vehicles from responding to calls. Vehicle accidents rise among those who try to drive. Power outages can result from physical damage to electrical infrastructure as a result of ice or snow, downed trees, debris, or from increases in demand beyond the capacity of the electrical system. Power outages may disrupt businesses, especially facilities without back-up generators, potentially increasing the economic impact of severe weather events. Members of the community who are isolated or have disabilities may be more vulnerable, especially those that may be trapped in their homes from power failures, heavy snow and ice, and debris from falling trees and power lines. Power losses during winter storms can result in deaths from carbon monoxide poisoning if people attempt to keep warm by lighting charcoal fires or operating backup generators indoors.

Snow storms also slow the local economy, but there is a debate about whether these slowdowns cause permanent revenue losses. Productivity and sales may decline but often accelerate after a storm. Some permanent effects may occur if some areas in the region are accessible and some are not. For example, visitors traveling to the County may choose to cancel their trips if roads through the mountains are impassible. For workers, snow can be a hardship, especially for those who lack benefits and vacation time. For local governments, responding to snowstorms can be a major unbudgeted expense.

Cascading Impacts

- Human health risks (e.g., hypothermia)
- Vehicular accidents
- Fires caused by damaged power lines
- Fuel loading for fires
- Landslides from downed trees
- Utility failures
- Property/structural damage
- Economic losses

5.5.9 Terrorism

<i>Hazard Type</i>	<i>Probability/ Frequency (1=lowest, 5=highest)</i>	<i>Magnitude (1=lowest, 5=highest)</i>	<i>Onset (1=slowest, 5=fastest)</i>	<i>Duration (1=shortest, 5=longest)</i>	<i>Average</i>	<i>Rank</i>
Terrorism	1.38	3.81	5.00	3.00	3.30	5

5.5.9.1 Nature

The Department of Justice (DOJ) Federal Bureau of Investigation (FBI) defines terrorism as the unlawful use of force or violence against persons or property to intimidate or coerce a government and/or the civilian population in furtherance of political or social objectives. Weapons of Mass Destruction (WMD) associated with terrorism are defined as nuclear, biological and chemical in origin. Technological terrorism is defined as the intentional disruption in the nation’s data control systems. Attacks on financial, business, and governmental computer networks are being considered as technological terrorist-related acts.

The FBI is the primary investigatory agency for domestic terrorism. The Central Intelligence Agency (CIA) monitors potential security threats from foreign sources. The DOJ through the FBI coordinates the domestic preparedness programs and activities of this nation to address the threat posed by terrorists and the use of weapons of mass destruction.

Acts of terrorism may originate from a single person, special interest groups, or acts sponsored by a foreign government. Terrorist acts include the use of arson, hostile takeovers, shootings, biological agents (such as anthrax, plague, botulism and others), chemical agents (such as hydrogen cyanide, sulfur mustard, sarin and chlorine), and hostage taking. The most frequently used method in recent events in the United States has been domestic terrorism by bombing, mass shootings, and cyber hacking.

5.5.9.2 History

There have been no incidents of terrorism in Storey County. According to the FBI, sporting events, political conventions, and other special events are attractive targets for domestic and foreign terrorists because they are highly visible and attract celebrities and political leaders. Other targets of opportunity for terrorism include large public works facilities, utilities, transportation facilities such as airports, train stations, subways, bridges and ferries, military bases, schools, medical facilities and other state and federal facilities. Examples of terrorism include the World Trade Center bombing in New York City, the Murray Federal Building bombing in Oklahoma City, the and Olympic Centennial Park bombing in Atlanta. Nevada's most notable incident of terrorism in the past 5 years occurred during the October 2017 mass shooting in Las Vegas, which resulted in 59 deaths and over 500 injuries (Reno-Gazette Journal 2017).

5.5.9.3 Location, Extent, Probability of Future Events

The overall magnitude, potential severity and frequency of impacts of terrorism and weapons of mass destruction is considered low in the County. Assessment of probability of future terrorism events in the County is gauged primarily on speculation, as no terrorism or events involving weapons of mass destruction have previously occurred in the planning area. The consensus of the Planning Committee is that probability of future events is low within Storey County, but concern remains around cyber security. Based on the Homeland Security Threatened Level System, it is anticipated that terrorism will remain a high threat into the foreseeable future. Because terrorism events typically are focused on a single high payoff area or facility, estimated damage is less than one percent damage to facilities in the County.

5.5.9.4 Vulnerability and Cascading Impacts

The State of Nevada is comprised of diverse populations that include members of nation-wide militia organizations. The Federal government has continually released terrorism warnings since 1998 that state most communities in the United States are vulnerable to terrorist attack. In determining the risk areas within a jurisdiction, the vulnerabilities of potential targets should be identified, and the targets themselves should be prepared to respond to a terrorism incident. In-depth vulnerability assessments are needed for determining a response to such an incident and special attention should be paid to areas of high economic activity or with critical facilities.

Cascading Impacts

- Possible injuries and/or fatalities
- Health impacts
- Fires caused by damaged power lines
- Utility failures
- Property/structural damage
- Economic losses

5.5.10 Wildland Fire

<i>Hazard Type</i>	<i>Probability/ Frequency (1=lowest, 5=highest)</i>	<i>Magnitude (1=lowest, 5=highest)</i>	<i>Onset (1=slowest, 5=fastest)</i>	<i>Duration (1=shortest, 5=longest)</i>	<i>Average</i>	<i>Rank</i>
Wildland Fire	4.13	3.81	4.38	4.00	4.08	1

5.5.10.1 Nature

A wildland fire is a type of fire that spreads through consumption of vegetation. It often begins unnoticed, spreads quickly, and is usually signaled by dense smoke that may be visible from miles around. Wildland fires can be caused by human activities (such as arson or campfires) or by natural events such as lightning. Wildland fires often occur in forests or other areas with ample vegetation. In addition to wildland fires, wildfires can be classified as urban fires, interface or intermix fires, and prescribed fires.

The following three factors contribute significantly to wildland fire behavior and can be used to identify wildland fire hazard areas.

- **Topography:** As slope increases, the rate of wildland fire spread increases. South-facing slopes are also subject to more solar radiation, making them drier and thereby intensifying wildland fire behavior. However, ridge tops can cause fire to spread more slowly or may even be unable to spread downhill. Narrow canyons, chutes and saddles can funnel and accelerate winds, causing fire to spread faster.
- **Fuel:** The type and condition of vegetation plays a significant role in the occurrence and spread of wildland fires. Certain types of plants are more susceptible to burning or will burn with greater intensity. Dense or overgrown vegetation increases the amount of combustible material available to fuel the fire (referred to as the “fuel load”). The ratio of living to dead plant matter is also important. The risk of fire is increased significantly during periods of prolonged drought, as the moisture content of both living and dead plant matter decreases. The fuel’s continuity, both horizontally and vertically, is also an important factor.
- **Weather:** The most variable factor affecting wildland fire behavior is weather. Temperature, humidity, wind, and lightning can affect chances for ignition and spread of fire. Extreme

weather, such as high temperatures, low humidity and high winds, can lead to extreme wildland fire activity. By contrast, cooling and higher humidity often signals reduced wildland fire occurrence and easier containment.

The frequency and severity of wildland fires also depends upon other hazards, such as lightning, drought, and infestations. If not promptly controlled, wildland fires may grow into an emergency or disaster. Even small fires can threaten lives and resources and destroy improved properties. In addition to affecting people, wildland fires may severely affect livestock and pets. Such events may require emergency watering/feeding, evacuation, and shelter.

The indirect effects of wildland fires can be catastrophic. In addition to stripping the land of vegetation and destroying forest resources, large, intense fires can harm the soil, waterways, and the land itself. Soil exposed to intense heat may lose its capability to absorb moisture and support life. Exposed soils erode quickly and enhance siltation of rivers and streams, thereby increasing flood potential, harming aquatic life, and degrading water quality. Lands stripped of vegetation are also subject to increased debris flow hazards, as described above.

5.5.10.2 History

Storey County had 82 wildland fires that burned 8,295 acres, of which 38 were less than one acre, from 2003 to the beginning of 2013 according to Nevada Division of Forestry (NDF). Approximately 95 percent of these fires were due to lightning, while humans and unknown causes make up the remaining 5 percent of ignition sources.

In 2013, Storey County Fire Protection District assumed responsibility for wildfire response. According to the Storey County Fire Protection District (SCFPD), SCFPD responded to 50 reported wildland fires in 2013. None of the 50 fires exceeded an acre in size, and most were either single tree fires that were extinguished before they spread or false alarms. While large fires are low frequency, they have a high potential for impacting natural resources, communities, and critical infrastructure.

5.5.10.3 Location, Extent, Probability of Future Events

Communities in Storey County have a varying degree of risk from wildland fire. This risk is varied, largely due to past fire activity and the type of moisture received during the winter months. Lengthy rainy seasons tend to increase the production of grasses which can create fast moving fires in the brush and grass areas of the County. Drought seasons tend to decrease the fuel moisture in the large fuels (trees and large brush) and create high output BTU fires that are difficult to control and can extend for days. Depending upon the type and amount of moisture received, the risk to a given community in Storey County can change from season to season. Appendix B (Figure B-6) provides a map of the historic fire locations in Storey County from 1992 to 2015 and maps hazard potential in the County.

Table 5- 10: Wildfire Assessment Summary by Community

Community	Hazard Rating
Gold Hill	High
Lockwood	Moderate
Six Mile	Moderate
Virginia City	High
Virginia Highlands	Extreme

Source: RCI County Wide Assessment Results, <http://www.rci-nv.com/reports/storey/section04.html>

Based on historical records, Storey County can anticipate nearly 1.5 wildland fire starts per year, which will burn more than one acre. However, a very small percentage of these (less than 1%) will exceed 100 acres.

5.5.10.4 Vulnerability and Cascading Impacts

Appendix G (Figure G-6) maps Storey County’s vulnerability to wildland fires. As seen in the map, several critical facilities and hazardous materials locations occur nearby areas of an historic wildland fire. Storey County has developed a Community Wildfire Protection Plan to help guide the community and its residents on where and how to focus fuel reduction efforts. The Community Wildfire Protection Plan (CWPP) generally speaks to protecting the built environment from the threats of wildland fire. The Virginia Highlands area has extreme rating due to interface fuel hazard and ignition risk.

Cascading Impacts
<ul style="list-style-type: none"> • Flooding • Landslides, washouts, erosion, and potential re-burns • Degraded water quality and damage to fisheries • Spread of invasive plant species • Power outages and communications disruptions • Health affects including asthma

While not required by the DMA 2000, an important component of a hazard mitigation plan is a review of the County’s resources to identify, evaluate, and enhance the capacity of those resources to mitigate the effects of hazards. This section evaluates the County’s resources in three areas—legal and regulatory, administrative and technical, and financial—and assesses capabilities to implement current and future hazard mitigation actions.

6.1 LEGAL AND REGULATORY CAPABILITIES

Legal and regulatory capabilities, as shown in Table 6-1, include applicable building codes, zoning ordinances, subdivision regulations, and other regulatory development guides that provide specified support to hazard mitigation activities. Other less prescriptive documents describe the County’s hazard mitigation capabilities to include various Master Plan elements, economic development strategies, and emergency response procedures, among others. This section lists these various tools, provides a brief description of the capability, and identifies the hazard mitigated by each capability.

In addition to policies and regulations, the County participates in several hazard mitigation programs including the NFIP, Fire Safe, and Living With Fire programs.

Table 6-1: Storey County Legal and Regulatory Capability

Capability (Regulatory Tools, Ordinances, Codes, Plans, Assessments etc.)	Description	Hazard Mitigated
Building and fire codes	Regulates development and building standards to ensure quality and safety of structures and protect structures and occupants from threats.	Multiple hazards
Zoning ordinance	Regulates land use to protect the character, harmony, and stability of residential and business areas.	Multiple hazards
Subdivision ordinance or regulations	Includes standards for subdivisions to ensure safe, responsible development.	Multiple hazards

Table 6-1: Storey County Legal and Regulatory Capability

Capability (Regulatory Tools, Ordinances, Codes, Plans, Assessments etc.)	Description	Hazard Mitigated
Special purpose ordinances (floodplain management, storm-water management, hillside or steep slope ordinances, wildfire ordinances, hazard setback requirements)	Establishes standards for development in hazard areas to protect property from damage.	Multiple hazards
Growth management ordinances (also called “smart growth” or anti-sprawl programs)	Establishes standards for development in order to protect property and natural resources from damage (i.e. to mitigate the risk of water shortage due to over-population in an area with water constraints).	Multiple hazards
Site plan review requirements	Ensures safe and appropriate construction methods and materials.	Multiple hazards
General or comprehensive plan	Storey County Master Plan (2016) provides goals and objectives for development of the County.	Multiple hazards
An economic development plan	Storey County Master Plan (2016), Chapter 7 provides goals and objectives for economic development of the County. Storey County is in the process of developing a Strategic Plan.	Multiple hazards
A continuity of operations plan	The Continuity of Operations Plan (COOP) addresses emergencies from an all-hazards approach and ensures critical functions continue. COOPs for individual departments are currently being updated and reviewed, with an expected completion date of July 2020.	Multiple Hazards

Table 6-1: Storey County Legal and Regulatory Capability

Capability (Regulatory Tools, Ordinances, Codes, Plans, Assessments etc.)	Description	Hazard Mitigated
<p>An emergency response plan</p>	<p>The Comprehensive Emergency Management Plan (2019) provides planning and coordination of response, recovery, and mitigation of natural and man-made disasters.</p> <p>The Quad County Emergency Coordination Plan (2013) outlines roles and responsibilities for agency coordination and cooperation in order to prepare for and respond to emergencies.</p> <p>The Hazardous Materials Emergency Response Plan (2012) specifically addresses emergency response to situations involving hazardous materials.</p> <p>The Community Assessment for Public Health Emergency Response (CASPER) survey currently is underway and will reveal health vulnerabilities in the community so that the County is able to prepare for those vulnerabilities during emergencies.</p>	<p>Multiple hazards</p>
<p>A hazard mitigation plan</p>	<p>The State of Nevada Enhanced Hazard Mitigation Plan (2018) profiles hazards throughout the State, assesses risks, and outlines potential mitigation actions.</p> <p>The Storey County Hazard Mitigation Plan (2020) profiles hazards throughout the County, assesses risks, and outlines potential mitigation actions.</p>	<p>Multiple hazards</p>
<p>A wildfire plan</p>	<p>The Nevada Community Wildfire Risk/Hazard Assessment Project (2005, updated 2013) and the Landscape-Scale Wildland Fire Risk/Hazard/Value Assessment for Storey County (2009) provide information on wildfire risk and potential consequences of wildfire within the County.</p>	<p>Wildfire</p>
<p>A flood plan</p>	<p>Storey County Comprehensive Flood Control Plan (2011) and the Flood Insurance Study (2010)</p>	<p>Flooding</p>

Table 6-1: Storey County Legal and Regulatory Capability

Capability (Regulatory Tools, Ordinances, Codes, Plans, Assessments etc.)	Description	Hazard Mitigated
	<p>provides information on flooding locations and specific mitigation recommendations.</p> <p>The Carson River Watershed Floodplain Management Plan (2018) provides flood history, risk, and strategies related to the Carson River Watershed.</p> <p>The Dayton Valley Area Drainage Master (2019) is a study of flooding hazards in Lyon County and Storey County to develop an understanding of existing conditions and develop mitigation solutions.</p> <p>The County currently is completing a Water Resources Plan to study surface and groundwater resources and is working with FEMA on developing a risk mapping program.</p>	
<p>Mutual aid agreements</p>	<p>Standing agreements to provide support to partners in times of need.</p>	<p>Multiple hazards</p>
<p>Information technology</p>	<p>The Comprehensive Security Assessment (2018) is a study of cyber security risks and strategies to reduce vulnerabilities.</p> <p>Cyber security program with systems and guides for use and protection of information systems and ongoing cyber assessments to uncover risks to operations and assets from the use of information systems.</p>	<p>Multiple hazards</p>

6.2 ADMINISTRATIVE AND TECHNICAL CAPABILITIES

The administrative and technical capability, as shown in Table 6-2, of the County provides an identification of the staff and department resources available to expedite the actions identified in the Mitigation Strategy. Specific resources reviewed include those involving technical personnel that can apply GIS and other services needed to facilitate hazard mitigation actions throughout Storey County.

Table 6-2: Storey County Administrative and Technical Capability

Staff/Personnel Resources	Department/Agency
Planner(s) or engineer(s) with knowledge of land development and land management practices	Building & Planning Department
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Building & Planning Department (Contract engineer as needed; no full-time employee).
Planner(s) or Engineer(s) with an understanding of natural and/or human-caused hazards	Building & Planning Department
Floodplain manager	Building & Planning Department
Staff with education or expertise to assess the community’s vulnerability to hazards	Building & Planning Department
Personnel skilled in GIS and/or HAZUS	GIS Services (Assessor’s Office and Contracted)
Personnel in Information Technology and cyber monitoring	Information Technology Department
Personnel dedicated to emergency management planning and response	Emergency Management Department (no full-time employee), Fire Department, Law Enforcement (Sheriff’s Office), Emergency Medical Services (EMS), Quad County Public Health Preparedness and Resources
Grant writers	Fire Department, Emergency Management Department (no full-time employee), Building & Planning Department.

In addition to the staff/personnel resources identified in Table 6-2, the County has identified the following equipment/software resources available in assisting with hazard mitigation planning and response:

- Heavy equipment (excavators, dozers, dump trucks, backhoe and loaders, semi-trucks, snow plows)
- Emergency medical equipment
- Backup generators
- Emergency shelters
- Personal Protective Equipment (PPE)

- Redundant storage for digital information
- Next Gen firewalls and anti-virus software

6.3 FINANCIAL CAPABILITIES

Specific financial and budgetary tools, as shown in Table 6-3, available to the County for hazard mitigation include Federal entitlements, general fund monies, secondary sales and property taxes, and various unique debt service techniques including bonding indebtedness.

Table 6-3: Storey County Fiscal Capability

Financial Resources	Accessible or Eligible to Use (Yes/No/Don't Know)
Community Development Block Grants (CDBG)	Yes
Capital improvements project funding	Yes
Authority to levy taxes for specific purposes	Only by vote of public
Fees for water, sewer, gas, or electric service	Yes
Insurance	Yes
Special assessment fees for equipment or needs due to impacts	Yes
Incur debt through general obligation bonds	Yes, established by Commissioners
Incur debt through special tax and revenue bonds	Yes, established by Commissioners
Incur debt through private activity bonds	Yes, established by Commissioners
Divert or withhold additional investment in hazard-prone areas	Yes, established by Commissioners
Fire Department, Plan Review fees	Yes
Ambulance fees	Yes
Business license and events fees	Yes
Assistance available through mutual aid agreements/Quad County resources	Yes

6.4 CURRENT MITIGATION CAPABILITIES

Table 6-4 lists Storey County’s primary departments and POCs. Based on feedback from department POCs, Table 6-4 also lists departmental strengths and actions taken in the past five years to increase capabilities.

Table 6-4: Storey County Local Mitigation Capability

Department/ Commission	Applicable Programs, Plans, Policies, Regulations, Funding, or Practices	Point of Contact	Department Strengths	Key Mitigation Accomplishments (2015 – 2020)
Building & Planning Department	Flood plain management, economic development, code enforcement, public health nurse	Kathy Canfield	Engineering and planning support	Completed Community Rating Study (2018); adopted Carson River Watershed Floodplain Management Plan (2018); outlined additional mitigation solutions through the Dayton Valley Area Drainage Master (2019).
Fire Department	Public education, plan review, code enforcement	Jeff Nevin	Use of mutual aid partnerships; Federal and State partnerships; familiar with grants	Upgraded facilities to reduce risks and increase resilience; received grant from the U.S. Forest Service for fuels reduction work.
Public Works	Roads, water, sewer, capital projects, building maintenance, County shop (vehicle repairs), parks, pools	Jason Wierzbicki	Collaboration and coordination within department and across departments; detailed knowledge of infrastructure; source of skilled manpower	Completed drainage improvements in Mark Twain estates and Six Mile Canyon; replaced sewer collection lines in Virginia City; completed replacement of roughly 4 miles of water main; rerouted stormwater lines (2018); rehabilitated two water reservoirs (Divide and Five Mile); currently constructing a wastewater treatment facility and replacing 2 water tanks.

Table 6-4: Storey County Local Mitigation Capability

Department/ Commission	Applicable Programs, Plans, Policies, Regulations, Funding, or Practices	Point of Contact	Department Strengths	Key Mitigation Accomplishments (2015 – 2020)
Emergency Management	Mitigation grants, develop and maintain mitigation plan	Joe Curtis	Preparedness planning; access to Federal and State resources; partnerships with State and other County agencies/ departments; conduit to grants	Updated Comprehensive Emergency Management Plan; completed Quad County Multi-Agency Coordination Interlocal Agreement
Information Technology/GIS	Systems and guides for use and protection of information systems; Cyber Security Program	James Deane	Regular data backups using “best of class” software (Veam)	Increased budget spending on hardware, staff, and training.
School District	Identify and implement mitigation actions for school property	Todd Hess	Intricately familiar with school district infrastructure and hazard risks	Secured grants for security updates to facilities; obtained a backup generator for the Virginia City High School (shelter location).

Storey County is a close-knit community where many of those responsible for managing the various departments have multi-generational ties to the community or are long-time residents. This mutual bond creates a cohesiveness that is visualized on Table 6-4. Each agency’s mission, mitigation programs, plans, policies, funding, and practices complement one another while working together to develop and effectively protect Storey County residents, visitors, and property.

The programs, plan, policies and regulations listed above provide a basic framework for mitigation projects. These programs cover the County's infrastructure and program needs and are effective. However, the funding for mitigation projects may not always be available.

The County being small in population has individuals wearing multiple hats and therefore does not have strong legal, administrative, and financial capabilities in relation to larger counties within Nevada. However, the County is able to enforce building codes which restrict building within a floodway; is a member of the NFIP; and implements programs for public safety, health, human services, public works, and the school district. These programs are run by trained County staff, who are provided the resources to implement and promote the programs.

6.4.1 National Flood Insurance Program

DMA 2000 Requirements: Mitigation Strategy – National Flood Insurance Program

National Flood Insurance Program (NFIP) Compliance

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

Element

- Does the updated plan document how the planning team reviewed and analyzed this section of the plan and whether this section was revised as part of the update process?
- Does the new or updated plan describe the jurisdiction(s) participation in the NFIP?
- Does the mitigation strategy identify, analyze and prioritize actions related to continued compliance with the NFIP?

Source: FEMA, March 2008.

The County has identified special flood-hazard areas. They entered the NFIP in 1994. The County participates in the Community Rating System (CRS) and is currently rated as an 8. The CRS is a voluntary program for the NFIP-participating communities. The goals of the CRS are to reduce flood losses, to facilitate accurate insurance rating, and to promote the awareness of flood insurance. There are no repetitive loss or severe repetitive loss properties (as defined by the NFIP) within the County. County Building Code restricts future building within a floodway. The Carson Water Subconservancy District (CWSD) is a special district and due to the nature of its jurisdiction is excluded from participating in the NFIP.

The following provides an overview of the four-step process for preparing a mitigation strategy: developing mitigation goals and objectives, identifying and analyzing potential actions, prioritizing mitigation actions, and implementing an action plan.

7.1 MITIGATION GOALS AND OBJECTIVES

The requirements for the local hazard mitigation goals, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements: Mitigation Strategy – Local Hazard Mitigation Goals

Local Hazard Mitigation Goals

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

Element

- Does the new or updated plan include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards?

Source: FEMA, March 2008.

The Planning Committee reviewed the hazard profiles in Section 5 as a basis for developing mitigation goals and objectives. Mitigation goals are defined as general guidelines that explain what a community wants to achieve in terms of hazard and loss prevention. Goal statements are typically long-range, policy-oriented statements representing community-wide visions. The Planning Team developed three goals to reduce or avoid long-term vulnerabilities to the identified hazards and specified objectives under each goal (Table 7-1).

Table 7-1: Mitigation Goals

Goal Number	Goal Description	Objectives
1	Adopt an all-hazard approach to risk reduction in the community that considers both the natural and human environment.	<p>Enhance cyber security to combat threats of cyber terrorism and align with state and federal goals.</p> <p>Develop strategies that reflect the County’s geographic/transportation constraints and the County’s ability to respond to emergencies due to issues of access.</p>

Table 7-1: Mitigation Goals

Goal Number	Goal Description	Objectives
2	Establish a culture of risk reduction and mitigation in the County through effective communication, outreach, and education.	Build resiliency into communication networks. Build in redundancies and reduce dependencies.
		Target hard-to-reach populations, such as the elderly, when exploring avenues for disseminating information related to emergencies.
3	Build community capacity and relationships to foster successful planning and implementation of mitigation strategies.	Strengthen strategic partnerships through Quad County relationships and through fostering public-private partnerships.
		Identify methods and mechanisms for increasing funding for mitigation strategies. Utilize public-private partnerships to boost financial investment in the community. Explore opportunities with conservation districts and potential funding mechanisms available through those relationships.
		Enhance information retention and knowledge transfer.

7.2 IDENTIFYING MITIGATION ACTIONS

The requirements for the identification and analysis of mitigation actions, as stipulated in the DMA 2000 and its implementing regulations, are described below.

<p>DMA 2000 Requirements: Mitigation Strategy</p> <p>Identification and Analysis of Mitigation Actions</p> <p>Requirement §201.6(c)(3)(ii): [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.</p> <p>Element</p> <ul style="list-style-type: none"> ■ Does the plan identify and analyze a comprehensive range of specific mitigation actions and projects for each hazard? ■ Do the identified actions and projects address reducing the effects of hazards on new buildings and infrastructure?

DMA 2000 Requirements: Mitigation Strategy

- Do the identified actions and projects address reducing the effects of hazards on existing buildings and infrastructure?
- Does the mitigation strategy identify actions related to the participation in and continued compliance with the NFIP?

Source: FEMA, March 2008.

Mitigation actions are usually grouped into six broad categories: prevention, property protection, public education and awareness, natural resource protection, emergency services, and structural projects. Table 7-2 lists the goals and potential actions selected for this HMP by the Planning Committee.

Table 7-2 – Mitigation Goals and Actions

Goals	Action	Action Status: New (N), Existing (E)	Description
<p>Goal 1: <i>Adopt an all-hazard approach to risk reduction in the community that considers both the natural and human environment.</i></p>	1.A	E	Review and update ordinances and code every three years.
	1.B	E	Enforce zoning ordinances to reduce public health risks from hazardous materials releases.
	1.C	E	Recommend retrofit for private businesses, homes, and government, with higher priority on critical facilities, infrastructure, and government agencies located within identified historical buildings.
	1.D	N / E	Increase the resilience of critical infrastructure by increasing sources of back-up power and updating insurance coverage to account for retrofits/improvements.
	1.E	E	Develop a voluntary building inspection program in which homes, businesses, schools, and critical facilities and infrastructure are inspected by a building official for non-structural elements that might break during an earthquake. In conjunction with this action, develop a non-structural retrofitting program to correct identified problems.
	1.F	E	Retrofit all critical assets within strong shaking areas that do not meet the most current IBC requirements for safety; with higher priority given to critical facilities, infrastructure, and government agencies located within identified historical buildings.
	1.G	E	Perform study to determine appropriate method to retrofit buildings located in the Virginia City urban fire hazard zone (i.e. critical facilities, commercial business district, historic district and infrastructure).

Table 7-2 – Mitigation Goals and Actions

Goals	Action	Action Status: New (N), Existing (E)	Description
	1.H	N / E	Work with utility companies to evaluate the seismic risk to their transmission pipelines and implement mitigation measures, such as automatic shut-off valves. Additionally, work with utility companies to evaluate the fuels risk around assets and implement mitigation measures, such as fuels reduction.
	1.I	E	Install on all private and public buildings propane earthquake disconnect valves.
	1.J	E	Continue seismic retrofit on facades on B & C Streets.
	1.K	N / E	Implement fuels-reduction treatment along all boundaries of Six Mile Canyon to protect residences and community infrastructure. Continue to identify areas for fuel reduction and work to create buffers in areas that will assist in fighting fire by reducing the distance fire can spread and allowing additional time for evacuation and response measures.
	1.L	N	Complete inventory of buildings with unreinforced masonry structures.
	1.M	N / E	Enhance current cyber security capabilities and develop a detailed plan to respond to a cyber incident (ransomware, virus, successful hacking attempt, election security) that determines the scope of the incident, affected platforms, and immediately works to restore systems from the most recent backup.
	1.N	E	Install new flood facilities including upgrade of the existing storm drain system to current standards including culverts and channel improvements throughout Storey County.
	1.O	E	Protect and enhance existing water conveyance structures, storage, and treatment facilities to reduce impact from flood (i.e. Lockwood, Virginia City).

Table 7-2 – Mitigation Goals and Actions

Goals	Action	Action Status: New (N), Existing (E)	Description
	1.P	E	Within the Virginia Highlands, create manageable, shaded fuel breaks through the entire subdivision including Virginia City Highlands and Highland Ranches.
<p>Goal 2: <i>Establish a culture of risk reduction and mitigation in the County through effective communication, outreach, and education.</i></p>	2.A	N / E	Identify a temporary location within the County to establish County offices and conduct essential duties should catastrophic damage occur to the County Courthouse or other County buildings that requires the need to relocate offices for an extended period of time. Identify a plan for replacing damaged equipment (hardware, digital assets) to ensure continuity of operations.
	2.B	E	Continue and expand the Risk Watch outreach program that coordinates with the school district to teach children about the hazards in their community and what they can do to mitigate, prevent, and prepare for these hazard events.
	2.C	E	Continue and sustain a public outreach program that encourages consistent hazard mitigation content including all hazards addressed in this mitigation plan.
	2.D	E	Develop outreach program that will teach adults how to anchor parapets, signs, glass, machinery, shelving, fixtures, and other nonstructural elements or architectural detailing that might cause injury if items were to fall or break during an earthquake.
	2.E	E	Use seasonal firefighters to conduct an outreach program to inform homeowners about the threat of wildfires; to explain how homeowners can reduce the wildfire hazards around their homes; to encourage homeowners to take the necessary action to improve the chance of their home surviving a wildfire; encourage homeowners to become involved with the Living With Fire program.

Table 7-2 – Mitigation Goals and Actions

Goals	Action	Action Status: New (N), Existing (E)	Description
	2.F	E	Initiate an outreach program to inform and instruct building contractors, County and State road maintenance agencies, and Storey County schools in best management practices for vegetation management in developments, around existing and new construction, and along road right-of-ways.
	2.G	E	Continue program using seasonal firefighters and community service groups to provide vegetation management services to elderly, disabled, or low-income persons to remove flammable vegetation around homes.
<p>Goal 3: <i>Build community capacity and relationships to foster successful planning and implementation of mitigation strategies.</i></p>	3.A	N / E	Partner with Lyon County to conduct a flood assessment of the area. Use the results of the study to continue improving drainage issues in the area.
	3.B	N / E	Increase local staff with emergency management and response capabilities.
	3.C	N	Build tourism into planning and implementation of mitigation strategies. Account for population fluctuations/increases as the result of tourism and major events. Establish plans to address mass injuries/causalities should an emergency occur during an event drawing concentrated populations to the County (i.e. parades on C Street, events at Fairgrounds).
	3.D	E	Develop partnerships for a community based vegetation management program including chipping programs.
	3.E	N	Develop partnership with State to coordinate efforts and increase capabilities to reduce and respond to emergencies along USA Parkway and I-80, such as evacuation routes, signage, communication tower, etc. Share data to better understand potential hazards occurring on roads within the County, especially in relation to the transport of hazardous materials.

7.3 EVALUATING AND PRIORITIZING MITIGATION ACTIONS

The requirements for the evaluation and implementation of mitigation actions, as stipulated in DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements: Mitigation Strategy - Implementation of Mitigation Actions

Implementation of Mitigation Actions

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

Element

- Does the mitigation strategy include how the actions are prioritized? (For example, is there a discussion of the process and criteria used?)
- Does the mitigation strategy address how the actions will be implemented and administered? (For example, does it identify the responsible department, existing and potential resources, and timeframe?)
- Does the prioritization process include an emphasis on the use of a cost-benefit review (see page 3-36 of *Multi-Hazard Mitigation Planning Guidance*) to maximize benefits?

Source: FEMA, March 2008.

The mitigation actions were discussed during the Planning Committee meeting on October 9, 2019 and finalized through review of the draft plan. The Planning Committee evaluated and prioritized each of the actions. To complete this task, the Planning Committee completed the STAPLE+E evaluation criteria using rankings of zero for lowest and three for highest priority, acceptance, feasibility etc., and the rankings for each action were totaled. See Table 7-3 for the evaluation criteria.

Table 7-3: STAPLE+E Evaluation Criteria for Mitigation Actions

Evaluation Category	Discussion “It is important to consider...”	Considerations
Social	The public support for the overall mitigation strategy and specific mitigation actions	Community acceptance; adversely affects population
Technical	If the mitigation action is technically feasible and if it is the whole or partial solution	Technical feasibility; long-term solutions; secondary impacts
Administrative	If the community has the personnel and administrative capabilities necessary to implement the action or whether outside help will be necessary	Staffing; funding allocation; maintenance/operations

Table 7-3: STAPLE+E Evaluation Criteria for Mitigation Actions

Evaluation Category	Discussion “It is important to consider...”	Considerations
Political	What the community and its members feel about issues related to the environment, economic development, safety, and emergency management	Political support; local champion; public support
Legal	Whether the community has the legal authority to implement the action, or whether the community must pass new regulations	Local, State, and Federal authority; potential legal challenge
Economic	If the action can be funded with current or future internal and external sources, if the costs seem reasonable for the size of the project, and if enough information is available to complete a FEMA Benefit Cost Analysis	Benefit/cost of action; contributes to other economic goals; outside funding required; FEMA Benefit Cost Analysis
Environmental	The impact on the environment because of public desire for a sustainable and environmentally healthy community	Effect on local flora and fauna; consistent with community environmental goals; consistent with local, State and Federal laws

Upon review by the Planning Committee, mitigation actions were selected for the County and Carson Water Subconservancy District (CWSD) that best fulfill the goals of the HMP and were appropriate and feasible to implement during the 5-year lifespan of this version of the HMP. In reviewing the actions, the Planning Committee considered the following:

- Actions that strengthen, elevate, relocate, or otherwise improve buildings, infrastructure, or other facilities to enhance their ability to withstand the damaging impacts of future disasters
- Actions in which the benefits (which are the reduction in expected future damages and losses) are greater than the costs considered as necessary to implement the specific action
- Actions that either address multi-hazard scenarios or address a hazard that presents the greatest risk to the jurisdiction

The high priority actions are shown in Table 7-4. Mitigation actions for the Carson Water Subconservancy District (CWSD) are included in Annex A.

7.4 IMPLEMENTING A MITIGATION ACTION PLAN

A Mitigation Action Plan Matrix was prepared for the County detailing the mitigation actions and their priority level, how the overall benefit-cost were taken into consideration, and how each mitigation action will be implemented and administered. This matrix is Table 7-4.

Table 7-4: Action Plan Matrix

Action Number	Action Item	Department / Division	Potential Funding Source	Implementation Timeline	Economic Justification	Priority Level
1.A	Review and update ordinances every three years.	County Planning	Local Gen. Fund, HUD	24-36 months	Protection of lives due to pre-planning.	Low
1.B	Enforce zoning ordinances to reduce public health risks from hazardous materials releases and prevent roof collapse/damage.	Building Dept.	PDM, HMGP, Local Gen. Fund	12-14 months	Protection of infrastructure, and critical facilities.	Low
1.C	Recommend retrofit for private businesses, homes, and government, with higher priority on critical facilities, infrastructure, and government agencies located within identified historical buildings.	Bldg. Dept., Emergency Management	HMGP, PDM, HUD, Local Gen. Fund	24-48 months	Protection of lives, homes, businesses, infrastructure, and critical facilities.	Low
1.D	Increase the resilience of critical infrastructure by increasing sources of back-up power and updating insurance coverage to account for retrofits/improvements.	Community Relations, County Manager, Public Works, Emergency Management	Insurance	12 months	Protection of lives, homes, businesses, infrastructure, and critical facilities.	High
1.E	Develop a voluntary building inspection program in which homes, businesses, schools, and critical	Bldg. Dept., Emergency Management	Local Gen. Fund, FEMA HMGP, PDM	Ongoing	Protection of homes, businesses, infrastructure, and critical facilities.	Low

Table 7-4: Action Plan Matrix

Action Number	Action Item	Department / Division	Potential Funding Source	Implementation Timeline	Economic Justification	Priority Level
	facilities and infrastructure are inspected by a building official for non-structural elements that might break during an earthquake. In conjunction with this action, develop a non-structural retrofitting program to correct identified problems.					
1.F	Retrofit all critical assets within strong shaking areas that do not meet the most current IBC requirements for safety; with higher priority given to critical facilities, infrastructure, and government agencies located within identified historical buildings.	Bldg. Dept., Public Works, Emergency Management	HMGP, PDM, HUD, Local Gen. Fund	24-48 months	Protection of lives, homes, businesses, infrastructure, and critical facilities.	High
1.G	Perform study to determine appropriate method to retrofit buildings located in the Virginia City urban fire hazard zone (i.e. critical facilities, commercial business district, historic district and infrastructure).	Fire Dept.	PDM, HMGP, RFC, USDA, NDEP, EPA, NDRCS, Local, PW	24-36 months	Protection of homes, businesses, infrastructure, and critical facilities.	Medium

SECTION SEVEN

Mitigation Strategy

Table 7-4: Action Plan Matrix

Action Number	Action Item	Department / Division	Potential Funding Source	Implementation Timeline	Economic Justification	Priority Level
1.H	Work with utility companies to evaluate the seismic risk to their transmission and pipelines to implement mitigation measures, such as automatic shut-off valves. Additionally, work with utility companies to evaluate the fuels risk around assets and implement mitigation measures, such as fuels reduction.	Bldg. Dept., Public Works, Emergency Management	HMGP, PDM, HUD, Local Gen. Fund	24-48 months	Protection of lives, homes, businesses, infrastructure, and critical facilities.	High
1.I	Install on all private and public buildings propane earthquake disconnect valves.	Bldg. Dept., Emergency Management	HMGP, PDM, HUD, Local Gen. Fund	24-48 months	Protection of lives, homes, businesses, infrastructure, and critical facilities.	Medium High for schools/ County buildings
1.J	Continue seismic retrofit on facades on B & C Streets.	County Building, Planning & Public Works	HMGP, PDM, HUD, Local Gen. Fund	24-48 months	Protection of lives, homes, businesses, infrastructure, and critical facilities.	Medium
1.K	Implement fuels-reduction treatment along all boundaries of Six Mile Canyon to protect	Fire Dept.	PDM, HMGP, RFC, USDA, NDEP, EPA, NRCS, FEMA,	24-36 months	Protection of homes, businesses, infrastructure, and critical facilities.	High

Table 7-4: Action Plan Matrix

Action Number	Action Item	Department / Division	Potential Funding Source	Implementation Timeline	Economic Justification	Priority Level
	residences and community infrastructure. Continue to identify areas for fuel reduction and work to create buffers in areas that will assist in fighting fire by reducing the distance fire can spread and allowing additional time for evacuation and response measures.		USFS, 319(h) grants (Clean Water Act), Local, PW			
1.L	Complete inventory of buildings with unreinforced masonry structures.	Assessor's Office, Comstock Historic District	Local Gen. Fund	12-24 months	Protection of lives, homes, businesses, infrastructure, and critical facilities.	High
1.M	Enhance current cyber security capabilities and develop a detailed plan to respond to a cyber incident (ransomware, virus, successful hacking attempt, election security) that determines the scope of the incident, affected platforms, and immediately works to restore systems from the most recent backup.	IT	Local Gen. Fund	12 months	Protection of lives, homes, businesses, infrastructure, and critical facilities.	High

SECTION SEVEN

Mitigation Strategy

Table 7-4: Action Plan Matrix

Action Number	Action Item	Department / Division	Potential Funding Source	Implementation Timeline	Economic Justification	Priority Level
1.N	Install new flood facilities including upgrade of the existing storm drain system to current standards including culverts and channel improvements throughout Storey County.	Public Works	PDM, HMGP, FMA, RFC, USDA, NDEP, EPA, NDRCS, Local, PW	24-48 months	Protection of lives, homes, businesses, infrastructure, and critical facilities.	Medium
1.O	Protect and enhance existing water conveyance structures, storage, and treatment facilities to reduce impact from flood (i.e. Lockwood, Virginia City).	Public Works	PDM, HMGP, FMA, RFC, USDA, NDEP, EPA, NDRCS, Local, PW	24-48 months	Protection of lives, homes, businesses, infrastructure, and critical facilities.	Medium
1.P	Within the Virginia Highlands, create manageable, shaded fuel breaks through the entire subdivision including Virginia City Highlands and Highland Ranches.	Fire Dept.	PDM, HMGP, RFC, USDA, NDEP, EPA, NDRCS, BLM, Local, PW	24-36 months	Protection of homes, businesses, infrastructure, and critical facilities.	High
2.A	Identify a temporary location within the County to establish County offices and conduct essential duties should catastrophic damage occur to the County Courthouse or other County	Bldg. Dept., Emergency Management	Insurance	12 months	Continuation of essential functions.	High

Table 7-4: Action Plan Matrix

Action Number	Action Item	Department / Division	Potential Funding Source	Implementation Timeline	Economic Justification	Priority Level
	buildings that requires the need to relocate offices for an extended period of time. Identify a plan for replacing damaged equipment (hardware, digital assets) to ensure continuity of operations.					
2.B	Continue and expand Risk Watch outreach program that coordinates with the school district to teach children about the hazards in their community and what they can do to mitigate, prevent, and prepare for these hazard events.	Emergency Mgmt., Fire Dept., Sheriff, School District, Health Dept.	Local Gen. Fund	Ongoing	Protection of homes, businesses, infrastructure, and critical facilities.	High
2.C	Continue and sustain a public outreach program that encourages consistent hazard mitigation content including all hazards addressed in this mitigation plan.	Emergency Mgmt., Fire Dept.	EMPG, SERC, EPA, NDEP, NDCNR, Local Gen. Fund	Ongoing	Protection of lives and property due to pre-planning.	Low
2.D	Develop outreach program that will teach adults how to anchor parapets, signs,	Public Works, Fire Dept.	EMPG, SERC, EPA, NDEP,	18-24 months	Protection of lives due to pre-planning.	Low

Table 7-4: Action Plan Matrix

Action Number	Action Item	Department / Division	Potential Funding Source	Implementation Timeline	Economic Justification	Priority Level
	glass, machinery, shelving, fixtures, and other nonstructural elements or architectural detailing that might cause injury if items were to fall or break during an earthquake.		NDCNR, Utility Service Charge			
2.E	Use seasonal firefighters to conduct an outreach program to inform homeowners about the threat of wildfires; to explain how homeowners can reduce the wildfire hazards around their homes; to encourage homeowners to take the necessary action to improve the chance of their home surviving a wildfire; encourage homeowners to become involved with the Living With Fire program.	Emergency Mgmt., Fire Dept.	HMGP, PDM, FMAG, NDF, Fire Dept., Local Gen. Fund	Ongoing	Protection of homes, businesses, infrastructure, and critical facilities.	High
2.F	Continue an outreach program to inform and instruct building contractors, County and State road maintenance	Emergency Mgmt., Bldg. Dept.	Local Gen. Fund, FEMA, HUD	Ongoing	Protection of homes, businesses, infrastructure, and critical facilities.	Low

Table 7-4: Action Plan Matrix

Action Number	Action Item	Department / Division	Potential Funding Source	Implementation Timeline	Economic Justification	Priority Level
	agencies, and Storey County schools in best management practices for vegetation management in developments, around existing and new construction, and along road right-of-ways.					
2.G	Continue program using seasonal firefighters and community service groups to provide vegetation management services to elderly, disabled, or low-income persons to remove flammable vegetation around homes.	Fire Dept.	PDM, HMGP, RFC, USDA, NDEP, EPA, NDRCS, BLM, Local, PW	Ongoing	Protection of homes, businesses, infrastructure, and critical facilities.	High
3.A	Partner with Lyon County to conduct a flood assessment of the area. Use the results of the study to continue improving drainage issues in the area.	Bldg. Dept., Public Works	Local	Ongoing	Protection of lives, homes, businesses, infrastructure, and critical facilities.	High
3.B	Increase local staff with emergency management and response capabilities.	Emergency Mgmt., DA	Local	12-24 months	Protection of lives and property due to pre-planning.	High

Table 7-4: Action Plan Matrix

Action Number	Action Item	Department / Division	Potential Funding Source	Implementation Timeline	Economic Justification	Priority Level
3.C	Continue to build tourism into planning and implementation of mitigation strategies. Account for population fluctuations/increases as the result of tourism and major events. Establish plans to address mass injuries/causalities should an emergency occur during an event drawing concentrated populations to the County (i.e. parades on C Street, events at Fairgrounds).	Emergency Mgmt., Fire Dept., Sheriff, County Manager, Virginia City Tourism Commission, County Commission	Local	Ongoing	Protection of lives due to pre-planning.	High

Table 7-4: Action Plan Matrix

Action Number	Action Item	Department / Division	Potential Funding Source	Implementation Timeline	Economic Justification	Priority Level
3.D	Develop partnerships for a community based vegetation management program including chipping programs.	Fire Dept.	PDM, HMGP, RFC, USDA, NDEP, EPA, NDRCS, BLM, Local, PW	Ongoing	Protection of homes, businesses, infrastructure, and critical facilities.	High
3.E	Develop partnership with State to coordinate efforts and increase capabilities to reduce and respond to emergencies along USA Parkway and I-80, such as evacuation routes, signage, communication tower, etc. Share data to better understand potential hazards occurring on roads within the County, especially in relation to the transport of hazardous materials.	NDOT, State Highway Patrol, Emergency Mgmt.	Local	Ongoing	Protection of lives due to pre-planning.	Medium

BLM= Bureau of Land Management
 PW = Public Works
 DHS= Dept. of Homeland Security
 EMPG = Emergency Management Performance Grant
 EPA = U.S. Environmental Protection Agency
 FMA=Flood Management Assistance

HMGP = Hazard Mitigation Grant Program
 HUD=Housing & Urban Development
 NDEP = Nevada Division of Environmental Protection
 NDOT = Nevada Department of Transportation
 NDF = Nevada Division of Forestry
 NDRCS=Nevada Dept. Resource Conservation Services

PDM = Pre-Disaster Mitigation
 RFC=Resource Finance Corporation
 SERC = State Emergency Response Commission
 USDA = U.S. Department of Agriculture
 USFS = U.S. Forest Service
 USGS = US Geological Survey

This section describes a formal plan maintenance process to ensure that the HMP remains an active and applicable document. It includes an explanation of how the County and the Planning Committee intend to organize its efforts to ensure that improvements and revisions to the HMP occur in a well-managed, efficient, and coordinated manner.

The following three process steps are addressed in detail below:

- Monitoring, evaluating, and updating the HMP
- Implementation through existing planning mechanisms
- Continued public involvement

8.1 MONITORING, EVALUATING, AND UPDATING THE HMP

The requirements for monitoring, evaluating, and updating the HMP, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements: Plan Maintenance Process - Monitoring, Evaluating, and Updating the Plan

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

Element

- Does the new or updated plan describe the method and schedule for monitoring the plan? (For example, does it identify the party responsible for monitoring and include a schedule for reports, site visits, phone calls, and meetings?)
- Does the new or updated plan describe the method and schedule for evaluating the plan? (For example, does it identify the party responsible for evaluating the plan and include the criteria used to evaluate the plan?)
- Does the new or updated plan describe the method and schedule for updating the plan within the five-year cycle?

Source: FEMA 2008.

The County Emergency Manager recognizes the need for plan maintenance and wanted to include tools in the plan for maintenance. The HMP was prepared as a collaborative effort between the County Emergency Management, the Local Emergency Management Committee (LEPC), and the Nevada Division of Emergency Management (NDEM). To maintain momentum and build upon this hazard mitigation planning effort, the LEPC will monitor, evaluate, and update the HMP. The LEPC will be responsible for implementing the Mitigation Action Plan. The County Emergency Manager will serve as the primary POC and will coordinate all local efforts to monitor, evaluate, and revise the HMP.

The LEPC will conduct an annual review of the progress in implementing the HMP, particularly the Mitigation Action Plan. As shown in Appendix E, the Annual Review Questionnaire and Mitigation Action Progress Report will provide the basis for possible changes in the overall Mitigation Action Plan by refocusing on new or more threatening hazards, adjusting to changes or increases in resource allocations, and engaging additional support for the HMP implementation. The County Emergency Manager will initiate the annual review one month prior to the date of adoption. The findings from this review will be presented annually to the County Manager. The review will include an evaluation of the following:

- Participation of County agencies and others in the HMP implementation.
- Notable changes in the County’s risk of natural or human-caused hazards.
- Impacts of land development activities and related programs on hazard mitigation.
- Progress made implementing the Mitigation Action Plan (identify problems and suggest improvements as necessary).
- The adequacy of resources for implementation of the HMP.

The process of reviewing the progress on achieving the mitigation goals and implementing the Mitigation Action Plan activities and projects will also be accomplished during the annual review process. During each annual review, a Mitigation Action Progress Report will be submitted to the Planning Committee and provide a brief overview of mitigation projects completed or in progress since the last review. As shown in Appendix E, the report will include the current status of the mitigation project, including any changes made to the project, the identification of implementation problems and appropriate strategies to overcome them, and whether or not the project has helped achieve the appropriate goals identified in the plan.

In addition to the annual review, the LEPC will update the HMP every five years. To ensure that this occurs, in the fourth year following adoption of the HMP, the LEPC will undertake the following activities:

- Thoroughly analyze and update the County’s risk of natural and man-made hazards.
- Provide a new annual review (as noted above), plus a review of the three previous annual reports.
- Provide a detailed review and revision of the mitigation strategy.
- Prepare a new action plan with prioritized actions, responsible parties, and resources.
- Prepare a new draft HMP and submit it to the County for adoption.
- Submit an updated HMP to the Nevada State Hazard Mitigation Officer and FEMA for approval.

8.2 IMPLEMENTATION THROUGH EXISTING PLANNING MECHANISMS

The requirements for implementation through existing planning mechanisms, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements: Plan Maintenance Process - Incorporation into Existing Planning Mechanisms

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

Element

- Does the new or updated plan identify other local planning mechanisms available for incorporating the requirements of the mitigation plan?
- Does the new or updated plan include a process by which the local government will incorporate the requirements in other plans, when appropriate?

Source: FEMA 2008.

After the adoption of the HMP, the LEPC will continue to ensure that the HMP, in particular the Mitigation Action Plan, is incorporated into existing planning mechanisms. Each member of the LEPC will achieve this incorporation by undertaking the following activities.

- Conduct a review of the community-specific regulatory tools to assess the integration of the mitigation strategy. These regulatory tools are identified in Table 6-1.
- Work with pertinent divisions and departments to increase awareness of the HMP and provide assistance in integrating the mitigation strategy (including the action plan) into relevant planning mechanisms. Implementation of these requirements may require updating or amending specific planning mechanisms.

8.3 CONTINUED PUBLIC INVOLVEMENT

The requirements for continued public involvement, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements: Plan Maintenance Process - Continued Public Involvement

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

Element

- Does the new or updated plan explain how **continued public participation** will be obtained? (For example, will there be public notices, an ongoing mitigation plan committee, or annual review meetings with stakeholders?)

Source: FEMA 2008.

The County is dedicated to involving the public directly in the continual reshaping and updating of the HMP. Hard copies of the HMP will be provided to each department. In addition, a downloadable copy of the plan and any proposed changes will be posted on the County's website. This site will also contain an e-mail address and phone number to which interested parties may direct their comments or concerns.

The LEPC will also identify opportunities to raise community awareness about the HMP and the County's hazards. This could include attendance and provision of materials at sponsored events. Any public comments received regarding the HMP will be collected by the County Emergency Manager, included in the annual report to the County Manager, and considered during future HMP updates. A press release and public notice by the County will be issued each year before the annual maintenance meeting inviting the public to participate.

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Appendix A
Adoption Resolution

To Be Included Upon County Adoption

Appendix B
Figures

Figure B-1 Planning Area

Storey County Hazard Mitigation

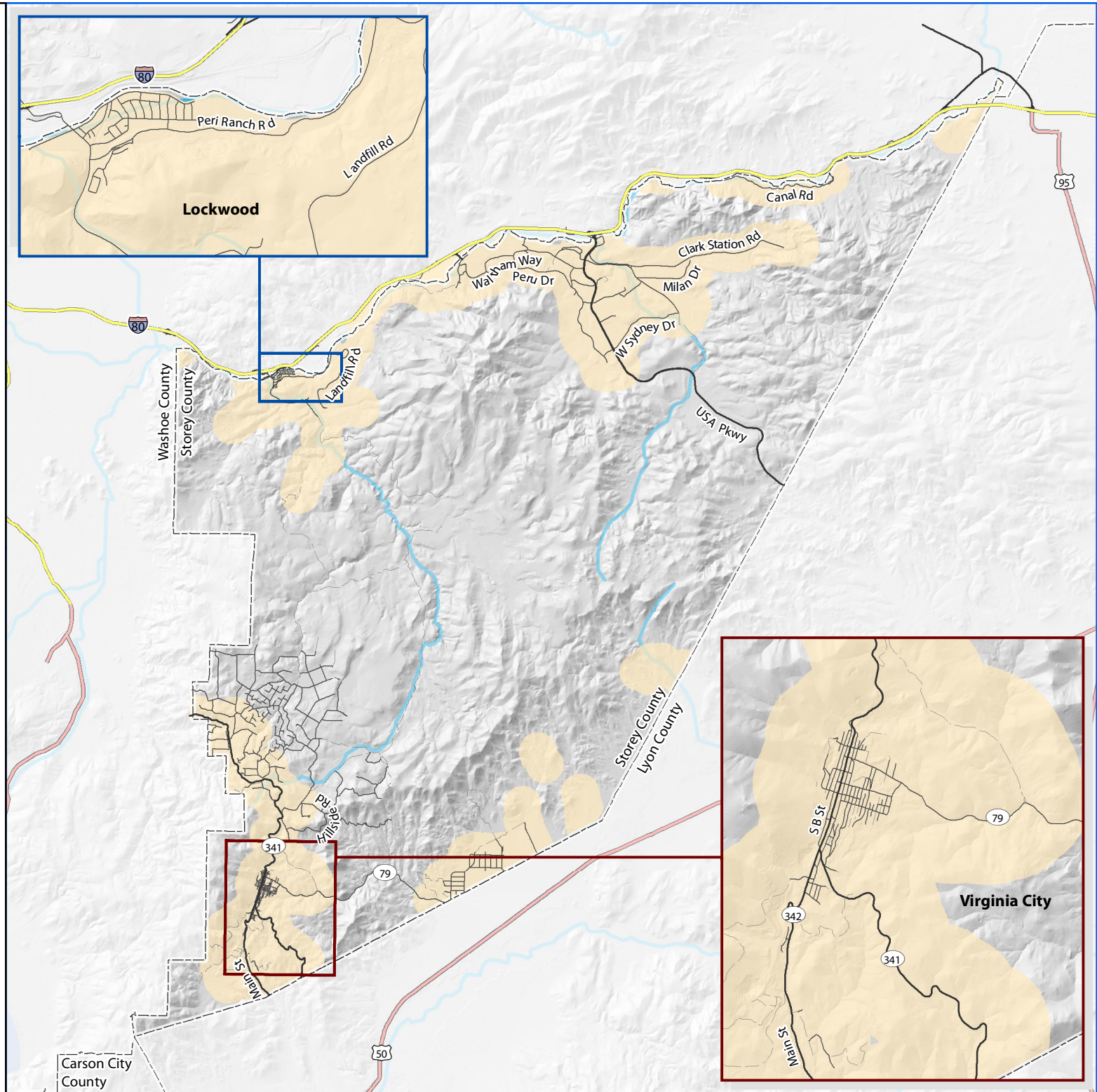
November 2019

- Interstate
- Highway
- State Road
- Local Road
- Dirt Road
- County Boundary
- Developed Area



0 2 4 Miles















Sources: ESRI 2019, Storey County 2019

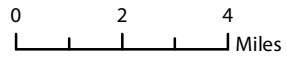


**Figure B-2
Land Use**

**Storey County
Hazard Mitigation**

November 2019

-  Interstate
-  Highway
-  State Road
-  Local Road
-  Dirt Road
-  County Boundary
-  Residential
-  Rural Residential
-  Resource
-  Historic Resource Interface
-  Mixed-Use Commercial-Residential
-  Industrial
-  Public Facilities
-  Pyramid Lake Paiute Tribe



Sources: ESRI 2019, Storey County 2019

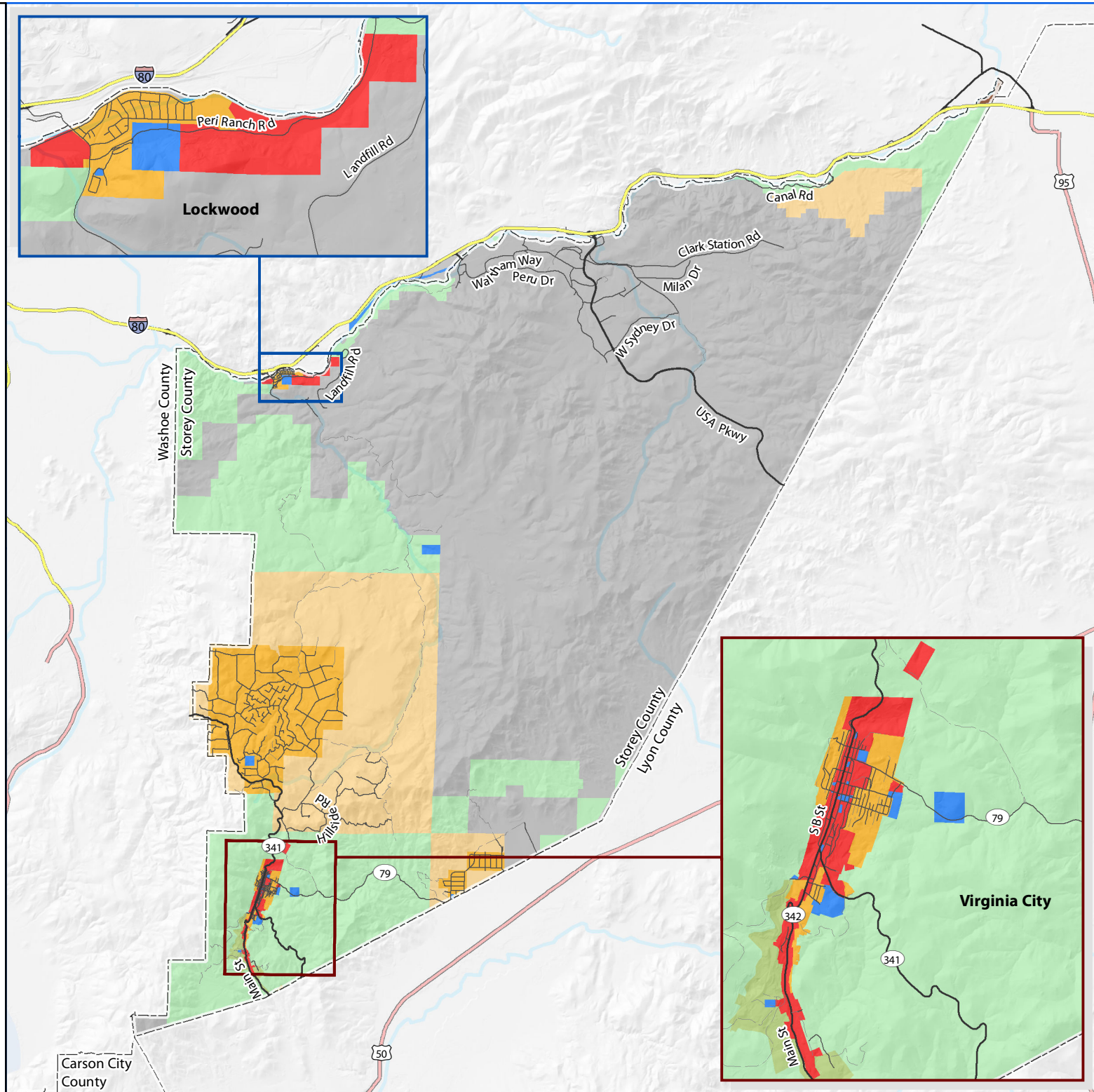


Figure B-3 Earthquake Risk: 2% Probability

Storey County Hazard Mitigation

Historical Earthquakes: 1960-2019

- M2
- M3

— Interstate

— Highway

— State Road

— Local Road

- - - Dirt Road

County Boundary

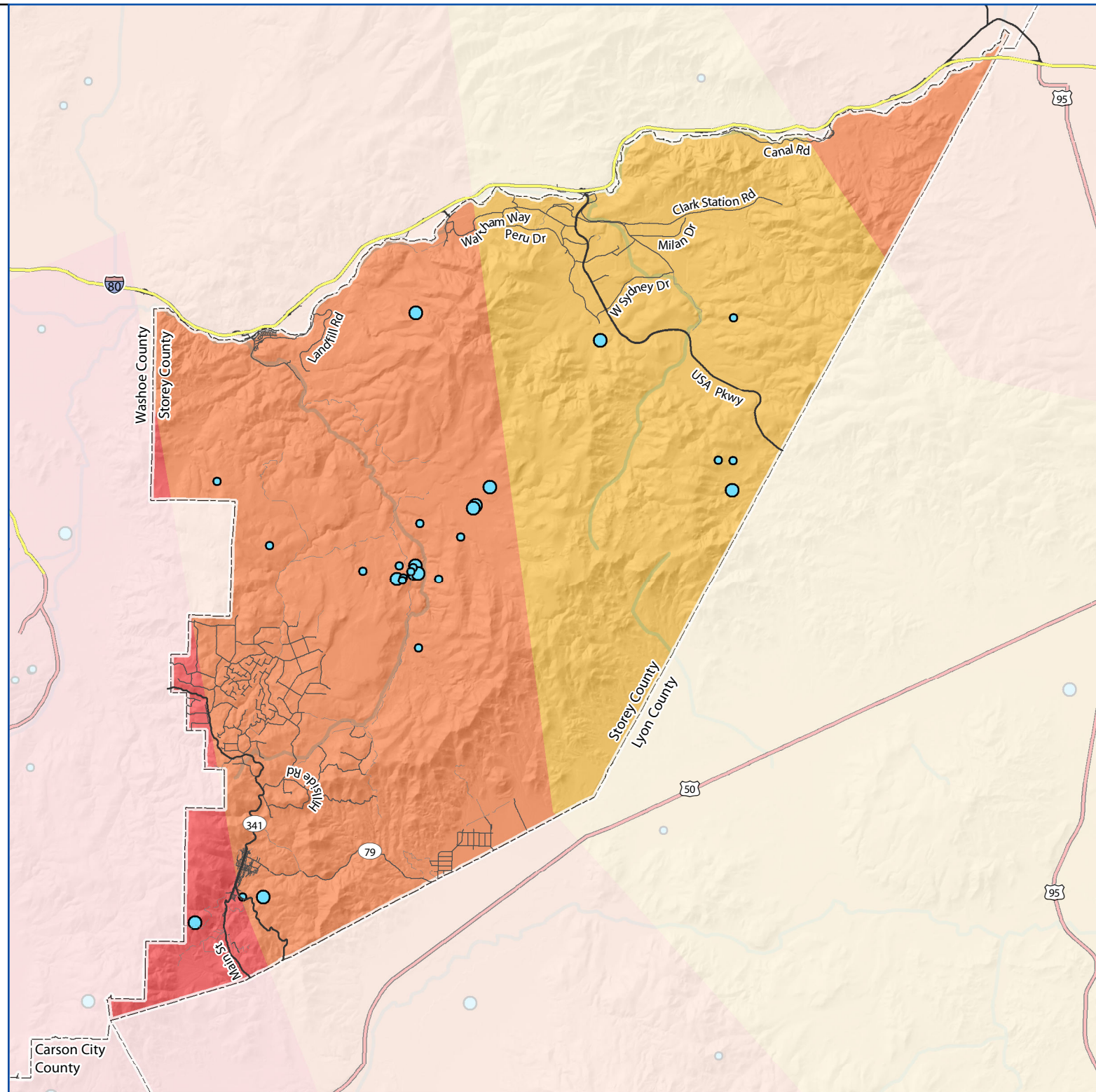
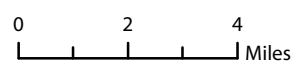
Seismic Ground Motion Hazards

2% probability of being exceeded in 50 years

32-48 Percent Gravity (%G)

48-64 %G

64+ %G



Sources: ESRI 2019, Storey County 2019, HSIP 2012, USGS 2019

Figure B-4
Earthquake Risk: 10%
Probability

Storey County
Hazard Mitigation

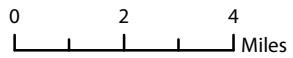
Historical Earthquakes: 1960-2019

- M2
- M3
- Interstate
- Highway
- State Road
- Local Road
- - - Dirt Road

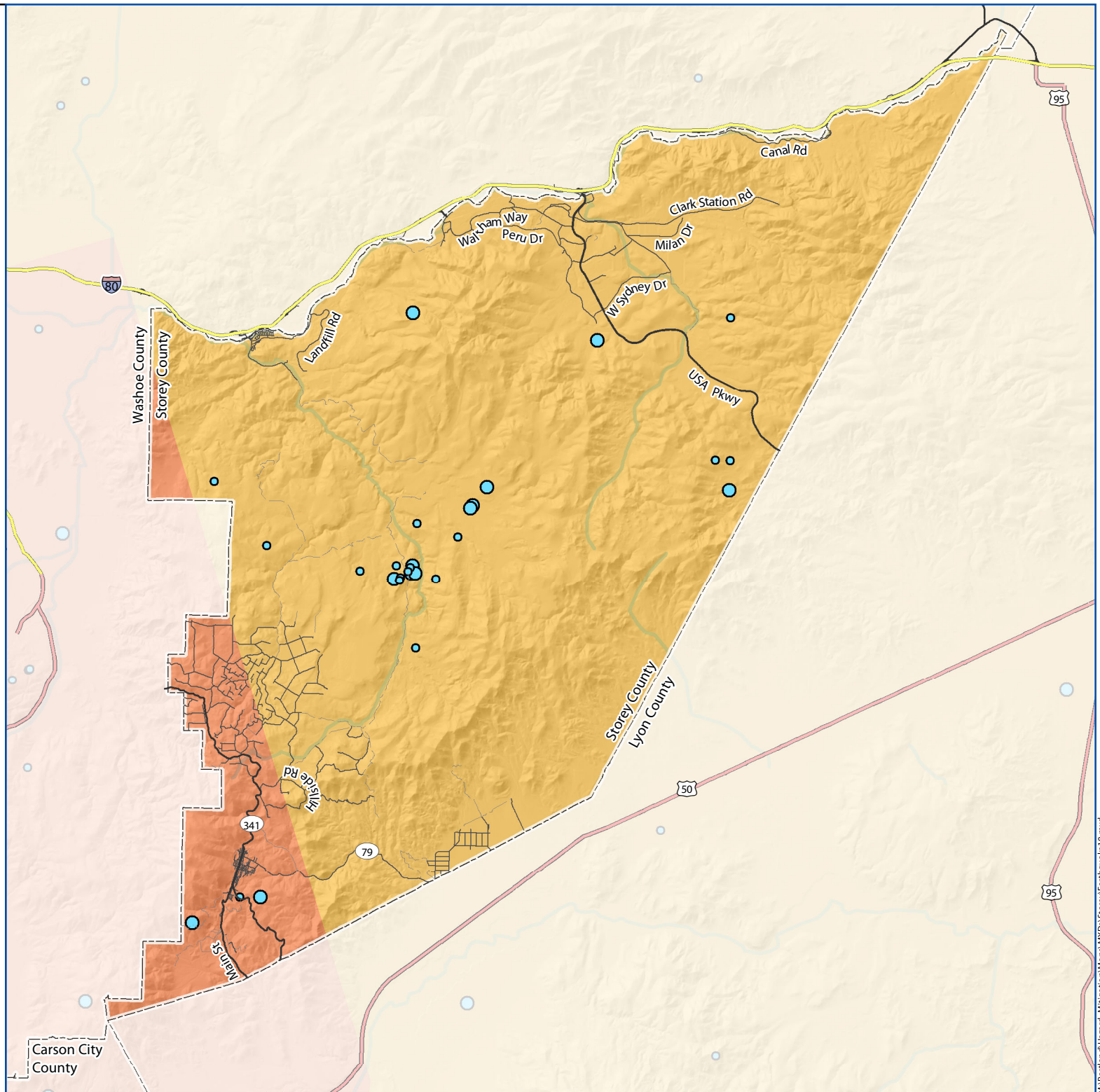
Seismic Ground Motion Hazards

10% probability of being exceeded in 50 years

- 32-48 Percent Gravity (%G)
- 48-64 %G












Sources: ESRI 2019, Storey County 2019, HSIP 2012, USGS 2019

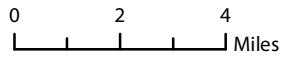


**Figure B-5
Flood Risk**

**Storey County
Hazard Mitigation**

November 2019

-  Interstate
-  Highway
-  State Road
-  Local Road
-  Dirt Road
-  County Boundary
- FEMA Flood Zone**
-  100 yr Floodplain
-  500 yr Floodplain
-  Undetermined Flooding Hazard



Sources: ESRI 2019, Storey County 2019, FEMA 2019

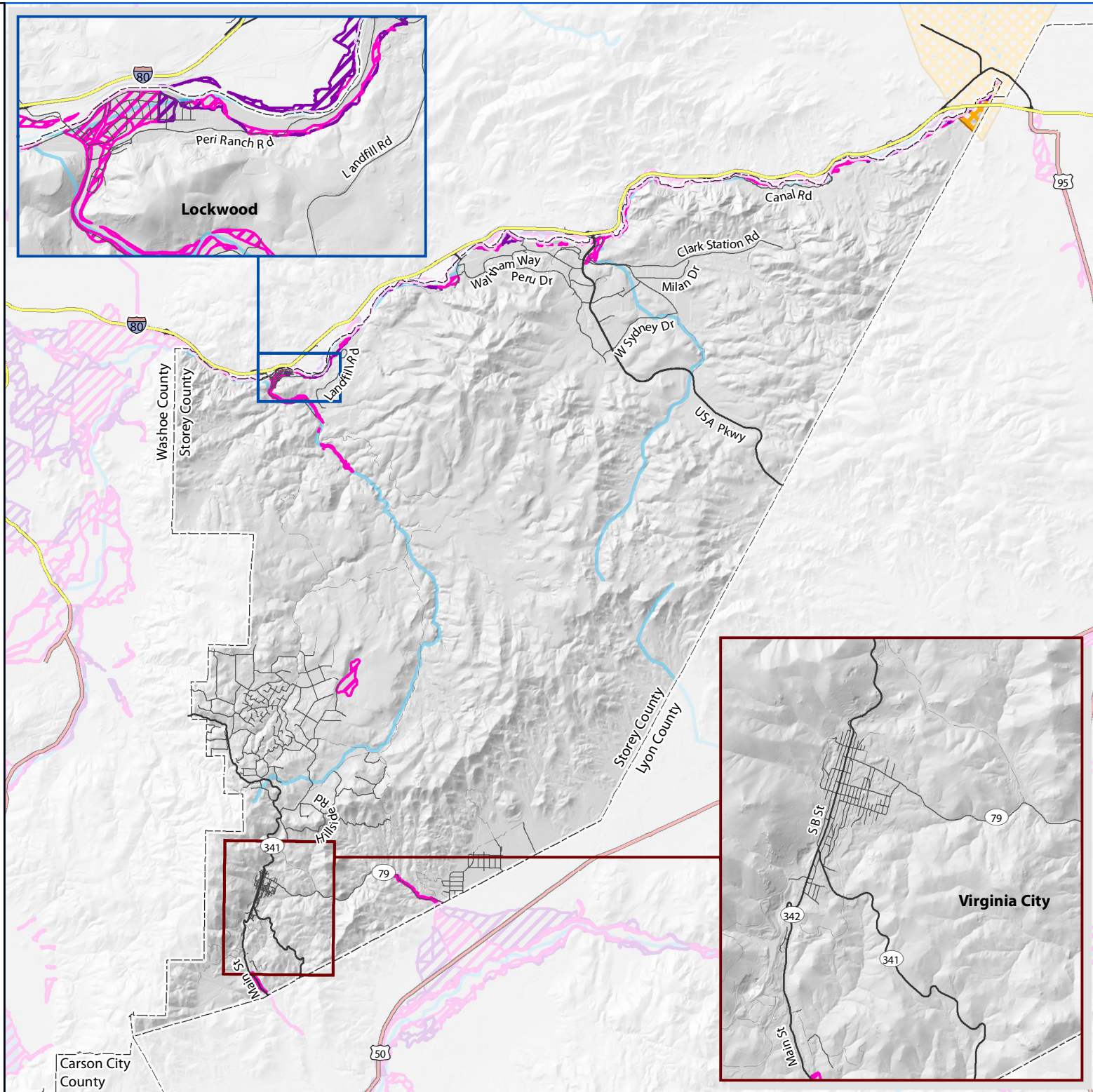







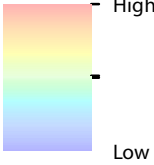


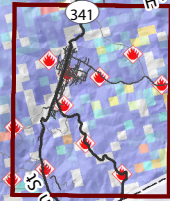
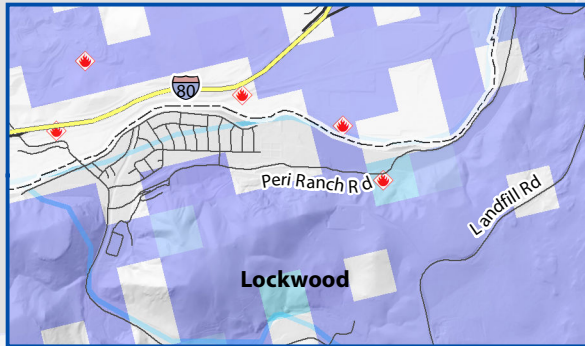
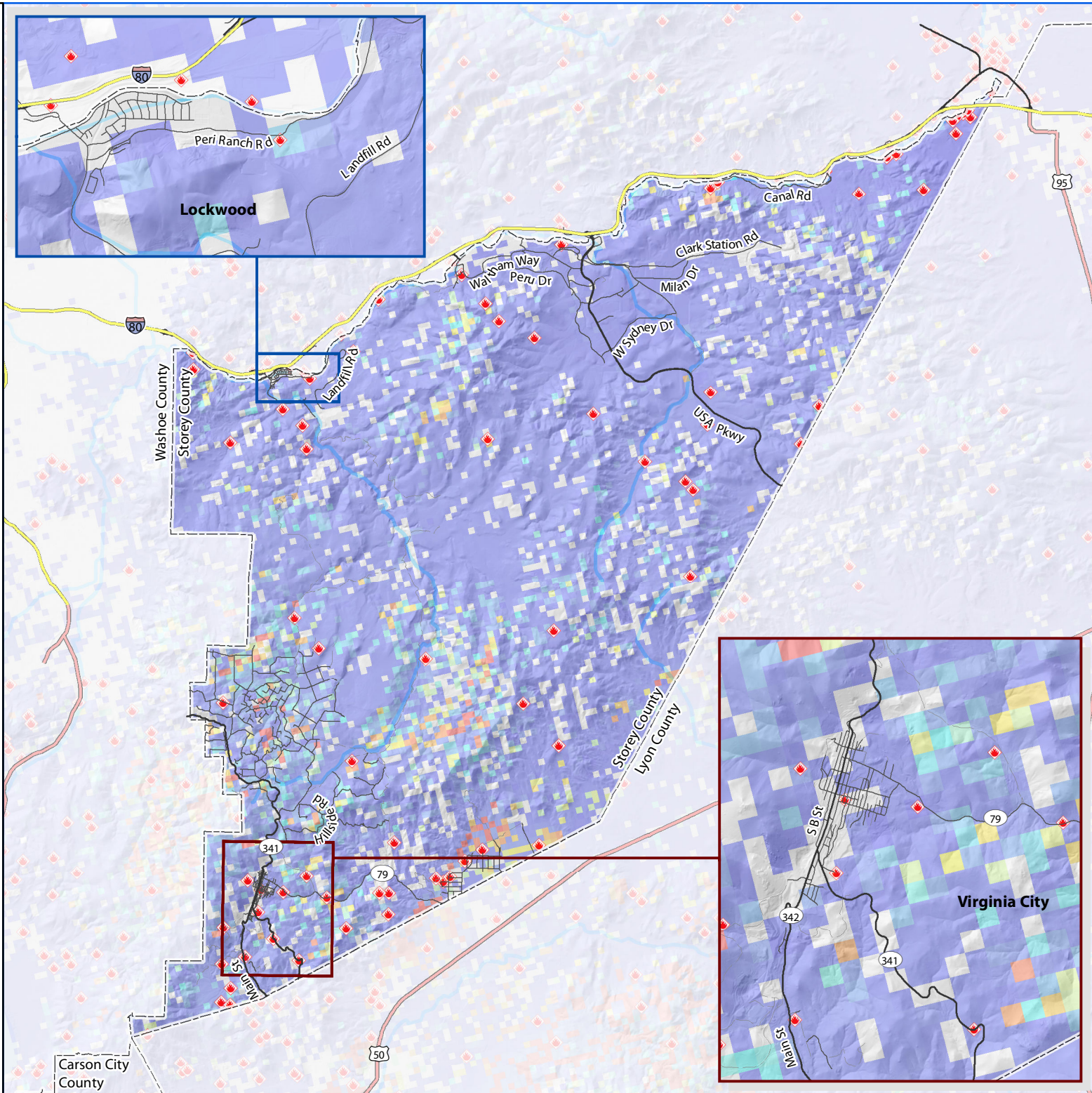
Figure B-6 Wildland Fire Risk Storey County Hazard Mitigation

November 2019

-  Historic Wildland Fire (1992-2015)
 -  Interstate
 -  Highway
 -  State Road
 -  Local Road
 -  Dirt Road
 -  County Boundary
- Wildland Fire Hazard Potential**
- 
- High
 - Low



0 2 4 Miles



Appendix C
Public Information

PLEASE COMPLETE OUR SURVEY
Storey County Hazard Mitigation Plan Update

The Hazard Mitigation Plan is the document that guides the County and its partners in reducing risks and lessening the impact of disasters. Hazard mitigation planning is all about taking actions to help reduce our community's risks caused by natural disasters.

Storey County wants to hear from you on the best way to reduce hazard risks to our communities.

The County is required by law to update the HMP once every five years to be eligible for mitigation funding and your participation is critical to ensure that the plan is informed by the latest information regarding local capabilities, as well as identifying actions to be taken to address ongoing risks.

Please assist us by completing an on-line survey at:

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

If you have additional questions, please call 775-847-0986 or email cnevin@storeycounty.org

THANK YOU FOR YOUR PARTICIPATION

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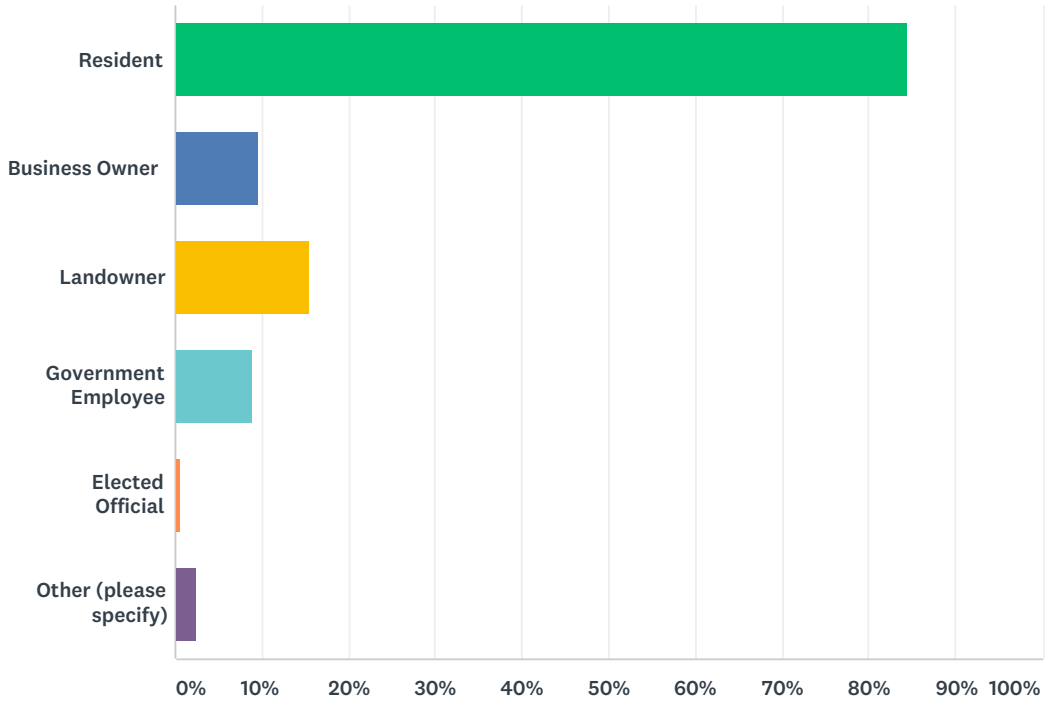
<https://www.surveymonkey.com/r/storeyhmp>

If you have additional questions, please call 775-847-0986 or email cnevin@storeycounty.org

THANK YOU FOR YOUR PARTICIPATION

Q1 Which of the following best defines your role in the community?

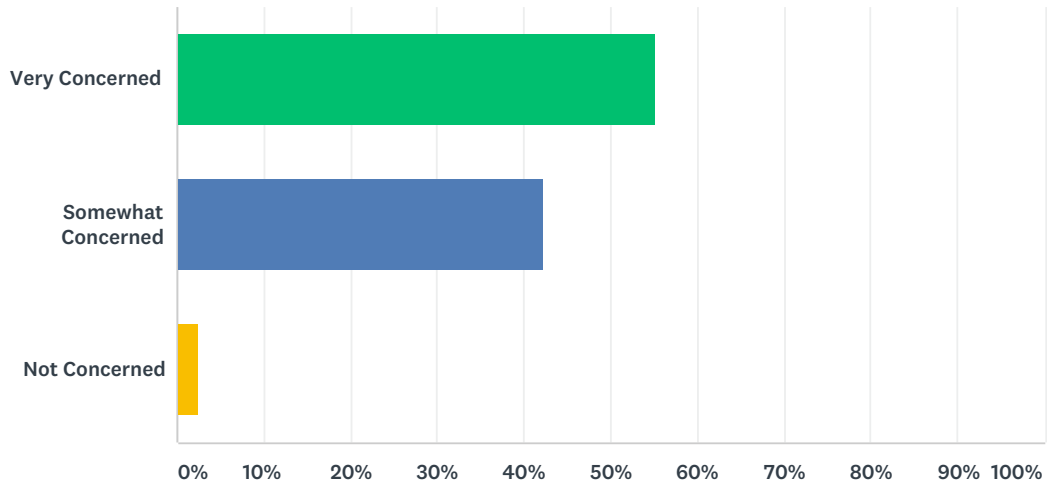
Answered: 155 Skipped: 0



ANSWER CHOICES	RESPONSES	
Resident	84.52%	131
Business Owner	9.68%	15
Landowner	15.48%	24
Government Employee	9.03%	14
Elected Official	0.65%	1
Other (please specify)	2.58%	4
Total Respondents: 155		

Q2 How concerned are you about the impacts of natural disasters in your community?

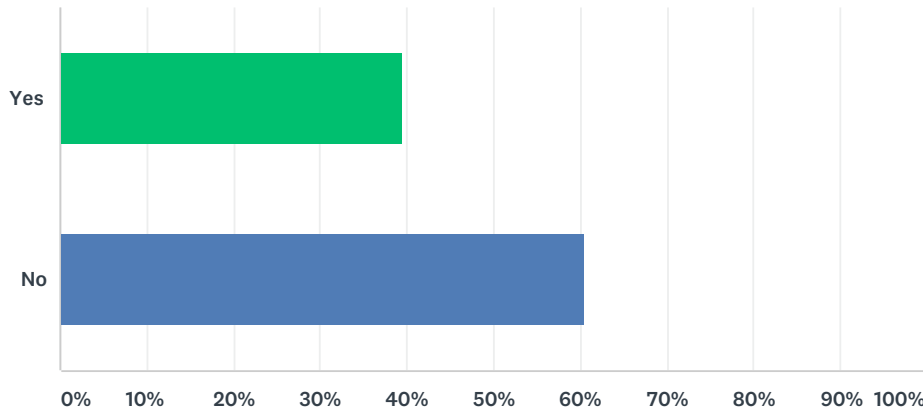
Answered: 154 Skipped: 1



ANSWER CHOICES	RESPONSES	
Very Concerned	55.19%	85
Somewhat Concerned	42.21%	65
Not Concerned	2.60%	4
TOTAL		154

Q3 Have you been impacted by a natural disaster in your community?

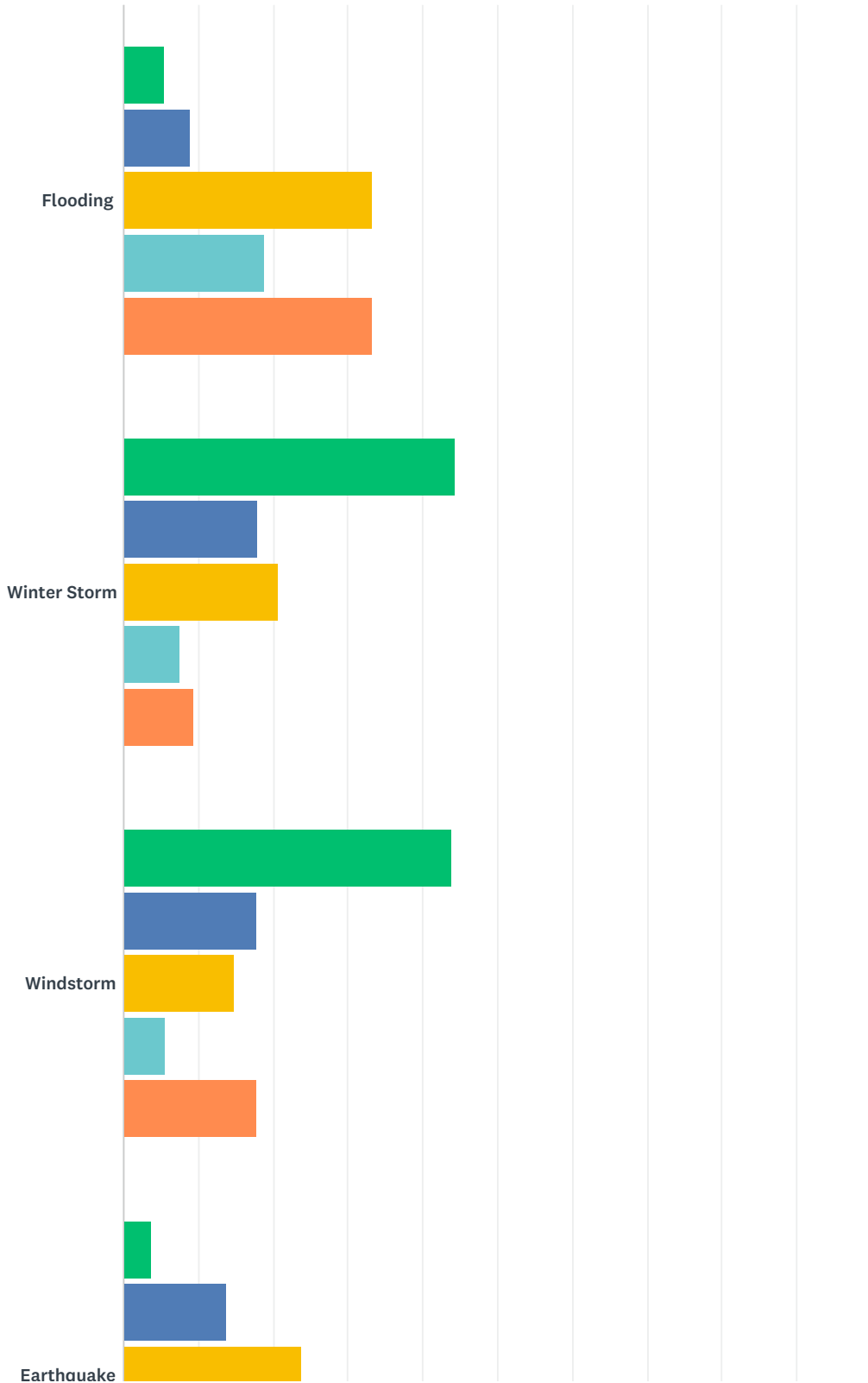
Answered: 154 Skipped: 1



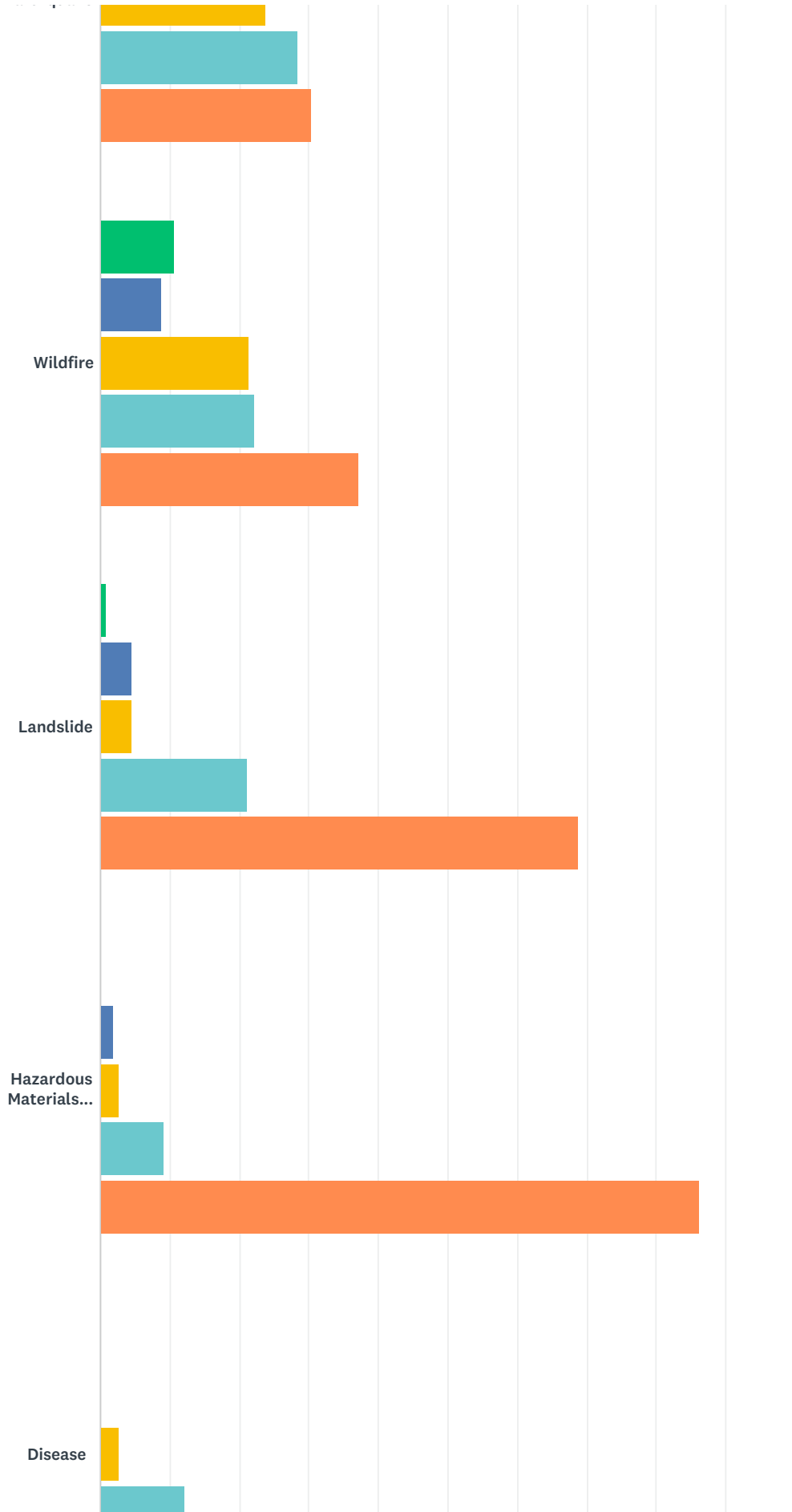
ANSWER CHOICES	RESPONSES	
Yes	39.61%	61
No	60.39%	93
TOTAL		154

Q4 If you answered 'yes' to the previous questions, please indicate the type(s) of disasters and the frequency with which you have experienced them in your community

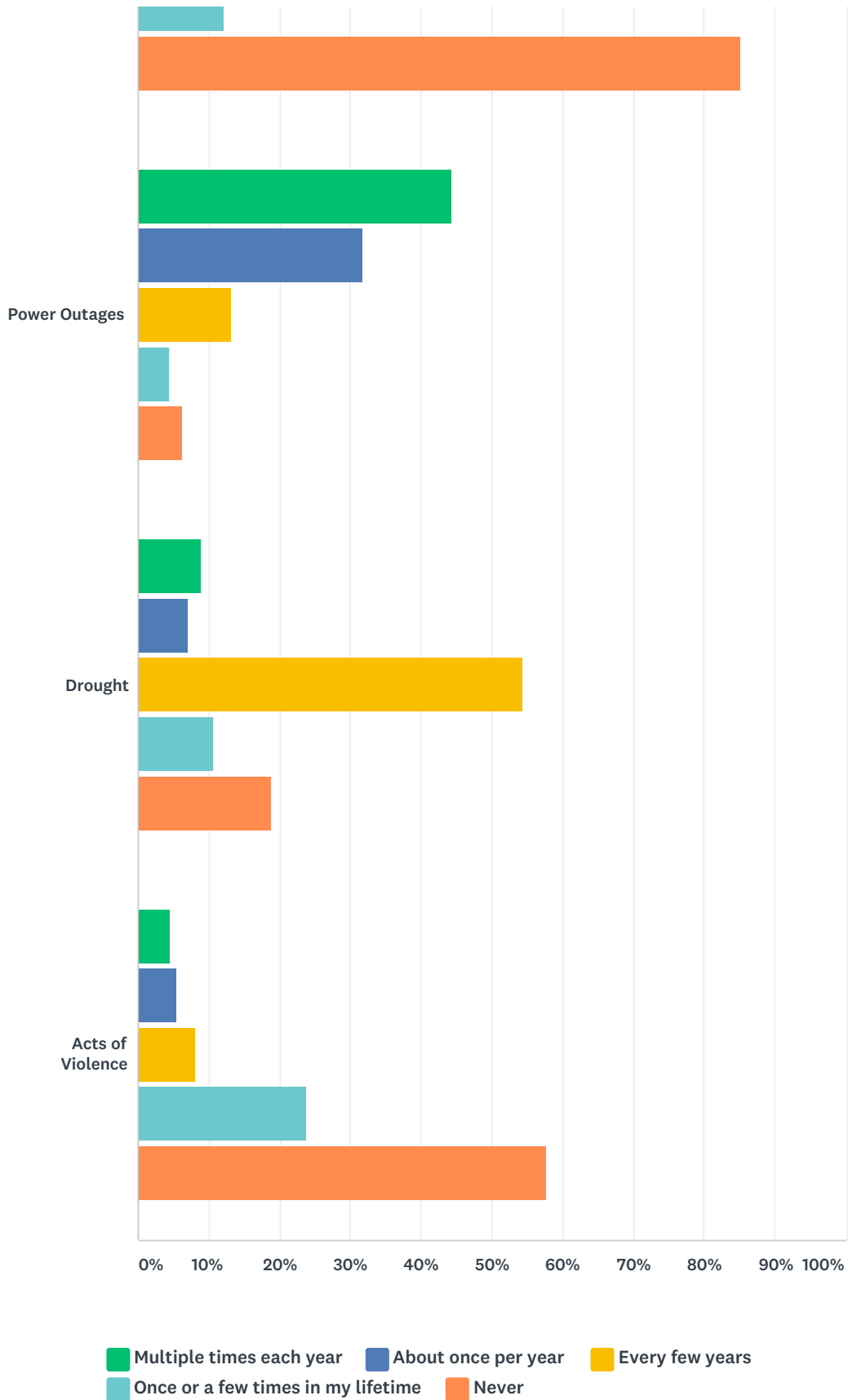
Answered: 120 Skipped: 35



Storey County Hazard Mitigation Public Survey



Storey County Hazard Mitigation Public Survey



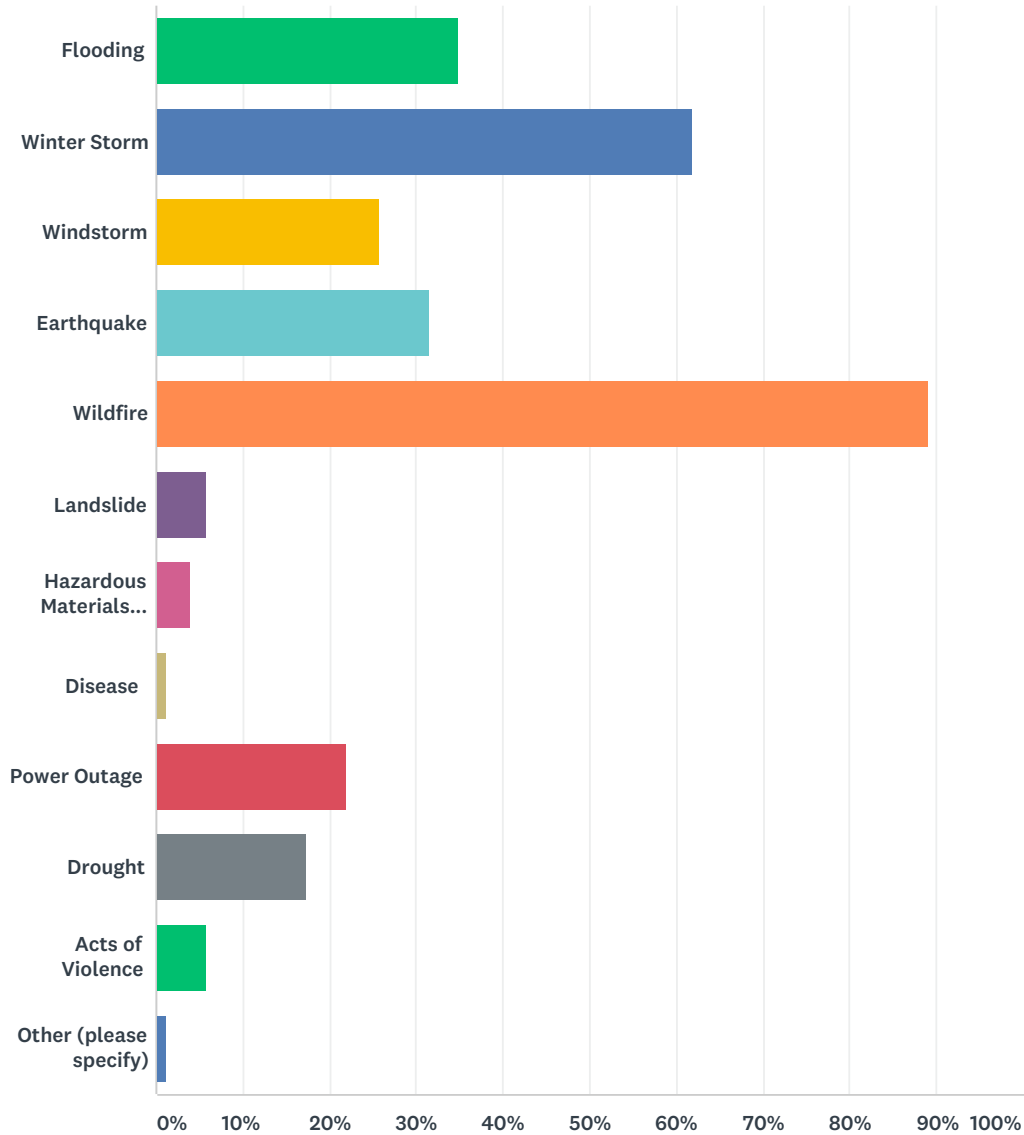
	MULTIPLE TIMES EACH YEAR	ABOUT ONCE PER YEAR	EVERY FEW YEARS	ONCE OR A FEW TIMES IN MY LIFETIME	NEVER	TOTAL
Flooding	5.41%	9.01%	33.33%	18.92%	33.33%	111
	6	10	37	21	37	

Storey County Hazard Mitigation Public Survey

Winter Storm	44.34% 47	17.92% 19	20.75% 22	7.55% 8	9.43% 10	106
Windstorm	43.93% 47	17.76% 19	14.95% 16	5.61% 6	17.76% 19	107
Earthquake	3.67% 4	13.76% 15	23.85% 26	28.44% 31	30.28% 33	109
Wildfire	10.62% 12	8.85% 10	21.24% 24	22.12% 25	37.17% 42	113
Landslide	0.92% 1	4.59% 5	4.59% 5	21.10% 23	68.81% 75	109
Hazardous Materials Accident	0.00% 0	1.83% 2	2.75% 3	9.17% 10	86.24% 94	109
Disease	0.00% 0	0.00% 0	2.78% 3	12.04% 13	85.19% 92	108
Power Outages	44.25% 50	31.86% 36	13.27% 15	4.42% 5	6.19% 7	113
Drought	8.93% 10	7.14% 8	54.46% 61	10.71% 12	18.75% 21	112
Acts of Violence	4.59% 5	5.50% 6	8.26% 9	23.85% 26	57.80% 63	109

Q5 Please selected the top THREE (3) hazards you think are the GREATEST THREAT to your community, considering both frequency of occurrence and potential for severe damage

Answered: 155 Skipped: 0



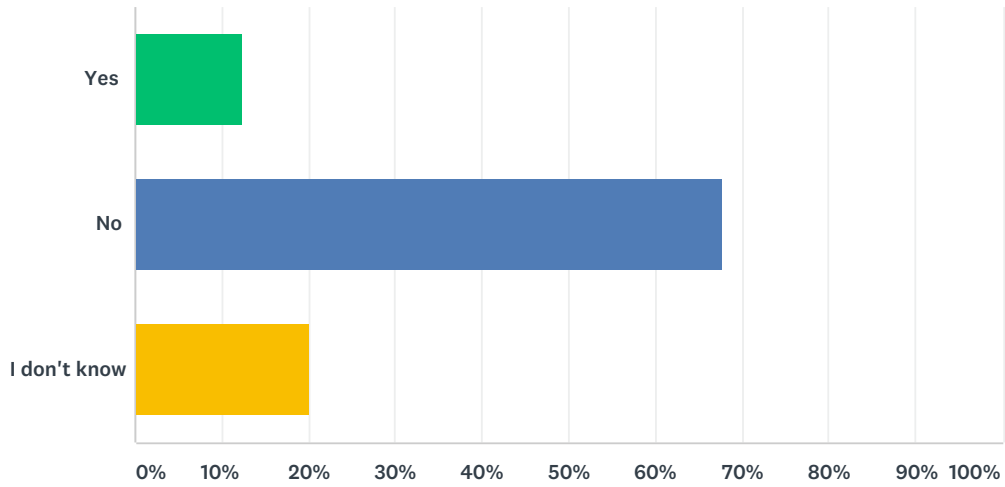
ANSWER CHOICES	RESPONSES	
Flooding	34.84%	54
Winter Storm	61.94%	96
Windstorm	25.81%	40
Earthquake	31.61%	49
Wildfire	89.03%	138
Landslide	5.81%	9

Storey County Hazard Mitigation Public Survey

Hazardous Materials Accident	3.87%	6
Disease	1.29%	2
Power Outage	21.94%	34
Drought	17.42%	27
Acts of Violence	5.81%	9
Other (please specify)	1.29%	2
Total Respondents: 155		

Q6 Is your home or business located in a designated floodplain or flood zone?

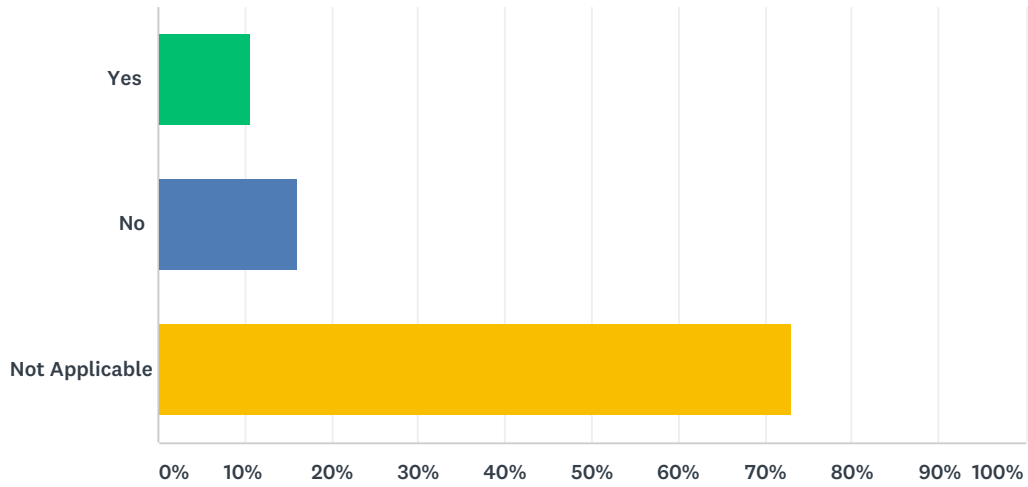
Answered: 155 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	12.26%	19
No	67.74%	105
I don't know	20.00%	31
TOTAL		155

Q7 If you responded 'Yes' to the above question, do you currently have flood insurance?

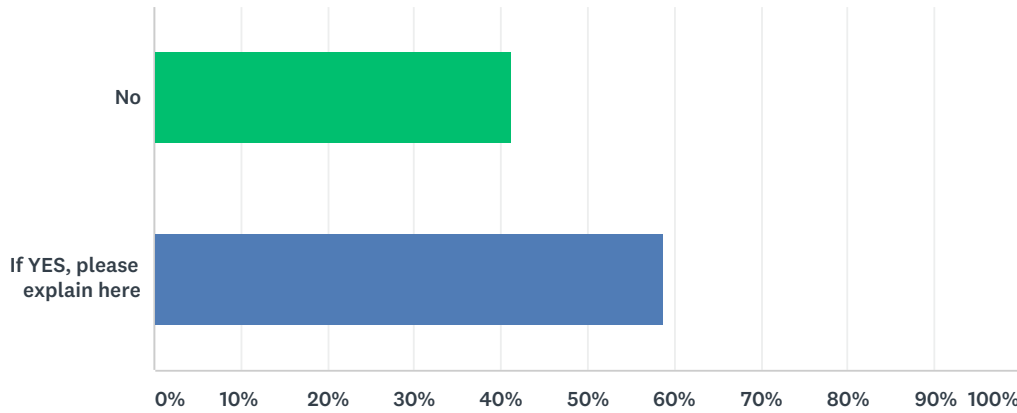
Answered: 130 Skipped: 25



ANSWER CHOICES	RESPONSES	
Yes	10.77%	14
No	16.15%	21
Not Applicable	73.08%	95
TOTAL		130

Q8 Have you taken actions to protect your home and/or business from impacts of hazards?

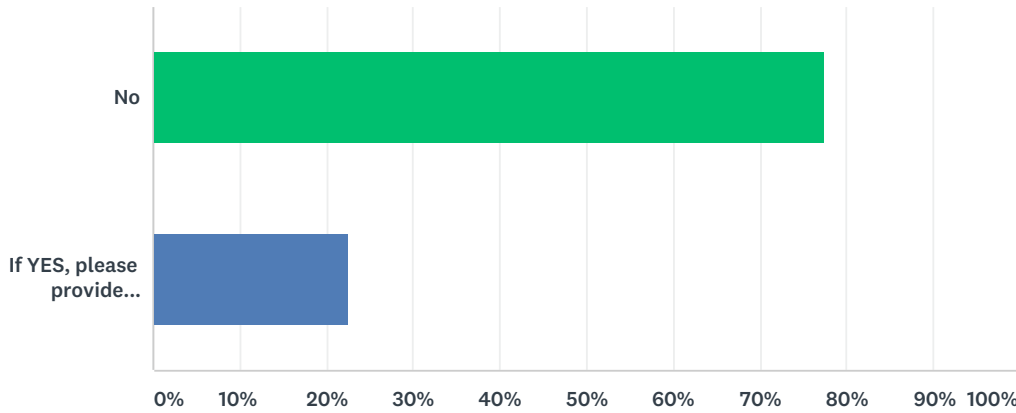
Answered: 153 Skipped: 2



ANSWER CHOICES	RESPONSES	
No	41.18%	63
If YES, please explain here	58.82%	90
TOTAL		153

Q9 Do you have project ideas for how to protect the community from the impacts of hazards?

Answered: 155 Skipped: 0



ANSWER CHOICES	RESPONSES	
No	77.42%	120
If YES, please provide additional detail on what you would like to see	22.58%	35
TOTAL		155

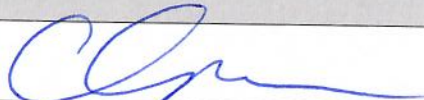





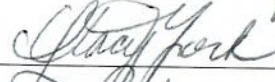
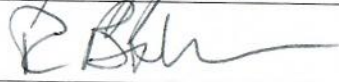
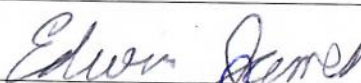
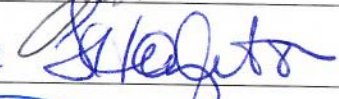
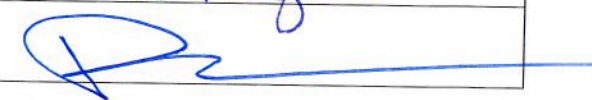
Q10 Are you interested in staying up to date with our progress? Provide your email address and we will provide you with updates and information about what you can do to help us!

Answered: 72 Skipped: 83

Appendix D
Meeting Agendas, Meeting Summaries, & Handouts

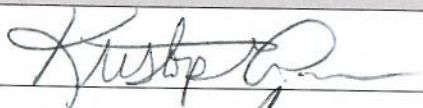

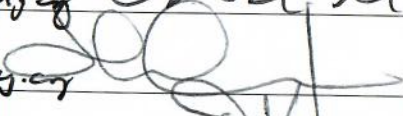

STOREY COUNTY LOCAL EMERGENCY PLANNING COMMITTEE

JULY 17, 2019 10:00 A.M.
Virginia City Conference Center
10 South E Street Virginia City, NV

NAME (PLEASE PRINT)	AGENCY	EMAIL	SIGNATURE
Chris Smallcomb	NWS	chris.smallcomb@noaa.gov	
Lauren Staffen	Quad-PMP	LStaffen@carson.org	
Jessica Rapp	"	JRapp@Carson.org	
Martin Azevedo	FIRE MARSHAL	—	
Alex Lanza	NDEP/CAPP	alanza@ndep.nv.gov	
Alyse Weyman	NDEP/BCA	aweyman@ndep.nv.gov	
Stacy York	Senior Services	sjork@storeycounty.org	
Rebecca Bodnae	NDEP/BCA	rebecca.bodnae@ndep.nv.gov	
Ed James	CWSD	edjames@cwso.org	
Stephanie Houghton	Walmart DC	Stephanie.Houghton@walmart.com	
Tom Becht	Walmar DC	Duane.becht@walmart.com	

STOREY COUNTY LOCAL EMERGENCY PLANNING COMMITTEE

JULY 17, 2019 10:00 A.M.
 Virginia City Conference Center
 10 South E Street Virginia City, NV

NAME (PLEASE PRINT)	AGENCY	EMAIL	SIGNATURE
Kristopher Paulk	AUECC	kristopher.paulk@ auecc.com.tw	
Shawn Dixon	SCFD	sdixon@storeycounty.org	
Cherie Nevin	Storey County	cherie@storeycounty.org	Cherie M. Nevin
Joe Curtis	SEEM	jcurtis@storeycounty.org	
Danielle Knight	AUECC	danielle.knight@ auecc.com.tw	
Marena Worley	NV Health Center		Teleconference
Jay Carmone	Storey County		Teleconference
Dan Hile	Barnick		Teleconference
Zane Beal	E & E		Teleconference

**Storey County 2020 Hazard Mitigation Plan Update
Project Kickoff Workshop**

Storey County 2020 Hazard Mitigation Plan Update

PROJECT KICKOFF WORKSHOP

DATE: Wednesday, July 17, 2019
TIME: 9:00am-12:00pm
LOCATION: Webinar Link to Follow

Thank you for participating in the kickoff workshop for the **update of the Storey County Hazard Mitigation Plan Update (HMP)**. The HMP is the document that guides the County and its partners in reducing risks and lessening the impact of disasters.

The County is required by law to update the HMP once every five years to be eligible for mitigation funding and your participation is critical to ensure that the HMP is informed by the latest information regarding local capabilities, as well as identifying actions to be taken to address ongoing risks. Given the recent flooding and fires that have impacted the region, it is also an opportunity to address changes in risk and development.

The County has engaged Ecology and Environment, Inc. (E & E) to facilitate the HMP update process including facilitation of this workshop. The kickoff will be a one-hour webinar that will focus on providing partners with an *overview of the planning process and outputs*, an interactive discussion to discuss *what has changed* since the last update, and establishment of *concrete action items* to move forward.

AGENDA:

Agenda Item	Description
Welcome	<i>Introductions to the E&E team and an opportunity to meet new faces</i>
Overview of the Planning Process, Purpose, and Requirements	<i>An introduction to mitigation planning and primer into desired project outcomes</i>
Talking Hazards	<i>A discussion around recent disaster impacts followed by an interactive hazard ranking activity</i>
BREAK	
Refinement of Plan Goals and Objectives	<i>Identification of recent changes in the region and reframing of regional goals, values, and priorities</i>
Planning for Public Engagement	<i>An open forum to share ideas about how we want to engage the public and ensure the updated HMP responds to their needs</i>
Next Steps and Key Action Items	<i>Establishing responsibilities moving forward and outlining future engagement</i>

**Storey County 2020 Hazard Mitigation Plan Update
Project Kickoff Workshop**

CONTACT INFORMATION:

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Storey County Emergency Management
(o) 775-847-0986
jcurtis@storeycounty.org

Zane Beall, E & E Project Manager
(o) 503-248-5600 x4622 | (c) 360-904-6828
zbeall@ene.com

NOTES:



Storey County 2020 Hazard Mitigation Plan Update

Project Kickoff Webinar

Wednesday, July 17 | 10am-11am | Webinar



Welcome and Introductions

- Name
- Organization/Department
- Did you participate in the last update of the Hazard Mitigation Plan?
 - What is keeping you up at night?

Meet the E & E Team



Matthew Lieuallen
Principal in Charge



Nicki Hurley
GIS Analyst



Zane Beall
Project Manager



Manique Talaia-Murray
Emergency Planner



Jessica Forbes-Guerrero
Deputy PM



Tyler Chatriand
Engineering Approach

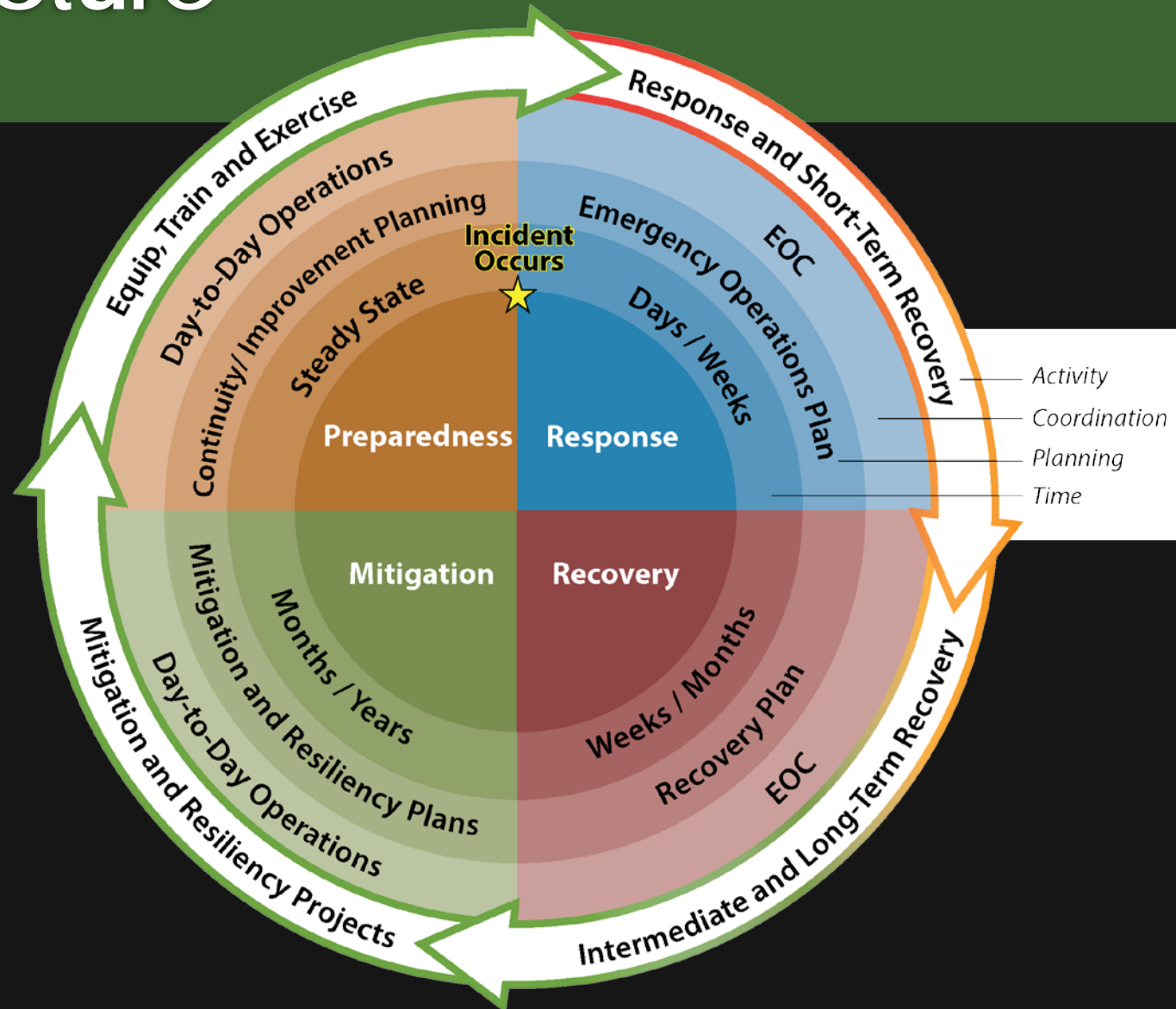
Meeting Objectives

- Overview of the Planning Process
- Validation of Hazards
- Refinement of Goals and Objectives
- Planning for Public Engagement
- Next Steps and Action Items



Why Do We Plan?

The Big Picture



Mitigation vs. Adaptation



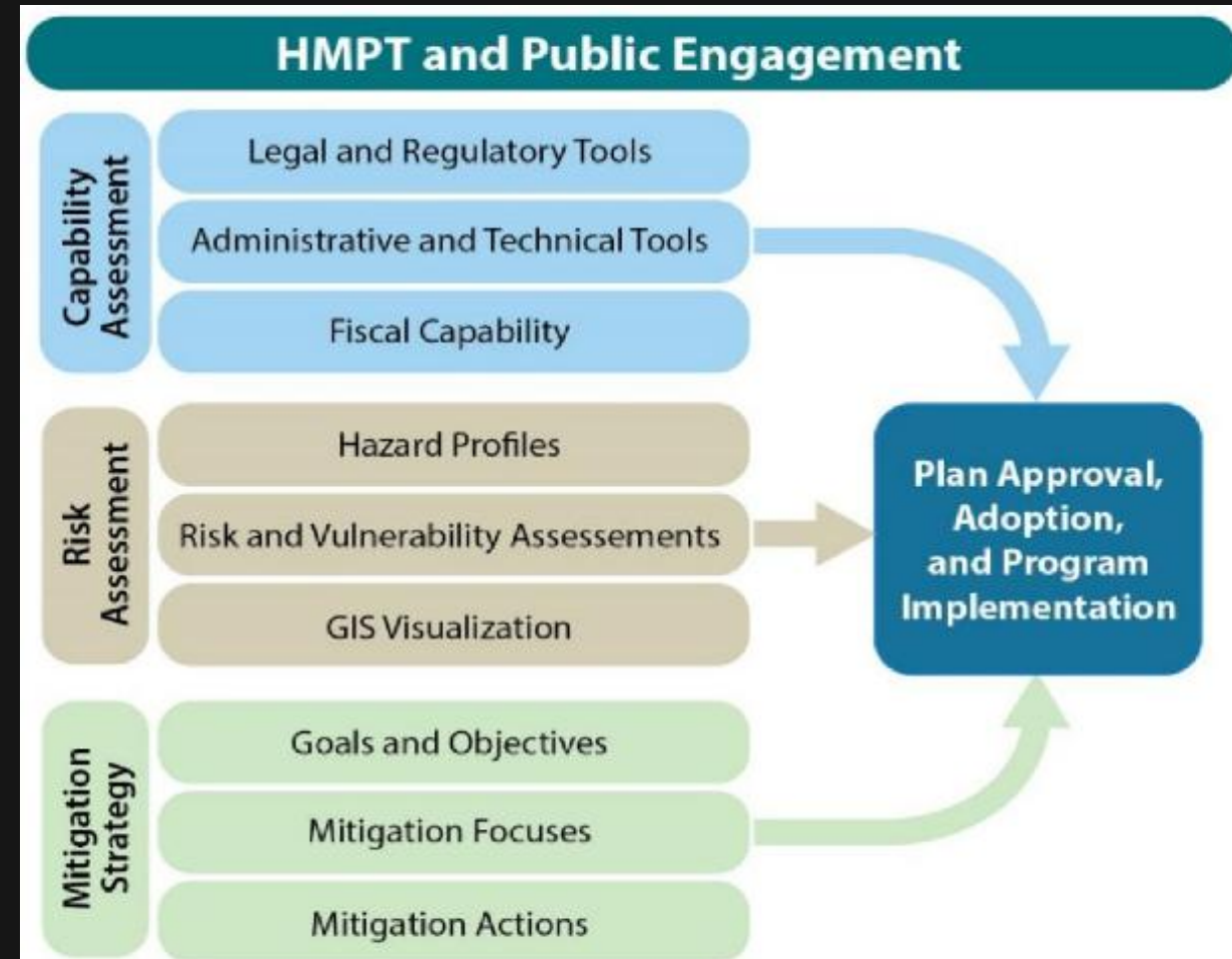
Thames Barrier, London



What's in the plan?

1. Introduction
2. Planning Process
3. Community Profile
4. Hazard Profiles and Vulnerability Assessments
5. Capability Assessment
6. Mitigation Strategy
7. Program Implementation

*Jurisdiction Annexes and Appendices



Whole Community Planning

- Understand complexity
- Recognize capabilities and needs
- Build relationships and partnerships
- Empower community action
- Strengthen community resilience



Review of 2015 Plan

2015 Goals

1. Promote increased and ongoing County involvement in hazard mitigation planning and projects.
2. Building and support local capacity to enable the public to prepare for, respond to, and recover from disasters.
3. Reduce the possibility of damage and losses due to earthquakes.
4. Reduce the possibility of damage and losses due to floods.
5. Reduce the possibility of damage and losses due to severe weather.
6. Reduce the possibility of damage and losses due to wildland fires.
7. Reduce the possibility of damage and losses due to hazardous material releases

Updated Mitigation Goals

Broad ideas aligning our vision for hazard mitigation success

- What do we want to do or where to do we want to be?
- What does hazard mitigation look like in Washoe County?
- Frame goals through risk reduction
- Think about community values
- Approach through an all-hazards lens



2015 Hazards of Concern

- Avalanche
- Drought
- Earthquake
- Epidemic
- Flood (including Dam Failure)
- Land Subsidence and Ground Failure
- Severe Weather (including Snow, Ice, Windstorm, Hail)
- Terrorism
- Wildland Fire

What is keeping you up at night now?

- Hazards
- Infrastructure concerns
- Locations
- Specific populations
- Other concerns?



Ranking Hazards

Each hazard includes information on the following:

- **Probability** - Likelihood of the hazard occurring.
- **Magnitude** - Areas potentially impacted, the overall impacts, and the chance of one hazard triggering another hazard, thus causing a cascading effect.
- **Frequency** - How often a hazard has resulted in an emergency or disaster.
- **Onset** - The time between recognition of an approaching hazard and when the hazard begins to affect the Tribe.
- **Duration** - The length of time the hazard remains active, the length of time emergency operations continue after the hazard event and the length of time that recovery will take.

Workshop #2 will focus on the specific impacts from each hazard

Measuring Risk

Rating	Probability	Magnitude	Frequency	Onset	Duration
1	Highly unlikely (0-10%)	No injuries or deaths expected, minimal property damage	Less than every 25 years	Greater than 30 days of warning	Only brief moments
2	Fairly unlikely (10-25%)	Between 1 and 5 injuries or deaths, minor property damage	10-25 years	5-30 days of warning	1-24 hours
3	Moderate (25-75%)	Between 5 and 25 injuries or deaths, moderate property damage	5-10 years	1-5 days of warning	Days to weeks
4	Likely (75-90%)	Between 25 and 50 injuries or deaths, severe property damage	1-5 years	1-10 hours of warning	Weeks to months
5	Highly likely (90-100%)	Greater than 50 injuries or deaths, catastrophic property damage	Once per year	No warning	Months to years

The Planning Output

	Magnitude (1=lowest, 5=highest)	Onset (1=slowest, 5=fastest)	Duration (1=shortest, 5=longest)	Frequency (1=lowest, 5=highest)		Average	Rank
Cascadia Earthquake	4.75	4.83	3.08	1.25		3.48	1
Earthquake	4.33	4.67	3.17	1.42		3.40	2
Disease	3.58	3.17	3.83	2.82		3.35	3
Power Outages	1.75	4.50	2.83	4.17		3.31	4
Wildfire	2.25	4.00	3.25	2.75		3.06	5
Windstorm	1.92	3.50	2.33	4.42		3.04	6
Winter Storm	2.00	3.25	2.75	4.00		3.00	7
Active Shooter	2.92	5.00	2.17	1.42		2.88	9
Hazardous Materials Accident	1.92	4.92	2.67	1.83		2.83	10
Landslide	1.50	4.42	2.58	2.67		2.79	11
Flooding	1.67	3.33	2.42	3.25		2.67	12
Tsunami	3.25	4.08	2.17	1.08		2.65	13
Drought	1.83	1.58	3.92	2.67		2.50	14

Changes in Vulnerability

- Describe changes in vulnerability
- Describe recent development trends in the region
- Discuss potentially new priorities
 - Added emphasis on land use changes
 - Decreased concern around certain hazards
 - New partners to engage and support



Activity

Public Engagement Strategy

Where do we meet the people?

- Two regional public meetings (Open House concept)
 - Building stories and photos into the plan
- Online engagement and plan review
 - Support E&E by posting on Facebook, etc.
- Engagement at community events

Which community events provide the best opportunity to engage the public?

Next Steps and Wrap Up

Future Meeting Topics

Meeting	Tentative Date	Topics
2	October 9, 2019	Determination of progress made on past mitigation actions, identification of new actions
3	November 20, 2019	Draft Plan Workshop
4	January 8, 2020	Final Plan Presentation

DATA NEEDS

- Lists of critical infrastructure
- Historic damage reports
- GIS data and/or contacts
- Risk studies and analyses
- Additional points of contact
- Status reports on past mitigation projects
- Related plans

*See data request form for additional detail



Contact Information

County Project Lead

Joe Curtis

775-847-0986

jcurtis@storeycounty.org

E & E Project Manager

Zane Beall

503-248-5600 x4622

zbeall@ene.com

Any Final Questions?



Storey County Local Emergency Planning Committee (LEPC)

Regular Meeting Minutes

Wednesday, July 17, 2019- 10:00 A.M.

Virginia City Conference Center

CALL TO ORDER

Meeting called to order by Chairman Curtis at 10:00 am

Members Present:

Alex Lanza	Nevada Division of Environmental Protection
Alyse Weyman	Nevada Division of Environmental Protection
Cherie Nevin	Storey County
Chris Smallcomb	National Weather Service
Dan Hile	Barrick (teleconference)
Danielle Knight	AUECC
Ed James	Carson Water Subconservancy District
Jay Carmona	Storey County Commissioner (teleconference)
Jessica Rapp	Quad County Public Health Preparedness
Joe Curtis	Storey County Emergency Management
Kristopher Paulk	AUECC
Lauren Staffen	Quad County Public Health Preparedness
Marena Works	Nevada Health Centers (teleconference)
Martin Avezedo	Storey County Community Development
Rebecca Bodner	Nevada Division of Environmental Protection
Shane Dixon	Storey County Fire Protection Dist
Stacy York	Storey County Senior Center
Stephanie Houghton	Wal-Mart DC
Tom Becht	Wal-Mart DC

GREETING AND OPENING REMARKS

Roundtable introductions of all those present.

PUBLIC COMMENT

Rebecca Bodner- NDEP Alyse Wyman does the Environmental Assistance Program. Runs the spill hotline. 6 Mile Canyon Road during Mercury testing. Test Subject Site. State of Nevada and EPA are doing soil testing. Talked about the project. Handouts. Cherie asked Rebecca to send some photos for socials. Chris asked if weather mattered for sampling. They prefer dry times. Looking for mercury, arsenic and lead.

APPROVAL OF APRIL 10, 2019 MEETING MINUTES

A motion was made to approve the April 10, 2019 Meeting Minutes by Tom Becht. This motion was seconded by Marena Works. Discussion was called for and none heard. All present in favor, motion carries.

HAZARD MITIGATION PLAN UPDATE

Zane Beall gave an overview of the planning process.
Send out hazard ranking sheet to all.

2019 TRAINING OPPORTUNITIES

Hazmat Drill
FireShowsWest

REVIEW OF GRANTS RECEIVED BY STOREY COUNTY LOCAL EMERGENCY PLANNING COMMITTEE

Cherie Nevin provided an overview of current grant and application submitting and being worked on.

Joe talked about future grant opportunities.

Fiscal Year 2020 State of Nevada Emergency Response Commission HMEP GRANT APPLICATION

Fire Shows West approval- motion by Stephanie Houghton, Tom Becht.
Quad County Hazmat Drill- motion to approve by Stacy York, 2nd Lauren Staffen.

EMERGENCY MANAGEMENT DIRECTORS REPORT

CASPER- Jessica Rapp gave overview. Door to door survey 30 census blocks and 7 houses in the blocks. Ask emergency preparedness questions. 210- 168 to be valid. CDC survey parameter. Joe- NV Energy rolling blackouts for durable medical equipment.

Silver Crucible Statewide Exercise- terrorism related. Storey County will be involved.

October 5 Hazmat Exercise

Cooperating Local Emergency Planning Committee Members Report on Activities

- Stephanie- 3rd Annual First Responders Luncheon on August 21
- Stacy- have a database for Seniors who have DME. Lauren helpful info for planning concerns.
- Shane- fire season is here. Fuels work is done for summer. Will start back up in the Fall.
- Lauren- CASPER in early September 4-13. Water Distribution Exercise at National Night Out on August 6. Healthcare Coalition doing a walkthrough for the Night in the County event next week. See the setup and MCI planning. Bleed Control Kits have been distributed and installed. Continue to do Family Assistance and Resiliency Planning process. Mental Health First Aid Train the trainer course- focus on Public Safety on October 14-18. Will be trained to give an 8hr course once certified.
- Elyse- NDEP Environmental Assistance Program Coordinator. Talked about spill reporting and response and recovery.
- Alex- CAP NDEP- here to reach out.
- Chris Smallcomb- NWS presented a handout. Fire Station 71 is the reporting site for VC. Fire weather products that they provide. Changing monsoon moisture next week. Extreme Red Flag Warning. Shane asked who runs the Tahoe Alert Cams- they don't run them but they use them. First responders can get access.
- Martin- Fire Marshal- have some companies coming in that will have hazardous materials. Fulcrum BioEnergy- garbage to jet fuel. Willing to have training at their facility. AUECC- moving along will have chemicals onsite. Rise Renewables- taking raw material like vegetables and making fuel out of that. Tesla. More coming in and lots of ongoing projects. Better reports at the next meeting. Elyse- community engagement

receiving complaints and concerns. Provide more info to her on stuff so that they can be in the communication loop. Danielle- transparency from the private sector in what they are doing.

- Danielle- AUECC. Working on proper permitting and personnel training. Ensuring communications. 4 CAP Chemicals- permit to construct under review and then permit to operate. Air Permit. Water attempting to be zero wastewater facility. Working with Washoe hospitals to make sure that they have protocols in place. Danielle would like to come to Quad County Coalition Meeting and speak about their process and protocol.
- Jay- communications for Six Mile Canyon. Radio equipment. Joe said communication on that fire was no cell service in the area. A cell site in the area would be good. Jay will look into this. Cell extender.

Review any Hazardous Materials Incidents that have occurred since the last meeting

Nothing of significance.

PUBLIC COMMENT

ADJOURNMENT

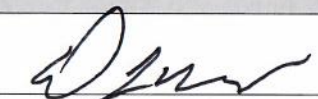




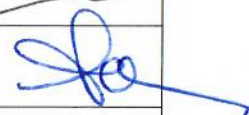
Motion to adjourn 12:03 Stephanie. 2nd by Tom

Please note that these minutes are not verbatim and are presented in summary format. These are draft minutes and will be submitted for approval at our next LEPC meeting.

Respectfully Submitted by: Cherie Nevin

STOREY COUNTY LOCAL EMERGENCY PLANNING COMMITTEE

OCTOBER 9, 2019 10:00 A.M.
Virginia City Conference Center
10 South E Street Virginia City, NV




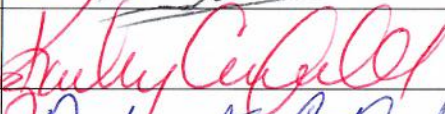
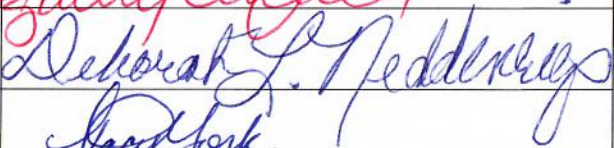
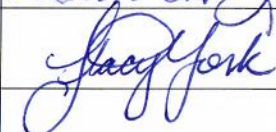
NAME (PLEASE PRINT)	AGENCY	EMAIL	SIGNATURE
DAUG BALLAN	SC Communications	dballan@storeycounty.org	
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STOREY COUNTY LOCAL EMERGENCY PLANNING COMMITTEE

OCTOBER 9, 2019 10:00 A.M.

Virginia City Conference Center

10 South E Street Virginia City, NV

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Storey County Hazard Mitigation Plan Update

MITIGATION WORKSHOP

DATE: Wednesday, October 9, 2019
TIME: 10:30am-12:00pm
LOCATION: Virginia City Conference Center, 10 South E Street, Virginia City, NV 89440

Thank you for participating in the Hazard Mitigation Planning Team Meeting #2 for the **Storey County Hazard Mitigation Plan Update (HMP)**.

MEETING PURPOSE:

This meeting builds on the concepts discussed in the prior planning meeting. We will discuss the updated hazard rankings, mitigation goals, and begin the process of developing comprehensive mitigation strategies to reduce risks to community members and their property. Participants will be provided with example mitigation strategies and will work as a group to build out additional strategies.

AGENDA:

1. Welcome and Introductions (3 minutes)
2. Review of Risk Assessments (5 minutes)
3. Review of Mitigation Goals (15 minutes)
4. Review of Capability Assessment Worksheet (10 minutes)
5. Review of 2015 Mitigation Actions (25 minutes)
6. Mitigation Strategies Exercise (20 minutes)
7. Review of Mitigation Action Worksheet (10 minutes)
8. Next Steps (2 minutes)

NEXT STEPS:

Please return the completed Capability Assessment Worksheet and Mitigation Action Worksheet to Alyssa Russell by October 30, 2019.

Alyssa Russell , Ecology and Environment, Inc.
(o) 716-684-8060 x4506 | (c) 225-323-0438
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NOTES:

Storey County 2020 Hazard Mitigation Plan Update

Meeting #2 – Mitigation Strategies

Wednesday, October 9 | 10:30am – 12:00pm | Virginia City Conference Center



Welcome and Introductions

- Name
- Organization/
Department

Meet the E & E Team



Matthew Lieuallen
Principal in Charge



Nicki Hurley
GIS Analyst



Alyssa Russell
Project Manager



Manique Talaia-Murray
Emergency Planner

Meeting Objectives

- Validate hazard rankings
- Refine mitigation goals
- Review capability assessment and mitigation action worksheets
- Review 2015 mitigation actions
- Mitigation strategies exercise
- Next steps and action items



What Have We Been Up To?

- Project Kickoff Workshop (July 17, 2019)
- Hazard Identification and Ranking
- Community Outreach
- Plan Development
- Process Documentation

Framing Through Risk

Hazard Rankings

Storey County - 2020 Hazard Rankings							
<i>Hazard Type</i>	<i>Magnitude (1=lowest, 5=highest)</i>	<i>Frequency (1=lowest, 5=highest)</i>	<i>Onset (1=slowest, 5=fastest)</i>	<i>Duration (1=shortest, 5=longest)</i>		<i>Average</i>	<i>Rank</i>
Wildland Fire	3.71	4.43	4.29	4.14		4.14	1
Earthquake	4.29	2.86	4.86	3.57		3.89	2
Hazardous Materials Event	3.00	3.14	4.86	3.43		3.61	3
Flood	3.43	3.71	3.86	3.14		3.54	4
Severe Weather (Snow, Ice, Wind, Hail)	3.00	3.86	3.29	3.29		3.36	5
Terrorism	3.71	1.43	5.00	3.14		3.32	6
Caving Ground (Mine Collapse)	3.00	2.14	5.00	2.71		3.21	7
Drought	2.00	4.00	2.00	4.43		3.11	8
Epidemic	2.86	1.86	3.29	3.29		2.82	9
Avalanche	2.14	1.57	4.14	1.86		2.43	10

Hazard Rankings - Comparison

Storey County - 2015 Hazard Rankings	
<i>Hazard Type</i>	<i>Rank</i>
Wildland Fire	1
Flood	2
Severe Weather (Snow, Ice, Wind, Hail)	3
Earthquake	4
Caving Ground (Mine Collapse)	5
Terrorism	6
Hazardous Materials Event	7
Drought	8
Epidemic	8
Avalanche	9

Storey County - 2020 Hazard Rankings		
<i>Hazard Type</i>	<i>Average</i>	<i>Rank</i>
Wildland Fire	4.14	1
Earthquake	3.89	2
Hazardous Materials Event	3.61	3
Flood	3.54	4
Severe Weather (Snow, Ice, Wind, Hail)	3.36	5
Terrorism	3.32	6
Caving Ground (Mine Collapse)	3.21	7
Drought	3.11	8
Epidemic	2.82	9
Avalanche	2.43	10

Linking Strategies to Risk

- Start with a problem statement. What are we trying to fix?
- How does the strategy address the prioritized hazards?
- Do specific properties need strategies developed for them?

Review of Mitigation Goals

2015 HMP Goals

- **Goal 1:** Promote increased and ongoing involvement in hazard-mitigation planning and projects.
- **Goal 2:** Build and support local capacity to enable the public to prepare for, respond to, and recover from disaster.
- **Goal 3:** Reduce the possibility of damage and losses due to earthquakes.
- **Goal 4:** Reduce the possibility of damage and losses due to flood and flash floods.
- **Goal 5:** Reduce the possibility of damage and losses due to severe weather.
- **Goal 6:** Reduce the possibility of damage and losses due to wildland fires.
- **Goal 7:** Reduce the possibility of damage and losses due to hazardous materials release.

Updated 2020 HMP Goals

- Do any of the 2015 HMP goals address our 2020 risk assessment?
- Have priorities shifted that necessitate new goals?
- What goals are most critical for the upcoming 5-year planning period?

Capabilities Assessment

Identifying Capabilities

- What hazards are you most concerned about that would impact your ability to provide your essential functions?
- What would you consider your biggest vulnerability to those hazards?
- What would you consider your biggest strength is in being resilient to hazard events?

Identifying Capabilities

- What **plans and policies** do you have in place to support risk reduction?

Plans and Policies	
Plans	Policies and Regulations
<ul style="list-style-type: none">➤ Department Hazard Mitigation Plan or Hazard Analysis➤ Department Emergency Operations or Emergency Response Plan➤ Floodplain Management Plan➤ Land Use Plan➤ Stormwater Management Plan➤ Continuity of Operations Plan or Business Continuity Plan➤ Capital Improvements Plan	<ul style="list-style-type: none">➤ Zoning Ordinance➤ Flood Damage Prevention Ordinance➤ Mutual Aid or Other Mutual Assistance Agreements➤ National Flood Insurance Program➤ Community Rating System➤ Building Code➤ Fire Code

Identifying Capabilities

- What staff and equipment do you have in place to support risk reduction?

Staff and Equipment Capability	
Staff	Equipment
<ul style="list-style-type: none">➤ Planners with knowledge of land development and land management practices➤ Engineers or professionals trained in construction practices related to buildings and/or infrastructure➤ Planners or engineers with an understanding of natural and/or human-caused hazards➤ Emergency manager➤ Floodplain manager➤ Scientist familiar with hazards of the area➤ Staff with education or expertise to assess vulnerability to hazards➤ Personnel skilled in Geographic Information Systems (GIS)➤ Resource development staff or grant writers	<ul style="list-style-type: none">➤ Damage assessment tool➤ Sandbagging machine➤ Snow plows➤ Generators➤ Communication devices➤ Personal Protective Equipment (PPE), such as hearing protective devices (earplugs, muffs), hard hats, respirators, gloves, eye protective devices (goggles), full body suits➤ Shelters➤ Utility fleet

Identifying Capabilities

- What **fiscal mechanisms** do you have in place to support risk reduction?

Fiscal Capability

- Capital Improvement Program
- Community Development Block Grants (CDBG)
- Special Purpose Taxes (or taxing districts)
- Utility Fees
- Development Impact Fees
- General Obligation, Revenue, and/or Special Tax Bonds
- Partnering arrangements or intergovernmental agreements

Mitigation Action Planning

Looking Back at 2015

- What is the status of the 2015 mitigation actions?
 - Completed, altered, ongoing, carryover, cancelled

*Refer to 2015 Mitigation Actions

Mitigation Action Exercise

Activity Logistics

- In small groups, brainstorm potential mitigation strategies for the upcoming 5-year planning period (15 minutes)
- Create a comprehensive list of mitigation strategies resulting from activity (5 minutes)
- Narrow, validate, and form final list of mitigation strategies for the 2020 HMP update (5 minutes)

Developing Effective Strategies

SMART actions!

- *Specific* – target a specific area for improvement
- *Measurable* – quantify or at least suggest an indicator of progress
- *Assignable* – specify who will do it
- *Realistic* – state what results can be achieved realistically, given available resources
- *Time-related* – specify when the result(s) can be achieved

Mitigation Action Worksheet

Mitigation Actions

1. CONTACT INFORMATION

2. IDENTIFY THE PROBLEM

3a. IDENTIFY THE MITIGATION ACTION

3b. IDENTIFY MITIGATION ALTERNATIVES

4. ACTION STATUS

- **New** – The action is new and will be included for the first time in the 2020 plan update.
- **Existing** – The action was implemented prior to the 2020 plan update, but is ongoing and additional or ongoing action is required for completion.
- **Complete** – The action has been completed.

Mitigation Actions

5. TYPE OF ACTION

- ***Plans and Regulations*** – Regulatory actions or planning processes that reduce vulnerability to hazards
- ***Infrastructure/Capital Project*** – Actions that involve modification of existing buildings or structures to protect them from a hazard, or removal from the hazard area
- ***Natural Systems Protection*** – Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems
- ***Education and Awareness*** – Actions to inform and educate residents, elected officials, and property owners about hazards and potential ways to mitigate them.
- ***Preparedness and Response*** – Actions that protect people and property during and immediately after a hazard or hazard event.

Example Strategies

- Plans and Regulations
 - Develop land use standards for new development
 - Identify updated floodplains
 - Map cell towers in the area
- Infrastructure/Capital Project
 - Build updated and enhanced culvert/bridge/road
 - Assess and retrofit acclimation pond
- Natural Systems Protection
 - Restrict development in sensitive habitats
 - Remove identified contaminants from streambeds

Example Strategies (cont.)

- Education and Awareness
 - Develop continuous public education program
 - Identify opportunities to integrate community partners into the County's mitigation program
 - Strengthen awareness of health systems/disease prevention
- Preparedness and Response
 - Preposition supplies needed for utility restoration efforts
 - Conduct an earthquake damage repair planning exercise
 - Prepare for water supply and utility system threats resulting from drought

Mitigation Actions

6. GOALS SUPPORTED

7. HAZARDS ADDRESSED

8a/b. LEAD/SUPPORT DEPARTMENT ORGANIZATION

- Government agencies
- Regional agencies
- Others?

Mitigation Actions

9a. TIMELINE FOR IMPLEMENTATION

- Immediate
- >1 Year
- 1-3 Years
- 3-5 Years

9b. LIFE OF ACTION

- Temporary
- Short-Term
- Long-Term

Mitigation Actions

10a/10b/10c. ANTICIPATED COST/FUNDING
AVAILABILITY/FUNDING SOURCE



Mitigation Actions

11. STAPLEE PRIORITIZATION + MITIGATION EFFECTIVENESS

S: Is it Socially acceptable?

T: Is it Technically feasible and potentially successful?

A: Does the responsible state agency/department have the Administrative capacity to execute this action?

P: Is it Politically acceptable?

L: Is there Legal authority to implement?

E: Is it Economically beneficial?

E: Will the project have either a neutral or positive impact on the natural Environment? (score a 3 if positive impact, 2 if neutral impact)

Will historic structures or key cultural resources be saved or protected?

Could it be implemented quickly?

Next Steps and Wrap Up

Next Steps

- Provide completed worksheets (capability assessment and mitigation actions) by **October 30, 2019**
- Draft Plan released in **November 2019**
- Draft Plan Workshop on **November 20, 2019**

What Can I Do?

- Submit mitigation action worksheet
- Review draft plan once available
- Participate in upcoming workshop

Contact Information

County Project Lead

Joe Curtis

jcurtis@storeycounty.org

E & E Project Manager

Alyssa Russell

arussell@ene.com

**Storey County 2020 Hazard Mitigation Plan Update
Mitigation Strategies Workshop**

Storey County 2020 Hazard Mitigation Plan Update

MITIGATION STRATEGIES WORKSHOP

DATE: Wednesday, October 9, 2019
TIME: 11:00 a.m. – 12:15 p.m.
LOCATION: Virginia City Conference Center

ATTENDEES: *See Attachment*

SUMMARY:

The Hazard Mitigation Planning Team (HMPT) hosted the second HMPT meeting on October 9, 2019. This HMPT meeting served to validate hazard rankings, form mitigation goals, introduce the capabilities assessment worksheet, and brainstorm mitigation actions the County intends to take within the next five years to decrease risk to hazards. Ecology and Environment, Inc. (E & E) facilitated stakeholders through the workshop.

Welcome and Introductions

Joe Curtis, County Emergency Manager and Director of the Local Emergency Planning Committee (LEPC), thanked the group for coming to the meeting and initiated the LEPC regular meeting. He informed members that the second half of the meeting would be used as a workshop for the Hazard Mitigation Plan (HMP) 2020 update.

LEPC Meeting

See attachment for official meeting minutes for the LEPC portion of the workshop. A short summary is provided below:

- General Comments:
 - State Emergency Response Commission (SERC) grants are delayed.
 - Community Assessment for Public Health Emergency Response (CASPER) surveys are underway.
 - Being undertaken as a part of Quad County Public Health preparedness.
 - Results will be incorporated into the HMP when available.
 - The survey helps reveal health vulnerabilities in the community that the County would need to be prepared for during emergencies.
 - TRI Partners
 - Asia Union Electronic Chemical Corporation (AUECC)
 - Walmart
 - Emergency exercises
 - Silver Crucible scheduled for November 12. Be prepared to participate.
 - National Weather Service (NWS)
 - The “Blob,” which is associated with dryer than average winters is one of the considerations we are taking into account.

Storey County 2020 Hazard Mitigation Plan Update Mitigation Strategies Workshop

- USGS Stream Flow Gauge Data shows more water in the system than normal in late September/early October, which means it may not take a big winter to have flooding impacts.
- Red Flag Warning for Fire. There were only 5 issued in Summer 2019, which is fewer than usual (normally about 14).
- The winters of 2017 and 2019 are examples of high precipitation seasons. There is a lot moisture left over from these years that factors into the current conditions.
- There is the lake effect snow off Pyramid.
- Could partner with NWS on outreach and education concerning winter weather in the I-80 corridor.
- Lack of weather monitoring in the TRI area. Weather stations in industrial center.
- Department/Stakeholder updates:
 - Health
 - Quad County Healthcare Coalition
 - Quad County Public Health Preparedness
 - Local Emergency Planning Committee
 - Resilience Center Planning
 - Medical Countermeasures and POD Planning
 - Flu Clinics
 - CASPER Survey (179 responses)
 - Mental Health First Aid Training
 - Fire
 - Adding staff to the HazMat Technician Class.
 - Fire suppression and fuels management (open burning season starts soon).
 - NVEnergy
 - Installing weather stations on power poles in Northern Nevada (putting one in Storey County). 25 for the Northern Nevada area that will feed data into the NOAA system and monitor wind, wind gusts, ground saturation.
 - Storey County is not in the Tier 3 area for planned power outages. The Highlands likely falls into Tier 2. These areas are focused on hardening (wood to metal poles, vegetation management) as opposed to de-energization.
 - Communications
 - Phone and radio upgrade underway.
 - 911 system upgrade – NextGen. Text and video to 911 is around the corner.
 - Public Works
 - Heavy equipment
 - Information Technology
 - N/A
 - County Manager
 - Special Use Permit Process. Process to mitigate impacts of hazardous materials process.

- Planning ongoing exercises with facility.
- Creating a Water Resources Plan to look at above and below ground water resources.
- Community Development
 - HazMat Drill at AEUCC.
- Nevada Highway Patrol (NHP)
 - One area problematic with communications (Lyon 4, 5, and 6).
 - 100-foot tower that is built. NDOT working on solar array. Infrastructure is in place to light it up.
 - Interstate 80 issue – 9 car pileup this week. Would be useful to pull information on who accident victims are employed by in order to be able to message specifically to them regarding risks.
 - Getting two more troopers.
- FEMA/USACE Meetings
 - Review of local emergency planning documents.
 - FEMA Region IX – trying to identify different community concerns.
 - Planning has identified different flooding issues, earthquakes, fires.
- State
 - Hazard mitigation grant period is open.

2020 HMP Update

Project Update / Hazard Rankings

Alyssa Russell with E & E introduced the purpose of this workshop, which is to identify and begin the process of framing mitigation actions that will reduce hazard risks and reviewed the workshop agenda.

Alyssa provided a status update on the project. The project team has been building out the risk assessment sections of the plan based on information the planning team provided in HMPT Meeting #1. Participants reviewed the results of the hazard rankings, agreed that the results were as expected, and concurred with the findings.

Review of HMP Goals

Alyssa reviewed the HMP goals from 2015 and encouraged participants to consider the 2020 hazard rankings and risks as they developed goals for the 2020 plan update. In small groups, participants brainstormed ideas for mitigation goals. Participants brought their ideas to the group, and together the planning team formed a comprehensive list of mitigation goals for 2020.

Goals from the 2015 HMP include:

- Goal 1: Promote increased and ongoing involvement in hazard-mitigation planning and projects.
- Goal 2: Build and support local capacity to enable the public to prepare for, respond to, and recover from disaster.
- Goal 3: Reduce the possibility of damage and losses due to earthquakes.
- Goal 4: Reduce the possibility of damage and losses due to flood and flash floods.

Storey County 2020 Hazard Mitigation Plan Update Mitigation Strategies Workshop

- Goal 5: Reduce the possibility of damage and losses due to severe weather.
- Goal 6: Reduce the possibility of damage and losses due to wildland fires.
- Goal 7: Reduce the possibility of damage and losses due to hazardous materials release.

Draft goals for the 2020 HMP include:

- Goal 1: Adopt an all-hazard approach to risk reduction in the community that considers both the natural and human environment.
- Goal 2: Establish a culture of risk reduction and mitigation in the County through effective communication, outreach, and education.
- Goal 3: Build community capacity and relationships to foster successful planning and implementation of mitigation strategies.

Draft objectives for the 2020 HMP include:

- Goal 1
 - Objective 1: Enhance cyber security to combat threats of cyber terrorism and align with state and federal goals.
 - Objective 2: Develop strategies that reflect the County's geographic/transportation constraints and the County's ability to respond to emergencies due to issues of access.
- Goal 2
 - Objective 1: Build resiliency into communication networks. Build in redundancies and reduce dependencies.
 - Objective 2: Target hard-to-reach populations, such as the elderly, when exploring avenues for disseminating information related to emergencies.
- Goal 3
 - Objective 1: Strengthen strategic partnerships through Quad County relationships and through fostering public-private partnerships.
 - Objective 2: Identify methods and mechanisms for increasing funding for mitigation strategies. Utilize public-private partnerships to boost financial investment in the community. Explore opportunities with conservation districts and potential funding mechanisms available through those relationships.
 - Objective 3: Enhance information retention and knowledge transfer.

Capabilities Assessment

Matthew Lieuallen of E & E introduced the capabilities assessment and the importance of identifying local capabilities (plans, policies, staff, equipment, fiscal mechanisms) that are available to advance mitigation strategies. Matthew walked through the capabilities assessment worksheet and informed participants that they would receive a copy via email in the upcoming days to complete.

Mitigation Action Planning

Due to time constraints, the planning team decided to postpone review of the 2015 mitigation actions. Follow-up actions will be taken after the meeting to obtain a status update on the 2015 mitigation actions.

Storey County 2020 Hazard Mitigation Plan Update Mitigation Strategies Workshop

Alyssa introduced the mitigation strategies exercise. Alyssa discussed the process of developing actions, including the need to use SMART criteria (Specific, Measurable, Actionable, Realistic, and Time-related). Ideally, strategies should be able to reach significant milestones within five years, so that they can be revisited and adjusted during the next plan update. Participants divided into small groups to brainstorm ideas for 2020 mitigation actions. Alyssa informed participants that they would receive a copy of the mitigation action worksheet via email in the upcoming days to complete.

2020 Mitigation Action Brainstorming:

- Public health targets planning, training, and relationship building.
- Public outreach to residents regarding mitigation actions that individuals, families, and businesses can take.
- Holistic communication strategy. Currently there is no media that specifically serves Storey County, and many methods such as social media do not target the elderly population. Need communication/media/outreach that is all-inclusive and considers the micro-climate of Storey County when interpreting weather data of surrounding areas.
- Need to hire a fulltime emergency manager.
- In terms of flooding in the Lockwood Creek area, there is a need to review flood mapping documentation and data to understand if the current FEMA mapping is accurate for present conditions. The outcome of this assessment will help determine what areas are vulnerable to impacts and help identify options to mitigate risks.
- Establish fiscal mechanisms for hazard mitigation.
- Integrate mitigation into strategic/capital planning efforts.
- Establish methods of knowledge transfer and how to address staffing issues.
- Identify grant/funding opportunities to leverage smaller budgets.

Action items / next steps:

- Provide completed capabilities assessment worksheets and mitigation action worksheets to the E & E team for incorporation in the HMP.
- The draft plan is anticipated to be released in November 2019.
- The draft plan workshop is scheduled for November 20, 2019.

CONTACT INFORMATION:

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Alyssa Russell, E & E Project Manager
Ecology and Environment, Inc.
arussell@ene.com



Hazard Mitigation Plan

**Storey County
2020**

Mitigation Workshop Packet

Packet Contents

1. 2020 Preliminary Hazard Rankings
2. Mitigation Goals
3. Capabilities Assessment Worksheet Instructions
4. Capabilities Assessment Worksheet
5. 2015 Mitigation Actions Check-in
6. Workshop Exercise – 2020 Mitigation Actions
7. Mitigation Action Worksheet Instructions
8. STAPLEE Overview
9. Mitigation Action Worksheet

HAZARD MITIGATION TOOLKIT

Hazard Rankings

During the first Hazard Mitigation Plan meeting on July 17, 2019, the Planning Committee members were tasked with prioritizing local hazards by their total impact in the community. An exercise requiring the committee to complete a form which tabulated their ratings of each hazard was accomplished. The following hazard prioritization is the result of this exercise.

Please consider these results *preliminary* and *draft*, as input is still being collected from Planning Committee members. The list below may be reordered based on the additional forms received between now and the October 9, 2019 planning meeting. For the October 9, 2019 planning meeting, be prepared to review the hazard ranking results and discuss as a group.

Preliminary and Draft

Storey County - 2020 Hazard Rankings							
Hazard Type	Magnitude (1=lowest, 5=highest)	Frequency (1=lowest, 5=highest)	Onset (1=slowest, 5=fastest)	Duration (1=shortest, 5=longest)		Average	Rank
Wildland Fire	3.71	4.43	4.29	4.14		4.14	1
Earthquake	4.29	2.86	4.86	3.57		3.89	2
Hazardous Materials Event	3.00	3.14	4.86	3.43		3.61	3
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Drought	2.00	4.00	2.00	4.43		3.11	8
Epidemic	2.86	1.86	3.29	3.29		2.82	9
Avalanche	2.14	1.57	4.14	1.86		2.43	10

HAZARD MITIGATION TOOLKIT

Mitigation Goals

When planning for Storey County’s 2020 mitigation goals and strategies, consider the County’s 2015 mitigation goals. Should any goals from the 2015 Hazard Mitigation Plan be carried over into the planning process for the upcoming 5-year period? Have priorities shifted that necessitate new goals? Do goals align with the results of the 2020 hazard rankings?

2015 Goals	2020 Goals
Goal 1 Promote increased and ongoing involvement in hazard-mitigation planning and projects	
Goal 2 Build and support local capacity to enable the public to prepare for, respond to, and recover from disasters	
Goal 3 Reduce the possibility of damage and losses due to earthquakes	
Goal 4 Reduce the possibility of damage and losses due to flood and flash flood	
Goal 5 Reduce the possibility of damage and losses due to severe weather	
Goal 6 Reduce the possibility of damage and losses due to wildland fires	
Goal 7 Reduce the possibility of damage and losses due to hazardous materials release	

HAZARD MITIGATION TOOLKIT

Capability Assessment Worksheet Instructions

1. **Think about hazard mitigation in the context of your departmental/organizational mission and essential functions.** Not all hazards impact your operations in the same way and you may be uniquely vulnerable to certain hazards (e.g., facilities known to be in a hazard zone), or uniquely prepared for others (e.g., backup generators during a power disruption). You also might have functions that are specific to a particular hazard (e.g., public health’s responsibility during a disease outbreak, or the fire department’s role in fire prevention and suppression). This analysis also creates an important link between your department/organization’s approach to hazard mitigation (how we reduce our risk) and continuity of operations (how we maintain our essential functions during a disruption). Based on this exercise, answer the following two questions for your department/organization:
 - a. What hazards are you most concerned about that would impact your ability to provide your essential functions?
 - b. What would you consider your **biggest vulnerability** to those hazards?
 - c. What would you consider your **biggest strength** in being resilient to hazard events?

2. **Think about what capabilities do you have to create a more resilient department organization to hazards and threats.** All partners in the community’s hazard mitigation have a role in reducing vulnerability to hazards. That may come in the form of *policies* (e.g., policies restricting development in hazard zones), *plans* (e.g., strategies or operational plans to address hazards and threats), specialized *staff* (e.g., engineers, geospatial professionals), specialized *equipment or systems* (e.g., damage assessment tool, sandbagging machine), and *fiscal mechanisms* to support risk reduction (e.g., fees, grants). Based on this exercise answer the following questions for your department/organization:
 - a. What **plans and policies** do you have in place to support community risk reduction?
 - b. What **staff and equipment** do you have in place to support community risk reduction?
 - c. What **fiscal mechanisms** to you have in place to support risk reduction?
 - d. What **actions have you taken in the last 5 years** (since the last plan update) to build these capabilities?

Table 1 provides examples of plans and policies, staff and equipment, and fiscal mechanisms to support risk reduction. This list is not intended to be all-inclusive—please provide feedback on any asset or capability you think is appropriate.

3. **Think about your answers to the first two exercises—what strategies or actions might you propose to build on your existing capabilities and reduce both your department/organization’s and the community’s risks to hazards and threats.** A successful hazard mitigation strategy proposes actions that build on existing strengths and fill known gaps in capability. Based on this exercise, answer the following question:
 - a. What **future investments** in any of these program elements do you foresee in the next 5 years to support risk reduction?

Storey County 2020 Hazard Mitigation Plan Update
Capability Assessment Worksheet Instructions

Table 1 Capability Element Examples

Plans and Policies	
Plans	Policies and Regulations
<ul style="list-style-type: none"> ➤ Department Hazard Mitigation Plan or Hazard Analysis ➤ Department Emergency Operations or Emergency Response Plan ➤ Floodplain Management Plan ➤ Land Use Plan ➤ Stormwater Management Plan ➤ Continuity of Operations Plan or Business Continuity Plan ➤ Capital Improvements Plan 	<ul style="list-style-type: none"> ➤ Zoning Ordinance ➤ Flood Damage Prevention Ordinance ➤ Mutual Aid or Other Mutual Assistance Agreements ➤ National Flood Insurance Program ➤ Community Rating System ➤ Building Code ➤ Fire Code
Staff and Equipment Capability	
Staff	Equipment
<ul style="list-style-type: none"> ➤ Planners with knowledge of land development and land management practices ➤ Engineers or professionals trained in construction practices related to buildings and/or infrastructure ➤ Planners or engineers with an understanding of natural and/or human-caused hazards ➤ Emergency manager ➤ Floodplain manager ➤ Scientist familiar with hazards of the area ➤ Staff with education or expertise to assess vulnerability to hazards ➤ Personnel skilled in Geographic Information Systems (GIS) ➤ Resource development staff or grant writers 	<ul style="list-style-type: none"> ➤ Damage assessment tool ➤ Sandbagging machine ➤ Snow plows ➤ Generators ➤ Communication devices ➤ Personal Protective Equipment (PPE), such as hearing protective devices (earplugs, muffs), hard hats, respirators, gloves, eye protective devices (goggles), full body suits ➤ Shelters ➤ Utility fleet
Fiscal Capability	
<ul style="list-style-type: none"> ➤ Capital Improvement Program ➤ Community Development Block Grants (CDBG) ➤ Special Purpose Taxes (or taxing districts) ➤ Utility Fees ➤ Development Impact Fees ➤ General Obligation, Revenue, and/or Special Tax Bonds ➤ Partnering arrangements or intergovernmental agreements 	

HAZARD MITIGATION TOOLKIT

Capability Assessment Worksheet

Contact Information:

Name:	Department/Organization:	Title:
Phone:		E-Mail:

Overview

1. What hazards are you most concerned about that would impact your ability to provide your essential functions?

2. What would you consider your **biggest vulnerability** to those hazards?

3. What would you consider your **biggest strength** is in being resilient to hazard events?

Storey County 2020 Hazard Mitigation Plan Update
Capability Assessment Worksheet

4. What **plans and policies** do you have in place to support community risk reduction?

Plan/Policy	Notes

5. What **staff and equipment** do you have in place to support community risk reduction?

Staff/Equipment	Notes

6. What **fiscal mechanisms** do you have in place to support risk reduction?

Plan/Policy	Notes

7. What **actions** have you taken in the last 5 years (since the last plan update) to build these capabilities?

Additional Notes

HAZARD MITIGATION TOOLKIT
2015 Mitigation Actions Check-in

Goals	Description	Progress Update (Completed, Altered, Ongoing, Carryover, Cancelled)
	<ul style="list-style-type: none">▪ Completed: The mitigation action has been completed as written.▪ Altered: The mitigation action was changed to address a similar problem.▪ Ongoing: Progress has begun on the mitigation action.▪ Carryover: The mitigation has not begun due to funding or priority limitations but is still a desired action.▪ Cancelled: The mitigation action is no longer a priority.	

**Storey County 2020 Hazard Mitigation Plan Update
2015 Mitigation Actions Check-in**

Goals	Description	Progress Update (Completed, Altered, Ongoing, Carryover, Cancelled)
<i>Goal 1: Promote increased and ongoing involvement in hazard-mitigation planning and projects</i>	Update the Master Plan to be consistent with the hazard area maps and implementation strategies developed in the HMP every 10 years. Review & update ordinances & code every 3 years.	
	Continue GIS data sharing agreements with Douglas County.	
<i>Goal 2: Build and support local capacity to enable the public to prepare for, respond to, and recover from disasters</i>	Continue and expand Risk Watch outreach program that coordinates with the school district to teach children about the hazards in their community and what they can do to mitigate, prevent, and prepare for these hazard events. Additionally, the safety tips will be posted on the County Web site.	
	Develop and sustain a public outreach programs that encourages consistent hazard mitigation content including all hazards addressed in this mitigation plan.	
	Develop outreach program that will teach adults how to anchor parapets, signs, glass, machinery, shelving, fixtures, and other nonstructural elements or architectural detailing that might cause injury if items were to fall or break during an earthquake.	
	Use seasonal firefighters to conduct an outreach program to inform homeowners about the threat of wildfires; to explain how homeowners can reduce the wildfire hazards around their homes; to encourage homeowners to take the necessary action to improve the chance of their home surviving a wildfire; encourage homeowners to become involved with the Living With Fire program; and encourage attendance of existing Fire Safe Chapter members to the annual Wildfire Urban Interface Fire Summit.	

Storey County 2020 Hazard Mitigation Plan Update
2015 Mitigation Actions Check-in

Goals	Description	Progress Update (Completed, Altered, Ongoing, Carryover, Cancelled)
	Expand Highlands Fire Safe Council to include additional communities to inform Fire Safe councils, homeowner associations, and property owners about best management practices for Piñon-Juniper woodlands.	
	Initiate an outreach program to inform and instruct building contractors, County and State road maintenance agencies, and Storey County schools in best management practices for vegetation management in developments, around existing and new construction, and along road right-of-ways.	
	Within and immediately surrounding the area of the Virginia Highlands, the local chapter of the Nevada Fire Safe Council continue outreach efforts to emphasize the importance of internal fuel breaks to property owners in the community as a necessary prerequisite to enhancing fire protection.	
Goal 3: Reduce the possibility of damage and losses due to earthquakes	Develop a voluntary building inspection program in which homes, businesses, schools, and critical facilities and infrastructure are inspected by a building official for nonstructural elements that might break during an earthquake. In conjunction with this action, develop a nonstructural retrofitting program to correct identified problems.	
	Recommend retrofit for private business, homes, and government, with higher priority to critical facilities, infrastructure, and government agencies located within identified historical buildings.	
	Initiate program to provide funding for structural engineers to inspect County-owned critical facilities and infrastructure within identified high-shaking areas and historical buildings.	

**Storey County 2020 Hazard Mitigation Plan Update
2015 Mitigation Actions Check-in**

Goals	Description	Progress Update (Completed, Altered, Ongoing, Carryover, Cancelled)
	Retrofit all critical assets within strong shaking areas that do not meet the most current IBC requirements for safety; with higher priority given to critical facilities, infrastructure, and government agencies located within identified historical buildings.	
	Work with utility companies to evaluate the seismic risk to their transmission pipelines and implement mitigation measures, such as automatic shut-off valves.	
	Install on all private and public buildings propane earthquake disconnect valves.	
	Continue seismic retrofit on facades on B & C Streets.	
Goal 4: Reduce the possibility of damage and losses due to flood and flash flood	Review and update flood plans that would include coordination with adjacent counties, cities, and special districts supporting a regional approach to flood control	
	Install new flood facilities including upgrade of the existing storm drain system to current standards including culverts and channel improvements throughout Storey Co.	
	Protect and enhance existing water conveyance structures, storage, and treatment facilities to reduce impact from flood (i.e. Lockwood, VC)	
Goal 5: Reduce the possibility of damage and losses due to Severe Weather	In areas at risk to severe weather, retrofit public buildings to withstand snow loads and sever winds to prevent roof collapse/damage (Sheriff Sub-station, EOC, Courthouse)	

<p>Goal 6:</p> <p><i>Reduce the possibility of damage and losses due to wildland fires</i></p>	Develop partnerships for a community based vegetation management program including chipping programs	
	Within the VH create manageable, shaded fuel breaks thru entire subdivision including VC Highlands and Highland Ranches	
	Continue program using seasonal firefighters and community service groups to provide veg. mgmt. services to elderly, disable, or low-income persons to remove flammable veg. around homes	
	Create a veg. mgmt. program to replace cheat grass w/perennial grasses around communities to slow wildfire spread	
	Perform study to determine appropriate method to retrofit buildings located VC urban fire hazard zone. (i.e. critical facilities, commercial business district, historic district and infrastructure)	
	Implement fuels-reduction treatment along all boundaries of Six Mile Canyon to protect residences and community infrastructure	
<p>Goal 7:</p> <p><i>Reduce the possibility of damage and losses due to hazardous materials release</i></p>	Enforce zoning ordinances to reduce public health risks from hazardous materials releases	

HAZARD MITIGATION TOOLKIT

Workshop Exercise – 2020 Mitigation Actions

Hazard mitigation plans are intended to drive action, and the mitigation strategy developed through this process is an important tool to support the community in ongoing activities for risk reduction. The purpose of this exercise is to brainstorm potential mitigation actions for the 2020 plan update and assist departments and community partners in identifying and prioritizing new or revised mitigation actions. The product of this activity will form a list of mitigation actions for the 2020 plan update, each of which will be further explored and analyzed when completing the Mitigation Action Worksheet.

1. Identify the Problems. Mitigation actions should be tied to the vulnerabilities your community is experiencing based on the hazards and threats identified through the planning process. What problem is your action intended to address?

Storey County 2020 Hazard Mitigation Plan Update
Workshop Exercise – 2020 Mitigation Actions

2. Mitigation Actions. Brainstorm actions to respond to the problems identified above. Consider SMART criteria (Specific, Measurable, Actionable, Realistic, and Time-related). Ideally, strategies should be able to reach significant milestones within five years, so that they can be revisited and adjusted during the next plan update.

HAZARD MITIGATION TOOLKIT

Mitigation Action Worksheet Instructions

Hazard mitigation plans are intended to drive action and the mitigation strategy developed through this process is an important tool to support the community in ongoing activities for risk reduction. Including risk-driven and realistic mitigation in the plans not only provides partners with strategy to implement, but also ensures that projects that may be eligible for FEMA funding are captured in the document. The following instructions are designed to assist departments and community partners in identifying and prioritizing new or revised mitigation actions for the plan update. The instructions supplement the *Mitigation Action Worksheet* and are meant to provide additional information for each of the worksheet elements.

1. **Contact Information.** It is important to have a primary contact for each mitigation action item to allow for follow up questions and clarification. If you are providing the action on behalf of another individual, please provide their information as well. At a minimum please provide full name, department/organization, title, phone number, and email.
2. **Problem Statement.** Mitigation actions should be tied to the vulnerabilities your community is experiencing based on the hazards and threats identified through the planning process. What problem is your action intended to address? For example, repetitive flooding of properties might drive an action related to elevation of structures or buyouts.
- 3a. **Mitigation Action.** Describe your action in a manner detailed enough to be understood by the plan's readers. Consider using the SMART method of describing objectives to develop your actions:
 - **Specific** – target a specific area for improvement.
 - **Measurable** – quantify or at least suggest an indicator of progress.
 - **Assignable** – specify who will do it.
 - **Realistic** – state what results can realistically be achieved, given available resources.
 - **Time-related** – specify when the result(s) can be achieved.
- 3a. **Alternatives.** What other actions, if any, have you considered to address the problem? How does it compare to the stated mitigation action? Are there challenges to implementing the alternative? Are there benefits of the alternative? Could the alternative realistically be achieved?
4. **Action Status.** Identify the status of the action:
 - **New** – The action is new and will be included for the first time in the plan update.
 - **Existing** – The action was implemented prior to the plan update but is ongoing, and additional or ongoing action is required for completion.
 - **Complete** – The action has been completed.

5. **Type of Action.** Identify the type of action:
- **Plans and Regulations** – Regulatory actions or planning processes that result in reducing vulnerability to hazards.
 - **Infrastructure/Capital Projects** – Actions taken to modify existing buildings or structures to protect them from a hazard or remove them from the hazard area.
 - **Natural Systems Protection** – Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems.
 - **Education and Awareness** – Actions taken to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them.
 - **Preparedness and Response** – Actions that protect people and property during and immediately after a disaster or hazard event.

6. **Goals Supported.** Identify which of the goals the action supports (you may select more than one):

The October 9, 2019 Mitigation Workshop will establish the 2020 Mitigation Goals. Based on the updated list of goals, identify which goals the action supports. The 2020 Mitigation Goals established at the workshop will be distributed via email for reference.

7. **Hazards Addressed.** This section lists all of the hazards identified in the update of the hazard mitigation plan. Check all hazards that will be mitigated by the action. If it is a general action, then check “All Hazards.” Your department may have a specific responsibility for reducing the risk of certain hazards. If so, you may wish to focus your actions on those key hazards.

Examples:

- Electric utility partners should develop actions to reduce the effects of power outages.
 - Fire services may develop actions to address hazardous materials.
 - School districts should develop actions, in coordination with law enforcement, to address active shooter incidents.
- 8a. **Lead Department/Organization.** Identify what department(s), or community partner(s), would be primarily responsible for implementing the action.
- 8b. **Supporting Department/Organization.** Identify what department(s), or community partner(s), would be key to support implementing the action.
- 9a. **Timeline for Implementation.** Indicate the expected timeline for completion of the action.
- 9b. **Life of Action.** Identify how long the mitigation action is intended to remain in effect.
- **Temporary** – Action is a time-limited, one-time activity.

- **Short-Term (Interim)** – Generally defined as an action that can be accomplished within one year of the plan adoption.
- **Long-Term** – Generally defined as an action that takes longer than a year or is ongoing throughout several years.

10a. Anticipated Cost (if known). If possible, identify the estimated cost of the action based on best available data. If the cost is unknown, you may make a more qualitative assessment of the cost impact based on the following considerations:

- **High** – Existing funding levels are not adequate to cover the costs for the proposed action, and implementation would require an increase in revenue through alternate sources.
- **Medium** – The action could be implemented with existing funding but would require a reapportionment of the budget or a budget amendment, or the cost of the action would have to be spread out over time.
- **Low** – The action could be funded under the existing budget. The action is part of or can be part of an existing or ongoing program.

10b. Funding Available? Identify whether funding for the action is currently or is anticipated to be available.

10c. Funding Source. If funding is available, please identify the anticipated funding source (e.g., existing budget, grants, bond/levy). The cost of some actions may consist only of staff time and administrative resources.

11. STAPLEE Prioritization. A key element of the community’s mitigation strategy is prioritizing mitigation actions. The methodology being used for this update is FEMA’s STAPLEE criteria. Refer to the *STAPLEE Overview* for a description of each criterion.

Table 1 Mitigation Action Examples

Type of Action	Description	Examples
Plans and Regulations	These actions include government authorities, policies, or codes that influence the way land and buildings are developed and built.	<ul style="list-style-type: none"> ▪ Comprehensive plans ▪ Director’s Rules ▪ Department Standard Operating Procedures ▪ Land Use Plans ▪ Subdivision regulations ▪ Building codes and enforcement ▪ NFIP Community Rating System ▪ Capital improvement programs ▪ Open Space Preservation ▪ Stormwater management regulations and master plan
Infrastructure/Capital Project	These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.	<ul style="list-style-type: none"> ▪ Utility undergrounding ▪ Structural retrofits ▪ Non-structural measures ▪ Sea walls and retaining walls ▪ Detention and retention structures ▪ Culverts
Natural Systems Protection	These actions minimize damage and losses and also preserve or restore the functions of natural systems and cultural and historic resources.	<ul style="list-style-type: none"> ▪ Sediment and erosion control ▪ Stream corridor restoration ▪ Green space management ▪ Conservation easements ▪ Wetland restoration and preservation ▪ Identification of historic and cultural resources in high hazard areas

Storey County 2020 Hazard Mitigation Plan Update
Mitigation Actions Worksheet Instructions

Type of Action	Description	Examples
Education and Awareness	<p>These actions inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Although this type of mitigation reduces risk less directly than structural projects or regulation, it is an important foundation. A greater understanding and awareness of hazards and risk among local officials, stakeholders, and the public is more likely to lead to direct actions.</p>	<ul style="list-style-type: none"> ▪ Radio or television spots ▪ Websites with maps and information ▪ Real estate disclosure ▪ Presentations to school groups or neighborhood organizations ▪ Mailings to residents in hazard-prone areas ▪ StormReady ▪ Firewise Communities
Preparedness and Response	<p>These actions protect people and property during and immediately after a disaster or hazard event. Services include warning systems, emergency response services, and protection of critical facilities.</p>	<ul style="list-style-type: none"> ▪ Identify resources and supplies that may be required in an emergency ▪ Designate facilities for emergency use ▪ Restore critical infrastructure ▪ Enhance warning and communications systems

HAZARD MITIGATION TOOLKIT

STAPLEE Overview

A key element of the community's mitigation strategy is prioritizing mitigation actions. The methodology being used for this update is FEMA's STAPLEE criteria. Each element of the criteria is described below.

S: Is it Socially acceptable?

The public must support the overall implementation strategy and specific mitigation actions. Therefore, the actions will have to be evaluated in terms of community acceptance by asking questions such as:

- Will the proposed action adversely affect one segment of the population?
- Will the action disrupt established neighborhoods, break up voting districts, or cause the relocation of lower income people?
- Is the action compatible with present and future community values?
- If the community is a tribal entity, will the actions adversely affect cultural values or resources?

T: Is it Technically feasible and potentially successful?

It is important to determine whether the proposed action is technically feasible, will help to reduce losses in the long term, and has minimal secondary impacts. Here, you will determine whether the alternative action is a whole or partial solution, or not a solution at all, by considering the following types of issues:

- How effective is the action in avoiding or reducing future losses?
For example, if the proposed action involves upgrading culverts and storm drains to handle a 10-year storm event, and the objective is to reduce the potential impacts of a catastrophic flood, the proposed mitigation cannot be considered effective. Conversely, if the objective were to reduce the adverse impacts of frequent flooding events, the same action would certainly meet the technical feasibility criterion.
- Will it create more problems than it solves?
- Does it solve the problem or only a symptom?

A: Does the responsible agency have the Administrative capacity to execute this action?

Under this part of the evaluation criteria, you will examine the anticipated staffing, funding, and maintenance requirements for the mitigation action to determine if the jurisdiction has the personnel and administrative capabilities necessary to implement the action or whether outside help will be necessary.

- Does the jurisdiction have the capability (staff, technical experts, and/or funding) to implement the action, or can it be readily obtained?
- Can the community provide the necessary maintenance?
- Can it be accomplished in a timely manner?

P: Is it Politically acceptable?

Understanding how your current community and state political leadership feel about issues related to the environment, economic development, safety, and emergency management will provide valuable insight into the level of political support you are likely to have for mitigation activities and programs.

Proposed mitigation objectives sometimes fail because of a lack of political acceptability. This can be avoided by considering the following questions:

- Is there political support to implement and maintain this action?
- Have political leaders participated in the planning process so far?
- Is there a local champion willing to help see the action to completion?
- Who are the stakeholders in this proposed action?
- Is there enough public support to ensure the success of the action?
- Have all stakeholders been offered an opportunity to participate in the planning process?
- How can the mitigation objectives be accomplished at the lowest “cost” to the public?

L: Is there Legal authority to implement?

Without the appropriate legal authority, the action cannot lawfully be undertaken. When considering this criterion, you will determine whether your jurisdiction has the legal authority to implement the action, or whether the jurisdiction must pass new laws or regulations.

You should identify the unit of government undertaking the mitigation action and include an analysis of the interrelationships among local, regional, state, and federal governments. Legal authority is likely to have a significant role later in the process when your community will have to determine how mitigation activities can best be carried out and to what extent mitigation policies and programs can be enforced.

- Does the community have the authority to implement the proposed action?
- Is there a technical, scientific, or legal basis for the mitigation action (i.e., does the mitigation action “fit” the hazard setting)?
- Are the proper laws, ordinances, and resolutions in place to implement the action?
- Are there any potential legal consequences?
- Will the action, or lack of action, result in legal liability for the community?
- Is the action likely to be challenged by stakeholders who may be negatively affected?

E: Is it Economically beneficial?

Everyone experiences budget constraints at one time or another. Cost-effective mitigation actions that can be funded in current or upcoming budget cycles are much more likely to be implemented than mitigation actions requiring general obligation bonds or other instruments that would incur long-term debt to a community. A community with tight budgets or budget shortfalls may be more willing to undertake a mitigation initiative if it can be funded, at least in part, by outside sources. “Big ticket” mitigation actions, such as large-scale acquisition and relocation, are often considered for implementation in a post-disaster scenario when additional federal and state funding for mitigation is available.

Economic considerations must include the present economic base and projected growth and should be based on answers to questions such as:

- Are there currently sources of funds that can be used to implement the action?

- What benefits will the action provide?
- Does the cost seem reasonable for the size of the problem and likely benefits?
- What burden will be placed on the tax base or local economy to implement this action?
- Does the action contribute to other community economic goals, such as capital improvements or economic development?
- What proposed actions should be considered but “tabled” for implementation until outside sources of funding are available?

E: Will the action have either a neutral or positive impact on the natural Environment?

Impact on the environment is an important consideration because of public desire for sustainable and environmentally healthy communities and the many statutory considerations, such as the National Environmental Policy Act (NEPA), to keep in mind when using federal funds.

You will need to evaluate whether a mitigation action would have negative consequences for environmental assets such as threatened and endangered species, wetlands, and other protected natural resources, by considering questions such as:

- How will this action affect the environment (land, water, endangered species)?
- Will this action comply with local, state, and federal environmental laws or regulations?
- Is the action consistent with community environmental goals?

Will historic structures or key cultural resources be saved or protected?

Impacts on historic or key cultural resources are important to your community. You will need to evaluate whether a mitigation action would result in negative consequence or impact to historic structures or important cultural resources.

Can the action be implemented quickly?

The ability of the community to quickly and effectively implement a mitigation action may impact how it is prioritized. Consider questions such as:

- Could this action be started easily and within a reasonable timeframe?
- Could the action be implemented immediately?
- Would this action require other actions to be completed before it could be implemented?

Will the implemented action result in lives saved or a reduction in disaster damage?

Protecting lives and property is the fundamental goal of the mitigation actions. You will need to evaluate whether the action would prevent loss of life in future events. Please rank these based on the following considerations:

- **High** – The action will have an immediate impact on the reduction of risk exposure to life and property.
- **Medium** – The action will have a long-term impact on the reduction of risk exposure to life and property or will provide an immediate reduction in risk exposure to property.
- **Low** – Long-term benefits of the action are difficult to quantify in the short-term.

HAZARD MITIGATION TOOLKIT

Mitigation Action Worksheet

1. Contact Information:

Name:	Department/Organization:	Title:
Phone:		E-Mail:

2. Identify the Problem

3a. Mitigation Action

3b. Alternatives

4. Action Status:

- New Existing Complete

5. Type of Action:

- Plans and Regulations Infrastructure/Capital Project Natural Systems Protection
- Education and Awareness Preparedness and Response

6. Goals Supported: *[The October 9, 2019 Mitigation Workshop will establish the 2020 Mitigation Goals. Based on the updated list of goals, identify which goals the action supports. The 2020 Mitigation Goals established at the workshop will be distributed via email for reference]*

- Goal 1 Goal 2 Goal 3 Goal 4 Goal 5 Goal 6 Goal 7

7. Hazards Addressed (Check all that apply):

- All Hazards
- Avalanche
- Caving Ground (Mine Collapse)
- Drought
- Earthquake
- Epidemic
- Flood
- Hazardous Materials Event
- Severe Weather (snow, ice, wind, hail)
- Terrorism
- Wildland Fire

8a. Lead Department/Organization:

8b. Supporting Departments/Organizations:

9a. Timeline: Immediate < 1 year 1 – 3 years 3 – 5 years

9b. Life of Action: Temporary Short-Term (Interim) Long-Term

10a. Anticipated Cost (if known): No known costs.

10b. Funding Available?: Yes Anticipated No

10c. Funding Source: Existing Budget Grant Bond/Levy No/minimal cost

Other:

11. STAPLEE Prioritization

STAPLEE Criteria	Evaluation Rating	Score
S: Is it Socially acceptable?	Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	
T: Is it Technically feasible and potentially successful?		
A: Does the responsible state agency/department have the Administrative capacity to execute this action?		
P: Is it Politically acceptable?		
L: Is there Legal authority to implement?		
E: Is it Economically beneficial?		
E: Will the project have either a neutral or positive impact on the natural Environment? (score a 3 if positive impact, 2 if neutral impact)		
Will historic structures or key cultural resources be saved or protected?		
Could it be implemented quickly?		
STAPLEE Score Total		
Mitigation Effectiveness Criteria	Evaluation Rating	Score
Will the implemented action result in lives saved?	High = 5 Medium = 3 Low = 1	
Will the implemented action result in a reduction of disaster damage?	High = 5 Medium = 3 Low = 1	
Mitigation Effectiveness Score Total		
Total Score (STAPLEE + Mitigation Effectiveness)		

**Storey County 2020 HMP Update
Meeting # 3 - Draft Workshop
Sign In Sheet**

NAME	TITLE	DEPARTMENT/AGENCY	PHONE	EMAIL
1. Daniel Hiles	EHS Compliance Engineer	Western 102 Power Plant	951-316-0000	daniel.hiles@picworld.com
2. Jen Chapman	Admin. Officer	Storey		jchapman@storeycounty.org
3. Lyndi Renaud	Planning Asst.	Storey	7758471144	L.Renaud
4. Sham Dixon	Battalion Chief SCLFD	storey	847-0954	sdixon@storeycounty.org
5. Mamey Hansen-Martin	Recorder	Storey	847-0967	mmartin@storeycounty.org
6. Vanessa Stephens	Clerk / Treasurer	Storey	847-0969	vstephense@storeycounty.org
7. Anne Langer	DA	Storey	847-0964	alanger@storeycounty.org
8. Jessica Rapp	PHP Comms Specialist	Quad-County PHP	283-7536	JRapp@carson.org
9. Cherie Nevin	Community Relations	Storey County	230-1474	chevnevin@storeycounters

Storey County 2020 Hazard Mitigation Plan Update
Mitigation Workshop

NAME	TITLE	DEPARTMENT/AGENCY	PHONE	EMAIL
10. Debbie Nedderrief	Water Resources Specialist 2	CWSD	775.887.1260	debbie(a)cwSD.org
11. Alyssa Russell	environmental Specialist	E E E	225-0438	arussell@ene.com
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				

Storey County Hazard Mitigation Plan Update

DRAFT WORKSHOP

DATE: Wednesday, November 20, 2019
TIME: 9:00 am - 11:00 am / E & E available on-site for one-on-one meetings until 12:00 pm
LOCATION: Virginia City Conference Center, 10 South E Street, Virginia City, NV 89440

Thank you for participating in the Hazard Mitigation Planning Team Meeting #3 for the **Storey County Hazard Mitigation Plan Update (HMP)**.

MEETING PURPOSE:

Meeting #3 provides an opportunity for the group to discuss comments on the Draft HMP. This meeting will be largely discussion based, so please come prepared with your comments. E & E will be available for an hour following the group workshop to discuss any comments specific to an agency/department's expertise.

AGENDA:

1. Welcome and Introductions (5 minutes)
2. Overview of Draft HMP (5 minutes)
3. Discussion of Data Gaps and Comments/Plan Review (60 minutes)
4. Review of Mitigation Action Prioritization (35 minutes)
5. Next Steps (15 minutes)

NEXT STEPS:

Please provide any additional comments on the Preliminary Draft HMP to Alyssa Russell by **November 25, 2019**.

Alyssa Russell , Ecology and Environment, Inc.
(o) 716-684-8060 x4506 | (c) 225-323-0438
arussell@ene.com

NOTES:

Storey County 2020 Hazard Mitigation Plan Update

Meeting #3 – Draft Plan Review

Wednesday, November 20 | 9am – 11am | Virginia City Conference Center



Welcome and Introductions

- Name
- Organization/
Department

Meet the E & E Team



Matthew Lieuallen
Principal in Charge



Nicki Hurley
GIS Analyst



Alyssa Russell
Project Manager



Manique Talaia-Murray
Emergency Planner

Meeting Objectives

- Project Update
- Presentation of the Preliminary Draft HMP
- Discussion of Data Gaps and Comments
- Mitigation Action Prioritization
- Next Steps



What Have We Been Up To?

- Mitigation Workshop (October 9, 2019)
- Plan Development
- Process Documentation

Presentation of Preliminary Draft HMP

Sections

- Section 1: Official Record of Adoption
- Section 2: Background
- Section 3: Community Description
- Section 4: Planning Process
- Section 5: Risk and Vulnerability Assessment
- Section 6: Capability Assessment
- Section 7: Mitigation Strategy
- Section 8: Plan Maintenance
- Section 9: References

Appendices

- **Appendix A:** Adoption Resolution
- **Appendix B:** Public Figures
- **Appendix C:** Public Information
- **Appendix D:** Meeting Agendas, Meeting Summaries, and handouts
- **Appendix E:** Plan Maintenance Documents
- **Appendix F:** Mitigation Goals and Actions from Previous Plan
- **Appendix G:** Critical Infrastructure and Hazardous Materials Figures
- **Appendix H:** FEMA Local Plan Review Tool



Data Gaps and Comments

Key Data Gaps

- Planning committee participation
- Public involvement and outreach
- Repetitive loss properties
- Validation/additional information on hazard occurrences in County based on local knowledge
- Key mitigation accomplishments since 2015
- Community Rating System
- Mitigation Action prioritization

Discussion of Data Gaps and Comments

Mitigation Action Prioritization

STAPLEE Criteria

STAPLEE Criteria	Evaluation Rating
S: Is it Socially acceptable?	
T: Is it Technically feasible and potentially successful?	
A: Does the responsible agency/department have the Administrative capacity to execute this action?	Definitely YES = 3
P: Is it Politically acceptable?	Maybe YES = 2
L: Is there Legal authority to implement?	Probably NO = 1
E: Is it Economically beneficial?	Definitely NO = 0
E: Will the project have either a neutral or positive impact on the natural Environment? (score a 3 if positive impact, 2 if neutral impact)	

Mitigation Effectiveness Criteria

Mitigation Effectiveness Criteria	Evaluation Rating
Will the implemented action result in lives saved?	High = 5 Medium = 3 Low = 1
Will the implemented action result in a reduction of disaster damage?	High = 5 Medium = 3 Low = 1

Review

The combined STAPLEE and Mitigation Effectiveness Criteria scores can be used as a tool to prioritize mitigation actions.

Key Questions:

1. Is the prioritization for each action accurate?
2. Does the prioritization stack up the way you would expect? Do higher priority actions rise to the top?

Next Steps

Next Steps

- Additional data incorporation
- Draft comments and edits
- Public review of Revised Draft Plan
- Submittal to the State and FEMA

What Can I Do?

- Review draft plan and submit comments and edits
- Review plan appendices
- Facilitate plan adoption

Upcoming Milestones

Milestone	Date
Submit any additional comments on Preliminary Draft HMP	November 25, 2019
30-day public review period	December 2, 2019 – January 2, 2020
Final HMP presentation	January 8, 2020
Final HMP submittal to State and FEMA	January 2020 – February 2020
HMP Adoption	Within 2 weeks of FEMA approval (March 2020)

Contact Information

County Project Lead

Joe Curtis

jcurtis@storeycounty.org

E & E Project Manager

Alyssa Russell

arussell@ene.com

Any Final Questions?



Storey County 2020 Hazard Mitigation Plan Update

DRAFT WORKSHOP

DATE: Wednesday, November 20, 2019
TIME: 9:00 a.m. – 11:00 a.m. / E & E available on-site for one-on-one meetings until 12:00 p.m.
LOCATION: Virginia City Conference Center, 10 South E Street, Virginia City, NV 89440

ATTENDEES: *See Attachment*

SUMMARY:

The Hazard Mitigation Planning Team (HMPT) hosted the third HMPT meeting on November 20, 2019. This HMPT meeting served to provide an opportunity for the group to discuss comments on the Draft HMP and address data gaps. Ecology and Environment, Inc. (E & E) facilitated stakeholders through the workshop.

Welcome and Introductions

Joe Curtis, County Emergency Manager and Director of the Local Emergency Planning Committee (LEPC), thanked the group for coming to the meeting and initiated the meeting.

Alyssa Russell with E & E introduced the purpose of this workshop, which is to discuss comments on the Draft HMP and address data gaps. She reviewed the workshop agenda and provided a status update on the project. The project team has been building out the plan based on information the planning team provided in HMPT Meeting #2.

Review of Draft HMP

Participants reviewed the plan, addressed data gaps, and provided comments and feedback. Comments and feedback were related to:

- An Annex for Carson Water Subconservancy District
- Labor force statistics
- Stakeholder outreach efforts
- GIS services
- Critical facilities and infrastructure
- Repetitive loss properties
- Additional plans related to flooding and historical flood events
- Hazardous material releases
- Additional plans and procedures related to regulatory and legal capabilities
- Additional information related to fiscal capabilities
- Key mitigation accomplishments in the past 5 years
- Validation and modification of the mitigation actions and prioritization
- Addition of a mitigation action related to coordination between DOT, State Highway Patrol, and Storey County Emergency Management to reduce and respond to emergencies along US

Parkway and I-80 sections (including evacuation routes, signage, communication tower) with an all-hazards approach to planning. County and State also to coordinate and share data to better understand potential hazards occurring on roads within the County, especially in relation to the transport of hazardous materials.

Action items / next steps:

- Provide additional comments on the Draft HMP to the E & E team for incorporation by November 25, 2019.
- Comments and feedback to be incorporated into the Draft HMP prior to public release.
- The Draft HMP is anticipated to be released for public comment beginning December 2, 2019.
- Final HMP presentation is scheduled to coincide with the LEPC meeting on January 8, 2020.

CONTACT INFORMATION:

Joe Curtis, Emergency Manager
Storey County Emergency Management
jcurtis@storeycounty.org





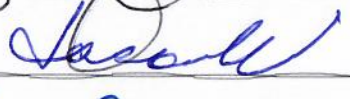





Alyssa Russell, E & E Project Manager
Ecology and Environment, Inc.
arussell@ene.com

**Storey County 2020 HMP Update
Meeting # 4 – Final HMP Presentation
Sign In Sheet**

NAME	TITLE	DEPARTMENT/AGENCY	PHONE	EMAIL
1. MARTIN AZEVEDO	File Manager	COM DEV	443-7103	mazevedo@storeycounty.org
2. Laurin Staffen	PHP Planner	Quand Co PHP	775-283-7908	Lstaffen@carson.org
3. DAVE BALLARD	Dir. Communication	SC Com	775-722-0902	dballard@storeycounty.org
4. Jason Wierzbicki	Director Pub Works		2299920	jwierzbicki@storeycounty.org
5. Alex Lanza	NDEP CAPP	Engineer	(775) 687-9334	alanza@ndep.nv.gov
6. JEFF NEVIN	FIRE CHIEF	STOREY COUNTY	817-0954	JNEVIN@STOREYCOUNTY.NV.GOV
7.				
8.				
9.				

STOREY COUNTY LOCAL EMERGENCY PLANNING COMMITTEE

JANUARY 8, 2020 10:00 A.M.
 Virginia City Conference Center
 10 South E Street Virginia City, NV

NAME (PLEASE PRINT)	AGENCY	EMAIL	SIGNATURE
Tom Becht	Walmart	Duane.Becht@walmart.com	
Lance O'Flynn	SCEM-VOL	lavelal9651@att.net	
Stephanie Houghton	Walmart	Stephanie.Houghton@walmart.com	
JEN CHAPMAN	Storey	jchapman@storeycounty.org	
Jasow Wierzbicki	Storey	Jwierzbicki@storeycounty.org	
Alex Lanza	NDEP - CAPP	alanza@ndep.nv.gov	
Mark Carmonne	NECC	Mark.Carmonne@avecc.com.nv	
Alex Roberson	AUECC	alex.roberson@avecc.com.nv	
Jennifer McCain	Storey	jmccain@storeycounty.org	
Kori DeGristina	DEM	kdegristina@ps.state.nv.us	

Storey County Hazard Mitigation Plan Update

Final HMP Presentation

DATE: Wednesday, January 8, 2020
TIME: 10:00 am - 12:00 pm
LOCATION: Virginia City Conference Center, 10 South E Street, Virginia City, NV 89440

Thank you for participating in the Hazard Mitigation Planning Team Meeting #4 for the **Storey County Hazard Mitigation Plan Update (HMP)**.

MEETING PURPOSE:

Meeting #4 provides a presentation of the Final HMP. This meeting will provide an overview of the planning process; review of the HMP; and overview of next steps for plan review and adoption.

AGENDA:

1. Welcome and Introductions (5 minutes)
2. Overview of the Planning Process (10 minutes)
3. Final HMP Review (10 minutes)
4. Next Steps (5 minutes)

CONTACT INFORMATION:

Joe Curtis, Emergency Manager
Storey County Emergency Management
(o) 775-847-0986
jcurtis@storeycounty.org

Alyssa Russell , Ecology and Environment, Inc.
(o) 716-684-8060 x4506 | (c) 225-323-0438
arussell@ene.com

NOTES:

Storey County 2020 Hazard Mitigation Plan Update

Meeting #4 – Final HMP Presentation

Wednesday, January 8 | 10am – 12pm | Virginia City Conference Center



Welcome and Introductions

- Name
- Organization/
Department

Meet the E & E Team



Matthew Lieuallen
Principal in Charge



Nicki Hurley
GIS Analyst



Alyssa Russell
Project Manager



Manique Talaia-Murray
Emergency Planner

Meeting Objectives

- Project Update
- Review of the Planning Process
- Presentation of the Final HMP
- Next Steps



What Have We Been Up To?

- Draft Plan Workshop (November 20, 2019)
- Continued public involvement
- Continued collaboration with stakeholders
- Plan Development
- Process Documentation

The Planning Process

5 Step Planning Process

- Organize resources
- Assess risks and vulnerabilities
- Assess capabilities
- Develop a mitigation strategy
- Monitor progress

- July 2019 – Kick-off Meeting
- October 2019 – Mitigation Workshop
- November 2019 – Draft Plan Workshop

Public Involvement

- Questionnaire
- Public Awareness
- Public Review of Draft Plan

Presentation of Final HMP

Sections

- **Section 1:** Official Record of Adoption
- **Section 2:** Background
- **Section 3:** Community Description
- **Section 4:** Planning Process
- **Section 5:** Risk and Vulnerability Assessment
- **Section 6:** Capability Assessment
- **Section 7:** Mitigation Strategy
- **Section 8:** Plan Maintenance
- **Section 9:** References

Appendices

- **Appendix A:** Adoption Resolution
- **Appendix B:** Public Figures
- **Appendix C:** Public Information
- **Appendix D:** Meeting Agendas, Meeting Summaries, and handouts
- **Appendix E:** Plan Maintenance Documents
- **Appendix F:** Mitigation Goals and Actions from Previous Plan
- **Appendix G:** Critical Infrastructure and Hazardous Materials Figures
- **Appendix H:** FEMA Local Plan Review Tool

Annexes

- **Annex A:** Carson Water Subconservancy District (CWSD)

Next Steps

Next Steps

- Submittal to the State and FEMA for review
- County adoption of Plan

What Can I Do?

- Facilitate plan adoption

Recent and Upcoming Milestones

Milestone	Date
30-day public review period	December 9, 2019 – January 9, 2020
Final HMP presentation	January 8, 2020
Final HMP submittal to State and FEMA	January 2020 – February 2020
HMP Adoption	Within 2 weeks of FEMA approval (March 2020)

Contact Information

County Project Lead

Joe Curtis

jcurtis@storeycounty.org

E & E Project Manager

Alyssa Russell

arussell@ene.com

Any Final Questions?



Storey County 2020 Hazard Mitigation Plan Update

Final HMP Presentation

DATE: Wednesday, January 8, 2020
TIME: 10:00 a.m. – 12:00 p.m.
LOCATION: Virginia City Conference Center, 10 South E Street, Virginia City, NV 89440

ATTENDEES: *See Attachment*

SUMMARY:

The Hazard Mitigation Planning Team (HMPT) hosted the fourth HMPT meeting on January 8, 2020. This HMPT meeting served to provide a presentation of the Final HMP. The meeting provided an overview of the planning process; review of the HMP; and overview of next steps for plan review and adoption. Ecology and Environment, Inc. (E & E) facilitated the presentation.

Welcome and Introductions

Joe Curtis, County Emergency Manager and Director of the Local Emergency Planning Committee (LEPC), thanked the group for coming to the meeting and initiated the meeting. The January LEPC meeting commenced, followed by the portion of the meeting focused on the Final HMP presentation.

Alyssa Russell with E & E introduced the purpose of this fourth HMPT meeting, which is provide an overview of the planning process; review of the Final HMP; and overview of next steps for plan review and adoption. She reviewed the agenda and provided a status update on the project. The project team has been building out the plan based on information the planning team provided in HMPT Meeting #3.

Review of the Planning Process

1. Organize resources

- a. First, the team sought to organize available resources. The planning process for the HMP update began in July 2019 by bringing together local resources, including County staff, agencies, and local community members to provide expertise and insight. The team also reviewed relevant data which could provide technical expertise and historical information needed in the development of the HMP.

2. Assess risks and vulnerabilities:

- a. The next part of the process moved on to assessing risks and vulnerabilities.
- b. During the kick-off meeting, the planning process was discussed including the purpose of the plan and the plan tasks, goals, and actions. The Committee received instructions on the risk and vulnerability assessment and were sent a Hazard Ranking Worksheet after the meeting for completion and submission. The exercise identified the specific hazards that the Planning Committee wanted to address in the HMP. The exercise used averages to prioritize the hazards based on probability/frequency, magnitude, onset, and duration.

3. Assess capabilities/develop a mitigation strategy:

- a. During the 3rd and 4th step of the planning process, the team began to assess local capabilities and develop a mitigation strategy.
- b. For the October 2019 Workshop, the team discussed the results of the hazard ranking exercise and validated results for the plan. The meeting served to form mitigation goals and objectives, introduce the capabilities assessment, and brainstorm mitigation actions the County intends to take within the next five years to decrease risk to hazards.
- c. As part of assessing local capabilities, the team discussed the administrative, technical, legal and regulatory, and fiscal resources available to the County for implementation of mitigation actions.
- d. The Planning Committee completed a workshop exercise to brainstorm mitigation strategies and following the workshop were sent the Capabilities Assessment Worksheet and the Mitigation Action Worksheet for completion and submission.
- e. The mitigation action exercise led to the formation and prioritization of actions to be implemented in the upcoming 5-year period.
- f. During this workshop, the Planning Committee also was tasked with providing an update and input on the status of the 2015 mitigation actions.
- g. In November 2019, the draft HMP was presented and submitted to the Planning Committee for review and comment. At this Draft Plan Workshop, the Planning Committee discussed data gaps, provided additional information where applicable, verified the contents of the draft HMP, and discussed individual follow-up meetings to address specific sections of the HMP. This feedback was then incorporated into the Final HMP.

4. Monitor progress:

- a. Moving forward from where the Plan stands today, during the 5th step of the planning process, the County will continue with the implementation of mitigation actions and the monitoring of progress to ensure the success of an ongoing program and minimize hazard impacts.

5. Public Involvement:

- a. Another critical part of the planning process included public participation.
- b. The County distributed a hazard mitigation questionnaire to the public at the beginning of the planning process. The survey went out in August 2019 and provided 155 responses. This strategy greatly increased public involvement from the 2015 HMP process.
- c. Additionally, the draft HMP was distributed to the public and advertised on the County's social media to increase awareness and to solicit feedback. As of today, no public comments have been received during the comment period. The 30-day public comment period closes tomorrow, January 9th. The team will continue to monitor comments until the end and incorporate those into the Final HMP.

Review of the Final HMP

1. Plan Sections:

- a. Section 1 is the Official Record of Adoption, which will be updated upon the County's adoption of the plan.
- b. Section 2 discusses the plan's purpose and the plan's organization.
- c. Section 3 provides a description of the community. It discusses the County's history, location, geography, government, and demographics.
- d. In Section 4, the planning process is outlined, including the roles and responsibilities of the planning committee and background on meetings and public involvement. It also incorporates by reference several existing plans.
- e. Section 5 is a large portion of the plan. It discusses the process for hazard identification; discusses data sources and limitations; identifies critical infrastructure; and provides an overview of the hazard rankings, hazard descriptions, history of hazards in the County, and the location, extent, and probability of future events, as well as vulnerabilities and cascading impacts.
- f. Sections 6 and 7 layout the local capabilities and mitigation strategy. It outlines the mitigation goals and objectives and identifies, evaluates, and prioritizes mitigation actions.
- g. Finally, Section 8 discusses the process for monitoring, evaluating, and updating the HMP.

2. Appendices:

- a. Since the draft plan, the appendices have been updated. Appendix A will remain pending until adoption of the plan. A few of the more critical appendices include Appendix B and G, which map hazards and vulnerabilities in the County. Appendix H is a new addition since the Draft HMP. It's a guidance document to help guide the State and FEMA during review of the plan.

3. Annexes:

- a. Also new since the Draft HMP is the addition of an annex for Carson Water Subconservancy District.

Action items / next steps:

- Public comment period ends January 9, 2020.
- Submission of Plan to State for review and address State comments (anticipated January 2020).
- Submission of Plan to FEMA for review and address FEMA comments (anticipated February 2020).
- County adoption of Plan (anticipated March 2020).

CONTACT INFORMATION:

Joe Curtis, Emergency Manager
Storey County Emergency Management
jcurtis@storeycounty.org

Alyssa Russell, E & E Project Manager
Ecology and Environment, Inc.
arussell@ene.com

Appendix E
Plan Maintenance Document

Sample Press Release for:

Annual Hazard Mitigation Plan Maintenance Meeting

Storey County, Nevada is meeting to review and maintain its Hazard Mitigation Plan to assess risks posed by natural and manmade disasters and identify ways to reduce those risks. This plan is required under the Federal Disaster Mitigation Act of 2000 as a prerequisite for receiving certain forms of Federal disaster assistance. The plan can be found on the County's website at www.storeycounty.org.

Public comments and participation are welcomed. For additional information, to request to participate, or to submit comments, please contact Joe Curtis, Storey County Emergency Management, at (775) 691-5333 or jcurtis@storeycounty.org.

Annual Review Questionnaire

PLAN SECTION	QUESTIONS	YES	NO	COMMENTS
PLANNING PROCESS	Are there internal or external organizations and agencies that have been invaluable to the planning process or to mitigation action?			
	Are there procedures (e.g., meeting announcement, plan updates) that can be done more efficiently?			
	Has the Steering Committee undertaken any public outreach activities regarding the HMP or implementation of mitigation actions?			
RISK ASSESSMENT & VULNERABILITY ANALYSIS	Has a natural and/or human-caused disasters occurred in this reporting period?			
	Are there natural and/or human-caused hazards that have not been addressed in this HMP and should be?			
	Are additional maps or new hazards studies available? If so, what have they revealed?			
	Do any new critical facilities or infrastructure need to be added to the asset lists?			
	Have there been changes in development patterns that could influence the effects of hazards or create additional risks?			
CAPABILITY ASSESSMENT	Are there different or additional resources (financial, technical, and human) that are now available for mitigation planning?			
MITIGATION STRATEGY	Are the goals still applicable?			
	Should new mitigation actions be added to a community's Mitigation Action Plan?			
	Do existing mitigation actions listed in a community's Mitigation Action Plan need to be reprioritized?			
	Are the mitigation actions listed in a community's Mitigation Action Plan appropriate for available resources?			

Mitigation Action Progress Report

Progress Report Period: _____ to _____
(date) (date)

Project Title: _____ Project ID# _____

Responsible Agency: _____

Address: _____

City: _____

Contact Person: _____

Phone # (s): _____ email address: _____

List Supporting Agencies and Contacts:

Total Project Cost: _____

Anticipated Cost: _____

Overrun/Underrun: _____

Date of Project Approval: _____

Start date of the project: _____

Anticipated completion date: _____

Description of the Project (include a description of each phase, if applicable, and the time frame for completing each phase): _____

Plan Goal(s) Address Goal: _____

Indicator of Success: _____

Project Status

Project on schedule

Project completed

Project delayed*

*explain _____

Project Cancelled

Project Cost Status

Cost unchanged

Cost overrun*

*explain _____

Cost underrun*

*explain _____

Summary of progress on project for this report:

A. what was accomplished during this reporting period?

B. What obstacles, problems, or delays did you encounter, if any?

C. How was each problem resolved?

Next Steps: What are the next step(s) to be accomplished over the next reporting period?

Other Comments:

Appendix F
Status of Previous Actions

HAZARD MITIGATION TOOLKIT
2015 Mitigation Actions Check-in

Goals	Description	Progress Update (Completed, Altered, Ongoing, Carryover, Cancelled)
	<ul style="list-style-type: none">▪ Completed: The mitigation action has been completed as written.▪ Altered: The mitigation action was changed to address a similar problem.▪ Ongoing: Progress has begun on the mitigation action.▪ Carryover: The mitigation has not begun due to funding or priority limitations but is still a desired action.▪ Cancelled: The mitigation action is no longer a priority.	

**Storey County 2020 Hazard Mitigation Plan Update
2015 Mitigation Actions Check-in**

Goals	Description	Progress Update (Completed, Altered, Ongoing, Carryover, Cancelled)
<i>Goal 1: Promote increased and ongoing involvement in hazard-mitigation planning and projects</i>	Update the Master Plan to be consistent with the hazard area maps and implementation strategies developed in the HMP every 10 years. Review & update ordinances & code every 3 years.	Completed Master Plan update. This is an ongoing effort to review.
	Continue GIS data sharing agreements with Douglas County.	Altered. Storey County now contracts with Farr West Engineering for GIS.
<i>Goal 2: Build and support local capacity to enable the public to prepare for, respond to, and recover from disasters</i>	Continue and expand Risk Watch outreach program that coordinates with the school district to teach children about the hazards in their community and what they can do to mitigate, prevent, and prepare for these hazard events. Additionally, the safety tips will be posted on the County Web site.	Carryover. No action taken due to staff limitations.
	Develop and sustain a public outreach program that encourages consistent hazard mitigation content including all hazards addressed in this mitigation plan.	Ongoing. Storey County Emergency Management conducts Public Outreach through email, social media, and public events.
	Develop outreach program that will teach adults how to anchor parapets, signs, glass, machinery, shelving, fixtures, and other nonstructural elements or architectural detailing that might cause injury if items were to fall or break during an earthquake.	Carryover. No action taken due to staff limitations.

Goals	Description	Progress Update (Completed, Altered, Ongoing, Carryover, Cancelled)
	Use seasonal firefighters to conduct an outreach program to inform homeowners about the threat of wildfires; to explain how homeowners can reduce the wildfire hazards around their homes; to encourage homeowners to take the necessary action to improve the chance of their home surviving a wildfire; encourage homeowners to become involved with the Living With Fire program; and encourage attendance of existing Fire Safe Chapter members to the annual Wildfire Urban Interface Fire Summit.	Ongoing. Fire Department does this annually.
	Expand Highlands Fire Safe Council to include additional communities to inform Fire Safe councils, homeowner associations, and property owners about best management practices for Piñon-Juniper woodlands.	Cancelled. Fire Safe Council no longer exists.
	Initiate an outreach program to inform and instruct building contractors, County and State road maintenance agencies, and Storey County schools in best management practices for vegetation management in developments, around existing and new construction, and along road right-of-ways.	Ongoing. Through Fire Code. Fire Department and Fire Marshal.
	Within and immediately surrounding the area of the Virginia Highlands, the local chapter of the Nevada Fire Safe Council to continue outreach efforts to emphasize the importance of internal fuel breaks to property owners in the community as a necessary prerequisite to enhancing fire protection.	Cancelled. Fire Safe Council no longer exists.
<p>Goal 3: <i>Reduce the possibility of</i></p>	Develop a voluntary building inspection program in which homes, businesses, schools, and critical facilities and infrastructure are inspected by a building official for non-structural elements that might break during an earthquake. In conjunction with this action, develop a non-structural retrofitting program to correct identified problems.	Ongoing.

Storey County 2020 Hazard Mitigation Plan Update
2015 Mitigation Actions Check-in

Goals	Description	Progress Update (Completed, Altered, Ongoing, Carryover, Cancelled)
<i>damage and losses due to earthquakes</i>	Recommend retrofit for private business, homes, and government, with higher priority to critical facilities, infrastructure, and government agencies located within identified historical buildings.	Ongoing.
	Initiate program to provide funding for structural engineers to inspect County-owned critical facilities and infrastructure within identified high-shaking areas and historical buildings.	Complete. This was done for the Courthouse.
	Retrofit all critical assets within strong shaking areas that do not meet the most current IBC requirements for safety; with higher priority given to critical facilities, infrastructure, and government agencies located within identified historical buildings.	Carryover.
	Work with utility companies to evaluate the seismic risk to their transmission pipelines and implement mitigation measures, such as automatic shut-off valves.	Carryover.
	Install on all private and public buildings propane earthquake disconnect valves.	Carryover.
	Continue seismic retrofit on facades on B & C Streets.	Carryover.
<i>Goal 4: Reduce the possibility of damage and losses due to flood and flash flood</i>	Review and update flood plans that would include coordination with adjacent counties, cities, and special districts supporting a regional approach to flood control	Complete.
	Install new flood facilities including upgrade of the existing storm drain system to current standards including culverts and channel improvements throughout Storey Co.	Ongoing. Major work done after 2017 storm and continues into this year (2019).
	Protect and enhance existing water conveyance structures, storage, and treatment facilities to reduce impact from flood (i.e. Lockwood, VC)	Ongoing.

Storey County 2020 Hazard Mitigation Plan Update
2015 Mitigation Actions Check-in

Goals	Description	Progress Update (Completed, Altered, Ongoing, Carryover, Cancelled)
<i>Goal 5: Reduce the possibility of damage and losses due to Severe Weather</i>	In areas at risk to severe weather, retrofit public buildings to withstand snow loads and sever winds to prevent roof collapse/damage (Sheriff Sub-station, EOC, Courthouse)	Completed.

<p>Goal 6: <i>Reduce the possibility of damage and losses due to wildland fires</i></p>	<p>Develop partnerships for a community based vegetation management program including chipping programs</p>	<p>Ongoing. Fire Department has a great program.</p>
	<p>Within the VH create manageable, shaded fuel breaks thru entire subdivision including VC Highlands and Highland Ranches</p>	<p>Ongoing. Fire Department has a great program.</p>
	<p>Continue program using seasonal firefighters and community service groups to provide veg. mgmt. services to elderly, disable, or low-income persons to remove flammable veg. around homes</p>	<p>Ongoing. Fire Department has a great program.</p>
	<p>Create a veg. mgmt. program to replace cheat grass w/perennial grasses around communities to slow wildfire spread</p>	<p>Ongoing. Fire Department has a great program.</p>
	<p>Perform study to determine appropriate method to retrofit buildings located VC urban fire hazard zone. (i.e. critical facilities, commercial business district, historic district and infrastructure)</p>	<p>Carryover.</p>
	<p>Implement fuels-reduction treatment along all boundaries of Six Mile Canyon to protect residences and community infrastructure</p>	<p>Ongoing. Fire Department has a great program.</p>
<p>Goal 7: <i>Reduce the possibility of damage and losses due to hazardous materials release</i></p>	<p>Enforce zoning ordinances to reduce public health risks from hazardous materials releases</p>	<p>Ongoing. Through Building Codes.</p>

Appendix G
Critical Infrastructure and Hazardous Materials Figures

CONFIDENTIAL
Not for Public Distribution

Appendix H
FEMA Local Plan Review Tool

LOCAL HAZARD MITIGATION PLAN REVIEW TOOL

The *Local Hazard Mitigation Plan Review Tool* demonstrates how the Local Hazard Mitigation Plan meets the regulation in 44 CFR §201.6 and offers State and FEMA Mitigation Planners an opportunity to provide feedback to the community.

- The **Regulation Checklist** provides a summary of FEMA’s evaluation of whether the plan has addressed all requirements.
- The **Plan Assessment** identifies the plan’s strengths as well as documents areas for future improvement. This section also includes a list of resources for implementation of the plan.
- The **Multi-Jurisdiction Summary Sheet** is a mandatory worksheet for multi-jurisdictional plans that is used to document which jurisdictions are eligible to adopt the plan.
- The **Hazard Identification and Risk Assessment Matrix** is a tool for plan reviewers to identify if all components of Element B are met.

Jurisdiction: Storey County, Nevada	Title of Plan: Hazard Mitigation Plan	Date of Plan: January 2020
Local Point of Contact: Joe Curtis		Address: 141 N. C Street, P.O. Box 7, Virginia City, NV 89440
Title: Storey County Emergency Manager		
Agency: Washoe County Emergency Management and Homeland Security		
Phone Number: 775-847-0986		E-Mail: jcurtis@storeycounty.org

State Reviewer: Janell Woodward 2478 Fairview Drive Carson City, NV 89701 775-687-9056	Title: SHMO	Date: 1/17/2020
Date Received at State Agency		
Date Sent to FEMA		

FEMA Reviewer:	Title:	Date:
Date Received in FEMA Region IX		
Date Not Approved		
Date Approvable Pending Adoption		
Date Approved		

**SECTION 1:
REGULATION CHECKLIST**

INSTRUCTIONS: The Regulation Checklist must be completed by FEMA. The purpose of the Checklist is to identify the location of relevant or applicable content in the plan by element/sub-element and to determine if each requirement has been ‘Met’ or ‘Not Met.’ The ‘Required Revisions’ summary at the bottom of each element must be completed by FEMA to provide a clear explanation of the revisions that are required for plan approval. Required revisions must be explained for each plan sub-element that is ‘Not Met.’ Sub-elements should be referenced in each summary by using the appropriate numbers (A1, B3, etc.), where applicable. Requirements for each Element and sub-element are described in detail in the *Local Plan Review Guide* in Section 4, Regulation Checklist.

1. REGULATION CHECKLIST Regulation (44 CFR 201.6 Local Mitigation Plans)		Location in Plan (section and/or page number)	Met	Not Met
ELEMENT A. PLANNING PROCESS				
A1. Does the plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))	a. Does the plan provide documentation of how the plan was prepared? This documentation must include the schedule or timeframe and activities that made up the plan’s development as well as who was involved.	HMP Section 4.1, 4.2, 4.3		
	b. Does the plan list the jurisdiction(s) participating in the plan that are seeking approval?	HMP Section 1.2, 2.3, 4.1; Annex A: Carson Water Subconservancy District (CWSD)		
	c. Does the plan identify who represented each jurisdiction? (At a minimum, it must identify the jurisdiction represented and the person’s position or title and agency within the jurisdiction.)	HMP Section 4.2.1; Annex A: Carson Water Subconservancy District (CWSD)		

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
A2. Does the plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))	a. Does the plan document an opportunity for neighboring communities, local, and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development, as well as other interested parties to be involved in the planning process?	HMP Section 4.2.1 and 4.3; Appendix D; Annex A: Carson Water Subconservancy District (CWSD)		
	b. Does the plan identify how the stakeholders were invited to participate in the process?	HMP Section 4.3		
A3. Does the plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))	a. Does the plan document how the public was given the opportunity to be involved in the planning process?	HMP Section 4.3		
	b. Does the plan document how the public's feedback was incorporated into the plan?	HMP Section 4.3		
A4. Does the plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))		HMP Section 4.4		
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))		HMP Section 8.3		
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))	a. Does the plan identify how, when, and by whom the plan will be monitored (how will implementation be tracked) over time?	HMP Section 8.1		
	b. Does the plan identify how, when, and by whom the plan will be evaluated (assessing the effectiveness of the plan at achieving stated purpose and goals) over time?	HMP Section 8.1		
	c. Does the plan identify how, when, and by whom the plan will be updated during the 5-year cycle?	HMP Section 8.1		

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
ELEMENT A: REQUIRED REVISIONS				
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT				
(Reviewer: See Section 4 for assistance with Element B)				
B1. Does the plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))	a. Does the plan include a general description of all natural hazards that can affect each jurisdiction?	HMP Section 5.5.1-5.5.10		
	b. Does the plan provide rationale for the omission of any natural hazards that are commonly recognized to affect the jurisdiction(s) in the planning area?	HMP Section 5.1		
	c. Does the plan include a description of the type of all natural hazards that can affect each jurisdiction?	HMP Section 5.5.1-5.5.10		
	d. Does the plan include a description of the location for all natural hazards that can affect each jurisdiction?	HMP Section 5.5.1-5.5.10		
	e. Does the plan include a description of the extent for all natural hazards that can affect each jurisdiction?	HMP Section 5.5.1-5.5.10		
B2. Does the plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))	a. Does the plan include information on previous occurrences of hazard events for each jurisdiction?	HMP Section 5.5.1-5.5.10		
	b. Does the plan include information on the probability of future hazard events for each jurisdiction?	HMP Section 5.5.1-5.5.10		
B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))	a. Is there a description of each hazard's impacts on each jurisdiction (what happens to structures, infrastructure, people, environment, etc.)?	HMP Section 5.4; 5.5.1-5.5.10; Appendix B and G		

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
	b. Is there a description of each identified hazard's overall vulnerability (structures, systems, populations, or other community assets defined by the community that are identified as being susceptible to damage and loss from hazard events) for each jurisdiction?	HMP Section 5.4; 5.5.1-5.5.10; Appendix B and G		
B4. Does the plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))		HMP Section 5.4.4		
<u>ELEMENT B: REQUIRED REVISIONS</u>				
ELEMENT C. MITIGATION STRATEGY				
C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))	a. Does the plan document each jurisdiction's existing authorities, policies, programs and resources?	HMP Section 6.1-6.4		
	b. Does the plan document each jurisdiction's ability to expand on and improve these existing policies and programs?	HMP Section 6.4		
C2. Does the plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))		HMP Section 6.4.1		
C3. Does the plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))		HMP Section 7.1		
C4. Does the plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))	a. Does the plan identify and analyze a comprehensive range of specific mitigation actions and projects to reduce the impacts from hazards?	HMP Section 7.2-7.4; Appendix F		

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
	b. Does the plan identify mitigation actions for every hazard posing a threat to each participating jurisdiction?	HMP Section 7.2-7.4; Appendix F		
	c. Do the identified mitigation actions and projects have an emphasis on new and existing buildings and infrastructure?	HMP Section 7.2-7.4; Appendix F		
C5. Does the plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))	a. Does the plan explain how the mitigation actions will be prioritized (including cost benefit review)?	HMP Section 7.3-7.4		
	b. Does the plan identify the position, office, department, or agency responsible for implementing and administering the action, potential funding sources and expected timeframes for completion?	HMP Section 7.4		
C6. Does the plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))	a. Does the plan identify the local planning mechanisms where hazard mitigation information and/or actions may be incorporated?	HMP Section 7.4; 8.2		
	b. Does the plan describe each community's process to integrate the data, information, and hazard mitigation goals and actions into other planning mechanisms?	HMP Section 7.4; 8.2		
	c. The updated plan must explain how the jurisdiction(s) incorporated the mitigation plan, when appropriate, into other planning mechanisms as a demonstration of progress in local hazard mitigation efforts.	HMP Section 8.2 (TO BE INITIATED UPON PLAN APPROVAL AND ADOPTION)		

1. REGULATION CHECKLIST		Location in Plan	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)		(section and/or page number)		
<u>ELEMENT C: REQUIRED REVISIONS</u>				
ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION				
<i>(Applicable to plan updates only)</i>				
D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))	HMP Section 3; 5.5.1-5.5.10			
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))	Section 6.4; Appendix F			
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))	Basic Plan Section 4.1; 5.1; 5.2			
<u>ELEMENT D: REQUIRED REVISIONS</u>				
ELEMENT E. PLAN ADOPTION				
E1. Does the plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))	HMP Section 1.2; Appendix A [PLAN TO BE ADOPTED FOLLOWING APPROVAL]			
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))	[PLAN TO BE ADOPTED FOLLOWING APPROVAL]			
<u>ELEMENT E: REQUIRED REVISIONS</u>				
ELEMENT F. ADDITIONAL STATE REQUIREMENTS				
<i>(Optional for State Reviewers only; not to be completed by FEMA)</i>				
F1.				
F2.				
<u>ELEMENT F: REQUIRED REVISIONS</u>				

SECTION 2: PLAN ASSESSMENT

INSTRUCTIONS: The purpose of this Plan Assessment is to offer the local community more comprehensive feedback to the community on the quality and utility of the plan in a narrative format. The Plan Assessment **must** be completed by FEMA.

The Assessment is an opportunity for FEMA to provide feedback and information to the community on: 1) suggested improvements to the plan; 2) specific sections in the plan where the community has gone above and beyond minimum requirements; 3) recommendations for plan implementation; and 4) ongoing partnership(s) and information on other FEMA programs, specifically Risk MAP and Hazard Mitigation Assistance programs.

The Plan Assessment is divided into two sections:

- 1) Plan Strengths and Opportunities for Improvement
- 2) Resources for Implementing Your Approved Plan

Plan Strengths and Opportunities for Improvement is organized according to the plan elements listed in the Regulation Checklist. Each element includes a series of italicized bulleted items that are suggested topics for consideration while evaluating plans, but it is not intended to be a comprehensive list. FEMA Mitigation Planners are not required to answer each bullet item, and should use them as a guide to paraphrase their own written assessment (2-3 sentences) of each element.

The Plan Assessment must not reiterate the required revisions from the Regulation Checklist or be regulatory in nature, and should be open-ended and to provide the community with suggestions for improvements or recommended revisions. The recommended revisions are suggestions for improvement and are not required to be made for the plan to meet Federal regulatory requirements. The italicized text should be deleted once FEMA has added comments regarding strengths of the plan and potential improvements for future plan revisions. It is recommended that the Plan Assessment be a short synopsis of the overall strengths and weaknesses of the Plan (no longer than two pages), rather than a complete recap section by section.

Resources for Implementing Your Approved Plan provides a place for FEMA to offer information, data sources and general suggestions on the overall plan implementation and maintenance process. Information on other possible sources of assistance including, but not limited to, existing publications, grant funding or training opportunities, can be provided. States may add state and local resources, if available.

A. Plan Strengths and Opportunities for Improvement

This section provides a discussion of the strengths of the plan document and identifies areas where these could be improved beyond minimum requirements.

Element A: Planning Process

Strengths:

- 1)
- 2)
- 3)

Opportunities for Improvement:

- 1)
- 2)
- 3)

Element B: Hazard Identification and Risk Assessment

Strengths:

- 1)
- 2)
- 3)

Opportunities for Improvement:

- 1)
- 2)
- 3)

Element C: Mitigation Strategy

Strengths:

- 1)
- 2)
- 3)

Opportunities for Improvement:

- 1)
- 2)
- 3)

Element D: Plan Update, Evaluation, and Implementation (*Plan Updates Only*)

Strengths:

- 1)
- 2)
- 3)

Opportunities for Improvement:

- 1)
- 2)
- 3)

B. Resources for Implementing and Updating Your Approved Plan

This resource section is organized into three categories:

- 1) Guidance and Resources
- 2) Training Topics and Courses
- 3) Funding Sources

Guidance and Resources

Local Mitigation Planning Handbook

<https://www.fema.gov/media-library/assets/documents/31598>

Beyond the Basics

<http://mitigationguide.org/>

Mitigation Ideas

<https://www.fema.gov/media-library/assets/documents/30627>

Plan Integration: Linking Local Planning Efforts

<https://www.fema.gov/media-library/assets/documents/108893>

Integrating Disaster Data into Hazard Mitigation Planning

<https://www.fema.gov/media-library/assets/documents/103486>

Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning

<https://www.fema.gov/ar/media-library/assets/documents/4317>

Community Rating System User Manual

<https://www.fema.gov/media-library/assets/documents/8768>

U.S. Climate Resilient Toolkit

<https://toolkit.climate.gov/>

2014 National Climate Assessment

<http://nca2014.globalchange.gov/>

Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation

http://ipcc-wg2.gov/SREX/images/uploads/SREX-All_FINAL.pdf

FY15 Hazard Mitigation Assistance Unified Guidance

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

Climate Resilient Mitigation Activities for Hazard Mitigation Assistance

<https://www.fema.gov/media-library/assets/documents/110202>

Training

More information at <https://training.fema.gov/emi.aspx> or through your State Training Officer

Mitigation Planning

IS-318 Mitigation Planning for Local and Tribal Communities

<https://training.fema.gov/is/courseoverview.aspx?code=is-318>

IS-393 Introduction to Hazard Mitigation

<https://training.fema.gov/is/courseoverview.aspx?code=is-393.a>

G-318 Preparing and Reviewing Local Plans

G-393 Mitigation for Emergency Managers

Hazard Mitigation Assistance (HMA) Grant Programs

IS-212.b Introduction to Unified HMA

<http://www.training.fema.gov/is/courseoverview.aspx?code=IS-212.b>

IS-277 Benefit Cost Analysis Entry Level

<http://www.training.fema.gov/is/courseoverview.aspx?code=IS-277>

E-212 HMA: Developing Quality Application Elements

E-213 HMA: Application Review and Evaluation

E-214 HMA: Project Implementation and Programmatic Closeout

E-276 Benefit-Cost Analysis Entry Level

GIS and Hazus-MH

IS-922 Application of GIS for Emergency Management

<http://www.training.fema.gov/is/courseoverview.aspx?code=IS-922>

E-190 ArcGIS for Emergency Managers

E-296 Application of Hazus-MH for Risk Assessment

E-313 Basic Hazus-MH

Floodplain Management

E-273 Managing Floodplain Development through the NFIP

E-278 National Flood Insurance Program/ Community Rating System

Potential Funding Sources

Hazard Mitigation Grant Program

POC: FEMA Region IX and State Hazard Mitigation Officer

Website: <https://www.fema.gov/hazard-mitigation-grant-program>

Pre-Disaster Mitigation Grant Program

POC: FEMA Region IX and State Hazard Mitigation Officer

Website: <https://www.fema.gov/pre-disaster-mitigation-grant-program>

Flood Mitigation Assistance Grant Program

POC: FEMA Region IX and State Hazard Mitigation Officer

Website: <https://www.fema.gov/flood-mitigation-assistance-grant-program>

Emergency Management Performance Grant Program

POC: FEMA Region IX

Website: <https://www.fema.gov/emergency-management-performance-grant-program>

**SECTION 3:
MULTI-JURISDICTIONAL SUMMARY SHEET**

INSTRUCTIONS: For multi-jurisdictional plans, this summary sheet must be completed by listing each participating jurisdiction that is eligible to adopt the plan.

#	Jurisdiction Name	Jurisdiction Type	Plan POC	Email
1	Storey County	County	Joe Curtis	jcurtis@storeycounty.org
2	Carson Water Subconservancy District (CWSD)	Multi-county, bi-state agency	Deborah Neddenriep	debbie@cwsd.org
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

SECTION 4:
HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX (OPTIONAL)

INSTRUCTIONS: This matrix can be used by the plan reviewer to help identify if all of the components of Element B have been met. List out natural hazard names that are identified in the plan in the column labeled “Hazards” and put a “Y” or “N” for each component of Element B.

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX								
Hazard	Requirement Met? (Y/N)							
	Type	Location	Extent	Previous Occurrences	Probability	Impacts	Vulnerability	Mitigation Action

Annex A
Carson Water Subconservancy District



Carson Water Subconservancy District

**Storey County Hazard Mitigation Plan
2020**

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1 ONE Introduction

1.1 CARSON WATER SUBCONSERVANCY DISTRICT

The Carson Water Subconservancy District (CWSD) is a unique multi-county, bi-state agency which crosses both agency and political boundaries between counties and other stakeholders. CWSD Board of Directors consists of eleven members with representatives from four counties within the watershed and includes several agricultural representatives. Additionally, two representatives from Alpine County and one representative from Storey County serve on the Carson River Watershed Committee.

CWSD's mission is to work within existing governmental frameworks to promote cooperative action in the Carson River Watershed which crosses both agency and political boundaries. CWSD acts as lead agency for integrated watershed planning and facilitates the [Carson River Coalition](#) (CRC). CWSD strives to involve all counties and communities within the watershed as it develops regional planning and management solutions for the Carson River Watershed. CWSD also works to ensure flood hazards within the region are recognized, prioritized, and addressed.

- CWSD has no regulatory authority.
- CWSD is funded by ad valorem taxes and federal, state, and local grants.
- CWSD is the designated Clean Water Act 208 Planning Agency.
- CWSD's Adaptive Stewardship Plan for the Carson River Watershed meets the funding requirements of EPA's clean water act, section 319.
- CWSD's is a Cooperating Technical Partner (CTP) with FEMA and signed a Charter Agreement with FEMA. As such, CWSD leverages its revenue with FEMA CTP funding.
- CWSD recently completed the 2018 Regional Floodplain Management Plan for the Carson River Watershed.

2. TWO Background: Community Description

2.1 HISTORY, LOCATION, AND GEOGRAPHY

The Carson River Watershed (Watershed) is located east of the Sierra range in Nevada and California (Figure 1). The Watershed is surrounded by mountains ranging in elevation from 6,000 to 11,000 feet MSL and flows north and then east the Carson Sink. The area is seismically active with a complex series of faults spanning a large area of Western Nevada. The Genoa Fault Zone is one of the most active faults in the region (Ramelli, et al., 1999).

The watershed consists of 3,966 square miles, with 606 square miles located in California. The Carson River flows approximately 184 miles from its headwaters in Alpine County, California, to the terminus at the Carson Sink in Churchill County, Nevada. The upper watershed in the Sierra Nevada experiences long, very cold winters and short, moderate to warm summers. The upper elevations receive more than 40 inches of precipitation per year, usually as snowfall, decreasing to about four to eight inches in the arid to semi-arid valley floors. Habitats within the watershed range from dry, salt desert scrublands, and sagebrush steppes to lush mountain meadows, forest, and aspen groves. Watershed characteristics and history are comprehensively detailed in Section 3 of the Carson River Watershed Adaptive Stewardship Plan (CWSD 2017).

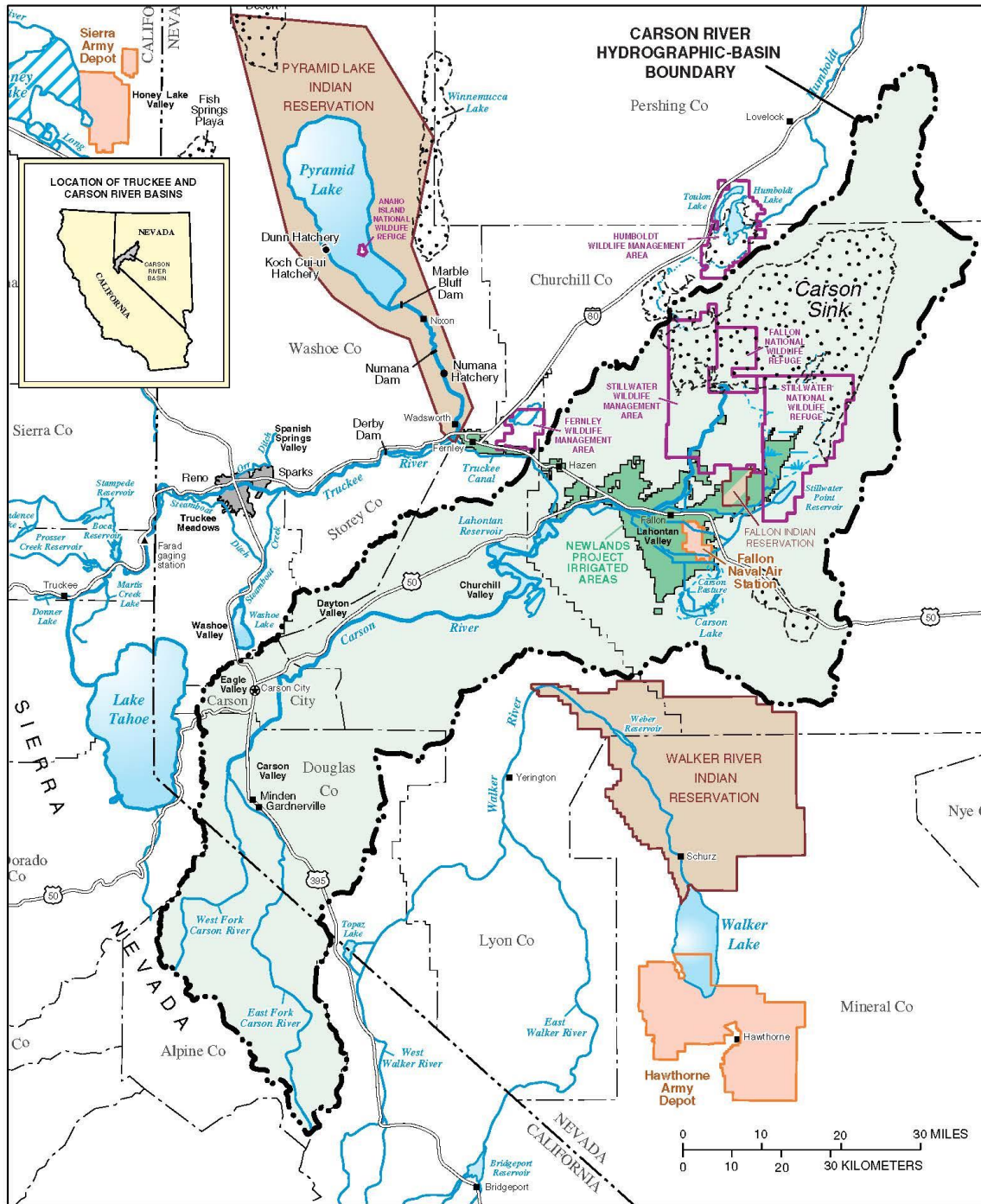


Figure 1. USGS hydrologic features map of the Carson River watershed and surroundings.

2.2 DEMOGRAPHICS

Population centers in the watershed include the Minden/Gardnerville area in Douglas County, Carson City, Dayton and Silver Springs in Lyon County, Virginia City in Storey County, and Fallon in Churchill County. The physical setting of the watershed has somewhat influenced the occurrence and size of population centers. Localized urban and residential areas (often located along or near the river) are separated by larger areas of ranchlands, farmlands, or sagebrush. Table 2.1 lists each watershed county’s entire population and indicates an increase over the last few decades, with Lyon and Douglas Counties experiencing the greatest population growth. Lyon County and Douglas County also provide the greatest opportunities for continued floodplain protection.

Table 2.1 Carson River Watershed Demographics		
County	2000	2019
Alpine County, California	1,113	1,071*
Carson City, Nevada	52,457	55,438
Churchill County, Nevada	23,982	25,387
Douglas County, Nevada	41,259	48,300
Lyon County, Nevada	34,501	54,657
Storey County, Nevada	3,399	4,084
* Alpine County 2015 data		
2000 & 2015 Alpine County Source: US Census Data (www.data.gov)		
2019 Source: Nevada Department of Taxation (https://tax.nv.gov/Publications/Population_Statistics_and_Reports/)		

3 THREE Risk and Vulnerability Assessment

3.1 HAZARD IDENTIFICATION

CSWD tabulated hazard rankings taking into account the historical occurrence of each respective hazard, the potential area of impact when the disaster does occur, and the magnitude. Please see Table 3-1 below for scoring criteria.

Table 3-1. Vulnerability Ratings Rubric

		Probability/ Frequency	Magnitude	Onset	Duration
Lowest	1	Highly unlikely (less than every 25 years)	No injuries or deaths expected, minimal property damage	Greater than 30 days of warning	Only brief moments
	2	Fairly unlikely (10-25 years)	Between 1 and 5 injuries or deaths, minor property damage	5-30 days of warning	1-24 hours
	3	Moderate (5-10 years)	Between 5 and 25 injuries or deaths, moderate property damage	1-5 days of warning	Days to weeks
	4	Likely (1-5 years)	Between 25 and 50 injuries or deaths, severe property damage	1-10 hours of warning	Weeks to months
Highest	5	Highly likely (once per year)	Greater than 50 injuries or deaths, catastrophic property damage	No warning	Months to years

In Table 3.2, CWSD addresses 5 hazards which pose a threat in the Carson River Watershed: alluvial fan flooding, riverine flooding, drought, severe weather, wildland fires, and hazardous materials events. CWSD has a regional focus on hazards in the watershed.

	<i>Probability/ Frequency (1=lowest, 5=highest)</i>	<i>Magnitude (1=lowest, 5=highest)</i>	<i>Onset (1=slowest, 5=fastest)</i>	<i>Duration (1=shortest, 5=longest)</i>	<i>Average</i>	<i>Rank</i>
Alluvial Fan Flooding	3.00	5.00	4.00	2.00	3.50	1
Riverine Flooding	3.00	4.00	3.00	3.00	3.25	2
Drought	2.00	3.00	1.00	5.00	2.75	3
Severe Weather	2.00	2.00	3.00	2.00	2.25	4
Wildland Fire (Post Fire)	2.00	3.00	2.00	2.00	2.25	4
Hazardous Materials Event	1.00	1.00	5.00	2.00	2.25	4

3.2 PLANNING FOR RISK AND VULNERABILITY

CWSD is a regional watershed planning agency which provides technical, financial, and outreach to Alpine County, California; Carson City, Churchill County, Douglas County, Lyon County, and Storey County Nevada. CWSD is a cooperating technical partner (CTP) with FEMA.

3.3 VULNERABILITY ASSESSMENT

In the past, CWSD has participated in various counties' hazard mitigation planning processes. Although each county may have a slight difference in the hazards mitigation scoring, CWSD focuses on flooding, drought, and stormwater hazards.

3.3.1 Identifying Critical Infrastructure

Being a regional watershed planning agency CWSD does not own or operate any facilities or infrastructure.

3.3.2 Data Limitations

Carson Water Subconservancy District is a regional watershed planning agency. As such, CWSD collects, compiles, and analyzes data from State and Federal Agencies regarding floods, droughts, severe weather, earthquakes, wildland fires, and hazardous materials events.

3.3.3 Repetitive Loss Properties

The repetitive loss properties recorded in the Carson River Watershed are listed in Table 3.4.

JURISDICTION	REPETITIVE LOSS PROPERTIES:
Alpine County	The only repetitive loss property is in Bear Valley, which is not in the Carson River Watershed.
Carson City	3 repetitive loss properties
Churchill County	1 repetitive loss property
Lyon County	0 repetitive loss properties
Douglas County	Within Douglas County, there are 2 repetitive loss properties in Genoa, 2 repetitive loss properties in Gardnerville, and 5 repetitive loss properties in Minden.
Storey County	0 repetitive loss properties
Source:	Carson River Watershed Floodplain Management Plan 2018

3.3.4 Exposure Assessment

Since 1998, CWSD has been collecting and studying various hazards in the Carson River Watershed. CWSD has various studies and data available on cwsd.org. Examples include the Carson River Watershed Adaptive Stewardship Plan (2017) and the Carson River Watershed Floodplain Management Plan (2018).

3.4 HAZARD PROFILES AND VULNERABILITY ASSESSMENTS**3.4.1 Alluvial Fan Flooding**

Planning Significance: High

As a cooperative agency, CWSD works with counties to address ways to reduce flood risks in the watershed. On June 6, 2005, CWSD became a Cooperating Technical Partner (CTP) with FEMA. Alluvial fan flooding is defined in the 2018 Carson River Watershed Floodplain Management Plan as “flooding [aka flash flooding] results from intense rainfall during summer thunderstorms on alluvial fan surfaces (gently sloping, fan-shaped landforms common just below mountain canyons). Flash flooding is characterized by high-velocity flows, sediment and bedload transport, erosion and deposition, and unpredictable flow paths.” CWSD has coordinated several alluvial fan drainage studies in the Carson River Watershed. These studies have focused on reducing flood risks in communities with significant risk from flash flooding.

3.4.2 Riverine Flooding

Planning Significance: High

As a cooperative agency, CWSD works with counties to address ways to reduce flood risks in the watershed. On June 6, 2005, CWSD became a Cooperating Technical Partner (CTP) with FEMA. Riverine (or main channel) flooding occurs in valley bottoms during large winter storms, when prolonged heavy rain falls on mountain snowpack. Since then CWSD has coordinated several flood studies in the Carson River Watershed. These studies have focused on reducing flood risks.

3.4.2 Drought

Planning Significance: High

As a cooperative agency, CWSD works with counties and various water purveyors in the Watershed to ensure adequate water supplies during droughts. CWSD provides regions water supply studies and provides funding assistance to intertie the various water purveyors together to provide water redundancy.

3.4.3 Severe Weather

Planning Significance: Moderate

As a cooperative agency, CWSD works with counties to address severe weather. CWSD has conducted several studies evaluating stormwater impacts to various communities in the

Watershed. These studies identify storm hazards and propose various projects to reduce these hazards.

3.4.4 Wildland Fire (Post Fire)

As a cooperative agency, CWSD works with counties to address increased flood hazards due to impacts caused by wildfires.

3.4.5 Hazardous Materials Events

As a cooperative agency, CWSD works with counties to address Hazardous Materials Events as they relate to impacts to surface and groundwater supplies.

4 FOUR Capability Assessment

4.1 LEGAL AND REGULATORY CAPABILITIES

CWSD does not have any legal or regulatory capability but provides technical and financial support to the various communities in the Carson River Watershed.

Table 4.1 is a list of various hazard mitigation support that CWSD provides in the watershed:

Master Plan	If asked, CWSD provides technical assistance, review and / or comment
Zoning Ordinance	If asked, CWSD provides technical assistance, review and / or comment
Subdivision Ordinance	If asked, CWSD provides technical assistance, review and / or comment
Growth management related to water supply	If asked, CWSD provides technical assistance, review and / or comment
Floodplain ordinance	Funded through FEMA, CWSD provides technical assistance and support city/county ordinance update.
Other special purpose ordinance (stormwater, steep slope, wildfire)	With Section 208 funding provided by NDEP, CWSD is providing technical assistance and support for city/county to review Low Impact Development Ordinances.
Stormwater management program	Provides information on ways to reduce storm water through the use of low impact development reports
Reduce flood risk	Provide funding and technical support to reduce flood risks
Water Supply	Provide funding and technical support to enhance water reliability

4.2 ADMINISTRATIVE AND TECHNICAL CAPABILITIES

The administrative and technical capability of the CWSD provides an identification of the staff resources available to expedite the actions identified in the Mitigation Strategy.

Table 4-2: Administrative and Technical Capability

Staff/Personnel Resources	Position
Planner/Engineer with knowledge of land development/land management practices	Licensed Engineer
Engineer/ Professional trained in construction practices related to buildings and/or infrastructure	Licensed Engineer
Planner/engineer/scientist with an understanding of natural hazards	Watershed Program Manager
Personnel skilled in GIS	Watershed Program Specialist
Floodplain Manager	Water Resources Specialist 2, CFM

4.3 FINANCIAL CAPABILITIES

Specific financial and budgetary tools available to CWSD for hazard mitigation include ad valorem taxes from watershed counties.

Table 4-3: Fiscal Capability

Financial Resources	Accessible or Eligible to Use (Yes/No/Don't Know)
Community Development Block Grants (CDBG)	No
Capital improvements project funding	No
Authority to levy taxes for specific purposes	CWSD has authority to levy \$.03 per \$100 from assessed valuation of properties located in the Nevada portion of the Watershed.
Fees for water, sewer, gas, or electric service	No
Insurance	No
Impact fees for homebuyers or developers for new developments/homes	No
Incur debt through general obligation bonds	No
Incur debt through special tax and revenue bonds	No
Incur debt through private activity bonds	No

Withhold spending in hazard-prone areas	No
Fire Department, Plan Review fees	No
Ambulance fees	No
Business license and events fees	No
Assistance available through mutual aid agreements/Quad County resources	No

4.4 CURRENT MITIGATION CAPABILITIES

Table 4-4 lists CWSD's primary strengths and actions taken to increase capabilities.

Table 4-4: CWSD Mitigation Capability

Applicable Programs, Plans, Policies, Regulations, Funding, or Practices	Point of Contact	Strengths	Key Mitigation Accomplishments
Water Law, Flood & Drought Policy, Engineering	Edwin D. James	Understanding of State and Federal Water Law, Legislative Process, Funding Mechanisms to leverage local money to achieve Regional Watershed Management goals	Through FEMA Cooperating Technical Partner grants, assist counties in data collection for flood and mitigation studies & expand community engagement and flood awareness. Procured USBR grant to create Water Marketing Strategy to reduce conflict and ensure water sustainability.
Watershed Program Management	Brenda Hunt	Coordinates integrated watershed management process and facilitates Carson River Coalition Stakeholder group.	Through Watershed Literacy Campaign, help residents understand they live in a watershed and how open floodplain lands are the best defense against flooding.
Watershed Program Specialist	Shane Fryer	Manages and monitors weed grants to reduce wildland fires; assists counties in monitoring river projects	Lead for the Invasive Species Working Group; Uses drones to monitor projects, & coordinates with conservation districts to reduce weeds.
Water Resource Specialist 2	Debbie Neddenriep	Grant Management of FEMA grants from cradle to grave: aka grant.gov, PARS system, ND Grants, and Mapping Information Platform. Coordinate community engagement and flood awareness in Carson River Watershed	Lead for community engagement and flood awareness. Project lead for Floodplains as Community Assets videos.

5 FIVE Mitigation Strategy**5.1 MITIGATION GOALS AND OBJECTIVES**

CWSD reviewed the hazard profiles as a basis for developing mitigation goals and objectives. CWSD works with local governments to address mitigation capability as it relates to flooding, drought, severe weather and in some cases, invasive species reduction to reduce wildland fuels.

Mitigation actions are usually grouped into six broad categories: prevention, property protection, public education and awareness, natural resource protection, emergency services, and structural projects. Table 5-1 lists CWSD goals and potential actions selected for this HMP.

Table 5-1: Mitigation Goals		
Goal Number	Goal Description	Objective
1	Goal 1: Promote increased and ongoing involvement in hazard-mitigation planning and projects.	Coordinate Carson River Watershed hazard mitigation planning with local, state, and federal plans. Create Carson River Hazard Mitigation Plan
2	Goal 2: Reduce the possibility of damage and losses due to drought.	Property protection: CWSD works to improve water supply - 2013 Regional Comprehensive Watershed Plan (2013) considers long-term water system viability in the Carson River Watershed.
		Property protection: CWSD works to improve water supply - Water Marketing Strategy for the Carson River Watershed to ensure water supply and reduce conflict between users.
		Create annual water rate report of 13 water purveyors in the Carson River Watershed.
		Property protection: CWSD helps fund USGS well monitoring of water levels in Carson River Watershed.
3	Goal 3: Reduce the possibility of damage and losses due to floods.	2018 Regional Floodplain Management Plan lists potential projects and suggested actions to mitigate flood hazards. This plan was adopted by Storey County Board 12/2018.
		2019 North Dayton Valley Area Drainage Master Plan includes Mark Twain Community of Storey County.
		CWSD is funded through FEMA to assist local counties and city conduct community engagement and flood outreach in the Carson River Watershed.

5.2 IDENTIFYING, EVALUATING, AND PRIORITIZING MITIGATION ACTIONS

CWSD identified, evaluated, and prioritized each mitigation action. To complete this task, the STAPLE+E evaluation criteria was used, including rankings of zero for lowest and three for highest priority, acceptance, feasibility etc., and the rankings for each action were totaled. See Table 5-2 for the evaluation criteria.

Table 5-2: STAPLE+E Evaluation Criteria for Mitigation Actions

Evaluation Category	Discussion “It is important to consider...”	Considerations
Social	The public Support for the overall mitigation strategy and specific mitigation actions	Community acceptance; adversely affects population
Technical	If the mitigation action is technically feasible and if it is the whole or partial solution	Technical feasibility; Long-term solutions; Secondary impacts
Administrative	If the community has the personnel and administrative capabilities necessary to implement the action or whether outside help will be necessary	Staffing: Funding allocation; Maintenance/operations
Political	What the community and its members feel about issues related to the environment, economic development, safety, and emergency management	Political support; Local champion; Public support
Legal	Whether the community has the legal authority to implement the action, or whether the community must pass new regulations	Local, State, and Federal authority; Potential legal challenge
Economic	If the action can be funded with current or future internal and external sources, if the costs seem reasonable for the size of the project, and if enough information is available to complete a FEMA Benefit Cost Analysis	Benefit/cost of action; Contributes to other economic goals; Outside funding required; FEMA Benefit Cost Analysis
Environmental	The impact on the environment because of public desire for a sustainable and environmentally healthy community	Effect on local flora and fauna; Consistent with community environmental goals; Consistent with local, State and Federal laws

6 SIX References

Carson Water Subconservancy District /Brenda Hunt. 2017. Adaptive Stewardship Plan.

Carson Water Subconservancy District /Deborah Neddenriep. 2018. Carson River Watershed Floodplain Management Plan. <http://www.cwsd.org/wp-content/uploads/2018/10/2018-10-18-RFMP-Bd-Approved-Final.pdf>.

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List of Acronyms & Common Terms

CRC	Carson River Coalition
CRS	Community Rating System
CWSD	Carson Water Subconservancy District
CTP	Cooperating Technical Partner
FEMA	Federal Emergency Management Agency
NFIP	National Flood Insurance Program
FMP2018	Carson River Watershed Floodplain Management Plan
Stewardship Plan	Carson River Watershed Adaptive Stewardship Plan
Watershed	Carson River Watershed

1.1 CARSON WATER SUBCONSERVANCY DISTRICT

The Carson Water Subconservancy District (CWSD) is a unique multi-county, bi-state agency which crosses both agency and political boundaries between counties and other stakeholders. CWSD Board of Directors consists of eleven members with representatives from four counties within the watershed and includes several agricultural representatives. Additionally, two representatives from Alpine County and one representative from Storey County serve on the Carson River Watershed Committee.

CWSD's mission is to work within existing governmental frameworks to promote cooperative action in the Carson River Watershed which crosses both agency and political boundaries. CWSD acts as lead agency for integrated watershed planning and facilitates the Carson River Coalition (CRC). CWSD strives to involve all counties and communities within the watershed as it develops regional planning and management solutions for the Carson River Watershed. CWSD also works to ensure flood hazards within the region are recognized, prioritized, and addressed.

- CWSD has no regulatory authority.
- CWSD is funded by ad valorem taxes and federal, state, and local grants.
- CWSD is the designated Clean Water Act 208 Planning Agency.
- CWSD's Adaptive Stewardship Plan for the Carson River Watershed meets the funding requirements of EPA's clean water act, section 319.
- CWSD is a Cooperating Technical Partner (CTP) with FEMA and signed a Charter Agreement with FEMA. As such, CWSD leverages its revenue with FEMA CTP funding.
- CWSD recently completed the 2018 Regional Floodplain Management Plan for the Carson River Watershed.

2.1 HISTORY, LOCATION, AND GEOGRAPHY

The Carson River Watershed (Watershed) is located east of the Sierra range in Nevada and California (Figure 1). The Watershed is surrounded by mountains ranging in elevation from 6,000 to 11,000 feet MSL and flows north and then east the Carson Sink. The area is seismically active with a complex series of faults spanning a large area of Western Nevada. The Genoa Fault Zone is one of the most active faults in the region (Ramelli, et al., 1999).

The watershed consists of 3,966 square miles, with 606 square miles located in California. The Carson River flows approximately 184 miles from its headwaters in Alpine County, California, to the terminus at the Carson Sink in Churchill County, Nevada. The upper watershed in the Sierra Nevada experiences long, very cold winters and short, moderate to warm summers. The upper elevations receive more than 40 inches of precipitation per year, usually as snowfall, decreasing to about four to eight inches in the arid to semi-arid valley floors. Habitats within the watershed range from dry, salt desert scrublands, and sagebrush steppes to lush mountain meadows, forest, and aspen groves. Watershed characteristics and history are comprehensively detailed in Section 3 of the Carson River Watershed Adaptive Stewardship Plan (CWSD 2017).¹

¹ <http://www.cwsd.org/carson-river-watershed-adaptive-stewardship-plan/>

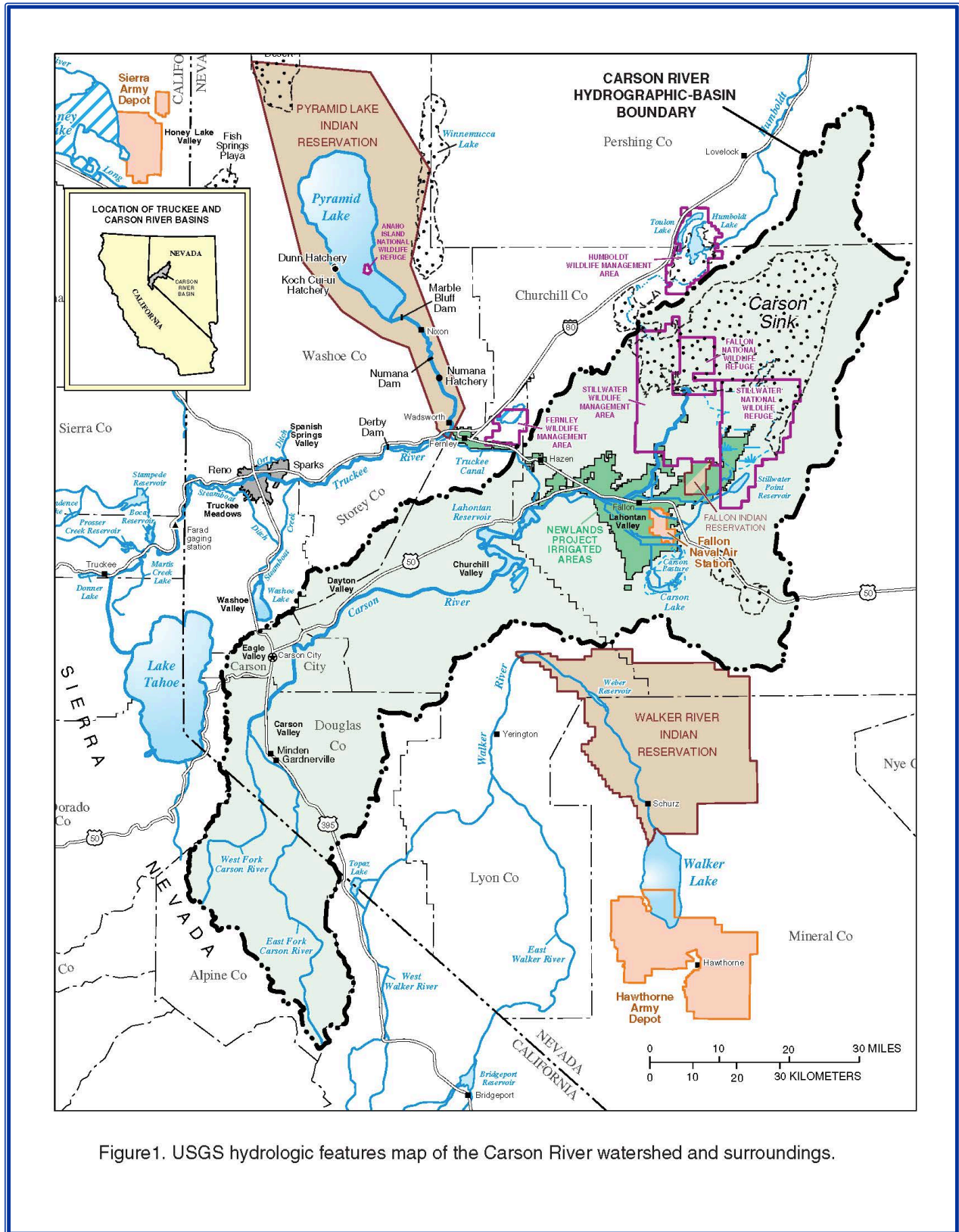


Figure 1. USGS hydrologic features map of the Carson River watershed and surroundings.

2.2 DEMOGRAPHICS

Population centers in the watershed include the Minden/Gardnerville area in Douglas County, Carson City, Dayton and Silver Springs in Lyon County, Virginia City in Storey County, and Fallon in Churchill County. The physical setting of the watershed has somewhat influenced the occurrence and size of population centers. Localized urban and residential areas (often located along or near the river) are separated by larger areas of ranchlands, farmlands, or sagebrush. Table 2.1 lists each watershed county's entire population and indicates an increase over the last few decades, with Lyon and Douglas Counties experiencing the greatest population growth. Lyon County and Douglas County also provide the greatest opportunities for continued floodplain protection.

Table 2.1 Carson River Watershed Demographics

County	2000	2015
Alpine County, California	1,113	1,071
Carson City, Nevada	52,457	54,742
Churchill County	23,982	24,198
Douglas County	41,259	48,020
Lyon County	34,501	53,179
Storey County	3,399	4,051

Source: US Census Data (www.data.gov)

3.1 HAZARD IDENTIFICATION

CSWD tabulated hazard rankings taking into account the historical occurrence of each respective hazard, the potential area of impact when the disaster does occur, and the magnitude. Please see Table 3-1 below for scoring criteria.

Table 3-1. Vulnerability Ratings Rubric

		Probability/ Frequency	Magnitude	Onset	Duration
Lowest	1	Highly unlikely (less than every 25 years)	No injuries or deaths expected, minimal property damage	Greater than 30 days of warning	Only brief moments
	2	Fairly unlikely (10-25 years)	Between 1 and 5 injuries or deaths, minor property damage	5-30 days of warning	1-24 hours
	3	Moderate (5-10 years)	Between 5 and 25 injuries or deaths, moderate property damage	1-5 days of warning	Days to weeks
	4	Likely (1-5 years)	Between 25 and 50 injuries or deaths, severe property damage	1-10 hours of warning	Weeks to months
Highest	5	Highly likely (once per year)	Greater than 50 injuries or deaths, catastrophic property damage	No warning	Months to years

CWSD determined that 6 hazards pose a threat to CWSD: drought, earthquake, flood, severe weather, hazardous materials events, and wildland fires. CWSD’s focus on these hazards are their impact to the watershed and its residents. The final rankings were adopted as the official rankings and are available in Table 3-2.

Table 3-2. 2020 Carson Water Subconservancy District Hazard Rankings						
	<i>Probability/ Frequency (1=lowest, 5=highest)</i>	<i>Magnitude (1=lowest, 5=highest)</i>	<i>Onset (1=slowest, 5=fastest)</i>	<i>Duration (1=shortest, 5=longest)</i>	<i>Average</i>	<i>Rank</i>
Flood	4.30	3.50	4.00	2.50	3.58	1
Drought	3.60	3.00	3.00	4.00	3.40	2
Severe Weather (Snow, Ice, Wind, Hail)	5.00	2.50	4.00	2.00	3.38	3
Earthquake	4.00	2.00	5.00	1.50	3.13	4
Wildland Fire	3.80	1.50	4.00	3.00	3.08	5
Hazardous Materials Event	3.00	2.00	5.00	2.00	3.00	6

3.2 PLANNING FOR RISK AND VULNERABILITY

CWSD is a regional watershed planning agency which provides technical, financial, and outreach to Alpine County, California; Carson City, Churchill County, Douglas County, Lyon County, and Storey County Nevada. CWSD is a cooperating technical partner (CTP) with FEMA.

3.3 VULNERABILITY ASSESSMENT

In the past, CWSD has participated in various counties’ hazard mitigation planning processes. Although each county may have a slight difference in the hazard mitigation scoring, CWSD focuses on flooding, drought, and stormwater hazards.

3.3.1 Identifying Critical Infrastructure

Being a regional watershed planning agency CWSD does not own or operate any facilities or infrastructure.

3.3.2 Data Limitations

Carson Water Subconservancy District is a regional watershed planning agency. As such, CWSD collects, compiles, and analyzes data from State and Federal Agencies regarding floods, droughts, severe weather, earthquakes, wildland fires, and hazardous materials events.

3.3.3 Repetitive Loss Properties

The repetitive loss properties recorded in the Carson River Watershed are listed in Table 3.4.

Table 3.4. Repetitive Losses in Carson River Watershed	
JURISDICTION	REPETITIVE LOSS PROPERTIES:
Alpine County	The only repetitive loss property is in Bear Valley, which is not in the Carson River Watershed.
Carson City	3 repetitive loss properties
Churchill County	1 repetitive loss property
Lyon County	0 repetitive loss properties
Douglas County	Within Douglas County, there are 2 repetitive loss properties in Genoa, 2 repetitive loss properties in Gardnerville, and 5 repetitive loss properties in Minden.
Storey County	0 repetitive loss properties
Source:	Carson River Watershed Floodplain Management Plan 2018

3.3.4 Exposure Assessment

Since 1998, CWSD has been collecting and studying various hazards in the Carson River Watershed. CWSD has various studies and data available on cwsd.org. Examples include the Carson River Watershed Adaptive Stewardship Plan (2017) and the Carson River Watershed Floodplain Management Plan (2018).

3.4 HAZARD PROFILES AND VULNERABILITY ASSESSMENTS**3.4.1 Flood**

Planning Significance: High

As a cooperative agency, CWSD works with counties to address ways to reduce flood risks in the watershed. On June 6, 2005, CWSD became a Cooperating Technical Partner (CTP) with FEMA. Since then CWSD has coordinated several flood studies in the Carson River Watershed. These studies have focused on reducing flood risks.

3.4.2 Drought

Planning Significance: High

As a cooperative agency, CWSD works with counties and various water purveyors in the Watershed to ensure adequate water supplies during droughts. CWSD provides regions water supply studies and provides funding assistance to intertie the various water purveyors together to provide water redundancy.

3.4.3 Severe Weather

Planning Significance: Moderate

As a cooperative agency, CWSD works with counties to address severe weather. CWSD has conducted several studies evaluating stormwater impacts to various communities in the Watershed. These studies identify storm hazards and propose various projects to reduce these hazards.

3.4.4 Earthquake

As a cooperative agency, CWSD works with counties to address Earthquakes as they relate to interrupting water supply.

3.4.5 Hazardous Materials Events

As a cooperative agency, CWSD works with counties to address Hazardous Materials Events as they relate to impacts to surface and groundwater supplies.

3.4.6 Wildland Fire

As a cooperative agency, CWSD works with counties to address impacts Wildland Fire can have on runoff, debris flows, and water quality impacts.

4.1 LEGAL AND REGULATORY CAPABILITIES

CWSD does not have any legal or regulatory capability but provides technical and financial support to the various communities in the Carson River Watershed.

Table 4.1 is a list of various hazard mitigation support that CWSD provides in the watershed:

Master Plan	If asked, CWSD provides technical assistance, review and / or comment
Zoning Ordinance	If asked, CWSD provides technical assistance, review and / or comment
Subdivision Ordinance	If asked, CWSD provides technical assistance, review and / or comment
Growth management related to water supply	If asked, CWSD provides technical assistance, review and / or comment
Floodplain ordinance	Funded through FEMA, CWSD provides technical assistance and support city/county ordinance update.
Other special purpose ordinance (stormwater, steep slope, wildfire)	With Section 208 funding provided by NDEP, CWSD is providing technical assistance and support for city/county to review Low Impact Development Ordinances.
Stormwater management program	Provides information on ways to reduce storm water through the use of low impact development reports
Reduce flood risk	Provide funding and technical support to reduce flood risks
Water Supply	Provide funding and technical support to enhance water reliability

4.2 ADMINISTRATIVE AND TECHNICAL CAPABILITIES

The administrative and technical capability of the CWSD provides an identification of the staff resources available to expedite the actions identified in the Mitigation Strategy.

Table 4-2: Administrative and Technical Capability

Staff/Personnel Resources	Position
Planner/Engineer with knowledge of land development/land management practices	Licensed Engineer
Engineer/ Professional trained in construction practices related to buildings and/or infrastructure	Licensed Engineer
Planner/engineer/scientist with an understanding of natural hazards	Watershed Program Manager
Personnel skilled in GIS	Watershed Program Specialist
Floodplain Manager	Water Resources Specialist 2, CFM

4.3 FINANCIAL CAPABILITIES

Specific financial and budgetary tools available to CWSD for hazard mitigation include ad valorem taxes from watershed counties.

Table 4-3: Fiscal Capability

Financial Resources	Accessible or Eligible to Use (Yes/No/Don't Know)
Community Development Block Grants (CDBG)	No
Capital improvements project funding	No
Authority to levy taxes for specific purposes	Yes, CWSD has authority to levy ad valorem taxes.
Fees for water, sewer, gas, or electric service	No
Insurance	No
Impact fees for homebuyers or developers for new developments/homes	No
Incur debt through general obligation bonds	No
Incur debt through special tax and revenue bonds	No
Incur debt through private activity bonds	No
Withhold spending in hazard-prone areas	No
Fire Department, Plan Review fees	No
Ambulance fees	No
Business license and events fees	No
Assistance available through mutual aid agreements/Quad County resources	No

4.4 CURRENT MITIGATION CAPABILITIES

Table 4-4 lists CWSD's primary strengths and actions taken to increase capabilities.

Table 4-4: CWSD Mitigation Capability

Applicable Programs, Plans, Policies, Regulations, Funding, or Practices	Point of Contact	Strengths	Key Mitigation Accomplishments
Water Law, Flood & Drought Policy, Engineering	Edwin D. James	Understanding of State and Federal Water Law, Legislative Process, Funding Mechanisms to leverage local money to achieve Regional Watershed Management goals.	Through FEMA Cooperating Technical Partner grants, assist counties in data collection for flood and mitigation studies & expand community engagement and flood awareness. Procured USBR grant to create Water Marketing Strategy to reduce conflict and ensure water sustainability.
Watershed Program Management	Brenda Hunt	Coordinates integrated watershed management process and facilitates Carson River Coalition Stakeholder group.	Through Watershed Literacy Campaign, help residents understand they live in a watershed and how open floodplain lands are the best defense against flooding.
Watershed Program Specialist	Shane Fryer	Manages and monitors weed grants to reduce wildland fires; assists counties in monitoring river projects.	Lead for the Invasive Species Working Group; uses drones to monitor projects; & coordinates with conservation districts to reduce weeds.
Water Resource Specialist 2	Debbie Neddenriep	Grant Management of FEMA grants from cradle to grave: aka grant.gov, PARS system, ND Grants, and Mapping Information Platform. Coordinate community engagement and flood awareness in Carson River Watershed.	Lead for community engagement and flood awareness. Project lead for Floodplains as Community Assets videos.

5.1 MITIGATION GOALS AND OBJECTIVES

CWSD reviewed the hazard profiles as a basis for developing mitigation goals and objectives. CWSD works with local governments to address mitigation capability as it relates to flooding, drought, severe weather and in some cases, invasive species reduction to reduce wildland fuels.

Table 5-1: Mitigation Goals

Goal Number	Goal Description	Objectives
1	Promote increased and ongoing involvement in hazard-mitigation planning and projects.	Coordinate Carson River Watershed hazard mitigation planning with local, state, and federal plans. Create Carson River Hazard Mitigation Plan.
2	Reduce the possibility of damage and losses due to drought.	Property protection: Work to improve water supply. The 2013 Regional Comprehensive Watershed Plan (2013) considers long-term water system viability in the Carson River Watershed.
		Property protection: Work to improve water supply. The Water Marketing Strategy for the Carson River Watershed ensures water supply and reduces conflict between users.
		Create annual water rate report of 13 water purveyors in the Carson River Watershed.
		Property protection: Help fund USGS well monitoring of water levels in Carson River Watershed.
3	Reduce the possibility of damage and losses due to floods.	The 2018 Regional Floodplain Management Plan lists potential projects and suggested actions to mitigate flood hazards. This plan was adopted by Storey County Board in December 2018.
		The 2019 North Dayton Valley Area Drainage Master Plan includes the Mark Twain Community of Storey County.
		CWSD is funded through FEMA to assist local counties and city conduct community engagement and flood outreach in the Carson River Watershed.

5.2 IDENTIFYING, EVALUATING, AND PRIORITIZING MITIGATION ACTIONS

CWSD participated in Storey County’s identification, evaluation, and prioritization of each mitigation action. To complete this task, the STAPLE+E evaluation criteria was used, including rankings of zero for lowest and three for highest priority, acceptance, feasibility etc., and the rankings for each action were totaled. See Table 5-2 for the evaluation criteria.

Table 5-2: STAPLE+E Evaluation Criteria for Mitigation Actions

Evaluation Category	Discussion “It is important to consider...”	Considerations
Social	The public Support for the overall mitigation strategy and specific mitigation actions	Community acceptance; adversely affects population
Technical	If the mitigation action is technically feasible and if it is the whole or partial solution	Technical feasibility; Long-term solutions; Secondary impacts
Administrative	If the community has the personnel and administrative capabilities necessary to implement the action or whether outside help will be necessary	Staffing; Funding allocation; Maintenance/operations
Political	What the community and its members feel about issues related to the environment, economic development, safety, and emergency management	Political support; Local champion; Public support
Legal	Whether the community has the legal authority to implement the action, or whether the community must pass new regulations	Local, State, and Federal authority; Potential legal challenge
Economic	If the action can be funded with current or future internal and external sources, if the costs seem reasonable for the size of the project, and if enough information is available to complete a FEMA Benefit Cost Analysis	Benefit/cost of action; Contributes to other economic goals; Outside funding required; FEMA Benefit Cost Analysis
Environmental	The impact on the environment because of public desire for a sustainable and environmentally healthy community	Effect on local flora and fauna; Consistent with community environmental goals; Consistent with local, State and Federal laws

Carson Water Subconservancy District /Brenda Hunt. 2017. *Adaptive Stewardship Plan*.

Carson Water Subconservancy District /Deborah Neddenriep. 2018. *Carson River Watershed Floodplain Management Plan*. <http://www.cwsd.org/wp-content/uploads/2018/10/2018-10-18-RFMP-Bd-Approved-Final.pdf>.