

CITY OF TRUTH OR CONSEQUENCES, NEW MEXICO

RESOLUTION NO. 57 25/26

A RESOLUTION OF THE CITY OF TRUTH OR CONSEQUENCES ADOPTING THE SIERRA COUNTY 2026 HAZARD MITIGATION ACTION PLAN.

WHEREAS, the City of Truth or Consequences recognizes the threat that natural hazards pose to people and property within the City of Truth or Consequences; and

WHEREAS, the County of Sierra has prepared a multi-hazard mitigation plan, hereby known as Sierra County 2026 Hazard Mitigation Action Plan, in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, the Sierra County 2026 Hazard Mitigation Action Plan, identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the City of Truth or Consequences from the impacts of future hazards and disasters; and

WHEREAS, adoption by the City Commission demonstrates their commitment to hazard mitigation and achieving the goals outlined in the Sierra County 2026 Hazard Mitigation Action Plan.

NOW THEREFORE, BE IT RESOLVED BY THE CITY OF TRUTH OR CONSEQUENCES, NEW MEXICO, THAT:

The City Commission adopts the Sierra County 2026 Hazard Mitigation Action Plan. This plan, approved by the community, may be edited or amended after submission for review, but will not require the community to re-adopt any further iterations. This only applies to this specific plan and does not prevent the community from updating the plan in 5 years.

ADOPTED by a vote of 5 in favor and 0 against, and 0 abstaining, this 10th day of June, 2026.

By: _____

Rolf Hechler, Mayor

ATTEST: By: _____

Angela A. Torres, City Clerk-Treasurer



2026



Sierra County

Hazard Mitigation Plan Update

Mitigating Risk for a Safe, Secure, Sustainable Future

For more information, visit our website at:

<https://www.sierraco.org/>

Written comments should be forwarded to:

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Section 1

Introduction



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BACKGROUND

Sierra County is located in southern New Mexico. The largest city and county seat, City of Truth or Consequences, is 75 miles northwest of Las Cruces, New Mexico. Catron County is to the northwest, Lincoln County is to the northeast, Socorro is adjacent to the north, Otero County borders the eastern portion of the county, Grant County is to the west, and Doña Ana County and Luna County are to the south.

New Mexico is prone to large wildfires, with the second most acres burned among all states in 2022.¹ While wildfire is a well-known risk, Sierra County is susceptible to a wide range of natural hazards, including but not limited to tornadoes, extreme temperatures, wildfire, and drought. These life-threatening hazards can destroy property, disrupt the economy, and lower the overall quality of life for individuals.

While it is impossible to prevent an event from occurring, the impacts to people and property can be minimized through effective mitigation. The Federal Emergency Management Agency (FEMA) defines mitigation as *sustained actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects*.² Communities participate in hazard mitigation by developing hazard mitigation plans. The New Mexico Department of Homeland Security and Emergency Management (NM DHSEM) is required to review the plan, and FEMA has the authority to review and approve hazard mitigation plans through the Disaster Mitigation Act of 2000.

The Disaster Mitigation Act requires that hazard mitigation plans be reviewed and revised every five years to maintain eligibility for Hazard Mitigation Assistance (HMA) grant funding. In 2019, Sierra County developed their previous Hazard Mitigation Action Plan (HMAP) to be specific to Sierra County and the Cities of Elephant Butte and Truth or Consequences, and the Village of Williamsburg.

FEMA approved the previous Sierra County New Mexico Hazard Mitigation Plan in 2019, which then was set to expire in 2024. Therefore, the County began the process of developing a Hazard Mitigation Plan Update in order to regain eligibility for grant funding. The HMAP Update planning process provided an opportunity for Sierra County to evaluate successful mitigation actions and explore opportunities to avoid future disaster loss.

Sierra County selected H2O Partners, Inc. to write and develop the 2026 Plan Update, hereinafter titled: “Sierra County Hazard Mitigation Action Plan Update 2026: Maintaining a Safe, Secure, and Sustainable Community” (Plan or Plan Update). This is a multi-jurisdictional plan; the participating jurisdictions include:

¹ Source: National Interagency Fire Center <https://www.iii.org/table-archive/23870>

² Source: <http://www.fema.gov/hazard-mitigation-planning-resources>

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- Sierra County
- City of Elephant Butte
- City of Truth or Consequences
- Village of Williamsburg

Hazard mitigation activities are an investment in a community's safety and sustainability. It is widely accepted that the most effective hazard mitigation measures are implemented at the local government level, where decisions on the regulation and control of development are ultimately made. A comprehensive review of a hazard mitigation plan addresses vulnerabilities to hazards that exist today and in the foreseeable future. Therefore, it is essential that a plan identify projected patterns of how future development will increase or decrease a community's overall hazard vulnerability.

SCOPE

The focus of the Plan is to identify activities to mitigate hazards classified as "high" or "moderate" risk, as determined through a detailed hazard risk assessment conducted for Sierra County and the participating jurisdictions. The hazard classification enables the participating jurisdictions to prioritize mitigation actions based on hazards that can present the greatest risk to lives and property in the geographic scope.

PURPOSE

The Plan Update was prepared by Sierra County, participating jurisdictions, and H2O Partners, Inc. The purpose of the Plan Update is to protect people and structures and to minimize the costs of disaster response and recovery. The goal of the Plan Update is to minimize or eliminate long-term risks to human life, property, operations, and the environment from known hazards by identifying risks and implementing cost-effective hazard mitigation actions. The planning process is an opportunity for participating jurisdictions within Sierra County, stakeholders, and the general public to evaluate and develop successful hazard mitigation actions to reduce future risk of loss of life and damage to property resulting from a disaster in Sierra County.

The Mission Statement of the Plan Update is *"Maintaining a secure and sustainable future through the revision and development of targeted hazard mitigation actions to protect life and property."*

Participating jurisdictions within Sierra County and planning participants identified 16 natural hazards to be addressed by the Plan Update. The specific goals of the Plan Update are to:

- Provide a comprehensive update to the 2019 HMAP;
- Minimize disruption to participating jurisdictions within Sierra County following a disaster;
- Streamline disaster recovery by articulating actions to be taken before a disaster strikes to reduce or eliminate future damage;
- Demonstrate a firm local commitment to hazard mitigation principles;
- Serve as a basis for future funding that may become available through grants and technical assistance programs offered by the State or Federal government. The Plan will enable participating jurisdictions within Sierra County to take advantage of rapidly developing mitigation grant opportunities as they arise; and
- Ensure that participating jurisdictions within Sierra County maintain eligibility for the full range of future Federal disaster relief.

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AUTHORITY



The Plan is tailored specifically for participating jurisdictions within Sierra County and plan participants including Planning Team members, stakeholders, and the general public who participated in the Plan Update development process. The Plan complies with all requirements promulgated by the New Mexico Department of Homeland Security and Emergency Management (NM DHSEM) and all applicable provisions of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Section 104 of the Disaster Mitigation Act of 2000 (DMA 2000) (P.L. 106-390), and the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004 (P.L. 108-264), which amended the National Flood Insurance Act (NFIA) of 1968 (42 U.S.C. 4001, et al). Additionally, the Plan complies with the Interim Final Rules for the Hazard Mitigation Planning and Hazard Mitigation Grant Program (44 CFR, Part 201), which specify the criteria for approval of mitigation plans required in Section 322 of the DMA 2000 and standards found in FEMA's "Local Mitigation Planning Policy Guide" (April 2025), and the "Local Mitigation Planning Handbook" (June 2025).

SUMMARY OF SECTIONS

Sections 1 and 2 of the Plan Update outline the Plan's purpose and development, including how Planning Team members, stakeholders, and members of the general public were involved in the planning process. Section 3 profiles the planning area's population and economy.

Sections 4 through 20 present a hazard overview and information on individual natural hazards in the planning area. For each hazard, the Plan Update presents a description of the hazard, a list of historical hazard events, and the results of the vulnerability and risk assessment process.

Section 21 presents hazard mitigation goals and objectives. Section 22 gives an analysis of the previous actions, and Section 23 presents hazard mitigation actions for Sierra County and the participating jurisdictions. Section 24 identifies Plan maintenance mechanisms.

Human-caused hazards are included in Appendix A. The list of Planning Team members and stakeholders is located in Appendix B. Public survey results are presented in Appendix C. Appendix D contains a detailed list of critical facilities for the area. Appendix E contains information regarding dam locations within Sierra County. Appendix F contains information regarding workshops and meeting documentation. Capability Assessment results for the Plan participants are in Appendix G. Appendix H includes State and Federal Funding Opportunities. Resolutions denoting adoption of the Plan Update are located at the end of this document.³

³ Information contained in some of these appendices is exempt from public release under the Freedom of Information Act (FOIA).

Section 2

Planning Process



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PLAN PREPARATION AND DEVELOPMENT

Hazard mitigation planning involves coordination with various constituents and stakeholders to develop a more disaster-resistant community. Section 2 provides an overview of the planning process including the identification of key steps and a detailed description of how stakeholders and the public were involved.

OVERVIEW OF THE PLAN

Sierra County hired H2O Partners, Inc. (Consultant Team), to provide technical support and oversee the development of the Sierra County Hazard Mitigation Action Plan Update 2026. The Consultant Team used the FEMA “Local Mitigation Planning Policy Guide” (April 2025), and the “Local Mitigation Planning Handbook” (June 2025) to develop the Plan Update. The overall planning process is shown in Figure 2-1 below.

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Figure 2-1. Mitigation Planning Process



Sierra County, the participating jurisdictions, and the Consultant Team met in May 2025 to begin organizing resources, identify Planning Team members, and conduct a Capability Assessment.

PLANNING TEAM

Key members of H2O Partners, Inc. developed the Plan Update in conjunction with the Planning Team. The Planning Team was established using a direct representation model. Some of the responsibilities of the Planning Team included: completing Capability Assessment surveys, providing input regarding the identification of hazards, identifying mitigation goals, and developing mitigation strategies. An Executive Planning Team consisting of key personnel involved in hazard mitigation activities from each of the participating jurisdictions within Sierra County, shown in Table 2-1, was formed to coordinate planning efforts and request input and participation in the planning process.

Table 2-2 reflects the Advisory Planning Team, consisting of additional representatives from area organizations and departments from the participating jurisdictions within Sierra County that participated throughout the planning process. All Executive and Advisory Planning Team members are involved in hazard mitigation activities; those with the authority to regulate development are identified with an asterisk next to their title.

Table 2-1. Executive Planning Team

ORGANIZATION / DEPARTMENT	TITLE
Sierra County – Emergency Management	Emergency Services Administrator
City of Elephant Butte – Fire	Fire Chief
City of Truth or Consequences – Police	Chief of Police
Village of Williamsburg – Local Government	Mayor*

Table 2-2. Advisory Planning Team

ORGANIZATION / DEPARTMENT	TITLE
Sierra County – Administration	County Clerk*
Sierra County – Administration	County Manager
Sierra County – Emergency Management	Deputy Emergency Services Administrator
Sierra County – Flood Commission	Commissioner*

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ORGANIZATION / DEPARTMENT	TITLE
Sierra County – Local Government	Chairman*
Sierra County – Local Government	Commissioner*
Sierra County – Local Government	Vice-Chair*
Sierra County – GIS	GIS Coordinator
Sierra County – Regional Dispatch Authority	911 Director
Sierra County – Roads	Director
Sierra County – Sheriff	Sheriff
City of Elephant Butte – Administration	City Clerk
City of Elephant Butte – Administration	City Manager
City of Elephant Butte – Fire	Administrative Assistant
City of Elephant Butte – Local Government	Board of Directors – City Council Representative*
City of Elephant Butte – Local Government	Mayor*
City of Elephant Butte – Public Works	Field Operations Supervisor
City of Truth or Consequences – Administration	City Clerk
City of Truth or Consequences – Administration	City Manager
City of Truth or Consequences – Administration	Executive Assistant to the City Manager
City of Truth or Consequences – Community Development	Director
City of Truth or Consequences – Facility Management	Supervisor
City of Truth or Consequences – Fire	Fire Chief
City of Truth or Consequences – Service Center	Director
City of Truth or Consequences – Streets	Manager
City of Truth or Consequences – Streets	Supervisor
City of Truth or Consequences – Utilities	Electric Department Director
Village of Williamsburg – Administration	Village Clerk

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Additionally, a Stakeholder Group was invited via email to participate in the planning process by attending meetings, commenting on draft versions of the Plan Update, and/or by providing data to inform the planning process. The Consultant Team, Planning Teams, and Stakeholder Group coordinated to identify mitigation goals, and develop mitigation strategies and actions for the Plan. Appendix B provides a complete listing of all participating Planning Team members and stakeholders from participating jurisdictions within Sierra County by organization, title, and stakeholder type. Stakeholder involvement is discussed further below.

Based on results of completed Capability Assessments, participating jurisdictions within Sierra County described methods for achieving future hazard mitigation measures by expanding existing capabilities. For example, each jurisdiction has an opportunity to identify opportunities for cross-training or increasing the technical expertise of staff by attending free training available through FEMA and the New Mexico Department of Homeland Security and Emergency Management (DHSEM), by monitoring classes and availability through preparingnewmexico.org. In addition, each jurisdiction can identify Planning Team members with the authority to monitor the Plan and identify grant funding opportunities for expanding staff. Other options for improving capabilities for each jurisdiction are included in Table 2-3.

Table 2-3. Opportunities for Improving and Expanding Existing Capabilities by Jurisdiction

JURISDICTION	OPPORTUNITIES
Sierra County	• Integrate risk information from HMAP into future updates to Capital Improvement Plan. • Integrate risk information from HMAP into future updates to Comprehensive Plan. • Integrate risk information from HMAP into future updates to Community Wildfire Protection Plan. • Review current floodplain ordinances for opportunities to increase resiliency such as modifying permitting or building codes. • Develop building and land use ordinances that will require all new developments to conform to the highest mitigation standards.
City of Elephant Butte	• Integrate risk information from HMAP into future updates to Capital Improvement Plan. • Integrate risk information from HMAP into future updates to Comprehensive Plan. • Integrate risk information from HMAP into future updates to Community Wildfire Protection Plan. • Review current floodplain ordinances for opportunities to increase resiliency such as modifying permitting or building codes. • Review current building and land use ordinances for opportunities to increase resiliency such as modifying permitting or building codes.

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JURISDICTION	OPPORTUNITIES
City of Truth or Consequences	• Develop a Capital Improvement Plan based on information in the risk assessment and identified mitigation projects within the HMAP. • Develop a Comprehensive Plan based on information in the risk assessment and identified mitigation projects within the HMAP. • Integrate risk information from HMAP into future updates to Community Wildfire Protection Plan. • Review current floodplain ordinances for opportunities to increase resiliency such as modifying permitting or building codes. • Develop building and land use ordinances that will require all new developments to conform to the highest mitigation standards.
Village of Williamsburg	• Integrate risk information from HMAP into future updates to Capital Improvement Plan. • Develop a Comprehensive Plan based on information in the risk assessment and identified mitigation projects within the HMAP. • Integrate risk information from HMAP into future updates to Community Wildfire Protection Plan. • Review current floodplain ordinances for opportunities to increase resiliency such as modifying permitting or building codes. • Review current building and land use ordinances for opportunities to increase resiliency such as modifying permitting or building codes.

Sample hazard mitigation actions developed with similar hazard risk were shared at the meetings. These important discussions resulted in the development of multiple mitigation actions that are included in the Plan Update to further mitigate risk from natural hazards in the future.

The Planning Team developed hazard mitigation actions for mitigating risk from all of the hazards including potential flood, tornado, and wildfire events. These actions, include but are not limited to, implementing education and awareness programs to educate citizens of hazards that can threaten the area, as well as acquiring and installing generators with hard-wired quick connections at all critical facilities.

PLANNING PROCESS

The process used to prepare the Plan Update followed the four major steps included at Figure 2-1. After the Planning Team was organized, a capability assessment was developed and distributed at the Kickoff Workshop. Hazards were identified and assessed, and results associated with each of the hazards were provided at the Risk Assessment Workshop. Based on Sierra County's identified vulnerabilities, specific mitigation strategies were discussed and developed at the Mitigation Strategy Workshop. Finally, Plan maintenance and implementation procedures were developed and are included in Section 24. Participation of Planning Team members, stakeholders, and the public at each of the workshops is documented in Appendix F .

At the Plan development workshops held throughout the planning process described herein, the following factors were taken into consideration:

- The nature and magnitude of risks currently affecting the communities;
- Hazard mitigation goals to address current and expected conditions;
- Whether current resources will be sufficient for implementing the Plan Update;

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- Implementation problems, such as technical, political, legal, and coordination issues that may hinder development;
- Anticipated outcomes; and
- How participating jurisdictions within Sierra County, agencies, and partners will participate in implementing the Plan Update.

KICKOFF WORKSHOP

The Kickoff Workshop was held on June 18, 2025 at the Sierra County Commissioners' Chambers in the City of Truth or Consequences. Participants were also given the option to attend virtually, via Zoom. The initial workshop informed participating officials and key department personnel about how the planning process pertained to their distinct roles and responsibilities and engaged stakeholder groups that focus on vulnerable populations and underserved communities including, but not limited to, public libraries, economic development agencies, local colleges, and surrounding communities. In addition to the kickoff presentation, participants received the following information:

- Project overview regarding the planning process;
- Public survey access information;
- Hazard Ranking form; and
- Capability Assessment survey for completion.

A risk ranking exercise was conducted at the Kickoff Workshop to get input from the Planning Team and stakeholders pertaining to various risks from a list of natural hazards affecting the planning area. Each participant at the Kickoff Workshop was provided with a risk ranking sheet that asked participants to rank hazards in terms of the probability or frequency of occurrence, extent of spatial impact, and the magnitude of impact. The results of the ranking sheets identified unique perspectives on varied risks throughout the planning area. The assessments were also used to set priorities for hazard mitigation actions based on potential loss of lives and dollar losses.

HAZARD IDENTIFICATION

At the Kickoff Workshop, and through e-mail and phone correspondence, the Planning Team conducted preliminary hazard identification. The Planning Team, in coordination with the Consultant Team, reviewed and considered a full range of natural hazards. Once identified, the teams narrowed the list to significant hazards by reviewing hazards affecting the area, the 2023 State of New Mexico Hazard Mitigation Plan, and initial study results from reputable sources such as federal and state agencies. Based on this initial analysis, the teams identified a total of 16 natural hazards which pose a significant threat to the planning area.

RISK ASSESSMENT

An initial risk assessment for participating jurisdictions within Sierra County was completed in August 2025 and results were presented to Planning Team members at the Risk Assessment Workshop held on August 20, 2026, in conjunction with the Mitigation Strategy Workshop, at the Sierra County Commissioners' Chambers in the City of Truth or Consequences. Participants were also given the option to attend virtually, via Zoom. At the workshop, the characteristics and consequences of each hazard were evaluated to determine the extent to which the planning area would be affected in terms of potential danger to property and citizens.

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Property and crop damages were estimated by gathering data from the National Centers for Environmental Information (NCEI) and the National Oceanic and Atmospheric Administration (NOAA). The assessment also examined the impact of various hazards on the built environment, including general building stock, critical facilities, lifelines, and infrastructure. The resulting risk assessment profiled hazard events, provided information on previous occurrences, estimated probability of future events, and detailed the spatial extent and magnitude of impact on people and property. Following the risk assessment workshop, past event data from NCEI was provided to the Planning Team for their review and assistance in identifying significant events. A hazard profile and vulnerability analysis for each of the hazards can be found in Sections 4 through 20.

MITIGATION REVIEW AND DEVELOPMENT

Developing the mitigation strategy for the Plan Update involved identifying mitigation goals and new mitigation actions. A Mitigation Strategy Workshop was held on August 20, 2025, in conjunction with the Risk Assessment Workshop, at the Sierra County Commissioners' Chambers in the City of Truth or Consequences. Participants were also given the option to attend virtually, via Zoom. In addition to the Planning Team, stakeholder groups were invited to attend the workshop. Regarding hazard mitigation actions, workshop participants emphasized the desire for drought and flood projects. Additionally, the participating jurisdictions were proactive in identifying mitigation actions to lessen the risk of all the identified hazards included in the Plan Update.

An inclusive and structured process was used to develop and prioritize new hazard mitigation actions for the Plan Update. The prioritization method was based on FEMA's STAPLEE criteria and included social, technical, administrative, political, legal, economic, and environmental considerations. As a result, each Planning Team member assigned an overall priority to each hazard mitigation action. The overall priority of each action is reflected in the hazard mitigation actions found in Section 23.

Planning Team members then developed action plans identifying proposed actions, costs and benefits, the responsible organization(s), effects on new and existing buildings, implementation schedules, priorities, and potential funding sources.

Specifically, the process involved:

- Listing optional hazard mitigation actions based on information collected from previous plan reviews, studies, and interviews with federal, state, and local officials. Workshop participants reviewed the optional mitigation actions and selected actions that were most applicable to their area of responsibility, cost-effective in reducing risk, easily implemented, and likely to receive institutional and community support.
- Workshop participants inventoried federal and state funding sources that could assist in implementing the proposed hazard mitigation actions. Information was collected, including the program name, authority, purpose of the program, types of assistance and eligible projects, conditions on funding, types of hazards covered, matching requirements, application deadlines, and a point of contact.
- Planning Team members considered the benefits that would result from implementing the hazard mitigation actions compared to the cost of those projects. Although detailed cost-benefit analyses were beyond the scope of the Plan Update, Planning Team members utilized economic evaluation as a determining factor between hazard mitigation actions.
- Planning Team members then selected and prioritized mitigation actions.

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Hazard mitigation actions identified in the process were made available to the Planning Team for review. The draft Plan Update was maintained on file by Sierra County and participating jurisdictions and was made available to the general public for review.

REVIEW AND INCORPORATION OF EXISTING PLANS

REVIEW

Background information utilized during the planning process included various studies, plans, reports, and technical information from sources such as FEMA, the United States Army Corps of Engineers (USACE), the U.S. Fire Administration, the National Oceanic and Atmospheric Administration (NOAA), the New Mexico Bureau of Geology and Mining Resources, the Office of the State Engineer Dam Safety Bureau, the New Mexico Forestry Division, the New Mexico Department of Homeland Security and Emergency Management (NM DHSEM), and local hazard assessments and plans. Section 4 and the hazard-specific sections of the Plan Update (Sections 5-20) summarize the relevant background information.

Specific background documents, including those from FEMA, provided information on hazard risk, hazard mitigation actions currently being implemented, and potential mitigation actions. Previous hazard events, occurrences, and descriptions were identified through NOAA's National Centers for Environmental Information (NCEI). Results of past hazard events were found through searching the NCEI Storm Events Database. The USACE studies were reviewed for their assessment of risk and potential projects in the region. Information from the University of New Mexico Geospatial and Population Studies Department was reviewed for population and other projections and included in Section 3 of the Plan Update. Data from New Mexico Forestry Division was used to appropriately rank the wildfire hazard, and to help identify potential grant opportunities. Materials from FEMA and NM DHSEM were reviewed for guidance on Plan Update development requirements.

INCORPORATION OF EXISTING PLANS INTO THE HMAP PROCESS

A Capability Assessment was completed by key departments from the participating jurisdictions within Sierra County which provided information pertaining to existing plans, policies, ordinances, and regulations to be integrated into the goals and objectives of the Plan Update. The relevant information was included in a master Capability Assessment, Appendix G.

Existing projects and studies were utilized as a starting point for discussing hazard mitigation actions among Planning and Consultant Team members. For example, the City of Elephant Butte and Village of Williamsburg adopted zoning restrictions in known hazard areas. Subsequently, the Planning Team included mitigation actions such as digitizing data on value, construction, and age of buildings in the County to use for risk assessment analysis and zoning maps to build upon ongoing efforts to strengthen the ability to make informed land-use decisions and reduce future hazard risks within the planning area.

For a comprehensive list of actions from the previous Sierra County, New Mexico Hazard Mitigation Plan 2019, please refer to Section 22.

The current Flood Insurance Study (FIS) as well as the current effective Flood Insurance Rate Maps (FIRMs) were used in the flood hazard risk assessment (Section 11). The FIRM panels for the Sierra County (map ID 350071C, panels 25-1150, dated July 16, 1996) show the areas

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throughout Sierra County at greater risk of flooding. The FIS report contains detailed flood elevation data in flood profiles and data tables and is utilized in determining extent.

Additionally, policies and ordinances were reviewed by several of the participating jurisdictions. Other plans were reviewed, such as Capital Improvement Plans and Comprehensive Plans, to identify any additional mitigation actions. Furthermore, applicable information was included in the wildfire risk assessment from the jurisdictions' Community Wildfire Protection Plans.

Finally, the 2023 State of New Mexico Hazard Mitigation Plan, developed by NM DHSEM, was discussed in the initial planning meeting in order to develop a specific group of hazards to address in the planning effort. The 2023 State Plan was also used as a guidance document, along with FEMA materials, in the development of the Sierra County Hazard Mitigation Action Plan Update 2026.

INCORPORATION OF THE HMAP INTO OTHER PLANNING MECHANISMS

Planning Team members will integrate implementation of the Plan Update with other planning mechanisms for Sierra County, such as the Continuity of Operations Plan. Existing plans for participating jurisdictions will be reviewed and incorporated into the Plan Update, as appropriate. This section discusses how the Plan will be implemented by the participating jurisdictions within Sierra County. It also addresses how the Plan will be evaluated and improved over time, and how the public will continue to be involved in the hazard mitigation planning process.

Participating jurisdictions within Sierra County will be responsible for implementing hazard mitigation actions contained in Section 23. Each hazard mitigation action has been assigned to a specific County, City, or Village department that is responsible for tracking and implementing the action.

A funding source has been listed for each identified hazard mitigation action and may be utilized to implement the action. An implementation time period has also been assigned to each hazard mitigation action as an incentive and to determine whether actions are implemented on a timely basis.

Participating jurisdictions within Sierra County will integrate hazard mitigation actions contained in the Plan Update with existing planning mechanisms such as ordinances, Emergency Operations or Management Plans, and other local and area planning efforts. Sierra County will work closely with area organizations to coordinate implementation of hazard mitigation actions that benefit the planning area in terms of financial and economic impact.

Upon formal adoption of the Plan Update, Planning Team members from the participating jurisdictions will review existing plans along with building codes to guide development and ensure that hazard mitigation actions are implemented. Each of the jurisdictions will be responsible for coordinating periodic reviews of the Plan Update with members of the Advisory Planning Team to ensure integration of hazard mitigation strategies into these planning mechanisms and codes. The Planning Team will also conduct periodic reviews of various existing planning mechanisms and analyze the need for any revisions or updates in light of the approved Plan Update. Participating jurisdictions within Sierra County will ensure that future long-term planning objectives will contribute to the goals of the Plan Update to reduce the long-term risk to life and property from moderate and high-risk hazards. Within one year of formal adoption of the Plan Update, existing planning mechanisms will be reviewed and analyzed as they pertain to the Plan Update.

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Planning Team members will review and revise, as necessary, the long-range goals and objectives in its strategic plan and budgets to ensure that they are consistent with the Plan Update.

Furthermore, Sierra County will work with neighboring jurisdictions to advance the goals of the Plan Update as it applies to ongoing, long-range planning goals and actions for mitigating risk to natural hazards throughout the planning area.

The HMAP has been used as a reference when reviewing and updating all plans and ordinances across the planning area, including all participating jurisdictions, since the 2019 plan. The Village of Williamsburg did not have any plan development or update opportunities to incorporate the HMAP strategies over the last five year planning cycle. The Village is in discussions to develop a comprehensive plan in the future and will utilize strategies from the HMAP during that development.

Integration examples include:

- Sierra County updated the EOP in 2019, aligning the 2019 HMAP risk reduction strategies with their daily operations, hazard risk assessments, and response procedures. The County is in the process of updating the EOP again and will similarly review strategies from the HMAP for incorporation into the EOP.
- The Emergency Management Action Plan developed for the City of Elephant Butte is updated every five years and incorporates goals, objectives and actions identified in the Mitigation Plan. The EOP is embedded in the action plan and similarly aligns mitigation strategies with the HMAP.
- Truth or Consequences updated their Comprehensive Plan in 2025 and utilized the 2019 HMAP to integrate hazard risk assessments, resilience strategies, and specific mitigation actions directly into long-term land use, housing, transportation, and infrastructure planning.

Table 2-4 identifies methods for incorporating the HMAP into other community plans currently in place or other plans that will be developed over the five year planning cycle in the participating jurisdictions. This serves as a guide for communities when long term plans come up for renewal, such as drought contingency plans.

Table 2-4. Examples of Methods of Incorporation

PLANNING MECHANISM	INCORPORATION OF PLAN
Annual Budget Reviews	Various departments and key personnel that participated in the planning process will review the Plan and mitigation actions therein when conducting their annual budget review. Allowances will be made in accordance with grant applications sought, and mitigation actions that will be undertaken, according to the implementation schedule of the specific action.

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PLANNING MECHANISM	INCORPORATION OF PLAN
Capital Improvement Plans	Several participating jurisdictions within Sierra County have a Capital Improvement Plan (CIP) in place or under development. Prior to any revisions to the CIP, County, City, or Village departments will review the risk assessment and mitigation strategy sections of the HMAP, as limiting public spending in hazardous zones is one of the most effective long-term mitigation actions available to local governments.
Community Wildfire Protection Plans	Community Wildfire Protection Plans (CWPPs) include preventative and corrective actions to address a community's risk of damage from wildfire. Information found in Section 20 of this Plan Update discussing the people and property at risk to wildfire will be reviewed and revised when the County, City, and/or Village updates their CWPP.
Comprehensive Plans	Several participating jurisdictions within Sierra County have a Comprehensive Land Use Plan in place or under development. Since Comprehensive Plans involve developing a unified vision for a community, the mitigation vision and goals of the Plan Update will be reviewed in the development or revision of a Comprehensive Plan.
Floodplain Management Plans	Floodplain Management Plans include preventative and corrective actions to address the flood hazard. Therefore, the actions for flooding and information found in Section 11 of this Plan Update discussing the people and property at risk to flood will be reviewed and revised when participating jurisdictions within Sierra County update their management plans or develop new plans.
Grant Applications	The HMAP will be evaluated by participating jurisdictions within Sierra County when grant funding is sought for mitigation projects. If a project is not in the Plan Update, a Plan Revision may be necessary to include the action in the Plan.
Regulatory Plans	Currently, several participating jurisdictions within Sierra County have regulatory plans in place or under development, such as Emergency Management Action Plans and/or Land Use Plans. The Plan Update will be consulted when County, City, and/or Village departments review or revise their current regulatory planning mechanisms, or in the development of regulatory plans that are not currently in place.

Appendix G Capability Assessment provides an overview of Planning Team members' existing planning and regulatory capabilities. These existing capabilities provide the mechanisms to implement the mitigation strategy objectives. For example, the adoption of building codes and implementation of land use regulations have been demonstrated to help communities avoid losses from natural hazard events. Currently, the City of Elephant Butte and Village of Williamsburg have building codes, zoning ordinances, and/or land use ordinances in place or

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under development. Please refer to Appendix G for a complete inventory of each participating jurisdiction's capabilities.

PLAN REVIEW AND PLAN UPDATE

As with the development of Plan Update, participating jurisdictions within Sierra County will oversee the review and update process for relevance and if necessary, make adjustments. At the beginning of each fiscal year, Planning Team members will meet to evaluate the Plan Update and review other planning mechanisms to ensure consistency with long-range planning efforts. In addition, planning participants will also meet once a year, by conference call or presentation, to re-evaluate prioritization of the hazard mitigation actions. The Plan Update may be amended to include additional hazard mitigation actions as they are developed.

TIMELINE FOR IMPLEMENTING MITIGATION ACTIONS

Both the Executive Planning Team (Table 2-1) and the Advisory Planning Team (Table 2-2) will engage in discussions regarding a timeframe for how and when to implement each hazard mitigation action. Considerations include when the action will be started, how existing planning mechanisms' timelines affect implementation, and when the action should be fully implemented. Timeframes may be general, and there will be short-, medium-, and long-term goals for implementation based on prioritization of each action, as identified on the individual hazard mitigation action tables included in the Plan Update for participating jurisdictions within Sierra County.

Both the Executive and Advisory Planning Team will evaluate and prioritize the most suitable hazard mitigation actions for the community to implement. The timeline for implementation of actions will partially be directed by participating jurisdictions' comprehensive planning process, budgetary constraints, and community needs. Participating jurisdictions within Sierra County are committed to addressing and implementing hazard mitigation actions that may be aligned with and integrated into the Plan Update.

Overall, the Planning Team is in agreement that goals and actions of the Plan Update shall be aligned with the timeframe for implementation of hazard mitigation actions with respect to annual review and updates of existing plans and policies.

PUBLIC AND STAKEHOLDER INVOLVEMENT

An important component of hazard mitigation planning is public participation and stakeholder involvement. Input from individual citizens and the community as a whole provides the Planning Team with a greater understanding of local concerns and increases the likelihood of successfully implementing hazard mitigation actions. If citizens and stakeholders, such as local businesses, non-profits, hospitals, and schools are involved, they are more likely to gain a greater appreciation of the risks that hazards may present in their community and take steps to reduce or mitigate their impact.

The public was involved in the development of the Sierra County Hazard Mitigation Action Plan Update 2026 at different stages prior to official Plan approval and adoption. Public input was sought using three methods: (1) open public meetings; (2) survey instruments; and (3) making the draft Plan Update available for public review on participating jurisdictions' websites.

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The draft Plan Update was made available to the general public for review and comment on participating jurisdictions' websites. The public was notified at the public meetings that the draft Plan Update would be available for review. No feedback was received on the draft Plan Update, although it was given on the public survey, and all relevant information was incorporated into the Plan Update. Public input was utilized to assist in identifying hazards that were of most concern to the citizens of the County and what actions they felt should be included and prioritized.

The Plan Update will be advertised and posted on Sierra County and participating jurisdictions' websites upon approval from FEMA, and a copy will be kept at the Sierra County Courthouse.

UNDERSERVED COMMUNITIES / VULNERABLE POPULATIONS

A goal of the Planning Team was building equity into the planning process. Inviting organizations that aid underserved communities and socially vulnerable populations to participate in the Plan helps ensure equitable access to the planning process and the meaningful participation of all residents. In addition, these groups can make sure that the interests of vulnerable populations are accurately represented and act as a valuable resource to share information with those vulnerable populations.

The Planning Team worked to identify local agencies, organizations, and community leaders that focus on reaching vulnerable populations and underserved communities. These organizations were included in the planning process as stakeholders and were invited to participate in the planning process via email. These agencies were encouraged to post public planning meetings as well as solicit feedback via the public survey.

All stakeholders and Planning Team members were invited to participate in the development of the Plan Update during this process, including all public meetings, and surveys. All stakeholders are listed in Table 2-5 below. Some stakeholders have been detailed below along with the agency's mission, including:

- Matthew 25 Food Pantry – Provides food assistance to all residents of Sierra County, New Mexico, living at or below the Federal Poverty level who are underprivileged or impoverished. This assistance is available to those who qualify, without discrimination on the basis of age, race, color, religion, sex, ancestry, national origin, spousal affiliation, sexual orientation, gender identity, mental or physical handicap, or medical condition.¹
- Truth or Consequences Public Library – A vital community hub in T or C, offering books, programs, and a welcoming space beyond just lending materials, serving as essential resources for residents of all ages, focusing on literacy and community connection. The library provides accurate information in a timely manner to those who need it and is a source of enlightenment as well as entertainment for the community.²
- United Ways of Southwest New Mexico – Improves lives by mobilizing the caring power of communities to advance the common good and create positive, meaningful change by focusing on education, financial stability, and basic needs (health) in the region, working to build a stronger, more resilient Southwest New Mexico.³

In addition, public notices were posted on public bulletin boards throughout the planning area, such as at the Sierra County Courthouse, as well as posted on the participating jurisdictions'

¹ Source: <https://sharenm.org/matthew-25-food-pantry>

² Source: <https://www.torcnm.gov/explore/library/index.php>

³ Source: <https://www.uwswnm.org/about-us>

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websites and social media platforms. For a sample of these postings, please see Appendix F. In addition to public meetings, the Planning and Consultant Teams developed a public survey designed to solicit public input during the planning process from citizens and stakeholders and to obtain input and feedback on the Mitigation Plan. For each form of engagement, all efforts were made to reach Sierra County's underserved communities and vulnerable populations throughout the planning process. Additional survey information is provided at the end of this section.

STAKEHOLDER INVOLVEMENT

Stakeholder involvement is essential to hazard mitigation planning since a wide range of stakeholders can provide input on specific topics and from various points of view. Throughout the planning process, members of community groups, local businesses, and neighboring jurisdictions were invited to participate in development of the Plan Update. The Stakeholder Group (Table 2-5) included a broad range of representatives from both the public and private sectors and served as a key component in Sierra County's outreach efforts for development of the Plan Update. Documentation of stakeholder meetings is found in Appendix F. A list of organizations invited to attend via email is found in Table 2-5. Those that participated in the public meetings are identified with a plus symbol (+) next to their stakeholder type.

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Table 2-5. Stakeholder Working Group

AGENCY	TITLE	STAKEHOLDER TYPE
American Red Cross	Area Representative	Non-Profit / Community Organization / Regional Agency
American Red Cross	Community Disaster Program Manager	Non-Profit / Community Organization / Regional Agency
American Red Cross	Senior Disaster Program Manager	Non-Profit / Community Organization / Regional Agency
Arrey Elementary Schools	Principal	Academia
Arrey Elementary Schools	Schools Coordinator	Academia
Catron County	Emergency Manager	Neighboring Jurisdiction
Columbus Electric Cooperative	Executive Vice President / General Manager	Utility Provider
Copper Flat Corporation THEMAC	Senior Vice President of Project Development	Private Organization
Dona Ana County	Emergency Manager	Neighboring Jurisdiction
Environmental Protection Agency (EPA), Region 6	Director of Emergency Management Division	Federal Agency
Federal Emergency Management Agency (FEMA)	Hazard Mitigation Branch Director	Federal Agency
Forest Stewards Guild	Forest Health Specialist	State Agency
Garfield Mutual Water Systems	Supervisor	Utility Provider
Gila Landscape Collaborative	Director	State Agency
Grant County	Emergency Manager	Neighboring Jurisdiction
Habitat for Humanity	Executive Director	Non-Profit / Community Organization / Regional Agency
Lincoln County	Chief Procurement Officer	Neighboring Jurisdiction
Lincoln County	County Sheriff	Neighboring Jurisdiction
Luna County	Emergency Manager	Neighboring Jurisdiction
Matthew 25 Food Pantry	General Representative	Non-Profit / Community Organization / Regional Agency

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AGENCY	TITLE	STAKEHOLDER TYPE
National Oceanic and Atmospheric Administration (NOAA)	Western Regional Contact	Federal Agency
National Weather Service (NWS)	General Representative	Federal Agency
New Mexico Acequia Association	Executive Director	State Agency
New Mexico Aging and Long-Term Services	Cabinet Secretary	State Agency
New Mexico Bureau of Land Management	District Fire Management Officer	State Agency
New Mexico Bureau of Land Management	Fuels Specialist	State Agency
New Mexico Bureau of Minerals and Geology	Director and State Geologist	State Agency
New Mexico Cattle Growers Association	President	State Agency
New Mexico Department of African American Affairs	Communications and Marketing Coordinator	State Agency
New Mexico Department of African American Affairs	Deputy Director	State Agency
New Mexico Department of Agriculture	Biosecurity Program Specialist	State Agency
New Mexico Department of Agriculture	Director	State Agency
New Mexico Department of Agriculture	Southwest Board and Emergency Preparedness Director	State Agency
New Mexico Department of Energy, Minerals, and Natural Resources	Communications Coordinator	State Agency
New Mexico Department of Energy, Minerals, and Natural Resources	Pancho Villa State Park Manager	State Agency +
New Mexico Department of Health	Communications Coordinator	State Agency
New Mexico Department of Health	Emergency Manager	State Agency
New Mexico Department of Health	Preparedness and Response Section Manager	State Agency
New Mexico Department of Health	Public Information Officer (PIO)	State Agency

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AGENCY	TITLE	STAKEHOLDER TYPE
New Mexico Department of Homeland Security and Emergency Management (NM DHSEM)	Mitigation Specialist	State Agency +
New Mexico Department of Homeland Security and Emergency Management (NM DHSEM)	Response, Recovery, and Mitigation Bureau Chief	State Agency
New Mexico Department of Indian Affairs	Cabinet Secretary	State Agency
New Mexico Department of Transportation, NMDOT-D1	Public Information Officer (PIO)	State Agency
New Mexico Department of Transportation, NMDOT-D1	Supervisor	State Agency
New Mexico Drought Task Force	Water Use & Conservation Department Representative	State Agency
New Mexico Environmental Department	Environmental Specialist	State Agency
New Mexico Environmental Department	Incident Response Coordinator	State Agency
New Mexico Gas Company	Operations Manager	Utility Provider +
New Mexico Gas Company	Operations Supervisor	Utility Provider +
New Mexico Gas Company	Safety Auditor	Utility Provider +
New Mexico Livestock Bureau	Deputy Director	State Agency
New Mexico Office of the State Engineer – Dam Safety	Bureau Chief	State Agency
New Mexico Office of the State Engineer – Dam Safety	Public Information Officer (PIO)	State Agency
New Mexico State Parks	Superintendent	State Agency
New Mexico Water	Operations Manager	Utility Provider +
New Mexico Water and Wastewater Association	Executive Manager	State Agency
Otero County	County Manager	Neighboring Jurisdiction
Public Service Company of New Mexico (PNM)	Community Manager	Utility Provider
Roadrunner Food Bank	General Representative	Non-Profit / Community Organization / Regional Agency

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AGENCY	TITLE	STAKEHOLDER TYPE
Sierra County Arroyo Flood Control District	Chairman	Utility Provider
Sierra Electric Cooperative	Line Superintendent	Utility Provider +
Sierra Soil and Water Conservation District	Natural Resource Director	Utility Provider
Sierra Vista Emergency Medical Services	Emergency Medical Services (EMS) Administrative Supervisor	Healthcare Agency
Sierra Vista Emergency Medical Services	Emergency Medical Services (EMS) Director / Emergency Management	Healthcare Agency
Sierra Vista Hospital and Clinics	Marketing / Public Relations / Procurement	Healthcare Agency
Socorro County	Emergency Manager	Neighboring Jurisdiction
Synergy	Director of Planning	State Agency
Truth or Consequences Library	Library Director	Community Organization
Truth or Consequences Municipal Airport	Airport Manager	Regional and Local Agency
Truth or Consequences Municipal Schools	Chief Finance and Operations Officer	Academia
Truth or Consequences Municipal Schools	Safety & Security Director	Academia
Truth or Consequences Municipal Schools	Superintendent	Academia
United Way of Southwest New Mexico	Community Engagement Specialist	Non-Profit / Community Organization / Regional Agency
United Way of Southwest New Mexico	County Representative	Non-Profit / Community Organization / Regional Agency
United Way of Southwest New Mexico	Grant Coordinator	Non-Profit / Community Organization / Regional Agency
United States Army Corps of Engineers	Engineer	Federal Agency
United State Army Corps of Engineers	Southwest Region – Emergency Management	Federal Agency
United States Bureau of Reclamation	Facility Manager – Elephant Butte Dam	Federal Agency

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AGENCY	TITLE	STAKEHOLDER TYPE
United States Fish & Wildlife	Southwest Region Representative	Federal Agency
United States Forest Service	District Ranger	State Agency +
United States Forest Service	Public Affairs Officer	Federal Agency
United States Department of Agriculture (USDA) / Rural Partners Network	Community Liaison	Federal Agency

Stakeholders and participants from neighboring communities that attended the Planning Team and public meetings played a key role in the planning process. For example, wildfire was a concern to stakeholders, so Sierra County included an action to determine locations to reduce fuel on public and private lands and implement a fuels reduction program.

PUBLIC MEETINGS

A series of public meetings were held in the planning area to collect public and stakeholder input. Topics of discussion included the purpose of hazard mitigation, discussion of the planning process, and types of natural hazards. Plan participants released information regarding the public meetings in their area to increase public participation in the Plan Update development process, through posting on their website, on social media sources, and/or posting the information on bulletin boards in public facilities. A sampling of these notices can be found in Appendix F, along with the documentation on the public meetings.

Public meetings were held on the following dates:

- June 18, 2025, at the Sierra County Commissioners' Chambers in the City of Truth or Consequences
- August 20, 2025, at the Sierra County Commissioners' Chambers in the City of Truth or Consequences

PUBLIC PARTICIPATION SURVEY

In addition to public meetings, the Planning and Consultant Teams developed a public survey designed to solicit public input during the planning process from citizens and stakeholders to obtain data regarding the identification of any potential hazard mitigation actions or problem areas. The survey was promoted by local officials and a link to the survey was posted on participating jurisdictions' websites. A total of five surveys were completed online. The survey results are presented in Appendix C. Participating jurisdictions within Sierra County reviewed the input from the surveys and decided which information to incorporate into the Plan as hazard mitigation actions. For example, results indicate that drought and flood are the hazards of highest concern for the public. Protecting and improving reliability of utilities and strengthening building codes and laws were among the main actions indicated that the local government should take to mitigate risk to these hazards. As a result, the Planning Team has included mitigation actions to harden or retrofit critical facilities to hazard-resistant levels along with creating, adopting, and enforcing local ordinances related to hazard events.

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HHPD CONSIDERATIONS

Sierra County has been in communication with the New Mexico Office of the State Engineer (OSE) Dam Safety Bureau regarding the dams within their jurisdiction, and have shared inundation maps, EAPs, inspection reports, floodplain management plans and data or summaries provided by dam breach modeling software such as HEC-RAS, DSS-WISE, HCOM, DSS-WISE Lite, FLO-2D, as well as more detailed studies, when available.

Sierra County works in coordination with the OSE-DSB for all safety inspections of dams, the technical review of proposed dam construction or rehabilitation, monitoring for compliance with dam safety criteria, when seeking grant funding, and regarding emergency preparedness for all dams. The County and participating jurisdictions are encouraged to collaborate with local, private, state, and federal dam owners throughout the planning process to maintain the safety of high-hazard potential dams.

Dam owners associated with the HHPDs participated in the planning process and are identified in Table 2-6 below. Please refer to Section 5 for a detailed risk assessment pertaining to all dams within the planning area, including HHPDs.

Table 2-6. Sierra County High Hazard Potential Dams

DAM NAME	RESPONSIBLE ENTITY
Caballo Arroyo Dam No. 1	Caballo Soil & Water Conservation District
County Line Detention Dam	Caballo Soil & Water Conservation District
Green Canyon Dam	Caballo Soil & Water Conservation District
Marie Street Dam	City of Truth or Consequences
Sibley Green Site 4	Caballo Soil & Water Conservation District
Sibley Green Site 5	Caballo Soil & Water Conservation District
St. Anne's Dam	City of Truth or Consequences
T or C Site 8c Dam	Village of Williamsburg



Section 3

County Profile



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OVERVIEW

Sierra County, located in southern New Mexico, has a rich and complex history that reflects the broader narrative of the American Southwest. From its ancient indigenous roots to its involvement in the cutting-edge world of commercial spaceflight, the region has continually evolved, adapting to various cultural, economic, and environmental forces.

Long before European settlers arrived, Sierra County was home to various indigenous cultures, including the Mogollon and Ancestral Puebloans. These early inhabitants left pottery, petroglyphs, cliff dwellings, and other archaeological artifacts throughout Sierra County. The Spanish colonial period began in the 16th century and brought profound changes to the area. Spanish explorers and missionaries introduced Christianity, new agricultural techniques, and European governance structures. The region became part of the broader Spanish mission system and later fell under Mexican control until the mid-1800s when it became part of the United States following the Treaty of Guadalupe Hidalgo.

The late 19th century marked a dramatic shift in Sierra County's economic and social makeup with the discovery of precious metals. In 1879, prospector Harry Pye discovered silver chloride in the Black Range, sparking a silver rush that transformed the region. Towns such as Chloride, Kingston, and Lake Valley sprang up almost overnight, bustling with miners, merchants, and opportunity seekers. The Town of Kingston was one of the largest towns in the territory, with an opera house, hotels, and newspapers. Meanwhile, the U.S. Army established Fort McRae in 1863 near present-day Elephant Butte, playing a crucial role in protecting settlers and facilitating military operations. The County was officially formed in 1884 from parts of Socorro, Grant, and Doña Ana Counties. The unincorporated Community of Hillsboro was initially the county seat due to the mining boom, but the county seat was later relocated to the Town of Hot Springs.

The 20th century ushered in further transformation. One of the most significant developments was the construction of the Elephant Butte Dam, completed in the 1910s. This massive infrastructure project provided vital irrigation for the Rio Grande Valley, turning arid lands into productive farmland and spurring economic growth. In 1937, the Town of Hot Springs became the county seat, reflecting its rise in importance, partly due to its popularity as a health resort thanks to its natural hot springs.

The Great Depression, along with fluctuating mineral prices, led to the closure of many mines and the decline of once-thriving communities. Towns like Chloride and Lake Valley experienced decreased populations and became semi-abandoned, later preserved as "living ghost towns" that now attract tourists and history buffs interested in the boom-and-bust cycles of the Old West.

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In 1950 the City of Hot Springs changed its name to the City of Truth or Consequences as the NBC radio show *Truth or Consequences* offered to host its 10th-anniversary radio show in any town that would rename itself after the show. This gave rise to an event called Fiesta, an annual event held the first weekend of May to commemorate the name change, and includes a parade and other events.¹

The population in Sierra County has fluctuated from 3,630 residents in 1930 to 11,576 in 2020. The lowest population was seen in 1900 with a census count of 3,158 residents and the highest was in 2000 with a population of 13,270.

The County continues to have a positive economic impact with the establishment of Spaceport America in 2006. Located near Truth or Consequences, it became the world's first purpose-built commercial spaceport. In 2021, it hosted its first crewed spaceflight, signaling the County's entry into the realm of aerospace technology and commercial space travel.

Figure 3-1 shows the general location of Sierra County and the communities within the County.

Figure 3-1. Location of Sierra County

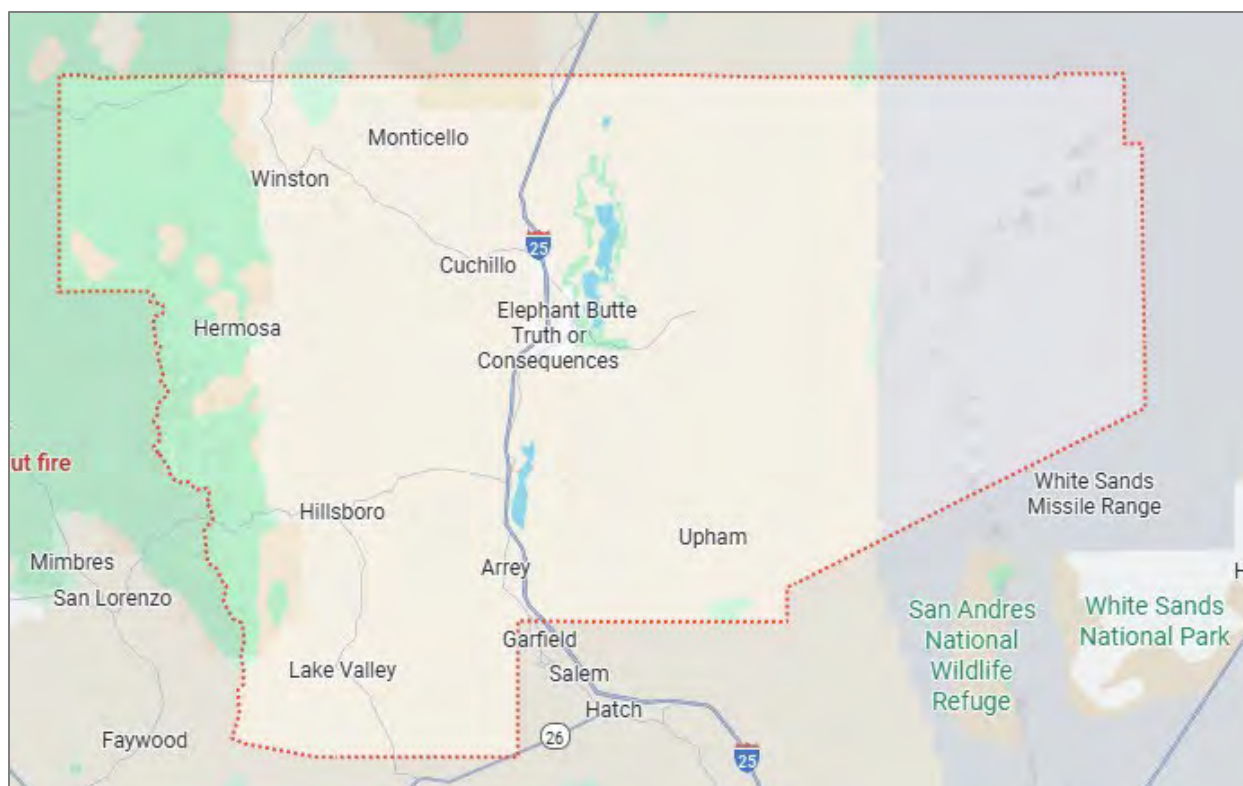


Table 3-1 below lists the jurisdictions in Sierra County that participated in the Sierra County Hazard Mitigation Action Plan Update 2026.

¹ Source: <https://www.newmexico.org/places-to-visit/regions/southwest/truth-or-consequences/>

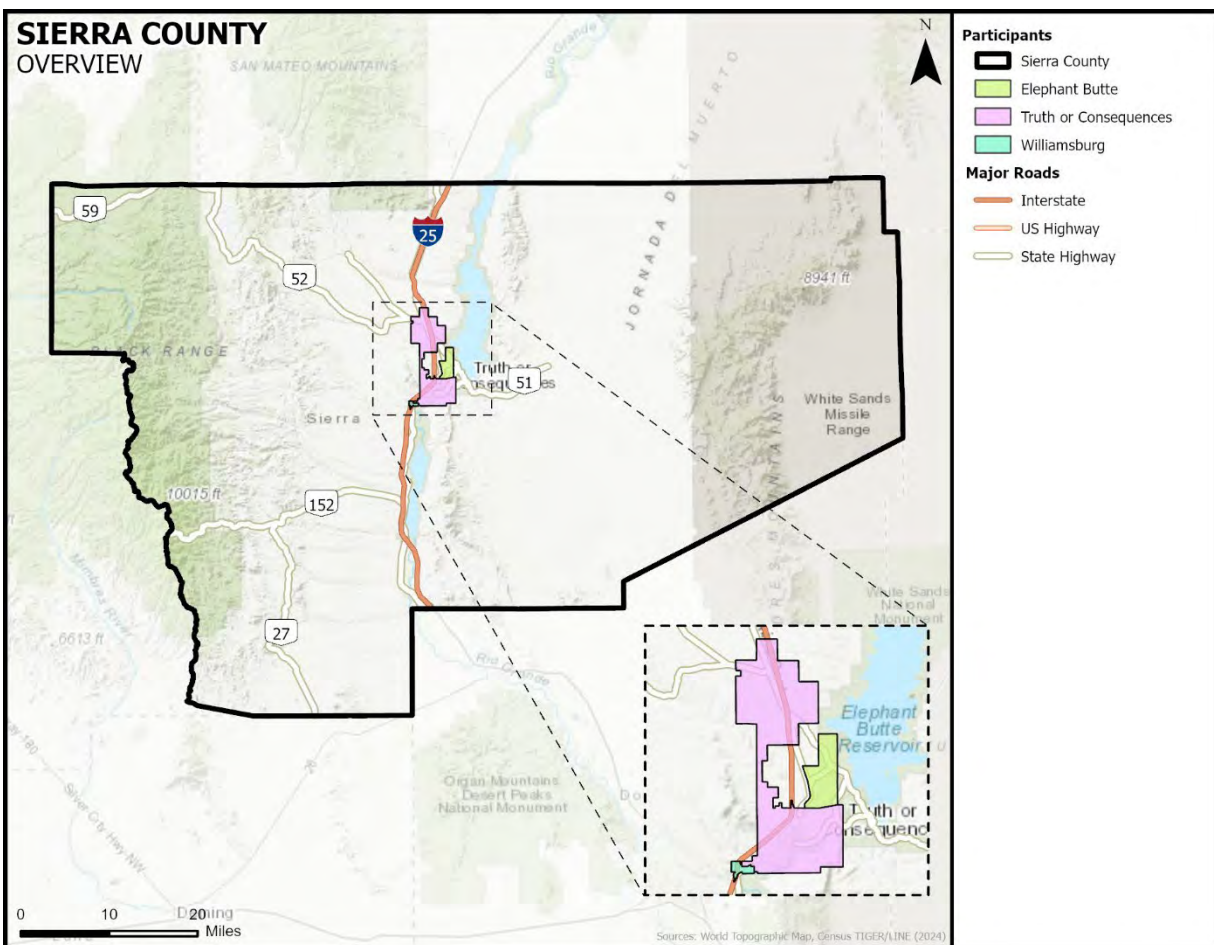
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Table 3-1. Participating Jurisdictions

PARTICIPATING JURISDICTIONS
Sierra County
City of Elephant Butte
City of Truth or Consequences
Village of Williamsburg

Figure 3-2 shows the Sierra County jurisdictional lines that make up the planning area. The planning area refers to that which is covered in the risk assessment analysis of the Plan.

Figure 3-2. Sierra County Planning Area



POPULATION AND DEMOGRAPHICS

According to the 2020 Census, Sierra County has an official population of 11,576 residents, a 3 percent decrease since the 2010 census. Table 3-2 summarizes select characteristics of vulnerable or sensitive populations in Sierra County and the participating jurisdictions using data from the U.S. Census Bureau 2023 American Community Survey (ACS) five-year estimates. Note

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that in some cases, the 2023 ACS estimates may differ from the 2020 census counts: the ACS estimates are used throughout this section for consistency.²

Between official U.S. Census population counts, the estimate uses a formula based on new residential building permits and household size. It is simply an estimate, and many variables are involved in achieving an accurate estimation of the number of people living in a given area at a given time.

Table 3-2. Population Distribution by Jurisdiction

JURISDICTION	TOTAL 2010 POPULATION (Census)	TOTAL 2020 POPULATION (Census)	TOTAL 2023 POPULATION (ACS Estimates)	POPULATION CHANGE (Percent)	
				2010-2020	2010-2023
Sierra County ³	11,988	11,576	11,511	-3	-4
City of Elephant Butte	1,431	1,447	1,586	1	11
City of Truth or Consequences	6,475	6,052	6,026	-7	-7
Village of Williamsburg	449	462	599	3	33

Table 3-3. Populations at Greater Risk by Jurisdiction

JURISDICTION	POPULATION				
	65 AND OLDER	UNDER 5	WITH A DISABILITY	BELOW POVERTY LEVEL	LIMITED ENGLISH SPEAKING
Sierra County ⁴	4,251	420	3,253	2,866	489
City of Elephant Butte	881	32	527	159	0
City of Truth or Consequences	1,354	369	1,468	2,097	187
Village of Williamsburg	173	19	222	131	72

In addition to the vulnerable population counts above in Table 3-3, there are various other examined key metrics that are useful to understand the social vulnerability within Sierra County. Table 3-4 lists the percentages of Sierra County's 2020 population count that falls within select vulnerable populations. The table also lists Sierra County's rank in each category among all counties in New Mexico, with 1st being most vulnerable and 33rd being least vulnerable.

² U.S. Census Bureau: <https://www.census.gov/en.html> and <https://www.census.gov/acs/www/data/data-tables-and-tools/data-profiles/2023/>

³ County totals include the entire population within the county lines, including unincorporated areas and non-participating jurisdictions within the County.

⁴ County totals include the entire population within the county lines, including unincorporated areas and non-participating jurisdictions within the County.

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Table 3-4. Sierra County Vulnerable Population Percentages, 2020⁵

VULNERABLE OR SENSITIVE POPULATIONS	PERCENT OF TOTAL COUNTY POPULATION	STATEWIDE COUNTY RANKING
Children Under Age 18 Living in Poverty	33.5	6 th
People 65 Years or Older	36.4	2 nd
Unable to Get Needed Medical Care Because of Cost	9.9	25 th
High School Graduation Rate	25.3	21 st
Unemployment Rate	4.4	9 th
People With Disabilities	25.5	4 th
Housing Units That are Mobile Homes	39.3	2 nd
Households With No Vehicle	7.5	6 th
Households Without Broadband Internet	31.3	14 th

POPULATION GROWTH

The official 2020 Sierra County population is 11,576. Overall, Sierra County experienced a population increase of 17 percent between 1990 and 2020, or 1,664 residents. Between 2010 and 2020 Sierra County and the City of Truth or Consequences experienced population decline, while the City of Elephant Butte and the Village of Williamsburg experienced population growth. Table 3-5 provides historical growth rates in Sierra County.

Table 3-5. Population Growth by Jurisdiction, 1990-2020⁶

JURISDICTIONS	1990	2000	2010	2020	POPULATION CHANGE			
					1990-2020	PERCENT	2010-2020	PERCENT
Sierra County ⁷	9,912	13,270	11,988	11,576	1,664	17	-412	-3
City of Elephant Butte ⁸	-	1,390	1,431	1,447	-	-	16	1
City of Truth or Consequences	6,221	7,289	6,475	6,052	-169	-3	-423	-7

⁵ New Mexico Department of Homeland Security and Emergency Management (2023). *2023 State of New Mexico Hazard Mitigation Plan*. Note that in some cases the 2020 Census count may differ from the 2023 ACS estimates; unless otherwise stated, the ACS estimates are used throughout the plan for consistency.

⁶ U.S. Census Bureau: <https://www.census.gov/en.html>

⁷ County totals include the entire population within the county lines, including unincorporated areas and non-participating jurisdictions within the County.

⁸ Census data for this jurisdiction was unavailable in the database for one or more census years presented in the table.

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JURISDICTIONS	1990	2000	2010	2020	POPULATION CHANGE			
					1990-2020	PERCENT	2010-2020	PERCENT
Village of Williamsburg	456	527	449	462	6	1	13	3

ECONOMIC IMPACT

Building and maintaining infrastructure depends on the economy, and therefore, protecting infrastructure from risk due to natural hazards in the planning area is important to the participating jurisdictions within Sierra County. Whether it is expanding culverts under a road that washes out during flash flooding, shuttering a fire station, or flood-proofing a wastewater facility, infrastructure must be mitigated from natural hazards in order to continue providing essential utility and emergency response services in a fast-growing planning area.

Based on the American Community Survey 2023 estimates, 35 percent of the population 16 years and over (9,838) is employed in the labor force. The per capita income is \$24,882, and the median household income countywide is \$37,840. Families with incomes below the poverty level in 2023 made up 17.6 percent of all families. Of families that have children under 18 years old, 36.6 percent are below the poverty level.

Tables 3-6 and 3-7 show the various occupations and industries within Sierra County, according to the 2023 estimates by the American Community Survey.

Table 3-6. Occupations of Employed Population in Sierra County⁹

OCCUPATION	ESTIMATE	PERCENT
Civilian employed population 16 years and over	3,460	
Management, business, science, and arts occupations	1,407	40.7
Service occupations	905	26.2
Sales and office occupations	584	16.9
Natural resources, construction, and maintenance occupations	331	9.6
Production, transportation, and material moving occupations	233	6.7

Table 3-7. Industries of Employed Population in Sierra County¹⁰

INDUSTRY	ESTIMATE	PERCENT
Civilian employed population 16 years and over	3,460	
Educational services, and health care and social assistance	1,128	32.6

⁹ U.S. Census Bureau: 2023 American Community Survey 5-Year Estimates Data Profiles.

¹⁰ U.S. Census Bureau: 2023 American Community Survey 5-Year Estimates Data Profiles.

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INDUSTRY	ESTIMATE	PERCENT
Retail trade	527	15.2
Agriculture, forestry, fishing and hunting, and mining	404	11.7
Arts, entertainment, and recreation, and accommodation and food services	382	11.0
Public administration	239	6.9
Professional, scientific, and management, and administrative and waste management services	210	6.1
Other services, except public administration	185	5.3
Construction	174	5.0
Transportation and warehousing, and utilities	83	2.4
Manufacturing	67	1.9
Finance and insurance, and real estate and rental and leasing	47	1.4
Information	14	0.4
Wholesale Trade	0	0.0

NATURAL, CULTURAL, AND HISTORIC RESOURCES

Sierra County offers a vibrant mix of natural beauty, outdoor adventures, and cultural richness. Known for its wide-open landscapes, historic towns, and healing hot springs, the County is a haven for those seeking both relaxation and excitement. From the warm waters of Elephant Butte Lake to the high trails of the Gila National Forest, Sierra County provides a diverse array of recreational opportunities for visitors of all interests.

One of the County's most prominent attractions is Elephant Butte Lake State Park, the largest state park in New Mexico. The 36,000-acre reservoir is a paradise for water enthusiasts. With over 200 miles of shoreline, the lake supports activities such as boating, jet skiing, swimming, and fishing. It also serves as a site for community events like the annual Elephant Butte Balloon Regatta, which brings vibrant hot air balloons soaring above the lake each August. Nearby, Caballo Lake State Park offers peaceful waters for kayaking, birdwatching, and shoreline camping.

The County is home to part of the Gila National Forest, including the Aldo Leopold Wilderness, for hiking, backpacking, and camping. The terrain ranges from challenging high-country trails with panoramic vistas to more accessible paths. Locations like Percha Dam State Park and Elephant Butte Lake have been recognized as Important Bird Areas by the Audubon Society. Events like "Migration Sensation" provide guided tours to observe the seasonal movements of birds through the region.

The City of Truth or Consequences (originally named Hot Springs) is known for its abundance of natural mineral springs, which maintain soothing temperatures between 102°F and 112°F. These

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springs are believed to have therapeutic properties, and many spas and bathhouses in the historic downtown offer relaxing soaks and treatments in serene, private settings.

The County also offers a window into New Mexico's fascinating cultural and historical landscape. The Geronimo Springs Museum, located in Truth or Consequences, features exhibits on indigenous cultures, pioneer life, mining history, and geothermal science. For those interested in space and technology, Spaceport America, the world's first purpose-built commercial spaceport, is situated nearby and offers guided tours of its facilities.

To further understand natural resources that may be vulnerable to a hazard event and those that need consideration when implementing mitigation activities, it is important to identify at-risk species (i.e., endangered species) in the planning area. A federally endangered species is any species of fish, plant life, or wildlife that is in danger of extinction throughout all or most of its range. A threatened species is a species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Both endangered and threatened species are protected by federal law, and any future hazard mitigation projects are subject to these laws. Candidate species are plants and animals that have been proposed as endangered or threatened but are not currently listed.

According to the U.S. Fish and Wildlife Service, as of December 2025, there are 14 federally endangered, threatened, or candidate species in Sierra County, listed in Table 3-8. There is also one species listed as a resolved taxon (Sprague's Pipit), one species listed as under review (White Sands Pupfish), one species has a status of no ESA (Endangered Species Act) listing (Rio Grande Cutthroat Trout), and two species are listed as experimental population, non-essential (Mexican Wolf and Northern Aplomado Falcon).

Table 3-8. Endangered Species in Sierra County¹¹

TYPE OF SPECIES	COMMON NAME	SCIENTIFIC NAME	SPECIES STATUS
Birds	Southwestern Willow Flycatcher	<i>Empidonax traillii extimus</i>	Endangered
Snails	Alamosa Springsnail	<i>Tryonia alamosae</i>	Endangered
Fishes	Gila Topminnow (Incl. Yaqui)	<i>Poeciliopsis occidentalis</i>	Endangered
Fishes	Loach Minnow	<i>Tiaroga cobitis</i>	Endangered
Fishes	Spikedace	<i>Meda fulgida</i>	Endangered
Flowering Plants	Todsen's Pennyroyal	<i>Hedeoma todsenii</i>	Endangered
Insects	Suckley's Cuckoo Bumble Bee	<i>Bombus suckleyi</i>	Proposed Endangered
Amphibians	Chiricahua Leopard Frog	<i>Rana chiricahuensis</i>	Threatened
Birds	Yellow-Billed Cuckoo	<i>Coccyzus americanus</i>	Threatened

¹¹ U.S. Fish and Wildlife Service: <https://ecos.fws.gov/ecp/report/species-listings-by-current-range-county?fips=35051>

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TYPE OF SPECIES	COMMON NAME	SCIENTIFIC NAME	SPECIES STATUS
Fishes	Gila Trout	Oncorhynchus gilae	Threatened
Reptiles	Narrow-Headed Gartersnake	Thamnophis rufipunctatus	Threatened
Birds	Mexican Spotted Owl	Strix occidentalis lucida	Threatened
Fishes	Chihuahua Chub	Gila nigrescens	Threatened
Insects	Monarch Butterfly	Danaus plexippus	Proposed Threatened

Sierra County's designated historic buildings and sites preserve a rich history. The County has 32 entries on the National Register of Historic Places. Historic buildings are vulnerable to natural hazards as their construction pre-dates modern building codes. There are also historic preservation considerations and requirements for historic structures when they are included in mitigation or recovery projects. Additionally, there are 54 sites in the Sierra County planning area listed on the New Mexico State Register of Cultural Properties.¹² The State Register includes sites, buildings, features, or events that are of local significance and have anthropological, cultural, military, political, architectural, economic, scientific, or technical, religious, experimental, or other value.

Table 3-9. Historic Properties on the National Register^{13,14}

PROPERTY NAME	LOCATION	ADDRESS
Archeological Site No. LA517	Arrey (CDP)	Address Restricted
Archeological Site No. LA50751	Arrey (CDP)	Address Restricted
Percha Diversion Dam	Arrey (CDP)	2 miles northeast of Arrey
Archeological Site No. LA1119	Caballo (CDP)	Address Restricted
Archeological Site No. LA1236	Caballo (CDP)	Address Restricted
Longbottom Canyon Site (LA49033)	Caballo (CDP)	Address Restricted
Elephant Butte Dam	City of Elephant Butte	Address Restricted
Elephant Butte Historic District	City of Elephant Butte	Roughly, along New Mexico State Road 51 from the Elephant Butte Dam to Mescal Canyon and along New Mexico State Road 52 from Ash Canyon to Long Ridge
Fort McRae	City of Elephant Butte	Address Restricted

¹² New Mexico State Register of Cultural Properties: <https://www.nmhistoricpreservation.org/programs/registers.html>

¹³ National Register of Historic Places: <https://npgallery.nps.gov/nrhp>

¹⁴ NRHP and NM State Register listings may overlap; in such cases, identical entries are listed only once in the table.

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PROPERTY NAME	LOCATION	ADDRESS
Alert-Hatcher Building	Community of Hillsboro	Junction of Second Avenue and Main Street, southeast corner
Cornelius Sullivan House	Community of Hillsboro	Junction of Elenora and First Avenue, southwest corner
Hillsboro High School	Community of Hillsboro	Junction of Elenora Street and First Avenue, southeast corner
Hillsboro Historic District	Community of Hillsboro	State Road 90
John M. Webster House	Community of Hillsboro	Junction of Main Street and Fifth Avenue, southeast corner
Meyers House	Community of Hillsboro	Main Street north side between 4th and 5th Avenues
Miller, George Tambling and Ninette Stocker, House	Community of Hillsboro	Elenora Street south side, west of Union Church
Tom Murphy House	Community of Hillsboro	Elenora Street
Percha Creek Bridge	Community of Hillsboro	New Mexico State Road 152
Will M. Robins House	Community of Hillsboro	Junction of Main Street and Fifth Avenue, southwest corner
William H. Butcher House	Community of Hillsboro	300 West Main Street
Union Community Church	Community of Hillsboro	178 Elenora Street
Hillsboro Peak Lookout Tower and Cabin	Kingston (CDP)	Gila National Forest
Percha Bank	Kingston (CDP)	Main Street
Lake Valley School House	Lake Valley (CDP)	Approximately 12 miles south on New Mexico State Road 26 from the Town of Nutt
Lake Valley Mining District	Lake Valley (CDP)	Approximately 12 miles south on New Mexico State Road 26 from the Town of Nutt
Camino Real-Point of Rocks Section	Rincon (CDP)	Address Restricted
Alamosa Ranch House and Blacksmith Shop	City of Truth or Consequences	Martin Ranch Road
Archeological Site No. LA1119	City of Truth or Consequences	Address Restricted
Archeological Site No. LA49016	City of Truth or Consequences	Address Restricted
Archeological Site No. LA49030	City of Truth or Consequences	Address Restricted
Archeological Site No. LA517	City of Truth or Consequences	Address Restricted
Caballo Dam	City of Truth or Consequences	Address Restricted
Carrie Tingley Hospital Historic District	City of Truth or Consequences	992 Broadway

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PROPERTY NAME	LOCATION	ADDRESS
Chambers Canyon Site (LA49028)	City of Truth or Consequences	Address Restricted
Hedrick House	City of Truth or Consequences	East Riverside Drive
Horse Island Site (LA48996)	City of Truth or Consequences	Address Restricted
Hot Springs Bathhouse and Commercial Historic District	City of Truth or Consequences	Roughly bounded by Post, Ban Patten, Pershing and Main Streets
Hot Springs Main Post Office	City of Truth or Consequences	400 Main Street
Kettle Top Butte Site (LA48995)	City of Truth or Consequences	Address Restricted
Las Palomas (LA8707)	City of Truth or Consequences	Address Restricted
Monticello Point Archeological District (LA48990-48994)	City of Truth or Consequences	Address Restricted
Palomas Narrows North (LA38755)	City of Truth or Consequences	Address Restricted
Palomas Narrows South (LA49007)	City of Truth or Consequences	Address Restricted
Sierra Grande Lodge and Spa	City of Truth or Consequences	501 McAdoo Street
Austin Crawford House	Unincorporated Sierra County (Chloride)	Wall Street
Monte Christo Saloon	Unincorporated Sierra County (Chloride)	Wall Street
Old Stone House	Unincorporated Sierra County (Chloride)	Wall Street
Pioneer Store	Unincorporated Sierra County (Chloride)	Wall Street
Archeological Site No. LA50548	Unincorporated Sierra County (Cuchillo)	Address Restricted
Archeological Site No. LA1082	Unincorporated Sierra County (Derry)	Address Restricted
Archeological Site No. LA50743	Unincorporated Sierra County (Derry)	Address Restricted
Archeological Site No. LA50749	Unincorporated Sierra County (Derry)	Address Restricted
Camino Real-Jornada Lakes Section	Unincorporated Sierra County (Engle)	Address Restricted
Camino Real-Yost Draw Section	Unincorporated Sierra County (Engle)	Address Restricted

EXISTING LAND USE AND DEVELOPMENT TRENDS

A zoning ordinance sets forth regulations and standards related to the extent of land and structure uses that are allowed in certain areas. A zoning map shows the location of zoning districts and

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standards within a community, gives an overall picture of the types of developments, and is used as a tool to inform continued growth efforts and initiatives. The City of Elephant Butte and the Village of Williamsburg have zoning ordinances in place.

A review of housing can also give a picture of the built environment and the changes in vulnerability to various hazards in a jurisdiction. Table 3-10 lists the total housing units for each jurisdiction, where data was available, between 2019 and 2023, utilizing 2020 Decennial Census data and American Community Survey (ACS) five-year estimates. Between official U.S. Census counts, the estimates use a formula based on the applicable Decennial Census housing units count, new residential construction, new mobile homes, and housing unit loss. The census data “residential construction” category calculates building permits issued utilizing permitted construction counts as well as permit completion rates. Estimates of decreasing housing units are computed by applying an annual loss rate to the housing stock. The rate is then added to an estimate of the number of units lost due to natural disasters. Housing loss rates are derived from prior American Housing Survey (AHS) estimates at the regional level. A unit is counted as lost if a survey was completed in the AHS, but it was listed as a non-response (Type C, 30- Demolished) in the subsequent survey, indicating a permanent loss to the housing stock.¹⁵ It is simply an estimate, and many variables are involved in achieving an accurate estimation of the number of housing units in a given area at a given time.

Table 3-10. Total Housing Units by Jurisdiction, 2019-2023¹⁶

JURISDICTION	TOTAL HOUSING UNITS					CHANGE 2019-2023	PERCENT OF CHANGE
	2019	2020	2021	2022	2023		
Sierra County ¹⁷	8,555	8,056	8,111	8,115	8,139	-416	-5
City of Elephant Butte	1,581	1,291	1,612	1,641	1,566	-15	-1
City of Truth or Consequences	3,908	3,985	3,571	3,514	3,516	-392	-10
Village of Williamsburg	317	320	340	392	363	46	15

Certain types of housing found in the Sierra County planning area are more vulnerable than typical site-built, newly constructed residential structures. This includes mobile or manufactured homes, of which 3,390 (approximately 42 percent of total housing stock) are in the planning area. Additionally, single-family residences (SFR) built before 1980 are typically built to lower or less stringent construction standards than newer construction, making these homes more susceptible to damage during hazard events. These older homes comprise 45 percent (3,703 structures) of housing stock in the planning area. Table 3-11 includes housing inventory data for the participating jurisdictions per the American Community Survey five-year estimates.

¹⁵ U.S. Census Bureau: <https://www.census.gov/programs-surveys/popest/technical-documentation/methodology.html>

¹⁶ U.S. Census Bureau: <https://www.census.gov>

¹⁷ County totals include the entire planning area within county lines, including unincorporated areas and non-participating jurisdictions within the County.

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Table 3-11. Housing Inventory and Vulnerable Structures by Jurisdiction¹⁸

JURISDICTION	HOUSING UNITS		
	TOTAL	SFR BUILT PRIOR TO 1980	MANUFACTURED HOMES
Sierra County ¹⁹	8,139	3,703	3,390
City of Elephant Butte	1,566	261	899
City of Truth or Consequences	3,516	2,130	1,086
Village of Williamsburg	363	170	223

CHANGES IN VULNERABILITY

The Sierra County planning area experienced an overall population decrease of 3 percent between 2010 and 2020. The American Community Survey estimates the 2023 total housing units for the planning area to be 8,139, or a 15 percent decrease from 2019. The overall population decrease, combined with decrease in housing units, indicates no known increase in vulnerability to all hazards in terms of populations and the built environment. Changes in vulnerability vary by jurisdiction based on each jurisdiction's trends in population and development (Table 3-12).

Table 3-12. Changes in Vulnerability by Jurisdiction

JURISDICTION	POPULATION TREND	HOUSING TREND	CHANGE IN VULNERABILITY
Sierra County ²⁰	Decrease	Decrease	No Change
City of Elephant Butte	Increase	Decrease	Increase
City of Truth or Consequences	Decrease	Decrease	No Change
Village of Williamsburg	Increase	Increase	Increase

Changes in vulnerability are applicable to all natural hazards except when discussing dam failure as vulnerability for this hazard is discussed in relation to changes in the estimated inundation areas for profiled dams. For the 13 dams profiled in Section 5, there is no known increase in vulnerability in the estimated inundation areas. While flood and wildfire hazards feature geographical boundaries, increases in population and building inventory can increase overall vulnerability for these hazards even when the trends occur outside of the known hazard boundary. Development decreases permeable surface areas and increases runoff, increasing flood risk.

¹⁸ The Housing Inventory and Vulnerable Structures are based off the 2023 American Community Survey 5-Year Estimates Data Profiles.

¹⁹ County totals include all housing units within the county lines, including unincorporated areas and non-participating jurisdictions within the County.

²⁰ County totals include all housing units within the county lines, including unincorporated areas and non-participating jurisdictions within the County.

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While the actual numbers of new structures in the floodplain and Wildland Urban Interface (WUI) are not available, decreases in population and minimal movement in building inventory suggest that vulnerability has a slight increase and has likely remained the same, even within these specific geographic areas.

FUTURE GROWTH AND DEVELOPMENT

To better understand how future growth and development in Sierra County might affect hazard vulnerability, it is useful to consider population growth, occupied and vacant land, the potential for future development in hazard areas, and current planning and growth management efforts.

Population projections from 2010 to 2050 are listed in Table 3-13, provided by the University of New Mexico Geospatial and Population Studies. At the county level, population projections are developed by analyzing trends between the 2010 and 2020 census data. This information is only available at the state and county levels; however, the projections reflect an overall decrease in population density, which would indicate no known increase in vulnerability for the County.

Table 3-13. Sierra County Population Projections²¹

LAND AREA (SQ MI)	2010		2020		2030		2040		2050	
	POPULATION									
	Total Number	Density	Total Number	Density	Total Number	Density	Total Number	Density	Total Number	Density
4,181.21	11,988	2.87	11,576	2.77	11,064	2.65	10,313	2.47	9,252	2.21

Comprehensive Plans are guiding documents in a community that set forth a vision, goals, policies, and guidelines to direct future physical, social, and economic development within a jurisdiction. They are part of a continuous process to provide a sustainable environment for citizens and consider the general desire of the community to conserve, preserve, and protect the natural environment of their jurisdiction. These plans present a future vision for each participating jurisdiction and special district, outlining recommendations on growth, community character, infrastructure, land use, economic development, zoning, mobility, and public facilities, while guiding staff, decision-makers, and citizens to weigh choice with an eye toward the future.

Sierra County and the Cities of Elephant Butte and Truth or Consequences have Comprehensive Plans in place. Sierra County adopted their Comprehensive Plan in July 2017. The City of Truth or Consequences adopted their comprehensive plan in October 2014. Refer to the Capability Assessment in Appendix G for a complete list of the plans, ordinances, and other resources for all participating jurisdictions.

²¹ The University of New Mexico Geospatial and Population Studies: <https://gps.unm.edu/pop/population-projections.html>

Section 4

Risk Overview



SECTION 4: RISK OVERVIEW

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HAZARD DESCRIPTION

Section 4 is the first phase of the Risk Assessment, providing background information for the hazard identification process and descriptions for the hazards identified. The Risk Assessment continues with Sections 5 through 20 and Appendix A, which include hazard descriptions and vulnerability assessments.

Upon a review of the full range of natural hazards suggested under FEMA planning guidance, participating jurisdictions identified 16 natural hazards and 4 human-caused hazards that are addressed in the Hazard Mitigation Action Plan Update and were identified as significant, as shown in Table 4-1. The hazards were identified through input from Planning Team members and a review of the current 2023 State of New Mexico Hazard Mitigation Plan (State Plan). Readily available online information from reputable sources such as federal and state agencies were also evaluated and utilized to supplement information as needed.

There are four main categories of natural hazards: atmospheric, geologic, hydrologic, and technological. Atmospheric hazards are events or incidents associated with weather-generated phenomena. The following are significant for the planning area: extreme cold, extreme heat, hail, high winds, lightning, severe winter storm, and tornado (Table 4-1).

Geologic hazards are events or incidents associated with the earth's crust. The geologic hazards identified as significant for the planning area are earthquakes, expansive soils, land subsidence, rockfall and landslides, and volcano.

Hydrologic hazards are events or incidents associated with water-related damage and account for over 75 percent of federal disaster declarations in the United States. Hydrologic hazards identified as significant for the planning area include flood and drought.

Technological hazards refer to the origins of incidents that can arise from human activities, such as the construction and maintenance of dams. They are distinct from natural hazards primarily because they originate from human activity. Human activity may increase or decrease the risks presented by natural hazards; however, they are not inherently human-induced. Therefore, dam failure is classified as a quasi-technological hazard and referred to as “technological” in Table 4-1 for description purposes.

For the Risk Assessment, the wildfire hazard is considered “other” since this hazard is not considered atmospheric, hydrologic, geologic, or technological.

Human-caused hazards are events or incidents caused by human intent, human error, or failed systems. They can be caused or exacerbated by either accidental or intentional human actions

SECTION 4: RISK OVERVIEW

that result in the loss of life or property. Appendix A includes the following human-caused hazards: civil unrest, cyber-attack, hazardous materials, and terrorism.

Table 4-1. Hazard Descriptions

HAZARD	DESCRIPTION
ATMOSPHERIC	
Extreme Cold	Extreme cold refers to temperatures that are significantly lower than what is normal for a particular region or season. Extreme cold may also result in a freeze, which occurs when the temperature drops below 32°F for a significant period of time.
Extreme Heat	Extreme heat is the condition whereby temperatures hover ten degrees or more above the average high temperature in a region for an extended period of time.
Hail	Hailstorms are a potentially damaging outgrowth of severe thunderstorms. Early in the developmental stages of a hailstorm, ice crystals form within a low-pressure front due to the rapid rising of warm air into the upper atmosphere and subsequent cooling of the air mass.
High Wind	Thunderstorm winds, often referred to as straight-line winds, are produced by severe thunderstorms and can reach speeds exceeding 100 mph. These winds are often caused by downbursts or microbursts, which are powerful columns of air that descend from a storm and spread outward upon hitting the ground. They can cause damage patterns similar to tornadoes but occur without rotation, spreading out in a straight path. Contrastingly, high wind events can occur in the absence of other definable hazard conditions, developing from strong pressure systems or terrain effects and causing similar impacts, especially in exposed or rural areas.
Lightning	Lightning is a sudden electrostatic discharge that occurs during an electrical storm. This discharge occurs between electrically charged regions of a cloud, between two clouds, or between a cloud and the ground.
Severe Winter Storm	Severe winter storms may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. Blizzards, the most dangerous of all winter storms, combine low temperatures, heavy snowfall, and winds of at least 35 mph, reducing visibility to only a few yards. Ice storms occur when moisture falls and freezes immediately upon impact on trees, power lines, communication towers, structures, roads, and other hard surfaces. Winter storms and ice storms can down trees, cause widespread power outages, damage property, and cause fatalities and injuries to human life.
Tornado	A tornado is a violently rotating column of air that has contact with the ground and is often visible as a funnel cloud. Its vortex rotates cyclonically with wind speeds ranging from as low as 40 mph to as high as 300 mph. The destruction caused by tornadoes ranges from light to catastrophic, depending on the location, intensity, size, and duration of the storm.
GEOLOGIC	
Earthquake	An earthquake is the sudden, rapid shaking of the earth, caused by the breaking and shifting of subterranean rock as it releases strain that has accumulated over a long time. Initial mild shaking may strengthen and become extremely violent within seconds.

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HAZARD	DESCRIPTION
Expansive Soils	Expansive soils are soils and soft rock that tend to swell or shrink due to changes in moisture content. Changes in soils volume present a hazard primarily to structures built on top of expansive soils.
Landslide and Rockfall	A landslide is a geological phenomenon where there is down slope movement of mass rock, debris, or earth. A rockfall is a type of fast-moving landslide that happens when rock falls, bounces, or rolls from a cliff or down a very steep slope. They usually occur in conjunction with other natural hazards, such as earthquakes, volcanoes, wildfires, and floods.
Land Subsidence	Land subsidence occurs when land sinks into underground voids. These voids may occur naturally or through human-driven or technologically exacerbated circumstances. When the void can no longer support the weight of the earth above it, it collapses, causing a sinkhole depression in the landscape.
Volcano	A volcano is a vent through which molten rock escapes to the earth's surface. Unlike other mountains, which are pushed up from tectonic activity below, volcanoes grow through the surface accumulation of their eruptive products (such as lava, pyroclastic flows, and ash). Hazards associated with volcanic eruptions includes gases; lava and pyroclastic flows; airborne ash; landslides; earthquakes; and explosive eruptions.
HYDROLOGIC	
Drought	A prolonged period of less than normal precipitation such that the lack of water causes a serious hydrologic imbalance. Common effects of drought include crop failure, water supply shortages, and fish and wildlife mortality.
Flood	The accumulation of water within a body of water, which results in the overflow of excess water onto adjacent lands, usually floodplains. The floodplain is the land adjoining the channel of a river, stream, ocean, lake, or other watercourse or water body that is susceptible to flooding. Most floods fall into the following three categories: riverine flooding, coastal flooding, and shallow flooding.
OTHER	
Wildfire	A wildfire is an uncontrolled fire burning in an area of vegetative fuels such as grasslands, brush, or woodlands. Heavier fuels with high continuity, steep slopes, high temperatures, low humidity, low rainfall, and high winds all work to increase the risk for people and property located within wildfire hazard areas or along the urban/wildland interface. Wildfires are part of the natural management of forest ecosystems, but most are caused by human factors.
TECHNOLOGICAL	
Dam Failure	Dam failure is the collapse, breach, or other failure of a dam structure resulting in downstream flooding. In the event of a dam failure, the energy of the water stored behind even a small dam is capable of causing loss of life and severe property damage if development exists downstream of the dam.

All natural hazards profiled for Sierra County are listed in Table 4-1 and are consistent with hazards profiled in the 2023 New Mexico State Hazard Mitigation Plan.

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DISASTER DECLARATION HISTORY

One method of understanding hazards that pose a risk to the planning area is to identify past hazard events that triggered federal or state disaster declarations. Federal and state declarations may be declared when the severity and magnitude of an event surpasses the ability of the local government to respond and recover. Disaster assistance is supplemental and sequential. Table 4-2 lists state and federal disaster declarations received by Sierra County. Many of the disaster events were regional or statewide.

Between 1953 and November 2025, Sierra County received 13 federal disaster declarations. The largest share was related to severe storms (5), followed by declarations for floods (3), biological (2), fire (2), and impacts from the Hurricane Katrina evacuation (1).

Table 4-2. Disaster Declaration History in Sierra County, 1953 – November 2025¹

YEAR	DECLARATION TITLE	HAZARD	DECLARATION TYPE	DISASTER NO.
1972	Heavy Rains and Flooding	Flood	DR	DR-353
1979	Flooding	Flood	DR	DR-571
1999	Severe Ice Storms, Flooding, and Heavy Rains	Severe Storm	DR	DR-1301
2000	Severe Fire Threats	Fire	EM	EM-3154
2000	Severe Forest Fire	Fire	DR	DR-1329
2005	Hurricane Katrina Evacuation	Hurricane	EM	EM-3229
2006	Severe Storms and Flooding	Severe Storm	DR	DR-1659
2011	Severe Winter Storm and Extreme Cold Temperatures	Severe Storm	DR	DR-1962
2013	Severe Storms and Flooding	Severe Storm	DR	DR-4148
2013	Severe Storms, Flooding, and Mudslides	Flood	DR	DR-4152
2014	Severe Storms and Flooding	Severe Storm	DR	DR-4199
2020	Covid-19	Biological	EM	EM-3460
2020	Covid-19 Pandemic	Biological	DR	DR-4529

In addition to the 13 federally declared disaster there have been 24 U.S. Department of Agriculture (USDA) Secretarial disaster designations between 2012 and 2025. The Secretary of Agriculture is authorized to designate counties as disaster areas to make emergency loans available to producers suffering losses in those counties and in counties that are contiguous to a designated county. Of the 24 USDA designations for Sierra County, many listed multiple factors as having caused the disaster area designation. The leading cause was drought, which was included in all

¹ FEMA: <https://www.fema.gov/openfema-data-page/disaster-declarations-summaries-v2>

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24 designations. Other factors listed include excessive heat (3 designations), high wind (3), fire / wildfire (3), and insects (3).²

NATURAL HAZARDS AND CLIMATE CHANGE

Climate change is defined as a long-term shift in temperature and weather patterns. These shifts can increase or decrease the risk of natural hazards. Global climate change is expected to exacerbate the risks of certain types of natural hazards impacted through rising sea levels, warmer ocean temperatures, higher humidity, the possibility of stronger storms, and an increase in wind and flood damages due to storm surges. New Mexico is considered particularly vulnerable to climate change as atmospheric warming, and its cascading effects may result in greater severity and frequency of hazard events such as wildfires, extreme heat, and flooding.

Climate change is expected to lead to an increase in average temperatures as well as an increase in frequency, duration, and intensity of extreme heat events. With no reductions in emissions worldwide, the state of New Mexico is expected to experience an increase in average temperature by 5°F to 7°F over the next 50 years.

The New Mexico Bureau of Geology and Mineral Resources published *Climate Change in New Mexico Over the Next 50 Years: Impacts on Water Resources* in 2022, which identifies ongoing and likely future climate trends over the next 50 years in New Mexico based on historical observations and studies conducted at regional, national, and global scales. Table 4-3 highlights New Mexico's future trends in extreme weather from the report.

Table 4-3. Future Trends in Extreme Weather in New Mexico³

HAZARDS	EXPECTED TRENDS
Extreme Temperatures	• Over the next 50 years, statewide temperatures are projected to increase by 5°F to 7°F. • Climate warming will greatly increase the frequency of extreme temperature days and heat waves. • Forest stress and tree mortality will increase as atmospheric warming continues. • The coolest days of the summer are expected to continue becoming warmer. • The number of frost days per year is expected to decrease. • The coolest days of the summer are expected to continue becoming warmer.

² United States Department of Agriculture: <https://www.fsa.usda.gov/resources/disaster-assistance-program/disaster-designation-information>

³ Dunbar, N.W., Gutzler, D.S., Pearthree, K.S., Phillips, F.M., Bauer, P.W., Allen, C.D., DuBois, D., Harvey, M.D., King, J.P., McFadden, L.D., Thomson, B.M., and Tillery, A.C., 2022, Climate change in New Mexico over the next 50 years: Impacts on water resources: New Mexico Bureau of Geology and Mineral Resources, Bulletin 164, 218 p. <https://doi.org/10.58799/B-164>

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HAZARDS	EXPECTED TRENDS
Precipitation	• Across the state, models do not consistently project a significant change in average annual precipitation. However, some seasonal precipitations may emerge, such as more winter precipitation in the northern mountains and drier seasons in the southern parts of New Mexico. • Spring precipitation, critical for snowmelt runoff and ecosystems, may decline. • Somewhat stronger monsoonal activity may result in more summer precipitation in southern New Mexico.
Drought	• Increasing temperatures and no clear increasing trend in precipitation lead to a projection of increasingly arid conditions, decreased soil moisture, stressed vegetation, and more severe droughts. • Substantial declines in snowpack and associated water runoff by 2070 will lead to diminished headwater streamflow, negatively impacting water supply. • Warmer temperatures will also lead to lower river flows due to increasing evaporation.
Flood	• A warming climate could increase the magnitude of future storms, leading to more extreme precipitation events that result in flooding. • Data suggests that the most severe storms New Mexico experiences may not increase beyond current estimated values, however less severe (but still high intensity) storms may occur more frequently. • Increases in the frequency and severity of wildfires may dramatically increase the probability and magnitude of flooding and debris flows.
Winter Weather	• As the climate warms, the likelihood of winter weather decreases. • Both extreme cold and snowfall either become less frequent or are expected to do so. • Fewer cold spells are projected to occur per year, but the length of cold spells will be longer when they do occur.
Thunderstorms (Wind, Hail, Lightning)	• Projection suggests little change in the frequency of extreme storm events over the next few decades; however, an increase in summer storm events is predicted after 2050. • Though New Mexico may experience more thunderstorms in the future, it is not clear that they will result in an increased risk of flooding due, in part, to typically short storm durations. • Even less severe storms could result in and exacerbate debris flows following wildfires (which are expected to increase in frequency.). • Generally, there is a high level of scientific uncertainty with future extreme precipitation events, meaning continuing future research is needed to reveal potential trends.

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HAZARDS	EXPECTED TRENDS
Wildfire	- Weather and climate drivers of wildfire risk are projected to increase the burn area, severity, frequency, and overall risk of wildfires throughout the state. - Other climate trends that will exacerbate wildfire risk include warmer temperatures, decreased water supply, lower soil moisture levels, and a general trend toward more arid conditions. - Increased amounts of runoff from a greater number of wildfires may degrade water quality. - Plant communities stressed by higher temperatures and greater aridity will result in more extreme wildfires. - Coupled with a rise in rainfall intensities, post-wildfire erosion will increase and become more widespread.

OVERVIEW OF HAZARD ANALYSIS

The methodologies utilized to develop the Risk Assessment are a historical analysis and a statistical approach. Both methodologies provide an estimate of potential impact by using a common, systematic framework for evaluation.

Records retrieved from National Centers for Environmental Information (NCEI) and National Oceanic and Atmospheric Administration (NOAA) were reported for Sierra County. Remaining records identifying the occurrence of hazard events in the planning area and the maximum recorded magnitude of each event were also evaluated.

The use of geographic information system (GIS) technology to identify and assess risks for Sierra County and evaluate community assets and their vulnerability to the hazards.

The four general parameters that are described for each hazard in the Risk Assessment include frequency of return, approximate annualized losses, a description of the general vulnerability, and a statement of the hazard's impact.

The frequency of return was calculated by dividing the number of events in the recorded time period for each hazard by the overall time period that the resource database was recording events. Frequency of return statements are defined in Table 4-4, and impact statements are defined in Table 4-5 below.

Table 4-4. Frequency of Return Statements

PROBABILITY	DESCRIPTION
Highly Likely	Event is probable in the next year.
Likely	Event is probable in the next three years.
Occasional	Event is probable in the next five years.
Unlikely	Event is probable in the next ten years.

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Table 4-5. Impact Statements

POTENTIAL SEVERITY	DESCRIPTION
Substantial	Multiple deaths. Complete shutdown of facilities for 30 days or more. More than 50 percent of property destroyed or with major damage.
Major	Injuries and illnesses resulting in permanent disability. Complete shutdown of critical facilities between one and four weeks. More than 25 percent of property destroyed or with major damage.
Minor	Injuries and illnesses do not result in permanent disability. Complete shutdown of critical facilities for up to one week. More than 10 percent of property destroyed or with major damage.
Limited	Injuries and illnesses are treatable with first aid. Shutdown of critical facilities and services for 24 hours or less. Less than 10 percent of property destroyed or with major damage.

Each of the hazard profiles includes a description of a general Vulnerability Assessment. Vulnerability is the total of assets that are subject to damages from a hazard, based on historic recorded damages. Assets in the region were inventoried and defined in hazard zones where appropriate. The total amount of damages, including property and crop damages, for each hazard is divided by the total number of assets (building value totals) in that community to determine the percentage of damage that each hazard can cause to the community. Risk and consequences will be addressed and covered within each hazard profile under the Vulnerability and Impact section as well as under the Assessment of Impact sections, where applicable.

To better understand how future growth and development in the Sierra County region might affect hazard vulnerability, it is useful to consider population growth, occupied and vacant land, the potential for future development in hazard areas, and current planning and growth management efforts. Hazard vulnerability for all participating jurisdictions within Sierra County was reviewed based on recent development changes that occurred throughout the planning area. The overall population of Sierra County has decreased by 3 percent between 2010 and 2020, according to the U.S. Census Bureau, therefore the vulnerability to the population, infrastructure, and buildings has no known increase for hazards that do not have a geographical boundary.

Once loss estimates and vulnerability were known, an impact statement was applied to relate the potential impact of the hazard on the assets within the area of impact.

HAZARD RANKING

During the 2025 planning process, the Planning Team conducted a risk ranking exercise to get input from the Planning Team and stakeholders. Table 4-6 portrays the results of the risk assessment analysis including the frequency of occurrence and potential severity and the Planning Team's self-assessment for hazard ranking, based on local knowledge of past hazard events and impacts for each of the identified hazards. The definitions for frequency of occurrence and potential severity can be found in Table 4-4 and Table 4-5.

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Table 4-6. Hazard Risk Ranking

HAZARD	FREQUENCY OF OCCURRENCE	POTENTIAL SEVERITY	RANKING
Drought	Highly Likely	Limited	High
Extreme Cold	Highly Likely	Limited	High
Extreme Heat	Highly Likely	Limited	High
Flood	Highly Likely	Substantial	High
High Winds	Highly Likely	Limited	High
Lightning	Highly Likely	Limited	High
Wildfire	Highly Likely	Major	High
Dam Failure	Unlikely	Limited	Moderate
Expansive Soils	Likely	Limited	Moderate
Hail	Highly Likely	Substantial	Moderate
Landslide and Rockfall	Unlikely	Limited	Moderate
Land Subsidence	Unlikely	Limited	Moderate
Severe Winter Storm	Highly Likely	Limited	Moderate
Earthquake	Unlikely	Limited	Low
Tornado	Unlikely	Limited	Low
Volcano	Unlikely	Substantial	Low

RISK ASSESSMENT RESOURCES AND DATA LIMITATIONS

The risk and vulnerability assessment relies heavily on the content of the National Oceanic and Atmospheric Administration (NOAA) National Center for Environmental Information (NCEI) Storm Events Database. This database covers weather-related hazards that affect the planning area and that are profiled in this Plan, including winter weather (extreme cold and winter storm), drought, earthquake, hail, lightning, high wind, flood, extreme heat, and tornado. Other hazards were analyzed using databases containing more comprehensive historical data specific to New Mexico, such as the New Mexico Forestry Division of the New Mexico Energy, Minerals and Natural Resources Department (EMNRD) for wildfires or the New Mexico Bureau of Geology and Mineral Resources for expansive soils, landslide and rockfall, land subsidence, and volcano. Historical dam incidents, including failures, were researched through the Association of State Dam Safety Officials.

The NCEI Storm Events Database is a rich centralized repository of nationwide weather-related hazard events. Among other things, it is the source used by NOAA to populate its monthly storm data publication. The database contains recorded weather events of significance based on a

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range of potential criteria including intensity, duration, damages, injuries, or other noteworthy events. The history of data available in the NCEI database allows the study of impacts of individual hazards over an extended period of time. This data contributes to the framework for understanding relative risks over time.

While the NCEI is considered one of the most comprehensive national historical event databases, it is not without limitations. Records of historical occurrences in the state show significant variations in the number of events recorded from one county to the next. Further research shows that the variations are more attributable to under-reporting of events than variations in weather occurrences. Only the events that have been reported or recorded in the database are factored into the risk assessment when no other reliable resources are available. It is accurate to assume that additional natural hazard occurrences have gone unreported or have been underreported. The risk assessment in this Plan is considered the baseline for estimating potential future losses and frequency of events, which are assumed to be the minimum the planning area can anticipate. Additionally, significant events may be reported by both the county and local jurisdictions. This is due to reports from various locations impacted by a given event.

Finally, damages are not reported for the majority of events recorded in the NCEI, as property damage estimates are not always available. Natural hazard event damages are often covered by private insurance, and statistical insurance data is not readily available in the public domain. The National Weather Service (NWS) regional forecast coordinators utilize the resources available to them to describe damages or impacts of events. However, local input is key to assigning damages to historical events.

ASSUMPTIONS

Event data is often reported at the county level only. This is primarily due to the nature of most natural hazards impacting areas larger than a single municipality. Winter storms or extreme heat, for example, impact large regions and are not confined to a single location. NWS regional coordinators typically gather event data from countywide or regional reporting and record it accordingly. Some exceptional events are captured by NWS regional coordinators when the impact of the event is severe or catastrophic. However, most events recorded at the municipality level are conveyed by local officials. Event data at the municipality level is often limited as a result. Due to the more robust reporting at the county level and limited reporting at the local level, summary vulnerability statements are formulated using both local and countywide event data. These vulnerability assessments assume that events impacting the county similarly impact the jurisdictions within that county. Therefore, the countywide assessment is considered similar for all participating jurisdictions unless stated otherwise. Future risk and vulnerability assessments at the local, county, and state levels will benefit significantly from increased, detailed event reporting.

Section 5

Dam Failure



SECTION 5: DAM FAILURE

Section 5 is **For Official Use Only (FOUO)** and may be exempt from public release under the Freedom of Information Act (FOIA).



Section 6

Drought



SECTION 6: DROUGHT

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HAZARD DESCRIPTION

Drought is a period of time without substantial rainfall that persists from one year to the next. Drought is a normal part of virtually all climatic regions, including areas with high and low average rainfall. Drought is the consequence of anticipated natural precipitation reduction over an extended period of time, usually a season or more in length. Droughts can be classified as meteorological, hydrologic, agricultural, and socioeconomic. Table 6-1 presents definitions for these different types of droughts.

Droughts are one of the most complex of all natural hazards as it is difficult to determine their precise beginning or end. In addition, droughts can lead to other hazards such as extreme heat and wildfires. Their impact on wildlife and area farming is enormous, often killing crops, grazing land, edible plants, and even in severe cases, trees. A secondary hazard to drought is wildfire because dying vegetation serves as a prime ignition source. Therefore, a heat wave combined with a drought is a very dangerous situation.

Table 6-1. Drought Classification Definitions¹

METEOROLOGICAL DROUGHT	The degree of dryness or departure of actual precipitation from an expected average or normal amount based on monthly, seasonal, or annual time scales.
HYDROLOGIC DROUGHT	The effects of precipitation shortfalls on stream flows and reservoir, lake, and groundwater levels.
AGRICULTURAL DROUGHT	Soil moisture deficiencies relative to water demands of plant life, usually crops.
SOCIOECONOMIC DROUGHT	The effect of demands for water exceeding the supply as a result of a weather-related supply shortfall.

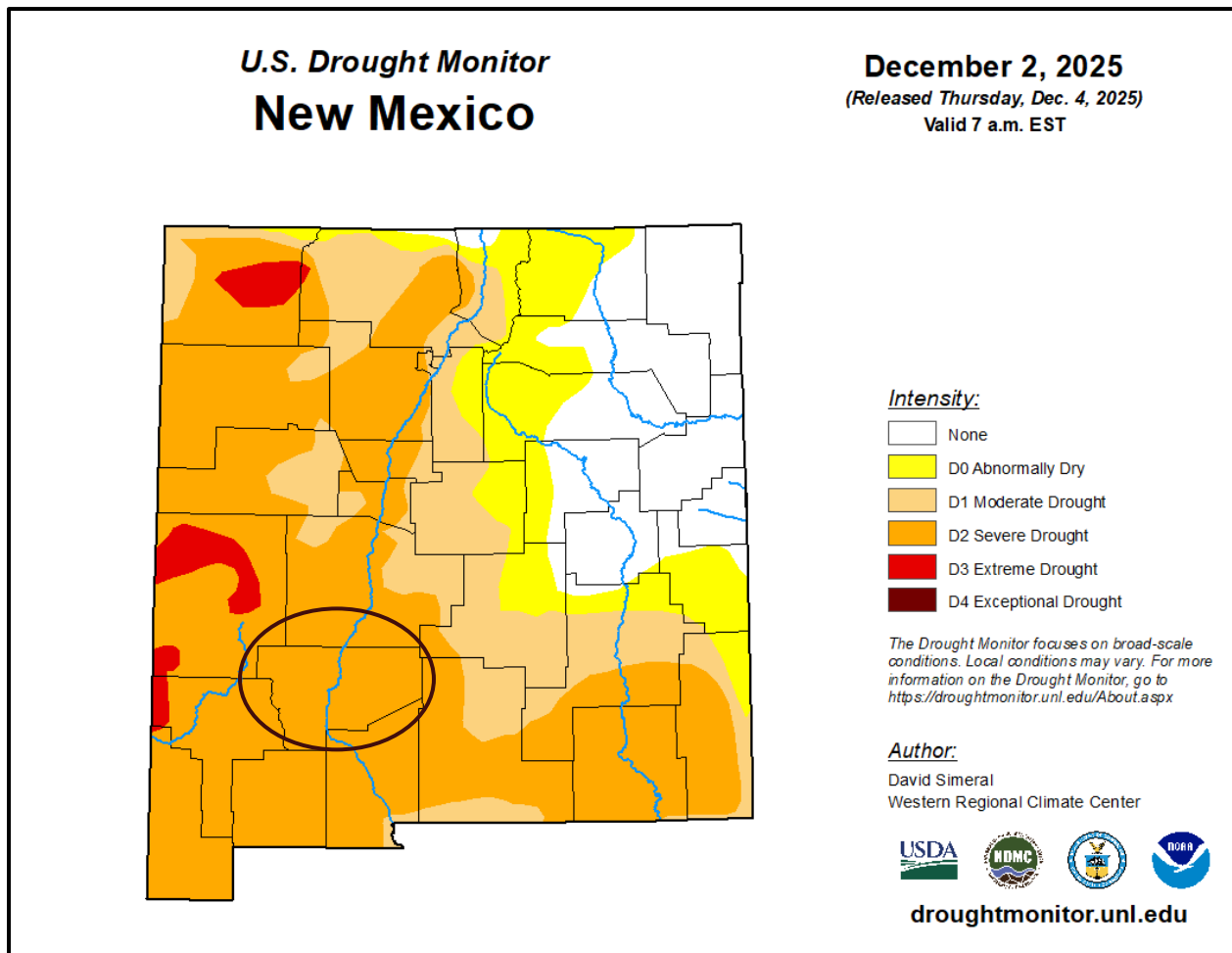
¹ Source: Multi-Hazard Identification and Risk Assessment: A Cornerstone of the National Mitigation Strategy, FEMA

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LOCATION

Droughts occur regularly throughout New Mexico and the Sierra County planning area and are considered a normal condition. However, they can vary greatly in their intensity and duration. The U.S. Drought Monitor, produced through a partnership between the National Drought Mitigation Center at the University of Nebraska-Lincoln, U.S. Department of Agriculture and the National Oceanic and Atmospheric Administration, shows the planning area is currently experiencing severe drought conditions (Figure 6-1) but has experienced a range of conditions from normal (none) to exceptional drought conditions over the last decade (Figure 6-2). There is no distinct geographic boundary to drought; therefore, it can occur anywhere throughout the Sierra County planning area.

Figure 6-1. U.S. Drought Monitor, December 2025



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EXTENT

The Palmer Drought Index is used to measure the extent of drought by measuring the duration and intensity of long-term drought-inducing circulation patterns. Long-term drought is cumulative, with the intensity of drought during the current month dependent upon the current weather patterns plus the cumulative patterns of previous months. The hydrological impacts of drought (e.g., reservoir levels, groundwater levels, etc.) take longer to develop. Table 6-2 depicts magnitude of drought, while Table 6-3 describes the classification descriptions.

Table 6-2. Palmer Drought Index

DROUGHT INDEX	DROUGHT CONDITION CLASSIFICATIONS						
	Extreme	Severe	Moderate	Normal	Moderately Moist	Very Moist	Extremely Moist
Z Index	-2.75 and below	-2.00 to -2.74	-1.25 to -1.99	-1.24 to +.99	+1.00 to +2.49	+2.50 to +3.49	n/a
Meteorological	-4.00 and below	-3.00 to -3.99	-2.00 to -2.99	-1.99 to +1.99	+2.00 to +2.99	+3.00 to +3.99	+4.00 and above
Hydrological	-4.00 and below	-3.00 to -3.99	-2.00 to -2.99	-1.99 to +1.99	+2.00 to +2.99	+3.00 to +3.99	+4.00 and above

Table 6-3. Palmer Drought Category Descriptions²

CATEGORY	DESCRIPTION	POSSIBLE IMPACTS	PALMER DROUGHT INDEX
D0	Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures; fire risk above average. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered.	-1.0 to -1.9
D1	Moderate Drought	Some damage to crops, pastures; fire risk high; streams, reservoirs, or wells low, some water shortages developing or imminent, voluntary water use restrictions requested.	-2.0 to -2.9
D2	Severe Drought	Crop or pasture losses likely; fire risk very high; water shortages common; water restrictions imposed.	-3.0 to -3.9
D3	Extreme Drought	Major crop/pasture losses; extreme fire danger; widespread water shortages or restrictions.	-4.0 to -4.9
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses; exceptional fire risk; shortages of water in reservoirs, streams, and wells, creating water emergencies.	-5.0 or less

² Source: National Drought Mitigation Center

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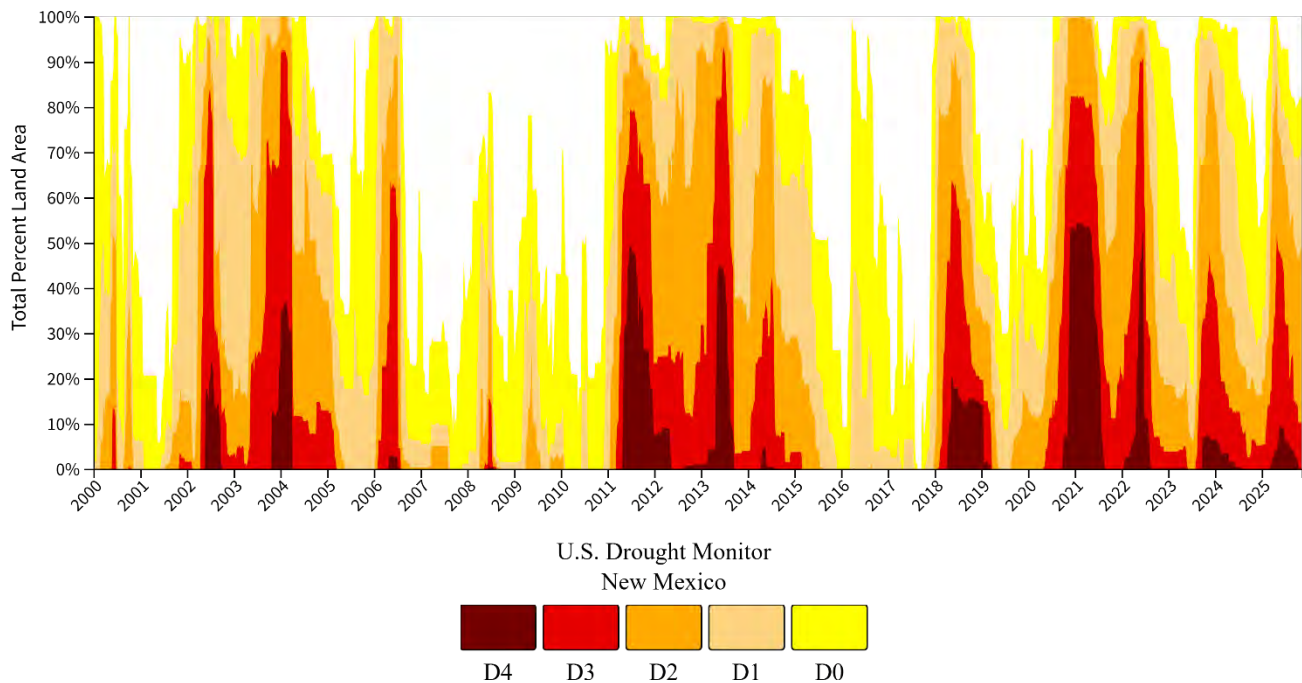
Drought is monitored nationwide by the National Drought Mitigation Center (NDMC). Indicators are used to describe broad scale drought conditions across the U.S. and correspond to the intensity of drought.

Based on the historical occurrences for drought and the location of the Sierra County planning area, the area can anticipate the full range of drought from abnormally dry to exceptional drought, or D0 to D4, based on the Palmer Drought Category. The entire planning area has experienced exceptional drought conditions. This is the highest level of drought severity and the most extreme drought conditions the planning area can anticipate in the future.

HISTORICAL OCCURRENCES

The Sierra County planning area may experience an extreme drought in any given year. According to the U.S. Drought Monitor, between January 2000 and June 2025, the Sierra County planning area spent 1,133 weeks (85%) in some level of drought as defined as Abnormally Dry (D0) or worse conditions. The longest drought during this period lasted for just over 5 years. Sierra County has received 24 USDA disaster designations for drought from 2012 through 2024.

Figure 6-2. Sierra County Drought Intensity, January 2000 – June 2025³



Historical drought conditions reported for the Sierra County planning area over the 25.5-year reporting period have resulted in no reported property or crop damages.

³ U.S. Drought Monitor

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Based on the historical drought events for the Sierra County planning area 2 unique drought periods have occurred since the 2019 Plan.

SIGNIFICANT EVENTS

December 2010 – October 2015

A lack of rain in the southwestern part of New Mexico led to significant drought impacts from December 2010 through October 2015. By July 2012, the eastern part of Sierra County was experiencing moderate (Stage D1) drought conditions but quickly moved into severe (Stage D2) drought conditions by the end of the month, following another dry month with little to no precipitation. Rain during this month was half an inch below normal rainfall. The county remained in severe (D2) drought conditions throughout the winter, however by July 2013, much of the planning area was in exceptional (Stage D4) drought conditions. After receiving some much-needed precipitation, the Sierra County planning area was downgraded to severe (D2) drought conditions. As summer approached in 2014 drought conditions began to improve, with some of the planning area receiving roughly 200 percent of the normal precipitation. During this time, most of the planning area was downgraded to moderate (D1) drought conditions. From July 2014 through October 2015, drought conditions continued to improve.

July 2020 – August 2025

With a lack of rain occurring through southern and southwestern portion of New Mexico in the summer of 2020, this led to the Sierra County planning area being placed in extreme (Stage D3) drought conditions in August 2020. By January 2021, the planning area had received enough rainfall to be downgraded to severe (Stage D2) drought conditions. From this point until August 2023, the Sierra County planning area bounced between severe (D2) and extreme (D3) drought conditions. In January 2024, much of the planning area received average to above average rainfall which helped improve drought conditions. Above normal rainfall continued throughout the spring and into the summer. In July 2024, Sierra County drought conditions improved enough to where at the end of the month they were only experiencing abnormally dry (Stage D0) drought conditions. However, drought conditions picked up in June 2025 and didn't subside until August.

PROBABILITY OF FUTURE EVENTS

According to the U.S. Drought Monitor, 14 unique drought periods (ranging from 5 weeks to about 5 years and 2 months in duration) over a 25.5-year reporting period, which provides a probability of approximately one event every year. This frequency supports a "Highly Likely" probability of future events for the Sierra County planning area.

CLIMATE CHANGE CONSIDERATIONS

According to the Fifth National Climate Assessment, climate change is threatening water resources and compromising human health and safety in the Southwestern United States region through drought. Annual rainfall in New Mexico is more likely to decrease than increase, so periods without rain are likely to become longer, increasing drought risk and severity.⁴ Warmer temperatures and less rainfall will increase the demand for water but also reduce the water supply,

⁴ Environmental Protection Agency. 2016. What Climate Change Means for New Mexico.
<https://19january2017snapshot.epa.gov/sites/production/files/2016-5-09/documents/climate-change-nm.pdf>.

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resulting in potential shortages. Increased drought risk due to climate change will also exacerbate impacts on local agriculture and increase wildfire risk.

It is projected that future changes to Sierra County will include increased temperatures, which according to the U.S. Climate Explorer, the planning area may experience a 6°F increase in average extreme heat temperatures. Historically, extreme temperatures averaged 96°F in Sierra County, but between 2035 and 2064 the average will be 102°F, increasing the severity and frequency of drought events. Some projections show an even higher increase; however, the severity will be dependent on overall future emissions and is subject to change.

VULNERABILITY AND IMPACT

Loss estimates were based on 25.5 years of statistical data from the NCEI and the U.S. Drought Monitor. A drought event frequency-impact was then developed to determine an impact profile on agriculture products and estimate potential losses due to drought in the area. All existing and future buildings, facilities, and populations are exposed to this hazard and could potentially be impacted. However, drought impacts are mostly experienced in water shortages, breaks in water lines, or crop and livestock losses on agricultural lands and typically have minimal impact on buildings.

The Sierra County Planning Team identified the following critical facilities as assets that are considered the most important to the planning area and are susceptible to a range of impacts caused by drought events. For a comprehensive list by participating jurisdiction, please see Appendix D.

Table 6-4. Critical Facilities Vulnerable to Drought Events

CRITICAL FACILITIES	POTENTIAL IMPACTS
Emergency Response Services (EOC, Fire, Police, EMS, Hospitals)	• Increased law enforcement activities may be required to enforce water restrictions. • Firefighters may have limited water resources to aid in firefighting and suppression activities, increasing risk to lives and property. • Potential for increased number of emergency calls as drought events can lead to cascading hazard events such as wildfires and flash flooding.
Airport, Academic Institutions, Community Residential Facilities, Day Care Facilities, Evacuation Centers & Shelters, Governmental Facilities	• Strain on staff as drought may cause health problems related to low water flows and poor water quality. • Water main breaks due to soil shrinking and swelling cycles could lead to facility closures. • Building foundations may crack due to soil shrinking and swelling cycles. • Operations dependent on water supply may be adversely impacted. • Economic disruptions due to cracked foundations and infrastructure damages as a result of soil shrinking and swelling cycles.

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CRITICAL FACILITIES	POTENTIAL IMPACTS
Commercial Suppliers (food, gas, etc.)	- Operations dependent on water supply may be adversely impacted. - Economic disruptions due to cracked foundations and infrastructure damages as a result of soil shrinking and swelling cycles.
Utility Services and Infrastructure (electric, water, wastewater, communications)	- Potential for increased number of emergency calls as drought events can lead to cascading hazard events such as wildfires and flash flooding. - Water main breaks due to soil shrinking and swelling cycles could lead to facility closures. - Operations dependent on water supply may be adversely impacted.

Even with the planning area relying on multiple water utility providers as well as local and private service, high demand can still deplete these resources during extreme drought conditions. As resources are depleted, potable water is in short supply and overall water quality can suffer, elevating health concerns for all residents but especially vulnerable populations – typically children, the elderly, and the ill. In addition, potable water is used for drinking, sanitation, patient care, sterilization, equipment, heating and cooling systems, and many other essential functions in medical facilities.

The average person will survive only a few days without potable water, and this timeframe can be drastically shortened for those people with more fragile health – typically children, the elderly, and people with disabilities. During summer drought, or hot and dry conditions, elderly persons, small children, infants, those with disabilities, or who do not have adequate cooling units in their homes may become more vulnerable to injury and/or death. In addition, people who speak a language other than English may face increased vulnerability due to language barriers that limit their access to important information such as weather-related warnings and instructions regarding safety measures.

The population over 65 in the Sierra County planning area is estimated at 37 percent of the total population and children under the age of 5 are estimated at 4 percent. The population with a disability is estimated at 28 percent of the total population. An estimated 25 percent of the planning area population live below the poverty level and 4 percent of the populations speak English “less than very well” (Table 6-5).

Table 6-5. Populations at Greater Risk by Participating Jurisdiction

JURISDICTION	POPULATION				
	65 AND OLDER	UNDER 5	WITH A DISABILITY	BELOW POVERTY LEVEL	LIMITED ENGLISH SPEAKING
Sierra County	4,251	420	3,253	2,866	489
City of Elephant Butte	881	32	527	159	0
City of Truth or Consequences	1,354	369	1,468	2,097	187

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JURISDICTION	POPULATION				
	65 AND OLDER	UNDER 5	WITH A DISABILITY	BELOW POVERTY LEVEL	LIMITED ENGLISH SPEAKING
Village of Williamsburg	173	19	222	131	72

The planning area is also vulnerable to food shortages when drought conditions exist, and potable water is in short supply. Potable water is used for drinking, sanitation, patient care, sterilization, equipment, heating and cooling systems, and many other essential functions in medical facilities. All residents in the Sierra County planning area could be adversely affected by drought conditions, which could limit water supplies and present health threats.

The economic impact of droughts can be significant as they produce a complex web of impacts that spans many sectors of the economy and reach well beyond the area experiencing physical drought. This complexity exists because water is integral to our ability to produce goods and provide services. If droughts extend over several years, the direct and indirect economic impact can be significant.

Sierra County has a prominent agricultural sector and features 269 farms over 1,070,677 acres of land including vegetables, melons, potatoes, sweet potatoes, cattle and calves. Sierra County's annual market value of agricultural products sold is over \$21,338,000. An estimated 32 percent of sales are from livestock and poultry products and an estimated 68 percent of sales are from crops. Most of the county's agriculture sales are cattle and calves. A lactating dairy cow will consume 30 to 50 gallons of water a day. The average adult beef cow requires approximately 12 gallons of water a day. Drought can negatively affect nutrition sources, milk production, and future yields. Dry pastures lead to lower quality hay and increased fire danger. Decreases in feed availability can lead to overgrazing. Heat stress can decrease milk production in dairy cattle. Prolonged drought periods could have devastating impacts on the agricultural industry across the planning area.

Impacts of past droughts experienced in the Sierra County planning area have not resulted in reported injuries, fatalities, property, or crop damages supporting a "Limited" severity of impact meaning injuries and illnesses are treatable with first aid, the shutdown of critical facilities and services for 24 hours or less, and less than 10 percent of property destroyed or with major damage.

ASSESSMENT OF IMPACTS

The Drought Impact Reporter was developed in 2005 by the University of Nebraska-Lincoln to provide a national database of drought impacts. Droughts can have an impact on agriculture, business and industry; energy; fire; plants and wildlife; relief, response, and restrictions; society and public health; tourism and recreation; and water supply and quality. This database defines a drought impact as an observable loss or change that occurred at a specific place and time because of drought. Reports are submitted from individuals to Federal, State, and local agencies, as well as the general public. Table 6-6 lists the drought impacts to Sierra County from January 2005 to June 2025 based on reports received by the Drought Impact Reporter.

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Table 6-6. Drought Impacts, January 2005 – June 2025

DROUGHT IMPACTS	
Agriculture	26
Business & Industry	0
Energy	0
Fire	15
Plants & Wildlife	8
Relief, Response & Restrictions	45
Society & Public Health	1
Tourism & Recreation	1
Water Supply & Quality	32

Drought has the potential to impact people in the Sierra County planning area. While it is rare that drought, in and of itself, leads to a direct risk to the health and safety of people in the U.S., severe water shortages could result in inadequate supply for human needs. Based on historical population trends, the Sierra County population is projected to increase. Future growth can cause concern for the current water infrastructure and demand for the planning area. Severe drought conditions can be frequently associated with a variety of impacts, including:

- Dry clay soils can lead to water main lines shifting and breaking. Often repair to water lines shutting off water to multiple homes at one time.
- The number of health-related low-flow issues (e.g., diminished sewage flows, increased pollution concentrations, reduced firefighting capacity, and cross-connection contamination) will increase as the drought intensifies.
- Public safety from forest/range/wildfires will increase as water availability and/or pressure decreases.
- Respiratory ailments may increase as the air quality decreases.
- There may be an increase in disease due to wildlife concentrations (e.g., rabies, Rocky Mountain spotted fever, Lyme disease).
- Residents may disagree with the County, City and Village over water use / water rights, creating conflict.
- Political conflicts may increase between municipalities, counties, states, and regions.
- Water management conflicts may arise between competing interests.
- Increased law enforcement activities may be required to enforce water restrictions.
- Severe water shortages could result in inadequate supply for human needs as well as lower quality of water for consumption.
- Firefighters may have limited water resources to aid in firefighting and suppression activities, increasing risk to lives and property.
- During drought there is an increased risk for wildfires and dust storms.

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- The community may need increased operational costs to enforce water restriction or rationing.
- Prolonged drought can lead to increases in illness and disease related to drought.
- Utility providers can see decreases in revenue as water supplies diminish.
- Utilities providers may cut back energy generation and service to their customers to prioritize critical service needs.
- Hydroelectric power generation facilities and infrastructure would have significantly diminished generation capability. Dams simply cannot produce as much electricity from low water levels as they can from high water levels.
- Fish and wildlife food and habitat will be reduced or degraded over time during a drought and disease will increase, especially for aquatic life.
- Wildlife will move to more sustainable locations creating higher concentrations of wildlife in smaller areas, increasing vulnerability, and further depleting limited natural resources.
- There are 14 federally endangered, threatened or candidate species in Sierra County. Severe and prolonged drought can result in the reduction of a species or cause the extinction of a species altogether.
- Plant life will suffer from long-term drought. Wind and erosion will also pose a threat to plant life as soil quality will decline. The urban tree canopy, including county and city parks, are vulnerable to the impacts of prolonged drought.
- Dry and dead vegetation will increase the risk of wildfire.
- Drought poses a significant risk to annual and perennial crop production and overall crop quality leading to higher food costs.
- Drought-related declines in production may lead to an increase in unemployment.
- Drought may limit livestock grazing resulting in decreased livestock weight, potential increased livestock mortality, and increased cost for feed.
- Negatively impacted water suppliers may face increased costs resulting from the transport water or developing supplemental water resources.
- Long term drought may negatively impact future economic development.

The overall extent of damage caused by periods of drought is dependent on its extent and duration. The level of preparedness and pre-event planning done by the community, local businesses, and citizens will contribute to the overall economic and financial conditions in the aftermath of a drought event.



Section 7

Earthquake



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HAZARD DESCRIPTION

An earthquake is the sudden movement of the Earth's surface caused by the release of stress accumulated within or along the edge of the Earth's tectonic plates, volcanic eruption, or by a manmade explosion. The majority of earthquakes occur along faults; however, earthquakes can occur within plate interiors. Over geologic time, plates move and plate boundaries change, pushing weakened boundary regions to the interior part of the plates. These areas of weakness within the continents can cause earthquakes in response to stresses that originate at the edges of the plate or in the deeper crust.

Earthquake locations are described by the focal depth and geographic position of the epicenter. The focal depth of an earthquake is the depth from the Earth's surface to the region where an earthquake's energy originates (the focus or hypocenter). The epicenter is the point on the Earth's surface directly above the hypocenter. Earthquakes usually occur without warning, with their effects impacting great distances away from the epicenter.

According to the U.S. Geological Society (USGS) Earthquake Hazards Program, an earthquake hazard is anything associated with an earthquake that may influence an individual's normal activities. Table 7-1 describes these various hazards associated with earthquakes.

Table 7-1. Definitions of Earthquake Hazards¹

HAZARD	DESCRIPTION
Surface Faulting	Displacement that reaches the earth's surface during slip along a fault. Commonly occurs with shallow earthquakes, those with an epicenter less than 20 kilometers.
Ground Motion (shaking)	The movement of the earth's surface from earthquakes or explosions. Ground motion or shaking is produced by waves that are generated by sudden slip on a fault or sudden pressure at the explosive source and travel through the earth and along its surface.
Landslide	A movement of surface material down a slope.
Liquefaction	A process by which water-saturated sediment temporarily loses strength and acts as a fluid, like when you wiggle your toes in the wet sand near the water at the beach. This effect can be caused by earthquake shaking.
Tectonic Deformation	A change in the original shape of a material due to stress and strain.

¹ Source: USGS, 2012

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HAZARD	DESCRIPTION
Tsunami	A sea wave of local or distant origin that results from large-scale seafloor displacements associated with large earthquakes, major submarine slides, or exploding volcanic islands.
Seiche	The sloshing of a closed body of water from earthquake shaking.

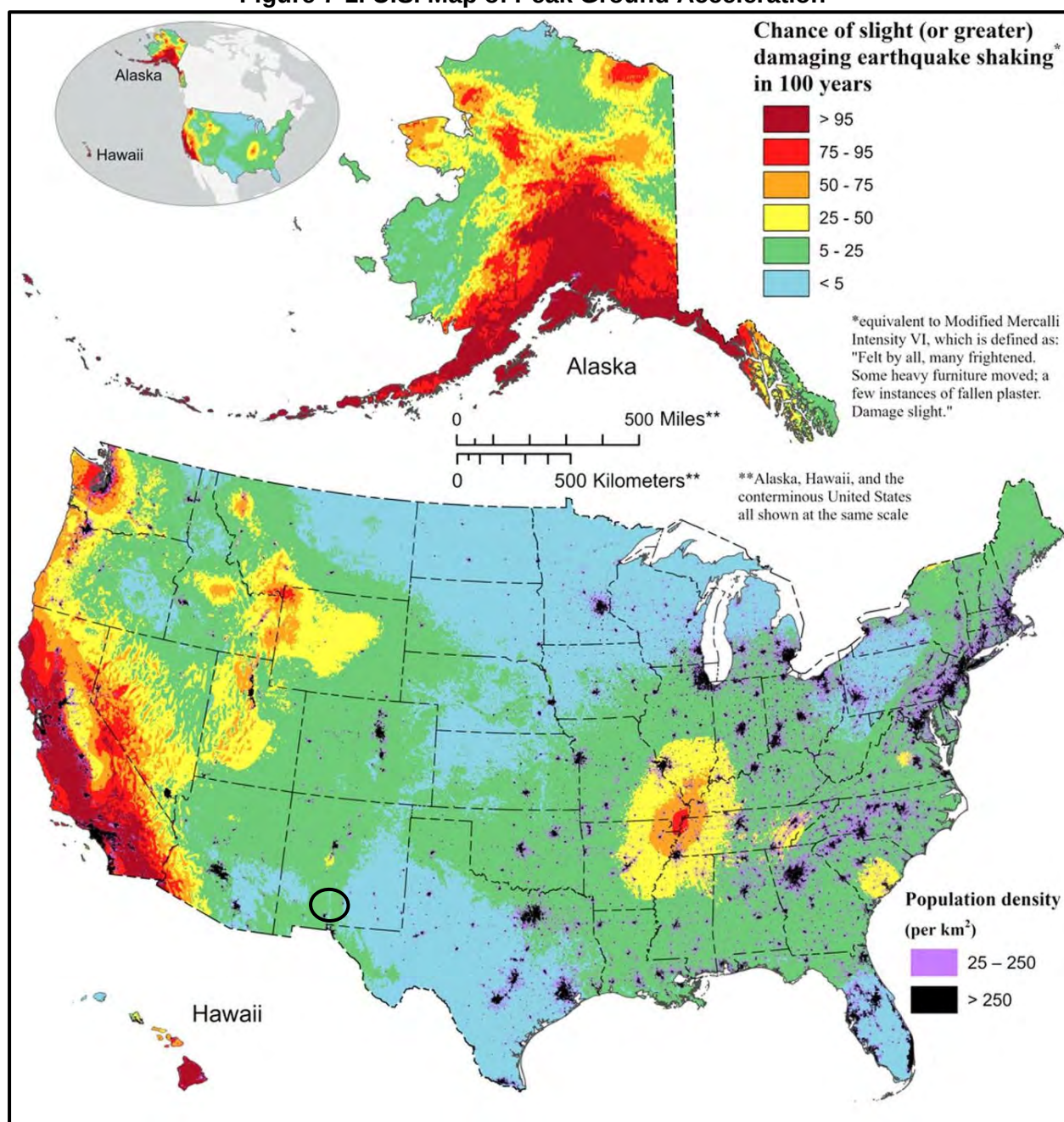
LOCATION

Earthquake hazard areas are mapped by the USGS's National Seismic Hazard Model (NSHM). Figure 7-1 shows the most recent 2023 iteration of this USGS model. The NSHM defines the potential for earthquake ground shaking for various probability levels across the United States. The 2023 NSHM is an update to the previous 2018 version, and compiles data and findings from a number of sources including earthquake catalogs, geodetic- and geologic-based fault and deformation models, and ground motion models (GMMs), among others.² The map shows the percent chance that a given area will experience a category VI (or stronger) earthquake in 100 years, as defined by the Modified Mercalli Intensity (MMI) Scale (Table 7-3). The likelihood of a significant earthquake event is signified by the color-coding on the map. Densely populated areas are also highlighted on the map (purple and black dotting) to indicate areas of elevated vulnerability in relation to higher seismic risk. The Sierra County planning area, as identified in Figure 7-1, is located in a moderately low hazard area, with between a 5 and 25 percent chance of experiencing a strong earthquake every 100 years.

² A comprehensive overview of the modelling process can be found at the USGS website, <https://www.usgs.gov/programs/earthquake-hazards/science/2023-50-state-long-term-national-seismic-hazard-model-0#overview>

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Figure 7-1. U.S. Map of Peak Ground Acceleration³



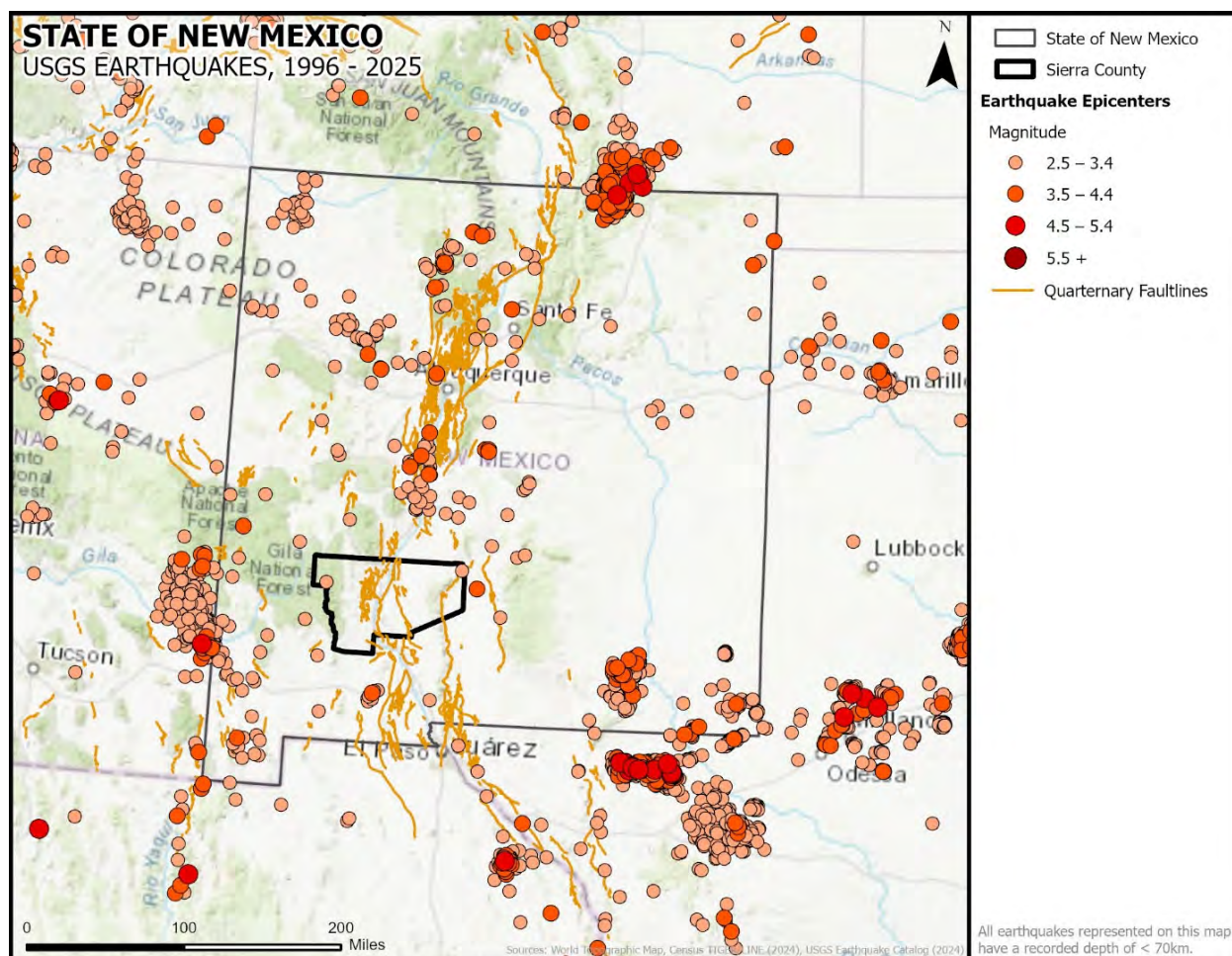
Figures 7-2 and 7-3 show historic earthquake events across New Mexico and Sierra County between 1996 and 2025, per data available in the USGS Earthquake Catalog database.⁴

³ Sierra County is indicated by the black circle.

⁴ Source: <https://www.usgs.gov/programs/earthquake-hazards>. Event data reported from 1950 through 2025.

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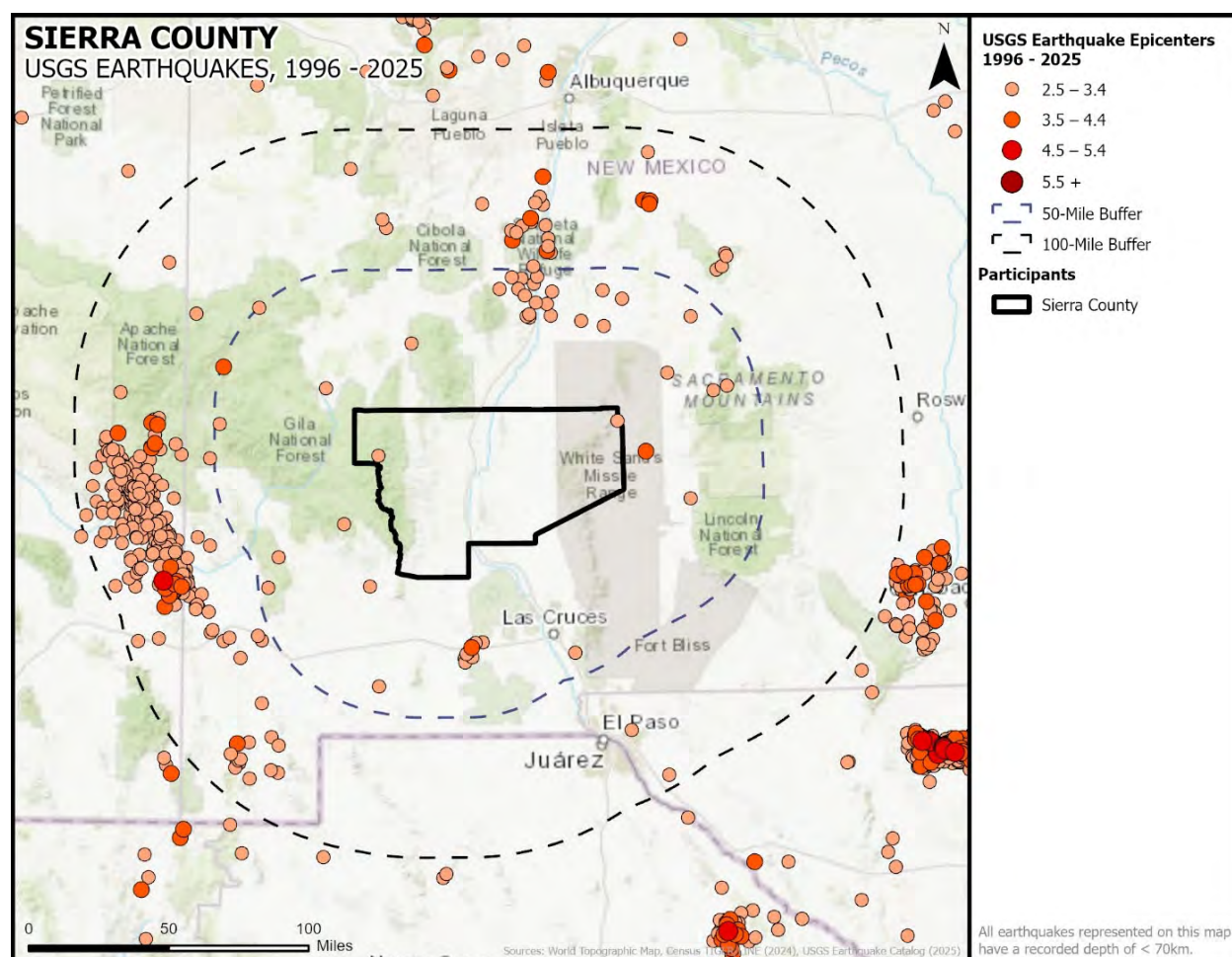
Figure 7-2. Historic Earthquake Epicenters, New Mexico, 1996-2025⁵



⁵ Sierra County planning area is indicated by the black polygon.

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Figure 7-3. Historic Earthquake Epicenters, Sierra County, 1996-2025



It is important to note that according to the New Mexico Bureau of Geology and Mineral Resources, an increase in earthquakes has been observed over the past several years in some parts of the State of New Mexico that did not experience much seismic activity in the past. This is believed to be due to human activity such as hydraulic fracturing (fracking), wastewater disposal, as well as explosions from mining. Sierra County is located within the active Rio Grande Rift. The Rio Grande Rift runs from Leadville Colorado to El Paso, Texas.⁶ The County is also located in the Palomas-San Marcial Basin system. The Palomas Basin contains the City of Truth or Consequences and has up to 7,000 feet of basin fill along its deep eastern edge. The Hot Springs fault system runs along the western edge of the Fra Cristobal Mountains and is associated with the geothermal activity found in the City of Truth or Consequences. The Cuchillo Fault zone is found in the central part of the Engle Basin; this zone consists of a series of aligned sub-basins. The Cuchillo Negro fault zone specifically lies between the Black Range and the Sierra Cuchillo. The Caballo Fault is located just south of the City of Truth or Consequences. This fault is a part of the larger rift system and has a history of quaternary movement.⁷

⁶ Source: <https://www.dunnhydrogeo.com/home/rio-grande-rift-geothermal-nt>

⁷ Source: https://earthquake.usgs.gov/cfusion/qfault/show_report_AB_archive.cfm?fault_id=2100§ion_id=

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EXTENT

Earthquakes are measured in terms of magnitude and intensity. The prevalent magnitude measurement in use today is based on the Moment Magnitude Scale (MMS). MMS measures the movement of rock along the fault. It accurately measures larger earthquakes, which can last for minutes, affect a much larger area, and cause more damage. Magnitudes are based on a logarithmic scale (base 10), meaning that for each whole number you go up on the magnitude scale, the amplitude of the ground motion recorded by a seismograph goes up ten times. Using this scale, a magnitude 5 earthquake would result in ten times the level of ground shaking as a magnitude 4 earthquake (and about 32 times as much energy would be released).⁸ The USGS reports earthquake magnitudes above 4.0 as “moment magnitude,” often described in the press as “Richter” magnitude. Table 7-2 shows the magnitude levels for the current Richter / Moment Magnitude scale.

Table 7-2. Richter / Moment Magnitude Scale⁹

MAGNITUDE	CATEGORY	DESCRIPTION OF EFFECTS	EVENTS PER YEAR
< 3.0	Micro	Usually not felt, but can be recorded by seismograph	+100,000
3.0 – 3.9	Minor	Often felt, but causes no damage	12,000 - 100,000
4.0 – 4.9	Light	Felt by all, minor breakage of objects	2,000 - 12,000
5.0 – 5.9	Moderate	Some damage to weak structures	200 – 2,000
6.0 – 6.9	Strong	Moderate damage in populated areas	20 – 200
7.0 – 7.9	Major	Serious damage over large areas with loss of life expected	3 – 20
> 7.9	Great	Severe destruction and loss of life over large areas	Less than 3

Earthquake Intensity measurement is an on-the-ground description. The measurement qualitatively explains the severity of earthquake shaking and its effects on people and their environment. Intensity measurements will differ depending on each location's proximity to the epicenter or point on the surface of the earth directly above the focus where the earthquake started. The intensity scale consists of a series of certain key responses such as people awakening, movement of furniture, damage to chimneys, and total destruction. There can be multiple intensity measurements associated with an earthquake as opposed to one magnitude measurement.¹⁰ The Modified Mercalli Intensity value assigned to a specific site after an earthquake has a more meaningful measure of severity to the nonscientist than the magnitude because intensity refers to the effects actually experienced at a specific location. The scale

⁸ (n.d.). How Do We Measure Earthquake Magnitude? Michigan Tech.

<https://www.mtu.edu/geo/community/seismology/learn/earthquake-measure/#:~:text=The%20moment%20magnitude%20scale%20is,the%20earthquake%20at%20multiple%20stations.>

⁹ (n.d.). Earthquakes. Britannica. <https://www.britannica.com/science/earthquake-geology>

¹⁰ Wood, H. O., and Neumann, Frank (1931). Modified Mercalli Intensity Scale of 1931: Seismological Society of America Bulletin, v. 21, no. 4, p. 277-283.

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provides the intensity of the earthquake in values ranging from I to X. Table 7-3 describes the typical effects and Intensities associated with earthquakes of various magnitudes. The intensity and effects depend on multiple factors (earthquake depth, epicenter location, site geology, population density, to name a few) and can vary widely.

Table 7-3. Magnitude and Modified Mercalli Intensity (MMI) Scale¹¹

INTENSITY	CATEGORY	DESCRIPTION OF EFFECTS	CORRESPONDING RICHTER MAGNITUDE
I	Not Felt	Not felt except by a very few under especially favorable conditions	< 2.0
I	Not Felt	Felt only by a few persons at rest, especially on upper floors of buildings.	2.0 – 2.9
II – III	Weak	Felt quite noticeably by persons indoors, with shaking of indoor objects. Rarely causes damages.	3.0 – 3.9
IV – V	Light to Moderate	Noticeable shaking of indoor objects and rattling noises. Felt by most people in the affected area. Generally, no to minimal damage	4.0 – 4.9
VI – VII	Strong to Very Strong	Significant damages to poorly constructed buildings. Limited to moderate damages to well-built structures.	5.0 – 5.9
VIII – IX	Severe to Violent	Damage slight in specially designed structures; considerable damage in ordinary buildings with partial collapse. Damage great in poorly built structures.	6.0 – 6.9
VIII +	Severe to Extreme	Damage considerable in specially designed structures. Damage substantial to most buildings, with partial or complete collapse. Felt across great distances with major damage mostly limited to 250 km from Epicenter.	7.0 – 7.9
VIII – IX	Severe to Violent	Major damage to buildings, structures likely to be destroyed; will cause moderate to heavy damage to sturdy or earthquake-resistant buildings; damaging in large areas; felt in extremely large regions.	8.0 – 8.9

¹¹ Source: USGS

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INTENSITY	CATEGORY	DESCRIPTION OF EFFECTS	CORRESPONDING RICHTER MAGNITUDE
VIII +	Severe to Extreme	At or near total destruction. Severe damage or collapse to all buildings; heavy damage and shaking extends to distant locations and permanent changes in ground topography.	9.0+

Taking into consideration the possible extent of an earthquake for the area, by reviewing Tables 7-2 and 7-3 in conjunction with no significant previous occurrences, as depicted in Figures 7-2 and 7-3, the Sierra County planning area experiences on average less than 3.0 magnitude or Levels II-III (weak impact) on the Modified Mercalli intensity scale. The strongest earthquake within a 100-mile radius of the planning area was a 5.3 magnitude earthquake which occurred on June 29, 2014, in Franklin, Arizona, approximately 177 miles west of Sierra County. The most significant historical event in the planning area was a 2.8 magnitude earthquake on January 3, 2025, as reported by the USGS. This is assumed to be the greatest extent the planning area can anticipate in the future, based on historic records.

Although previous earthquake events occurring in the planning area have been categorized as weak to moderate, the planning area's proximity to geologic features, including rifts and fault zones, increases the possibility of future significant events. The Rio Grande Rift runs from Leadville Colorado to El Paso, Texas, with Sierra County located in the middle of the rift.¹² Earthquakes have been felt in the area since the 1800s and the location of the County within the Rio Grande Rift increases the possibility of future significant events. While the probability that an earthquake would occur in this region is moderate, the impact could potentially be severe (Level VIII or greater on the Modified Mercalli scale) if a quake did occur.¹³

HISTORICAL OCCURRENCES

According to USGS, and the National Geophysical Data Center (NGDC), there are no "significant" earthquakes on record for the State of New Mexico and the entire Sierra County planning area from 2150 B.C. to present. A significant earthquake, as defined by NGDC, is one that has caused at least moderate damage (approximately \$1 million or more), has resulted in 10 or more deaths, has registered as a magnitude 7.5 or greater, has registered as Modified Mercalli Intensity (MMI) Scale X or greater, or generated a tsunami. None of these criteria have been met by any seismic activity known to have impacted the planning area.

Although significant earthquakes are not known to have impacted the Sierra County planning area, less severe earthquake activity has occurred. Additionally, moderate to severe earthquakes have occurred in the region historically, although these were not known to have impacted the planning area. According to the New Mexico Bureau of Geology and Mineral Resources, two of the largest historic earthquakes in New Mexico, estimated at magnitudes of 5.76 and 6.18,

¹² Source: <https://www.dunnhydrogeo.com/home/rio-grande-rift-geothermal-nt>

¹³ Source: <https://geoinfo.nmt.edu/hazards/earthquakes/home.html#:~:text=Two%20of%20the%20largest%20historic,northeastern%20Sonora%2C%20Mexico%20in%201887>

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occurred near Socorro in 1906. Regionally, the largest earthquake was in Sonora, Mexico in 1887, which registered as a 7.5 magnitude earthquake that was felt as far away as Albuquerque and Santa Fe.¹⁴ Table 7-5 includes a summary of historical earthquake events that have occurred in Sierra County, including all participating jurisdictions, as well as those within a 100-mile radius of the county.

The USGS also has a database that tracks all earthquakes with a magnitude 2.5 or greater across the United States. According to the database, there were two earthquakes reported within the planning area between 1996 and 2025 (Table 7-4). Of these, the strongest recorded event was a magnitude 2.8 earthquake, considered a Level I (not felt). During that same period, 46 earthquakes occurred within a 50-mile radius of the planning area and 690 earthquakes occurred within a 100-mile radius. The maximum magnitude recorded for earthquakes within the 50-mile radius was magnitude 3.9, considered a Level I (weak) earthquake. In the 100-mile radius, the greatest recorded magnitude was 5.3, considered a Level VI-VII (strong to very strong) earthquake.

Another aspect of earthquakes tracked by the USGS is the depth at which they occur. Shallow earthquakes tend to be more damaging and cause more intense shaking than deeper earthquakes, however deep earthquakes are more likely to be felt over a wider area. All recorded earthquakes in or near the Sierra County planning area have originated at depths categorized as shallow (1-70 km) or very shallow (<1 km).

While it is possible for the planning area to feel stronger earthquakes that occur inside county boundaries, or within the 100-mile area around the planning area, at this time, there are no known damages associated with these events for the Sierra County planning area. Table 7-5 summarizes historical earthquake events that have occurred inside or near the planning area.

Table 7-4. Historic Earthquakes in Sierra County, 1996 – 2025¹⁵

JURISDICTION	DATE	EXTENT	DEPTH (km)	INJURIES & FATALITIES	PROPERTY & CROP DAMAGE
Sierra County	1/3/2025	2.8	10	0	\$0
Sierra County	1/11/1999	2.5	0	0	\$0

¹⁴ Source:

<https://geoinfo.nmt.edu/hazards/earthquakes/home.html#:~:text=Two%20of%20the%20largest%20historic,northeastern%20Sonora%2C%20Mexico%20in%201887.>

¹⁵ USGS, only earthquakes to occur inside the Sierra County planning area are listed.

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Table 7-5. Historical Earthquake Event Summary, 1996-2025¹⁶

JURISDICTION	NUMBER OF EVENTS	MAXIMUM EXTENT	DEPTH RANGE	INJURIES & FATALITIES	PROPERTY & CROP DAMAGE
Sierra County	2	2.8	10	0	0
50-Mile Radius	46	3.9	0-13.01	0	0
100-Mile Radius	690	5.3	0-19.76	0	0

PROBABILITY OF FUTURE EVENTS

Earthquake Hazard Maps show the distribution of earthquake shaking levels that have a certain probability of occurring over a given period. According to the USGS, the entire Sierra County planning area has between a 5 and 25 percent chance of a slightly damaging (or greater) earthquake within 100 years. With two events in the county over a 29.5-year reporting period, the probability of an earthquake affecting the planning area, including participating jurisdictions, is considered “Unlikely”, meaning an event is probable in the next ten years.

CLIMATE CHANGE CONSIDERATIONS

Damaging earthquakes are rare within the State of New Mexico, including the Sierra County planning area. Changing conditions of weather patterns and climate change has not been established as having a direct impact on earthquake intensity or frequency.

According to the USGS, statistically there is an approximately equal distribution of earthquakes in all cold weather, hot weather, rainy weather, etc. Very large low-pressure changes associated with major storm systems, like typhoons and hurricanes, are known to trigger episodes of fault slip or slow earthquakes in the Earth’s crust and may also play a role in triggering some damaging earthquakes. However, the numbers are small and are not statistically significant.¹⁷ Climate change is assumed to have no impact on the probability or intensity of potential earthquakes in the planning area.

VULNERABILITY AND IMPACT

Little warning is usually associated with earthquakes and can impact areas a great distance away from the epicenter. The amount of damage depends on the density of population and buildings, and infrastructure construction in the affected area. Some places may be more vulnerable than others based on soil type, building age, and building codes in the Sierra County planning area.

Earthquakes often exhibit signs that when detected, allow forewarning. While all citizens are at risk of the impacts of an earthquake, forced relocation and disaster recovery disproportionately impacts low-income residents who lack the financial means to evacuate, afford a long-term stay away from home, and to rebuild or repair their homes. The elderly, children, and people with a disability may have trouble evacuating due to mobility issues or a lack of awareness, making them

¹⁶ NOAA, NCEI Storm Events Database

¹⁷ (n.d.). *Natural Hazards*. United States Geological Survey. <https://www.usgs.gov/faqs/there-earthquake-weather>

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more susceptible to injury or harm. In addition, people who speak a language other than English may face increased vulnerability due to language barriers that limit their access to important information such as warnings, evacuation routes and instructions regarding safety measures. The population over 65 in the Sierra County planning area is estimated at 37 percent of the total population and children under the age of 5 are estimated at 4 percent. The population with a disability is estimated at 28 percent of the total population. An estimated 25 percent of the planning area population live below the poverty level and 4 percent of the populations speaks a language other than English (Table 7-6).

Table 7-6. Populations at Greater Risk by Participating Jurisdiction¹⁸

JURISDICTION	POPULATION				
	65 AND OLDER	UNDER 5	WITH A DISABILITY	BELOW POVERTY LEVEL	LIMITED ENGLISH SPEAKING
Sierra County	4,251	420	3,253	2,866	489
City of Elephant Butte	881	32	527	159	0
City of Truth or Consequences	1,354	369	1,468	2,097	187
Village of Williamsburg	173	19	222	131	72

The Sierra County Planning Team identified the following critical facilities as assets that are considered the most important to the planning area and are susceptible to a range of impacts caused by earthquake events. For a comprehensive list of critical facilities by jurisdiction, see Appendix D.

Table 7-7. Critical Facilities Vulnerable to an Earthquake

CRITICAL FACILITIES	POTENTIAL IMPACTS
Emergency Response Services (EOC, Fire, Police, EMS), Hospitals and Medical Centers	- Emergency operations and services may be significantly impacted due to power outages, damaged facilities, fires and/or loss of communications. Impact can impede emergency response vehicle access to areas. - Power outages could disrupt communications, delaying emergency response times.

¹⁸ U.S. Census Bureau 2023 data for Sierra County.

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CRITICAL FACILITIES	POTENTIAL IMPACTS
Airport, Academic Institutions, Animal Shelter, Evacuation Centers & Shelters, Governmental Facilities, Residential/ Assisted Living Facilities	• Power outages could disrupt critical care. • Backup power sources could be damaged. • Evacuations may be necessary due to extended power outages or other associated damages to facilities. • Economic disruption due to power outages negatively impact airport services as well as area businesses reliant on airport operations.
Commercial Supplier (food, fuel, etc.)	• Facilities, infrastructure, or critical equipment including communications may be damaged, destroyed or otherwise inoperable. • Essential supplies like medicines, water, food, and equipment deliveries may be delayed.
Utility Services and Infrastructure (electric, water, wastewater, communications)	• Emergency operations and critical services may be significantly impacted due to power outages, damaged facilities, and/or loss of communications. Impact can impede emergency service vehicle access to areas. • Power outages could disrupt communications, delaying emergency response times further straining the capacity and resources of emergency service personnel.

While generally mild earthquake events have occurred in the Sierra County planning area, no known damages, injuries or fatalities have been recorded for these events. Based on historical events the potential severity of impact would be considered “Limited”, with critical facilities shutdown for 24 hours or less, injuries or illness treatable with first aid and less than ten percent of structures destroyed or with major damage within the Sierra County planning area, including participating jurisdictions. Sierra County’s proximity to a large number of geologically young faults elevates the potential for a significant earthquake event in the future.



Section 8

Expansive Soils

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HAZARD DESCRIPTION

Expansive soils are soils and soft rocks with a relatively high percentage of clay minerals that are subject to changes in volume as they swell and shrink with changing moisture conditions. Expansive soils contain minerals such as smectite clays that are capable of absorbing water. When these clays absorb water, they increase in volume and expand. The change in soil volume and resulting expansion can exert enough force on a building or other structure to cause damage.



Expansive soils will also lose volume and shrink when they dry. Drought conditions can cause soils to contract in response to a loss of soil moisture. A reduction in soil volume can affect the support to buildings or other structures and result in damage. Fissures in the soil can also develop and facilitate the deep penetration of water when moist conditions or runoff occurs. This produces a cycle of shrinkage and swelling that place repetitive stress on structures. The effect of expansive soil is most prevalent in regions prone to prolonged periods of drought followed by periods of moderate to high precipitation.

LOCATION

Expansive soils are found throughout the United States, with the highest concentrations being in Texas, Colorado, Virginia, North Dakota, Oklahoma, and Montana. Some of the most expansive soils, known locally as adobe or clay, are found in New Mexico. In the Sierra County planning area, the problems associated with expansive soil typically occur during drought periods. Expansive soils (such as bentonite, smectite, or other reactive clays) expand when the soil particles attract water and can shrink when the clay dries.

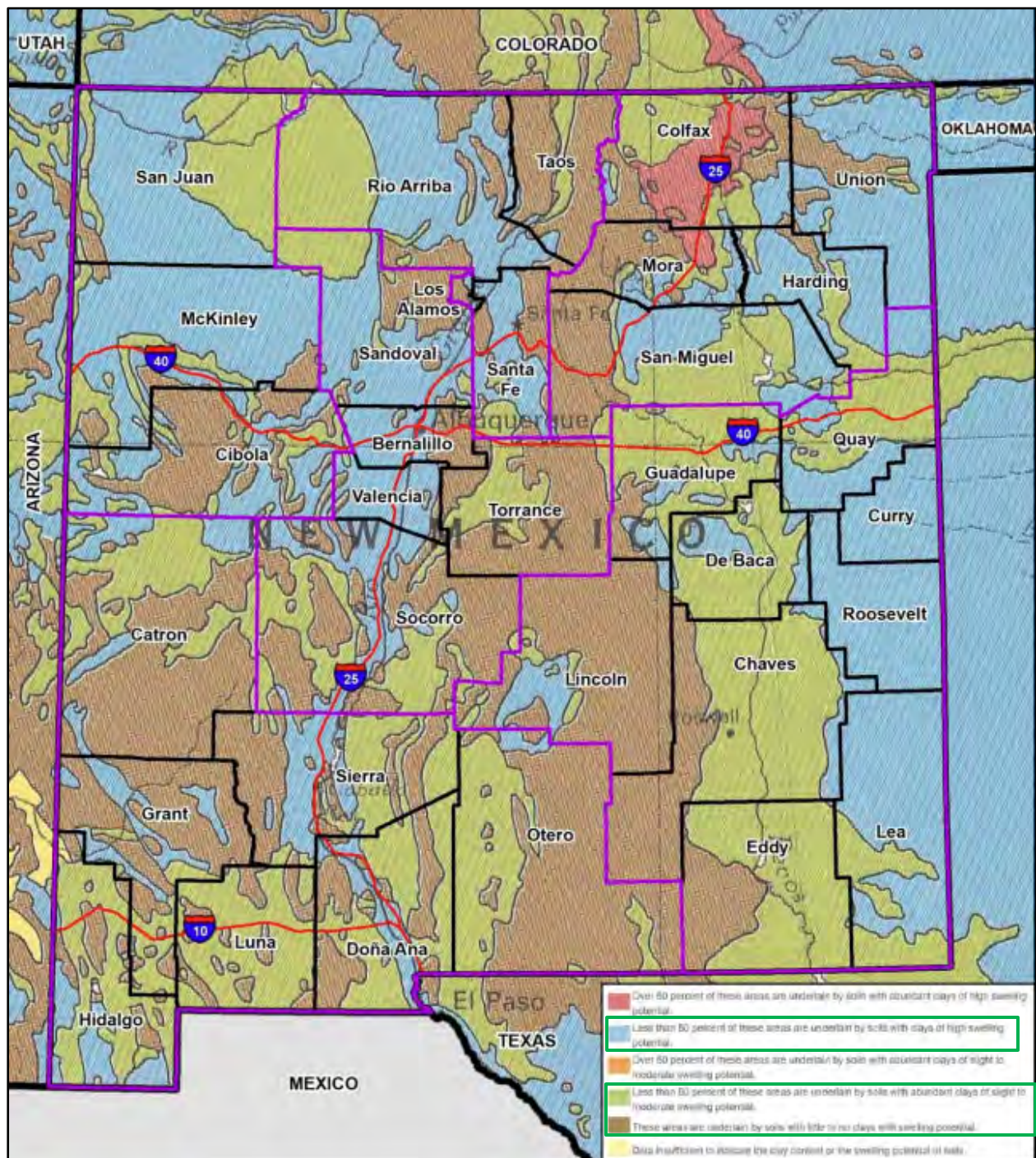
New Mexico's soils are quite varied, ranging from almost pure sand to heavy clay. According to the New Mexico Bureau of Geology and Mineral Resources, the landscape of New Mexico can be divided into six distinct provinces: Basin and Range, Colorado Plateau, Mogollon-Datil Volcanic Field, Rio Grande Rift, Southern High Plains, and Southern Rocky Mountains. Sierra County falls within the Basin and Range. This region is one of New Mexico's most abundant areas of clay and is considered to have high swelling potential.

Figure 8-1 shows areas of expansive soil in Sierra County. A great majority of the planning area is underlain by soils that consist of less than 50 percent clay with slight to moderate swelling potential, indicated in green. The central portion of the county is underlain by soils that consist of

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less than 50 percent clay with high swelling potential, indicated in blue. The western portion of the county falls within the limited-risk area, indicated in brown.

Figure 8-1. Location of Expansive Soils in Sierra County¹



¹ 2023 New Mexico State Hazard Mitigation Plan

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EXTENT

Expansive soils risk is measured by the degree to which soils may shrink or swell. Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent, moderate if 3 to 6 percent, high if 6 to 9 percent, and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures.²

Table 8-1. NRCS Soil Linear Extensibility Risk Categories

POTENTIAL CATEGORY	LINEAR EXTENSIBILITY %	CLAY %
Low	< 3%	< 25%
Moderate	3% - 6%	25% - 35%
High	6% - 9%	35% - 45%
Very High	> 9%	> 45%

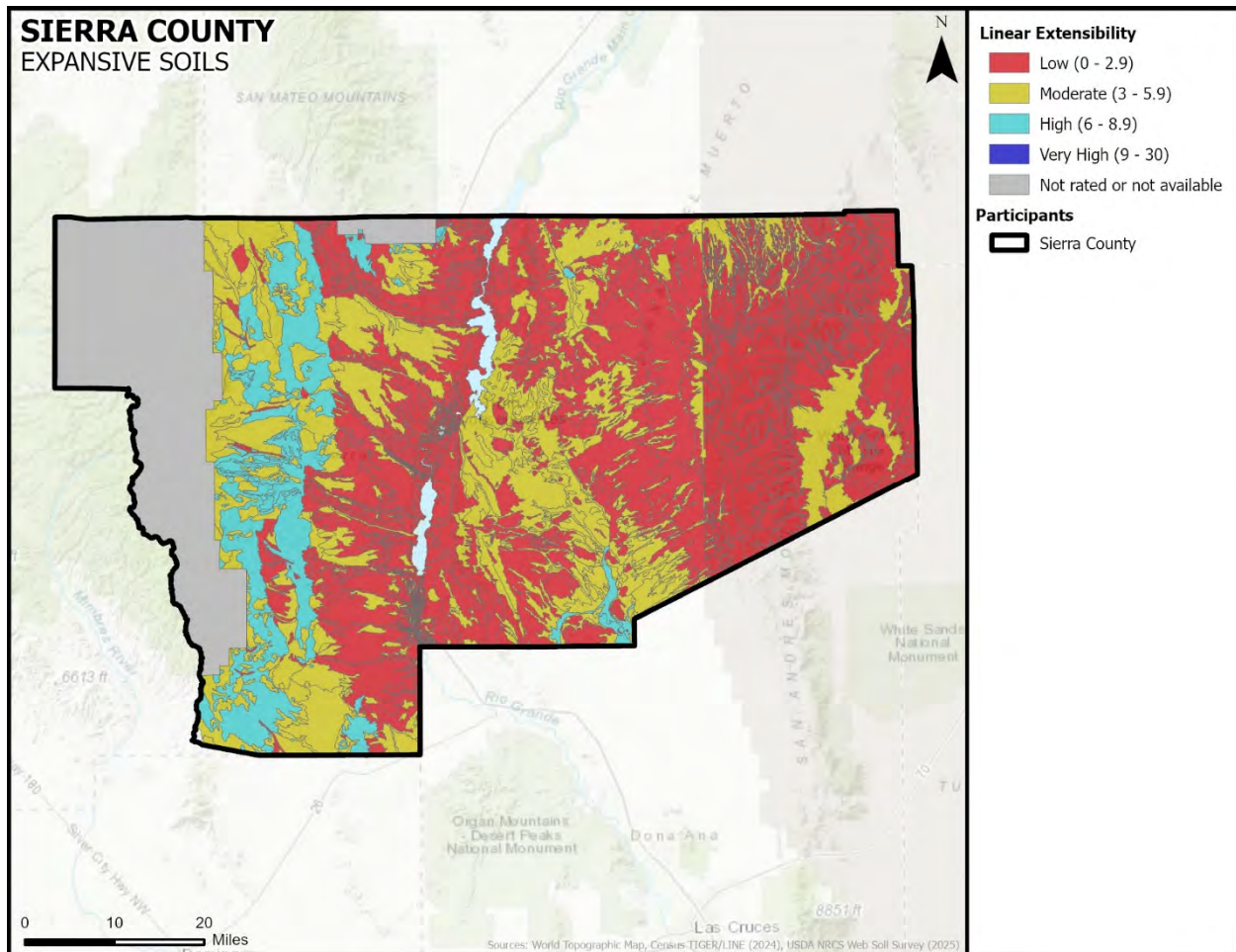
The Soil Survey was developed by the USDA Soils Conservation Service and contains information that can be applied in determining the suitability of soils in the planning area when selecting sites for roads, structures, and infrastructure. Based on Soil Survey data, roughly 42.9 percent of the Sierra County planning area is subject to the low (<3%) linear extensibility category (Table 8-1). The next most common linear extensibility category is moderate (3-6%) found in 24.4 percent of the planning area, followed by roughly 19.7 percent subject to high (6-9%) linear extensibility. The remaining 13 percent of the planning area consists of water, quarries, or sand and gravel pits which do not receive a linear extensibility rating.³ Figure 8-2 below illustrates the spatial distribution of linear extensibility across the Sierra County planning area, highlighting the areas where expansive soils are most likely to occur.

² (2009). *Soil Reports*. Natural Resources Conservation Service.
https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs141p2_016186.pdf

³ Source: <https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>

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Figure 8-2. Sierra County Soil Linear Extensibility Map



HISTORICAL OCCURRENCES

Expansive soil is a condition that is native to New Mexico soil characteristics and cannot be documented as a time-specific event, except when it leads to structural and infrastructure damage. Extreme conditions can damage roads, structures, and infrastructure, including projects still under construction. Damages from expansive soils are typically associated with droughts. Previous occurrences for expansive soils can be correlated with previous occurrences of drought, the impacts of which are typically negligible. The Sierra County planning area has no known recorded events of damaging expansive soils.

PROBABILITY OF FUTURE EVENTS

New Mexico's state building codes follow the requirements laid out by the International Building Code of 2021 (IBC 2021) for geotechnical investigations when building new structures (found in Section 1803 of IBC 2021). These requirements include investigating soil classification, soil strength, adequacy of load-bearing soils, the effect of moisture variation, and other soil attributes

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which may affect structures. In areas likely to have expansive soil, soil tests are required to determine where such soils exist.⁴

As noted above and shown in Figure 8-2, the Sierra County planning area is subject to the full range of linear extensibility with the majority of the planning area falling into the low category (42.9%). With the state regulations in place, new structures are generally protected from the impacts of expansive soils. These measures significantly reduce the probability of expansive soil impacts on newer and future development. It is unlikely that newer development will experience expansive soil impacts. However, for development that predates the soil testing requirements, impacts from expansive soils such as problems with foundations, roadways, and sidewalks in high risk areas are “Likely”, with impacts probable in the next three years, especially during times of drought.

CLIMATE CHANGE CONSIDERATIONS

Expansive soils are directly connected to drought and flood conditions as they literally swell and shrink with changing moisture conditions. Impacts of climate change on drought and flood events indicate similar changes to expansive soil frequency and impacts. Refer to Probability of Future Events section in Section 6 (Drought) and Section 11 (Flood) for more information on those hazards.

VULNERABILITY AND IMPACT

The effects of expansive soils are most prevalent when periods of moderate to high precipitation are followed by drought and then again by periods of rainfall. Other cases of damage result from increases in moisture volume from such sources as broken or leaking water and sewer lines. Dry clays are capable of absorbing water and will increase in volume in an amount proportional to the amount of water absorbed. Soils capable of changes in volume present a hazard to structures built over them and to the pipelines buried in them. Houses and one-story commercial buildings are more apt to be damaged by the expansion of swelling clays than are multi-story buildings, which are usually heavy enough to counter swelling pressures. However, if constructed on wet clay, multi-story buildings may also be damaged by clay shrinkage when moisture levels are substantially reduced.



Cracked foundations and floors, jammed windows and doors, and ruptured pipelines are typical types of damage resulting from swelling soils. Damage to the upper floors of larger buildings can occur when motion in the structure is significant. While all infrastructure within the planning area is minimally vulnerable, slab on grade structures are more likely to suffer damages from expansive soils. In addition, older structures built to less stringent building codes may also be more susceptible to damage than new construction.

⁴ 2021 New Mexico Building Codes; <https://www.rld.nm.gov/construction-industries/rules-laws-and-building-codes/>

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While the number of slab on grade structures is not available, the U.S. Census data indicates approximately 3,703 of the housing units (45 percent of all housing units) in the planning area were built before 1980 and may be more susceptible to damages.

Table 8-2. Residential Structures at Greater Risk

JURISDICTION	STRUCTURES
	SFR BUILT BEFORE 1980
Sierra County	3,703
City of Elephant Butte	261
City of Truth or Consequences	2,130
Village of Williamsburg	170

The Sierra County Planning Team identified the following critical facilities (Table 8-3) as assets that are considered the most important to the planning area and are susceptible to a range of impacts caused by expansive soils. For a comprehensive list by participating jurisdiction, please see Appendix D.

Table 8-3. Critical Facilities Vulnerable to Expansive Soils

CRITICAL FACILITIES	POTENTIAL IMPACTS
Emergency Response Services (EOC, Fire, Police, EMS), Hospitals and Medical Centers	• Uneven settling and shifting cause cracks in building foundations impacting the integrity of critical facility structures and lead to doors being unable to open or close properly. • Damages and cracks in streets and highway infrastructure may lead to emergency vehicles being unable to access areas increasing the need for emergency operations. • Ruptured water pipes can lead to loss of function or water pressure impacting drinking water availability and firefighting capabilities.
Airport, Academic Institutions, Animal Shelter, Evacuation Centers & Shelters, Governmental Facilities, Residential/ Assisted Living Facilities	• Uneven settling and shifting cause cracks in building foundations impacting the integrity of critical facility structures and lead to doors being unable to open or close properly. • Damages and cracks in streets and highway infrastructure may lead to emergency vehicles being unable to access areas increasing the need for emergency operations.
Commercial Supplier (food, fuel, etc.)	• Essential supplies like medicines, water, food, and equipment deliveries may be delayed.

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CRITICAL FACILITIES	POTENTIAL IMPACTS
Utility Services and Infrastructure (electric, water, wastewater, communications)	• Wastewater and drinking water facilities and infrastructure may be damaged or destroyed resulting in services disruption or outage for multiple days or weeks. • Disruptions and outages impact public welfare as safe drinking water is critical. • A break in essential and effective wastewater collection and treatment is a health concern, potentially spreading disease. • Exposure to untreated wastewater is harmful to people and the environment.

ASSESSMENT OF IMPACTS

Expansive soils are generally influenced by how wet or dry reactive clay types of soils become. The climate of an area, and more specifically the seasonal precipitation-drought cycle associated with arid or semi-arid regions, influences the occurrence and severity of these hazards. Problems associated with expansive soils in Sierra County typically occur during extended periods of drought.

Expansive soils present a hazard to lightweight buildings and other infrastructure. Uneven settling and shifting in such structures may occur, causing cracks in foundations, walls, streets, driveways, and sidewalks; ruptured pipes; and windows and doors that do not open and close properly. Special provisions are necessary in the construction of footings and slabs resting on expansive soils to minimize damages due to the expansiveness. Homeowners and public agencies that assume they cannot afford preventative measures such as more costly foundations and floor systems, often incur the largest percentage of damage and costly repairs from expanding soil. No figures are available for the total damage to homes in the planning area from expansive clays. The greatest damage occurs when structures are constructed when clays are dry (such as during a drought) and then subsequent soaking rains swell the clay.

Infrastructure such as pipelines can be damaged, causing increased maintenance and repairs, replacement, or damage to the point of failure. Sewer and water lines are also affected by shrinking and swelling soils. The movement of the soil can snap water and sewer lines. Field monitoring and testing should be conducted on a regular basis, especially during extended drought periods, to avoid loss of function or water pressure, which could impact drinking water and firefighting capabilities. In addition, highways and other critical egress routes (such as Interstate 25, State Highway 152, State Highway 197, State Highway 179, State Highway 27, and State Highway 195) can be affected by expansive soils, causing possible closures during costly repair work.

Unlike many other environmental hazards, the effects of expansive soil are deceptive in that they are not revealed suddenly or caused by a single event but rather become increasingly evident and destructive over time. As such, the vast majority of expansive soil impacts are relatively benign in terms of emergency management and emergency response. Similarly, the impacts to humans is considered negligible, as the slow moving nature of expansive soils has no direct link to injuries or illnesses but instead impacts.

Expansive soil can directly impact infrastructure and, as a result, indirectly create impacts on residents. The impact of climate change could produce more severe expansive soils events,

SECTION 8: EXPANSIVE SOILS

exacerbating the current expansive soils impacts. The following are a summary of impacts frequently associated with expansive soils:

- Expansive soils are influenced by the seasonal precipitation-drought cycle. Most impacts on Sierra County typically occur during extended periods of drought.
- Changes in soil moisture content can affect the stability of slopes, leading to movement or failure.
- The cyclical nature of soil expansion and contraction due to weather patterns means that repairs may be an ongoing necessity if the underlying soil is not properly treated or considered during construction. Heaving, cracking, and an uneven surface on roads, driveways, sidewalks, and parking lots create pedestrian and traffic hazards and increase maintenance costs for taxpayers. The upward pressure and differential movement on foundations, particularly slab foundations, may cause cracking, heaving, settling, and potential structural failure. Economic impacts include costly repairs when
- Expansive soils cause cracks in interior, and exterior walls as well as drywall and as some of the first signs of distress.
- Ruptured or severed pipelines, sewer lines, and other underground utility connections can lead to service interruptions and potential environmental contamination. As the population grows and development increases in the county, the potential risk to expansive soils will also increase.
- Standard homeowner's insurance often does not cover damage caused by expansive soils, leaving property owners to bear the repair costs.
- Cracks in foundations can lead to water intrusion, increasing the risk of mold growth and potentially impacting occupant health and energy efficiency due to air leakage..
- Even heavy structures like chimneys can be affected by differential movement, and retaining walls can undergo lateral movement due to soil pressure.

The impact of expansive soils experienced in Sierra County, including all participating jurisdictions, has resulted in no injuries and fatalities, supporting a "Limited" severity of impact meaning injuries and illnesses are treatable with first aid, shutdown of critical facilities and services for 24 hours or less, and less than 10 percent of property destroyed or with major damage.

Section 9

Extreme Cold



SECTION 9: EXTREME COLD

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HAZARD DESCRIPTION



Extreme cold refers to temperatures that are significantly lower than what is normal for a particular region or season. Extreme cold temperatures occur every winter in at least part of the country and affects millions of people across the United States. The arctic air can be dangerous and when combined with brisk winds, the planning area may experience dangerously cold wind chill values. Extreme cold may also result in a freeze, which, according to the National Weather Service, occurs when the temperature

drops below 32°F for a significant period of time.

People exposed to extreme cold are susceptible to frostbite and can succumb to hypothermia in a matter of minutes. Extreme cold temperatures can also affect crops. In late spring or early fall, cold air outbreaks can damage or kill produce for farmers, as well as residential plants and flowers. Freezes and their effects are significant during the growing season. Extreme cold may also impact or damage roads, bridges, buildings, and critical infrastructure.

As indicated in Figure 9-1, the Sierra County planning area is in USDA Hardiness Zones 7a, 7b, and 8a, with annual minimum temperatures between 0°F and 15°F.

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Figure 9-1. Annual Minimum Temperature¹



LOCATION

Extreme cold events are not confined to specific geographic boundaries. Therefore, the entire Sierra County planning area, including all participating jurisdictions, is exposed to extreme cold temperatures and may be impacted.

¹ Source: USDA

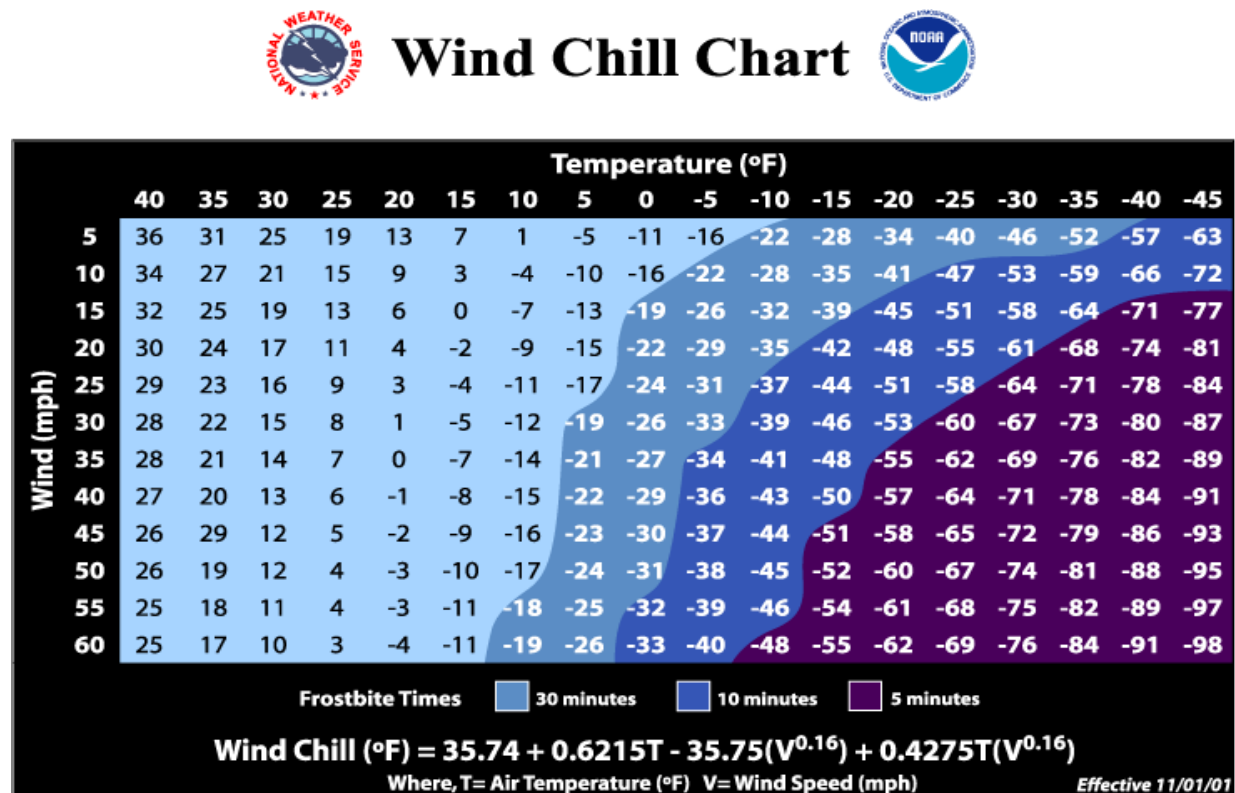
SECTION 9: EXTREME COLD

EXTENT

The extent of extreme cold is measured by wind chill, which is the temperature of the atmosphere in relation to wind speed. Wind chill describes what the air temperature *feels* like to the human skin. In simple terms, the colder the air temperature and the higher the wind speeds the colder it will feel on your skin if you're outside. So even if it remains the same temperature, but the wind speed increases, it will actually feel colder to your skin. This is because as wind blows across our bodies it takes our heat and blows it away. The faster the wind speeds, the faster our body heat is taken away and the colder it feels. It is important to understand the full extent of extreme cold temperatures because it can have significant effects on the human body.

Figure 9-2 presents the National Weather Service Wind Chill Temperature Index. This chart represents wind chill based on the temperature and wind speed. The colors represent a frostbite indicator, showing the points where temperature, wind speed and exposure time will cause frostbite on an individual exposed to the elements. For example, a temperature of 20°F and a wind speed of 10mph will produce a wind chill temperature of 9°F. Under these conditions, exposed skin can freeze in 30 minutes.

Figure 9-2. Wind Chill Temperature Index



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As described in Figure 9-1, the Sierra County planning area has an average annual minimum cold temperature of 0°F to 15°F. The coldest temperature recorded for the planning area was -7°F in Truth or Consequences on January 11, 1962. This is the worst the planning area can anticipate, based on historical events. While the NCEI Storm Events Database provides historical records of extreme cold, frost, and freeze events since 1996, none have been reported for the Sierra County planning area during this reporting period. Based on the Sierra County's annual minimum temperatures, taken with the wind chill chart (Figure 9-2), it can be anticipated that the planning area will experience conditions cold enough to cause frostbite in 30 minutes or less each year.

HISTORICAL OCCURRENCES

Since January 1996, there have been no recorded extreme cold events for the Sierra County planning area, including participating jurisdictions, based upon NCEI records. It is highly likely multiple extreme cold occurrences have gone unreported before and during the recording period. The NCEI is a national data source organized under the National Oceanic and Atmospheric Administration and considered a reliable resource for hazards. However, underreporting of more typical hazard events is not uncommon. To combat this underreporting, the annual minimum temperatures for the planning area is considered along with input from local team members. This indicated regular extreme cold occurrences each season, across the planning area, that simply have not been reported.

PROBABILITY OF FUTURE EVENTS

According to input from the planning team and annual low temperatures, the Sierra County planning area is expected to experience one or more extreme cold event annually. The probability of future extreme cold events affecting the Sierra County planning area, including all participating jurisdictions, is considered "Highly Likely", with an extreme cold event likely to occur within the next year.

CLIMATE CHANGE CONSIDERATIONS

Climate change may slightly decrease the risk of extreme cold events in the planning area. According to the New Mexico Bureau of Geology and Mineral Resources, both extreme cold and snowfall are expected to become less frequent in the coming decades. By the middle of this century, winters are projected to be milder, with fewer cold extremes, with fewer frost days per year. This will likely result in a shorter and less pronounced cold season. Fewer cold spells are projected to occur per year, but the length of cold spells will be longer when they do occur.²

While this assessment states that New Mexico will experience fewer cold extremes, data on future impacts is limited and these projections are subject to change as the research evolves.

VULNERABILITY AND IMPACT

Extreme cold can be very dangerous and may cause fatalities, especially for people experiencing homelessness or for those living below the poverty level who may be unable to afford heating

² Dunbar, N.W., Gutzler, D.S., Pearthree, K.S., Phillips, F.M., Bauer, P.W., Allen, C.D., DuBois, D., Harvey, M.D., King, J.P., McFadden, L.D., Thomson, B.M., and Tillery, A.C., 2022, Climate change in New Mexico over the next 50 years: Impacts on water resources: New Mexico Bureau of Geology and Mineral Resources, Bulletin 164, 218 p. <https://doi.org/10.58799/B-164>

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their homes. During extreme cold, power outages often disable primary heating systems, forcing residents to seek alternative sources for heat. This frequently leads to dangerous practices, such as operating generators or gas stoves indoors, which creates a risk of carbon monoxide poisoning and structure fires.

During periods of extreme cold, aging critical infrastructure and utility systems, such as electrical and water systems, may fail. Freezing temperatures can cause water pipes to freeze and crack. In addition, ice may gather along electrical lines which can impact the electrical infrastructure and cause widespread outages for potentially long periods of time.

Sierra County is a rich and diverse agricultural area. With more than 269 farms and ranches, agriculture is a vital part of the economy in the planning area. The average value of agricultural products sold in Sierra County is \$21,338,000.³ Extreme cold events may severely damage crops and may even cause low crop yields by restricting stem growth. The most dangerous time for an extreme cold event to occur is during the spring months, when crops are the most vulnerable to damage. An extreme cold event in the planning area may impact the County's agricultural assets causing severe economic loss.

The Sierra County Planning Team identified the following critical facilities (Table 9-1) as assets that are considered the most important to the planning area and susceptible to a range of impacts caused by extreme cold events. For a comprehensive list by participating jurisdiction, see Appendix D.

Table 9-1. Critical Facilities Vulnerable to Extreme Cold Events

CRITICAL FACILITIES	POTENTIAL IMPACTS
Emergency Response Departments (EOC, Fire, Police, EMS), Hospitals and Medical Centers	• Emergency operations, services and response times may be significantly impacted due to power outages, and/or loss of communications. • Exposure to extreme cold can cause injury in first responders if exposed for a period of time. • Roads may become impassable due to snow and/or ice impacting response times by emergency services.

³ USDA 2022 Census of Agriculture

SECTION 9: EXTREME COLD

CRITICAL FACILITIES	POTENTIAL IMPACTS
Airport, Academic Institutions, Animal Shelter, Evacuation Centers & Shelters, Governmental Facilities, Residential/ Assisted Living Facilities	• Power outages due to increased usage could disrupt critical care. • Backup power sources could be damaged. • Increased number of patients due to exposure to cold temperatures could lead to a strain on staff. • Water pipes can freeze and burst leading to flooding within facilities. • Facilities, infrastructure, or critical equipment including communications may be damaged, destroyed or otherwise inoperable. • Essential supplies like medicines, water, food, and equipment deliveries may be delayed. • Economic disruption due to power outages negatively impact airport services as well as area businesses reliant on airport operations. • Exposure risks to outdoor workers.
Commercial Supplier (food, gas/fuel, etc.)	• Facilities, infrastructure, or critical equipment including communications may be damaged, destroyed or otherwise inoperable. • Essential supplies like medicines, water, food, and equipment deliveries may be delayed.
Utility Services and Infrastructure (electric, water, wastewater, communications)	• Emergency operations, services and response times may be significantly impacted due to power outages, and/or loss of communications. • Roads may become impassable due to snow and/or ice impacting response times by emergency services. • Power outages due to increased usage could disrupt critical care. • Backup power sources could be damaged. • Water pipes can freeze and burst leading to flooding within facilities.

People and animals are subject to health risks from extended exposure to cold air. Elderly people are at greater risk of death from hypothermia during these events, especially in the neighborhoods with older housing stock. According to the U.S. Center for Disease Control, every year hypothermia kills about 600 Americans, half of whom are 65 years of age or older. In addition, populations living below the poverty level may not be able to afford to run heat on a regular basis or for an extended period of time.

The population over 65 and under the age of 5 in the Sierra County planning area is estimated at 41 percent of the total population or an estimated total of 4,671 potentially vulnerable residents in the planning area based on age. An estimated 25 percent of the planning area population live below the poverty level. Table 9-2 lists population data for several vulnerable population categories throughout the Sierra County planning area.

Another segment of the population at risk are those who are experiencing homelessness. While reliable data at the county-level is limited, estimates show that 19,000-20,000 individuals experienced homelessness statewide throughout the year in 2022. HUD's Annual Homeless Assessment Report estimated 2,560 people were homeless one night in January 2022.⁴

⁴ 2023 New Mexico Affordable Housing Needs Assessment, July 7, 2023

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Table 9-2. Populations at Greater Risk of Extreme Cold Events⁵

JURISDICTION	POPULATION				
	65 AND OLDER	UNDER 5	WITH A DISABILITY	BELOW POVERTY LEVEL	LIMITED ENGLISH SPEAKING
Sierra County	4,251	420	2,866	3,253	489
City of Elephant Butte	881	32	527	159	0
City of Truth or Consequences	1,354	369	1,468	2,097	187
Village of Williamsburg	173	19	222	131	72

Older homes tend to be more vulnerable to the impacts of extreme cold events. Approximately 3,703 housing units (45 percent) in the planning area were built before 1980 (Table 9-3).

Table 9-3. Structures at Greater Risk of Extreme Cold Events⁶

JURISDICTION	STRUCTURES
	SFR BUILT BEFORE 1980
Sierra County	3,703
City of Elephant Butte	261
City of Truth or Consequences	2,130
Village of Williamsburg	170

There are no recorded fatalities or injuries within the Sierra County planning area due to extreme cold events. Additionally, there are no recorded extreme cold events in the planning area, and therefore total monetary losses or annual loss estimates due to extreme cold are difficult to determine. The limited recorded impacts on the Sierra County planning area, including participating jurisdictions, indicate a “Limited” severity of impact, meaning minimal quality of life lost, critical facilities and services shut down for 24 hours or less, and less than 10 percent of property destroyed.

ASSESSMENT OF IMPACTS

The greatest risk from an extreme cold event is to public health and safety. The impact of climate change could produce more frequent and intense extreme cold events, exacerbating the current winter storm impacts. Extreme cold conditions are associated with a variety of impacts, including:

- Vulnerable populations, particularly the elderly (37 percent of total population) and children under 5 (4 percent of total population), can face serious or life-threatening health problems from exposure to extreme cold including hypothermia and frostbite.

⁵ U.S. Census Bureau, American Community Survey, 2023

⁶ U.S. Census Bureau, American Community Survey, 2022

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- Loss of electric power or other heat source can result in increased potential for fire injuries or hazardous gas inhalation because residents burn candles for light or use fires or generators to stay warm.
- Response personnel, including utility workers, public works personnel, debris removal staff, tow truck operators, and other first responders, are subject to injury resulting from exposure to extreme cold temperatures.
- Response personnel would be required to travel in potentially hazardous conditions, elevating the life safety risk due to accidents and potential contact with downed power lines.
- Operations or service delivery may experience impacts from electricity blackouts due to ice and extreme cold related damages.
- Power outages are possible throughout the planning area due to downed trees and power lines and/or rolling blackouts. Outages are also possible due to an increase in electricity usage and demand when using electric heating systems.
- Critical facilities without emergency backup power may not be operational during power outages.
- Severe cold could significantly damage vegetation and crops.
- Exposed water pipes may freeze and break when exposed to extreme cold temperatures, both residential and commercial structures are vulnerable, causing significant damages.

The economic and financial impacts of extreme cold events on the community will depend on the scale of the event, what is damaged, and how quickly repairs to critical components of the economy can be implemented. The level of preparedness and pre-event planning done by community, local businesses, and citizens will also contribute to the overall economic and financial conditions in the aftermath of an extreme cold event.

Section 10

Extreme Heat



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HAZARD DESCRIPTION

Extreme heat is a prolonged period of excessively high temperatures and exceptionally humid conditions. Extreme heat during the summer months is a common occurrence throughout the State of New Mexico, and the Sierra County planning area is no exception. The County typically experiences extended heat waves or an extended period of extreme heat and is often accompanied by high humidity.



Although heat can damage buildings and facilities, it presents a more significant threat to the safety and welfare of citizens. The major human risks associated with extreme heat include heat cramps; sunburn; dehydration; fatigue; heat exhaustion; and even heat stroke. The most vulnerable population to heat casualties are children and the elderly or infirmed who frequently live on low fixed incomes and cannot afford to run air-conditioning on a regular basis. This population is sometimes isolated, with no immediate family or friends to look out for their well-being.

Critical infrastructure can also be damaged or impacted by extreme heat. High temperatures may cause a rise in electricity consumption as homes, schools, and businesses try to regulate the temperature. This may lead to energy shortages and possible blackouts.

LOCATION

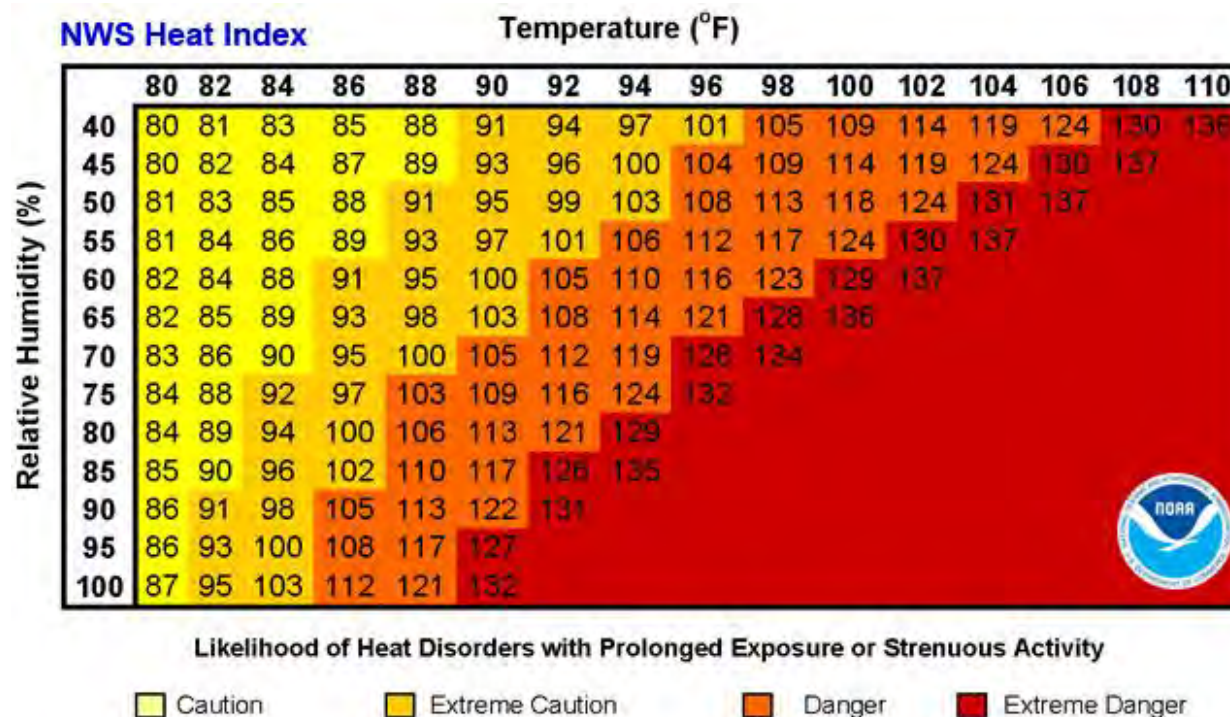
Extreme heat events can occur throughout the Sierra County planning area as there is no specific geographic scope to the extreme heat hazard. Extreme heat could occur anywhere within the Sierra County planning area, including all participating jurisdictions.

EXTENT

The magnitude or intensity of an extreme heat event is measured according to temperature in relation to the percentage of humidity. According to the National Oceanic Atmospheric Administration (NOAA), this relationship is referred to as the “Heat Index” and is depicted in Figure 10-1. This index measures how hot it feels outside when humidity is combined with high temperatures.

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Figure 10-1. Extent Scale for Extreme Heat¹



The index in Figure 10-1 displays varying categories of caution depending on the relative humidity combined with the temperature. For example, when the temperature is at 90 degrees Fahrenheit (°F) or lower, caution should be exercised if the humidity level is at or above 40 percent.

The shaded zones on the chart indicate varying symptoms or disorders that could occur depending on the magnitude or intensity of the event. “Caution” is the first category of intensity, and it indicates when fatigue due to heat exposure is possible. “Extreme Caution” indicates that sunstroke, muscle cramps, or heat exhaustion are possible, and a “Danger” level means that these symptoms are likely. “Extreme Danger” indicates that heat stroke is likely. The National Weather Service (NWS) initiates alerts based on the Heat Index as shown in Table 10-1.

Table 10-1. Heat Index and Warnings

CATEGORY	HEAT INDEX	POSSIBLE HEAT DISORDERS	WARNING TYPE
Extreme Danger	125°F and higher	Heat stroke or sun stroke likely.	An Excessive Heat Warning is issued if the Heat Index rises above 105°F at least 3 hours during the day or above 80°F at night.
Danger	103 – 124°F	Sunstroke, muscle cramps, and/or heat exhaustion are likely. Heatstroke possible with prolonged exposure and/or physical activity.	An Excessive Heat Warning is issued if the Heat Index rises above 105°F at least 3 hours during the day or above 80°F at night.

¹ Source: NOAA

SECTION 10: EXTREME HEAT

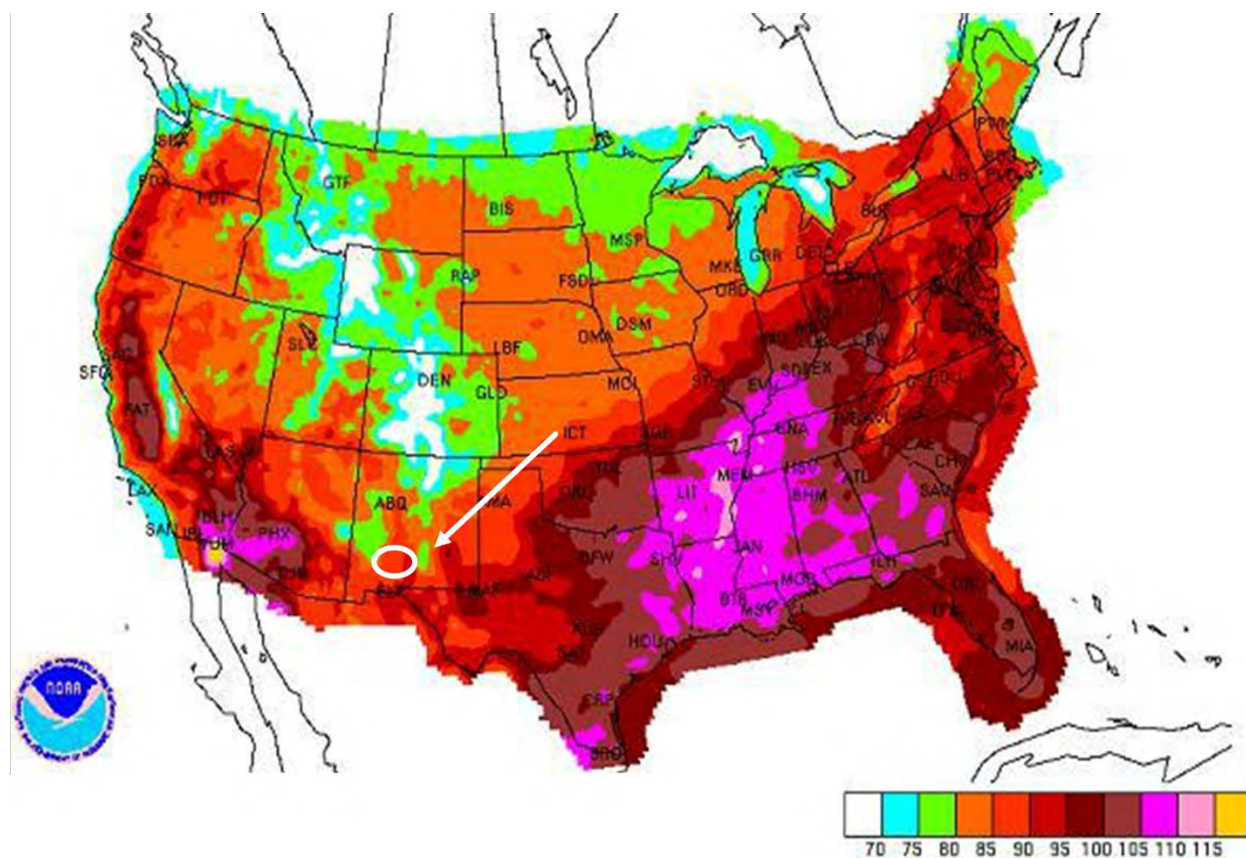
CATEGORY	HEAT INDEX	POSSIBLE HEAT DISORDERS	WARNING TYPE
Extreme Caution	90 – 103°F	Sunstroke, muscle cramps, and/or heat exhaustion possible with prolonged exposure and/or physical activity.	A Heat Advisory will be issued to warn that the Heat Index may exceed 105°F.
Caution	80 – 90°F	Fatigue is possible with prolonged exposure and/or physical activity.	A Heat Advisory will be issued to warn that the Heat Index may exceed 105°F.

Due to its geography and its dry, arid, and sunny climate, the Sierra County planning area can expect an extreme heat event each summer. Citizens, especially children and the elderly, should exercise caution by staying out of the heat for prolonged periods when a heat advisory or excessive heat warning is issued. In addition, those working or remaining outdoors for extended periods of time are at greater risk.

Figure 10-2 displays the daily maximum heat index as derived from NOAA based on data compiled from 1838 to 2015. The white circle shows the Sierra County planning area. The planning area is represented in dark orange across the County. The dark orange color indicates an average daily heat index of between 85°F to 90°F. Therefore, Sierra County could experience dangerous heat from 90°F, or the “Extreme Caution” category, which can include sunstroke, muscle cramps, and potential heat exhaustion. The planning area’s record high temperature of 111°F was documented in the City of Truth or Consequences on June 26, 1994. This is the maximum temperature the planning area can anticipate based on historical events.

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Figure 10-2. Average Daily Maximum Heat Index Days²



HISTORICAL OCCURRENCES

The National Centers for Environmental Information (NCEI) Storm Events database is a national data source organized under the National Oceanic and Atmospheric Administration (NOAA). The NCEI is the largest archive available for historic storm events data. Previous occurrences for extreme heat are derived from the NCEI database, which identifies extreme heat events at the county level. According to heat related incidents located solely within Sierra County, there has been one extreme heat event reported for the planning area, including three impact reports for that one event (Table 10-2). Historical extreme heat information, as provided by the NCEI, shows extreme heat activity across a multi-county forecast area for each event, the appropriate percentage of the total property and crop damage reported for the entire forecast area has been allocated to each county impacted by the event.

Historical extreme heat data for the Sierra County planning area is provided on the NCEI database from January 1996 through June 2025. No deaths, injuries, or damages were reported. It is highly likely additional extreme heat occurrences have gone unreported before and during the recording period. Due to the limited number of reported events, average high temperatures have been analyzed in order to determine the probability of future events.

² NRDC and the white circle indicates the Sierra County planning area.

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Table 10-2. Historical Extreme Heat Events, 1996 – 2025³

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Sierra County	7/1/2023	0	0	\$0	\$0
Sierra County	7/1/2023	0	0	\$0	\$0
Sierra County	7/1/2023	0	0	\$0	\$0
TOTALS		0	0	\$0	\$0

Based on the historical extreme heat events for the Sierra County planning area, including all participating jurisdictions, one extreme heat event has been reported since the 2019 Plan, including three impact reports for that event.

SIGNIFICANT EVENTS

July 1, 2023

July was the hottest month on record for Southern New Mexico, with a persistent upper ridge over the Borderland. At New Mexico State University, temperatures exceeded 100°F on 28 out of 31 days, averaging 88°F. The NMSU Cooperative Observer station reported an average temperature of 82°F, breaking the previous 2016 record by 1.9°F. High temperatures surpassed 95°F daily, and the area received just 0.03 inches of rain.

PROBABILITY OF FUTURE EVENTS

According to historical records, the Sierra County planning area, including all participating jurisdictions, has experienced one event in a 29.5-year reporting period. It can be assumed that multiple events have gone unreported due to the average daily temperatures throughout the summer. Historical records in combination with an analysis of maximum average temperatures provides a probability of at least one event every year. This frequency supports a “Highly Likely” probability of future events.

CLIMATE CHANGE CONSIDERATIONS

Climate change is expected to lead to an increase in average temperatures as well as an increase in frequency, duration, and intensity of extreme heat events. The Fifth National Climate Assessment states that increasing temperatures are leading to hotter extreme heat events that will increase animal and ecosystem stress, reduce crop quality and yield, and increase wildfire risk across the southwestern United States.

It is projected that future changes to Sierra County will include increased temperatures, which according to the U.S. Climate Explorer, the conservative projections show the planning area may experience a 6°F increase in the average extreme heat temperatures. Historically, extreme temperatures averaged 96°F in Sierra County, but between 2035 and 2064 the average will be 102°F, increasing the severity and frequency of drought events. With the full range of projections,

³ NOAA, NCEI Storm Events Database. Reporting period from January 1996 through June 2025.

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average temperatures could increase up to 20°F higher, which would have detrimental consequences, but the severity is dependent on overall future emissions.

VULNERABILITY AND IMPACT

While the entirety of the Sierra County planning area is exposed to extreme temperatures, existing buildings, infrastructure, and critical facilities are not likely to sustain significant damage from extreme heat events. Therefore, any estimated property losses associated with the extreme heat hazard are anticipated to be minimal across the area.

According to the USDA 2022 Census of Agriculture, there are 269 farms over a total of 1,070,677 acres in size throughout the Sierra County planning area. The average value of agricultural products sold in Sierra County is \$21,338,000. Extreme heat events may severely damage crops and negatively impact the crop yield if the higher temperature exceeds a crop's optimum temperature. The most dangerous time for an extreme heat event to occur is during the spring months, when crops are the most vulnerable to damage. An extreme heat event in the planning area may impact the planning area's agricultural assets causing severe economic loss.

Every summer, the hazard of heat-related illness becomes a significant public health issue throughout much of the United States. Mortality rates increase during heat waves, and excessive heat is an important contributing factor to deaths from other causes, particularly among the elderly. Extreme temperatures present a significant threat to life and safety for the population of the County as a whole. Heat casualties, for example, are typically caused by a lack of adequate air-conditioning or heat exhaustion. The most vulnerable population to heat casualties are the elderly or infirmed who frequently live on fixed incomes and cannot afford to run air-conditioning on a regular basis. This population is sometimes isolated, with no immediate family or friends to look out for their well-being. Children may also be more vulnerable if left unattended in vehicles. Populations living below the poverty level are often unable to run air-conditioning on a regular basis and are limited in their ability to seek medical treatment.

Vulnerable and underserved populations are disproportionately impacted by extreme heat events as they may be more susceptible to health risks. The population below the poverty level are less likely to be able to afford air conditioning during the hot summer months as well as less likely to have access to medical care. In addition, people who speak a language other than English may face increased vulnerability due to language barriers that limit their access to important information such as weather-related warnings and instructions regarding safety measures.

The population over 65 in the Sierra County planning area is estimated at 37 percent of the total population and children under the age of 5 are estimated at 4 percent. The population with a disability is estimated at 28 percent of the total population. An estimated 25 percent of the planning area population live below the poverty level and 4 percent of the populations speak English "less than very well" (Table 10-3).

Table 10-3. Populations Vulnerable to Extreme Heat

JURISDICTION	POPULATION				
	65 AND OLDER	UNDER 5	WITH A DISABILITY	BELOW POVERTY LEVEL	LIMITED ENGLISH SPEAKING
Sierra County	4,251	420	2,866	3,253	489

SECTION 10: EXTREME HEAT

JURISDICTION	POPULATION				
	65 AND OLDER	UNDER 5	WITH A DISABILITY	BELOW POVERTY LEVEL	LIMITED ENGLISH SPEAKING
City of Elephant Butte	881	32	527	159	0
City of Truth or Consequences	1,354	369	1,468	2,097	187
Village of Williamsburg	173	19	222	131	72

Extremely high temperatures can have significant secondary impacts, leading to droughts, water shortages, increased fire danger, and prompt excessive demands for energy. The possibility of water shortages and power outages increases with unseasonably high temperatures. Typically, more than 12 hours of warning time would be given before the onset of an extreme heat event.

High demand for air conditioning during extreme temperatures can strain transmission lines, and can cause transformers to overheat and fail, leading to short-term blackouts. It is possible that critical facilities could be shut down due to temporary power outages (Table 10-4). Roadways may be damaged during prolonged heat waves as asphalt softens, creating ruts and potholes, reducing the lifespan of critical infrastructure.

Based on historical records, annualized property and crop losses for the Sierra County planning area are negligible. The number of historical injuries and fatalities also indicates a “Limited” level of impact, meaning injuries or illness can be treated with first aid.

The Sierra County Planning Team identified the following critical facilities as assets that are considered the most important to the planning area and are susceptible to a range of impacts caused by extreme heat events. The following critical facilities would be vulnerable to extreme heat events in the Sierra County planning area. For a detailed list see Appendix D.

Table 10-4. Critical Facilities Vulnerable to Extreme Heat Events

CRITICAL FACILITIES	POTENTIAL IMPACTS
Emergency Response Services (EOC, Fire, Police, EMS, Hospitals)	- Emergency operations, services and response times may be significantly impacted due to power outages, and/or loss of communications. - Exposure to heat can cause heat illnesses in first responders, especially for those in heavy equipment. - Roads may become impassable due to excessive heat causing asphalt roads to soften and concrete roads to shift or buckle impacting response times by emergency services.
Airport, Academic Institutions, Community Residential Facilities, Day Care Facilities, Evacuation Centers & Shelters, Governmental Facilities	- Facilities, infrastructure, or critical equipment including communications may be damaged, destroyed or otherwise inoperable. - Power outages due to increased usage could disrupt critical care. - Backup power sources could be damaged. - Evacuations may be necessary due to extended power outages, breaks in water main lines or other associated damage to facilities.

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CRITICAL FACILITIES	POTENTIAL IMPACTS
	• Facilities, infrastructure, or critical equipment including communications may be damaged, destroyed or otherwise inoperable. • Economic disruption due to power outages negatively impact airport services as well as area businesses reliant on airport operations.
Commercial Suppliers (food, gas, etc.)	• Facilities, infrastructure, or critical equipment including communications may be damaged, destroyed or otherwise inoperable. • Essential supplies like medicines, water, food, and equipment deliveries may be delayed.
Utility Services and Infrastructure (electric, water, wastewater, communications)	• Emergency operations, services and response times may be significantly impacted due to power outages, and/or loss of communications. • Roads may become impassable due to excessive heat causing asphalt roads to soften and concrete roads to shift or buckle impacting response times by emergency services. • Breaks in water main lines or other associated damage to facilities.

ASSESSMENT OF IMPACTS

The greatest risk from extreme heat is to public health and safety. Extreme heat conditions can be frequently associated with a variety of impacts, including:

- Vulnerable populations, particularly the elderly (37 percent of total population), children under 5 (4 percent of total population), and those with a disability (28 percent of total population) can face serious or life-threatening health problems from exposure to extreme heat including hyperthermia, heat cramps, heat exhaustion, and heat stroke (or sunstroke).
- Response personnel, including utility workers, public works personnel, and any other professions where individuals are required to work outside, are more subject to extreme heat related illnesses since their exposure would typically be greater.
- High energy demand periods can outpace the supply of energy, potentially creating the need for rolling brownouts which would elevate the risk of illness to vulnerable residents.
- Highways and roads may be damaged by excessive heat causing asphalt roads to soften and concrete roads to shift or buckle.
- Vehicle engines and cooling systems typically run harder during extreme heat events resulting in increases in mechanical failures.
- Extreme heat events during times of drought can exacerbate the environmental impacts associated with drought, decreasing water and air quality and further degrading wildlife habitat.
- Extreme heat increases ground-level ozone (smog), increasing the risk of respiratory illnesses.
- Negatively impacted water suppliers may face increased costs resulting from the transport of water resources or development of supplemental water resources.

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- Tourism and recreational activities at places may be negatively impacted during extreme heat events, reducing seasonal revenue.
- Outdoor activities may see an increase in school injury or illness during extreme heat events.

The economic and financial impacts of extreme heat on the community will depend on the duration of the event, demand for energy, drought associated with extreme heat, and many other factors. The level of preparedness and the amount of planning done by the community, local businesses, and citizens will impact the overall economic and financial conditions before, during, and after an extreme heat event.



Section 11

Flood



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HAZARD DESCRIPTION

Floods generally result from excessive precipitation. The severity of a flood event is determined by a combination of several major factors, including: stream and river basin topography and physiography; precipitation and weather patterns; recent soil moisture conditions; and the degree of vegetative clearing and impervious surfaces. Typically, floods are long-term events often lasting for several days or even weeks, due to gradual rises in river levels from prolonged heavy rainfall or snowmelt, unlike rapid flash floods.

Inland or riverine flooding is a result of excessive precipitation levels and water runoff volumes within the watershed of a stream or river. Inland or riverine flooding is overbank flooding of rivers and streams, typically resulting from large-scale weather systems that generate prolonged rainfall over a wide geographic area. Therefore, it is a naturally occurring and inevitable event. Some river floods occur seasonally when winter or spring rainfalls fill river basins with too much water, too quickly.

Flash flooding is the result of excessive rainfall in a short period of time, usually within three to six hours of rainfall. Flash flooding is most commonly caused by heavy rainfall from thunderstorms but can also occur due to dam breaks or debris flow. Urban areas are more prone to flash flooding as impervious surfaces in these areas do not allow water to infiltrate the ground and soil. The varied terrain of New Mexico can carry water into areas that did not receive rain, also causing flash flooding. Storms that produce large amounts of runoff typically occur during monsoon season which begins in June and ends in October. In addition, Sierra County has several arroyos, which is a water-carved gully or a normally dry creek bed. These arroyos can fill with fast moving water very quickly during flash flood events and become very dangerous.

The Sierra County planning area is subject to extreme rainfall events, often in short durations, leading to dangerous flash flooding events. Historically, portions of Sierra County have always been at risk to flooding because of monsoon rainfall, topography, and the location of development adjacent to flood-prone areas. Flooding events generally impact the entire planning area and have caused significant damage in the populated areas of the County. Flooding has occurred both

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within mapped floodplains and in other localized areas. Floods are a natural and recurrent event and can take place any time of the year.

Wildfire events can also have long-term cascading impacts and can create an increased risk of flooding, even many years after an event occurs. A burn scar is the barren or destroyed part of land after a wildfire, where extreme soil damage occurs, creating hydrophobic, or water repellent, soil. Rainfall that would normally be absorbed by the landscape will instead quickly run off. With such conditions, much less rainfall is required to produce a flash flood. Sierra County faces an increased risk of flooding due to damaged and burned landscapes.

LOCATION

The Flood Insurance Rate Maps (FIRMs) prepared by FEMA provide an overview of flood risk but can also be used to identify the areas of the County that are vulnerable to flooding. FIRMs are used to regulate new development and to control the substantial improvement and repair of substantially damaged buildings. Flood Insurance Studies (FIS) are often developed in conjunction with FIRMs. The FIS typically contains a narrative of the flood history of a community and discusses the engineering methods used to develop the FIRMs. The FIS also contains flood profiles for studying flooding sources and can be used to determine Base Flood Elevations (BFEs) for some areas.

The FIS for unincorporated Sierra County is dated July 16, 1996. This FIS predates the incorporation of the City of Elephant Butte, which occurred in 1998. Therefore, the City of Elephant Butte is currently included in the county flood study. The FIS for the City of Truth or Consequences as well as the Village of Williamsburg were similarly dated July 16, 1996. Each FIS compiles all previous flood information including data collected on numerous waterways. All three studies indicate that the principal flood problems are due to the complex system of arroyos and nonporous soil which leads to flash flooding. They also note that extensive flooding typically occurs in the spring and along the Rio Grande, due to snowmelt from the mountains in Colorado.

Current effective FIRM panels adopted by each participating jurisdiction are listed in Table 11-1.

Table 11-1. Current Effective FIRMs

JURISDICTION	COMMUNITY ID	FIRM PANEL(S)
Sierra County Unincorporated	350071	0025 - 1150
City of Elephant Butte	350071	0485
City of Truth or Consequences	350073	0005
Village of Williamsburg	350074	0001

The current effective FEMA FIRMs for the Sierra County planning area show the following flood hazard areas:

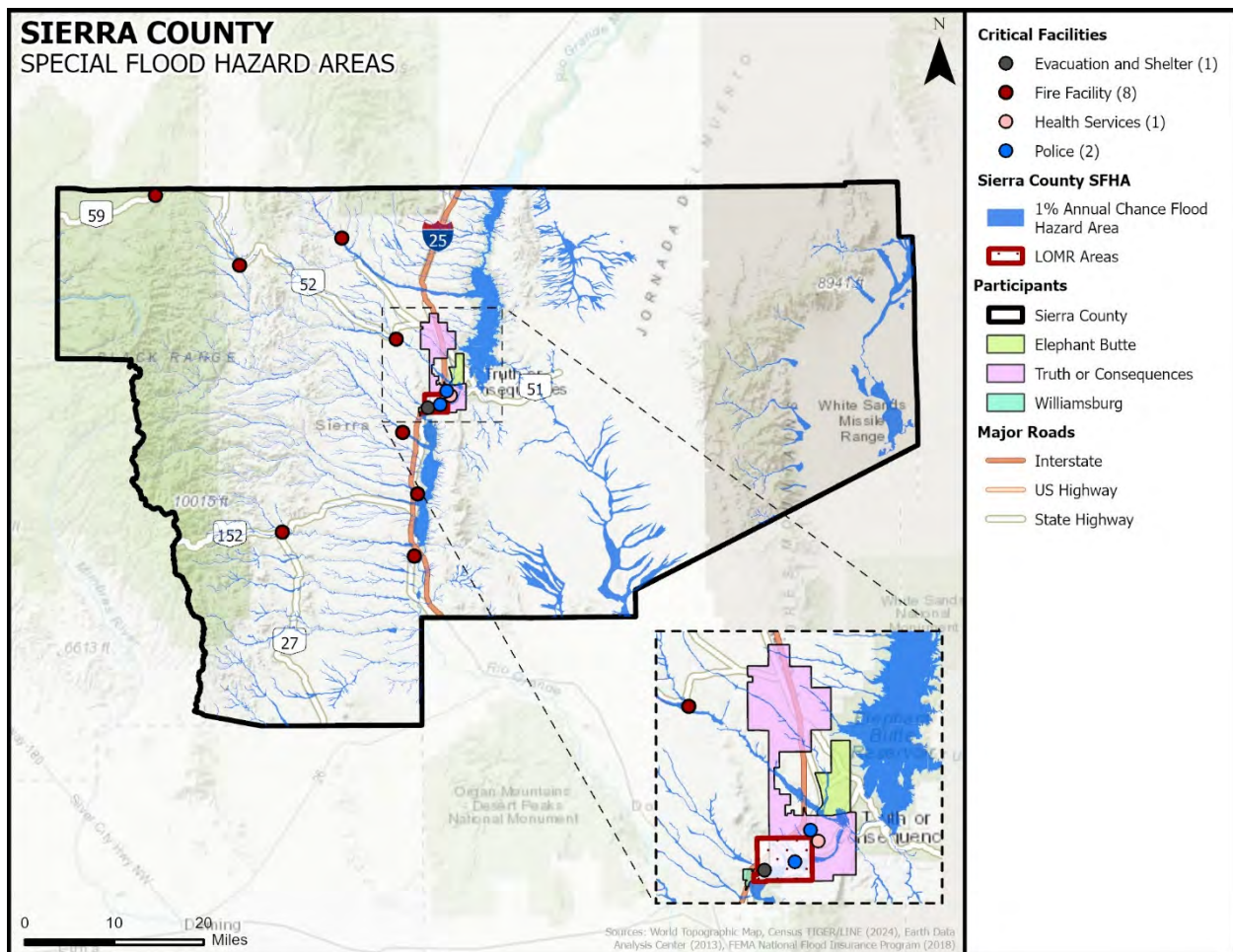
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- Zone A: Areas subject to inundation by the 1-percent-annual-chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. Mandatory flood insurance requirements and floodplain management standards apply.
- Zone C: Area of minimal flood hazard, usually depicted on FIRMs as above the 500-year flood level. Zone C may have ponding and local drainage problems that don't warrant a detailed study or designation as base floodplain.

Locations of flood zones in Sierra County based on the Flood Insurance Rate Map (FIRM) from FEMA are illustrated in Figures 11-1 to 11-4. FEMA's digital flood hazard data are shown; however, within the areas outlined by the red box, the flood hazard information should be considered superseded by the flood zones delineated in the approved Letter of Map Revision (LOMR).

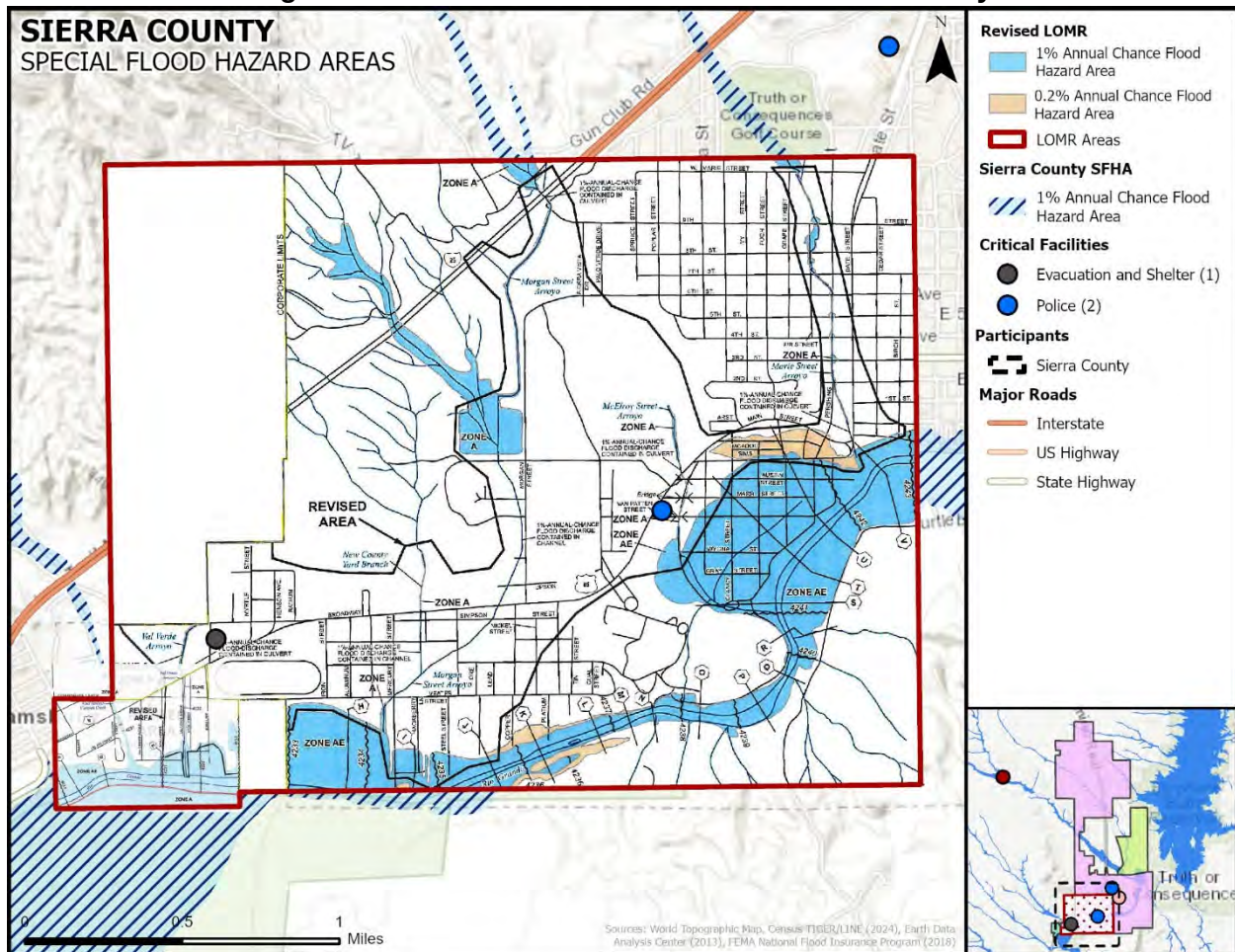
It is also important to note that areas downhill or downstream from burn scars are highly susceptible to localized flash flooding, especially near deep terrain. Recent burn scar areas susceptible to flash flooding are primarily located in the northern Black Range in Sierra County following the Black Fire of 2022.

Figure 11-1a. Estimated Flood Zones in Sierra County



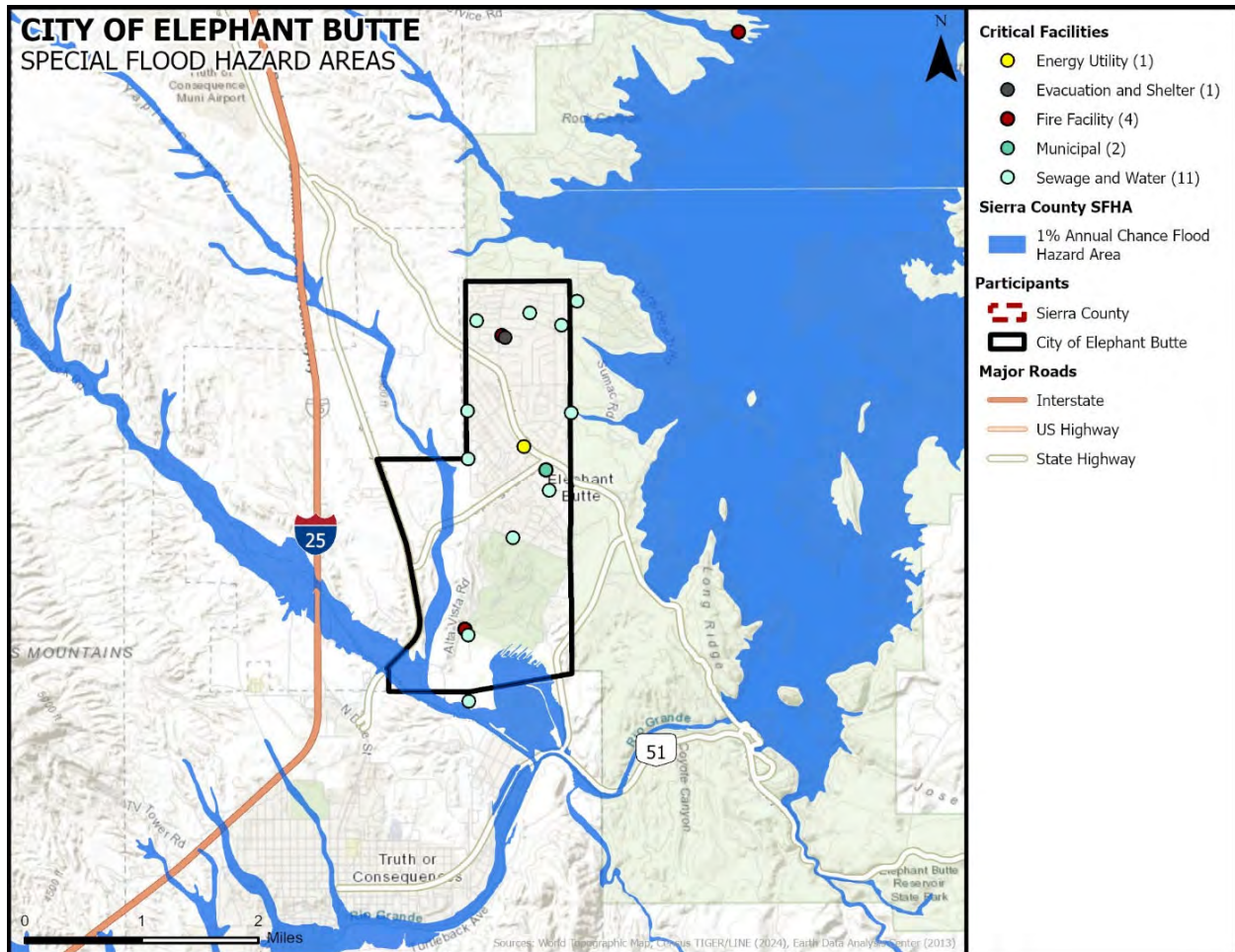
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Figure 11-1b. Estimated Flood Zones in Sierra County



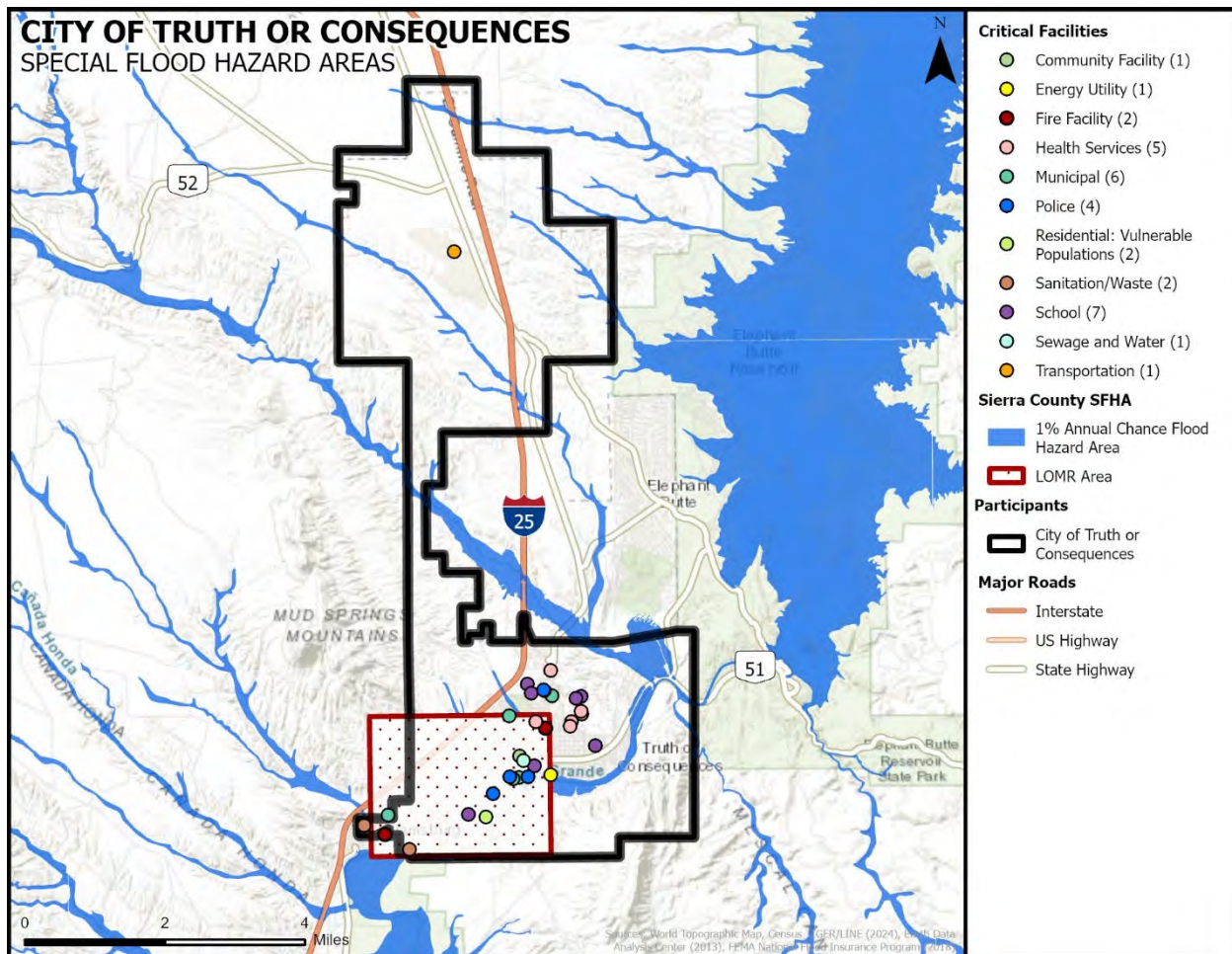
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Figure 11-2. Estimated Flood Zones in the City of Elephant Butte



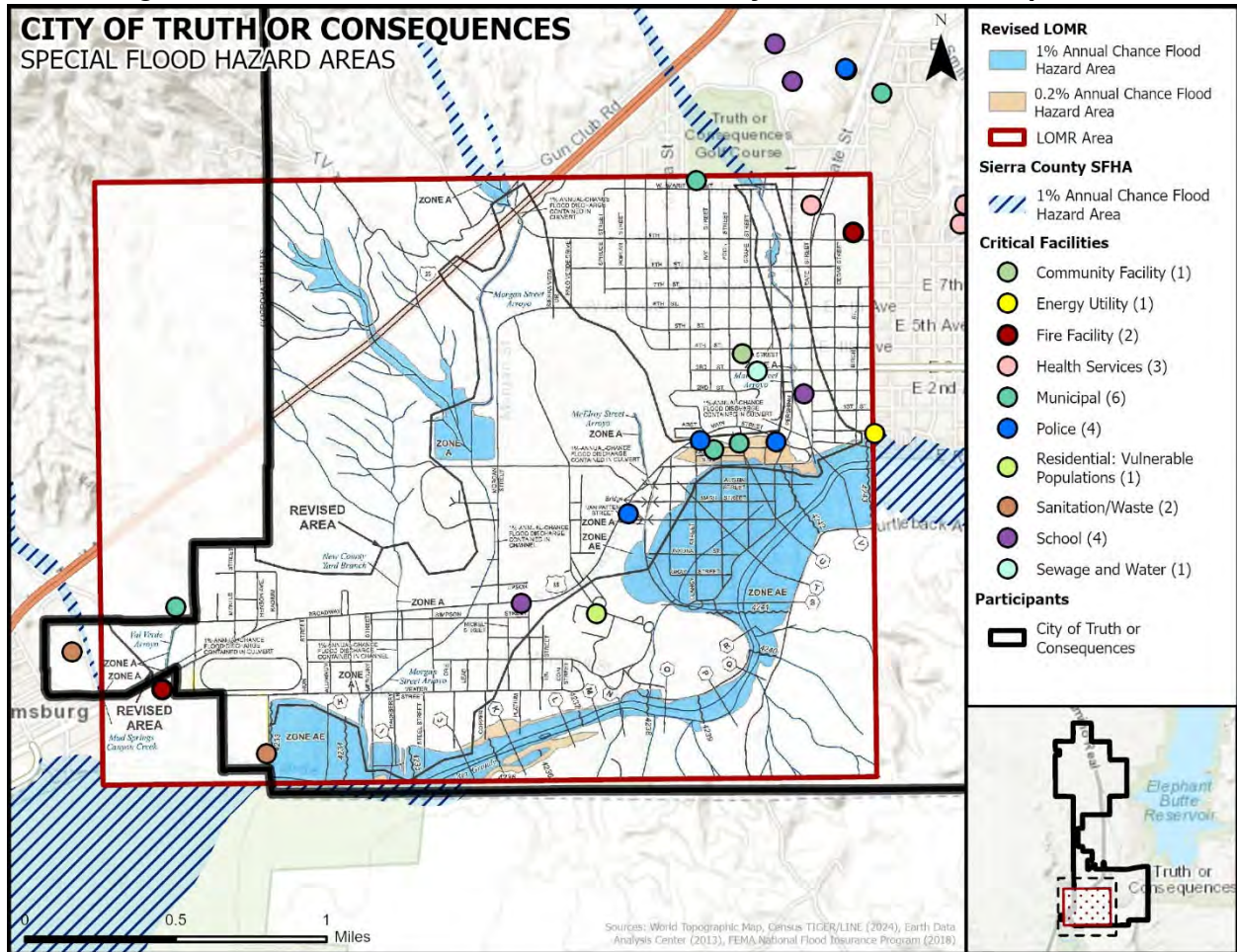
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Figure 11-3a. Estimated Flood Zones in the City of Truth or Consequences



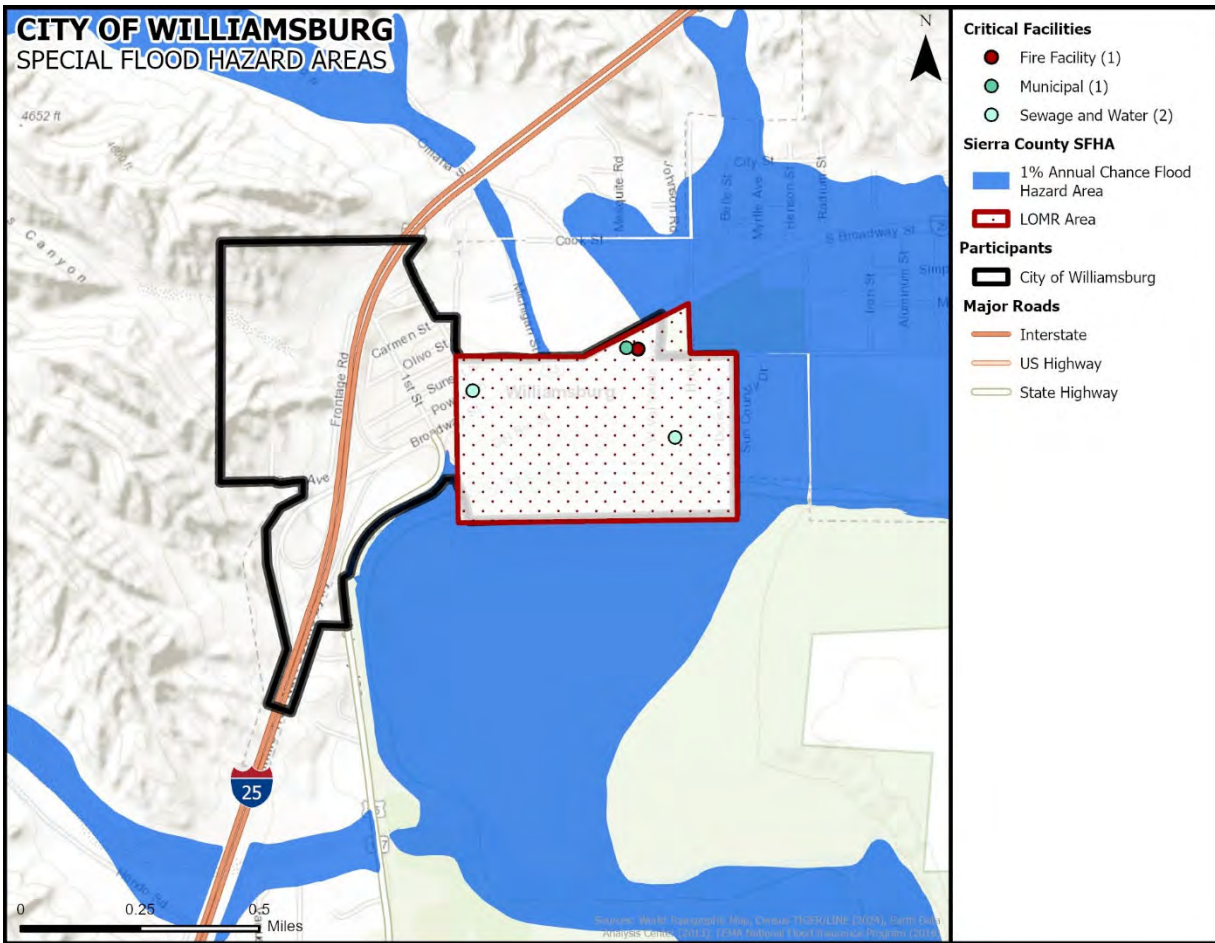
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Figure 11-3b. Estimated Flood Zones in the City of Truth or Consequences



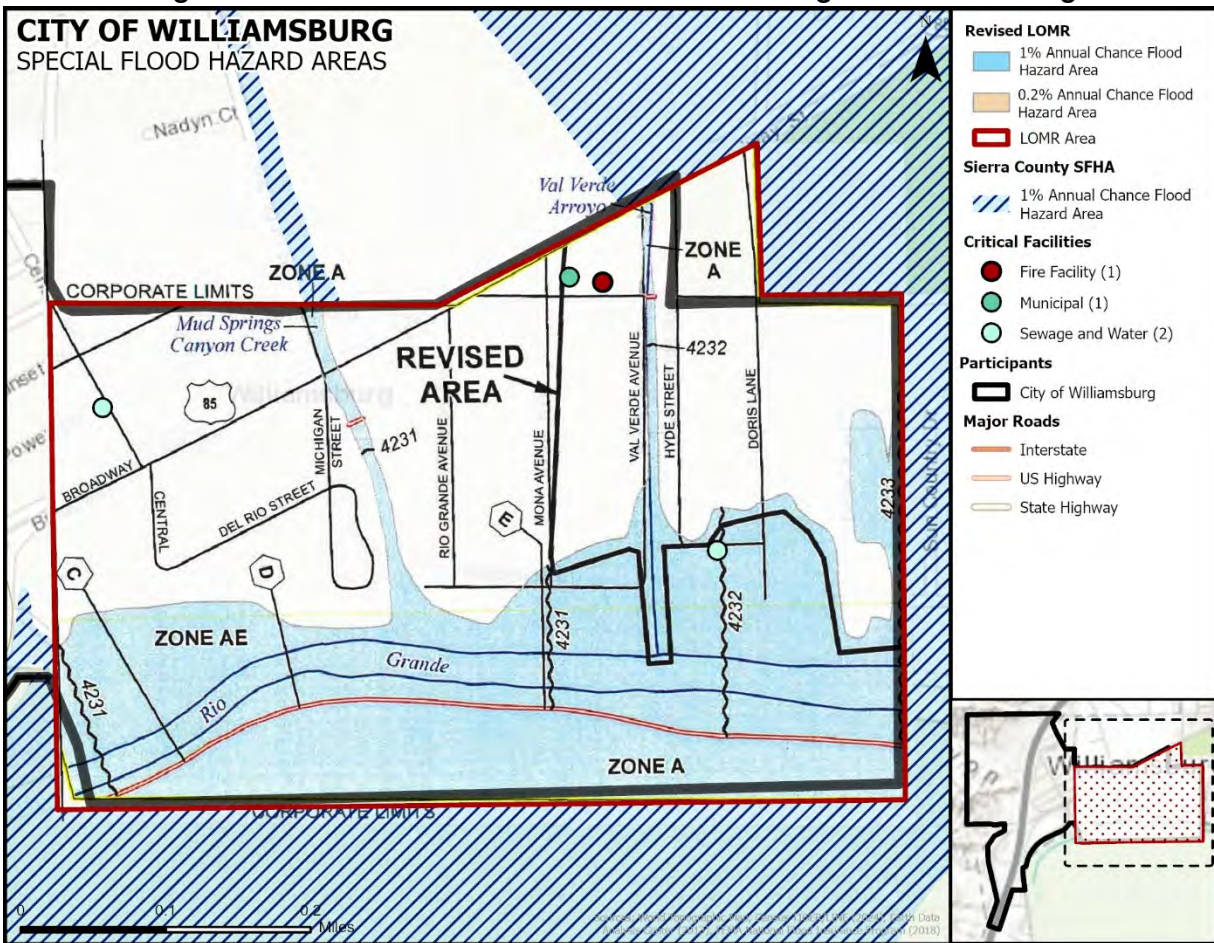
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Figure 11-4a. Estimated Flood Zones in the Village of Williamsburg



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Figure 11-4b. Estimated Flood Zones in the Village of Williamsburg



EXTENT

The severity of a flood event is determined by a combination of several major factors, including stream and river basin topography and physiography; precipitation and weather patterns; recent soil moisture conditions; and the degree of vegetative clearing and impervious surfaces. Typically, floods are long-term events that may last for several days.

Determining the intensity and magnitude of a flood event is dependent upon the flood zone and location of the flood hazard area in addition to the depths of floodwaters. The extent of flood damages can be expected to be more damaging in the areas that will convey a base flood. FEMA categorizes areas on the terrain according to how the area will convey floodwater. Flood zones are the categories that are mapped on FIRMs. Table 11-2 provides a description of FEMA flood zones and the flood impact in terms of severity or potential harm. Flood Zones A are the hazard areas mapped in the region. Figure 11-1 through 11-4 should be read in conjunction with the extent for flooding in Tables 11-2 and 11-3 to determine the intensity of a potential flood event.

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Table 11-2. Flood Zones

INTENSITY	ZONE	DESCRIPTION
HIGH	ZONE A	Areas with a 1-percent-annual-chance of flooding and a 26 percent chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas, no depths or base flood elevations are shown within these zones.
	ZONE A1-30	These are known as numbered A Zones (e.g., A7 or A14). This is the base floodplain where the FIRM shows a Base Flood Elevation (BFE) (old format).
	ZONE AE	The base floodplain where BFEs are provided. AE Zones are now used on the new format FIRMs instead of A1-A30 Zones.
	ZONE AO	River or stream flood hazard areas and areas with a 1-percent-annual-chance or greater of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. These areas have a 26 percent chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones.
	ZONE AH	Areas with a 1-percent-annual-chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet. These areas have a 26 percent chance of flooding over the life of a 30-year mortgage. BFEs derived from detailed analyses are shown at selected intervals within these zones.
	ZONE A99	Areas with a 1-percent-annual-chance of flooding that will be protected by a federal flood control system where construction has reached specified legal requirements. No depths or BFEs are shown within these zones.
MODERATE to LOW	ZONE AR	Areas with a temporarily increased flood risk due to the building or restoration of a flood control system (such as a levee or a dam). Mandatory flood insurance purchase requirements will apply, but rates will not exceed the rates for unnumbered A zones if the structure is built or restored in compliance with Zone AR floodplain management regulations.
	ZONE X 500	An area inundated by 500-year flooding; an area inundated by 100-year flooding with average depths of less than 1 foot or with drainage areas less than 1 square mile; or an area protected by levees from 100-year flooding.

Zone A is interchangeably referred to as the 100-year flood, the 1-percent-annual-chance flood, the Special Flood Hazard Area (SFHA), or more commonly, the base flood. This is the area that will convey the base flood and constitutes a threat to the planning area. The impact from a flood event can be more damaging in areas that will convey a base flood.

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Structures built in the SFHA are subject to damage by rising waters and floating debris. Moving floodwater exerts pressure on everything in its path and causes erosion of soil and solid objects. If not elevated above Base Flood Elevation, utility systems, such as heating, ventilation, air conditioning, fuel, electrical systems, sewage maintenance systems and water systems, may also be damaged.

The intensity and magnitude of a flood event is also determined by the depth of floodwater. Table 11-3 describes the stream gauge data provided by the United States Geological Survey (USGS). Peak flood data at the locations available in the planning area indicate a peak flood depth range of 0 to 13 feet above average peak flows.

Table 11-3. Extent for Sierra County¹

SITE NAME ²	PEAK FLOOD EVENT
San Jose Arroyo near Monticello, NM	The San Jose Arroyo near Monticello in Sierra County, New Mexico reached an overflow elevation of 6 feet in 1988. The average peak flow for the San Jose Arroyo is 2 feet at this site. This indicates a maximum flood depth of 4 feet above the average peak flow at this site.
Rio Grande below Elephant Butte Dam, NM	The Rio Grande below the Elephant Butte Dam Sierra County, New Mexico reached an overflow elevation of 9 feet in 2007. The average peak flow for the Rio Grande is 7 feet at this site. This indicates a maximum flood depth of 2 feet above the average peak flow at this site.
Rio Grande at Narrows in Elephant Butte, NM	The Rio Grande at Narrows in Elephant Butte in Sierra County, New Mexico reached an overflow elevation of 13 feet in 2023. The average peak flow for the Rio Grande is 9 feet at this site. This indicates a maximum flood depth of 4 feet above the average peak flow at this site.
Aleman Draw at Aleman, NM	The Aleman Draw at Aleman in Sierra County, New Mexico reached an overflow elevation of 19 in 1967. The average peak flow for Aleman Draw is 6 feet at this site. This indicates a maximum flood depth of 13 feet above the average peak flow at this site.
Salt Creek near Tularosa, NM	The Salt Creek near Tularosa in Sierra County, New Mexico reached on overflow elevation of 7 feet in 2007. The average peak flow for Salt Creek is 5 feet at this site. This indicates a maximum flood depth of 2 feet above the average peak flow at this site.

The range of flood intensity that the planning area can experience is high, or Zone A. Based on historical occurrences, the planning area could expect to experience approximately 3 inches of rain within a 1-hour period, resulting in flash flooding.

The data described in Tables 11-1 and 11-2, together with Figures 11-1 through 11-4, and historical occurrences for the area, provides an estimated potential magnitude and severity for the Sierra County planning area, including all participating jurisdictions.

¹ Severity estimated by averaging floods at certain stage level over the history of flood events. Severity and peak events are based on USGS data.

² Severity is provided where peak data was provided throughout for the County.

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HISTORICAL OCCURRENCES

Historical evidence indicates that areas within the planning area are susceptible to flooding, especially in the form of flash flooding. It is important to note that only flood events that have been reported have been factored into this risk assessment, therefore it is likely that additional flood occurrences have gone unreported before and during the recording period.

Table 11-4 identifies historical flood events that resulted in damages, injuries, or fatalities within the Sierra County planning area. Table 11-5 provides a historical flood event summary for Sierra County and participating jurisdictions. Historical data is provided by the Storm Prediction Center (NOAA), National Centers for Environmental Information (NCEI) database. There have been 61 recorded flood events in the Sierra County planning area during the reporting period.

Table 11-4. Historical Flood Events, January 1996 – June 2025³

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
City of Truth or Consequences	6/29/1996	0	0	\$2,040,900	\$0
City of Truth or Consequences	6/26/2000	0	0	\$18,600	\$0
Sierra County	7/17/2002	0	0	\$44,400	\$0
Sierra County	9/11/2002	0	0	\$883,500	\$0
Sierra County	8/5/2004	0	0	\$16,900	\$0
Sierra County	2/11/2005	0	0	\$833,700	\$0
City of Truth or Consequences	7/8/2006	0	0	\$7,900	\$0
City of Truth or Consequences	8/13/2006	0	0	\$125,500	\$0
Sierra County	8/21/2006	0	0	\$31,400	\$0
City of Truth or Consequences	7/9/2008	0	0	\$436,200	\$0
Sierra County	7/13/2008	0	0	\$7,300	\$0
Sierra County	7/27/2008	0	0	\$14,600	\$0
Sierra County	8/31/2008	0	0	\$219,000	\$0
Sierra County	7/3/2009	0	0	\$14,900	\$0
Sierra County	8/24/2009	0	0	\$111,200	\$0
Sierra County	9/11/2009	0	0	\$185,100	\$0

³ Values are in 2025 dollars.

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JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
City of Truth or Consequences	7/25/2010	0	0	\$14,700	\$0
City of Truth or Consequences	9/13/2013	1	0	\$682,900	\$0
Sierra County	8/26/2014	0	0	\$4,100	\$0
Village of Williamsburg	7/26/2020	0	0	\$2,962,300	\$0
TOTALS		1	0	\$8,655,100	

Table 11-5. Summary of Historical Flood Events, January 1996 – June 2025

JURISDICTION	NUMBER OF EVENTS	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Sierra County	46	0	0	\$2,366,100	\$0
City of Elephant Butte	1	0	0	\$0	\$0
City of Truth or Consequences	11	1	0	\$3,326,700	\$0
Village of Williamsburg	3	0	0	\$2,962,300	\$0
TOTALS	61	1	0	\$8,655,100	

Based on the list of historical flood events for the Sierra County planning area, 6 events have occurred since the 2019 Plan.

SIGNIFICANT EVENTS

Flash Flood on September 13, 2013

Sierra County experienced flooding as a deep plume of moisture persisted over the region, driven by low-level moisture transport from the Gulf of Mexico and mid- to upper-level moisture from the Gulf of California. A total of 3.35 inches of rain was recorded at the New Mexico State Veterans Home. Intense rainfall resulted washed-out bridges and evacuations in the City of Truth or Consequences. According to local news reports, several dams were breached and more than 200 homes were evacuated. Multiple roads, including portions of Highway 187, were closed due to flood damage. State Police confirmed one fatality in Ash Canyon near the Elephant Butte Dam. This event resulted in an estimated \$682,900 (2025 dollars) in property damages.

Flash Flood on July 26, 2020

Flash flooding resulted from modest low-level moisture, substantial mid-level moisture, and a zone of surface convergence that supported the development of intense thunderstorms. Weak upper-level flow contributed to very slow storm motion, allowing more than four inches of rain to fall in a short period of time across central Sierra County.

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Extensive flash flooding was reported across the City of Truth or Consequences and the Village of Williamsburg, where both roads and buildings were inundated. Heavy rainfall produced near-zero visibility and was accompanied by pea-sized hail. At least one vehicle was reported washed off the roadway. Multiple homes in both jurisdictions were evacuated. Rising water levels on the Rio Grande threatened to exceed the riverbanks, prompting the closure of Elephant Butte Dam. This event resulted in \$8,655,100 (2025 dollars) in property damages for Sierra County.

PROBABILITY OF FUTURE EVENTS

Based on 61 recorded historical occurrences within a 29.5-year reporting period within the Sierra County planning area, including all participating jurisdictions, flooding is considered “Highly Likely,” meaning an event is probable within the next year.

CLIMATE CHANGE CONSIDERATIONS

According to FEMA, flooding is the most common and costly disaster in the United States, and this risk is constantly increasing due to increased wildfire risk and changes in precipitation patterns.

Even though the southwestern United States region is becoming more arid and annual rainfall is more likely to decrease than increase, precipitation events may actually increase in severity, when they do occur. This means that rain may fall faster in shorter periods of time, contributing to flash flood risk. Due to climate change, snowmelt-driven flooding is expected to occur earlier in the year.⁴ When rain falls on snow, it can result in more intense runoff and greater flood conditions during the spring months.

Wildfire risk is also expected to increase with climate change which can directly increase the risk of flooding in areas that have been burned. Wildfire destroys vegetation and burns the ground, meaning the soil is no longer able to absorb rainwater. It can take years for vegetation to be restored, increasing long term flood risk.

VULNERABILITY AND IMPACT

A property's vulnerability to a flood depends on its location and proximity to the floodplain. Structures that lie along banks of a waterway are the most vulnerable and can often be repetitive loss structures. Sierra County encourages development outside of the floodplain. Sierra County is at an increased level of flood risk due to the cascading impacts of wildfire events. The loss of vegetation, such as trees, shrubs, and soil, increases the speed and volume of stormwater runoff. Sierra County may experience more extreme flooding with greater impacts on the safety of people, structures, and the environment.

The impact for flood for the Sierra County planning area is considered limited in terms of structure and infrastructure damages with facilities and services potentially shut down for 24 hours or less, and less than ten percent of properties destroyed or with major damage. However, with one fatality reported from historical flood events, the flood impact for the Sierra County planning area would be considered “Substantial”, with multiple deaths and injuries possible depending on the size of the event.

⁴ Fifth National Climate Assessment. Southwest. <https://nca2023.globalchange.gov/chapter/28/>

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Table 11-6 includes the comprehensive critical facilities identified in Appendix D that were considered the most important to the planning area that are subject to a range of impacts due to flood and are located in the regulatory floodplain. For a comprehensive list of identified critical facilities by participating jurisdiction, please see Appendix D.

Table 11-6. Critical Facilities in the Floodplain

CRITICAL FACILITY TYPES	CRITICAL FACILITIES AT RISK	POTENTIAL IMPACTS
Emergency Response Departments (EOC, Fire, Police, EMS), Hospitals	Sierra County: 1 Fire Facility Village of Williamsburg: 1 Fire Facility	- Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. - Emergency vehicles can be damaged by rising floodwaters. - Flood-related rescues may be necessary at swift and low water crossings or in flooded neighborhoods where roads have become impassable, placing first responders in harm's way. - Evacuations may be required for entire neighborhoods because of rising floodwaters, further taxing limited response capabilities and increasing sheltering needs for displaced residents. - Power outages could disrupt communications, delaying emergency response times. - Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities. - Washed out roads and bridges can impede emergency response vehicle access to areas. - Increased number of structure fires due to gas line ruptures and downed power lines, further straining the capacity and resources of emergency personnel. - First responders are exposed to downed power lines, contaminated and unusual debris, hazardous materials, and generally unsafe conditions.
Airport, Academic Institutions, Community Residential Facilities, Day Care Facilities, Evacuation Centers & Shelters, Governmental Facilities	N/A	- Structures can be damaged by rising floodwaters. - Power outages could disrupt critical care. - Backup power sources could be damaged, inundated or otherwise inoperable. - Critical staff may be impacted and unable to report for duty, limiting response capabilities. - Evacuations may be necessary due to extended power outages, gas line ruptures, or inundation of facilities. - Additional emergency responders and critical aid workers may not be able to reach the area for days. - Power outages and infrastructure damage may prevent larger airports from acting as temporary command centers for logistics, communications, and emergency operations. - Temporary break in operations may significantly inhibit post event evacuations.

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CRITICAL FACILITY TYPES	CRITICAL FACILITIES AT RISK	POTENTIAL IMPACTS
		Damaged or destroyed highway infrastructure may substantially increase the need for airport operations.
Commercial Suppliers (food, gas, etc.)	N/A	- Facilities or infrastructure may be damaged, destroyed or otherwise inaccessible. - Essential supplies like medicines, water, food, and equipment deliveries may be significantly delayed.
Utility Services and Infrastructure (electric, water, wastewater, communications)	City of Truth or Consequences: 1 Energy Utility Facility, 1 Sanitation and Waste Facility Village of Williamsburg: 1 Sewage and Water Facility	- Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. - Emergency service vehicles can be damaged by rising floodwaters. - Flood-related rescues may be necessary at swift and low water crossings or in flooded neighborhoods where roads have become impassable, placing emergency service workers in harm's way. - Increased number of structure fires due to gas line ruptures and downed power lines, further straining the capacity and resources of emergency personnel. - Service responders are exposed to downed power lines, contaminated and unusual debris, hazardous materials, and generally unsafe conditions.

Historic loss estimates due to flood are presented in Table 11-7 below. Considering 61 flood events over a 29.5-year period, the frequency is approximately two events every year.

Table 11-7. Average Annualized Losses, January 1996 – June 2025

JURISDICTION	NUMBER OF EVENTS	PROPERTY & CROP LOSS	AVERAGE ANNUAL LOSS ESTIMATES
Sierra County	46	\$2,366,100	\$80,200
City of Elephant Butte	1	\$0	\$0
City of Truth or Consequences	11	\$3,326,700	\$112,800
Village of Williamsburg	3	\$2,962,300	\$100,400
TOTALS	61	\$8,655,100	\$293,400

While all citizens are at risk of the impacts of a flood, forced relocation and disaster recovery disproportionately impacts low-income residents who lack the financial means to travel, afford a long-term stay away from home, and to rebuild or repair their homes. In addition, due to factors like limited mobility, communication difficulties, medical needs, reliance on support services, transportation challenges, housing accessibility issues, and possible shortages in emergency shelter accommodations, the elderly, children, and people with disabilities are also disproportionately affected by flooding events. People who speak a language other than English

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may face increased vulnerability due to language barriers that limit their access to important information such as weather-related warnings and instructions regarding safety measures.

The population over 65 in the Sierra County planning area is estimated at 37 percent of the total population and children under the age of 5 are estimated at 4 percent. The population with a disability is estimated at 28 percent of the total population. In addition, an estimated 25 percent of the planning area population live below the poverty level and 4 percent of the populations speaks English “less than very well.”

Table 11-8. Populations Vulnerable to Flood Events⁵

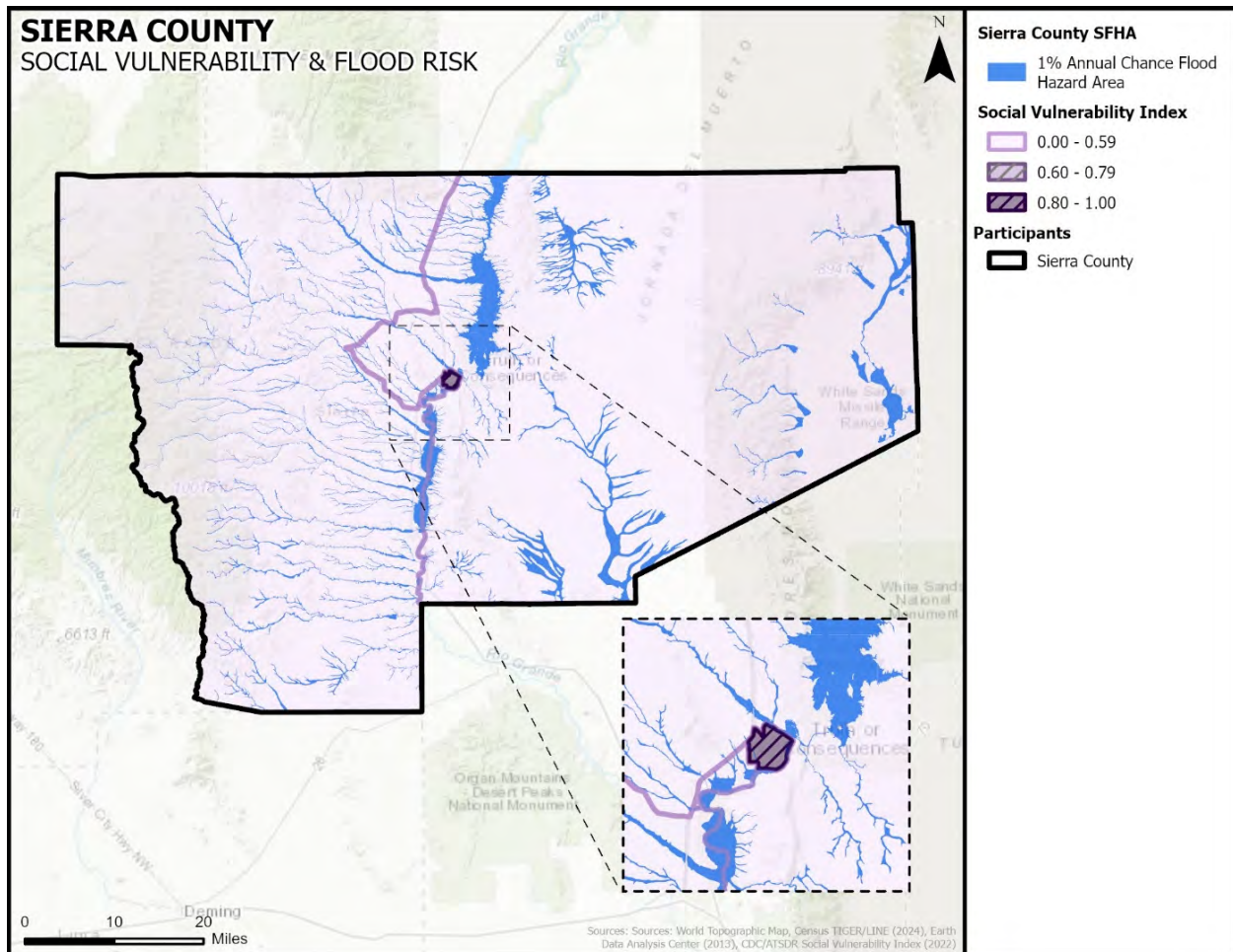
JURISDICTION	POPULATION				
	65 AND OLDER	UNDER 5	WITH A DISABILITY	BELOW POVERTY LEVEL	LIMITED ENGLISH SPEAKING
Sierra County	4,251	420	3,253	2,866	489
City of Elephant Butte	881	32	527	159	0
City of Truth or Consequences	1,354	369	1,468	2,097	187
Village of Williamsburg	173	19	222	131	72

The Center for Disease Control (CDC) created a Social Vulnerability Index (SVI) which includes a database and mapping application that identifies and quantifies communities experiencing social vulnerability. The current CDC SVI uses 16 U.S. census variables from the 5-year American Community Survey (ACS) to identify communities that may need support before, during, or after disasters. All 16 variables fall under four broad categories including socioeconomic status (population in poverty, unemployment, etc.), household characteristics (age, disability status, etc.), racial and ethnic minority status, and housing type and transportation (mobile homes, no vehicles, etc.). Populations experiencing social vulnerability may be adversely impacted by natural hazards, disasters, and other community-level stressors. Figure 11-5 identifies areas of social vulnerability using the CDC’s SVI and where these areas overlap Sierra County’s flood hazard areas.

⁵ U.S. Census Bureau Five-Year estimates.

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Figure 11-5. Sierra County Social Vulnerability and Flood Hazard Areas



ASSESSMENT OF IMPACTS

Flooding is the deadliest natural disaster that occurs in the U.S. each year, and it poses a constant and significant threat to the health and safety of the people in the Sierra County planning area. Impacts to the planning area can include:

- Flood-related rescues may be necessary at swift water and low water crossings or in flooded neighborhoods where roads have become impassable, placing first responders in harm's way.
- Evacuations may be required for entire neighborhoods because of rising floodwaters, further taxing limited response capabilities and increasing sheltering needs for displaced residents.
- Health risks and threats to residents are elevated after the floodwaters have receded due to contaminated floodwaters (untreated sewage and hazardous chemicals) and mold growth typical in flooded buildings and homes.
- Significant flood events often result in widespread power outages, increasing the risk to more vulnerable portions of the population who rely on power for health and/or life safety.

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- Extended power outages can result in an increase in structure fires and/or carbon monoxide poisoning, as individuals attempt to cook or heat their home with alternate, unsafe cooking or heating devices, such as grills.
- Floods can destroy or make residential structures uninhabitable, requiring shelter or relocation of residents in the aftermath of the event.
- First responders are exposed to downed power lines, contaminated and potentially unstable debris, hazardous materials, and generally unsafe conditions, elevating the risk of injury to first responders and potentially diminishing emergency response capabilities.
- Emergency operations and services may be significantly impacted due to damaged facilities.
- Significant flooding can result in the inability of emergency response vehicles to access areas of the community.
- Critical staff may suffer personal losses or otherwise be impacted by a flood event and be unable to report for duty, limiting response capabilities.
- County departments may be flooded, delaying response and recovery efforts for the entire community.
- Private sector entities that the planning area and its residents rely on, such as utility providers, financial institutions, and medical care providers, may not be fully operational and may require assistance from neighboring communities until full services can be restored.
- Damage to infrastructure may slow economic recovery since repairs may be extensive and lengthy.
- Some businesses not directly damaged by the flood may be negatively impacted while utilities are being restored or water recedes, further slowing economic recovery.
- When the community is affected by significant property damage it is anticipated that funding would be required for infrastructure repair and restoration, temporary services and facilities, overtime pay for responders, as well as normal day-to-day operating expenses.
- Displaced residents may not be able to immediately return to work, further slowing economic recovery.
- Residential structures substantially damaged by a flood may not be rebuilt for years and uninsured or underinsured residential structures may never be rebuilt, reducing the tax base for the community.
- Large floods may result in a dramatic population fluctuation, as people are unable to return to their homes or jobs and must seek shelter and/or work outside of the affected area.
- Businesses that are uninsured or underinsured may have difficulty reopening, which results in a net loss of jobs for the community and a potential increase in the unemployment rate.
- Recreation activities may be unavailable, and tourism can be unappealing for years following a large flood event, devastating directly related local businesses and negatively impacting economic recovery.
- Flooding may cause significant disruptions of clean water and sewer services, elevating health risks and delaying recovery efforts.
- The psychosocial effects on flood victims and their families can traumatize them for long periods of time, creating long term increases in medical treatment and services.

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- Extensive or repetitive flooding can lead to decreases in property value for the affected community.
- Flood poses a potential catastrophic risk to annual and perennial crop production and overall crop quality, leading to higher food costs.
- Flood related declines in production may lead to an increase in unemployment.
- Large floods may result in loss of livestock, potential increased livestock mortality due to stress and water borne disease, and increased cost for feed.

The overall extent of damage caused by floods is dependent on the extent, depth, and duration of flooding, in addition to the velocities of flows in the flooded areas. The level of preparedness and pre-event planning done by the community, local businesses, and citizens will contribute to the overall economic and financial conditions in the aftermath of a flood event.

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) PARTICIPATION

Flood insurance offered through the National Flood Insurance Program (NFIP) is the best way for home and business owners to protect themselves financially against the flood hazard. Sierra County, the City of Elephant Butte, the City of Truth or Consequences, and the Village of Williamsburg are participating in the NFIP and are in good standing.

As an additional indicator of floodplain management responsibility, communities may choose to participate in FEMA's Community Rating System (CRS). This is an incentive-based program that allows communities to undertake flood mitigation activities that go beyond NFIP requirements. Currently Sierra County and participating jurisdictions do not participate in the CRS. All participating jurisdictions may evaluate their capacity for CRS participation in the next planning cycle.

All NFIP participating communities currently have standard flood damage prevention ordinances in place which include minimum NFIP standards for new construction and substantial improvements of structures. However, all jurisdictions are considering adopting higher regulatory NFIP standards to limit or further regulate floodplain development.

The flood hazard areas throughout Sierra County are subject to periodic inundation, which may adversely affect public safety, resulting in loss of life and property, health and safety hazards, disruption of commerce and governmental services, and extraordinary public expenditures for flood protection and relief. Flood losses are created by the cumulative effect of obstructions in floodplains which cause an increase in flood heights and velocities. In addition, occupancy in flood hazard areas creates an increase in vulnerabilities to flood hazards as they typically are inadequately elevated, flood-proofed, or otherwise protected from flood damage. Mitigation actions are included to address flood maintenance issues as well, including routinely clearing debris from roadside ditches and bridges, and expanding drainage culverts and storm water structures to convey floodwater more adequately.

It is the purpose of Sierra County and participating jurisdictions to continue to promote public health, safety, and general welfare by minimizing public and private losses due to flood conditions in specific areas. Sierra County and participating jurisdictions are guided by their local Flood Damage Prevention Ordinance. All participating jurisdictions will continue to comply with NFIP requirements through their local permitting, inspection, and record-keeping requirements for new

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and substantially developed construction. Further, the NFIP program promotes sound development in floodplain areas and includes provisions designed to:

- Protect human life and health;
- Minimize expenditure of public money for costly flood control projects;
- Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- Minimize prolonged business interruptions;
- Minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets, and bridges located in floodplains;
- Help maintain a stable tax base by providing for the sound use and development of flood-prone areas in such a manner as to minimize future flood blight areas; and
- Ensure that potential buyers are notified that property is in a flood area.

In order to accomplish these tasks, Sierra County and participating jurisdictions seek to observe the following guidelines in order to achieve flood mitigation:

- Restrict or prohibit uses that are dangerous to health, safety, or property in times of flood, such as filling or dumping, that may cause excessive increases in flood heights or velocities;
- Require that uses vulnerable to floods, including facilities, which serve such uses, be protected against flood damage at the time of initial construction, as a method of reducing flood losses;
- Control the alteration of natural floodplains, stream channels, and natural protective barriers, which are involved in the accommodation of floodwaters;
- Control filling, grading, dredging, and other development, which may increase flood damage; and
- Prevent or regulate the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards to other lands.

NFIP COMPLIANCE AND MAINTENANCE

Sierra County and all participating jurisdictions have developed mitigation actions that relate to either NFIP maintenance or compliance. Compliance and maintenance actions can be found in Section 23.

Flooding was identified as a high-risk hazard during hazard ranking activities at the Risk Assessment Workshop by the majority of the planning team. As such, many of the mitigation actions were developed with flood mitigation in mind. A majority of these flood actions address compliance with the NFIP and implementing flood awareness programs. The planning area recognizes the need and are working towards adopting higher NFIP regulatory standards to further minimize flood risk in their community. In addition, the county is focusing on public flood awareness activities. This includes promoting the availability of flood insurance by placing NFIP brochures and flyers in public libraries or public meeting places.

All NFIP participating jurisdictions have a designated floodplain administrator. The floodplain administrator will continue to maintain compliance with the NFIP, including continued floodplain administration, zoning ordinances, and development regulation. The floodplain ordinance

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adopted by Sierra County outlines the minimum requirements for development in Special Flood Hazard Areas.

All NFIP participating jurisdictions have a permitting process in place and the local floodplain administrator is responsible for coordinating inspections of damaged homes located in the floodplain. Following a flood event, local officials inspect damaged homes to make a substantial damage determination. Substantially damaged homes must be brought into compliance. Similarly, proposed improvements to homes located in the floodplain are reviewed by the local building official to determine if a substantial improvement is proposed. The floodplain administrator oversees permitted repairs and improvements to ensure compliance during the rebuilding or improvement process.

REPETITIVE LOSS

The Flood Mitigation Assistance (FMA) Grant Program under FEMA provides federal funding to assist states and communities in implementing mitigation measures to reduce or eliminate the long-term risk of flood damage to buildings that are insured under the National Flood Insurance Program. The New Mexico Department of Homeland Security and Emergency Management administers the FMA grant program for the State of New Mexico. One of the goals of the FMA program is to reduce the burden of repetitive loss and severe repetitive loss properties on the NFIP through mitigation activities that significantly reduce or eliminate the threat of future flood damages.

Repetitive Loss properties are defined as structures that are:

- Any insurable building for which 2 or more claims of more than \$1,000 each, paid by the National Flood Insurance Program (NFIP) within any 11-year period, since 1978;
- May or may not be currently insured under the NFIP.

Severe Repetitive Loss properties are defined as structures that are:

- Covered under the NFIP and have at least 4 flood related damage claim payments (building and contents) over \$5,000.00 each, and the cumulative amount of such claims payments exceed \$20,000; or
- At least 2 separate claim 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.

Sierra County, the City of Elephant Butte, the City of Truth or Consequences, and the Village of Williamsburg have no Repetitive Loss or Severe Repetitive Loss properties.

Section 12

Hail



SECTION 12: HAIL

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HAZARD DESCRIPTION

Hail is precipitation in the form of round masses and irregular lumps consisting of layers of ice and compact snow. Hail is formed inside of thunderstorm updrafts and can be particularly damaging to the built environment and infrastructure.

During the developmental stages of a hailstorm, ice crystals form within a low-pressure front due to the rapid rising of warm air into the upper atmosphere, and the subsequent cooling of the air mass. Frozen droplets gradually accumulate into ice crystals until they fall as precipitation that is round or irregularly shaped masses of ice typically greater than 0.75 inches in diameter. The size of hailstones is a direct result of the size and severity of the storm. High velocity updraft winds are required to keep hail in suspension in thunderclouds. The strength of the updraft is a by-product of heating on the Earth's surface. Higher temperature gradients above Earth's surface result in increased suspension time and hailstone size.



Hail falls when it becomes heavy enough to overcome the strength of the thunderstorm updraft and is pulled toward the earth by gravity. Smaller hailstones can be blown away from the updraft by horizontal winds, so larger hail typically falls closer to the updraft than smaller hail. If the winds near the surface are strong enough, hail can fall at an angle or even nearly sideways. Wind-driven hail can tear up siding on houses, break windows and blow into houses, break side windows on cars, and cause severe injury or death to people and animals.

There is no clear distinction between storms that do and do not produce hailstones. Nearly all severe thunderstorms probably produce hail aloft, though it may melt before reaching the ground. In all cases, the hail falls when the thunderstorm's updraft can no longer support the weight of the ice. The stronger the updraft, the larger the hailstone can grow, and the greater the potential for loss or damage.¹

¹ National Oceanic and Atmospheric Administration, National Severe Storms Laboratory, Severe Weather 101.

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LOCATION

Hailstorms are an extension of severe thunderstorms that could potentially cause severe damage. In New Mexico, hail most commonly occurs during monsoon season between June and the end of September. Hail events are not confined to any specific geographic location and can vary greatly in size, location, intensity, and duration. Therefore, the entire Sierra County planning area, including all participating jurisdictions, is equally at risk to the hazard of hail. Refer to Figure 12-1 for the location of past hail events in the planning area.

EXTENT

The National Weather Service (NWS) classifies a storm as “severe” if there is hail three-quarters of an inch in diameter (approximately the size of a penny) or greater, based on radar intensity or as seen by observers. The intensity category of a hailstorm depends on hail size and the potential damage it could cause, as depicted in the National Centers for Environmental Information (NCEI) Intensity Scale in Table 12-1.

Table 12-1. Hail Intensity and Magnitude²

SIZE CODE	INTENSITY CATEGORY	SIZE (diameter inches)	DESCRIPTIVE TERM	TYPICAL DAMAGE
H0	Hard Hail	Up to 0.33	Pea	No damage
H1	Potentially Damaging	0.33 – 0.60	Marble	Slight damage to plants and crops
H2	Potentially Damaging	0.60 – 0.80	Dime	Significant damage to plants and crops
H3	Severe	0.80 – 1.20	Nickel	Severe damage to plants and crops
H4	Severe	1.2 – 1.6	Quarter	Widespread glass and auto damage
H5	Destructive	1.6 – 2.0	Half Dollar	Widespread destruction of glass, roofs, and risk of injuries
H6	Destructive	2.0 – 2.4	Ping Pong Ball	Aircraft bodywork dented and brick walls pitted
H7	Very Destructive	2.4 – 3.0	Golf Ball	Severe roof damage and risk of serious injuries
H8	Very Destructive	3.0 – 3.5	Hen Egg	Severe damage to all structures
H9	Super Hailstorms	3.5 – 4.0	Tennis Ball	Extensive structural damage, could cause fatal injuries
H10	Super Hailstorms	4.0 +	Baseball	Extensive structural damage, could cause fatal injuries

² NCEI Intensity Scale, based on the TORRO Hailstorm Intensity Scale.

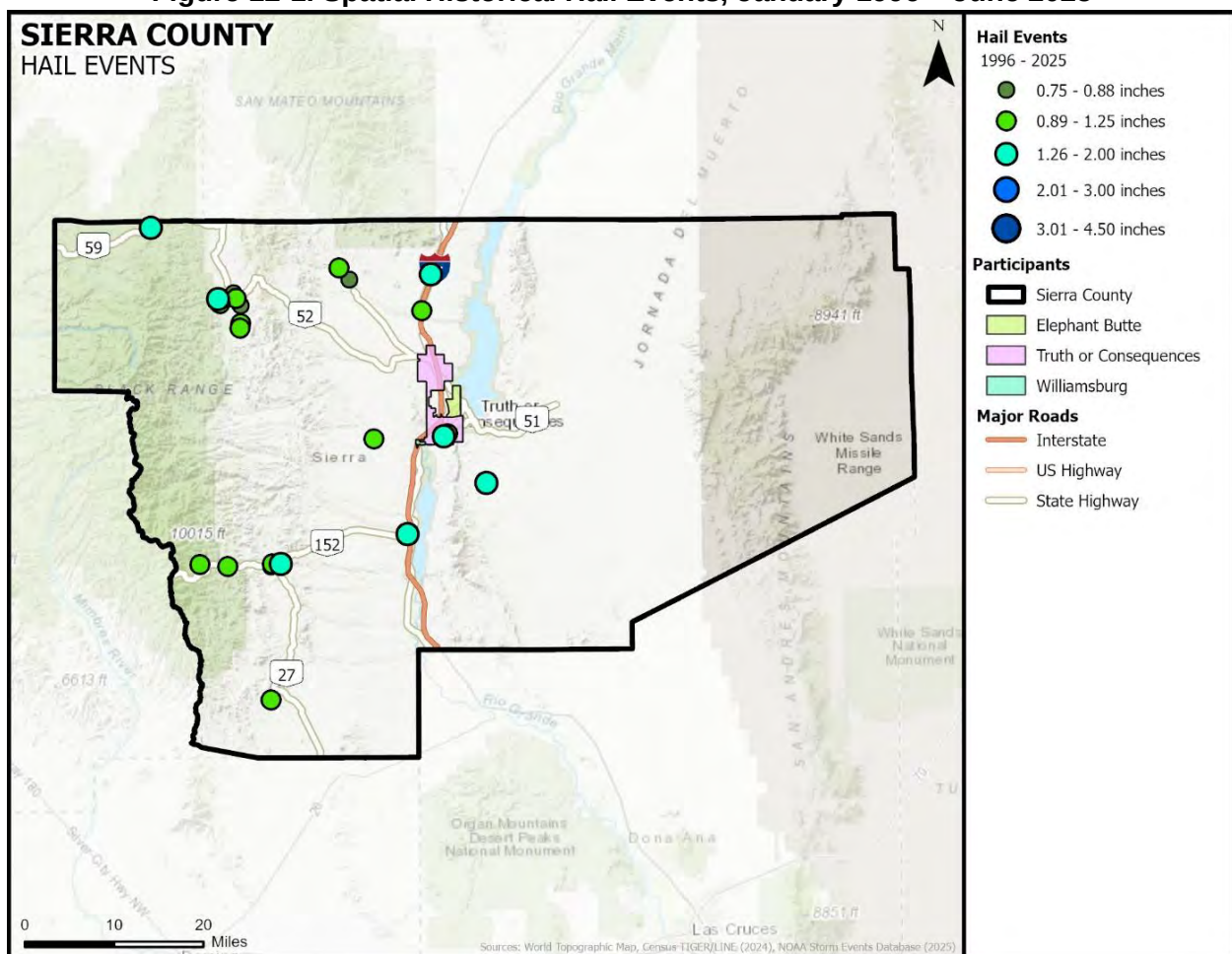
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The intensity scale in Table 12-1 ranges from H0 to H10, with increments of intensity or damage potential in relation to hail size (distribution and maximum), texture, fall speed, speed of storm translation, and strength of the accompanying wind. Based on the best available data regarding the previous occurrences for the area, the Sierra County planning area may experience hailstorms ranging from an H0 (pea size) to an H7 (golf ball size). The largest size hail to be reported was 2.5 inches in diameter, or an H7, which is considered a very destructive hailstorm that can cause severe roof damage and cause serious injuries. This record event occurred on May 20, 1991, and caused significant damages. H7 is likely the greatest extent the planning area can anticipate in the future, based on historical records. Refer to the Historical Occurrences section below for more details on damaging hail events in Sierra County and all participating jurisdictions.

HISTORICAL OCCURRENCES

Historical evidence shown in Figure 12-1 demonstrates that the planning area is vulnerable to hail events overall. Historical events reported within the planning area are listed in Table 12-2. A total of 30 reported historical hail events impacted the Sierra County planning area from January 1996 to June 2025; these events were reported to NCEI and NOAA databases and may not represent all hail events to have occurred during the past 29.5 years. Only those events for the Sierra County planning area with latitude and longitude available were plotted (Figure 12-1).

Figure 12-1. Spatial Historical Hail Events, January 1996 – June 2025



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Table 12-2. Historical Hail Events, January 1996 – June 2025³

JURISDICTION	DATE	MAGNITUDE (inches)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Sierra County	7/4/1997	1	0	0	\$0	\$0
Sierra County	8/4/1998	1	1	0	\$0	\$0
City of Truth or Consequences	6/26/2000	1.25	0	0	\$0	\$0
Sierra County	6/14/2002	1	0	0	\$8,900	\$0
Sierra County	8/10/2002	1.25	0	0	\$0	\$0
Sierra County	10/23/2002	1	0	0	\$0	\$0
Sierra County	6/27/2003	0.75	0	0	\$0	\$0
Sierra County	4/3/2004	1.25	0	0	\$0	\$0
City of Truth or Consequences	9/24/2004	1.75	0	0	\$16,900	\$0
City of Truth or Consequences	6/1/2006	1	0	0	\$0	\$0
Sierra County	6/28/2007	1.75	0	0	\$0	\$0
Sierra County	10/10/2007	1	0	0	\$0	\$0
Sierra County	6/20/2008	1.75	0	0	\$0	\$0
Sierra County	8/20/2008	1.75	0	0	\$0	\$0
Sierra County	4/18/2010	0.88	0	0	\$0	\$0
City of Truth or Consequences	9/15/2011	1.75	0	0	\$0	\$0
Sierra County	4/9/2012	1	0	0	\$0	\$0
Sierra County	5/8/2012	1.75	0	0	\$0	\$0
Sierra County	5/12/2012	0.75	0	0	\$0	\$0
Sierra County	7/8/2015	1	0	0	\$0	\$0
Sierra County	7/9/2015	1	0	0	\$0	\$0
Sierra County	7/9/2015	0.88	0	0	\$0	\$0
Sierra County	4/22/2016	0.75	0	0	\$0	\$0
Sierra County	9/30/2016	0.75	0	0	\$0	\$0

³ Monetary damages have been inflated to their 2025 value.

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JURISDICTION	DATE	MAGNITUDE (inches)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Village of Williamsburg	10/9/2016	1	0	0	\$0	\$0
City of Truth or Consequences	6/24/2017	1	0	0	\$0	\$0
Sierra County	10/19/2017	1.75	0	0	\$0	\$0
City of Truth or Consequences	6/13/2019	1.25	0	0	\$0	\$0
Sierra County	2/10/2020	0.75	0	0	\$0	\$0
Sierra County	6/24/2020	0.75	0	0	\$0	\$0
TOTALS		(MAX EXTENT)	1	0	\$25,800	\$0

Table 12-3. Historical Hail Events Summary, January 1996 – June 2025⁴

JURISDICTION	NUMBER of EVENTS	MAX MAGNITUDE (inches)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Sierra County	23	1.75	1	0	\$8,900	\$0
City of Elephant Butte	0	-	-	-	-	-
City of Truth or Consequences	6	1.75	0	0	\$16,900	\$0
Village of Williamsburg	1	1	0	0	\$0	\$0
TOTALS	30	(MAX EXTENT)	1	0	\$25,800	

Based on the list of historical hail events for the Sierra County planning area, three of the events have occurred since the 2019 Plan according to reports in the NCEI database.

SIGNIFICANT EVENTS

May 20, 1991

Late in the evening, large hail up to 2.5 inches in diameter impacted wide areas of Sierra and Dona Ana counties. A variety of hail damages were felt within the planning area including destroyed crops, shattered windows, automobile damage, and severed phone lines. The hail from this event, which reportedly accumulated up to two inches deep, is the largest magnitude hail reported historically within Sierra County.

⁴ Participating jurisdictions with no reported events show a “-” in table columns where damages, deaths or injuries would be otherwise reported.

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June 14, 2002

A severe afternoon thunderstorm brought large quantities of quarter-size hail to Sierra County, with hail accumulations reaching up to eight inches in some areas. The hail's weight caused the partial collapse of the roof on a new home in the Lake Valley area, resulting in an estimated \$8,900 (2025 dollars) in property damage.

September 24, 2004

Golf ball size hail accumulated up to four inches deep on Interstate 25 south of the City of Truth or Consequences, causing multiple automobile accidents. No injuries were reported, though total monetary damages from the accidents were estimated at \$16,900 (2025 dollars).

PROBABILITY OF FUTURE EVENTS

Based on available records of historic events, 30 events in a 29.5-year reporting period for the Sierra County planning area provides an average annual occurrence of approximately one event per year. This frequency supports a “Highly Likely” probability of future events for the Sierra County planning area, including all participating jurisdictions.

CLIMATE CHANGE CONSIDERATIONS

Although the impact of climate change on the frequency and severity of hail events is uncertain, some climate studies attempt to give insight on the future conditions of hailstorms. As ocean temperatures rise due to climate change, more moisture is evaporating into the atmosphere. The warm and moist air masses that fuel severe weather may become more unstable on average, which could favor the increased development of thunderstorms and hail. However, it is also suggested that in a warming climate, the average melting level will rise in thunderstorms, meaning small hailstones will have more of a chance to melt as they fall to the ground. Therefore, hail may become less frequent, but large hail can be expected when it does occur, leading to the possibility of increased damages.⁵

VULNERABILITY AND IMPACT

Sierra County has a vast, historically, and culturally significant agriculture industry which is a crucial part of the planning area's economy. According to the USDA 2022 Census of Agriculture, there are 269 farms over a total of 1,070,677 acres throughout Sierra County. While NCEI reported damages are limited, historically much of the damage inflicted by hail is to crops. Even relatively small hail can shred plants to ribbons in a matter of minutes. Impacts to crops can also have effects on the local economy; the estimated total value of agricultural products sold in Sierra County in 2022 was \$21,338,000.⁶ All farms throughout the county may be more susceptible to substantial hail damage.

Vehicles and the roofs of buildings and homes are often damaged by hail. Utility systems on roofs of buildings and critical facilities would be vulnerable and could be damaged. Hail could cause a significant threat to people, as they could be struck by hail and falling trees and branches. Outdoor

⁵ Yale Climate Connections, Hailstorms and Climate Change, March 17, 2022.

⁶ USDA, New Mexico Agricultural Statistics 2023-2024 Annual Bulletin.

https://www.nass.usda.gov/Statistics_by_State/New_Mexico/Publications/Annual_Statistical_Bulletin/2023-2024/2023-2024-NM-Ag-Statistics.pdf

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activities and events may elevate the risk to residents and visitors when a hailstorm strikes with little warning. Portable buildings typically utilized by schools and commercial sites such as construction areas would be more vulnerable to hail events than the typical site-built structures.

The Sierra County planning area features mobile or manufactured homes throughout the planning area. These homes are typically more vulnerable to hail events than typical site-built structures. The U.S. Census data indicates a total of 3,390 (42 percent of total housing stock) manufactured homes located in the Sierra County planning area. In addition, 45 percent (approximately 3,703 structures) of the housing structures in the Sierra County planning area were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damage during significant wind events.

Table 12-4. Structures at Greater Risk by Participating Jurisdiction

JURISDICTION	STRUCTURES	
	SFR BUILT BEFORE 1980	MANUFACTURED HOMES
Sierra County	3,703	3,390
City of Elephant Butte	261	899
City of Truth or Consequences	2,130	1,086
Village of Williamsburg	170	223

While all citizens are at risk of the impacts of hail and disaster recovery disproportionately impacts low-income residents who lack the financial means to repair their homes. An estimated 25 percent of the planning area population live below the poverty level (Table 12-5). While warning times for this type of hazard events should be substantial enough for these individuals to seek shelter, the elderly, children, and people with a disability may have trouble taking shelter due to mobility issues or a lack of awareness, making them more susceptible to injury or harm. In addition, people who speak a language other than English may face increased vulnerability due to language barriers that limit their access to important information such as weather-related warnings and instructions regarding safety measures.

Table 12-5. Populations at Greater Risk by Jurisdiction⁷

JURISDICTION	POPULATION				
	65 AND OLDER	UNDER 5	WITH A DISABILITY	BELOW POVERTY LEVEL	LIMITED ENGLISH SPEAKING
Sierra County	4,251	420	3,253	2,866	489
City of Elephant Butte	881	32	527	159	0
City of Truth or Consequences	1,354	369	1,468	2,097	187

⁷ US Census Bureau 2023 data.

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JURISDICTION	POPULATION				
	65 AND OLDER	UNDER 5	WITH A DISABILITY	BELOW POVERTY LEVEL	LIMITED ENGLISH SPEAKING
Village of Williamsburg	173	19	222	131	72

The Sierra County Planning Team identified the following critical facilities (Table 12-6) as assets that are considered the most important to the planning area and are susceptible to a range of impacts caused by hail events. For a comprehensive list by participating jurisdiction, see Appendix D.

Table 12-6. Critical Facilities Vulnerable to Hail

CRITICAL FACILITY TYPE	POTENTIAL IMPACTS
Emergency Response Services (EOC, Fire, Police, EMS), Hospitals and Medical Centers	- Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. - Emergency vehicles can be damaged by hailstones. - Power outages could disrupt communications, delaying emergency response times. - Accumulated hail on the streets may impede emergency response vehicle access to areas.
Airport, Academic Institutions, Animal Shelter, Evacuation Centers & Shelters, Governmental Facilities, Residential/ Assisted Living Facilities	- Structures can be damaged by hailstones. - Power outages could disrupt critical care. - Backup power sources could be damaged. - Evacuations may be necessary due to extended power outages, gas line ruptures, or structural damage to facilities. - Power outages and infrastructure damage may prevent larger airports from acting as temporary command centers for logistics, communications, and emergency operations. - Temporary break in operations may significantly inhibit post event evacuations. - Damaged or destroyed highway infrastructure may substantially increase the need for airport operations.
Commercial Supplier (food, fuel, etc.)	- Facilities or infrastructure may be damaged, destroyed or otherwise inaccessible. - Essential supplies like medicines, water, food, and equipment deliveries may be significantly delayed.
Utility Services and Infrastructure (electric, water, wastewater, communications)	- Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. - Power outages could disrupt communications, delaying emergency response times. - Accumulated hail on the streets may impede service response vehicle access to areas.

Overall, the total loss estimate of property and crops in the planning area is \$25,800 (2025 dollars) with an average annualized loss of \$900. Based on historic loss and damages to property and crops, the impact of hail on the Sierra County planning area would be considered limited in severity of impact, meaning critical facilities and services shut down for 24 hours or less and less than 10 percent of property destroyed or with major damage. However, with one fatality being

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reported due to hail, the impact of hail on the Sierra County planning area, including all participating jurisdictions, is considered “Substantial,” meaning the potential for fatal injuries depending on the size and severity of the event.

Table 12-7. Estimated Annualized Losses

JURISDICTION	TOTAL PROPERTY & CROP LOSS	AVERAGE ANNUAL LOSS ESTIMATES
Sierra County	\$8,900	\$300
City of Elephant Butte	\$0	\$0
City of Truth or Consequences	\$16,900	\$600
Village of Williamsburg	\$0	\$0
TOTALS	\$25,800	\$900

ASSESSMENT OF IMPACTS

Hail events have the potential to pose a significant risk to people and can create dangerous situations. Hail conditions can be frequently associated with a variety of impacts, including:

- Hail may create hazardous road conditions during and immediately following an event, potentially delaying critical staff from reporting for duty as well as delaying first responders from providing for or preserving public health and safety.
- Individuals and first responders who are exposed to the storm may be struck by hail, falling branches, or downed trees resulting in injuries or possible fatalities.
- Large hail events will likely cause extensive roof damage to residential structures along with siding damage and broken windows, creating a spike in insurance claims and a rise in premiums, and potentially result in physical harm to occupants.
- Automobile damage may be extensive depending on the size of the hail and length of the storm.
- Hail events can result in power outages over widespread areas increasing the risk to more vulnerable portions of the population who rely on power for health and/or life safety.
- Extended power outage can result in an increase in structure fires and/or carbon monoxide poisoning, as individuals attempt to cook or heat their home with alternate, unsafe cooking or heating devices, such as grills.
- First responders are exposed to downed power lines, damaged structures, hazardous spills, and debris that often accompany hail events, elevating the risk of injury to first responders and potentially diminishing emergency response capabilities.
- Some businesses not directly damaged by the hail event may be negatively impacted while roads are cleared and utilities are being restored, further slowing economic recovery.
- Businesses that are more reliant on utility infrastructure than others may suffer greater damage without a backup power source.
- Depending on the severity and scale of damage caused by large hail events, damage to power transmission and distribution infrastructure can require days or weeks to repair.

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- A significant hail event could significantly damage agricultural crops, resulting in extensive economic losses for the community and surrounding area.
- Hail events may injure or kill livestock and wildlife or destroy wildlife habitat
- A large hail event could impact the accessibility of recreational areas and parks due to extended power outages or debris clogged access roads.
- Historical sites and properties are placed at a higher risk of impact due to materials used and the inability to change properties due to their historic status. There are 32 historical entries listed on the National Register of Historic Places for Sierra County and 54 sites listed on the New Mexico State Register of Cultural Properties.

The economic and financial impacts of hail will depend entirely on the scale of the event, what is damaged, and how quickly repairs to critical components of the economy can be implemented. The level of preparedness and pre-event planning conducted by the community, local businesses, and citizens will contribute to the overall economic and financial conditions in the aftermath of any hail event.

Section 13

High Wind



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HAZARD DESCRIPTION



Wind is the horizontal motion of the air past a given point, beginning with differences in air pressures. Pressure that is higher at one place than another sets up a force pushing from high toward low pressure: the greater the difference in pressures, the stronger the force. The distance between the area of high pressure and the area of low pressure also determines how fast the moving air accelerates.

High wind events, those that sustain speeds of 40 mph or greater according to the National Weather Service (NWS), are often associated with severe thunderstorms. These wind events can cause significant property and crop damages. Winds in Sierra County are typically straight-line winds, which are generally any thunderstorm wind that is not associated with rotation or tornados. Straight line winds are responsible for most high wind damages. One type of straight-line wind, the downburst, is a small area of rapidly descending air beneath a thunderstorm. A downburst can cause damage equivalent to a strong tornado and make air travel extremely hazardous. In addition, these strong winds and thunderstorm winds can sometimes blow large amounts of dust and debris, creating dust storms. Strong thunderstorm winds may become more frequent or extreme during monsoon season, which begins in June and ends in October.

High winds can also occur in the absence of other definable hazard conditions creating “windstorms.” According to the NWS, high winds not associated with thunderstorms are often referred to as gradient winds. They are usually the result of tight pressure gradients between strong areas of low pressure and high pressure. These strong winds can be just as strong as thunderstorm wind gusts, but cover a much larger area, and can result in widespread damage.

LOCATION

High wind events can develop in any geographic location and are considered a common occurrence across the State of New Mexico. These storms develop randomly and are not confined to any geographic area within the county. It is assumed that the entire Sierra County planning area, including all participating jurisdictions, is uniformly exposed to the threat of high winds.

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EXTENT

The extent or magnitude of a high wind event is measured by the Beaufort Wind Scale. Table 13-1 describes the different intensities of wind in terms of speed and effects, from calm to violent and destructive.

Table 13-1. Beaufort Wind Scale¹

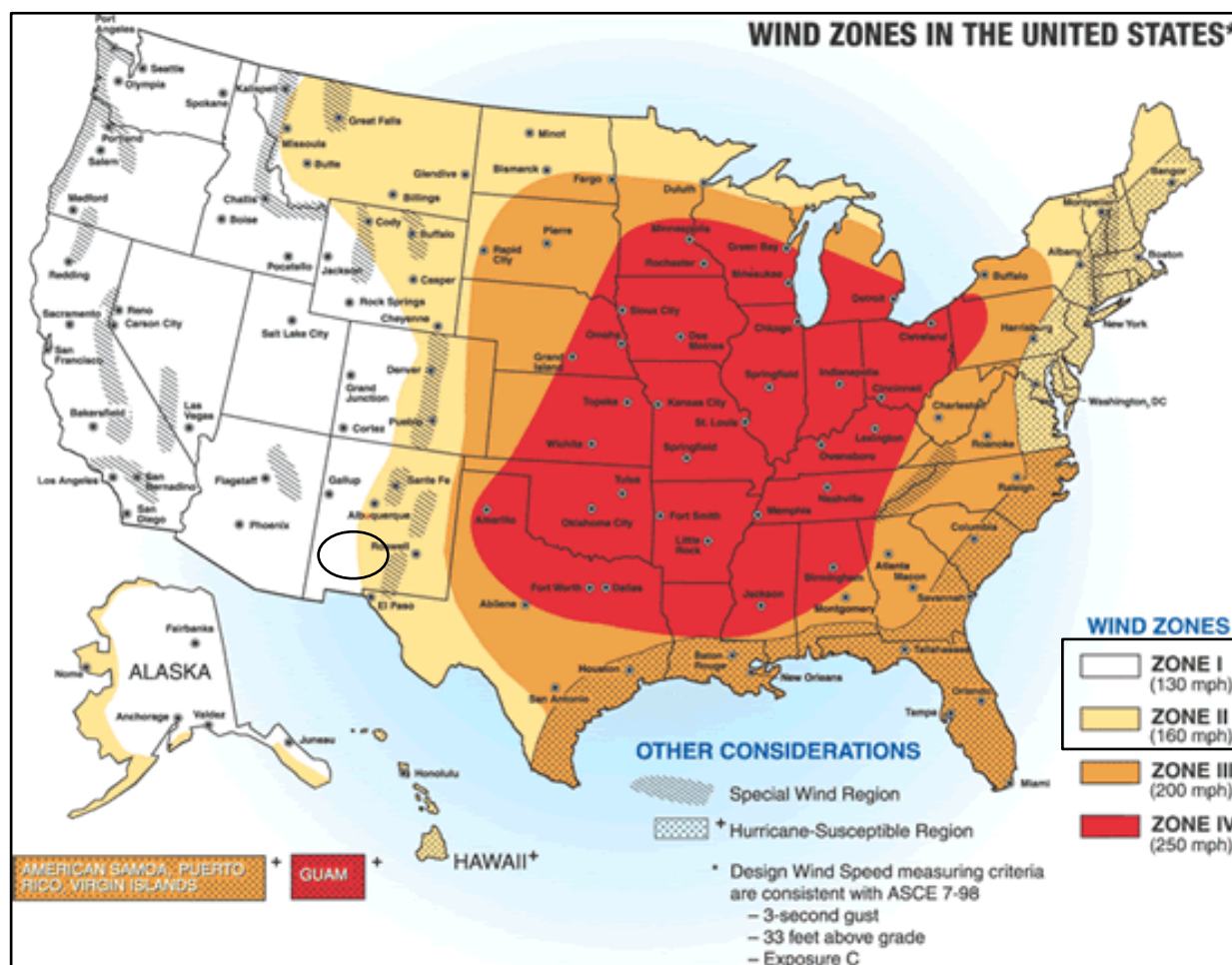
FORCE	WIND SPEED		WMO CLASSIFICATION	APPEARANCE OF WIND EFFECTS
	mph	knots		
0	Less than 1	Less than 1	Calm	Calm, smoke rises vertically
1	1-3	1-3	Light Air	Smoke drift indicates wind direction, still wind vanes
2	4-7	4-6	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
3	8-12	7-10	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
4	13-18	11-16	Moderate Breeze	Dust, leaves and loose paper lifted, small tree branches move
5	19-24	17-21	Fresh Breeze	Small trees in leaf begin to sway
6	25-31	22-27	Strong Breeze	Larger tree branches moving, whistling in wires
7	32-38	28-33	Near Gale	Whole trees moving, resistance felt walking against wind
8	39-46	34-40	Gale	Whole trees in motion, resistance felt walking against wind
9	47-54	41-47	Strong Gale	Slight structural damage occurs, slate blows off roofs
10	55-63	48-55	Storm	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	64-72	56-63	Violent Storm	If experienced on land, widespread damage
12	72-83	64-71	Hurricane	Violence and destruction

Figure 13-1 displays the wind zones as derived from NOAA.

¹ Source: World Meteorological Organization.

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Figure 13-1. Wind Zones in the United States²



On average, the planning area experiences approximately two wind events every year. The Sierra County planning area is located within Wind Zones I and II, meaning it can experience maximum winds between 130 and 160 mph. The Sierra County planning area has experienced a significant wind event, or an event with winds in the range of “Force 12” on the Beaufort Wind Scale with winds above 72 mph. This is the worst to be anticipated for the entire planning area based on historic events.

Based on a search of past events from January 1996 through June 2025, the strongest event reported in the planning area occurred on March 18, 2025, with reported wind speeds of 88 knots, or 101 mph. Historically, there have been 13 reported events in the planning area with “Force 12” winds (above 72 mph) since 1996.

HISTORICAL OCCURRENCES

The National Centers for Environmental Information (NCEI) Storm Events database is a national data source organized under the National Oceanic and Atmospheric Administration. The NCEI is the largest archive available for historic storm events data; however, it is important to note that

² The Sierra County planning area is indicated by the black oval.

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only incidents recorded in the NCEI have been factored into this risk assessment unless otherwise noted. It is likely that a high number of occurrences have gone unreported over the past 29.5 years. Tables 13-2, 13-3, and 13-4 depict historical occurrences of high wind events for the Sierra County planning area according to the NCEI database.

Since 1996, 65 high wind events are known to have occurred in the Sierra County planning area. Table 13-4 presents information on known historical events impacting the Sierra County planning area, resulting in damages, injuries, or fatalities. It is important to note that high wind events associated with tornadoes are not accounted for in this section. Property damage estimates are not always available. Table 13-5 provides event and damage summaries for each participating jurisdiction. Where an estimate has been provided in a table for losses, the dollar amounts have been modified for inflation to indicate the damage in 2025 dollars.

Table 13-2. Historical High Wind Speeds, January 1996 – June 2025

MAXIMUM WIND SPEED RECORDED (knots)	NUMBER OF REPORTED EVENTS
0-30	0
31-40	0
41-50	13
51-60	30
61-70	11
71-80	6
81-90	3
91-100+	0
Unknown	2

**Table 13-3. Historical Wind Event Types as Reported in the NCEI,
January 1996 – June 2025**

TYPE	NUMBER OF REPORTED EVENTS
Dust Storm	2
High Wind	45
Strong Wind	0
Thunderstorm Wind	18

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Table 13-4. Damaging Historical High Wind Events, January 1996 – June 2025³

JURISDICTION	DATE	MAGNITUDE (knots)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Sierra County	4/10/2001	60	0	0	\$18,100	\$0
Sierra County	5/22/2005	45	0	0	\$8,300	\$0
City of Elephant Butte	6/28/2008	43	0	0	\$36,600	\$0
Sierra County	7/31/2008	56	0	0	\$7,300	\$0
Sierra County	7/28/2009	61	0	0	\$6,000	\$0
Sierra County	4/1/2010	54	0	0	\$29,400	\$0
Sierra County	4/29/2010	60	0	0	\$22,100	\$0
City of Truth or Consequences	7/1/2013	74	0	0	\$137,000	\$0
City of Elephant Butte	8/17/2015	61	0	0	\$1,476,200	\$0
City of Truth or Consequences	7/19/2017	61	0	0	\$39,200	\$0
Sierra County	3/14/2025	83	0	0	\$20,000	\$0
TOTALS		(MAX EXTENT)	0	0	\$1,800,200	\$0

Table 13-5. Summary of Historical Events by Jurisdiction, January 1996 – June 2025⁴

JURISDICTION	NUMBER OF EVENTS	MAGNITUDE (knots)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Sierra County	58	88	0	0	\$111,200	\$0
City of Elephant Butte	3	61	0	0	\$1,512,800	\$0
City of Truth or Consequences	4	74	0	0	\$176,200	\$0
Village of Williamsburg	0	-	-	-	-	-
TOTALS	65	(MAX EXTENT)	0	0	\$1,800,200	

Based on the list of historical high wind events for the Sierra County planning area, 39 of the events have occurred since the 2019 Plan according to reports in the NCEI database.

³ Only recorded events with damages are listed; no events causing fatalities or injuries were reported. Monetary damages are inflated to their 2025 value. Magnitude is listed when available.

⁴ Participating jurisdictions with no reported events show a “-” in table columns where damages, deaths or injuries would be otherwise reported.

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SIGNIFICANT EVENTS

July 1, 2013

Severe thunderstorms brought damaging wind gusts ranging from 70 to 90 mph to Sierra County, causing significant impacts in Elephant Butte State Park. During the storm, 12 RV trailers were blown over with several being displaced as far as 40 yards. Additionally, several homes in the City of Elephant Butte lost their porches and suffered roof damage. Total property damage was estimated at \$137,000 (2025 dollars).

August 17, 2015

A mid-afternoon severe thunderstorm developed in Sierra County over the southern portion of Elephant Butte Lake, bringing torrential rain and wind gusts over 70 mph. These strong winds significantly damaged a marina at the lake, with impacts including several damaged boats, collapsed metal roofs, and concrete slabs anchoring the marina's structures being pulled out of the water. Total property damage was estimated at \$1,476,200 (2025 dollars), making this the most damaging high wind event reported within the planning area.

March 14, 2025

Overnight, a fast-moving trough moving into New Mexico was preceded by incredibly strong wind gusts which entered Sierra County in the early morning. Peak wind speeds of 95 mph were recorded at San Augustin Pass, with additional high wind speeds ranging from 63 to 87 mph observed elsewhere in the county. Impacts from these winds included uprooted trees and property damage in the White Sands Missile Range Headquarters residential area, as well as a boat being blown into an RV. In total, property damage was estimated at \$20,000.

PROBABILITY OF FUTURE EVENTS

Most high winds occur during the spring, with April and May being the windiest month for New Mexico, with March and June following. Based on available records of historic events, there have been a total of 65 events in a 29.5-year reporting period, which provides a probability of approximately two to three events every year. Even though the intensity of high wind events is not always damaging for the Sierra County planning area, the frequency of occurrence for a high wind event is "Highly Likely", meaning an event is probable in the next year.

CLIMATE CHANGE CONSIDERATIONS

The impacts on the frequency and severity of severe wind events due to climate change are unclear. However, as ocean temperatures rise due to climate change, more moisture is evaporating into the atmosphere. The warm and moist air masses that fuel severe weather may become more unstable on average, which could favor the increased development of thunderstorms and wind related events. It is suspected that an increase in thunderstorms would mean an increase in damaging winds, but there is limited data available to understand the full scope of future climate change impacts at this time.

VULNERABILITY AND IMPACT

Vulnerability is difficult to evaluate since high wind events can occur at different strength levels, in random locations, and can create relatively narrow paths of destruction. Due to the randomness of these events, all existing and future structures, and facilities within the Sierra County planning

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area could potentially be impacted and remain vulnerable to possible injury and property loss from strong winds.

Trees, power lines and poles, signage, manufactured housing, radio towers, concrete block walls, storage barns, windows, garbage receptacles, brick facades, and vehicles, unless reinforced, are vulnerable to high wind events. More severe damage involves windborne debris; in some instances, patio furniture and other lawn items have been reported to have been blown around by wind and, very commonly, debris from damaged structures in turn have caused damage to other buildings not directly impacted by the event. In numerous instances roofs have been reported as having been torn off of buildings. The portable buildings typically used at schools and construction sites would be more vulnerable to high wind events than typical site-built structures and could potentially pose a greater risk for wind-blown debris.

According to the U.S. Census data, a total of 3,390 manufactured homes are located in the Sierra County planning area (42 percent of total housing stock). In addition, 3,703 structures (45 percent of total housing stock) of the housing units were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damage during significant wind events.

Table 13-6. Structures at Greater Risk by Participating Jurisdiction

JURISDICTION	STRUCTURES	
	SFR BUILT BEFORE 1980	MANUFACTURED HOMES
Sierra County	3,703	3,390
City of Elephant Butte	261	899
City of Truth or Consequences	2,130	1,086
Village of Williamsburg	170	223

While all citizens are vulnerable to the impacts of high wind, forced relocation and disaster recovery disproportionately impacts low-income residents who lack the financial means to repair their homes. An estimated 25 percent of the planning area population live below the poverty level (Table 13-7). While warning times for these types of hazard events should be substantial enough for these individuals to seek shelter, the elderly, children, and people with a disability may have trouble taking shelter due to mobility issues or a lack of awareness, making them more susceptible to injury or harm. In addition, people who speak a language other than English may face increased vulnerability due to language barriers that limit their access to important information such as weather-related warnings and instructions regarding safety measures.

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Table 13-7. Populations at Greater Risk by Participating Jurisdiction⁵

JURISDICTION	POPULATION				
	65 AND OLDER	UNDER 5	WITH A DISABILITY	BELOW POVERTY LEVEL	LIMITED ENGLISH SPEAKING
Sierra County	4,251	420	3,253	2,866	489
City of Elephant Butte	881	32	527	159	0
City of Truth or Consequences	1,354	369	1,468	2,097	187
Village of Williamsburg	173	19	222	131	72

The Sierra County Planning Team identified the following critical facilities (Table 13-8) as assets that are considered the most important to the planning area and are susceptible to a range of impacts caused by high wind events. The critical infrastructure with the greatest vulnerability to thunderstorms are power and communications facilities. Failures of these facilities can result in a loss of service and cascading impacts such as posing enormous risk to individuals dependent on electricity as a medical necessity. For a comprehensive list by participating jurisdiction, see Appendix D.

Table 13-8. Critical Facilities Vulnerable to High Wind Event

CRITICAL FACILITY TYPE	POTENTIAL IMPACTS
Emergency Response Services (EOC, Fire, Police, EMS), Hospitals and Medical Centers	- Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. - Emergency vehicles can be damaged by falling trees or flying debris. - Power outages could disrupt communications, delaying emergency response times. - Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities. - Debris / downed trees can impede emergency response vehicle access to areas. - Increased number of structure fires due to gas line ruptures and downed power lines, further straining the capacity and resources of emergency personnel. - First responders are exposed to downed power lines, unstable and unusual debris, hazardous materials, and generally unsafe conditions.
Airport, Academic Institutions, Animal Shelter, Evacuation Centers & Shelters, Governmental Facilities,	- Structures can be damaged by falling trees or flying debris. - Power outages could disrupt critical care. - Backup power sources could be damaged. - Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities.

⁵ US Census Bureau 2023 data for Sierra County.

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CRITICAL FACILITY TYPE	POTENTIAL IMPACTS
Residential/ Assisted Living Facilities	• Evacuations may be necessary due to extended power outages, gas line ruptures, or structural damage to facilities. • Power outages and infrastructure damage may prevent larger airports from acting as temporary command centers for logistics, communications, and emergency operations. • Temporary break in operations may significantly inhibit post event evacuations. • Damaged or destroyed highway infrastructure may substantially increase the need for airport operations.
Commercial Supplier (food, fuel, etc.)	• Facilities, infrastructure, or critical equipment including communications may be damaged, destroyed or otherwise inoperable. • Essential supplies like medicines, water, food, and equipment deliveries may be delayed. • Economic disruption due to power outages and fires negatively impact airport services as well as area businesses reliant on airport operations.
Utility Services and Infrastructure (electric, water, wastewater, communications)	• Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. • Emergency vehicles can be damaged by falling trees or flying debris. • Power outages could disrupt communications, delaying emergency response times. • Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities. • Debris / downed trees can impede emergency response vehicle access to areas. • Increased number of structure fires due to gas line ruptures and downed power lines, further straining the capacity and resources of emergency personnel.

A high wind event can also result in traffic disruptions, injuries and in rare cases, fatalities. There have been no reported injuries or fatalities due to high wind events in the Sierra County planning area. Overall, in the past 29.5 years there has been an estimated total of \$1,800,200 in damages (2025 dollars) in the Sierra County planning area due to high wind events. The estimated average annual loss from high wind events is \$61,000. Based on historic loss and damages, the impact of high wind on the Sierra County planning area, including all participating jurisdictions, is considered “Limited” severity, meaning minor quality of life lost, critical facilities and services shut down for 24 hours or less, and less than 10 percent of property destroyed or with major damage.

Table 13-9. Estimated Annualized Losses by Participating Jurisdiction

JURISDICTION	TOTAL PROPERTY & CROP LOSS	AVERAGE ANNUAL LOSS ESTIMATES
Sierra County	\$111,200	\$3,800
City of Elephant Butte	\$1,512,800	\$51,300

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JURISDICTION	TOTAL PROPERTY & CROP LOSS	AVERAGE ANNUAL LOSS ESTIMATES
City of Truth or Consequences	\$176,200	\$6,000
Village of Williamsburg	\$0	\$0
TOTALS	\$1,800,200	\$61,000

ASSESSMENT OF IMPACTS

High wind events have the potential to pose a significant risk to people and can create dangerous and difficult situations for public health and safety officials. High wind conditions can be frequently associated with a variety of impacts, including:

- Individuals exposed to the storm can be struck by flying debris, falling limbs, or downed trees causing serious injury or death.
- Structures can be damaged or crushed by falling trees, which can result in physical harm to the occupants.
- Significant debris and downed trees can result in emergency response vehicles being unable to access areas of the community.
- Downed power lines may result in roadways being unsafe for use, which may prevent first responders from answering calls for assistance or rescue.
- High wind events often result in widespread power outages increasing the risk to more vulnerable portions of the population who rely on power for health and/or life safety.
- Extended power outage often results in an increase in structure fires and carbon monoxide poisoning, as individuals attempt to cook or heat their homes with alternate, unsafe cooking or heating devices, such as grills.
- Critical staff may be unable to report for duty, limiting response capabilities.
- Private sector entities that residents rely on, such as utility providers, financial institutions, and medical care providers may not be fully operational and may require assistance from neighboring communities until full services can be restored.
- Economic disruption negatively impacts the programs and services provided by the community due to short- and long-term loss in revenue.
- Some businesses not directly damaged by high wind events may be negatively impacted while roads are cleared and utilities are being restored, further slowing economic recovery.
- Older structures, specifically those built before 1980 (45 percent of the planning area), were built to less stringent building codes and may suffer greater damage as they are typically more vulnerable to high winds.
- Recreational areas such as community parks and green spaces may be damaged or inaccessible due to downed trees or debris, causing temporary impacts to associated businesses in the area.
- Historical sites and properties are placed at a higher risk of impact due to materials used and the inability to change properties due to their historic status. There are 32 historical entries listed on the National Register of Historic Places for Sierra County and 54 sites listed on the New Mexico State Register of Cultural Properties.

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The economic and financial impacts of high winds on the area will depend entirely on the scale of the event, what is damaged, and how quickly repairs to critical components of the economy can be implemented. The level of preparedness and pre-event planning done by the community, local businesses, and citizens will also contribute to the overall economic and financial conditions in the aftermath of any high wind event.

Section 14

Landslide & Rockfall



SECTION 14: LANDSLIDE AND ROCKFALL

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HAZARD DESCRIPTION



The United States Geological Survey (USGS) defines a landslide as any movement of rock, earth, or debris at a downward slope. There are five types of movement associated with landslides including falls, topples, slides, spreads, and flows. There are also several types of landslides, and each one is associated with a specific movement type.

Two common types of landslides in the Sierra County planning area include rockfall and debris flow. Debris flow is the hazardous flows of rock, mud, sediment, and water down mountain slopes and often occurs after intense rainfall. A rockfall is the descent of loose and free-falling rocks, which can range from small pebbles to very large boulders.

Landslides occur in all 50 states but primarily in coastal and mountainous areas of the western United States, in the mountainous regions of the eastern United States, and in Hawaii and Alaska. Landslides in the United States cause billions of dollars in damages every year and kills between 25 and 50 people annually. These fatalities are usually caused by rockfalls, rockslides, and debris flows.¹

The landscape in the State of New Mexico makes it prone to landslide events. Debris flow poses the greatest risk to communities in New Mexico due to their association with burned landscapes from widespread wildfires. Rockfalls have also caused deaths within the state and often cause tens of thousands of dollars in damage each year. The greatest concern for rockfall is along highways, which often need to be shut down due to debris or rocks blocking roads.²

LOCATION

The New Mexico Bureau of Geology created statewide maps depicting the susceptibility of communities to landslides and rockfalls. The susceptibility of the Sierra County planning area is described in Figure 14-1. While the entire planning area is at some risk of landslides, the map

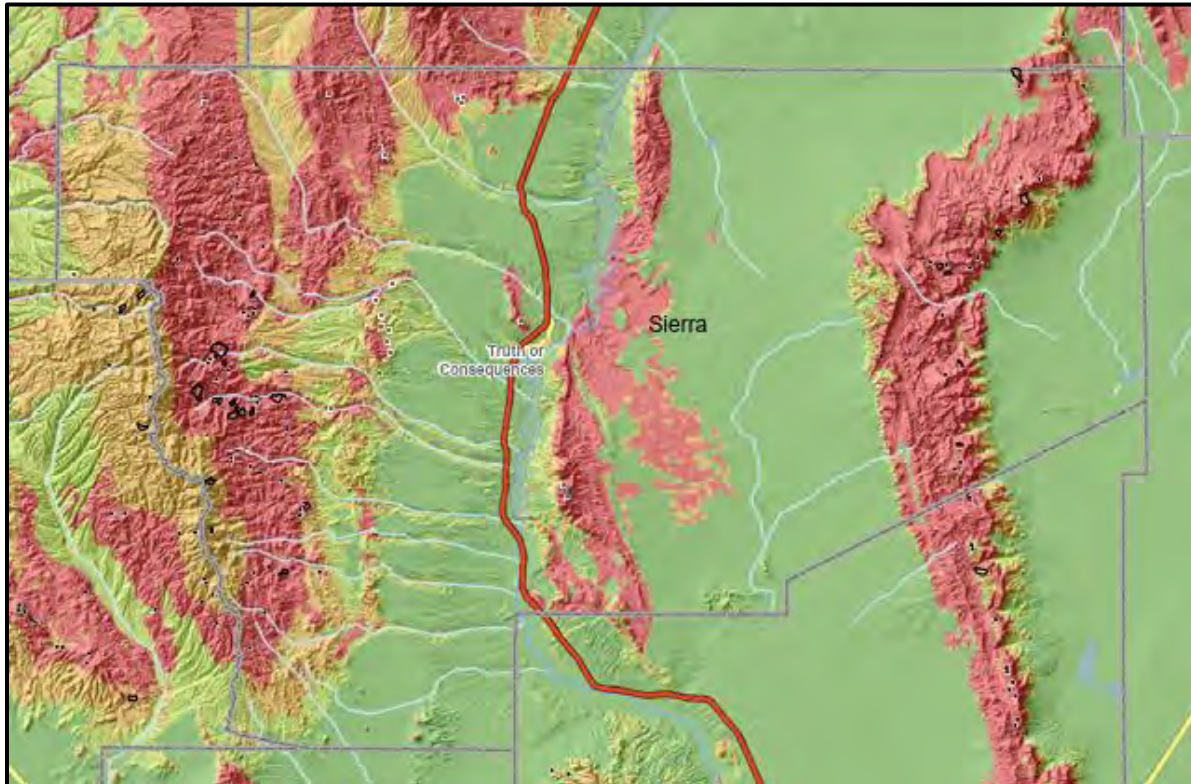
¹ USGS. Landslide Types and Processes. <https://pubs.usgs.gov/fs/2004/3072/fs-2004-3072.html>

² New Mexico Bureau of Geology and Mineral Resources. Dangers of Steep Slopes: Landslides, Rockfalls, and Debris Flows in New Mexico. https://geoinfo.nmt.edu/publications/periodicals/earthmatters/20/n1/em_v20_n1.pdf

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conveys where a landslide event is most likely to occur ranging from unlikely (green) to likely (red), as described in Figure 14-2. The planning area ranges from “unlikely” to “likely” susceptibility, with the most “likely” areas located along roadways within the mountainous portions of the county.

Figure 14-1. Areas Susceptible to Landslide³



³ New Mexico Bureau of Geology and Mineral Resources. Deep-Seated Landslide Susceptibility Map of New Mexico. https://geoinfo.nmt.edu/publications/openfile/downloads/500-599/594/Plate1/Plate1_LandslideSusceptibilityMap_PlotSize.pdf

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Figure 14-2. Susceptibility Classes

	Likely susceptible	Regions with landscape settings comparable to those of known landslide-affected areas; these regions likely include locations that are susceptible to deep-seated landsliding.
	Moderately likely susceptible	Regions with landscape settings moderately comparable to those of known landslide-affected areas; these regions are moderately likely to include locations that are susceptible to deep-seated landsliding.
	Potentially susceptible	Regions with landscape settings weakly comparable to those of known landslide-affected areas; these regions may include locations that are susceptible to deep-seated landsliding.
	Unlikely susceptible	Regions with landscape settings generally dissimilar to those of known landslide-affected areas; these regions are unlikely to include locations that are susceptible to deep-seated landsliding.

EXTENT

Severe landslides, rockfall, or debris flow events can impact widespread areas, move long distances, and exert considerable force, leading to infrastructure damage and loss of life. Landslides can be classified by using the Alexander Scale (Table 14-1) which measures intensity based on structural damage caused by landslides. It is possible that the planning area may experience the full extent of the Alexander Scale depending on the size and location of the landslide, especially in the “likely susceptible” areas depicted in Figure 14-1 above.

Table 14-1. Alexander Scale for Landslide Damage to Buildings

CLASSIFICATION	DAMAGE LEVEL	DESCRIPTION
1	Negligible	Hairline cracks in walls or structural members; no distortion of structure or detachment of external architectural details.
2	Light	Buildings continue to be habitable, repair not urgent. Settlement of foundations, distortion of structure, and inclination of walls are not sufficient to compromise overall stability.
3	Moderate	Walls out of perpendicular by one or two degrees, or there has been substantial cracking in structural members, or the foundations have settled during differential subsidence of at least 6 inches; building requires evacuation and rapid attention to ensure its continued life.
4	Serious	Walls out of perpendicular by several degrees; open cracks in walls; fracture of structural members; fragmentation of masonry; differential settlement of at least 10 inches compromising foundations; floors may be inclined by one or two degrees or ruined by heave. Internal partition walls will need to

SECTION 14: LANDSLIDE AND ROCKFALL

CLASSIFICATION	DAMAGE LEVEL	DESCRIPTION
		be replaced; door and window frames are too distorted to use; occupants must be evacuated, and major repairs carried out.
5	Very Serious	Walls out of plumb by five or six degrees; structure grossly distorted; differential settlement has seriously cracked floors and walls or caused major rotation or slewing of the building. Partition walls and brick infill will have at least partly collapsed; roofs may have partially collapsed; outhouses, porches, and patios may have been damaged more seriously than the principal structure itself. Occupants will need to be re-housed on a long-term basis, and rehabilitation of the building will probably not be feasible.
6	Partial Collapse	Requires immediate evacuation of the occupants and cordoning off the site to prevent accidents with falling masonry.
7	Total Collapse	Requires clearance of the site.

HISTORICAL OCCURRENCES

The National Centers for Environmental Information (NCEI) reports no debris flow events for the Sierra County planning area and there is limited data available regarding previous landslides and rockfall events. However, there has been one major disaster declaration issued for the Sierra County planning area. The following section provides a description of these events. It is likely that similar events have occurred in the past but have not been reported.

Table 14-2. Disaster Declarations for Mudslides

YEAR	DECLARATION TITLE	DECLARATION TYPE	DISASTER NO.
2013	Severe Storms, Flooding, and Mudslides in New Mexico	DR	DR-4152-NM

SIGNIFICANT EVENTS

October 29, 2013

A Major Disaster Declaration was issued on October 29, 2013. The severe storms, flooding, and mudslides occurred September 9 through September 13, 2013, damaging public facilities and roads in 14 New Mexico counties. According to National Weather Service reports, two locations in the planning area were significantly impacted by this event. A large culvert near County Road A6 along Canadian River and Tinaja Creek washed out with major bank erosion, and a bridge was washed away with major bank erosion near County Road A7 along Canadian River. There is no estimated potential dollar loss from this event for the Sierra County planning area.

PROBABILITY OF FUTURE EVENTS

With limited reports of landslide events, it can be difficult to calculate the probability of future events. Based on available historical data, future landslide events are considered “Unlikely” for the Sierra County planning area, including all participating jurisdictions, with an event probable in the next ten years.

SECTION 14: LANDSLIDE AND ROCKFALL

CLIMATE CHANGE CONSIDERATIONS

While total rainfall is expected to remain the same or decrease in the Southwest region, the rainfall events that do occur will increase in severity. This increase in severe precipitation events has the potential to cause more debris flows and landslides. In addition, wildfire intensity and frequency is expected to increase. Wildfires destroy natural vegetation meaning the ground is no longer able to soak up rainfall, which can be particularly dangerous in severe rainfall events. This will cause an increase in post-fire debris flow which is particularly hazardous because they can occur with little warning, can exert great impulsive loads on objects in their paths, can strip vegetation, block drainage ways, damage structures, and endanger human life.⁴

VULNERABILITY AND IMPACT

Landslides and rockfall events pose the greatest risk to critical highways and thoroughfares located in high risk areas of the county. Falling rocks and debris can damage roads and bridges, requiring extensive and costly repairs. Debris can also block roads, highways, and transportation routes, disrupting emergency services and travel. Landslides can also damage buildings and other infrastructure, potentially leading to full collapse depending on the severity of the event. While it is less common, people can be injured or killed if they are caught in the path of falling debris. It is also possible that a rockfall or landslide could impact the environment by affecting one of the rivers running through the area, possibly causing blockages and backwater flooding. The amount of monetary damage associated with previous events is unknown, but costs related to property damage can be expected in the future.

While many structures on or near deep sloping terrain in the planning area are at some risk of damage from a landslide (or cascading impacts such as backwater flooding), those located in the highest susceptibility areas are at greatest risk. Older and manufactured homes can also be more vulnerable due to construction materials and/or non-compliant construction practices. Structures with older or lightweight foundations are more susceptible to collapse and ground movement. Older homes may be located in areas with higher landslide or rockfall risk, such as areas with steep slopes or areas prone to erosion, due to historical land use practices. According to the U.S. Census data, a total of 3,390 manufactured homes are located in the Sierra County planning area (42 percent of total housing stock). In addition, approximately 3,703 structures (45 percent of total housing stock) of the housing units were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damage during landslide events.

Table 14-3. Structures at Greater Risk by Participating Jurisdiction

JURISDICTION	STRUCTURES	
	SFR BUILT BEFORE 1980	MANUFACTURED HOMES
Sierra County	3,703	3,390
City of Elephant Butte	261	899

⁴ USGS. What should I know about wildfires and debris flows? <https://www.usgs.gov/faqs/what-should-i-know-about-wildfires-and-debris-flows>

SECTION 14: LANDSLIDE AND ROCKFALL

JURISDICTION	STRUCTURES	
	SFR BUILT BEFORE 1980	MANUFACTURED HOMES
City of Truth or Consequences	2,130	1,086
Village of Williamsburg	170	223

While all citizens are vulnerable to the impacts of landslide, forced relocation and disaster recovery disproportionately impacts low-income residents who lack the financial means to travel, afford a long-term stay away from home, and to rebuild or repair their homes. An estimated 25 percent of the planning area population live below the poverty level (Table 14-4). The elderly, children, and people with a disability may have trouble evacuating if needed, making them more susceptible to injury or harm. In addition, people who speak a language other than English may face increased vulnerability due to language barriers that limit their access to important information regarding safety measures. The population over 65 in the Sierra County planning area is estimated at 37 percent of the total population and children under the age of 5 are estimated at 4 percent. The population with a disability is estimated at 28 percent of the total population and 4 percent of the populations speak English “less than very well” (Table 14-4).

Table 14-4. Populations at Greater Risk by Jurisdiction⁵

JURISDICTION	POPULATION				
	65 AND OLDER	UNDER 5	WITH A DISABILITY	BELOW POVERTY LEVEL	LIMITED ENGLISH SPEAKING
Sierra County	4,251	420	3,253	2,866	489
City of Elephant Butte	881	32	527	159	0
City of Truth or Consequences	1,354	369	1,468	2,097	187
Village of Williamsburg	173	19	222	131	72

The Sierra County Planning Team identified the following critical facilities (Table 14-5) as assets that are considered the most important to the planning area and are susceptible to a range of impacts caused by landslide events. The critical infrastructure with the greatest vulnerability are transportation structures and municipal infrastructure. Failures of these facilities can result in a loss of service and cascading impacts. For a comprehensive of critical facilities by participating jurisdiction, see Appendix D.

⁵ US Census Bureau 2022 data for Sierra County.

SECTION 14: LANDSLIDE AND ROCKFALL

Table 14-5. Critical Facilities Vulnerable to Landslide / Rockfall

CRITICAL FACILITY TYPE	POTENTIAL IMPACTS
Emergency Response Services (EOC, Fire, Police, EMS), Hospitals and Medical Centers	• Emergency operations and services may be significantly impacted due to damaged facilities. • Damaged roads or transportation structures can impede emergency response vehicle access to areas. • Fire stations, police stations, and hospitals may suffer structural damage, affecting their ability to function effectively during emergencies. • Landslide related emergencies may require the deployment of additional resources and personnel to impacted areas, and personnel may be exposed to unsafe conditions.
Airport, Academic Institutions, Animal Shelter, Evacuation Centers & Shelters, Governmental Facilities, Residential/ Assisted Living Facilities	• Structures and homes can be damaged and may potentially collapse, leading to higher operating levels at evacuation shelters. • Blocked roads and damaged transportation infrastructure could disrupt critical care. • Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities. • Evacuations may be necessary due to structural damage to facilities. • Infrastructure damage may prevent larger airports from acting as temporary command centers for logistics, communications, and emergency operations. • Temporary break in operations may significantly inhibit post event evacuations. • Damaged or destroyed highway infrastructure may substantially increase the need for airport operations.
Commercial Supplier (food, fuel, etc.)	• Facilities, infrastructure, or critical equipment including communications may be damaged, destroyed or otherwise inoperable. • Essential supplies like medicines, water, food, and equipment deliveries may be delayed, especially with blocked or damaged roads. • Economic disruption due to infrastructure damage negatively impact commercial services and distribution.
Utility Services and Infrastructure (electric, water, wastewater, communications)	• Emergency operations and services may be significantly impacted due to damaged facilities. • Damaged roads or transportation structures can impede emergency response vehicle access to areas. • Fire stations, police stations, and hospitals may suffer structural damage, affecting their ability to function effectively during emergencies. • Landslide related emergencies may require the deployment of additional resources and personnel to impacted areas, and personnel may be exposed to unsafe conditions.

The Sierra County planning area, including all participating jurisdictions, is predominantly at moderate risk for landslides. Future vulnerability is not expected to be substantial but could be

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significant if roadways and/or structures are impacted. The impact of landslides experienced in the Sierra County planning area has resulted in no reported injuries or fatalities, supporting a “Limited” severity of impact meaning injuries and/or illnesses are treatable with first aid, shutdown of facilities and services for 24 hours or less, and less than 10 percent of property is destroyed or with major damage.

ASSESSMENT OF IMPACTS

Landslides and rockfall events have the potential to pose a significant risk to people and can create dangerous and difficult situations for public health and safety officials. Landslide can be associated with a variety of impacts, including:

- Response personnel, including utility workers, public works personnel, debris removal staff, tow truck operators, and other first responders, are subject to injury or illness.
- Response personnel would be required to travel in potentially hazardous conditions, elevating the life safety risk due to accidents and damaged roads.
- Power and water outages are possible throughout the planning area due to damaged power lines, underground water pipes, and other damaged utility infrastructure.
- Emergency response and service operations may be impacted by limitations on access and mobility if roadways are closed, or obstructed.
- Depending on the severity and scale of damage caused by landslides, damage to critical infrastructure can require weeks to repair.
- Buildings, homes, and other structures can collapse, potentially trapping residents.
- Significant rock and debris can result in emergency response vehicles being unable to access areas of the community.
- Emergency operations and services may be significantly impacted due to damaged facilities, loss of communications, and damaged emergency vehicles and equipment.
- Private sector entities such as utility providers, financial institutions, and medical care providers may not be fully operational and may require assistance from neighboring communities until full services can be restored.
- Some businesses not directly damaged by landslides may be negatively impacted while roads are restored, further slowing economic recovery.
- Older structures built to less stringent building codes may suffer greater damage as they are typically more vulnerable to impacts of landslides.
- Historical sites and properties are placed at a higher risk of impact due to materials used and the inability to change properties due to their historic status. There are 32 historical sites listed on the National Register of Historic Places for Sierra County and 54 sites listed on the New Mexico State Register of Cultural Properties.

The economic and financial impacts of landslides on the area will depend entirely on the scale of the event, what is damaged, and how quickly repairs to critical components of the economy can be implemented. The level of preparedness and pre-event planning done by the community, local businesses, and citizens will also contribute to the overall economic and financial conditions in the aftermath of any landslide event.

Section 15

Land Subsidence



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HAZARD DESCRIPTION



Land subsidence is often described as the gradual or sudden sinking of the Earth's surface. Land subsidence typically happens slowly and goes unnoticed unless it reaches extreme levels, as seen in rare catastrophic sinkhole events. According to the United States Geological Survey (USGS), subsidence is a global problem, and in the United States more than 17,000 square miles in 45 States have been directly affected by subsidence.

Most subsidence is caused by human behavior such as mining, oil and gas extraction, and groundwater pumping from major and minor aquifer systems. The excessive removal of groundwater from aquifers that possess soluble or compressible layers may undergo an increase in erosion, compaction, and subsurface collapse. Even if the groundwater is returned to their average levels, most of land subsidence consequences are irreversible.

More than 80 percent of land subsidence in the United States is caused by groundwater use. Subsidence is an often-overlooked environmental consequence of land and water-use practices.¹ New Mexico heavily relies on groundwater sources, and they account for an estimated 87 percent of the state's public water supply.² Increased development and population growth in Sierra County, or the participating jurisdictions could increase the demand for groundwater, and therefore, increase land subsidence risk.

LOCATION

Land subsidence can be widespread and impact entire states, or it can be small and localized. The entire Sierra County planning area is at some risk for subsidence. While land subsidence is commonly caused by groundwater pumping, collapse features, like sinkholes, tend to be associated with different rock types such as evaporites (salt, gypsum, and anhydrite) and carbonates (limestone and dolomite). Evaporite rocks make up an estimated 40 percent of the

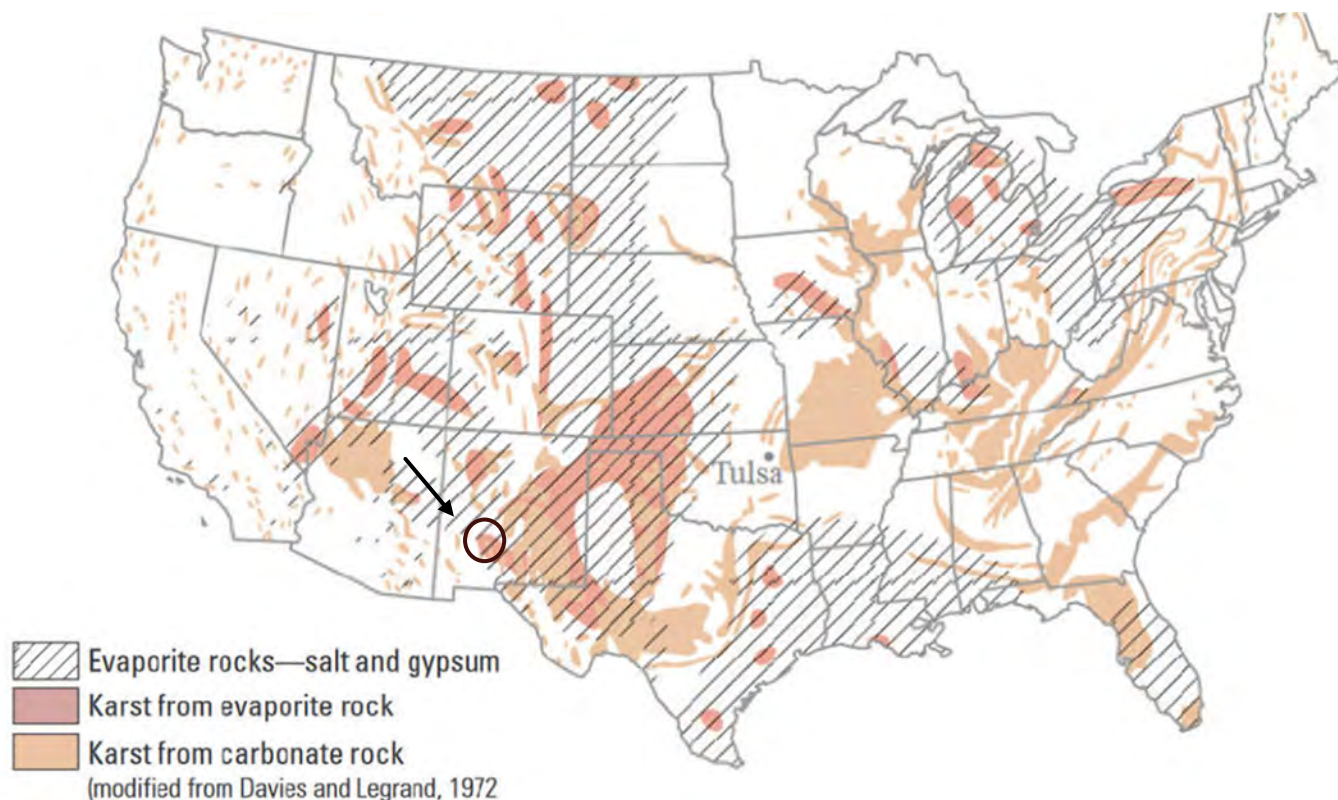
¹ United States Geological Survey (USGS). Land Subsidence. <https://www.usgs.gov/mission-areas/water-resources/science/land-subsidence>

² Environmental Protection Agency (EPA). Saving Water in New Mexico. <https://www.epa.gov/sites/default/files/2017-02/documents/ws-ourwater-new-mexico-state-fact-sheet.pdf>

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United States and are more susceptible to dissolution. The map below shows prominent areas of the United States made up of these rock types. Land subsidence can occur anywhere, but these areas are at higher risk of larger underground cavities and sinkholes.

Figure 15-1. Areas Prone to Collapse³



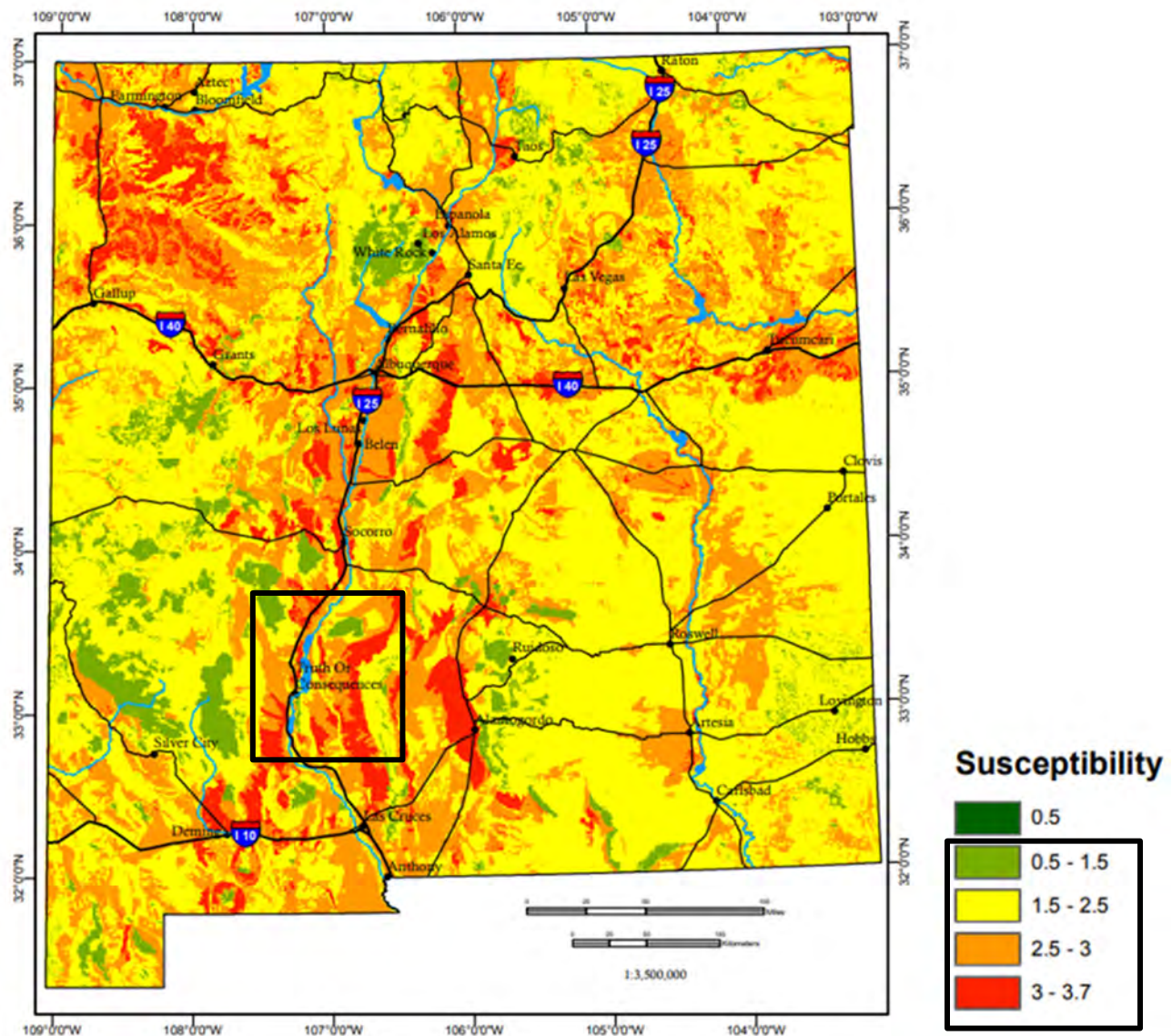
EXTENT

The New Mexico Bureau of Geology and Mineral Resources (NMBGMR) created a soil susceptibility map for New Mexico in 2017. These maps are meant to inform communities of their risk to soil subsidence. The map of collapsible soil total susceptibility is provided below. According to Figure 15-2, the Sierra County planning area (indicated by the black square) can anticipate moderately low to extremely high (0.5-3.7) levels of susceptibility to collapsible soils. The majority of the Sierra County planning area falls within susceptibility levels of 2.5-3.7 (Figure 15-2). Sierra County, generally, has high susceptibility across much of the planning area, with highest susceptibility areas being in the eastern and southern portions of the county.

³ United States Geological Survey (USGS). Land Subsidence in the United States.
<https://water.usgs.gov/ogw/pubs/fs00165/>

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Figure 15-2. NMBGMR Collapsible Soil Total Susceptibility⁴



In some rare cases, extreme land subsidence can lead to sinkholes when the subsurface land cannot support the surface land any longer. A sinkhole is described as a portion of the ground that possesses no natural external surface drainage, typically draining water into the subsurface.⁵ The development of sinkholes can range from slow to a dramatic collapse which may result in property damage or injury and loss of life. These events can differ in size from a few feet to many acres with equal variety in depth. While historical data is limited, Sierra County features area moderately to highly susceptible to subsidence. As a result, it is assumed that those susceptible locations across the planning area can reasonably anticipate the full extent range of a few feet to several acres.

⁴ New Mexico Bureau of Geology and Mineral Resources (NMBGMR). Collapsible Soil Susceptibility Map for New Mexico. 2017. https://geoinfo.nmt.edu/publications/openfile/downloads/500-599/593/OFR-593_Report.pdf

⁵ United States Geological Survey (USGS). Water Science School (2018). Sinkholes. <https://www.usgs.gov/special-topics/water-science-school/science/sinkholes>

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HISTORICAL OCCURRENCES

There are no reported historical incidents of land subsidence within the Sierra County planning area, however, data on these occurrences is limited. There is no comprehensive database available to provide information on the extent and magnitude of land subsidence events. Information about known subsidence events primarily depends on local knowledge and local news sources. Much of the Sierra County planning area exhibits moderate to extremely high susceptibility to land subsidence; therefore, it is likely there have been past occurrences that have simply gone unreported.

PROBABILITY OF FUTURE EVENTS

With limited reporting of subsidence, it can be difficult to calculate the probability of future events. However, land subsidence may continue to develop from below-ground withdrawals or from natural or man-made forces. Additionally, increasing population trends in the planning area will lead to increasing groundwater withdrawals from surface aquifers, and this can lead to more frequent incidences of small land subsidence / sinkholes. Major occurrences of future land subsidence events in Sierra County are considered “Unlikely” with an event probable in the next 10 years within the planning area, including all participating jurisdictions.

CLIMATE CHANGE CONSIDERATIONS

While data regarding the direct impact of climate change on land subsidence in non-coastal areas is limited, certain climate change conditions can increase land subsidence risk. As climate change causes higher temperatures, more severe drought, and changes in overall precipitation, the demand for water increases. In communities where groundwater is the main water source, the increase in groundwater pumping directly increases the risk of land subsidence.

Expansive soil issues, while a significant and costly geological hazard, typically do not require an emergency services response (police, fire, or ambulance). They are considered a chronic structural issue rather than a sudden disaster.

VULNERABILITY AND IMPACT

In terms of natural hazards, expansive soils are primarily a geotechnical condition affecting structures and infrastructure, not a rapid or sudden-onset hazard that disproportionately affects specific demographic groups or vulnerable populations. They are considered a chronic structural issue rather than a sudden disaster. Vulnerability is difficult to evaluate since land subsidence events are gradual, slow moving, and soil conditions can be very difficult and costly to monitor. Due to the randomness of these events, all existing and future structures, and facilities within the Sierra County planning area, including all participating jurisdictions, could potentially be impacted and remain vulnerable to possible damage and property loss. The amount of monetary damage associated with previous events is unknown, but costs related to property damage can be expected in the future.

Damage is likely to occur to underground utility systems including water, sewage, and electrical systems, which can lead to water and power outages, disrupting critical services. Land subsidence can also cause significant damage to roads, buildings, houses, and any other

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structure. While all improvements in the planning may be susceptible, structures built above major aquifers or otherwise closest to groundwater removal sites may be at highest risk.

Land subsidence typically poses limited risk to people. While all citizens are vulnerable to the impacts of subsidence, forced relocation and disaster recovery disproportionately impacts low-income residents who lack the financial means to travel, afford a long-term stay away from home, and to rebuild or repair their homes. An estimated 25 percent of the planning area population live below the poverty level (Table 15-1). The elderly, children, and people with a disability may have trouble evacuating if needed, making them more susceptible to injury or harm. In addition, people who speak a language other than English may face increased vulnerability due to language barriers that limit their access to important information regarding safety measures.

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Table 15-1. Populations at Greater Risk by Jurisdiction⁶

JURISDICTION	POPULATION				
	65 AND OLDER	UNDER 5	WITH A DISABILITY	BELOW POVERTY LEVEL	LIMITED ENGLISH SPEAKING
Sierra County	4,251	420	3,253	2,866	489
City of Elephant Butte	881	32	527	159	0
City of Truth or Consequences	1,354	369	1,468	2,097	187
Village of Williamsburg	173	19	222	131	72

The Sierra County Planning Team identified the following critical facilities (Table 15-2) as assets that are considered the most important to the planning area and are potentially susceptible to land subsidence. The critical infrastructure with the greatest vulnerability are utility services, transportation structures, and municipal infrastructure. Failures of these facilities can result in a loss of service and cascading impacts. For a comprehensive list by participating jurisdiction, see Appendix D.

Table 15-2. Critical Facilities Vulnerable to Land Subsidence

CRITICAL FACILITY TYPE	POTENTIAL IMPACTS
Emergency Response Services (EOC, Fire, Police, EMS), Hospitals and Medical Centers	- Emergency operations and services may be significantly impacted due to damaged facilities. - Damaged roads or transportation structures can impede emergency response vehicle access to areas. - Fire stations, police stations, and hospitals may suffer structural damage, affecting their ability to function effectively during emergencies. - Subsidence related emergencies may require the deployment of additional resources and personnel to impacted areas, and personnel may be exposed to unsafe conditions.
Airport, Academic Institutions, Animal Shelter, Evacuation Centers & Shelters, Governmental Facilities, Residential/ Assisted Living Facilities	- Structures can be damaged by the shifting of the Earth. - Power outages could disrupt critical care. - Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities. - Evacuations may be necessary due to structural damage to facilities. - Infrastructure damage may prevent larger airports from acting as temporary command centers for logistics, communications, and emergency operations. - Temporary break in operations may significantly inhibit post event evacuations.

⁶ US Census Bureau 2023 data for Sierra County.

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CRITICAL FACILITY TYPE	POTENTIAL IMPACTS
	• Damaged or destroyed highway infrastructure may substantially increase the need for airport operations.
Commercial Supplier (food, fuel, etc.)	• Facilities, infrastructure, or critical equipment including communications may be damaged, destroyed or otherwise inoperable. • Essential supplies like medicines, water, food, and equipment deliveries may be delayed. • Economic disruption due to infrastructure damage negatively impact commercial services and distribution.
Utility Services and Infrastructure (electric, water, wastewater, communications)	• Damage to underground utility systems including water, sewage, and electrical can lead to a disruption of essential services. • Emergency operations and services may be significantly impacted due to damaged facilities. • Damaged roads or transportation structures can impede emergency response vehicle access to areas. • Subsidence related emergencies may require the deployment of additional resources and personnel to impacted areas, and personnel may be exposed to unsafe conditions.

There are no reported damages, injuries, or fatalities from land subsidence events in Sierra County. The impact on the planning area, including Sierra County, and all participating jurisdictions, is considered “Limited” severity, meaning minor quality of life lost, critical facilities and services shut down for 24 hours or less, and less than 10 percent of property destroyed or with major damage.

ASSESSMENT OF IMPACTS

Land subsidence has the potential to pose a significant risk to people and can create dangerous and difficult situations for public health and safety officials. Land subsidence can be associated with a variety of impacts, including:

- Response personnel, including utility workers, public works personnel, debris removal staff, tow truck operators, and other first responders, are subject to injury or illness.
- Response personnel would be required to travel in potentially hazardous conditions, elevating the life safety risk due to accidents and potential contact with downed power lines.
- Power and water outages are possible throughout the planning area due to damaged power lines, underground water pipes, and other damaged utility infrastructure.
- Emergency response and service operations may be impacted by limitations on access and mobility if roadways are closed, or obstructed.
- Depending on the severity and scale of damage caused by ground movement, damage to critical infrastructure can require weeks to repair.
- Older structures built to less stringent building codes may suffer greater damage as they are typically more vulnerable to impacts of subsidence. Similarly, historic buildings and sites are placed at a higher risk of impact due to materials used and lack of fortification.
- Buildings, homes, and other structures can collapse or sink, potentially trapping residents.

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- Significant subsidence can result in emergency response vehicles being unable to access areas of the community.
- Emergency operations and services may be significantly impacted due to damaged facilities, loss of communications, and damaged emergency vehicles and equipment.
- Private sector entities such as utility providers, financial institutions, and medical care providers may not be fully operational and may require assistance from neighboring communities until full services can be restored.
- Some businesses not directly damaged by subsidence may be negatively impacted while roads are restored, further slowing economic recovery.
- Historical sites and properties are placed at a higher risk of impact due to materials used and the inability to change properties due to their historic status. There are 32 historical entries listed on the National Register of Historic Places for Sierra County and 54 sites listed on the New Mexico State Register of Cultural Properties..

The economic and financial impacts of land subsidence on the area will depend entirely on the scale of the event, what is damaged, and how quickly repairs to critical components of the economy can be implemented. The level of preparedness and pre-event planning done by the community, local businesses, and citizens will also contribute to the overall economic and financial conditions in the aftermath of any land subsidence event.



Section 16

Lightning



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HAZARD DESCRIPTION

Lightning is a discharge of electrical energy resulting from the buildup of positive and negative charges within a thunderstorm, creating a “bolt” when the buildup of charges becomes strong enough. This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning can reach temperatures approaching 50,000 degrees Fahrenheit. Lightning rapidly heats the sky as it flashes but the surrounding air cools following the bolt. This rapid heating and cooling of the surrounding air causes thunder which often accompanies lightning strikes. While most often affiliated with severe thunderstorms, lightning often strikes outside of heavy rain and might occur as far as 10 miles away from any rainfall.

According to the National Weather Service (NWS), the 10-year (2012–2021) average for fatalities is 23 people with an average of 300 injuries in the United States each year by lightning. Lightning can occur as cloud to ground flashes or as intra-cloud lightning flashes. Direct lightning strikes can cause significant damage to buildings, critical facilities, infrastructure, and communication equipment affecting emergency response. Lightning is also responsible for igniting wildfires that can result in widespread damages to property before firefighters have the ability to contain and suppress the resultant fire.

LOCATION

Lightning can strike in any geographic location and is considered a common occurrence in New Mexico. The Sierra County planning area is in a region of the country that is moderately susceptible to lightning strikes. Therefore, lightning could occur at any location within the entire planning area. It is assumed that the entire Sierra County planning area is uniformly exposed to the threat of lightning.

EXTENT

According to the 2024 Annual Lightning Report by Vaisala, the State of New Mexico ranks thirtieth in the U.S. for lightning strike density with an average of 34.1 flashes per square mile.¹ Vaisala’s U.S. National Lightning Detection Network lightning flash density map shows an average of 28 lightning events per square mile per year for the Sierra County planning area. This rate equates

¹ Source: <https://www.xweather.com/annual-lightning-report>

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to approximately 117,100 flashes per year for the entire planning area, or two to three flashes per 15-minute interval during storm events.

FEMA's National Risk Index includes an analysis of the planning area's expected annual loss and the community's risk factor which incorporates social vulnerability as well as community resilience to determine the lightning risk for the area, compared to the rest of the United States. Sierra County is located in an area where the extent is classified as relatively low (Figure 16-1).

Figure 16-1. Sierra County Lightning Risk, National Risk Index, December 2025²



HISTORICAL OCCURRENCES

The National Centers for Environmental Information (NCEI) database indicates no recorded lightning events for the Sierra County planning area. It is highly likely multiple lightning occurrences have gone unreported before and during the recording period. The NCEI is a national data source organized under the National Oceanic and Atmospheric Administration and considered a reliable resource for hazards. However, due to historical underreporting of lightning events, the flash density for the planning area along with input from local team members was considered more reliable, indicating regular lightning occurrences in the planning area that simply have not been reported.

PROBABILITY OF FUTURE EVENTS

Based on historical records and input from the planning team the probability of occurrence for future lightning events in the Sierra County planning area is considered “Highly Likely”, or an event probable in the next year. The planning team confirmed that lightning occurs regularly in the area. According to the 2024 Annual Lightning Report by Vaisala, the Sierra County planning area is located in an area of the country that experiences approximately 28 lightning flashes per square mile per year (approximately 117,100 flashes per year). Given this estimated probability

² Source: Map | National Risk Index, <https://hazards.fema.gov/nri/map>

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of events, it can be expected that future lightning events will continue to threaten life and cause minor property damage throughout the planning area.

CLIMATE CHANGE CONSIDERATIONS

As CO₂ increases and the land surface warms, stronger updrafts are more likely to produce lightning. In a climate with double the amount of CO₂, we may see fewer lightning storms overall, but 25 percent stronger storms, with a 5 percent increase in lightning. Lightning damage is also likely to increase because of its role in igniting forest fires, where dry vegetation, also caused by rising temperatures, creates more ‘fuel’ for fires, so even a small climate change may have huge consequences. While the impact climate change will have on our weather still remains uncertain, researchers agree that implementing simple measures like lightning detection systems and installing grounding systems in buildings could go a long way in avoiding deaths and injuries.³

Lightning events have the potential to pose a significant risk to people and property throughout the Sierra County planning area. The economic and financial impacts of lightning on the area will depend entirely on the scale of the event, what is damaged, and how quickly repairs to critical components of the economy can be implemented. While no increase in the number of hazard events is anticipated, the impact of the hazard may see an increase in losses. As populations grow and urban development continues to rise, the overall vulnerability and impact are expected to increase in the next five years.

VULNERABILITY AND IMPACT

Vulnerability is difficult to evaluate since lightning events can occur at different strength levels, in random locations, and can create a broad range of damage depending on the strike location. Due to the randomness of these events, all existing and future structures and facilities in the Sierra County planning area are vulnerable to lightning strikes. The direct and indirect losses associated with these events include injury and loss of life, damage to structures and infrastructure, agricultural losses, utility failure (power outages), and stress on community resources.

The peak lightning season in the State of New Mexico is from June to August, coinciding with the state's monsoon season. While severe thunderstorms can occur throughout the year, they are most frequent and intense during these summer months, especially in the afternoons. While lightning deaths are rare in New Mexico, fatalities typically occur during these summer months. Fatalities occur most often when people are outdoors and/or participating in some form of recreation. The population located outdoors during a lightning event is considered at risk and more vulnerable to a lightning strike compared to those inside a structure. Moving to a lower risk location will decrease a person's vulnerability.

The entire general building stock and all infrastructure of the Sierra County planning area are considered exposed to the lightning hazard. Lightning can be responsible for damages to buildings, cause electrical, forest and/or wildfires, and damage infrastructure such as power transmission lines and communication towers.

While all citizens are at risk to the impacts of lightning, forced relocation and disaster recovery disproportionately impacts low-income residents who lack the financial means to travel, afford a

³ Environmental Journal, Nathan Neal, January 11, 2021.

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long-term stay away from home, and to rebuild or repair their homes. An estimated 25 percent of the planning area population live below the poverty level. In addition, people who speak a language other than English may face increased vulnerability due to language barriers that limit their access to important information such as weather-related warnings and instructions regarding safety measures. Table 16-1 lists these vulnerable populations and several others for Sierra County and the participating jurisdictions.

Table 16-1. Populations at Greater Risk by Jurisdiction⁴

JURISDICTION	POPULATION				
	65 AND OLDER	UNDER 5	WITH A DISABILITY	BELOW POVERTY LEVEL	LIMITED ENGLISH SPEAKING
Sierra County	4,251	420	3,253	2,866	489
City of Elephant Butte	881	32	527	159	0
City of Truth or Consequences	1,354	369	1,468	2,097	187
Village of Williamsburg	173	19	222	131	72

The Sierra County Planning Team identified the following critical facilities (Table 16-2) as assets that are considered the most important to the planning area and are susceptible to a range of impacts caused by lightning events. For a comprehensive list by participating jurisdiction, please see Appendix D.

Table 16-2. Critical Facilities Vulnerable to Lightning Events

CRITICAL FACILITIES	POTENTIAL IMPACTS
Emergency Response Services (EOC, Fire, Police, EMS), Hospitals and Medical Centers	• Emergency operations and services may be significantly impacted due to power outages, damaged facilities, fires and/or loss of communications as a result of lightning strikes. • Emergency vehicles, including critical equipment, can be damaged by lightning strikes or by falling trees damaged by lightning. • Power outages could disrupt communications, delaying emergency response times. • Downed trees due to lightning strikes can impede emergency response vehicle access to areas. • Lightning strikes can be associated with structure fires and wildfires, further straining the capacity and resources of emergency personnel.
Airport, Academic Institutions, Animal Shelter, Evacuation Centers & Shelters,	• Structures can be damaged by falling trees damaged by lightning. • Power outages could disrupt critical care. • Backup power sources could be damaged.

⁴ US Census Bureau, American Community Survey Five-Year Estimates, 2023.

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CRITICAL FACILITIES	POTENTIAL IMPACTS
Governmental Facilities, Residential/ Assisted Living Facilities	• Evacuations may be necessary due to extended power outages, fires, or other associated damages to facilities.
Commercial Supplier (food, fuel, etc.)	• Facilities, infrastructure, or critical equipment including communications may be damaged, destroyed or otherwise inoperable. • Essential supplies like medicines, water, food, and equipment deliveries may be delayed. • Economic disruption due to power outages and fires negatively impact airport services as well as area businesses reliant on airport operations.
Utility Services and Infrastructure (electric, water, wastewater, communications)	• Emergency operations and critical services may be significantly impacted due to power outages, damaged facilities, fires and/or loss of communications as a result of lightning strikes. • Emergency vehicles, including critical equipment, can be damaged by lightning strikes or by falling trees damaged by lightning. • Power outages could disrupt communications, delaying emergency response times. • Downed trees due to lightning strikes can impede emergency response vehicle access to areas. • Lightning strikes can be associated with structure fires and wildfires, further straining the capacity and resources of emergency personnel.

There are no recorded fatalities or injuries within the Sierra County planning area due to lightning events. Additionally, there are no reports of lightning damage to property in the planning area according to NCEI data. These limited historical losses and damages as a result of lightning events, indicate a “Limited” impact, with minimal quality of life lost, critical facilities and services shut down for 24 hours or less, and less than 10 percent of property destroyed. Overall, the total loss estimate for the planning area is considered negligible.

ASSESSMENT OF IMPACTS

Lightning events have the potential to pose a significant risk to people and can create dangerous and difficult situations for public health and safety officials. Additional impacts to the planning area can include:

- The Sierra County planning area features developed parks and green spaces. Lightning events could impact recreational activities, placing residents and visitors in imminent danger, potentially requiring emergency services or park evacuation.
- Older structures built to less stringent building codes may suffer greater damage from a lightning strike as they are typically built with less fire-resistant materials and often lack any fire mitigation measures such as sprinkler systems. 45 percent of homes in Sierra County were built before 1980. Similarly, historic buildings may lack fire mitigation materials or measures due to their historic status. 32 historic entries in the Sierra County

SECTION 16: LIGHTNING

planning area, are listed on the National Register of Historic Places and 54 sites are listed on the New Mexico State Register of Cultural Properties.

- Vegetation in urban parks may be destroyed by lightning caused brush fires and result in poor air quality impacting public health.
- Individuals exposed to the storm can be directly struck, posing significant health risks and potential death.
- Structures can be damaged or crushed by falling trees damaged by lightning, which can result in physical harm to the occupants.
- Lightning strikes can result in widespread power outages increasing the risk to more vulnerable portions of the population who rely on power for health and/or life safety.
- Extended power outage often results in an increase in structure fires and carbon monoxide poisoning as individuals attempt to cook or heat their homes with alternate, unsafe cooking or heating devices, such as grills.
- Lightning strikes can be associated with structure fires and wildfires, creating additional risk to residents and first responders.
- Emergency operations and services may be significantly impacted due to power outages and/or loss of communications.
- County, city and village departments may be damaged, delaying response and recovery efforts for the entire community.
- Economic disruption due to power outages and fires negatively impacts the programs and services provided by the community due to short- and long-term loss in revenue.
- Some businesses not directly damaged by lightning events may be negatively impacted while utilities are being restored, further slowing economic recovery.
- Businesses that are more reliant on utility infrastructure than others may suffer greater damage without a backup power source.

The economic and financial impacts of lightning on the area will depend entirely on the scale of the event, what is damaged, and how quickly repairs to critical components of the economy can be implemented. The level of preparedness and pre-event planning done by the community, local businesses, and citizens will also contribute to the overall economic and financial conditions in the aftermath of any significant lightning event.

Section 17

Severe Winter Storm



SECTION 17: SEVERE WINTER STORM

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HAZARD DESCRIPTION



A severe winter storm event is identified as a storm with snow, ice, or freezing rain. This type of storm can cause significant problems for area residents. Winter storms are associated with freezing or frozen precipitation such as freezing rain, sleet, snow, and the combined effects of winter precipitation and strong winds. Wind chill is a function of temperature and wind. Low wind chill is a product of high winds and freezing temperatures.

Sierra County receives snowfall on a regular seasonal basis, typically between the months of October and April. Due to the average storm size, the entire planning area is usually affected by these events. Most winter precipitation in New Mexico is associated with Pacific Ocean storms that move across the state from west to east, typically bringing snow to the mountains and a mix of rain and snow in the valleys across the planning area.

As indicated in Figure 17-1, the Sierra County planning area is located within several Hardiness Zones according to the 2023 USDA Plant Hardiness Zone Map. These include zones 7a, 7b, and 8a, indicating a range of annual minimum temperatures between 0°F and 15°F. The western portion of the planning area can anticipate the coldest minimum temperatures. During times of ice and snow accumulation, response times may increase while roadways are impassable. Table 17-1 describes the types of winter weather possible to occur in the Sierra County planning area.

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Figure 17-1. Annual Minimum Temperature¹



¹ Source: USDA

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Table 17-1. Types of Winter Weather

TYPE OF WINTER WEATHER	DESCRIPTION
Freezing Rain or Freezing Drizzle	Rain or drizzle is likely to freeze upon impact, resulting in a coating of ice glaze on roads and all other exposed objects.
Sleet	Small particles of ice usually mixed with rain. If enough sleet accumulates on the ground, it makes travel hazardous.
Blizzard	Sustained wind speeds of at least 35 mph are accompanied by considerable falling or blowing snow. This alert is the most perilous winter storm with visibility dangerously restricted.
Frost / Freeze	Below freezing temperatures are expected and may cause significant damage to plants, crops, and fruit trees.
Wind Chill	A strong wind combined with a temperature slightly below freezing can have the same chilling effect as a temperature nearly 50 degrees lower in a calm atmosphere. The combined cooling power of the wind and temperature on exposed flesh is called the wind-chill factor.
Heavy Snowfall	Snowfall accumulating to 4" or more in depth in 12 hours or less; or snowfall accumulating to 6" or more in depth in 24 hours or less.
Ice storm	An ice storm is used to describe occasions when damaging accumulations of ice are expected during freezing rain situations. Significant accumulations of ice pull down trees and utility lines resulting in loss of power and communication. These accumulations of ice make walking and driving extremely dangerous.
Flurries	Light snow falling for short durations with little or no accumulation.

LOCATION

Winter storm events are not confined to specific geographic boundaries. Winter storm events generally impact the entire planning area uniformly in terms of severity and duration. Therefore, all existing and future buildings, facilities, and populations in the Sierra County planning area, including participating jurisdictions, are vulnerable to a winter storm hazard and could potentially be impacted.

EXTENT

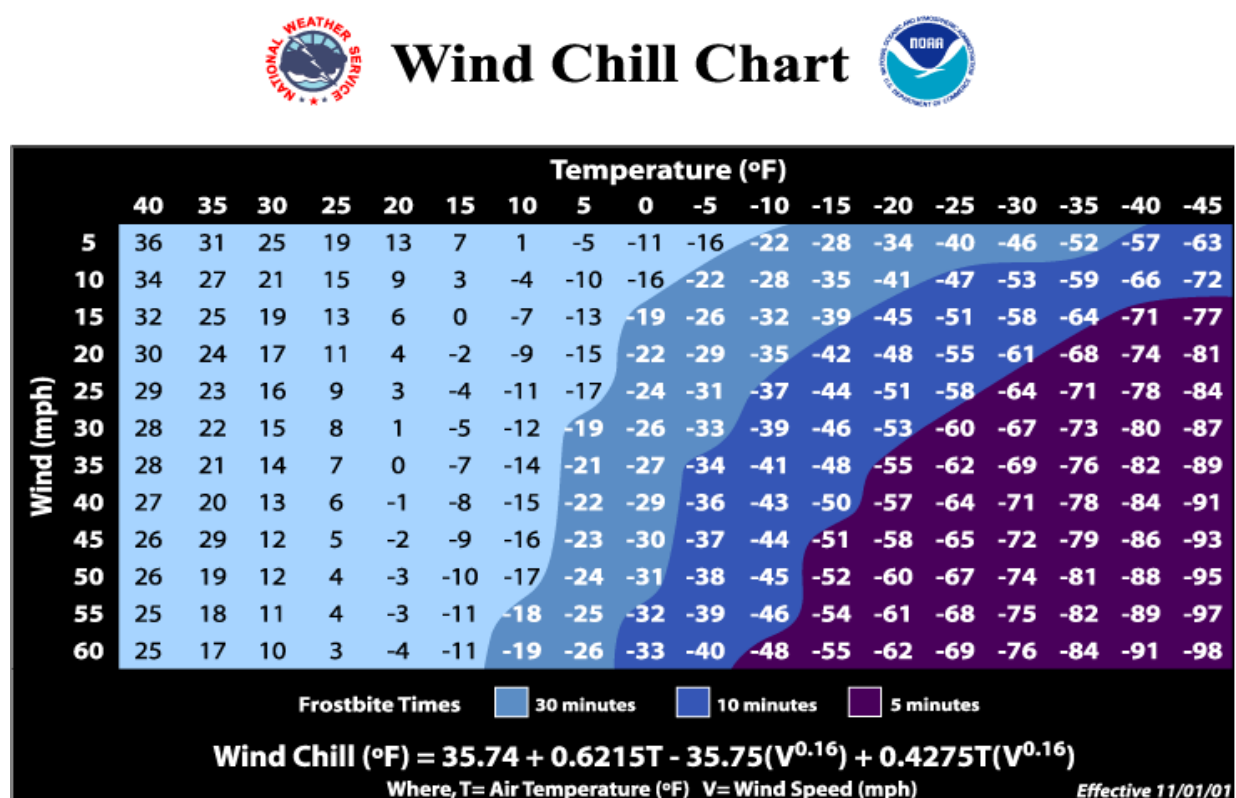
The extent or magnitude of a severe winter storm is measured in intensity based on the temperature and level of accumulations as shown in Table 17-2. Table 17-2 should be read in conjunction with the wind-chill factor described in Figure 17-2 to determine the intensity of a winter storm. The chart is not applicable when temperatures are over 50°F or winds are calm. This is an index developed by the National Weather Service.

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Table 17-2. Magnitude of Severe Winter Storms

INTENSITY	TEMPERATURE RANGE (Fahrenheit)	EXTENT DESCRIPTION
Mild	40° – 50°	Winds less than 10 mph and freezing rain or light snow falling for short durations with little or no accumulations.
Moderate	30° – 40°	Winds 10 – 15 mph and sleet and/or snow up to 4 inches.
Significant	25° – 30°	Intense snow showers accompanied with strong gusty winds between 15 and 20 mph with significant accumulation.
Extreme	20° – 25°	Wind driven snow that reduces visibility, heavy winds (between 20 to 30 mph), and sleet or ice up to 5 millimeters in diameter.
Severe	Below 20°	Winds of 35 mph or more and snow and sleet greater than 4 inches.

Figure 17-2. Wind Chill Chart



Wind chill temperature is a measure of how cold the wind makes real air temperature feel to the human body. Since wind can dramatically accelerate heat loss from the body, a blustery 30°F day would feel just as cold as a calm day with 0°F temperatures. The average number of cold days is similar for the entire planning area.

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The coldest temperature recorded for the planning area was -7°F in Truth or Consequences on January 11, 1962. This is the worst the planning area can anticipate, based on historical events. Therefore, the intensity or extent of a winter storm event to be mitigated for the area is “Severe” winter storm (Table 17-2), as annual extreme minimum temperatures across the planning area may dip below 0°F, with snow and sleet accumulations greater than four inches.

The National Weather Service issues a winter storm watch, advisory or warning in advance of an event in order to give people enough time to prepare for an event. Sierra County could be under any of these warning types in advance of a winter storm event. Table 17-3 describes when each warning type would be issued.

Table 17-3. Winter Storm Watch, Advisory, Warning Descriptions

TYPE OF WINTER WEATHER	DESCRIPTION
Winter Weather Advisory	This alert may be issued for a variety of severe conditions. Weather advisories may be announced for snow, blowing or drifting snow, freezing drizzle, freezing rain, or a combination of weather events.
Winter Storm Watch	Severe winter weather conditions may affect your area (freezing rain, sleet, or heavy snow may occur separately or in combination).
Winter Storm Warning	Severe winter weather conditions are imminent.

HISTORICAL OCCURRENCES

According to historical records and the best available data there have been 38 recorded winter storm events in the Sierra County planning area, all of which were reported as incidents of heavy snow, avalanche, and extreme cold / wind chill. None of these recorded events included fatalities or injuries, however there were reported losses. The National Centers for Environmental Information (NCEI) provides winter storm event data from January 1996 through June 2025.

Historical winter storm information, as provided by the NCEI, identifies winter storm activity across a multi-county forecast area for each event. The appropriate percentage of the total property and crop damage reported for the entire forecast area has been allocated to each county impacted by the event, when appropriate. Historical winter storm data for the planning area is provided on a County-wide basis per the NCEI database. Table 17-4 shows historical incident information for previous events within the planning area.

Table 17-4. Historical Winter Storm Events, 1996 – 2025²

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Sierra County	1/6/1997	0	0	\$0	\$0
Sierra County	3/17/1999	0	0	\$0	\$0
Sierra County	11/6/2000	0	0	\$36,800	\$0
Sierra County	1/17/2001	0	0	\$0	\$0

² Reporting period from January 1996 through June 2025.

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JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Sierra County	12/12/2001	0	0	\$0	\$0
Sierra County	3/4/2004	0	0	\$0	\$0
Sierra County	12/5/2004	0	0	\$0	\$0
Sierra County	1/19/2007	0	0	\$0	\$0
Sierra County	1/22/2007	0	0	\$0	\$0
Sierra County	2/1/2011	0	0	\$0	\$0
Sierra County	12/5/2011	0	0	\$0	\$0
Sierra County	12/22/2011	0	0	\$0	\$0
Sierra County	1/2/2015	0	0	\$0	\$0
Sierra County	12/26/2015	0	0	\$0	\$0
Sierra County	12/26/2015	0	0	\$0	\$0
Sierra County	1/4/2016	0	0	\$0	\$0
Sierra County	2/1/2016	0	0	\$0	\$0
Sierra County	9/6/2016	0	0	\$0	\$0
Sierra County	1/15/2017	0	0	\$0	\$0
Sierra County	1/20/2017	0	0	\$0	\$0
Sierra County	12/27/2018	0	0	\$0	\$0
Sierra County	2/11/2020	0	0	\$0	\$0
Sierra County	2/11/2020	0	0	\$0	\$0
Sierra County	2/11/2020	0	0	\$0	\$0
Sierra County	10/26/2020	0	0	\$0	\$0
Sierra County	10/26/2020	0	0	\$0	\$0
Sierra County	1/25/2021	0	0	\$0	\$0
Sierra County	2/14/2021	0	0	\$0	\$0
Sierra County	2/14/2021	0	0	\$0	\$0
Sierra County	2/14/2021	0	0	\$0	\$0
Sierra County	2/16/2021	0	0	\$0	\$0
Sierra County	2/16/2021	0	0	\$0	\$0
Sierra County	1/1/2022	0	0	\$0	\$0
Sierra County	2/2/2022	0	0	\$0	\$0
Sierra County	12/12/2022	0	0	\$0	\$0
Sierra County	1/1/2023	0	0	\$0	\$0
Sierra County	2/15/2023	0	0	\$0	\$0

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JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Sierra County	1/22/2025	0	0	\$0	\$0
TOTALS	38	0	0	\$36,800	

Based on the list of historical winter storm events for the Sierra County planning area, 17 of the events have occurred since the 2019 Plan.

SIGNIFICANT EVENTS

December 11, 2020

An early-season snowstorm struck southern New Mexico, driven by an upper-level low lifting from Baja into Arizona and a 130-knot jet streak over southern New Mexico that fueled heavy precipitation with a backdoor cold front. This rare event dumped over 7 inches of snow in the Gila region and lowlands near Sierra County, with 7.7 inches in Las Palomas and 5.0 to 6.5 inches around Truth or Consequences. The rapid, wet snowfall on steep Black Range terrain triggered a natural avalanche in the Gila Wilderness, a storm-slab slide with no injuries but a stark reminder of sudden mountain hazards in early fall.

February 13-17, 2021

Winter Storm Uri brought extreme cold to Sierra County, New Mexico, with lows near 2°F, wind chills below zero, and 2 to 6 inches of heavy snow across the lowlands and Black Range. Icy roads closed I-25 through Truth or Consequences, scattered power outages hit rural areas, and burst pipes triggered water issues, but no fatalities occurred. Disruptions lasted 2 to 3 days, with swift recovery underscoring the region's resilience despite the rare Arctic intrusion.

PROBABILITY OF FUTURE EVENTS

According to historical records, the Sierra County planning area has experienced 38 winter storm events in a 29.5 year reporting period. The probability of a future winter storm event affecting the Sierra County planning area, including all participating jurisdictions, is considered "Highly Likely," with a winter storm likely to occur within the next year.

CLIMATE CHANGE CONSIDERATIONS

Climate change is expected to reduce the number of extreme cold events statewide but increase in the variability of events. Extreme cold events will continue to be possible but overall winters are becoming milder, and the frequency of extreme winter weather events are decreasing due to the warming of the Arctic and less extreme cold air coming from that region. Fewer cold spells are projected to occur per year, but the length of cold spells may be longer when they do occur. A trend that is expected to continue with winter extremes is estimated to be milder over the next 50 years compared to extremes in the historic record.³

³ Dunbar, N.W., Gutzler, D.S., Pearthree, K.S., Phillips, F.M., Bauer, P.W., Allen, C.D., DuBois, D., Harvey, M.D., King, J.P., McFadden, L.D., Thomson, B.M., and Tillery, A.C., 2022, Climate change in New Mexico over the next 50 years: Impacts on water resources: New Mexico Bureau of Geology and Mineral Resources, Bulletin 164, 218 p. <https://doi.org/10.58799/B-164>

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VULNERABILITY AND IMPACT

During periods of extreme cold and freezing temperatures, water pipes can freeze and crack, and ice can build up on power lines, causing them to break under the weight or causing tree limbs to fall on the lines. These events can disrupt electric service for significant periods. Prolonged winter storms lead to increased consumption of heating fuel, which can lead to energy shortages and higher prices. House fires and resulting deaths tend to occur more frequently from increased and improper use of alternate heating sources. Fires during winter storms also present a greater danger because water supplies may freeze and impede firefighting efforts.

The Sierra County Planning Team identified the following critical facilities (Table 17-5) as assets that are considered the most important to the planning area and are susceptible to a range of impacts caused by winter storm events. For a comprehensive list by participating jurisdiction, see Appendix D.

Table 17-5. Critical Facilities Vulnerable to Winter Storm Events

CRITICAL FACILITIES	POTENTIAL IMPACTS
Emergency Response Services (EOC, Fire, Police, EMS), Hospitals and Medical Centers	• Emergency operations, services and response times may be significantly impacted due to power outages, and/or loss of communications. • Exposure to extreme cold can cause illnesses in first responders if exposed for a period of time. • Roads may become impassable due to snow and/or ice impacting response times by emergency services.
Airport, Academic Institutions, Animal Shelter, Evacuation Centers & Shelters, Governmental Facilities, Residential/ Assisted Living Facilities	• Power outages due to increased usage could disrupt critical care. • Backup power sources could be damaged. • Increased number of patients due to exposure to cold temperatures could lead to a strain on staff. • Water pipes can freeze and burst leading to flooding within facilities. • Facilities, infrastructure, or critical equipment including communications may be damaged, destroyed or otherwise inoperable. • Essential supplies like medicines, water, food, and equipment deliveries may be delayed. • Economic disruption due to power outages negatively impact airport services as well as area businesses reliant on airport operations. • Exposure risks to outdoor workers.
Commercial Supplier (food, fuel, etc.)	• Facilities, infrastructure, or critical equipment including communications may be damaged, destroyed or otherwise inoperable. • Essential supplies like medicines, water, food, and equipment deliveries may be delayed.
Utility Services and Infrastructure (electric, water, wastewater, communications)	• Emergency operations, services and response times may be significantly impacted due to power outages, and/or loss of communications. • Roads may become impassable due to snow and/or ice impacting response times by emergency services.

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CRITICAL FACILITIES	POTENTIAL IMPACTS
	- Power outages due to increased usage could disrupt critical care. - Backup power sources could be damaged. - Water pipes can freeze and burst leading to flooding within facilities.

People and animals are subject to health risks from extended exposure to cold air (Table 17-6). Elderly people are at greater risk of death from hypothermia during these events, especially in the neighborhoods with older housing stock. According to the U.S. Center for Disease Control, every year hypothermia kills about 600 Americans, half of whom are 65 years of age or older.

Due to factors like limited mobility, communication difficulties, medical needs, sensitivity to cold temperatures, reliance on support services, transportation challenges, housing accessibility issues, and possible shortages in emergency shelter accommodations, people with disabilities are particularly vulnerable to winter storms. Inclusive measures are crucial to address these vulnerabilities and ensure their safety during severe weather events.

Populations living below the poverty level may not be able to afford to run heat on a regular basis or extend period of time. In addition, people who speak a language other than English may face increased vulnerability due to language barriers that limit their access to important information such as weather-related warnings and instructions regarding safety measures.

The population over 65 in the Sierra County planning area is estimated at 37 percent of the total population and children under the age of 5 are estimated at 4 percent. The population with a disability is estimated at 28 percent of the total population. An estimated 25 percent of the planning area population live below the poverty level and 4 percent of the populations speak English “less than very well.”⁴

Table 17-6. Populations at Greater Risk to Winter Storm Events

JURISDICTION	POPULATION				
	65 AND OLDER	UNDER 5	WITH A DISABILITY	BELOW POVERTY LEVEL	LIMITED ENGLISH SPEAKING
Sierra County	4251	420	2866	3253	489
City of Elephant Butte	881	32	527	159	0
City of Truth or Consequences	1354	369	1468	2097	187
Village of Williamsburg	173	19	222	131	72

Older homes tend to be more vulnerable to the impacts of winter storm events. Approximately, 45 percent (an estimated 3,703 structures) of the housing units in the planning area were built before 1980 (Table 17-7).

⁴ US Census Bureau, 2022 American Community Survey Five-Year Estimates.

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Table 17-7. Structures at Greater Risk to Winter Storm Events

JURISDICTION	STRUCTURES
	SFR BUILT BEFORE 1980
Sierra County	3,703
City of Elephant Butte	261
City of Truth or Consequences	2,130
Village of Williamsburg	170

Winter storms have been known to cause injury to humans and occasionally have been fatal. However, no injuries or fatalities have been reported in the NCEI for Sierra County due to winter storm events. Overall, the total loss estimate of property and crops in the planning area is \$36,800 (in 2025 dollars) with an average annualized loss of \$1,200. Based on historic loss and damages, the impact of winter storm damages on the Sierra County planning area, including participating jurisdictions, can be considered “Limited” severity of impact, meaning minor quality of life lost, critical facilities and services shut down for 24 hours or less, and less than 10 percent of property destroyed or with major damage.

Table 17-8. Winter Storm Event Damage Totals, January 1996 - June 2025

JURISDICTION	PROPERTY & CROP LOSS	AVERAGE ANNUAL LOSS ESTIMATES
Sierra County	\$36,800	\$1,200

ASSESSMENT OF IMPACTS

The greatest risk from a winter storm hazard is to public health and safety. The impact of climate change could produce longer, more intense winter storm events, exacerbating the current winter storm impacts. Worsening winter storm conditions can be frequently associated with a variety of impacts, including:

- Vulnerable populations, particularly the elderly, can face serious or life-threatening health problems from exposure to extreme cold including hypothermia and frostbite.
- Loss of electric power or other heat source can result in increased potential for fire injuries or hazardous gas inhalation because residents burn candles for light or use fires or generators to stay warm.
- Response personnel, including utility workers, public works personnel, debris removal staff, tow truck operators, and other first responders, are subject to injury or illness resulting from exposure to extreme cold temperatures.
- Response personnel would be required to travel in potentially hazardous conditions, elevating the life safety risk due to accidents and potential contact with downed power lines.
- Operations or service delivery may experience impacts from electricity blackouts due to winter storms.

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- Power outages are possible throughout the planning area due to downed trees and power lines and/or rolling blackouts.
- Critical facilities without emergency backup power may not be operational during power outages.
- Emergency response and service operations may be impacted by limitations on access and mobility if roadways are closed, unsafe, or obstructed.
- Hazardous road conditions will likely lead to increases in automobile accidents, further straining emergency response capabilities.
- Depending on the severity and scale of damage caused by ice and snow events, damage to power transmission and distribution infrastructure can require days or weeks to repair.
- Winter storms can reduce the efficacy of shaded fuel breaks for wildfire mitigation as treated areas were more likely to have downed trees and limbs than untreated areas.
- Winter storms can result in damage to endangered species habitat and increased fuel loads within forested habitats.
- Older structures built to less stringent building codes may suffer greater damage as they are typically more vulnerable to impacts of winter storm events. Approximately 45 percent of homes in the County were built before 1980. Similarly, historic buildings and sites are placed at a higher risk of impact due to materials used and the inability to change properties due to their historic status. There are 32 historical entries listed on the National Register of Historic Places for Sierra County and 54 sites listed on the New Mexico State Register of Cultural Properties.
- Schools may be forced to shut early due to treacherous driving conditions.
- Exposed water pipes may be damaged by severe or late season winter storms at both residential and commercial structures, causing significant damages.

The economic and financial impacts of severe winter weather on the community will depend on the scale of the event, what is damaged, and how quickly repairs to critical components of the economy can be implemented. The level of preparedness and pre-event planning done by the community, local businesses and citizens will also contribute to the overall economic and financial conditions in the aftermath of a severe winter storm event.

Section 18

Tornado



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HAZARD DESCRIPTION

Tornadoes are among the most violent storms on the planet. A tornado is a rapidly rotating column of air extending between, and in contact with, a cloud and the surface of the earth. The most violent tornadoes are capable of tremendous destruction and have wind speeds of 250 miles per hour (mph) or more. In extreme cases, winds may approach 300 mph. Damage paths can be in excess of one mile wide and 50 miles long.

The most powerful tornadoes are produced by “Supercell Thunderstorms.” These thunderstorms are created when horizontal wind shears (winds moving in different directions at different altitudes) begin to rotate the storm. This horizontal rotation can be tilted vertically by violent updrafts, and the rotation radius can shrink, forming a vertical column of very quickly swirling air. This rotating air can eventually reach the ground, forming a tornado.



Table 18-1. Variations among Tornadoes

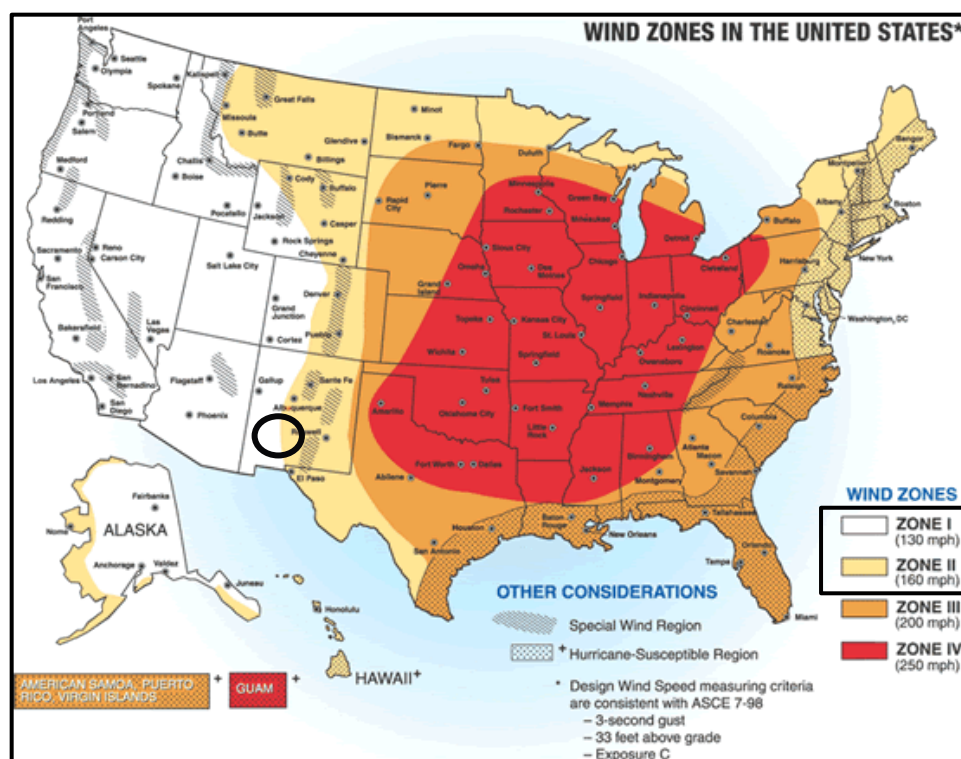
WEAK TORNADOES	STRONG TORNADOES	VIOLENT TORNADOES
• 69% of all tornadoes • Less than 5% of tornado deaths • Lifetime 1-10+ minutes • Winds less than 110 mph	• 29% of all tornadoes • Nearly 30% of all tornado deaths • May last 20 minutes or longer • Winds 110 – 205 mph	• 2% of all tornadoes • 70% of all tornado deaths • Lifetime can exceed one hour • Winds greater than 205 mph

LOCATION

Tornadoes do not have any specific geographic boundary and can occur throughout the county uniformly. It is assumed that the entire Sierra County planning area, including all participating jurisdictions, is uniformly exposed to tornado activity. The Sierra County planning area is located in Wind Zones I and II (Figure 18-1), meaning tornado winds can be as high as 130 to 160 mph.

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Figure 18-1. FEMA Wind Zones in the United States¹



EXTENT

The destruction caused by tornadoes ranges from light to inconceivable, depending on the intensity, size, and duration of the storm. Typically, tornadoes cause the greatest damage to structures of light construction, such as residential homes (particularly mobile homes).

Tornado magnitudes prior to 2007 were determined using the traditional version of the Fujita Scale, which estimated tornado wind speeds based on the damage caused by an event. Since February 2007, the Enhanced Fujita Scale has been utilized to classify tornadoes, which included improvements to the original scale. The original Fujita scale had limitations, such as a lack of damage indicators, no account for construction quality and variability, and no definitive correlation between damage and wind speed. These limitations led to some tornadoes being rated in an inconsistent manner and, in some cases, an overestimate of tornado wind speeds. The Enhanced Fujita scale retains the same basic design and six strength categories as the previous scale. The newer scale reflects more refined assessments of tornado damage surveys, standardization, and damage consideration to a wider range of structures. Table 18-2 includes both scales for reference when analyzing historical tornadoes since tornado events prior to 2007 will follow the original Fujita Scale.

¹ The Sierra County planning area is indicated by the black oval.

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Table 18-2. The Fujita and Enhanced Fujita Tornado Scale²

Enhanced Fujita Scale				Fujita Scale			
Category	Wind Speed	Damage Level	Damage	Category	Wind Speed	Intensity	Damage
EF0	65-85 MPH	Gale	The environment sustained minor damage: tree branches are broken, some shallow-rooted trees are uprooted, and some chimneys are damaged.	F0	45-78 MPH	Gale	Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
EF1	86-110 MPH	Weak	The environment sustained moderate damage: mobile homes are tipped over, windows are broken, roof tiles may be blown off, and some tree trunks have snapped.	F1	79-117 MPH	Moderate	Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.
EF2	111-135 MPH	Strong	The environment sustained considerable damage: mobile homes are destroyed, roofs are damaged, debris flies in the air, and large trees are snapped or uprooted.	F2	118-161 MPH	Significant	Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF3	136-165 MPH	Severe	The environment sustained severe damage: roofs and walls are ripped off buildings, small buildings are destroyed, and most trees are uprooted.	F3	162-209 MPH	Severe	Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
EF4	166-200 MPH	Devastating	The environment sustained devastating damage: well-built homes are destroyed, buildings are lifted off their foundations, cars are blown away, and large debris flies in the air.	F4	210-261 MPH	Devastating	Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown, and large missiles generated.
EF5	200+ MPH	Incredible	The environment sustained incredible damage: well-built homes are lifted from their foundations, reinforced concrete buildings are damaged, the bark is stripped from trees, and car-sized debris flies through the air.	F5	262-317 MPH	Incredible	Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yds); trees debarked; incredible phenomena will occur.

² Source: <http://www.tornadoproject.com/fscale/fscale.htm>

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Both the Fujita Scale and Enhanced Fujita Scale should be referenced in reviewing previous occurrences since tornado events that occurred before 2007 will follow the original Fujita Scale. The greatest magnitude reported within the planning area is an F1 (an EF0 to EF2 in the Enhanced Fujita Scale, depending on exact windspeed), a moderate tornado capable of damaging mobile homes and blowing cars from roadways. Based on the planning area's location in Wind Zones I and II, the planning area has the potential to experience anywhere from an EF0 to an EF3 depending on the wind speed. Of the five tornadoes reported within the planning area since 1958, only one has reached F1 magnitude.

HISTORICAL OCCURRENCES

The National Centers for Environmental Information (NCEI) Storm Events database is a national data source organized under the National Oceanic and Atmospheric Administration (NOAA). The NCEI is the largest archive available for historic storm events data; however, it is important to note that only incidents recorded in the NCEI have been factored into this risk assessment unless otherwise noted. It is likely that a number of occurrences have gone unreported over time.

Figure 18-2 identifies the locations of previous occurrences in the Sierra County planning area from January 1958 through June 2025. A total of five events have been recorded by NOAA's Storm Prediction Center and National Centers for Environmental Information (NCEI) databases for the Sierra County planning area. The strongest event reported in the planning area was an F1 tornado that occurred on September 16, 1971. This was also the most significant tornado in terms of reported damages, resulting in \$19,600 (2025 dollars) in estimated property damage.

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Figure 18-2. Spatial Historical Tornado Events, January 1958 – June 2025³

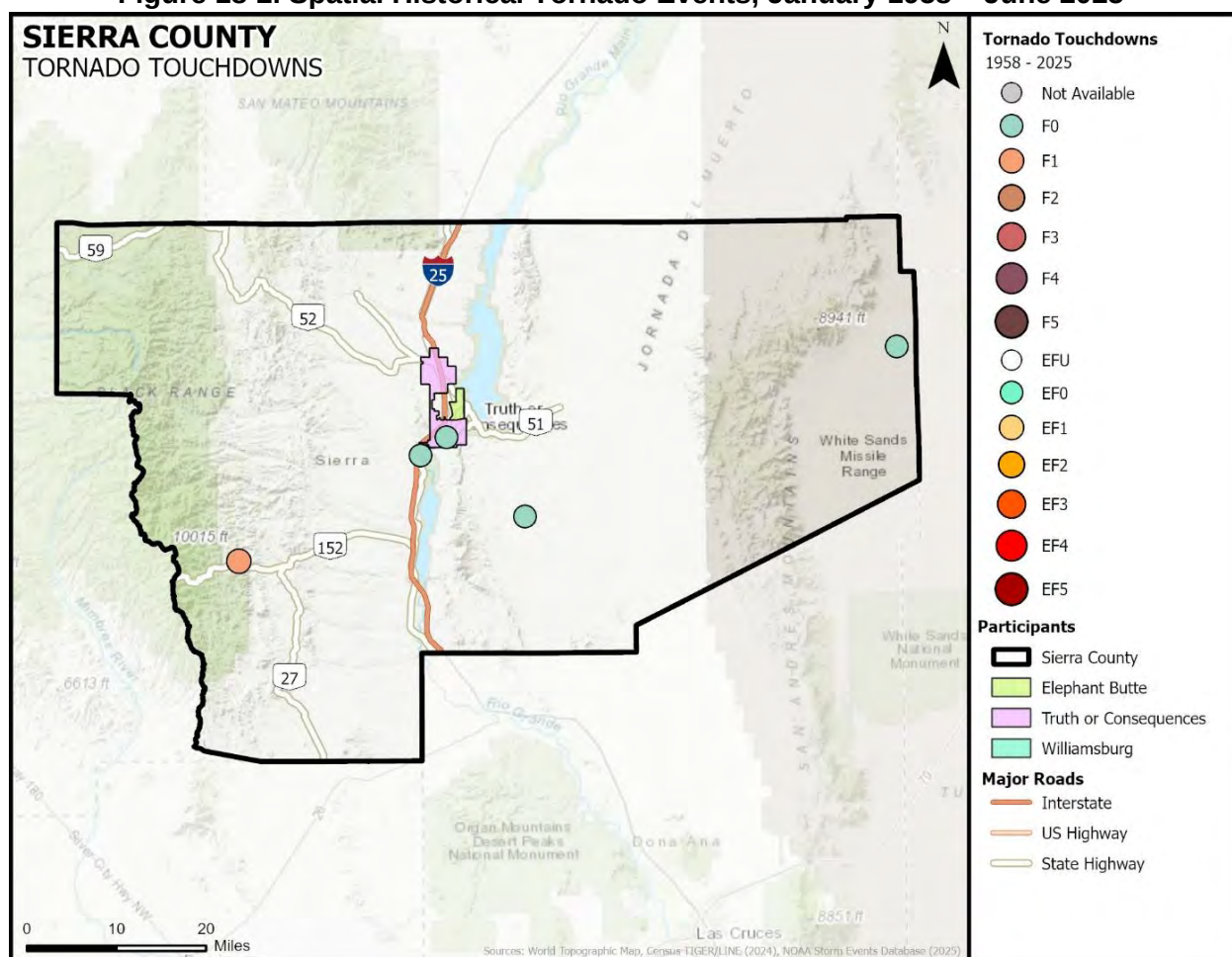


Table 18-3. Historical Tornado Events, January 1958 – June 2025⁴

JURISDICTION	DATE	MAGNITUDE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Sierra County	5/16/1958	F0	0	0	\$400	\$0
Sierra County	6/11/1960	F0	0	0	\$0	\$0
Sierra County	7/24/1970	F0	0	0	\$0	\$0
Sierra County	9/16/1971	F1	0	0	\$19,600	\$0
City of Truth or Consequences	6/20/1982	F0	0	0	\$100	\$0
TOTALS		(MAX EXTENT)	0	0	\$20,100	\$0

³ Source: NOAA Storm Prediction Center

⁴ Monetary damages have been inflated to their 2025 value.

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Table 18-4. Historical Tornado Events Summary, January 1958 – June 2025⁵

JURISDICTION	NUMBER OF EVENTS	MAX MAGNITUDE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Sierra County	4	F1	0	0	\$20,000	\$0
City of Elephant Butte	0	-	-	-	-	-
City of Truth or Consequences	1	F0	0	0	\$100	\$0
Village of Williamsburg	0	-	-	-	-	-
TOTALS	5	(MAX EXTENT)	0	0	\$20,1000	

Based on the list of historical tornado events for the Sierra County planning area, no events have occurred since the 2019 Plan according to reports in the NCEI database.

PROBABILITY OF FUTURE EVENTS

Tornadoes can occur at any time of year and at any time of day, but they are typically more common in the spring months during the late afternoon and evening hours. A smaller, high frequency period can emerge in the fall during the brief transition between the warm and cold seasons. With five historical events over a 67.5-year reporting period, Sierra County can anticipate a tornado touchdown approximately once every 10 to 15 years. This frequency supports an “Unlikely” probability of future events for the entire Sierra County planning area, including all participating jurisdictions, meaning an event is probable in the next ten years.

CLIMATE CHANGE CONSIDERATIONS

According to the National Oceanic and Atmospheric Administration (NOAA), the average annual number of EF1+ tornadoes is stable and has not shown a significant increase or decrease so far. However, tornado outbreaks, events with 16 or more EF1+ tornadoes, are increasing. There is also some evidence that suggests a shift in when we might experience tornadoes, due to climate change. According to the NOAA, the number of EF1+ tornadoes is decreasing in the spring and summer but increasing in the fall and winter. This suggests a greater risk of more off-season tornadoes in the future warmer climate. This could mean more tornado events at a time of year when people are not expecting it. The impacts on the frequency and severity of tornado events due to climate change can be hard to understand and results are generally inconclusive for tornado frequency during the traditional severe weather season.⁶

⁵ Participating jurisdictions with no reported events show a “-” in table columns where damages, deaths or injuries would be otherwise reported.

⁶ National Oceanic and Atmospheric Administration. Tornadoes and Climate Change.
https://www.noaa.gov/sites/default/files/2023-10/Tornadoes_Climate_OnePager_July2023.pdf

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VULNERABILITY AND IMPACT

Because tornadoes often cross jurisdictional boundaries, all existing and future buildings, facilities, and populations in the entire Sierra County planning area are considered to be exposed to this hazard and could potentially be impacted. The damage caused by a tornado is typically a result of high wind velocity, wind-blown debris, lightning, and large hail.

The average tornado moves from southwest to northeast, but tornadoes have been known to move in any direction. Consequently, vulnerability of humans and property is difficult to evaluate since tornadoes form at different strengths, in random locations, and create relatively narrow paths of destruction. Although tornadoes strike at random, making all buildings vulnerable, three types of structures are more likely to suffer damage:

- Manufactured Homes;
- Homes built of peer and beam construction (more susceptible to lift); and
- Buildings with large spans, such as shopping malls, gymnasiums, and factories.

Tornadoes can cause a significant threat to people as they could be struck by flying debris, falling trees / branches, utility lines, and poles. Blocked roads could prevent first responders from responding to calls. Tornadoes commonly cause power outages which could cause health and safety risks to residents and visitors, as well as to patients in hospitals.

The Sierra County planning area features mobile or manufactured homes throughout the planning area. These homes are typically more vulnerable to tornado events than typical site-built structures. The U.S. Census data indicates a total of 3,390 (42 percent of total housing stock) manufactured homes located in the Sierra County planning area. In addition, 45 percent (3,703 structures) of the single family residential (SFR) structures in the entire planning area were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damage during significant wind events (Table 18-5).

Table 18-5. Structures at Greater Risk by Participating Jurisdiction

JURISDICTION	STRUCTURES	
	SFR BUILT BEFORE 1980	MANUFACTURED HOMES
Sierra County	3,703	3,390
City of Elephant Butte	261	899
City of Truth or Consequences	2,130	1,086
Village of Williamsburg	170	223

While all citizens are at risk to the impacts of a tornado, forced relocation and disaster recovery disproportionately impacts low-income residents who lack the financial means to travel, afford a long-term stay away from home, and to rebuild or repair their homes. The elderly, children, and people with a disability may have trouble taking shelter due to mobility issues or a lack of awareness, making them more susceptible to injury or harm. In addition, people who speak a language other than English may face increased vulnerability due to language barriers that limit

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their access to important information such as weather-related warnings and instructions regarding safety measures.

The population over 65 in the Sierra County planning area is estimated at 37 percent of the total population and children under the age of 5 are estimated at 4 percent. The population with a disability is estimated at 28 percent of the total population. In addition, an estimated 25 percent of the planning area population live below the poverty level and 4 percent of the populations speaks English “less than very well” (Table 18-6).

Table 18-6. Populations at Greater Risk to Tornado Events⁷

JURISDICTION	POPULATION				
	65 AND OLDER	UNDER 5	WITH A DISABILITY	BELOW POVERTY LEVEL	LIMITED ENGLISH SPEAKING
Sierra County	4,251	420	3,253	2,866	489
City of Elephant Butte	881	32	527	159	0
City of Truth or Consequences	1,354	369	1,468	2,097	187
Village of Williamsburg	173	19	222	131	72

The Sierra County Planning Team identified the following critical facilities as assets that are considered the most important to the planning area and are susceptible to a range of impacts caused by tornado events (Table 18-7). The critical infrastructure with the greatest vulnerability to tornadoes are power and communications facilities. Failures of these facilities can result in a loss of service and cascading impacts such as posing enormous risk to individuals dependent on electricity as a medical necessity. For a comprehensive list by participating jurisdiction, see Appendix D.

Table 18-7. Critical Facilities Vulnerable to Tornado Events

CRITICAL FACILITIES	POTENTIAL IMPACTS
Emergency Response Services (EOC, Fire, Police, EMS), Hospitals and Medical Centers	- Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. - Emergency vehicles can be damaged by falling trees or flying debris. - Power outages could disrupt communications, delaying emergency response times. - Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities. - Debris / downed trees can impede emergency response vehicle access to areas. - Increased number of structure fires due to gas line ruptures and downed power lines, further straining the capacity and resources of emergency personnel.

⁷ U.S. Census Bureau 2023 data for Sierra County.

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CRITICAL FACILITIES	POTENTIAL IMPACTS
	First responders are exposed to downed power lines, unstable and unusual debris, hazardous materials, and generally unsafe conditions.
Airport, Academic Institutions, Animal Shelter, Evacuation Centers & Shelters, Governmental Facilities, Residential/ Assisted Living Facilities	- Structures can be damaged by falling trees damaged by lightning. - Power outages could disrupt critical care. - Backup power sources could be damaged. - Evacuations may be necessary due to extended power outages, fires, or other associated damage to facilities. - Power outages and infrastructure damage may prevent larger airports from acting as temporary command centers for logistics, communications, and emergency operations. - Temporary break in operations may significantly inhibit post event evacuations. - Damaged or destroyed highway infrastructure may substantially increase the need for airport operations.
Commercial Supplier (food, fuel, etc.)	- Facilities or infrastructure may be damaged, destroyed or otherwise inaccessible. - Essential supplies like medicines, water, food, and equipment deliveries may be significantly delayed. - Additional emergency responders and critical aid workers may not be able to reach the area for days.
Utility Services and Infrastructure (electric, water, wastewater, communications)	- Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. - Emergency vehicles can be damaged by falling trees or flying debris. - Power outages could disrupt communications, delaying emergency response times. - Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities. - Debris/downed trees can impede emergency response vehicle access to areas. - Increased number of structure fires due to gas line ruptures and downed power lines, further straining the capacity and resources of emergency personnel. - First responders are exposed to downed power lines, unstable and unusual debris, hazardous materials, and generally unsafe conditions.

The total loss estimate due to tornado events is \$20,100 (2025 dollars), having an approximate annual loss estimate of \$300. No reported injuries or fatalities have resulted within the Sierra County planning area due to tornado events. Based on historic loss and damages, the impact of tornadoes on the Sierra County planning area, including all participating jurisdictions, is considered “Limited” severity, meaning minor quality of life lost, critical facilities and services shut down for 24 hours or less, and less than 10 percent of property destroyed or with major damage.

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Table 18-8. Estimated Average Annual Losses

JURISDICTION	TOTAL PROPERTY & CROP LOSS	AVERAGE ANNUAL LOSS ESTIMATES
Sierra County	\$20,000	\$300
City of Elephant Butte	\$0	\$0
City of Truth or Consequences	\$100	\$0
Village of Williamsburg	\$0	\$0
TOTALS	\$20,100	\$300

ASSESSMENT OF IMPACTS

Tornadoes have the potential to pose a significant risk to the population and can create dangerous situations. Often, providing and preserving public health and safety is difficult. The impact of climate change could produce larger, more severe tornado events, exacerbating the current tornado impacts. More destructive tornado conditions can be frequently associated with a variety of impacts, including:

- Individuals exposed to the storm can be struck by flying debris, falling limbs, or downed trees causing serious injury or death.
- Structures can be damaged or crushed by falling trees, which can result in physical harm to the occupants.
- Manufactured homes may suffer substantial damage as they would be more vulnerable than typical site-built structures.
- Significant debris and downed trees can result in emergency response vehicles being unable to access areas of the community.
- Downed power lines may result in roadways being unsafe for use, which may prevent first responders from answering calls for assistance or rescue.
- Tornadoes often result in widespread power outages increasing the risk to more vulnerable portions of the population who rely on power for health and/or life safety.
- Extended power outages can result in an increase in structure fires and/or carbon monoxide poisoning as individuals attempt to cook or heat their home with alternate, unsafe cooking or heating devices, such as grills.
- Tornadoes can destroy or make residential structures uninhabitable, requiring shelter or relocation of residents in the aftermath of the event.
- First responders must enter the damage area shortly after the tornado passes to begin rescue operations and to organize cleanup and assessments efforts, therefore they are exposed to downed power lines, unstable and unusual debris, hazardous materials, and generally unsafe conditions, elevating the risk of injury to first responders and potentially diminishing emergency response capabilities.
- Emergency operations and services may be significantly impacted due to damaged facilities, loss of communications, and damaged emergency vehicles and equipment.
- Private sector entities such as utility providers, financial institutions, and medical care providers may not be fully operational and may require assistance from neighboring communities until full services can be restored.

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- Economic disruption negatively impacts the programs and services provided by the community due to short- and long-term loss in revenue, especially if damage is sustained to major employers within the planning area.
- Damage to infrastructure may slow economic recovery since repairs may be extensive and lengthy.
- When the community is affected by significant property damage it is anticipated that funding would be required for infrastructure repair and restoration, temporary services and facilities, overtime pay for responders, and normal day-to-day operating expenses.
- Displaced residents may not be able to immediately return to work, further slowing economic recovery.
- Residential structures destroyed by a tornado may not be rebuilt for years, reducing the tax base for the community.
- Large or intense tornadoes may result in a dramatic population fluctuation, as people are unable to return to their homes or jobs and must seek shelter and/or work outside of the affected area.
- Businesses that are uninsured or underinsured may have difficulty reopening, which results in a net loss of jobs for the community and a potential increase in the unemployment rate.
- Recreation activities may be unavailable, and tourism can be unappealing for years following a large tornado, devastating directly related local businesses.
- Tornadoes may destroy or degrade the habitat of endangered species.
- Historical sites and properties are placed at a higher risk of impact due to materials used and the inability to change properties due to their historic status. The Sierra County planning area has 32 historical entries listed on the National Register of Historic Places and 54 sites listed on the New Mexico State Register of Cultural Properties.

The economic and financial impacts of a tornado event on the community will depend on the scale of the event, what is damaged, costs of repair or replacement, lost business days in impacted areas, and how quickly repairs to critical components of the economy can be implemented. The level of preparedness and pre-event planning done by the community, local businesses, and citizens will contribute to the overall economic and financial conditions in the aftermath of a tornado event.

Section 19

Volcano



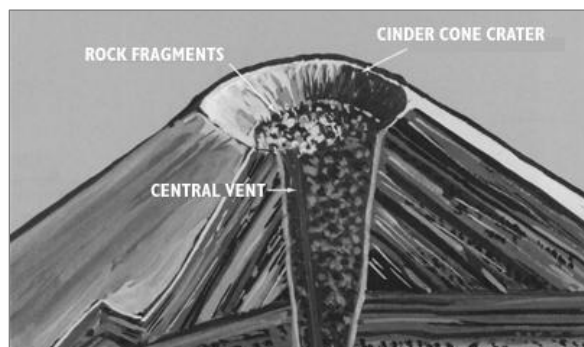
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HAZARD DESCRIPTION

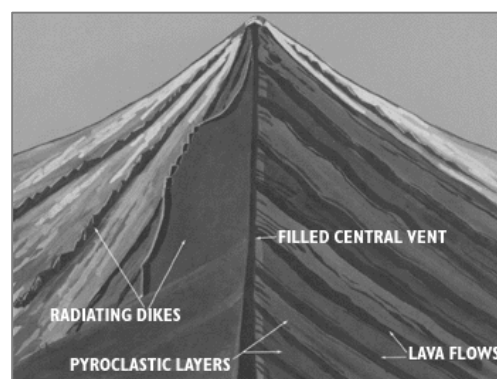
Volcanoes are openings in the Earth's surface where lava, tephra (small rocks), and steam erupt onto the surface. A volcanic eruption is the expulsion of these materials onto the Earth's surface or into the atmosphere. Volcanic eruptions can range from small, only consisting of gas emissions, to large scale, with cataclysmic explosions. They can last days, months, or even years.

According to the United States Geological Survey (USGS), there are many different types of volcanoes. The four primary types include cinder cones, composite volcanos (stratovolcano), shield volcanoes, and lava domes.¹ Each type of volcano can be found in the state of New Mexico.



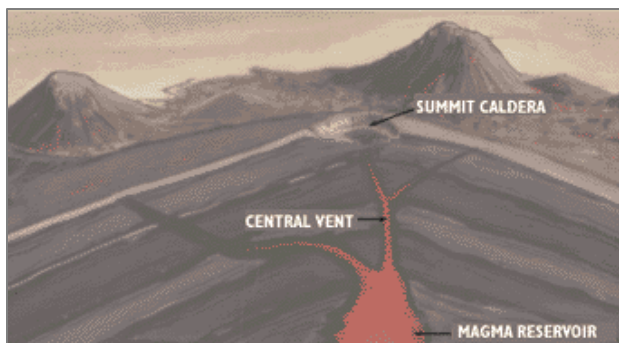
Cinder Cones are the simplest type of volcano. They develop as cinder (solid lava) erupts from a vent (the opening in the Earth's crust). As gas-charged lava is blown into the air, it solidifies around the vent to form a cone. Most cinder cones have a crater at the center where the vent is located. Cinder cones are common in western North America and in other volcanic areas around the world.

Composite volcanos, or stratovolcanoes, make up some of the Earth's largest and grandest mountains. They are usually steep, symmetrical cones that are made from different layers of lava, ash, and cinder. Composite volcanos notoriously have large pools of magma deep under the mountain, in the Earth's crust. The volcano increases in size as this material erupts and cools.



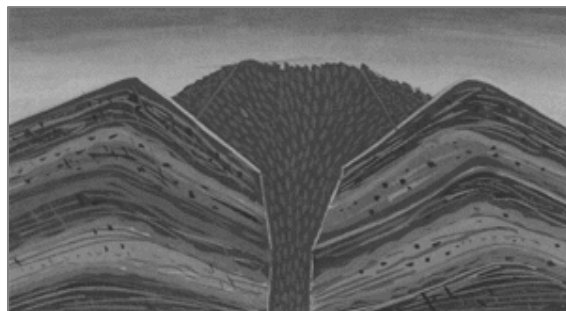
¹ United States Geological Survey (USGS). Principal Types of Volcanoes. <https://pubs.usgs.gov/gip/volc/types.html>

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Shield volcanoes are made entirely of fluid lava flows. Flow after flow pours out of the vent in all directions, building a flat cone with a dome shape. It resembles a warrior's shield. Lava commonly erupts from vents along fractures that develop on the cone. Some of the largest volcanoes in the world are shield volcanoes. These types can typically be found in the western United States.

Lava domes are made of lava that is too thick to flow a far distance. This lava will pile up over and around its vent, which forms a dome shape. Lava domes are dangerous because they grow from within. As fresh lava fills the inside, the cooler, dried outer surface will shatter and spill hot rock and gases down the mountain. Lava domes commonly form within the craters of composite volcanoes.



One additional volcano type is the caldera. Calderas are both its own type and a landform as part of other volcanoes. Calderas are referred to as inverse volcanoes because they are collapse features that form during large volcanic eruptions when the magma chamber is only partially emptied and the ground above it subsides into it.²

LOCATION

According to the USGS, there are an estimated 1,350 potentially active volcanoes worldwide and about 500 of these volcanoes have erupted in the last 100 years. USGS scientists monitor 160 active and potentially active volcanoes in the United States. These volcanoes are located in Alaska, Hawaii, and the western states, including New Mexico.

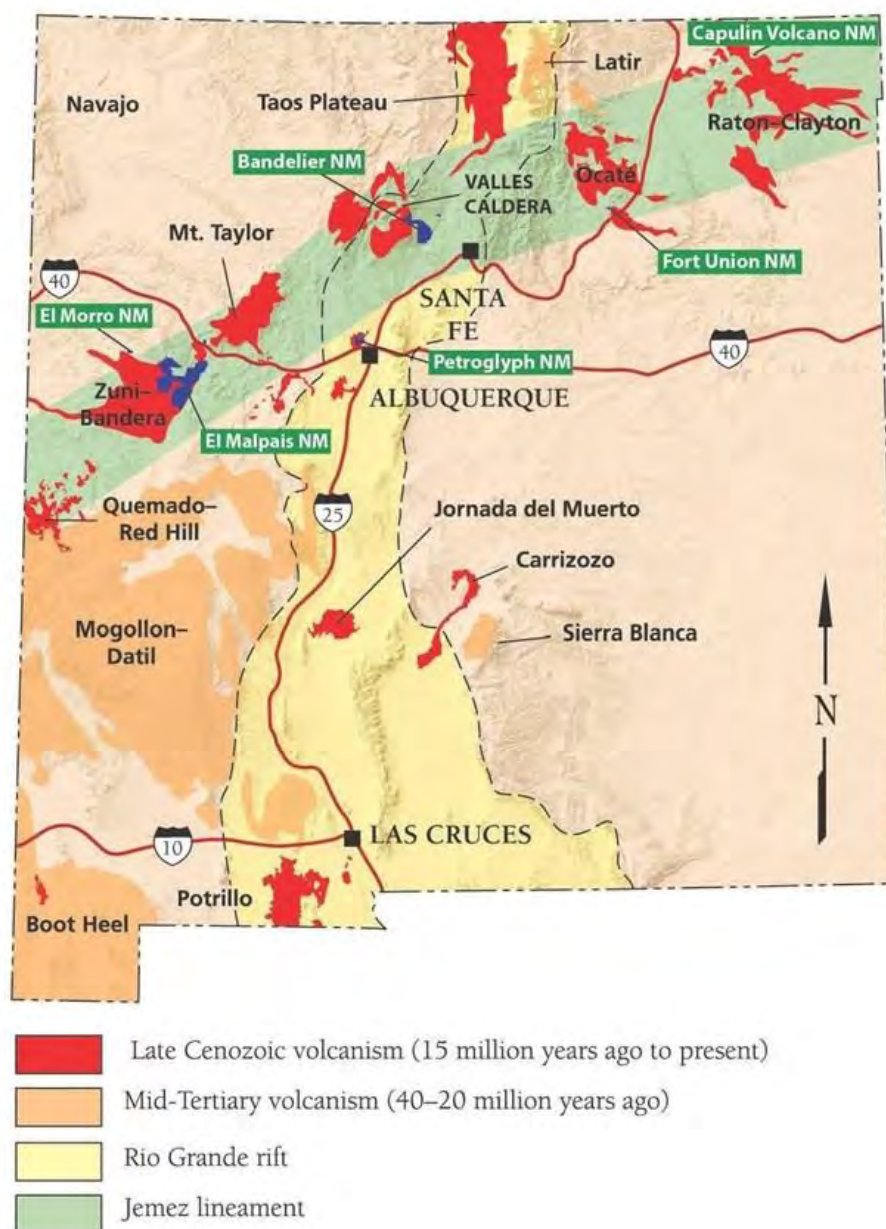
New Mexico has one of the greatest concentrations of young volcanoes in North America. Sierra County falls within the Rio Grande Rift major fault system, as shown in Figure 19-1. The Jornada del Muerto volcanic field, located along the eastern portion of the Rio Grande rift, consists of basaltic vents and lava flows that were formed during several eruptions over the last one million years. The most recent event, about 760,000 years ago, produced heavy lava flow that shaped the rugged landscape within the area. Today, Jornada del Muerto is dormant, but not extinct, and it still displays signs of activity with ongoing fault movements. If the volcano reawakens, there would be signs, like small earthquakes.³

² National Park Service. Calderas. <https://www.nps.gov/articles/000/calderas.htm>

³ New Mexico Museum of Natural History & Science. Jornada del Muerto Volcano. <https://www.nmnaturalhistory.org/volcanoes/jornada-del-muerto-volcano>

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Figure 19-1. Map of Volcanic National Park Sites⁴



Jornada del Muerto is just northeast of Sierra County; therefore, the entire Sierra County is at some risk of geothermal activity or potential volcanic activity.

⁴ National Park Service. Valles Caldera. Geology - Valles Caldera National Preserve (U.S. National Park Service) (nps.gov). <https://www.nps.gov/vall/learn/nature/geology.htm>

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Figure 19-2. Image of Jornada del Muerto⁵



EXTENT

The destruction caused by volcanoes ranges from light to devastating, depending on the intensity, length of eruption, and type of volcano. The Volcanic Explosivity Index (VEI) is a scale that measures the extent of a volcanic eruption based on magnitude and intensity. The scale has numerical intervals from 0 to 8, with effusive Hawaiian-style eruptions rated 0 on the index, and super volcano eruptions such as Yellowstone at an 8. The scale is based on the volume of magma erupted, which represents magnitude, and the height of the eruption column, which represents intensity. The VEI also includes a qualitative description for each value, ranging from “effusive” to “apocalyptic” as shown in Table 19-1.⁶ Since Jornada del Muerto is dormant and has not been active in a very long time, it can be difficult to estimate the full extent of a potential eruption. However, based on the volcano type provided in the VEI, Sierra County could experience a maximum VEI of 1.

⁵ New Mexico Museum of Natural History & Science. Jornada del Muerto Volcano.
<https://www.nmnaturalhistory.org/volcanoes/jornada-del-muerto-volcano>

⁶ National Park Service. VEI. Volcanic Explosivity Index - Volcanoes, Craters & Lava Flows (U.S. National Park Service) (nps.gov). <https://www.nps.gov/subjects/volcanoes/volcanic-explosivity-index.htm>

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Table 19-1. Volcanic Explosivity Index (VEI)

VEI	DESCRIPTION	EJECTA VOLUME (km ³)	COLUMN HEIGHT (km)	VOLCANO TYPES
0	Effusive	<0.00001	<0.1	Many Shield Volcanoes
1	Severe	0.001	1	Many Shield Volcanoes; Many Cinder Cones
2	Explosive	0.01	5	Most Cinder Cones
3	Catastrophic	0.1	15	Most Cinder Cones
4	Cataclysmic	1	25	Few Cinder Cones; Composite Volcanoes
5	Paroxysmal	10	>25	Composite Volcanoes
6	Colossal	100	>25	Calderas
7	Mega-colossal	1,000	>25	Calderas
8	Apocalyptic	>1,000	>25	Super Volcanoes

HISTORICAL OCCURRENCES

According to the New Mexico Bureau of Geology and Mineral Resources, there have been 700 volcanic eruptions across the state in the last 5 million years. The most recent volcanic eruption to occur in the state of New Mexico occurred about 3,900 years ago, and this was outside of the planning area.

According to the Bureau of Land Management (BLM), the Jornada del Muerto is one of the most noteworthy volcanic areas in the state, and it lies just northeast of the Sierra County planning area. The Jornada del Muerto was formed and last erupted around 760,000 years ago. Since that eruption, the Jornada del Muerto has been dormant.⁷

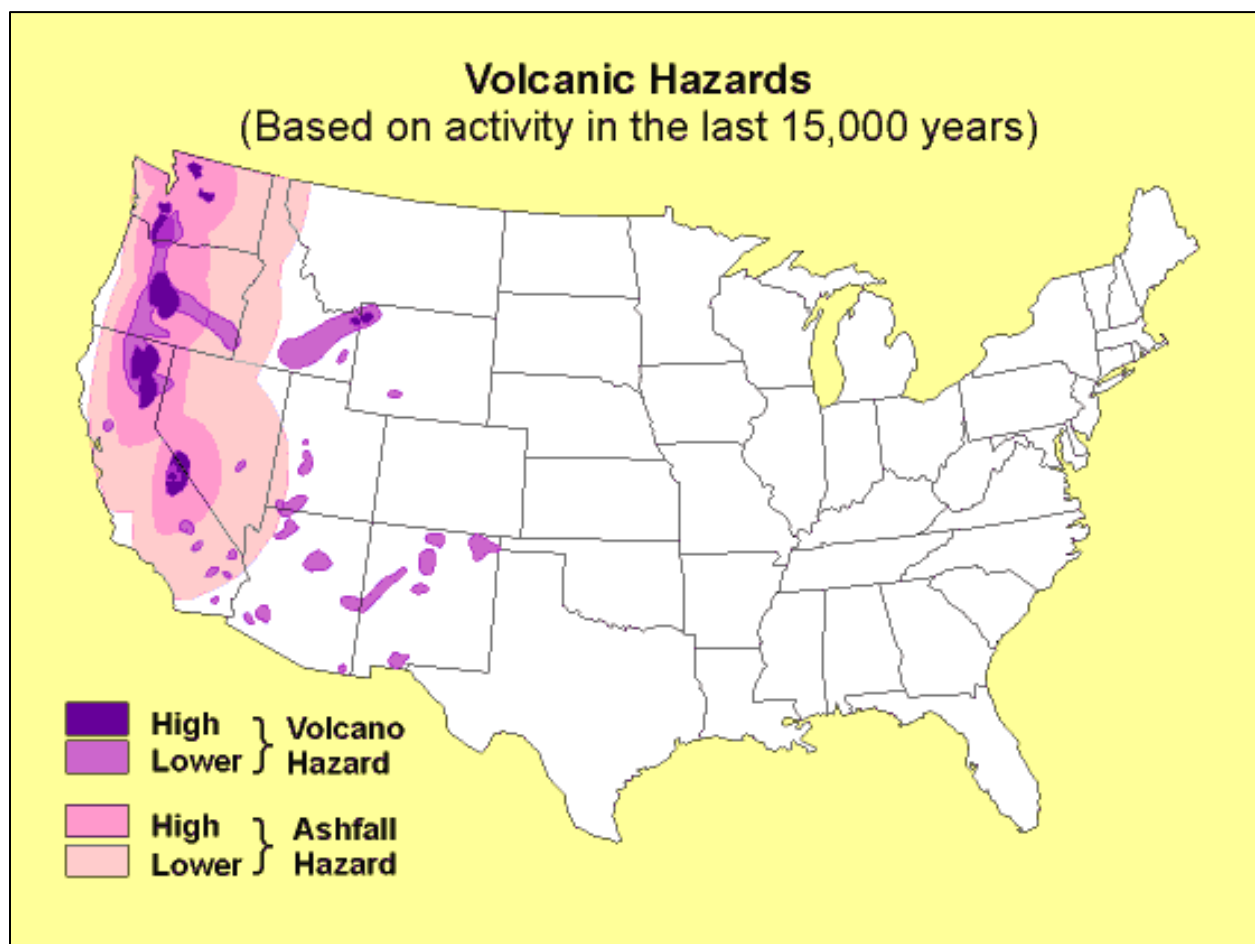
PROBABILITY OF FUTURE EVENTS

Figure 19-3 below shows the volcanic hazard areas for the United States based on volcanic history over the last 15,000 years. All activity has occurred within the western United States, including New Mexico. The six areas identified in New Mexico are considered lower risk areas in relation to other sites in the US.

⁷ BLM. Jornada del Muerto Wilderness Study Area. <https://www.blm.gov/visit/jornada-del-muerto-wsa>

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Figure 19-3. Volcanic Hazards Across the United States⁸



The Jornada del Muerto is one of the notable volcanoes in south-central New Mexico. The volcanic field consists of mainly basaltic lava flow and small vents that are scattered throughout the basin. This shield volcano is characterized by its older basaltic eruptions that led to the very rigid terrain. However, seismic activity at the shield is rare and there is no evidence for significant changes to ground deformation or activity.⁹ As mentioned previously, the last time this shield erupted was 760,000 years ago, and since, the shield has remained dormant.

One study conducted by the New Mexico Institute of Mining and Technology concluded that there is a 1 percent chance that some type of volcanic eruption could occur somewhere in New Mexico in the next 100 years, and a 10 percent chance that an eruption will occur in the next 1,000 years.¹⁰ With little to no activity over thousands of years, and no evidence to support an increase in future volcanic activity, the frequency of a volcanic eruption impacting the Sierra County planning area is considered “Unlikely”, or an event probable in the next ten or more years.

⁸ 2023 New Mexico State Hazard Mitigation Plan

⁹ New Mexico Geological Society. Evolution of the late Cenozoic Jornada Volcano, South-Central New Mexico. https://nmgs.nmt.edu/publications/guidebooks/downloads/42/42_p0159_p0163.pdf

¹⁰ New Mexico Bureau of Geology and Mineral Resources. About New Mexico Volcanoes. <https://geoinfo.nmt.edu/faq/volcanoes/>

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CLIMATE CHANGE CONSIDERATIONS

Currently there is very limited research on how climate change will impact the occurrence of geologic hazards, including volcanoes. Some research, according to the United Nations Office of Disaster Risk Reduction, suggests that sea level rise may redistribute the amount of pressure on certain fault lines, however, this seems to impact undersea volcanoes the most. Therefore, at this time, climate change is not expected to impact volcano risk in the Sierra County planning area for the foreseeable future.

VULNERABILITY AND IMPACT

Volcanic eruptions are low probability, high impact events. This means that while the risk of an eruption occurring is unlikely, the impacts could be detrimental. All existing and future buildings, facilities, and populations in the entire Sierra County planning area would be vulnerable. The damage caused by a volcano is typically a result of lava flows, lahars (debris flow), ash, tephra (rock), and volcanic gas.

Powerful eruptions can drastically alter the land miles around a volcano and can cause damage to widespread areas. Volcanic eruptions often force people living near volcanoes to evacuate their land and homes. People and structures located further away from the volcano are likely to avoid complete destruction and injury, however, homes, critical facilities, crops, transportation systems, and electrical grids can still be damaged by tephra, ash, lahars, and flooding.

Lava flows are streams of molten rock. They are typically slow moving flows that people can usually avoid. However, a lava flow will ignite or damage any structure within its path. This magma can also release toxic gases that can be harmful to human health and the environment including carbon dioxide, sulfur dioxide, hydrogen sulfide, and hydrogen halides. Ashfall can become heavy when it accumulates and may cause damage to buildings, utilities, agriculture, water supplies, and when ingested, can harm the respiratory systems of humans and animals.

Volcanoes often exhibit signs, like earthquakes, that when detected, allow forewarning. While all citizens are at risk to the impacts of a volcano, forced relocation and disaster recovery disproportionately impacts low-income residents who lack the financial means to evacuate, afford a long-term stay away from home, and to rebuild or repair their homes. The elderly, children, and people with a disability may have trouble evacuating due to mobility issues or a lack of awareness, making them more susceptible to injury or harm. In addition, people who speak a language other than English may face increased vulnerability due to language barriers that limit their access to important information such as weather-related warnings and instructions regarding safety measures. The population over 65 in the Sierra County planning area is estimated at 37 percent of the total population and children under the age of 5 are estimated at 4 percent. The population with a disability is estimated at 28 percent of the total population. An estimated 25 percent of the planning area population live below the poverty level and 4 percent of the populations speaks a language other than English (Table 19-2).

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Table 19-2. Populations at Greater Risk by Participating Jurisdiction¹¹

JURISDICTION	POPULATION				
	65 AND OLDER	UNDER 5	WITH A DISABILITY	BELOW POVERTY LEVEL	LIMITED ENGLISH SPEAKING
Sierra County	4,251	420	3,253	2,866	489
City of Elephant Butte	881	32	527	159	0
City of Truth or Consequences	1,354	369	1,468	2,097	187
Village of Williamsburg	173	19	222	131	72

The Sierra County Planning Team identified the following critical facilities as assets that are considered the most important to the planning area and are susceptible to a range of impacts caused by a potential volcano event (Table 19-3). Failures of these facilities and structures can result in a loss of service and cascading impacts. For a comprehensive list of identified critical facilities see Appendix D.

Table 19-3. Critical Facilities Vulnerable to Volcano Event

CRITICAL FACILITIES	POTENTIAL IMPACTS
Emergency Response Services (EOC, Fire, Police, EMS), Hospitals and Medical Centers	- Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. - Emergency vehicles can be damaged by falling rock or ash. - Power outages could disrupt communications, delaying emergency response times. - Critical staff may be injured, trapped, or otherwise unable to report for duty, limiting response capabilities. - Debris and ash can impede emergency response vehicle access to areas. - Increased number of structure fires due to lava flow, further straining the capacity and resources of emergency personnel. - First responders are exposed to ash inhalation, unstable and unusual debris, hazardous materials, and generally unsafe conditions.
Airport, Academic Institutions, Animal Shelter, Evacuation Centers & Shelters, Governmental Facilities, Residential/ Assisted Living Facilities	- Structures can be damaged by ash, tephra, or lava flow. - Power outages could disrupt critical care. - Backup power sources could be damaged. - Evacuations may be necessary in areas closest to the volcano. - Power outages and infrastructure damage may prevent larger airports from acting as temporary command centers for logistics, communications, and emergency operations.

¹¹ U.S. Census Bureau 2023 data for Sierra County.

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CRITICAL FACILITIES	POTENTIAL IMPACTS
	• Ashfall can block visibility and impact all transportation systems, including aviation systems. • Damaged or destroyed highway infrastructure may substantially disrupt evacuations and operations.
Commercial Supplier (food, fuel, etc.)	• Facilities or infrastructure may be damaged, destroyed or otherwise inaccessible. • Essential supplies like medicines, water, food, and equipment deliveries may be significantly delayed. • Additional emergency responders and critical aid workers may not be able to reach the area for days.
Utility Services and Infrastructure (electric, water, wastewater, communications)	• Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. • Emergency vehicles can be damaged by falling rock or ash. • Power outages could disrupt communications, delaying emergency response times. • Critical staff may be injured, trapped, or otherwise unable to report for duty, limiting response capabilities. • Debris and ash can impede emergency response vehicle access to areas. • Increased number of structure fires due to lava flow, further straining the capacity and resources of emergency personnel. • First responders are exposed to ash inhalation, unstable and unusual debris, hazardous materials, and generally unsafe conditions.

While the probability of a volcanic eruption is extremely low, the impact severity of any potential event would likely be devastating, indicating a “Substantial” impact, with more than 50 percent of property expected to be destroyed, multiple deaths and injuries, and a complete shutdown of critical facilities of 30 days or longer depending on the size and location of the event.

ASSESSMENT OF IMPACTS

Volcanoes have the potential to pose a significant risk to the population and can create dangerous situations. Often, providing and preserving public health and safety is difficult. While the likelihood of an eruption is low, volcanoes can be frequently associated with a variety of impacts, including:

- Individuals closest to the volcano may be subject to injury, especially if there is little warning time or if they have trouble evacuating.
- Exposure to ash can cause respiratory and health issues, especially for those with preexisting health conditions.
- Structures can be damaged by earthquakes, flying rocks and debris, lava flow, and ashfall.
- Significant debris and ash can result in emergency response vehicles being unable to access areas of the community.
- Damaged buildings, downed power lines, and fires may result in roadways being unsafe for use, which may impact first responder rescue operations.
- Volcanoes can destroy or make residential structures uninhabitable, requiring shelter or relocation of residents.

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- First responders must enter the damage area to begin rescue operations and to organize cleanup and assessments efforts, therefore they are exposed to downed power lines, unstable and unusual debris, hazardous materials, and generally unsafe conditions, elevating the risk of injury to first responders and potentially diminishing emergency response capabilities.
- Emergency operations and services may be significantly impacted due to damaged facilities, loss of communications, and damaged emergency vehicles and equipment.
- Private sector entities such as utility providers, financial institutions, and medical care providers may not be fully operational and may require assistance from neighboring communities until full services can be restored.
- Economic disruption negatively impacts the programs and services provided by the community due to short- and long-term loss in revenue, especially if damage is sustained to major employers within the planning area.
- Damage to infrastructure may slow economic recovery since repairs may be extensive and lengthy.
- When the community is affected by significant property damage it is anticipated that funding would be required for infrastructure repair and restoration, temporary services and facilities, overtime pay for responders, and normal day-to-day operating expenses.
- Displaced residents may not be able to immediately return to work, further slowing economic recovery.
- Eruptions may result in a dramatic population fluctuation, as people are unable to return to their homes or jobs and must seek shelter and/or work outside of the affected area.
- Recreation activities may be unavailable, and tourism can be unappealing for years, devastating local businesses.
- An eruption may destroy or degrade endangered species' habitats. There are 14 federally endangered, threatened or candidate species in Sierra County.
- Historical sites and properties are placed at a higher risk of impact due to materials used and the inability to change properties due to their historic status. The Sierra County planning area has 32 historical entries on the National Register of Historic Places and 54 sites on the New Mexico State Register of Cultural Properties.
- The geography of the land and water may be permanently altered by the eruption.
- Volcanic eruptions can have detrimental environmental impacts. Air quality, water quality, and soil health can be impacted, leading to a loss of vegetation and wildlife.

The economic and financial impacts of a volcano event on the community will depend on the scale of the event, what is damaged, costs of repair or replacement, lost business days in impacted areas, and how quickly repairs to critical components of the economy can be implemented. The level of preparedness and pre-event planning done by the community, local businesses, and citizens will contribute to the overall economic and financial conditions in the aftermath of a volcano event.

Section 20

Wildfire



SECTION 20: WILDFIRE

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HAZARD DESCRIPTION

Wildfire is an unplanned fire burning in natural or wildland areas such as forests, shrub lands, grasslands, or prairies.¹ Wildfires can start from both human and natural causes, such as lightning. New Mexico is prone to large wildfires, with the second most acres burned among all states in 2022.²

Wildfire risk is highest in the Wildland Urban Interface (WUI). The WUI is described as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels. Population growth and development within the WUI substantially increases the risk of wildfire. Continued housing development in the WUI will put more people at a greater risk of catastrophic wildfire and put more pressure on land managers and fire department personnel to mitigate fire risk. Additionally, the area is experiencing hotter, drier climatic conditions. These factors combine to make the planning area at risk from wildfires. While Sierra County is continually at some risk for wildfires, that risk is elevated during the summer and fall seasons. The Sierra County WUI is presented in Figure 20-1 below.

Wildfires spread based on the type and quantity of fuel that surrounds it. Fuel can include everything from trees, underbrush and dry grassy fields near homes. The amount of flammable material that surrounds a fire is referred to as the fuel load. Conditions in the weather and environment, such as drought, winds, and extreme heat, can cause a fire to spread more quickly.³ A wildfire event often begins unnoticed and spreads quickly, lighting brush, trees, and homes on fire.

Most ignition sources for wildfires are a result of human activities. For example, a wildfire may be started by a campfire that was not doused properly, a tossed cigarette, burning debris, or arson. Every year, on average, human-caused wildfires account for approximately 85 percent of wildfires in the United States.⁴ Human-caused wildfires were noted as a significant concern for the Sierra County planning area by the planning team. Wildland fires are fueled almost exclusively by natural vegetation, while interface or intermix fires are urban / wildland fires in which vegetation and the built environment provide the fuel. According to the Sierra County Community Wildfire Protection

¹ Source: FEMA: <https://hazards.fema.gov/nri/wildfire>

² Source: National Interagency Fire Center. <https://www.iii.org/table-archive/23870>

³ Source: NOAA Weather Forecasting: <https://scijinks.gov/wildfires/>

⁴ Source: <https://www.nifc.gov/fire-information/fire-prevention-education-mitigation>

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Plan (2019 Update), lightning strikes account for the majority (39%) of wildfires in the planning area. However, the combined total of human-caused wildfires (including debris burning, equipment use, smoking, campfires, powerlines, children and fireworks) exceeds lightning as the primary cause of wildfires with a total of 57 percent.

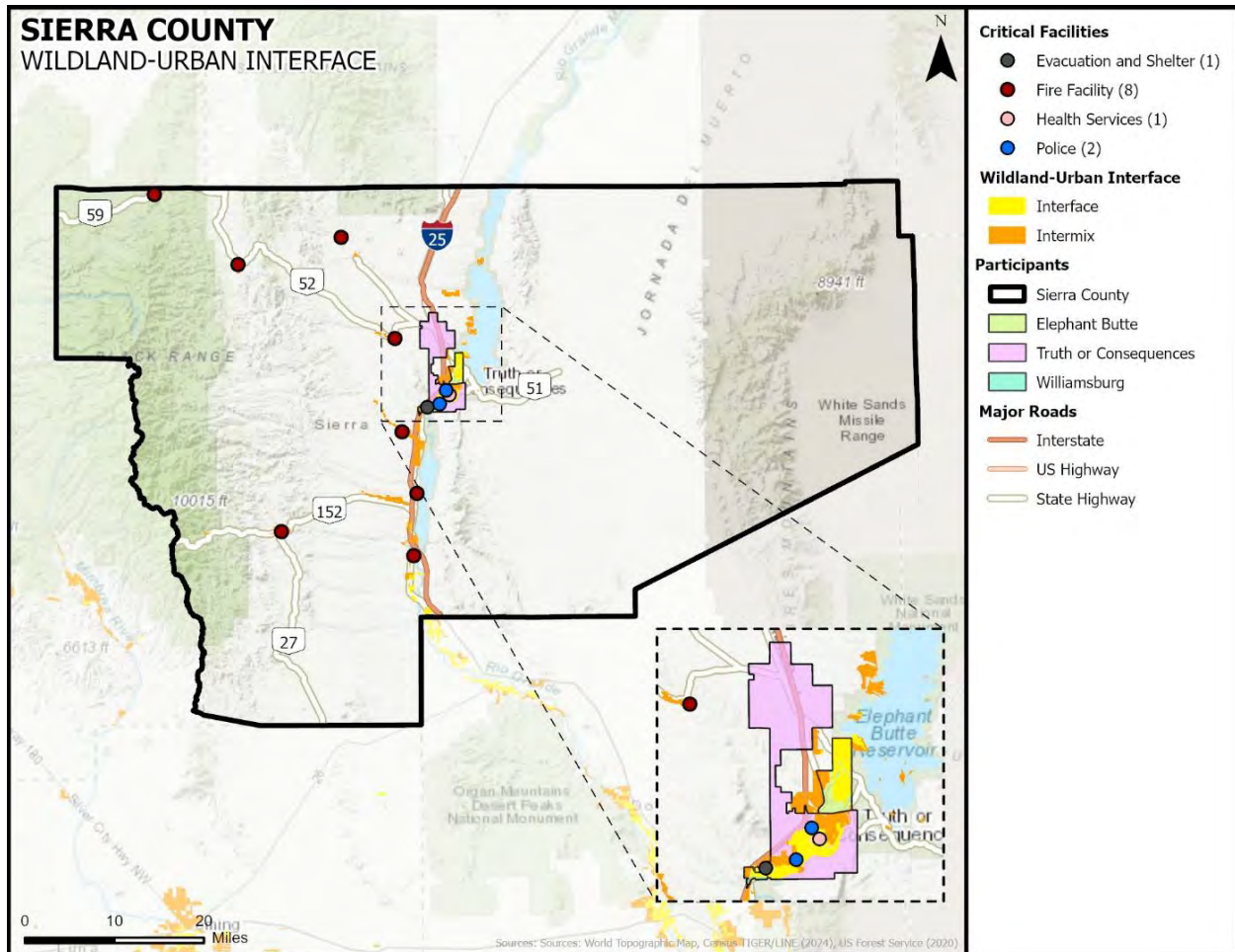
LOCATION

Wildfires can vary greatly in terms of size, location, intensity, and duration. While wildfires are not confined to any specific geographic location, they are most likely to occur in open grasslands. The New Mexico Wildfire Risk Assessment Portal (NMWRAP) provides historical wildfire data for New Mexico counties along with mapping resources that includes data layers on the WUI boundaries for communities throughout the Sierra County planning area, along with multiple tips, recommendations and mitigation solutions for communities and residents. The NMWRAP portal was utilized to produce the maps found in this profile.

The threat to people and property from a wildfire event is greater in the fringe areas where developed areas meet open grass lands, such as the Wildland Urban Interface (WUI) (Figures 20-1 through 20-4).

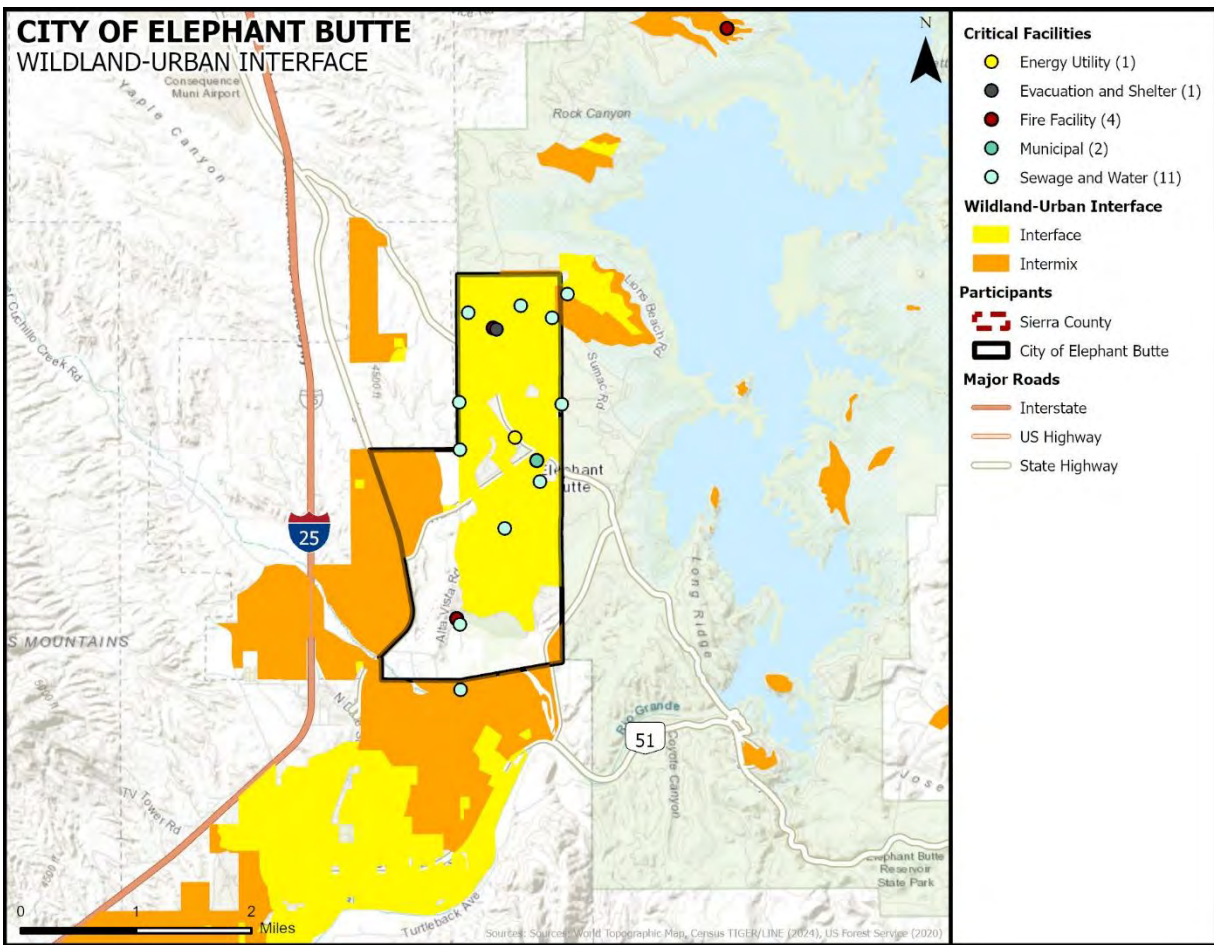
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Figure 20-1. Wildland Urban Interface Map for Sierra County



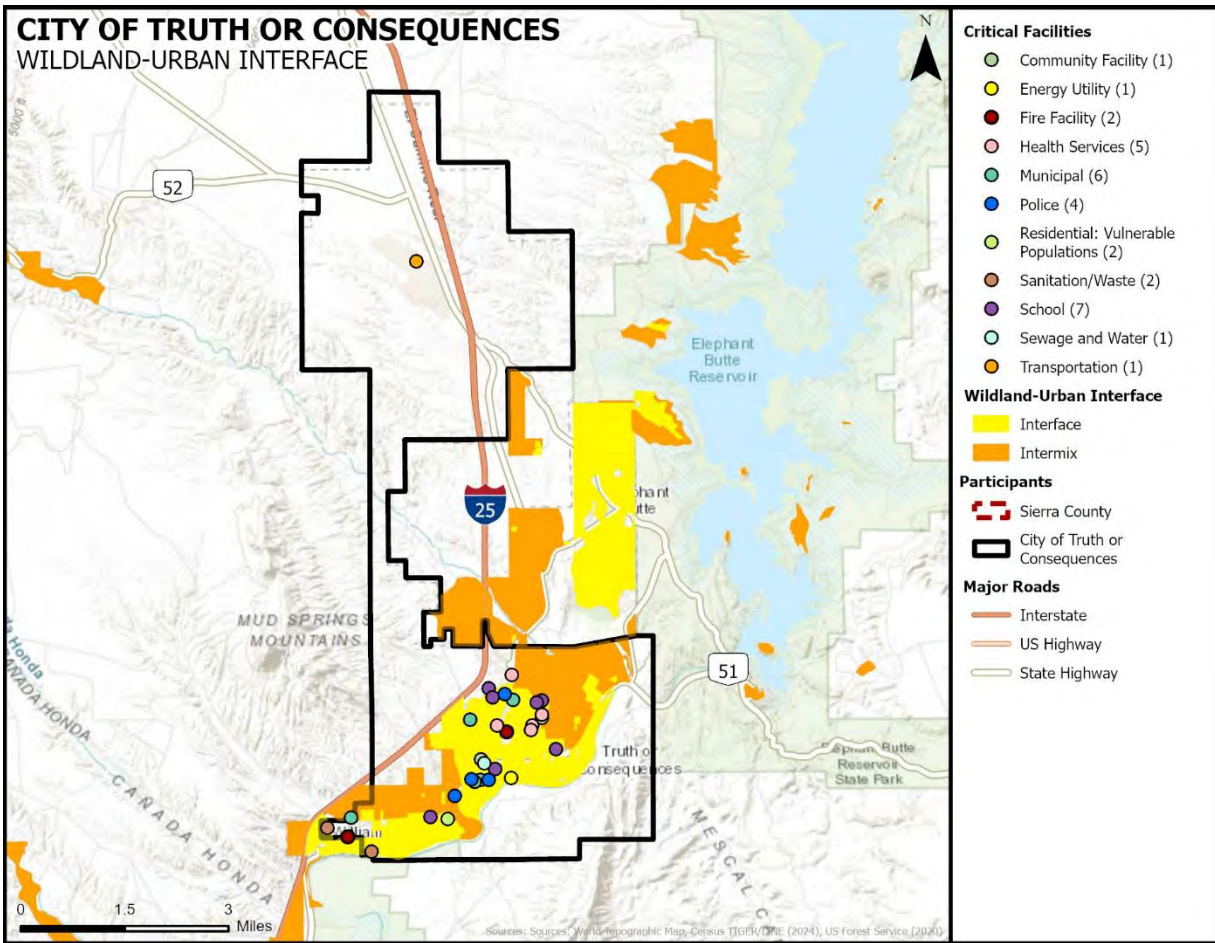
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Figure 20-2. Wildland Urban Interface Map for the City of Elephant Butte



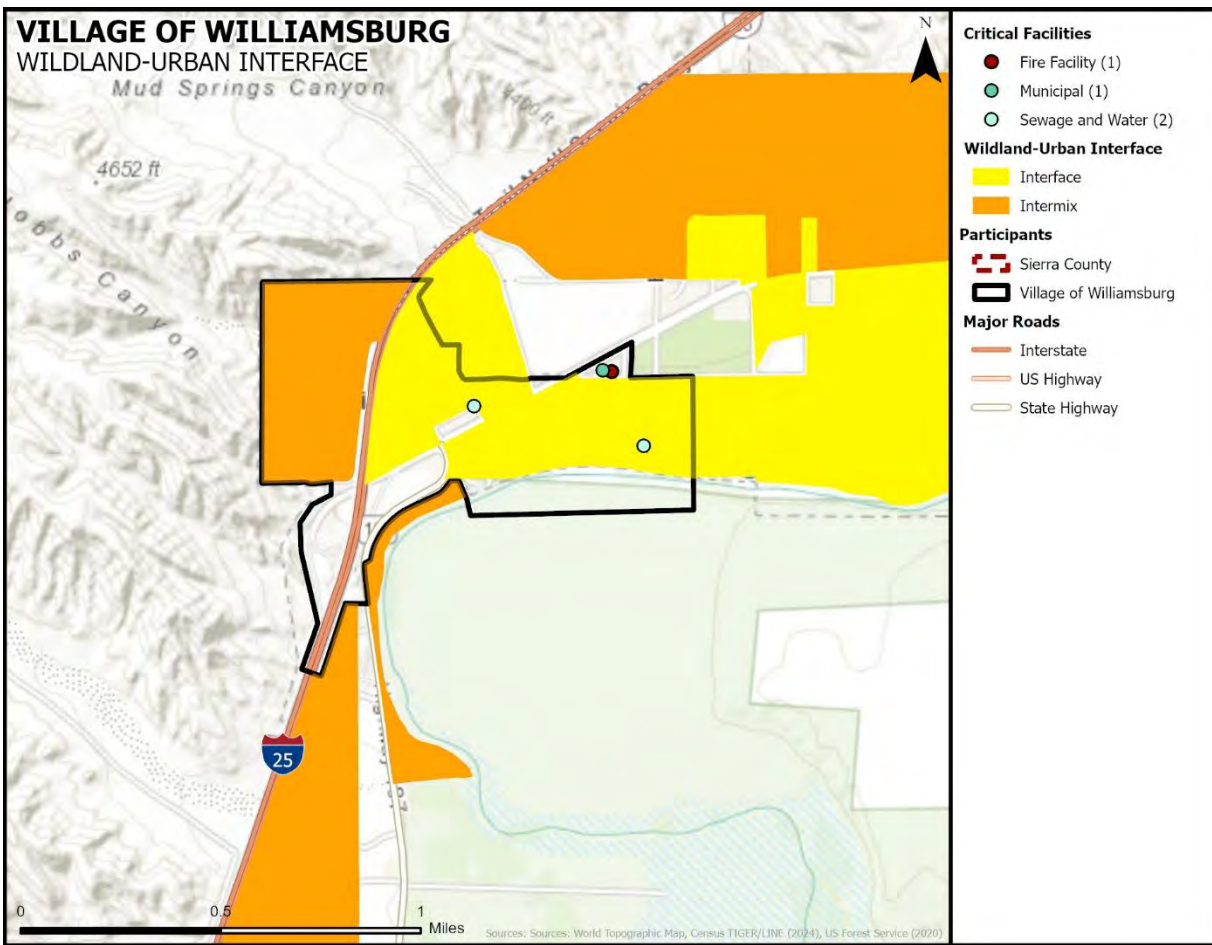
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Figure 20-3. Wildland Urban Interface Map for the City of Truth or Consequences



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Figure 20-4. Wildland Urban Interface Map for the Village of Williamsburg



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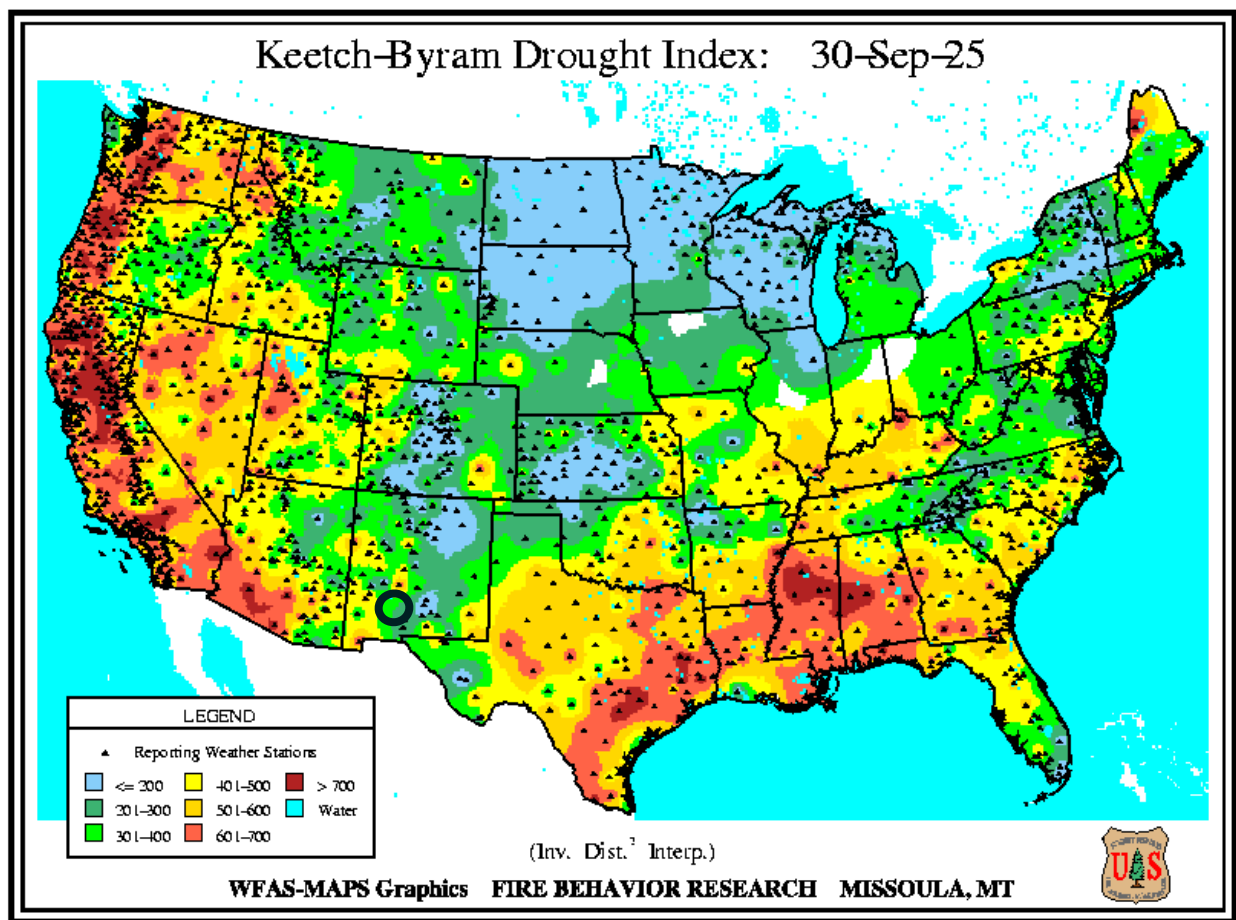
EXTENT



Risk for a wildfire event is measured in terms of magnitude and intensity using the Keetch Byram Drought Index (KBDI), a mathematical system for relating current and recent weather conditions to potential or expected fire behavior. The KBDI determines forest fire potential based on a daily water balance, derived by balancing a drought factor with precipitation and soil moisture (assumed to have a maximum storage capacity of eight inches), and is expressed in hundredths of an inch of soil moisture depletion.

Each color in Figure 20-5 represents the drought index at that location, by date. The drought index ranges from 0 to 800. A drought index of 0 represents no moisture depletion, and a drought index of 800 represents absolutely dry conditions. The most current available data shows the planning area is currently experiencing low moisture depletion with a KBDI between 300 and 400. However, the planning area has been subject to drier conditions historically and can expect a maximum KBDI range of 800.

Figure 20-5. Keetch-Byram Drought Index (KBDI), September 2025⁵



⁵ Sierra County planning area is located within the black circle.

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Fire behavior can be categorized at four distinct levels on the KBDI:

- **0-200:** Soil and fuel moisture are high. Most fuels will not readily ignite or burn. However, with sufficient sunlight and wind, cured grasses and some light surface fuels will burn in spots and patches.
- **200-400:** Fires more readily burn and will carry across an area with no gaps. Heavier fuels will not readily ignite and burn. Expect smoldering and the resulting smoke to carry into and possibly through the night.
- **400-600:** Fires intensity begins to significantly increase. Fires will readily burn in all directions exposing mineral soils in some locations. Larger fuels may burn or smolder for several days, creating possible smoke and control problems.
- **600-800:** Fires will burn to mineral soil. Stumps will burn to the end of underground roots and spotting will be a major problem. Fires will burn through the night and heavier fuels will actively burn and contribute to fire intensity.

The KBDI is a good measure of the readiness of fuels for a wildfire event. It should be referenced as the area experiences changes in precipitation and soil moisture, while caution should be exercised in dryer, hotter conditions.

Based on historical occurrences and readily available fuel, the planning area can anticipate the full KBDI range of 0 to 800. At the high end of this range fires will burn to mineral soil. Stumps will burn to the end of underground roots and spotting will be a major problem. Fires will burn through the night and heavier fuels will actively burn and contribute to fire intensity.

Fire conditions change daily, which is why the National Wildfire Coordinating Group created the National Fire Danger Rating System (NFDRS). Fire danger ratings describe conditions that reflect the potential, over a large area, for a fire to ignite, spread and require suppression action. There are five color coded levels that express the current risk level and potential fire extent. The rating system is provided in Table 20-1.⁶ The Wildland Fire Assessment System (WFAS) provides spatial views of fire weather and fire potential, including fuel moistures and fire danger classes from the National Fire Danger Rating System, Keetch-Byram and Palmer drought indices, lower atmospheric stability and satellite-derived vegetation conditions.

The Sierra County planning area can experience the full range of extent, from a low to extreme level of fire danger. Fire danger levels are anticipated to be higher during summer months and periods of extreme heat and drought. As shown in Figure 20-6, the Sierra County planning area experienced a low level of fire danger in October of 2025.

⁶ United States Forest Service. National Fire Danger Rating System.
<https://www.fs.usda.gov/detail/cibola/landmanagement/resourcemanagement/?cid=stelprdb5368839>

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Figure 20-6. Wildland Fire Assessment System (WFAS), October 2025⁷

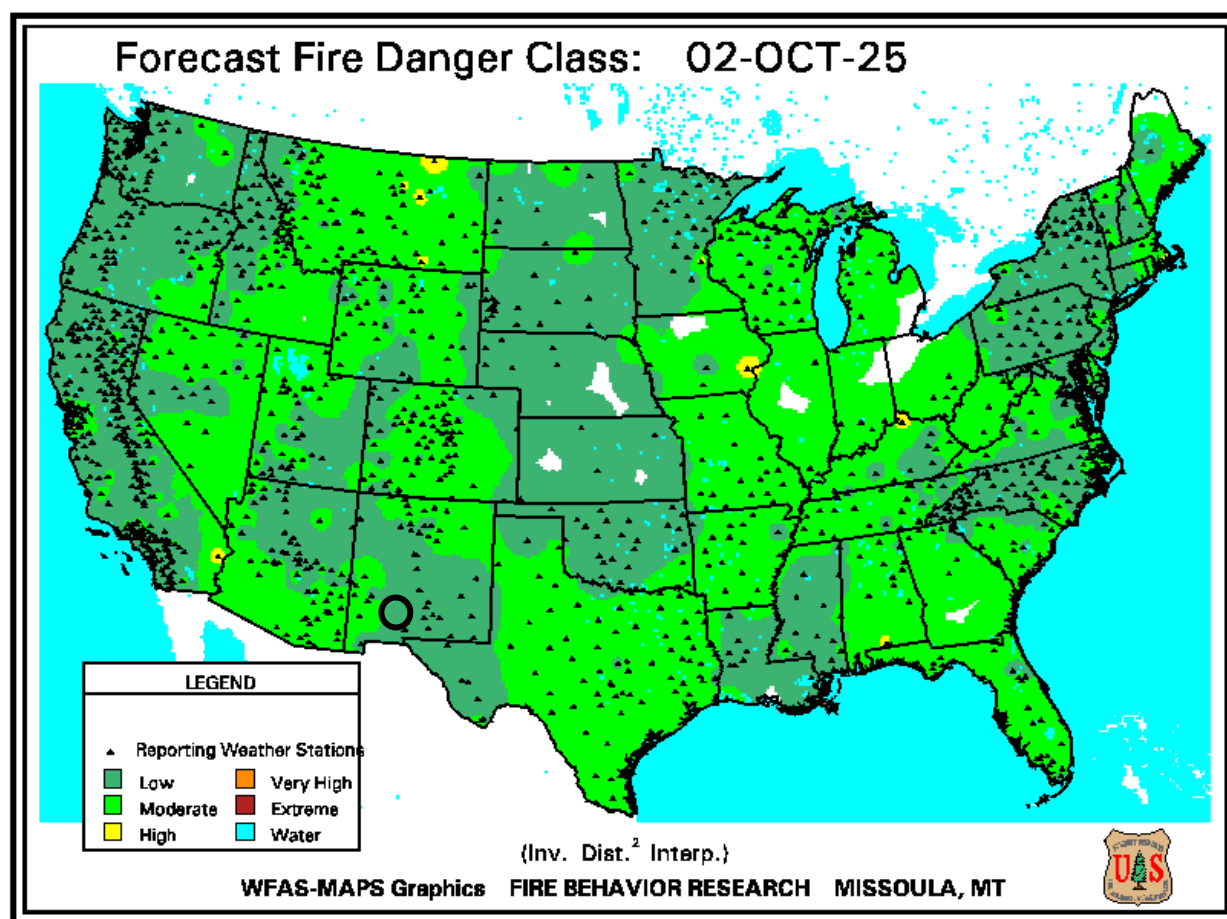


Table 20-1. National Fire Danger Rating System

RATING	DESCRIPTION	FULL EXTENT
Low (Green)	Fuels do not ignite easily	Fuels do not ignite easily from small embers, but a more intense heat source, such as lightning, may start fires in duff or dry rotten wood. Fires in open, dry grasslands may burn easily a few hours after a rain, but most wood fires will spread slowly, creeping or smoldering. Control of fires is generally easy.
Moderate (Light Green)	Fires can start easily and spread at a moderate rate	Fires can start from most accidental causes, but the number of fire starts is usually pretty low. If a fire does start in an open, dry grassland, it will burn and spread quickly on windy days. Most wood fires will spread slowly to moderately. Average fire intensity will be moderate except in heavy concentrations of fuel, which may burn hot. Fires are still not likely to become serious and are often easy to control.

⁷ Wildland Fire Assessment System. <https://www.wfas.net/index.php/keetch-byram-index-moisture--drought-49>

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RATING	DESCRIPTION	FULL EXTENT
High (Yellow)	Fires can start easily and spread at a rapid rate	Fires can start easily from most causes and small fuels (such as grasses and needles) will ignite readily. Unattended campfires and brush fires are likely to escape. Fires will spread easily, with some areas of high intensity burning on slopes or concentrated fuels. Fires can become serious and difficult to control unless they are put out while they are still small.
Very High (Orange)	Fires start very easily and spread at a very fast rate	Fires will start easily from most causes. The fires will spread rapidly and have a quick increase in intensity, right after ignition. Small fires can quickly become large fires and exhibit extreme fire intensity, such as long-distance spotting and fire whirls. These fires can be difficult to control and will often become much larger and longer-lasting fires.
Extreme (Red)	Fire situation is intense and can result in significant property damage	Fires of all types start quickly and burn intensely. All fires are potentially serious and can spread very quickly with intense burning. Small fires become big fires much faster than at the "very high" level. Spot fires are probable, with long-distance spotting likely. These fires are very difficult to fight and may become very dangerous and often last for several days.

HISTORICAL OCCURRENCES

The Historic Fires Database⁸ reported 126 wildfire events for the Sierra County planning area between 1985 and 2024. These events are reported on a county-wide basis, therefore events for the City of Elephant Butte, City of Truth or Consequences, and Village of Williamsburg are not reported separately. Many fire events may be unreported, but the Historic Fires Database provides the best available historical wildfire data. Tables 20-2 and 20-3 identify the number of wildfires and total acreage burned each year within the county boundaries. Figures 20-7 through 20-10 below show approximate locations of historic wildfires and statistical causes.

Table 20-2. Historical Wildfire Events Summary, 1985 – 2024⁹

JURISDICTION	NUMBER OF EVENTS	ACRES BURNED
Sierra County	126	1,047,069

⁸ Historic Fires Database. <https://giscenter.isu.edu/research/Techpg/HFD/index.htm>

⁹ Source: Historic Fires Database, Idaho State University and NASA

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Table 20-3. Historical Wildfire Events and Acreage Burned by Year

YEAR	NUMBER OF EVENTS	ACRES BURNED
1985	0	0
1986	0	0
1987	1	1,547
1988	2	4,020
1989	3	11,760
1990	0	0
1991	2	210
1992	0	0
1993	3	6,446
1994	10	13,106
1995	3	28,555
1996	5	28,658
1997	2	11,087
1998	2	4,186
1999	5	12,082
2000	6	14,921
2001	5	8,808
2002	3	4,038
2003	19	157,743
2004	1	35
2005	2	3,983
2006	1	9,676
2007	3	2,493
2008	3	1,989
2009	10	45,451
2010	1	6,415
2011	4	1,613

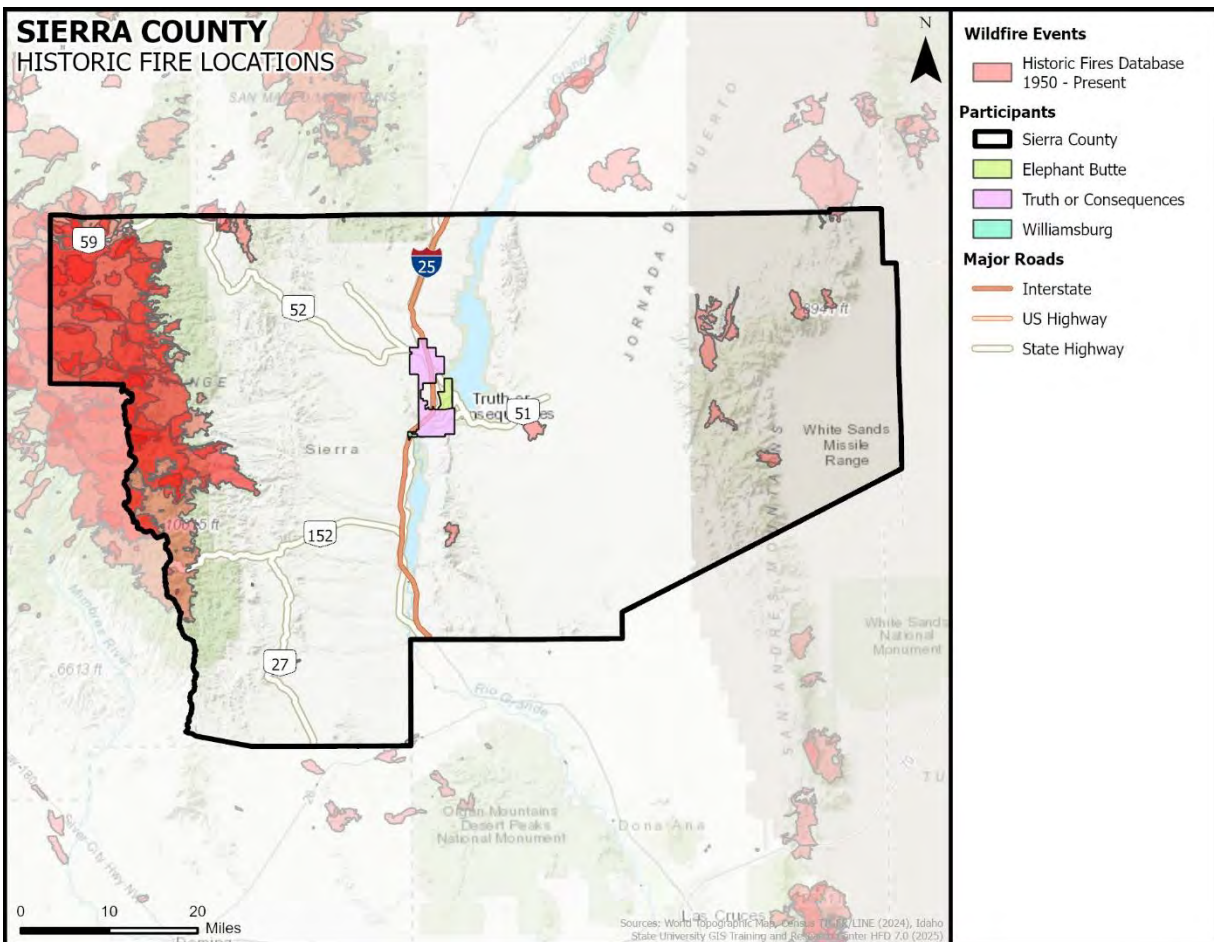
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YEAR	NUMBER OF EVENTS	ACRES BURNED
2012	5	2,610
2013	2	277,220
2014	0	0
2015	4	122
2016	2	866
2017	1	7,524
2018	1	1
2019	7	3,793
2020	1	73
2021	1	502
2022	1	325,136
2023	2	958
2024	1	1,330
TOTALS	126	1,047,069

Based on the list of historical wildfire events for the Sierra County planning area, including all participating jurisdictions, six events have occurred since the 2019 plan.

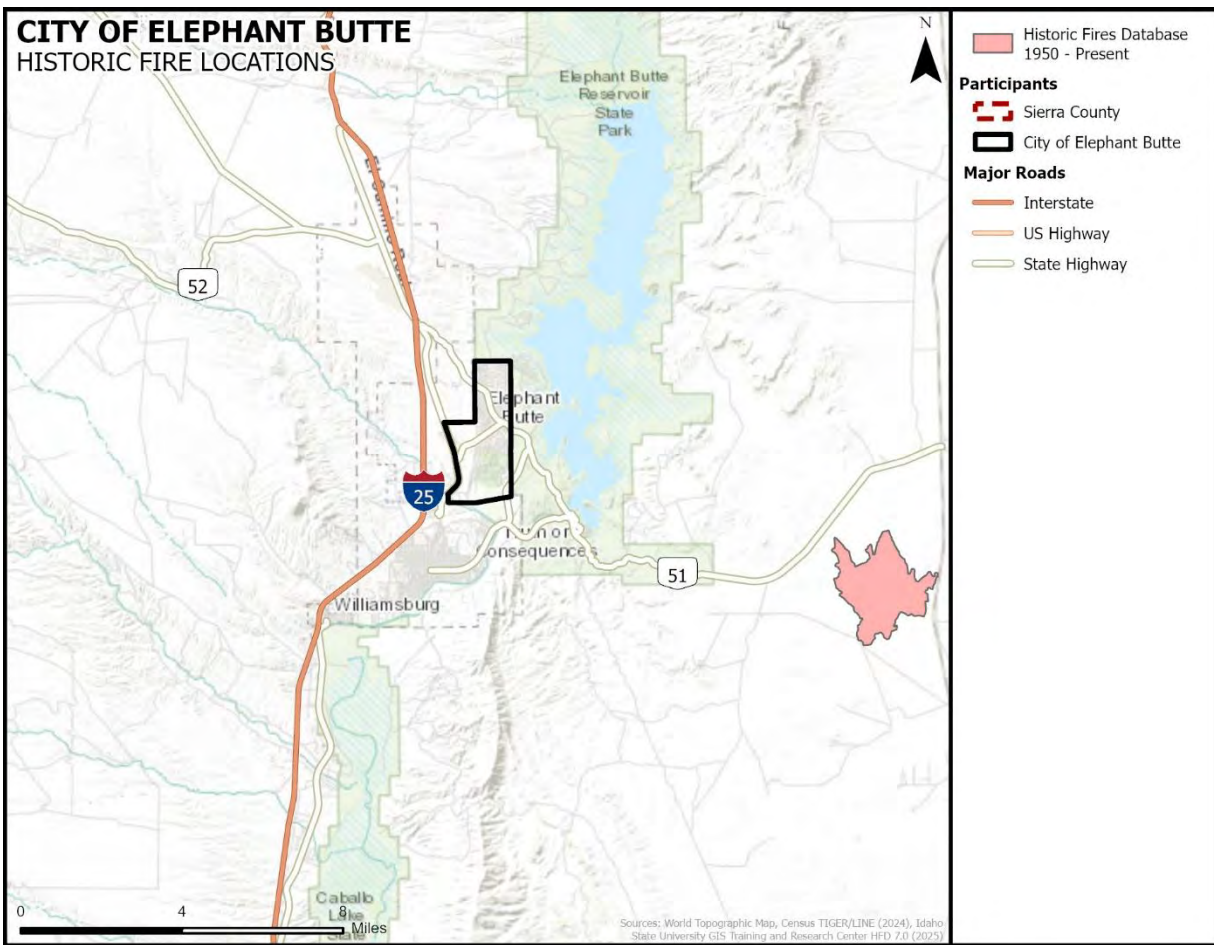
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Figure 20-7. Location of Historic Wildfire Events in Sierra County



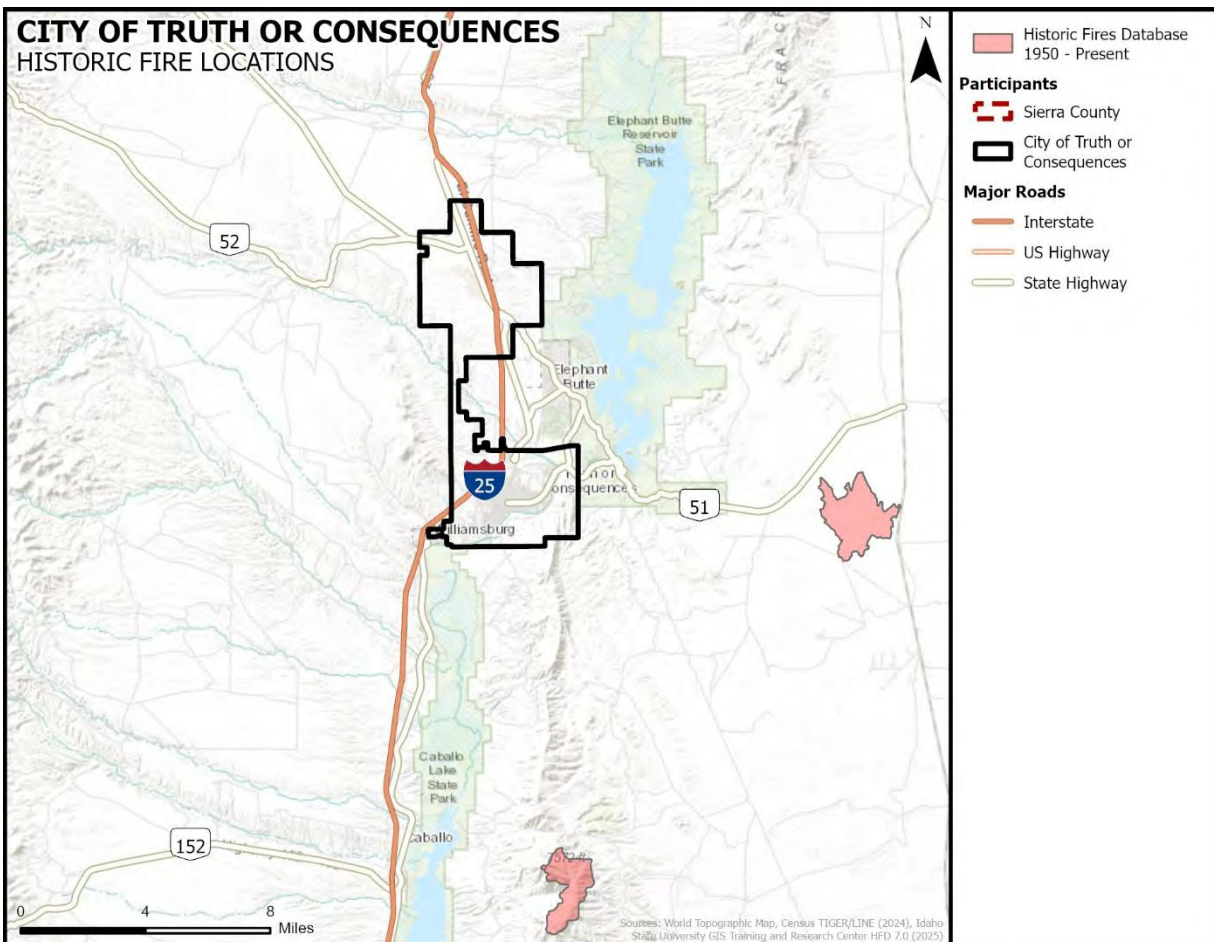
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Figure 20-8. Location of Historic Wildfire Events in the City of Elephant Butte



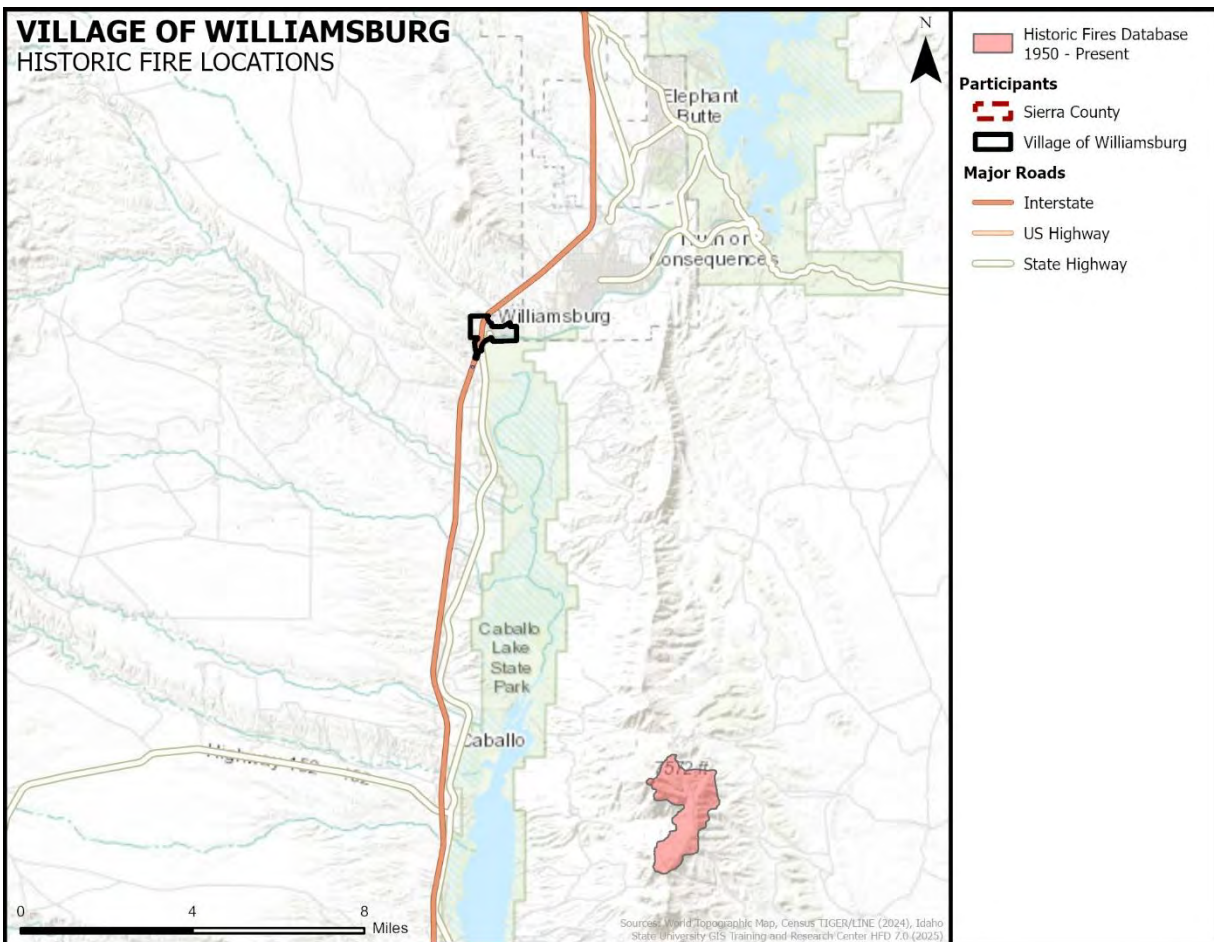
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Figure 20-9. Location of Historic Wildfire Events in the City of Truth or Consequences



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Figure 20-10. Location of Historic Wildfire Events in the Village of Williamsburg



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SIGNIFICANT EVENTS

There have been two declared disasters related to wildfire in Sierra County between 1953¹⁰ and 2025 (Table 20-4). Additional details on certain wildfire events are described below.

Table 20-4. Federal Disaster Declarations for Wildfire, 1953-2025

YEAR	DECLARATION TITLE	DECLARATION TYPE	DISASTER NO.
2000	Severe Fire Threats	EM	EM-3154
2000	Severe Forest Fire	DR	DR-1329

July 2, 1951 (McKnight Fire)

The 1951 McKnight Fire was a major wildfire in the Gila National Forest of southwestern New Mexico that burned approximately 41,000 acres. The fire burned intensely across a 70-mile front, frequently moving through the tops of trees and jumping established fire lines into previously unburned territory. A state of emergency was declared, leading to the deployment of troops from Fort Bliss, Texas, to assist the U.S. Forest Service. Tragically, a U.S. Army corporal was killed when his supply truck crashed. The fire was finally brought under control after six days of intensive firefighting. Significant losses of timberland occurred, and many deer and other wild game perished. The McKnight Fire remains a key point of study for forest historians and ecologists analyzing 20th-century fire patterns in the Gila / Aldo Leopold Wilderness Complex.

June 7, 2013 (Silver Fire)

The Silver Fire began on June 7, 2013, when lightning struck in the Black Range of the Gila National Forest, east of Silver City and within the wilderness areas that border Sierra County. The blaze rapidly expanded through rugged, heavily forested terrain that many residents considered some of the least-disturbed forest in the region. Driven by dry conditions, the fire quickly grew to thousands of acres within just a few days, eventually threatening nearby communities such as Kingston and prompting evacuation notices. The fire burned across steep slopes and dense mixed-conifer forest, creating intense smoke plumes visible for miles. Although firefighters worked to keep it from reaching homes, the fire still left a large ecological footprint, altering habitat, forest structure, and watershed conditions throughout the burned area. Its impact on the landscape continues to be visible today in the form of fire scars, younger regrowth, and changed drainage patterns across parts of the Black Range.

May 13, 2022 (Black Fire)

The Black Fire began on May 13, 2022, in the northern Black Range of the Gila National Forest, near Forest Road 150 in an area about 30 miles northwest of Truth or Consequences. The cause was human-related, though the exact circumstances were never publicly confirmed. Extremely dry fuels, high winds, and hot weather caused the fire to grow explosively, rapidly expanding from a few thousand acres to tens of thousands within days. Over the following weeks, the fire ultimately burned approximately 325,000 acres, making it one of the largest wildfires in New Mexico's recorded history. Much of the burn area included the Aldo Leopold Wilderness as well as multiple forested watersheds and recreation areas, including more than 40 miles of the

¹⁰ The first federally declared disaster was issued in 1953, following the adoption of the Disaster Relief Act of 1950.

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Continental Divide Trail. While only a small number of structures were lost, many more were threatened, and several communities experienced evacuation notices or pre-evacuation alerts.

The fire dramatically reshaped the landscape, leaving behind large areas of high severity burn where tree canopy, soils, and vegetation were heavily damaged. After the fire, monsoon rains created significant risks of flooding, debris flows, and erosion due to the loss of natural ground cover. Federal and state agencies have since focused on long-term recovery efforts, including watershed stabilization, habitat restoration, and monitoring of affected wildlife such as Gila trout. The ecological effects of the Black Fire continue to influence forest conditions, water quality, and trail access in Sierra County and the surrounding region, making it a major event in the area's natural and community history.

PROBABILITY OF FUTURE EVENTS

Wildfires can occur at any time of the year. As Sierra County communities move into wildland, the potential area of occurrence of wildfire increases. There have been 126 events in a 40-year period, however some events may have gone unreported. Wildfire events within the Sierra County planning area, including all participating jurisdictions, are considered "Highly Likely," meaning an event is probable within the next year.

CLIMATE CHANGE CONSIDERATIONS

According to the Fifth National Climate Assessment, in the Southwest, fires have become larger, more frequent, and, in many areas, more severe, with clear evidence of climate change as a major cause.

Wildfires require the alignment of a number of factors, including temperature, humidity, and the lack of moisture in fuels, such as trees, shrubs, grasses, and forest debris. All these factors have strong direct or indirect ties to climate variability and climate change. Research shows that changes in climate create warmer, drier conditions, leading to longer and more active fire seasons. Increases in temperatures and the thirst of the atmosphere due to human-caused climate change have increased aridity of forest fuels during the fire season.¹¹

The U.S. Climate Explorer indicates that wildfire risk for Sierra County may increase due to increased temperatures, which according to the U.S. Climate Explorer, the planning area may experience a 6°F increase in average extreme heat temperatures. Historically, extreme temperatures averaged 96°F in Sierra County, but between 2035 and 2064 the average will be 102°F. With the full range of projections, average temperatures could increase up to 20°F higher but the severity is dependent on overall future emissions.

Extreme heat and extended periods of drought contribute to wildfire risk in the planning area. Extreme temperatures and periods of drought destroy vegetation in the area, contributing to available fuels that spread wildfires. Additional climate change impacts from drought and extreme heat are discussed in Sections 6 and 10 of this Plan. The projected rise of severity in drought and extreme heat events suggest a growing likelihood of conditions that favor wildfires. Additional information and studies are needed to determine the degree and rate of any increased wildfire risk.

¹¹ NOAA Wildfire Climate Connection, August 2022: wildfire-climate-connection.

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As wildfire risk is expected to increase with climate change, additional risks and cascading impacts will be worsened. For example, with an increase in the severity and number of wildfire events, an increase in the frequency and intensity of flash flooding and debris flow can also be expected. Wildfires destroy vegetation and burn the ground, meaning the soil is no longer able to absorb rainwater. It can take years for vegetation to be restored, increasing long-term flood risk.

VULNERABILITY AND IMPACT

Periods of drought, dry conditions, high temperatures, and low humidity are factors that contribute to the occurrence of a wildfire event. Less developed areas, such as along interstates or in more remote areas where fuels are more prevalent have an increased risk of being affected by wildfire. The more heavily populated areas of the planning area are not highly likely to experience large, sweeping fires. Unoccupied buildings and open spaces that have not been maintained have the greatest vulnerability to wildfire. The overall level of concern for wildfires is located across the county where wildland and urban areas interface. Wildfires can devastate infrastructure by damaging roads, bridges, power lines, and communication networks, hindering emergency response efforts and disrupting daily life for impacted communities. People face immediate threats to their health and safety from flames, smoke inhalation, and evacuation challenges, leading to potential injuries and fatalities.

While all citizens are vulnerable to the impacts of wildfire, forced relocation and disaster recovery disproportionately impacts low-income residents who lack the financial means to travel, afford a long-term stay away from home, and to rebuild or repair their homes. While evacuation times for these types of hazard events should be substantial enough for these individuals to seek shelter, the elderly, children, and people with a disability may have trouble taking shelter due to mobility issues or a lack of awareness, making them more susceptible to injury or harm. In addition, people who speak a language other than English may face increased vulnerability due to language barriers that limit their access to important information such as weather-related warnings and instructions regarding safety measures.

The population over 65 in the Sierra County planning area is estimated at 37 percent of the total population and children under the age of 5 are estimated at 4 percent. The population with a disability is estimated at 28 percent of the total population. An estimated 25 percent of the planning area population live below the poverty level and 4 percent of the populations speak English “less than very well.”

Table 20-5. Populations at Greater Risk by Jurisdiction¹²

JURISDICTION	POPULATION				
	65 AND OLDER	UNDER 5	WITH A DISABILITY	BELOW POVERTY LEVEL	LIMITED ENGLISH SPEAKING
Sierra County	4,251	420	3,253	2,866	489
City of Elephant Butte	881	32	527	159	0

¹² U.S. Census Bureau 2023 data for Sierra County.

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JURISDICTION	POPULATION				
	65 AND OLDER	UNDER 5	WITH A DISABILITY	BELOW POVERTY LEVEL	LIMITED ENGLISH SPEAKING
City of Truth or Consequences	1,354	369	1,468	2,097	187
Village of Williamsburg	173	19	222	131	72

The Sierra County Planning Team identified the following critical facilities (Table 20-6) as assets that are considered the most important to the planning area and are located in the WUI, the area of greater risk. For a detailed list of identified critical facilities see Appendix D.

Table 20-6. Critical Facilities / Critical Services Vulnerable to Wildfire Events

CRITICAL FACILITIES	CRITICAL FACILITIES AT RISK	POTENTIAL IMPACTS
Emergency Response Services (EOC, Fire, Police, EMS), Hospitals and Medical Centers	Sierra County: 1 Fire Station, 1 Hospital, 1 Sheriff's Office, 1 Police Building City of Elephant Butte: 1 Fire Administration Building, 3 Fire Stations City of Truth or Consequences: 1 Fire Station, 2 Health Centers, 1 Hospital, 1 Police Station, 1 Sheriff's Office, 1 Police Building	- Emergency services may be disrupted during a wildfire if facilities are impacted, roadways are inaccessible, or personnel are unable to report for duty. - First responders are at greater risk of injury when in close proximity to the hazard while extinguishing flames, protecting property, or evacuating residents in the area. - Critical county or city departments may not be able to function and provide necessary services depending on the location of the fire and the structures or personnel impacted. - Roadways in or near the WUI could be damaged or closed due to smoke and limited visibility, slowing or preventing access for emergency response vehicles. - Fire suppression costs can be substantial, exhausting the financial resources of the community. - First responders can experience heart disease, respiratory problems, and other long-term related illnesses from prolonged exposure to smoke, chemicals, and heat. - Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. - Power outages could disrupt communications, delaying emergency response times. - Structures can be damaged or destroyed in the path of the wildfire. - Power outages could disrupt critical care. - Backup power sources could be damaged or destroyed.

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CRITICAL FACILITIES	CRITICAL FACILITIES AT RISK	POTENTIAL IMPACTS
		Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities.
Airport, Academic Institutions, Animal Shelter, Evacuation Centers & Shelters, Governmental Facilities, Residential/ Assisted Living Facilities	City of Elephant Butte: 1 Evacuation Shelter, 1 City Hall City of Truth or Consequences: 1 Gathering Center, 1 Hospice Care, 3 Municipal Offices, 1 Tax/Finance Office, 2 Assisted Living Facilities, 1 School Administration, 2 Early Childhood Education Locations, 3 Primary/Secondary Schools	- Facilities or infrastructure may be damaged, destroyed or otherwise inaccessible. - Essential supplies like medicines, water, food, and equipment deliveries may be significantly delayed. - Additional emergency responders and critical aid workers may not be able to reach the area for days. - Power outages and infrastructure damage may prevent larger airports from acting as temporary command centers for logistics, communications, and emergency operations.
Commercial Supplier (food, fuel, etc.)	N/A	- Facilities, infrastructure, or critical equipment including communications may be damaged, destroyed or otherwise inoperable. - Essential supplies like medicines, water, food, and equipment deliveries may be delayed. - Economic disruption due to power outages and fires negatively impact services as well as area businesses reliant on commercial suppliers.
Utility Services and Infrastructure (electric, water, wastewater, communications)	City of Elephant Butte: 1 Electric Utility, 1 Department of Public Works, 5 Lift Stations, 1 Wastewater Treatment Plant, 4 Wells City of Truth or Consequences: 1 Electric Utility, 1 Waste Collection, 1 Sewage and Water Administration Building	- Wastewater and drinking water facilities and infrastructure may be damaged or destroyed resulting in service disruption or outage for multiple days or weeks. - Disruptions and outages impact public welfare as safe drinking water is critical. - A break in essential and effective wastewater collection and treatment is a health concern, potentially spreading disease. - Exposure to untreated wastewater is harmful to people and the environment. - Any service disruptions can negatively impact or delay emergency management operations.

SECTION 20: WILDFIRE

CRITICAL FACILITIES	CRITICAL FACILITIES AT RISK	POTENTIAL IMPACTS
	Village of Williamsburg: 2 Lift Stations	

Within the Sierra County planning area, a total of 126 fire events were reported from 1985 through 2024. All events were suspected wildfires. Historic loss and annualized estimates of acres burned due to wildfires are presented in Table 20-7 below. The average frequency is approximately four to five events every year.

Table 20-7. Average Annualized Acreage Losses¹³

JURISDICTION	TOTAL ACRES BURNED	AVERAGE ANNUAL ACRE LOSSES
Sierra County	1,047,069	26,177

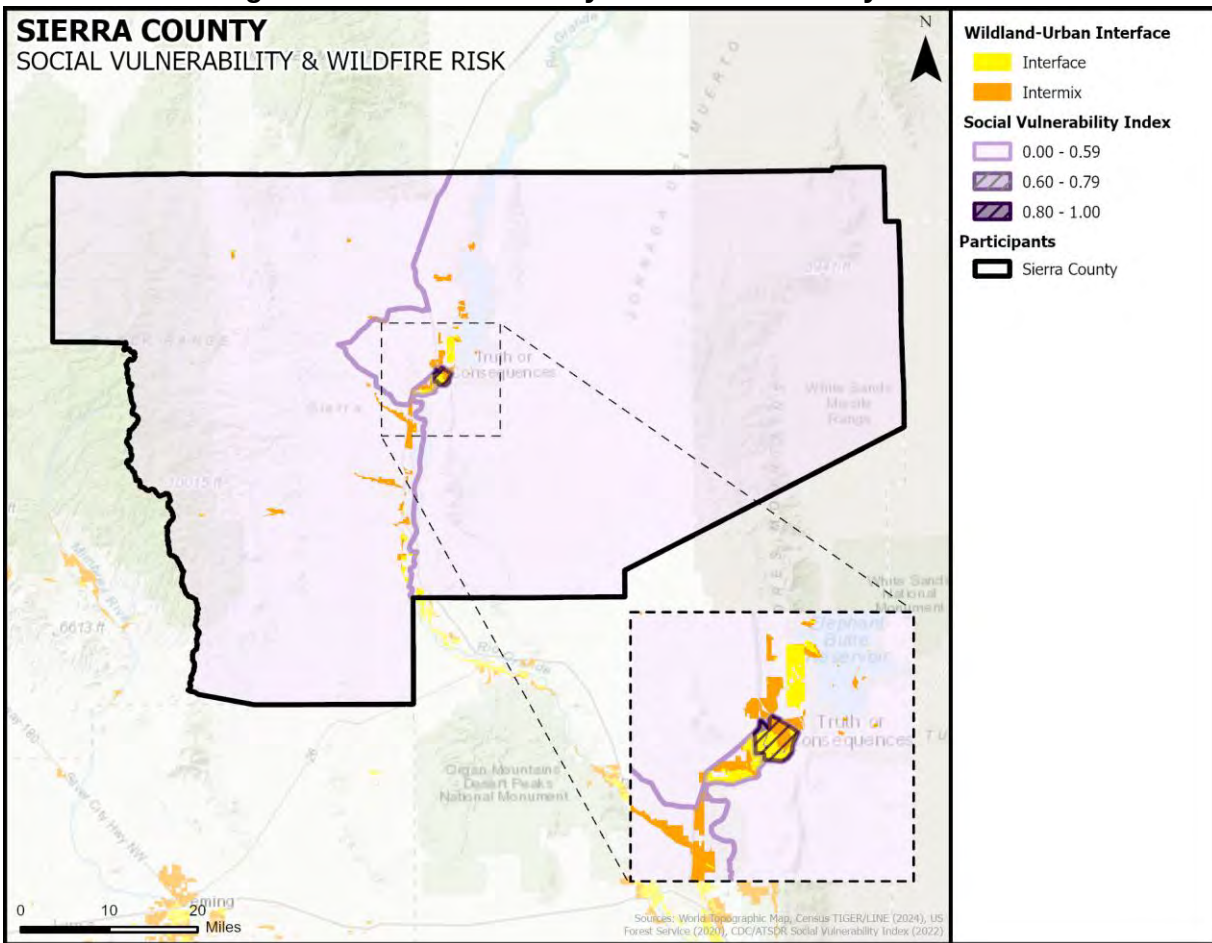
Diminished air quality is an environmental impact that can result from a wildfire event and pose a potential health risk. The smoke plumes from wildfires can contain potentially inhalable carcinogenic matter. Fine particles of invisible soot and ash that are too small for the respiratory system to filter can cause immediate and possibly long-term health effects. The elderly or those individuals with compromised respiratory systems may be more vulnerable to the effects of diminished air quality after a wildfire event.

The Center for Disease Control (CDC) created a Social Vulnerability Index (SVI) which includes a database and mapping application that identifies and quantifies communities experiencing social vulnerability. The current CDC SVI uses 16 U.S. census variables from the 5-year American Community Survey (ACS) to identify communities that may need support before, during, or after disasters. All 16 variables fall under four broad categories including socioeconomic status (population in poverty, unemployment, etc.), household characteristics (age, disability status, etc.), racial and ethnic minority status, and housing type and transportation (mobile homes, no vehicles, etc.). Populations experiencing social vulnerability may be adversely impacted by natural hazards, disasters, and other community-level stressors. Figure 20-11 identifies areas of social vulnerability using the CDC's SVI and where these areas overlap with the Sierra County WUI areas, where wildfire risk is considered the highest.

¹³ Events divided by 40 years of data.

SECTION 20: WILDFIRE

Figure 20-11. Sierra County Social Vulnerability and WUI



Climatic conditions such as severe freezes and drought can significantly increase the intensity of wildfires since these conditions kill vegetation, creating a prime fuel source for wildfires. The intensity and rate at which wildfires spread are directly related to wind speed, temperature, and relative humidity.

Wildfires can cause further cascading impacts such as flooding and debris flow. The loss of vegetation reduces the ability of the ground to absorb water, increasing runoff during rainstorms and increasing the risk of flash flooding. Without the stabilizing effect of live vegetation, slopes are more prone to erosion, leading to debris flows where mud, ash, and debris rush downhill, posing additional risk to communities.

The severity of impact from a wildfire event in the Sierra County planning area, including all participating jurisdictions, would be considered “Major” with injuries and illnesses resulting in permanent disability, the complete shutdown of critical facilities between one and four weeks, and more than 25 percent of property destroyed or with major damage.

ASSESSMENT OF IMPACTS

A wildfire event poses a potentially significant risk to public health and safety, particularly if the wildfire is initially unnoticed and spreads quickly. The impacts associated with a wildfire are not limited to direct damage. Significant wildfire events can be frequently associated with a variety of impacts, including:

SECTION 20: WILDFIRE

- The Sierra County planning area contains numerous open space areas. Wildfire may adversely affect or destroy endangered species' habitat, reduce air quality, increase erosion and risk of flash flooding, contribute to increased local temperatures, and disrupt other ecological functions.
- Recreation activities throughout county, city, and village parks may be unavailable and tourism can be unappealing for years following a large wildfire event, devastating directly related local businesses and negatively impacting economic recovery.
- Persons, pets, and wildlife in the area at the time of the fire are at risk for injury or death from burns and/or smoke inhalation. First responders are at greater risk of physical injury when in close proximity to the hazard while extinguishing flames, protecting property, or evacuating residents in the area.
- First responders can experience heart disease, respiratory problems, and other long-term related illnesses from prolonged exposure to smoke, chemicals, and heat.
- Emergency services may be disrupted during a wildfire if facilities are impacted, roadways are inaccessible, or personnel are unable to report for duty.
- Critical local departments may not be able to function and provide necessary services depending on the location of the fire and the structures or personnel impacted.
- Non-critical businesses may be directly damaged, suffer loss of utility services, or be otherwise inaccessible, delaying normal operations and slowing the recovery process.
- Displaced residents may not be able to immediately return to work, slowing economic recovery.
- Roadways in or near the WUI could be damaged or closed due to smoke and limited visibility.
- Older homes are generally exempt from modern building code requirements, which may require fire suppression equipment in the structure. An estimated 45 percent (3,703 structures) of homes in the planning area were built before 1980.
- Similarly, historic buildings may lack fire mitigation materials or measures due to their historic status. There are 32 historical entries listed on the National Register of Historic Places for Sierra County and 54 sites listed on the New Mexico State Register of Cultural Properties.
- Some high-density neighborhoods feature small lots with structures close together, increasing the potential for fire to spread rapidly.
- Air pollution from smoke may exacerbate respiratory problems of vulnerable residents.
- Charred ground after a wildfire cannot easily absorb rainwater, increasing the risk of flooding and potential mudflows, especially during periods of heavy rains, or during monsoon season.
- Wildlife may be displaced or destroyed.
- Historical or cultural resources may be damaged or destroyed.
- Tourism can be significantly disrupted, further delaying economic recovery for the area.
- Economic disruption negatively impacts the programs and services provided by the community due to short- and long-term loss in revenue.
- Fire suppression costs can be substantial, exhausting the financial resources of the community.
- Water supply may be limited for some communities, impacting the ability to extinguish the fire.
- Residential structures lost in a wildfire may not be rebuilt for years, reducing the tax base for the community.

SECTION 20: WILDFIRE

- Direct impacts to municipal water supply may occur through contamination of ash and debris during the fire, destruction of aboveground delivery lines, and soil erosion or debris deposits into waterways after the fire.

The economic and financial impacts of a wildfire event on local government will depend on the scale of the event, what is damaged, costs of repair or replacement, lost business days in impacted areas, and how quickly repairs to critical components of the economy can be implemented. The level of preparedness and pre-event planning done by the community, local businesses, and citizens will contribute to the overall economic and financial conditions in the aftermath of a wildfire event.



Section 21

Mitigation Strategy



SECTION 21: MITIGATION STRATEGY

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MITIGATION GOALS

Based on the results of the risk and capability assessments, the Planning Team developed and prioritized the mitigation strategy. This involved utilizing the results of both assessments and reviewing the goals and objectives that were included in the previous 2019 Plan. At the Mitigation Strategy Workshop in August 2025, Planning Team members reviewed the mitigation strategy from the previous Plan. The consensus among all members present was that the strategy developed for the 2019 Plan required realignment, including expanding on existing goals.

GOAL 1

Protect public health and safety.

OBJECTIVE 1.1

Advise the public about health and safety precautions to guard against injury and loss of life from hazards.

OBJECTIVE 1.2

Maximize utilization of the latest technology to provide adequate warning, communication, and mitigation of hazard events.

OBJECTIVE 1.3

Reduce the danger to, and enhance the protection of, high risk areas during hazard events.

OBJECTIVE 1.4

Protect critical facilities and services.

GOAL 2

Build and support local capacity and commitment to continuously become less vulnerable to hazards.

OBJECTIVE 2.1

Foster ongoing local partnerships and collaborations to improve long-term vulnerability to hazards.

OBJECTIVE 2.2

Establish a cadre of committed volunteers to safeguard the community before, during, and after a disaster.

SECTION 21: MITIGATION STRATEGY

OBJECTIVE 2.3

Incorporate hazard mitigation concerns into County, City, and Village planning and budgeting processes.

GOAL 3

Increase public understanding, support, and demand for hazard mitigation.

OBJECTIVE 3.1

Heighten public awareness regarding the full range of natural hazards the public may face.

OBJECTIVE 3.2

Educate the public on actions they can take to prevent or reduce the loss of life or property from all hazards and increase individual efforts to respond to potential hazards.

OBJECTIVE 3.3

Publicize and encourage the adoption of appropriate hazard mitigation measures.

GOAL 4

Protect new and existing properties.

OBJECTIVE 4.1

Reduce National Flood Insurance Program (NFIP) repetitive loss occurrences through increased mitigative intervention to structures that have been identified to have sustained repeated damage from hazards.

OBJECTIVE 4.2

Use the most cost-effective approach to protect existing buildings and public infrastructure from hazards.

OBJECTIVE 4.3

Enact and enforce regulatory measures to ensure that future development will not endanger or increase threats to people and existing properties.

GOAL 5

Maximize the resources for investment in hazard mitigation.

OBJECTIVE 5.1

Maximize the use of outside sources of funding.

OBJECTIVE 5.2

Maximize participation of property owners in protecting their properties.

OBJECTIVE 5.3

Maximize insurance coverage to provide financial protection against hazard events.

OBJECTIVE 5.4

Prioritize mitigation projects, based on cost-effectiveness and sites facing the greatest threat to life, health, and property.

GOAL 6

Promote growth in a sustainable manner.

OBJECTIVE 6.1

Incorporate hazard mitigation activities into long-range planning and development activities.

SECTION 21: MITIGATION STRATEGY

OBJECTIVE 6.2

Promote beneficial uses of hazardous areas while expanding open space and recreational opportunities.

OBJECTIVE 6.3

Utilize regulatory approaches to prevent the creation of future hazards to life and property.

GOAL 7

Promote equity and protect vulnerable populations and underserved communities through hazard mitigation activities.

OBJECTIVE 7.1

Allocate resources and funding to implement hazard mitigation activities that directly benefit vulnerable and underserved communities.

OBJECTIVE 7.2

Build and support local partnerships to leverage resources and expertise in addressing hazard-related equity concerns.

OBJECTIVE 7.3

Establish internal decision-making processes that integrate equity into project selection.

OBJECTIVE 7.4

Monitor and evaluate the effectiveness of mitigation activities to ensure equitable outcomes and protection of vulnerable populations.



Section 22

Previous Actions



SECTION 22: PREVIOUS ACTIONS

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SUMMARY

This section includes analysis from the 2019 Sierra County Hazard Mitigation Plan. Planning Team members were given copies of the previous mitigation actions submitted in the 2019 Sierra County Hazard Mitigation Plan at the mitigation workshop. Each previously participating jurisdiction reviewed the previous actions and provided an analysis as to whether the action had been completed, should be carried over as for future implementation, or be deleted from the Plan Update. The actions from the 2019 Plan are included in this section as they were written in 2019, except for the “2026 Analysis” section. **Any action in the analysis the team selected for future implementation (carried over) is considered a current action for potential implementation over the life cycle of this updated plan.** Additional new actions developed for this plan are detailed in Section 23.

SECTION 22: PREVIOUS ACTIONS

SIERRA COUNTY

Sierra County – Previous Action #1	
Proposed Action:	Conduct County-wide community outreach to promote participation in StormReady.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities, improve public outreach.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Public Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Severe Storms
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	Staff Time
Potential Funding Sources:	Local
Lead Agency/Department Responsible:	Emergency Manager
Implementation Schedule:	Continuous

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

Sierra County – Previous Action #2	
Proposed Action:	Conduct county-wide community outreach to promote participation in Firewise Communities Program.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities, improve public outreach.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Public Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	Staff Time
Potential Funding Sources:	Local
Lead Agency/Department Responsible:	Emergency Manager
Implementation Schedule:	Continuous

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

Sierra County – Previous Action #3	
Proposed Action:	Construction or multi-hazard shelters with generators for the general public.
BACKGROUND INFORMATION	
Site and Location:	TBD
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Property Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms
Effect on New/Existing Buildings:	New/Existing
Priority (High, Moderate, Low):	High
Estimated Cost:	\$500,000 per facility
Potential Funding Sources:	Local, State
Lead Agency/Department Responsible:	Emergency Manager
Implementation Schedule:	As Required

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

Sierra County – Previous Action #4	
Proposed Action:	Construction or multi-hazard shelters with generators for all school buildings.
BACKGROUND INFORMATION	
Site and Location:	Schools
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Property Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms
Effect on New/Existing Buildings:	New/Existing
Priority (High, Moderate, Low):	High
Estimated Cost:	\$500,000 per facility
Potential Funding Sources:	Local, State
Lead Agency/Department Responsible:	Emergency Manager
Implementation Schedule:	As Required

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

Sierra County – Previous Action #5	
Proposed Action:	On-going operation of Mitigation Planning Committee.
BACKGROUND INFORMATION	
Site and Location:	N/A
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	Staff Time
Potential Funding Sources:	Local
Lead Agency/Department Responsible:	Emergency Manager
Implementation Schedule:	Continuous

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

Sierra County – Previous Action #6	
Proposed Action:	Operation and management of Sierra County NFIP activities.
BACKGROUND INFORMATION	
Site and Location:	N/A
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on New/Existing Buildings:	New/Existing
Priority (High, Moderate, Low):	High
Estimated Cost:	Staff Time
Potential Funding Sources:	Local
Lead Agency/Department Responsible:	Flood Administrator
Implementation Schedule:	Continuous

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

Sierra County – Previous Action #7	
Proposed Action:	Update of all FEMA FIRMs for populated areas of county.
BACKGROUND INFORMATION	
Site and Location:	TBD
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood
Effect on New/Existing Buildings:	New/Existing
Priority (High, Moderate, Low):	High
Estimated Cost:	Staff Time and \$250,000
Potential Funding Sources:	Local and State
Lead Agency/Department Responsible:	Flood Administrator
Implementation Schedule:	12/31/2025

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

Sierra County – Previous Action #8	
Proposed Action:	Adopt zoning restrictions in known hazard areas.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood, Wildfire
Effect on New/Existing Buildings:	New/Existing
Priority (High, Moderate, Low):	High
Estimated Cost:	Staff Time
Potential Funding Sources:	Local
Lead Agency/Department Responsible:	Emergency Manager
Implementation Schedule:	12/31/2025

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

Sierra County – Previous Action #9	
Proposed Action:	Manage and maintain rural addressing program.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities, improve public outreach.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Emergency Services, Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms
Effect on New/Existing Buildings:	New/Existing
Priority (High, Moderate, Low):	High
Estimated Cost:	Staff Time and \$5,000
Potential Funding Sources:	Local and State
Lead Agency/Department Responsible:	Emergency Manager, GIS Director
Implementation Schedule:	On-going

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

Sierra County – Previous Action #10	
Proposed Action:	Digitize data on value, construction and age of buildings in the county to use for risk assessment analysis and zoning maps.
BACKGROUND INFORMATION	
Site and Location:	N/A
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities, improve public outreach.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms
Effect on New/Existing Buildings:	Existing
Priority (High, Moderate, Low):	High
Estimated Cost:	Staff Time and \$5,000
Potential Funding Sources:	Local and State
Lead Agency/Department Responsible:	Emergency Manager, GIS Director
Implementation Schedule:	On-going

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

Sierra County – Previous Action #11	
Proposed Action:	Construct flood mitigation and control measures in the to mitigate against flooding.
BACKGROUND INFORMATION	
Site and Location:	Floodplain
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Natural Resource Protection, Structural

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood
Effect on New/Existing Buildings:	New
Priority (High, Moderate, Low):	High
Estimated Cost:	Cost if project dependent
Potential Funding Sources:	Local, Federal
Lead Agency/Department Responsible:	Flood Administrator
Implementation Schedule:	12/31/2025

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Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

Sierra County – Previous Action #12	
Proposed Action:	Acquire backup generators at critical facilities.
BACKGROUND INFORMATION	
Site and Location:	Critical Facilities
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Property Protection, Structural

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms
Effect on New/Existing Buildings:	Existing
Priority (High, Moderate, Low):	High
Estimated Cost:	\$20,000 per generator
Potential Funding Sources:	Local, Federal
Lead Agency/Department Responsible:	Emergency Manager
Implementation Schedule:	12/31/2025

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

Sierra County – Previous Action #13	
Proposed Action:	Purchase fire equipment to augment wildfire response capabilities.
BACKGROUND INFORMATION	
Site and Location:	N/A
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Emergency Services, Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Wildfire
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	Equipment Dependent
Potential Funding Sources:	Local, State, Federal
Lead Agency/Department Responsible:	Emergency Manager, Fire Chief
Implementation Schedule:	12/31/2025

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

Sierra County – Previous Action #14	
Proposed Action:	Update Community Wildfire Protection Plan.
BACKGROUND INFORMATION	
Site and Location:	N/A
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities, improve public outreach and enhance communication and coordination.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	Staff Time and \$40,000
Potential Funding Sources:	Local, State, Federal
Lead Agency/Department Responsible:	Emergency Manager, Fire Chief
Implementation Schedule:	12/31/2025

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

Sierra County – Previous Action #15	
Proposed Action:	Purchase and install a video surveillance system / security system in all schools.
BACKGROUND INFORMATION	
Site and Location:	Schools
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Prevention, Property Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms
Effect on New/Existing Buildings:	Existing
Priority (High, Moderate, Low):	High
Estimated Cost:	\$100,000 each
Potential Funding Sources:	Local, State, Federal
Lead Agency/Department Responsible:	Superintendent
Implementation Schedule:	12/31/2025

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Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

Sierra County – Previous Action #16	
Proposed Action:	Fund paid positions for first responders in communities in need.
BACKGROUND INFORMATION	
Site and Location:	TBD
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Emergency Services, Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Medium
Estimated Cost:	\$60,000 per position
Potential Funding Sources:	Local, State, Federal
Lead Agency/Department Responsible:	County Commission
Implementation Schedule:	12/31/2025

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

Sierra County – Previous Action #17	
Proposed Action:	Reduce fuel loads and create defensible spaces near all critical facilities and residential areas.
BACKGROUND INFORMATION	
Site and Location:	TBD
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Natural Resource Protection, Property Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Effect on New/Existing Buildings:	Existing
Priority (High, Moderate, Low):	Medium
Estimated Cost:	\$15,000 per site
Potential Funding Sources:	Local, State, Federal
Lead Agency/Department Responsible:	Fire Chief(s)
Implementation Schedule:	Continuous

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

Sierra County – Previous Action #18	
Proposed Action:	Inventory all fire suppression resources, personnel, and water facilities.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Emergency Services, Natural Resource Protection, Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Effect on New/Existing Buildings:	New/Existing
Priority (High, Moderate, Low):	Medium
Estimated Cost:	Staff Time
Potential Funding Sources:	Local
Lead Agency/Department Responsible:	Fire Chief(s)
Implementation Schedule:	Continuous

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

Sierra County – Previous Action #19	
Proposed Action:	Educate residents about driving in winter storms and handling winter-related health effects.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Improve public outreach to include education, awareness and partnerships.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Public Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Winter Storm
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Medium
Estimated Cost:	Staff Time and \$20,000
Potential Funding Sources:	Local
Lead Agency/Department Responsible:	Emergency Manager
Implementation Schedule:	Continuous

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

Sierra County – Previous Action #20	
Proposed Action:	Purchase emergency generators and/or transfer switches to provide backup power for all school buildings and supporting facilities.
BACKGROUND INFORMATION	
Site and Location:	Schools
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Structural

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms
Effect on New/Existing Buildings:	Existing
Priority (High, Moderate, Low):	Medium
Estimated Cost:	\$50,000 each
Potential Funding Sources:	Local, State, Federal
Lead Agency/Department Responsible:	Superintendent
Implementation Schedule:	12/31/2025

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

Sierra County – Previous Action #21	
Proposed Action:	Educate residents about water usage and smart practices during times of drought.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Public Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Low
Estimated Cost:	Staff Time and \$10,000
Potential Funding Sources:	Local
Lead Agency/Department Responsible:	Emergency Manager
Implementation Schedule:	Continuous

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

Sierra County – Previous Action #22	
Proposed Action:	Purchase and install an audio emergency communication system in all schools.
BACKGROUND INFORMATION	
Site and Location:	Schools
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Improve public outreach to include education , awareness and partnerships.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms
Effect on New/Existing Buildings:	Existing
Priority (High, Moderate, Low):	Low
Estimated Cost:	\$30,000 each
Potential Funding Sources:	Local, State, Federal
Lead Agency/Department Responsible:	Superintendent
Implementation Schedule:	12/31/2025

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

Sierra County – Previous Action #23	
Proposed Action:	Create, adopt and enforce a water conservation ordinance.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Effect on New/Existing Buildings:	New/Existing
Priority (High, Moderate, Low):	High
Estimated Cost:	Staff Time
Potential Funding Sources:	Local
Lead Agency/Department Responsible:	Emergency Manager
Implementation Schedule:	12/31/2025

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

CITY OF ELEPHANT BUTTE

City of Elephant Butte – Previous Action #1	
Proposed Action:	Conduct jurisdiction-wide community outreach to promote participation in StormReady.
BACKGROUND INFORMATION	
Site and Location:	Citywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities, improve public outreach.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Public Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Severe Storms
Effect on New/Existing Buildings:	New/Existing
Priority (High, Moderate, Low):	High
Estimated Cost:	Staff Time
Potential Funding Sources:	Local
Lead Agency/Department Responsible:	Emergency Manager
Implementation Schedule:	Continuous

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

City of Elephant Butte – Previous Action #2	
Proposed Action:	Construction or multi-hazard shelters with generators for the general public.
BACKGROUND INFORMATION	
Site and Location:	TBD
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Property Protection, Structural

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms
Effect on New/Existing Buildings:	New
Priority (High, Moderate, Low):	High
Estimated Cost:	\$10,000 per facility
Potential Funding Sources:	Local, State
Lead Agency/Department Responsible:	Emergency Manager
Implementation Schedule:	As required

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

City of Elephant Butte – Previous Action #3	
Proposed Action:	Provide a continuous active member for the Mitigation Planning Committee to provide jurisdictional input.
BACKGROUND INFORMATION	
Site and Location:	N/A
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Enhance communication and coordination.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	Staff Time
Potential Funding Sources:	Local
Lead Agency/Department Responsible:	Board of Trustees
Implementation Schedule:	Continuous

2026 ANALYSIS:
Delete action. The City no longer considers this action a priority.

SECTION 22: PREVIOUS ACTIONS

City of Elephant Butte – Previous Action #4	
Proposed Action:	Operation and management of jurisdictional NFIP activities.
BACKGROUND INFORMATION	
Site and Location:	Floodplain
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood
Effect on New/Existing Buildings:	New, Existing
Priority (High, Moderate, Low):	High
Estimated Cost:	Staff Time
Potential Funding Sources:	Local
Lead Agency/Department Responsible:	Floodplain Administrator
Implementation Schedule:	Continuous

2026 ANALYSIS:
Delete action. The City no longer considers this action a priority.

SECTION 22: PREVIOUS ACTIONS

City of Elephant Butte – Previous Action #5	
Proposed Action:	Adopt zoning restrictions in known hazard areas.
BACKGROUND INFORMATION	
Site and Location:	Citywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms
Effect on New/Existing Buildings:	New/Existing
Priority (High, Moderate, Low):	High
Estimated Cost:	Staff Time
Potential Funding Sources:	Local
Lead Agency/Department Responsible:	Board of Trustees
Implementation Schedule:	12/31/2025

2026 ANALYSIS:
Complete.

SECTION 22: PREVIOUS ACTIONS

City of Elephant Butte – Previous Action #6	
Proposed Action:	Construct flood mitigation and control measures to mitigate against flooding.
BACKGROUND INFORMATION	
Site and Location:	TBD
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Natural Resource Protection, Structural

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	Cost is project dependent
Potential Funding Sources:	Local, Federal
Lead Agency/Department Responsible:	Flood Administrator
Implementation Schedule:	12/31/2025

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

City of Elephant Butte – Previous Action #7	
Proposed Action:	Acquire backup generators at critical facilities.
BACKGROUND INFORMATION	
Site and Location:	Critical Facilities
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Structural

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms
Effect on New/Existing Buildings:	Existing
Priority (High, Moderate, Low):	High
Estimated Cost:	\$20,000 per generator
Potential Funding Sources:	Local, Federal
Lead Agency/Department Responsible:	Board of Trustees
Implementation Schedule:	12/31/2025

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

City of Elephant Butte – Previous Action #8	
Proposed Action:	Update of all FEMA FIRMs.
BACKGROUND INFORMATION	
Site and Location:	N/A
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood
Effect on New/Existing Buildings:	New/Existing
Priority (High, Moderate, Low):	High
Estimated Cost:	Staff Time around \$250,000
Potential Funding Sources:	Local
Lead Agency/Department Responsible:	Flood Administrator
Implementation Schedule:	12/31/2025

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

City of Elephant Butte – Previous Action #9	
Proposed Action:	Fund paid positions for first responders in communities in need.
BACKGROUND INFORMATION	
Site and Location:	TBD
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Emergency Services

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Medium
Estimated Cost:	\$60,000 per position
Potential Funding Sources:	Local, State
Lead Agency/Department Responsible:	Board of Trustees
Implementation Schedule:	Yearly

2026 ANALYSIS:
Delete action. The City no longer considers this action a priority.

SECTION 22: PREVIOUS ACTIONS

City of Elephant Butte – Previous Action #10	
Proposed Action:	Create, adopt, and enforce a water conservation ordinance.
BACKGROUND INFORMATION	
Site and Location:	Citywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Natural Resource Protection, Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	Staff Time
Potential Funding Sources:	Local
Lead Agency/Department Responsible:	Board of Trustees
Implementation Schedule:	12/31/2025

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

City of Elephant Butte – Previous Action #11	
Proposed Action:	Deliver public awareness classes, in conjunction with state and local experts, on water conservation for homeowners, businesses, and industry.
BACKGROUND INFORMATION	
Site and Location:	TBD
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Improve public outreach to include education, awareness and partnerships and enhance communications and coordination.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Public Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Medium
Estimated Cost:	\$30,000
Potential Funding Sources:	Local, State
Lead Agency/Department Responsible:	Board of Trustees
Implementation Schedule:	Yearly

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

CITY OF TRUTH OR CONSEQUENCES

City of Truth or Consequences – Previous Action #1	
Proposed Action:	Conduct jurisdiction-wide community outreach to promote participation in StormReady.
BACKGROUND INFORMATION	
Site and Location:	Citywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities, improve public outreach.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Public Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Severe Storms
Effect on New/Existing Buildings:	New/Existing
Priority (High, Moderate, Low):	High
Estimated Cost:	Staff Time
Potential Funding Sources:	Local
Lead Agency/Department Responsible:	Emergency Manager
Implementation Schedule:	Continuous

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

City of Truth or Consequences – Previous Action #2	
Proposed Action:	Construction or multi-hazard shelters with generators for the general public.
BACKGROUND INFORMATION	
Site and Location:	TBD
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Property Protection, Structural

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms
Effect on New/Existing Buildings:	New
Priority (High, Moderate, Low):	High
Estimated Cost:	\$10,000 per facility
Potential Funding Sources:	Local, State
Lead Agency/Department Responsible:	Emergency Manager
Implementation Schedule:	As required

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

City of Truth or Consequences – Previous Action #3	
Proposed Action:	Provide a continuous active member for the Mitigation Planning Committee to provide jurisdictional input.
BACKGROUND INFORMATION	
Site and Location:	N/A
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Enhance communication and coordination.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	Staff Time
Potential Funding Sources:	Local
Lead Agency/Department Responsible:	Board of Trustees
Implementation Schedule:	Continuous

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

City of Truth or Consequences – Previous Action #4	
Proposed Action:	Operation and management of jurisdictional NFIP activities.
BACKGROUND INFORMATION	
Site and Location:	Floodplain
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood
Effect on New/Existing Buildings:	New, Existing
Priority (High, Moderate, Low):	High
Estimated Cost:	Staff Time
Potential Funding Sources:	Local
Lead Agency/Department Responsible:	Floodplain Administrator
Implementation Schedule:	Continuous

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

City of Truth or Consequences – Previous Action #5	
Proposed Action:	Adopt zoning restrictions in known hazard areas.
BACKGROUND INFORMATION	
Site and Location:	Citywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms
Effect on New/Existing Buildings:	New/Existing
Priority (High, Moderate, Low):	High
Estimated Cost:	Staff Time
Potential Funding Sources:	Local
Lead Agency/Department Responsible:	Board of Trustees
Implementation Schedule:	12/31/2025

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

City of Truth or Consequences – Previous Action #6	
Proposed Action:	Construct flood mitigation and control measures to mitigate against flooding.
BACKGROUND INFORMATION	
Site and Location:	TBD
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Natural Resource Protection, Structural

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	Cost is project dependent
Potential Funding Sources:	Local, Federal
Lead Agency/Department Responsible:	Flood Administrator
Implementation Schedule:	12/31/2025

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

City of Truth or Consequences – Previous Action #7	
Proposed Action:	Acquire backup generators at critical facilities.
BACKGROUND INFORMATION	
Site and Location:	Critical Facilities
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Structural

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms
Effect on New/Existing Buildings:	Existing
Priority (High, Moderate, Low):	High
Estimated Cost:	\$20,000 per generator
Potential Funding Sources:	Local, Federal
Lead Agency/Department Responsible:	Board of Trustees
Implementation Schedule:	12/31/2025

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

City of Truth or Consequences – Previous Action #8	
Proposed Action:	Update of all FEMA FIRMs.
BACKGROUND INFORMATION	
Site and Location:	N/A
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood
Effect on New/Existing Buildings:	New/Existing
Priority (High, Moderate, Low):	High
Estimated Cost:	Staff Time around \$250,000
Potential Funding Sources:	Local
Lead Agency/Department Responsible:	Flood Administrator
Implementation Schedule:	12/31/2025

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

City of Truth or Consequences – Previous Action #9	
Proposed Action:	Fund paid positions for first responders in communities in need.
BACKGROUND INFORMATION	
Site and Location:	TBD
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Emergency Services

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Medium
Estimated Cost:	\$60,000 per position
Potential Funding Sources:	Local, State
Lead Agency/Department Responsible:	Board of Trustees
Implementation Schedule:	Yearly

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

City of Truth or Consequences – Previous Action #10	
Proposed Action:	Create, adopt and enforce a water conservation ordinance.
BACKGROUND INFORMATION	
Site and Location:	Citywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Natural Resource Protection, Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	Staff Time
Potential Funding Sources:	Local
Lead Agency/Department Responsible:	Board of Trustees
Implementation Schedule:	12/31/2025

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

City of Truth or Consequences – Previous Action #11	
Proposed Action:	Deliver public awareness classes, in conjunction with state and local experts, on water conservation for homeowners, businesses, and industry.
BACKGROUND INFORMATION	
Site and Location:	TBD
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Improve public outreach to include education, awareness and partnerships and enhance communications and coordination.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Public Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Medium
Estimated Cost:	\$30,000
Potential Funding Sources:	Local, State
Lead Agency/Department Responsible:	Board of Trustees
Implementation Schedule:	Yearly

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

VILLAGE OF WILLIAMSBURG

Village of Williamsburg – Previous Action #1	
Proposed Action:	Conduct jurisdiction-wide community outreach to promote participation in StormReady.
BACKGROUND INFORMATION	
Site and Location:	Citywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities, improve public outreach.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Public Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Severe Storms
Effect on New/Existing Buildings:	New/Existing
Priority (High, Moderate, Low):	High
Estimated Cost:	Staff Time
Potential Funding Sources:	Local
Lead Agency/Department Responsible:	Emergency Manager
Implementation Schedule:	Continuous

2026 ANALYSIS:
Carryover to Plan Update. The Village would like to research and consider pursuing this certification during the Plan Update.

SECTION 22: PREVIOUS ACTIONS

Village of Williamsburg – Previous Action #2	
Proposed Action:	Construction or multi-hazard shelters with generators for the general public.
BACKGROUND INFORMATION	
Site and Location:	TBD
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Property Protection, Structural

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms
Effect on New/Existing Buildings:	New
Priority (High, Moderate, Low):	High
Estimated Cost:	\$10,000 per facility
Potential Funding Sources:	Local, State
Lead Agency/Department Responsible:	Emergency Manager
Implementation Schedule:	As required

2026 ANALYSIS:
Delete action. The Village no longer considers this action a priority.

SECTION 22: PREVIOUS ACTIONS

Village of Williamsburg – Previous Action #3	
Proposed Action:	Provide a continuous active member for the Mitigation Planning Committee to provide jurisdictional input.
BACKGROUND INFORMATION	
Site and Location:	N/A
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Enhance communication and coordination.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	Staff Time
Potential Funding Sources:	Local
Lead Agency/Department Responsible:	Board of Trustees
Implementation Schedule:	Continuous

2026 ANALYSIS:
Delete action. The Village no longer considers this action a priority.

SECTION 22: PREVIOUS ACTIONS

Village of Williamsburg – Previous Action #4	
Proposed Action:	Operation and management of jurisdictional NFIP activities.
BACKGROUND INFORMATION	
Site and Location:	Floodplain
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood
Effect on New/Existing Buildings:	New, Existing
Priority (High, Moderate, Low):	High
Estimated Cost:	Staff Time
Potential Funding Sources:	Local
Lead Agency/Department Responsible:	Floodplain Administrator
Implementation Schedule:	Continuous

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

Village of Williamsburg – Previous Action #5	
Proposed Action:	Adopt zoning restrictions in known hazard areas.
BACKGROUND INFORMATION	
Site and Location:	Citywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Prevention
MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms
Effect on New/Existing Buildings:	New/Existing
Priority (High, Moderate, Low):	High
Estimated Cost:	Staff Time
Potential Funding Sources:	Local
Lead Agency/Department Responsible:	Board of Trustees
Implementation Schedule:	12/31/2025
2026 ANALYSIS:	
Complete.	

SECTION 22: PREVIOUS ACTIONS

Village of Williamsburg – Previous Action #6	
Proposed Action:	Construct flood mitigation and control measures to mitigate against flooding.
BACKGROUND INFORMATION	
Site and Location:	TBD
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Natural Resource Protection, Structural

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	Cost is project dependent
Potential Funding Sources:	Local, Federal
Lead Agency/Department Responsible:	Flood Administrator
Implementation Schedule:	12/31/2025

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

Village of Williamsburg – Previous Action #7	
Proposed Action:	Acquire backup generators at critical facilities.
BACKGROUND INFORMATION	
Site and Location:	Critical Facilities
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Structural

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms
Effect on New/Existing Buildings:	Existing
Priority (High, Moderate, Low):	High
Estimated Cost:	\$20,000 per generator
Potential Funding Sources:	Local, Federal
Lead Agency/Department Responsible:	Board of Trustees
Implementation Schedule:	12/31/2025

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 22: PREVIOUS ACTIONS

Village of Williamsburg – Previous Action #8	
Proposed Action:	Update of all FEMA FIRMs.
BACKGROUND INFORMATION	
Site and Location:	N/A
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood
Effect on New/Existing Buildings:	New/Existing
Priority (High, Moderate, Low):	High
Estimated Cost:	Staff Time around \$250,000
Potential Funding Sources:	Local
Lead Agency/Department Responsible:	Flood Administrator
Implementation Schedule:	12/31/2025

2026 ANALYSIS:
Complete.

SECTION 22: PREVIOUS ACTIONS

Village of Williamsburg – Previous Action #9	
Proposed Action:	Fund paid positions for first responders in communities in need.
BACKGROUND INFORMATION	
Site and Location:	TBD
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Emergency Services

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Medium
Estimated Cost:	\$60,000 per position
Potential Funding Sources:	Local, State
Lead Agency/Department Responsible:	Board of Trustees
Implementation Schedule:	Yearly

2026 ANALYSIS:
Delete action. The Village no longer considers this action a priority.

SECTION 22: PREVIOUS ACTIONS

Village of Williamsburg – Previous Action #10	
Proposed Action:	Create, adopt and enforce a water conservation ordinance.
BACKGROUND INFORMATION	
Site and Location:	Citywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Natural Resource Protection, Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	Staff Time
Potential Funding Sources:	Local
Lead Agency/Department Responsible:	Board of Trustees
Implementation Schedule:	12/31/2025

2026 ANALYSIS:
Complete.

SECTION 22: PREVIOUS ACTIONS

Village of Williamsburg – Previous Action #11	
Proposed Action:	Deliver public awareness classes, in conjunction with state and local experts, on water conservation for homeowners, businesses, and industry.
BACKGROUND INFORMATION	
Site and Location:	TBD
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Improve public outreach to include education, awareness and partnerships and enhance communications and coordination.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Public Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Medium
Estimated Cost:	\$30,000
Potential Funding Sources:	Local, State
Lead Agency/Department Responsible:	Board of Trustees
Implementation Schedule:	Yearly

2026 ANALYSIS:
Carryover to Plan Update.

Section 23

Mitigation Actions



SECTION 23: MITIGATION ACTIONS

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SUMMARY

The 44 CFR § 201.6(c)(3)(ii) states that the plan must 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.” The mitigation planning process is designed to help communities identify feasible and cost-effective mitigation strategies, but implementation of actions is dependent on factors such as funding, staff time, and evolving community priorities, and there is no penalty for jurisdictions unable to implement projects throughout the plan's life.¹

As discussed in Section 2, at the Mitigation Strategy Workshop, the Planning Team and stakeholders met to develop mitigation actions for each of the natural hazards included in the Plan Update. Each of the actions in this section were prioritized based on FEMA’s Social, Technical, Administrative, Political, Legal, Economic, and Environmental (STAPLEE) criteria necessary for the implementation of each action.

As part of the economic evaluation of the STAPLEE analysis, jurisdictions analyzed each action in terms of the overall costs, measuring whether the potential benefit to be gained from the action outweighed the costs associated with it. As a result of this exercise, priority was assigned to each mitigation action by marking them as High (H), Moderate (M), or Low (L). An action that is ranked as “High” indicates that the action will be implemented as soon as funding is received. A “Moderate” action is one that may not be implemented right away, depending on the cost and number of citizens served by the action. Actions ranked as “Low” indicate that they will not be implemented without first seeking grant funding, and after “High” and “Moderate” actions have been completed. This analysis was also used to prioritize actions related to High Hazard Potential Dams (HHPDs).

Within each mitigation action, the Planning Team considered all potential funding sources that could be utilized to implement the proposed project. To ensure all potential funding resources are considered and are not limited to those sources identified within the action worksheet, please see Appendix H for a list of all available State and Federal grant programs as of 2025. The Planning Team will continue to seek out other available funding sources during the 5-year cycle as notices of funding opportunity (NOFO) are released.

All mitigation actions created by Planning Team members are presented in this section in the form of a Mitigation Action Table. More than one hazard is sometimes listed for an action, if appropriate.

¹ Cost, funding sources, and implementation schedules are subject to change upon full scoping of project and grant availability.

SECTION 23: MITIGATION ACTIONS

Actions presented in this section represent a comprehensive range of mitigation actions per current State and FEMA Guidelines, including one action per hazard, and at least two different types for each participating jurisdiction.

Sierra County, the Cities of Elephant Butte and Truth or Consequences, and the Village of Williamsburg are participants in the National Flood Insurance Program (NFIP). Flooding was identified as a significant risk for the community; therefore, many of the mitigation actions were developed with flood mitigation in mind. Actions related to NFIP compliance include additional narrative when deemed appropriate.

SECTION 23: MITIGATION ACTIONS

Table 23-1. Sierra County Mitigation Action Matrix

TYPE OF ACTION	
Action #1 – Plans/Regulations (Blue)	Action #4 – Structural (Orange)
Action #2 – Education/Awareness (Red)	Action #5 – Preparedness/Response (Black)
Action #3 – Natural Systems Protections (Green)	

Jurisdiction	Dam Failure	Drought	Earthquake	Expansive Soils	Extreme Cold	Extreme Heat	Flood	Hail	High Winds	Landslides and Rockfall	Land Subsidence	Lightning	Severe Winter Storm	Tornado	Volcano	Wildfire	Human-caused Hazards ²
Sierra County	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●
City of Elephant Butte	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●
City of Truth or Consequences	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●
Village of Williamsburg	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●

² Human-caused hazards are profiled in Appendix A.

SECTION 23: MITIGATION ACTIONS

SIERRA COUNTY

SIERRA COUNTY MITIGATION ACTIONS														
*Reduces risk to new and/or existing buildings and infrastructure														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
1	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages. Include links to weather alerts and departmental phone listings with contact personnel for residents.	County-wide	Promote hazard awareness and protect citizens from potential injuries and damages.	Education and Awareness	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Cold, Extreme Heat, Flood, Hail, High Winds, Landslides and Rockfall, Land Subsidence, Lightning, Severe Winter Storm, Tornado, Volcano, Wildfire, Human-caused Hazards	Communication	N/A	H	\$5,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Sierra County Emergency Management	24 Months	Emergency Management Action Plan	Promotes public safety.
Description of the Solution: Monthly tips can be promoted for each hazard type via social media or other media outlets; Dam Failure: Install backflow valves to prevent back water flooding; Drought: Drought tolerant landscaping guidance; Earthquake: Provide information on securing indoor appliances and furniture; Expansive Soils: Manage moisture levels and reinforce structures; Extreme Cold: Provide information on when and how to wrap exposed and outdoor pipes; Extreme Heat: Provide tree planning guidance to reduce heat island effects and information on how to conserve energy during extreme heat conditions; Flood: Elevating appliances and personal items to protect from floodwaters; Hail: Replace roofing with hail resistant materials; High Winds: Provide information on securing outdoor items and reinforcing windows; Landslides and Rockfall: Provide information on flexible barriers and fences to contain falling rocks.; Land Subsidence: Provide tips on vegetation management to reduce soil erosion; Lightning: Tips on indoor surge protection and installing lightning rods; Severe Winter Storm: Trim trees to prevent damage from ice accumulation; Tornado: Provide information on the safest room in the house and when to seek shelter; Volcano: Provide information on how to keep the home airtight and avoid high risk areas; Wildfire: Creating defensible space.														

SECTION 23: MITIGATION ACTIONS

SIERRA COUNTY MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
2	Harden/retrofit critical facilities to hazard-resistant levels to include schools.	County-wide	Reduce damages at critical facilities; Ensure continuity of critical services during and after event.	Structure and Infrastructure	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Cold, Extreme Heat, Flood, Hail, High Winds, Landslides and Rockfall, Land Subsidence, Lightning, Severe Winter Storm, Tornado, Volcano, Wildfire	Safety/Security	Y	H	\$500,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Sierra County Emergency Management	36-48 Months	Capital Improvement Plan	Protects infrastructure, reduces cost of reparation, and prevents injury to residents.
3	Implement a flood awareness program by providing FEMA / NFIP materials to mortgage lenders, real estate agents and insurance agents and place them in local libraries.	County-wide	Reduce flood risk through education and awareness; Increase flood insurance coverage.	Education and Awareness	Flood	Communication	N/A	M	\$5,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Sierra County Emergency Management	12 Months	Floodplain Ordinance	Protects infrastructure, reduces cost of reparation, and prevents injury to residents.

SECTION 23: MITIGATION ACTIONS

SIERRA COUNTY MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
4	Identify all dams in the County and ensure that each has a current EAP and condition status.	County-wide	Reduce loss of life and property.	Local Plans and Regulations	Dam Failure	Safety/Security	Y	H	\$2,000,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Sierra County Emergency Management	18 Months	Emergency Management Action Plan	N/A
5	Coordinate with local dam owners and/or the state dam agency to assess and rehabilitate all high hazard potential dams (HHPD) with the ability to impact the area, implementing mitigation measures recommended in the assessment.	County-wide	Reduce risk of damages to structures; Ensure continuity of critical services; Reduce risk of injury and fatalities to residents.	Local Plans and Regulations Structure and Infrastructure	Dam Failure	Water Systems	Y	H	\$2,000,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Sierra County Emergency Management	12 Months	Emergency Management Action Plan	N/A

SECTION 23: MITIGATION ACTIONS

SIERRA COUNTY MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
6	Raise the level of identified High Hazard Dams to increase storage capacity and structural integrity.	County-wide	Reduce risk of damages to structures; Ensure continuity of critical services.	Structure and Infrastructure	Dam Failure, Flood	Safety/Security, Water Systems	Y	M	\$1,000,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Sierra County Emergency Management	60 Months	Emergency Management Action Plan	Protects communities and reduces risk of flooding.
7	Cut firebreaks into public wooded areas according to risk factors.	County-wide	Reduce risk of wildfires and the spread of wildfire through targeted firebreaks.	Natural Systems Protection	Wildfire	Safety/Security	Y	M	\$500,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Sierra County Emergency Management	24 Months	Emergency Management Action Plan	N/A

SECTION 23: MITIGATION ACTIONS

SIERRA COUNTY MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
8	Install a network of dry hydrants in stock ponds, creeks, and small lakes to increase the supply of water for fire protection.	County-wide	Reduce risk of wildfires and the spread of wildfire by increasing water access and firefighting capabilities	Structure and Infrastructure	Wildfire	Safety/Security	Y	M	\$500,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Sierra County Emergency Management	24-36 Months	Emergency Management Action Plan	N/A
9	Restrict hillside development in wildfire areas; Implement density and setback requirements for structures located in wildfire hazard areas.	County-wide	Reduce risk of wildfires and the spread of wildfire through improved development practices and building requirements/restrictions.	Local Plans and Regulations	Wildfire	Safety/Security	Y	H	\$5,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Sierra County Emergency Management	12 Months	Subdivision Regulations	N/A

SECTION 23: MITIGATION ACTIONS

SIERRA COUNTY MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
10	Install fire danger rating/burn ban signs.	County-wide	Reduce risk and spread of wildfires through education and awareness programs; Reduce risk of damages and injuries.	Education and Awareness	Wildfire	Communication	N/A	H	\$5,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Sierra County Emergency Management	12 Months	Emergency Management Action Plan	N/A
11	Upgrade undersized stormwater drains and culverts.	County-wide	Reduce risk of flood damages through improved drainage capacity	Structure and Infrastructure	Flood	Safety/Security	Y	H	\$3,000,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Sierra County Emergency Management	48 Months	Emergency Management Action Plan	Protects communities and reduces risk of flooding.

SECTION 23: MITIGATION ACTIONS

SIERRA COUNTY MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
12	Implement a community education program regarding fire dangers for identified risk areas; Distribute pamphlets through neighborhood associations or insert flyers in water bills to make residents aware of wildfire hazard areas and fire protection measures for homes and yards.	County-wide	Reduce risk and spread of wildfires through education and awareness programs; Reduce risk of damages and injuries.	Education and Awareness	Wildfire	Communication	N/A	H	\$5,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Sierra County Emergency Management	12 Months	Emergency Management Action Plan	N/A
13	Conduct public education program on fire risks and wildland fire mitigation, with the assistance of the New Mexico Energy, Minerals and Natural Resources Department (EMNRD) Forestry Division.	County-wide	Reduce risk and spread of wildfires through education and awareness programs.	Education and Awareness	Wildfire	Communication	N/A	H	\$10,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Sierra County Emergency Management	12 Months	Emergency Management Action Plan	N/A

SECTION 23: MITIGATION ACTIONS

SIERRA COUNTY MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
14	Work with state and local agencies to determine locations to reduce fuel on public and private lands. Implement fuels reduction program.	County-wide	Reduce risk of wildfires and the spread of wildfire through targeted fuels reduction programs.	Natural Systems Protection	Wildfire	Safety/Security	Y	M	\$500,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Sierra County Emergency Management	24 Months	Emergency Management Action Plan	N/A
15	Require standard tie-downs of propane tanks.	County-wide	Reduce damages to structures and infrastructure.	Local Plans and Regulations	Dam Failure, Earthquake, Flood, High Winds, Tornado	Energy (Power/Fuel)	Y	M	\$5,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Sierra County Emergency Management	24 Months	N/A	Promotes public safety.

SECTION 23: MITIGATION ACTIONS

SIERRA COUNTY MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
16	Create and Implement a program to initiate controlled burns of grasslands.	County-wide	Reduce risk of damages and injuries due to wildfire events.	Structure and Infrastructure	Wildfire	Safety/Security	Y	M	\$50,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Sierra County Emergency Management	36 Months	Emergency Management Action Plan	N/A
17	Provide surge and lightning protection for computer-reliant critical facilities (e.g., Hall, 911 Center, EOC, Police and Fire stations, water / wastewater treatment plant, public works buildings, and schools).	County-wide	Reduce damages at critical and public facilities.	Structure and Infrastructure	Lightning	Safety/Security	Y	M	\$50,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Sierra County Emergency Management	48 Months	Emergency Management Action Plan	N/A

SECTION 23: MITIGATION ACTIONS

SIERRA COUNTY MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
18	Provide lightning warning systems for community public outdoor spaces to include sports areas, pools, golf courses, and parks.	County-wide	Reduce loss of life or property during lightning hazard events.	Structure and Infrastructure	Lightning	Safety/Security	Y	M	\$150,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Sierra County Emergency Management	48 Months	Emergency Management Action Plan	N/A
19	Identify public facilities that can function as heating and cooling shelters during extreme temperature events. Develop protocols to inform the public when shelters are available.	County-wide	Promote hazard awareness and protect citizens from potential injuries and damages.	Education and Awareness Local Plans and Regulations	Extreme Cold, Extreme Heat	Communication, Food/Hydration/Shelter	N/A	M	\$3,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Sierra County Emergency Management	12-24 Months	Emergency Management Action Plan	N/A

SECTION 23: MITIGATION ACTIONS

SIERRA COUNTY MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
20	Adopt building codes to provide for greater structural resistance to wind.	County-wide	Reduce damages to structures and infrastructure; Reduce risk of injuries or fatalities.	Local Plans and Regulations	High Winds, Tornado	Safety/Security	Y	M	\$5,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Sierra County Emergency Management	48 Months	N/A	N/A
21	Evaluate, upgrade and maintain community-wide outdoor omni-directional siren warning systems.	County-wide	Reduce risk to citizens through improved communication and early warning.	Education and Awareness Preparedness/Response	Dam Failure, Earthquake, Extreme Cold, Extreme Heat, Flood, Hail, High Winds, Lightning, Severe Winter Storm, Tornado, Wildfire, Human-Caused Hazards	Communication	Y	M	\$175,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Sierra County Emergency Management	24 Months	Emergency Management Action Plan	Promotes public safety.

SECTION 23: MITIGATION ACTIONS

SIERRA COUNTY MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
22	Acquire and distribute NOAA weather radios for all critical facilities and the public.	County-wide	Reduce risk to citizens through improved education.	Education and Awareness	Dam Failure, Drought, Earthquake, Extreme Cold, Extreme Heat, Flood, Hail, High Winds, Lightning, Severe Winter Storm, Tornado, Wildfire, Human-caused Hazards	Communication	Y	M	\$50,000	Local Budget; State Grants (OEM, ODAFF, ODOT, OWRB, OCC, ODWC); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Sierra County Emergency Management	12 Months	Emergency Management Action Plan	Promotes public safety.
23	Evaluate, upgrade and install flood gauges at low water crossings throughout the jurisdiction.	County-wide	Reduce risk to citizens through improved communication and early warning.	Structure and Infrastructure	Flood	Safety/Security	Y	H	\$100,000	Local Budget; State Grants (OEM, ODAFF, ODOT, OWRB, OCC, ODWC); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Sierra County Emergency Management	24 Months	Emergency Management Action Plan	Promotes public safety.

SECTION 23: MITIGATION ACTIONS

SIERRA COUNTY MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
24	Educate community on the dangers of low water crossings through the installation of warning signs.	County-wide	Reduce risk of injuries, fatalities and damages through education and awareness.	Education and Awareness	Flood	Communication	N/A	H	\$10,000	Local Budget; State Grants (OEM, ODAFF, ODOT, OWRB, OCC, ODWC); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Sierra County Emergency Management	12 Months	Floodplain Ordinance	Promotes public safety.
25	Create or Update, adopt, and enforce local ordinances relating to hazard events.	County-wide*	Reduce loss of life and property.	Local Plans and Regulations	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Cold, Extreme Heat, Flood, Hail, High Winds, Landslides and Rockfall, Land Subsidence, Lightning, Severe Winter Storm, Tornado, Volcano, Wildfire	Communication	Y	H	\$5,000	Local Budget; State Grants (OEM, ODAFF, ODOT, OWRB, OCC, ODWC); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Sierra County Emergency Management	12 Months	N/A	Protects infrastructure, reduces cost of reparation, and prevents injury to residents.
* Priority ordinances include: Flood, Stormwater, Water Conservation														

SECTION 23: MITIGATION ACTIONS

SIERRA COUNTY MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
26	Create and implement a program for dam channel restoration.	County-wide*	Reduce risk of flood damages through improved drainage capacity/diversion.	Structure and Infrastructure	Dam Failure, Flood	Water Systems	Y	H	\$1,000,000	Local Budget; State Grants (OEM, ODAFF, ODOT, OWRB, OCC, ODWC); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Sierra County Emergency Management	24 Months	Emergency Management Action Plan	Protects communities and reduces risk of flooding.
* Priority locations include: Truth or Consequences Site 8C dam, 800 channel, 600 channel														

SECTION 23: MITIGATION ACTIONS

CITY OF ELEPHANT BUTTE

CITY OF ELEPHANT BUTTE MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
1	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages. Include links to weather alerts and departmental phone listings with contact personnel for residents.	City-wide	Promote hazard awareness and protect citizens from potential injuries and damages.	Education and Awareness	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Cold, Extreme Heat, Flood, Hail, High Winds, Landslides and Rockfall, Land Subsidence, Lightning, Severe Winter Storm, Tornado, Volcano, Wildfire, Human-caused Hazards	Communication	N/A	H	\$5,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Elephant Butte Emergency Management	24 Months	N/A	Promotes public safety.
Description of the Solution: Monthly tips can be promoted for each hazard type via social media or other media outlets; Dam Failure: Install backflow valves to prevent back water flooding; Drought: Drought tolerant landscaping guidance; Earthquake: Provide information on securing indoor appliances and furniture; Expansive Soils: Manage moisture levels and reinforce structures; Extreme Cold: Provide information on when and how to wrap exposed and outdoor pipes; Extreme Heat: Provide tree planning guidance to reduce heat island effects and information on how to conserve energy during extreme heat conditions; Flood: Elevating appliances and personal items to protect from floodwaters; Hail: Replace roofing with hail resistant materials; High Winds: Provide information on securing outdoor items and reinforcing windows; Landslides and Rockfall: Provide information on flexible barriers and fences to contain falling rocks.; Land Subsidence: Provide tips on vegetation management to reduce soil erosion; Lightning: Tips on indoor surge protection and installing lightning rods; Severe Winter Storm: Trim trees to prevent damage from ice accumulation; Tornado: Provide information on the safest room in the house and when to seek shelter; Volcano: Provide information on how to keep the home airtight and avoid high risk areas; Wildfire: Creating defensible space.														

SECTION 23: MITIGATION ACTIONS

CITY OF ELEPHANT BUTTE MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
2	Harden/retrofit critical facilities to hazard-resistant levels to include schools.	City-wide	Reduce damages at critical facilities; Ensure continuity of critical services during and after event.	Structure and Infrastructure	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Cold, Extreme Heat, Flood, Hail, High Winds, Landslides and Rockfall, Land Subsidence, Lightning, Severe Winter Storm, Tornado, Volcano, Wildfire	Safety/Security	Y	H	\$500,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Elephant Butte Emergency Management	36-48 Months	N/A	Protects infrastructure, reduces cost of reparation, and prevents injury to residents.
3	Implement a flood awareness program by providing FEMA / NFIP materials to mortgage lenders, real estate agents and insurance agents and place them in local libraries.	City-wide	Reduce flood risk through education and awareness; Increase flood insurance coverage.	Education and Awareness	Flood	Communication	N/A	M	\$5,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Elephant Butte Emergency Management	12 Months	N/A	Protects infrastructure, reduces cost of reparation, and prevents injury to residents.

SECTION 23: MITIGATION ACTIONS

CITY OF ELEPHANT BUTTE MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
4	Identify all dams in the County and ensure that each has a current EAP and condition status.	City-wide	Reduce loss of life and property.	Local Plans and Regulations	Dam Failure	Safety/Security	Y	H	\$2,000,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Elephant Butte Emergency Management	18 Months	N/A	N/A
5	Coordinate with local dam owners and/or the state dam agency to assess and rehabilitate all high hazard potential dams (HHPD) with the ability to impact the city, implementing mitigation measures recommended in the assessment.	City-wide	Reduce risk of damages to structures; Ensure continuity of critical services; Reduce risk of injury and fatalities to residents.	Local Plans and Regulations Structure and Infrastructure	Dam Failure	Water Systems	Y	H	\$2,000,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Elephant Butte Emergency Management	12 Months	N/A	N/A

SECTION 23: MITIGATION ACTIONS

CITY OF ELEPHANT BUTTE MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
6	Raise the level of identified High Hazard Dams to increase storage capacity and structural integrity.	City-wide	Reduce risk of damages to structures; Ensure continuity of critical services.	Structure and Infrastructure	Dam Failure, Flood	Safety/Security, Water Systems	Y	M	\$1,000,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Elephant Butte Emergency Management	60 Months	N/A	Protects communities and reduces risk of flooding.
7	Cut firebreaks into public wooded areas according to risk factors.	City-wide	Reduce risk of wildfires and the spread of wildfire through targeted firebreaks.	Natural Systems Protection	Wildfire	Safety/Security	Y	M	\$500,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Elephant Butte Emergency Management	24 Months	N/A	N/A

SECTION 23: MITIGATION ACTIONS

CITY OF ELEPHANT BUTTE MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
8	Install a network of dry hydrants in stock ponds, creeks, and small lakes to increase the supply of water for fire protection.	City-wide	Reduce risk of wildfires and the spread of wildfire by increasing water access and firefighting capabilities.	Structure and Infrastructure	Wildfire	Safety/Security	Y	M	\$500,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Elephant Butte Emergency Management	24-36 Months	N/A	N/A
9	Restrict hillside development in wildfire areas; Implement density and setback requirements for structures located in wildfire hazard areas.	City-wide	Reduce risk of wildfires and the spread of wildfire through improved development practices and building requirements/restrictions.	Local Plans and Regulations	Wildfire	Safety/Security	Y	H	\$5,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Elephant Butte Emergency Management	12 Months	N/A	N/A

SECTION 23: MITIGATION ACTIONS

CITY OF ELEPHANT BUTTE MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
10	Install fire danger rating/burn ban signs.	City-wide	Reduce risk and spread of wildfires through education and awareness programs; Reduce risk of damages and injuries.	Education and Awareness	Wildfire	Communication	N/A	H	\$5,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Elephant Butte Emergency Management	12 Months	N/A	N/A
11	Upgrade undersized stormwater drains and culverts.	City-wide	Reduce risk of flood damages through improved drainage capacity	Structure and Infrastructure	Flood	Safety/Security	Y	H	\$3,000,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Elephant Butte Emergency Management	48 Months	N/A	Protects communities and reduces risk of flooding.

SECTION 23: MITIGATION ACTIONS

CITY OF ELEPHANT BUTTE MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
12	Work with state and local agencies to determine locations to reduce fuel on public and private lands. Implement fuels reduction program.	City-wide	Reduce risk of wildfires and the spread of wildfire through targeted fuels reduction programs.	Natural Systems Protection	Wildfire	Safety/Security	Y	M	\$500,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Elephant Butte Emergency Management	24 Months	N/A	N/A
13	Require standard tie-downs of propane tanks.	City-wide	Reduce damages to structures and infrastructure.	Local Plans and Regulations	Dam Failure, Earthquake, Flood, High Winds, Tornado	Energy (Power/Fuel)	Y	M	\$5,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Elephant Butte Emergency Management	24 Months	N/A	Promotes public safety.

SECTION 23: MITIGATION ACTIONS

CITY OF ELEPHANT BUTTE MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
14	Create and Implement a program to initiate controlled burns of grasslands.	City-wide	Reduce risk of damages and injuries due to wildfire events.	Structure and Infrastructure	Wildfire	Safety/Security	Y	M	\$50,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Elephant Butte Emergency Management	36 Months	N/A	N/A
15	Provide surge and lightning protection for computer-reliant critical facilities (e.g., Hall, 911 Center, EOC, Police and Fire stations, water / wastewater treatment plant, public works buildings, and schools).	City-wide	Reduce damages at critical and public facilities.	Structure and Infrastructure	Lightning	Safety/Security	Y	M	\$50,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Elephant Butte Emergency Management	48 Months	N/A	N/A

SECTION 23: MITIGATION ACTIONS

CITY OF ELEPHANT BUTTE MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
16	Provide lightning warning systems for community public outdoor spaces to include sports areas, pools, golf courses, and parks.	City-wide	Reduce loss of life or property during lightning hazard events.	Structure and Infrastructure	Lightning	Safety/Security	Y	M	\$150,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Elephant Butte Emergency Management	48 Months	N/A	N/A
17	Identify public facilities that can function as heating and cooling shelters during extreme temperature events. Develop protocols to inform the public when shelters are available.	City-wide	Promote hazard awareness and protect citizens from potential injuries and damages.	Education and Awareness Local Plans and Regulations	Extreme Cold, Extreme Heat	Communication, Food/Hydration/Shelter	N/A	M	\$3,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Elephant Butte Emergency Management	12-24 Months	N/A	N/A

SECTION 23: MITIGATION ACTIONS

CITY OF ELEPHANT BUTTE MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
18	Adopt building codes to provide for greater structural resistance to wind.	City-wide	Reduce damages to structures and infrastructure; Reduce risk of injuries or fatalities.	Local Plans and Regulations	High Winds, Tornado	Safety/Security	Y	M	\$5,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Elephant Butte Emergency Management	48 Months	N/A	N/A
19	Evaluate, upgrade and maintain community-wide outdoor omni-directional siren warning systems.	City-wide	Reduce risk to citizens through improved communication and early warning.	Education and Awareness Preparedness/Response	Dam Failure, Earthquake, Extreme Cold, Extreme Heat, Flood, Hail, High Winds, Lightning, Severe Winter Storm, Tornado, Wildfire, Human-Caused Hazards	Communication	Y	M	\$175,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Elephant Butte Emergency Management	24 Months	N/A	Promotes public safety.

SECTION 23: MITIGATION ACTIONS

CITY OF ELEPHANT BUTTE MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
20	Master Drainage/ Stormwater Management Plan	City-wide	Reduce damages at critical facilities; Ensure continuity of critical services during and after event.	Local Plans and Regulations	Flood	Water Systems	Y	H	\$200,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Elephant Butte Emergency Management	48 Months	N/A	Protects infrastructure, reduces cost of reparation, and prevents injury to residents.
21	Acquire and distribute NOAA weather radios for all critical facilities and the public.	City-wide	Reduce risk to citizens through improved education.	Education and Awareness	Dam Failure, Drought, Earthquake, Extreme Cold, Extreme Heat, Flood, Hail, High Winds, Lightning, Severe Winter Storm, Tornado, Wildfire, Human-caused Hazards	Communication	Y	M	\$50,000	Local Budget; State Grants (OEM, ODAFF, ODOT, OWRB, OCC, ODWC); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Elephant Butte Emergency Management	12 Months	N/A	Promotes public safety.

SECTION 23: MITIGATION ACTIONS

CITY OF ELEPHANT BUTTE MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
22	Evaluate, upgrade and install flood gauges at low water crossings throughout the jurisdiction.	City-wide	Reduce risk to citizens through improved communication and early warning.	Structure and Infrastructure	Flood	Safety/Security	Y	H	\$100,000	Local Budget; State Grants (OEM, ODAFF, ODOT, OWRB, OCC, ODWC); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Elephant Butte Emergency Management	24 Months	N/A	Promotes public safety.
23	Educate community on the dangers of low water crossings through the installation of warning signs.	City-wide	Reduce risk of injuries, fatalities and damages through education and awareness.	Education and Awareness	Flood	Communication	N/A	H	\$10,000	Local Budget; State Grants (OEM, ODAFF, ODOT, OWRB, OCC, ODWC); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Elephant Butte Emergency Management	12 Months	N/A	Promotes public safety.

SECTION 23: MITIGATION ACTIONS

CITY OF ELEPHANT BUTTE MITIGATION ACTIONS														
*Reduces risk to new and/or existing buildings and infrastructure														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
24	Create or Update, adopt, and enforce local ordinances relating to hazard events.	City-wide*	Reduce loss of life and property.	Local Plans and Regulations	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Cold, Extreme Heat, Flood, Hail, High Winds, Landslides and Rockfall, Land Subsidence, Lightning, Severe Winter Storm, Tornado, Volcano, Wildfire	Communication	Y	H	\$5,000	Local Budget; State Grants (OEM, ODAFF, ODOT, OWRB, OCC, ODWC); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Elephant Butte Emergency Management	12 Months	N/A	Protects infrastructure, reduces cost of reparation, and prevents injury to residents.
* Priority ordinances include: Flood, Stormwater, Water Conservation														
25	Create and implement a program for dam channel restoration.	City-wide*	Reduce risk of flood damages through improved drainage capacity/diversion.	Structure and Infrastructure	Dam Failure, Flood	Water Systems	Y	H	\$1,000,000	Local Budget; State Grants (OEM, ODAFF, ODOT, OWRB, OCC, ODWC); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Elephant Butte Emergency Management	24 Months	N/A	Protects communities and reduces risk of flooding.
* Priority locations include: Truth or Consequences Site 8C dam, 800 channel, 600 channel														

SECTION 23: MITIGATION ACTIONS

CITY OF TRUTH OR CONSEQUENCES

CITY OF TRUTH OR CONSEQUENCE MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
1	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages. Include links to weather alerts and departmental phone listings with contact personnel for residents.	City-wide	Promote hazard awareness and protect citizens from potential injuries and damages.	Education and Awareness	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Cold, Extreme Heat, Flood, Hail, High Winds, Landslides and Rockfall, Land Subsidence, Lightning, Severe Winter Storm, Tornado, Volcano, Wildfire, Human-caused Hazards	Communication	N/A	H	\$5,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Truth or Consequences Emergency Management	24 Months	N/A	Promotes public safety.
Description of the Solution: Monthly tips can be promoted for each hazard type via social media or other media outlets; Dam Failure: Install backflow valves to prevent back water flooding; Drought: Drought tolerant landscaping guidance; Earthquake: Provide information on securing indoor appliances and furniture; Expansive Soils: Manage moisture levels and reinforce structures; Extreme Cold: Provide information on when and how to wrap exposed and outdoor pipes; Extreme Heat: Provide tree planning guidance to reduce heat island effects and information on how to conserve energy during extreme heat conditions; Flood: Elevating appliances and personal items to protect from floodwaters; Hail: Replace roofing with hail resistant materials; High Winds: Provide information on securing outdoor items and reinforcing windows; Landslides and Rockfall: Provide information on flexible barriers and fences to contain falling rocks.; Land Subsidence: Provide tips on vegetation management to reduce soil erosion; Lightning: Tips on indoor surge protection and installing lightning rods; Severe Winter Storm: Trim trees to prevent damage from ice accumulation; Tornado: Provide information on the safest room in the house and when to seek shelter; Volcano: Provide information on how to keep the home airtight and avoid high risk areas; Wildfire: Creating defensible space.														

SECTION 23: MITIGATION ACTIONS

CITY OF TRUTH OR CONSEQUENCE MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
2	Harden/retrofit critical facilities to hazard-resistant levels to include schools.	City-wide	Reduce damages at critical facilities; Ensure continuity of critical services during and after event.	Structure and Infrastructure	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Cold, Extreme Heat, Flood, Hail, High Winds, Landslides and Rockfall, Land Subsidence, Lightning, Severe Winter Storm, Tornado, Volcano, Wildfire	Safety/Security	Y	H	\$500,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Truth or Consequences Emergency Management	36-48 Months	N/A	Protects infrastructure, reduces cost of reparation, and prevents injury to residents.
3	Identify all dams in the County and ensure that each has a current EAP and condition status.	City-wide	Reduce loss of life and property.	Local Plans and Regulations	Dam Failure	Safety/Security	Y	H	\$2,000,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Truth or Consequences Emergency Management	18 Months	N/A	N/A

SECTION 23: MITIGATION ACTIONS

CITY OF TRUTH OR CONSEQUENCE MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
4	Coordinate with local dam owners and/or the state dam agency to assess and rehabilitate all high hazard potential dams (HHPD) with the ability to impact the city, implementing mitigation measures recommended in the assessment.	City-wide	Reduce risk of damages to structures; Ensure continuity of critical services; Reduce risk of injury and fatalities to residents.	Local Plans and Regulations Structure and Infrastructure	Dam Failure	Water Systems	Y	H	\$2,000,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Truth or Consequences Emergency Management	12 Months	N/A	N/A
5	Raise the level of identified High Hazard Dams to increase storage capacity and structural integrity.	City-wide	Reduce risk of damages to structures; Ensure continuity of critical services.	Structure and Infrastructure	Dam Failure, Flood	Safety/Security, Water Systems	Y	M	\$1,000,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Truth or Consequences Emergency Management	60 Months	N/A	Protects communities and reduces risk of flooding.

SECTION 23: MITIGATION ACTIONS

CITY OF TRUTH OR CONSEQUENCE MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
6	Cut firebreaks into public wooded areas according to risk factors.	City-wide	Reduce risk of wildfires and the spread of wildfire through targeted firebreaks.	Natural Systems Protection	Wildfire	Safety/Security	Y	M	\$500,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Truth or Consequences Emergency Management	24 Months	CWPP	N/A
7	Install a network of dry hydrants in stock ponds, creeks, and small lakes to increase the supply of water for fire protection.	City-wide	Reduce risk of wildfires and the spread of wildfire by increasing water access and firefighting capabilities.	Structure and Infrastructure	Wildfire	Safety/Security	Y	M	\$500,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Truth or Consequences Emergency Management	24-36 Months	CWPP	N/A

SECTION 23: MITIGATION ACTIONS

CITY OF TRUTH OR CONSEQUENCE MITIGATION ACTIONS														
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Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
8	Restrict hillside development in wildfire areas; Implement density and setback requirements for structures located in wildfire hazard areas.	City-wide	Reduce risk of wildfires and the spread of wildfire through improved development practices and building requirements/restrictions.	Local Plans and Regulations	Wildfire	Safety/Security	Y	H	\$5,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Truth or Consequences Emergency Management	12 Months	CWPP	N/A
9	Install fire danger rating/burn ban signs.	City-wide	Reduce risk and spread of wildfires through education and awareness programs; Reduce risk of damages and injuries.	Education and Awareness	Wildfire	Communication	N/A	H	\$5,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Truth or Consequences Emergency Management	12 Months	CWPP	N/A

SECTION 23: MITIGATION ACTIONS

CITY OF TRUTH OR CONSEQUENCE MITIGATION ACTIONS														
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Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
10	Upgrade undersized stormwater drains and culverts.	City-wide	Reduce risk of flood damages through improved drainage capacity	Structure and Infrastructure	Flood	Safety/Security	Y	H	\$3,000,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Truth or Consequences Emergency Management	48 Months	N/A	Protects communities and reduces risk of flooding.
11	Work with state and local agencies to determine locations to reduce fuel on public and private lands. Implement fuels reduction program.	City-wide	Reduce risk of wildfires and the spread of wildfire through targeted fuels reduction programs.	Natural Systems Protection	Wildfire	Safety/Security	Y	M	\$500,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Truth or Consequences Emergency Management	24 Months	CWPP	N/A

SECTION 23: MITIGATION ACTIONS

CITY OF TRUTH OR CONSEQUENCE MITIGATION ACTIONS														
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Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
12	Require standard tie-downs of propane tanks.	City-wide	Reduce damages to structures and infrastructure.	Local Plans and Regulations	Dam Failure, Earthquake, Flood, High Winds, Tornado	Energy (Power/Fuel)	Y	M	\$5,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Truth or Consequences Emergency Management	24 Months	N/A	Promotes public safety.
13	Create and Implement a program to initiate controlled burns of grasslands.	City-wide	Reduce risk of damages and injuries due to wildfire events.	Structure and Infrastructure	Wildfire	Safety/Security	Y	M	\$50,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Truth or Consequences Emergency Management	36 Months	CWPP	N/A

SECTION 23: MITIGATION ACTIONS

CITY OF TRUTH OR CONSEQUENCE MITIGATION ACTIONS														
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Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
14	Provide surge and lightning protection for computer-reliant critical facilities (e.g., Hall, 911 Center, EOC, Police and Fire stations, water / wastewater treatment plant, public works buildings, and schools).	City-wide	Reduce damages at critical and public facilities.	Structure and Infrastructure	Lightning	Safety/Security	Y	M	\$50,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Truth or Consequences Emergency Management	48 Months	N/A	N/A
15	Provide lightning warning systems for community public outdoor spaces to include sports areas, pools, golf courses, and parks.	City-wide	Reduce loss of life or property during lightning hazard events.	Structure and Infrastructure	Lightning	Safety/Security	Y	M	\$150,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Truth or Consequences Emergency Management	48 Months	N/A	N/A

SECTION 23: MITIGATION ACTIONS

CITY OF TRUTH OR CONSEQUENCE MITIGATION ACTIONS														
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Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
16	Identify public facilities that can function as heating and cooling shelters during extreme temperature events. Develop protocols to inform the public when shelters are available.	City-wide	Promote hazard awareness and protect citizens from potential injuries and damages.	Education and Awareness Local Plans and Regulations	Extreme Cold, Extreme Heat	Communication, Food/Hydration/Shelter	N/A	M	\$3,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Truth or Consequences Emergency Management	12-24 Months	N/A	N/A
17	Adopt building codes to provide for greater structural resistance to wind.	City-wide	Reduce damages to structures and infrastructure; Reduce risk of injuries or fatalities.	Local Plans and Regulations	High Winds, Tornado	Safety/Security	Y	M	\$5,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Truth or Consequences Emergency Management	48 Months	N/A	N/A

SECTION 23: MITIGATION ACTIONS

CITY OF TRUTH OR CONSEQUENCE MITIGATION ACTIONS														
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Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
18	Evaluate, upgrade and maintain community-wide outdoor omni-directional siren warning systems.	City-wide	Reduce risk to citizens through improved communication and early warning.	Education and Awareness Preparedness/Response	Dam Failure, Earthquake, Extreme Cold, Extreme Heat, Flood, Hail, High Winds, Lightning, Severe Winter Storm, Tornado, Wildfire, Human-Caused Hazards	Communication	Y	M	\$175,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Truth or Consequences Emergency Management	24 Months	N/A	Promotes public safety.
19	Master Drainage/ Stormwater Management Plan	City-wide	Reduce damages at critical facilities; Ensure continuity of critical services during and after event.	Local Plans and Regulations	Flood	Water Systems	Y	H	\$200,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Truth or Consequences Emergency Management	48 Months	N/A	Protects infrastructure, reduces cost of reparation, and prevents injury to residents.

SECTION 23: MITIGATION ACTIONS

CITY OF TRUTH OR CONSEQUENCE MITIGATION ACTIONS														
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Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
20	Acquire and distribute NOAA weather radios for all critical facilities and the public.	City-wide	Reduce risk to citizens through improved education.	Education and Awareness	Dam Failure, Drought, Earthquake, Extreme Cold, Extreme Heat, Flood, Hail, High Winds, Lightning, Severe Winter Storm, Tornado, Wildfire, Human-caused Hazards	Communication	Y	M	\$50,000	Local Budget; State Grants (OEM, ODAFF, ODOT, OWRB, OCC, ODWC); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Truth or Consequences Emergency Management	12 Months	N/A	Promotes public safety.
21	Evaluate, upgrade and install flood gauges at low water crossings throughout the jurisdiction.	City-wide	Reduce risk to citizens through improved communication and early warning.	Structure and Infrastructure	Flood	Safety/Security	Y	H	\$100,000	Local Budget; State Grants (OEM, ODAFF, ODOT, OWRB, OCC, ODWC); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Truth or Consequences Emergency Management	24 Months	N/A	Promotes public safety.

SECTION 23: MITIGATION ACTIONS

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Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
22	Educate community on the dangers of low water crossings through the installation of warning signs.	City-wide	Reduce risk of injuries, fatalities and damages through education and awareness.	Education and Awareness	Flood	Communication	N/A	H	\$10,000	Local Budget; State Grants (OEM, ODAFF, ODOT, OWRB, OCC, ODWC); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Truth or Consequences Emergency Management	12 Months	N/A	Promotes public safety.
23	Create or Update, adopt, and enforce local ordinances relating to hazard events.	City-wide*	Reduce loss of life and property.	Local Plans and Regulations	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Temperatures, Flood, Hail, High Winds, Landslides and Rockfall, Land Subsidence, Lightning, Severe Winter Storm, Tornado, Volcano, Wildfire	Communication	Y	H	\$5,000	Local Budget; State Grants (OEM, ODAFF, ODOT, OWRB, OCC, ODWC); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Truth or Consequences Emergency Management	12 Months	N/A	Protects infrastructure, reduces cost of reparation, and prevents injury to residents.
* Priority ordinances include: Flood, Stormwater, Water Conservation														

SECTION 23: MITIGATION ACTIONS

CITY OF TRUTH OR CONSEQUENCE MITIGATION ACTIONS														
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Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
24	Create and implement a program for dam channel restoration.	City-wide*	Reduce risk of flood damages through improved drainage capacity/diversion.	Structure and Infrastructure	Dam Failure, Flood	Water Systems	Y	H	\$1,000,000	Local Budget; State Grants (OEM, ODAFF, ODOT, OWRB, OCC, ODWC); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Truth or Consequences Emergency Management	24 Months	N/A	Protects communities and reduces risk of flooding.
* Priority locations include: Truth or Consequences Site 8C dam, 800 channel, 600 channel														

SECTION 23: MITIGATION ACTIONS

VILLAGE OF WILLIAMSBURG

VILLAGE OF WILLIAMSBURG MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
1	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages. Include links to weather alerts and departmental phone listings with contact personnel for residents.	Village-wide	Promote hazard awareness and protect citizens from potential injuries and damages.	Education and Awareness	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Cold, Extreme Heat, Flood, Hail, High Winds, Landslides and Rockfall, Land Subsidence, Lightning, Severe Winter Storm, Tornado, Volcano, Wildfire, Human-caused Hazards	Communication	N/A	H	\$5,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Village of Williamsburg Mayor	24 Months	Emergency Management Action Plan	Promotes public safety.
Description of the Solution: Monthly tips can be promoted for each hazard type via social media or other media outlets; Dam Failure: Install backflow valves to prevent back water flooding; Drought: Drought tolerant landscaping guidance; Earthquake: Provide information on securing indoor appliances and furniture; Expansive Soils: Manage moisture levels and reinforce structures; Extreme Cold: Provide information on when and how to wrap exposed and outdoor pipes; Extreme Heat: Provide tree planning guidance to reduce heat island effects and information on how to conserve energy during extreme heat conditions; Flood: Elevating appliances and personal items to protect from floodwaters; Hail: Replace roofing with hail resistant materials; High Winds: Provide information on securing outdoor items and reinforcing windows; Landslides and Rockfall: Provide information on flexible barriers and fences to contain falling rocks.; Land Subsidence: Provide tips on vegetation management to reduce soil erosion; Lightning: Tips on indoor surge protection and installing lightning rods; Severe Winter Storm: Trim trees to prevent damage from ice accumulation; Tornado: Provide information on the safest room in the house and when to seek shelter; Volcano: Provide information on how to keep the home airtight and avoid high risk areas; Wildfire: Creating defensible space.														

SECTION 23: MITIGATION ACTIONS

VILLAGE OF WILLIAMSBURG MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
2	Harden/retrofit critical facilities to hazard-resistant levels to include schools.	Village-wide	Reduce damages at critical facilities; Ensure continuity of critical services during and after event.	Structure and Infrastructure	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Cold, Extreme Heat, Flood, Hail, High Winds, Landslides and Rockfall, Land Subsidence, Lightning, Severe Winter Storm, Tornado, Volcano, Wildfire	Safety/Security	Y	H	\$500,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Village of Williamsburg Mayor	36-48 Months	Capital Improvement Plan	Protects infrastructure, reduces cost of reparation, and prevents injury to residents.
3	Develop a Master Drainage/Stormwater Management Plan.	Village-wide	Reduce damages at critical facilities; Ensure continuity of critical services during and after event.	Local Plans and Regulations	Flood	Water Systems	Y	H	\$200,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Village of Williamsburg Mayor	48 Months	Capital Improvement Plan	Protects infrastructure, reduces cost of reparation, and prevents injury to residents.

SECTION 23: MITIGATION ACTIONS

VILLAGE OF WILLIAMSBURG MITIGATION ACTIONS														
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Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
4	Implement a flood awareness program by providing FEMA / NFIP materials to mortgage lenders, real estate agents and insurance agents and place them in local libraries.	Village-wide	Reduce flood risk through education and awareness; Increase flood insurance coverage.	Education and Awareness	Flood	Communication	N/A	M	\$5,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Village of Williamsburg Mayor	12 Months	Floodplain Ordinance	Protects infrastructure, reduces cost of reparation, and prevents injury to residents.
5	Identify all dams in the County and ensure that each has a current EAP and condition status.	Village-wide	Reduce loss of life and property.	Local Plans and Regulations	Dam Failure	Safety/Security	Y	H	\$2,000,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Village of Williamsburg Mayor	18 Months	Emergency Management Action Plan	N/A

SECTION 23: MITIGATION ACTIONS

VILLAGE OF WILLIAMSBURG MITIGATION ACTIONS														
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Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
6	Coordinate with local dam owners and/or the state dam agency to assess and rehabilitate all high hazard potential dams (HHPD) with the ability to impact the village, implementing mitigation measures recommended in the assessment.	Village-wide	Reduce risk of damages to structures; Ensure continuity of critical services; Reduce risk of injury and fatalities to residents.	Local Plans and Regulations Structure and Infrastructure	Dam Failure	Water Systems	Y	H	\$2,000,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Village of Williamsburg Mayor	12 Months	Emergency Management Action Plan	N/A
7	Raise the level of identified High Hazard Dams to increase storage capacity and structural integrity.	Village-wide	Reduce risk of damages to structures; Ensure continuity of critical services.	Structure and Infrastructure	Dam Failure, Flood	Safety/Security, Water Systems	Y	M	\$1,000,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Village of Williamsburg Mayor	60 Months	Emergency Management Action Plan	Protects communities and reduces risk of flooding.

SECTION 23: MITIGATION ACTIONS

VILLAGE OF WILLIAMSBURG MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
8	Cut firebreaks into public wooded areas according to risk factors.	Village-wide	Reduce risk of wildfires and the spread of wildfire through targeted firebreaks.	Natural Systems Protection	Wildfire	Safety/Security	Y	M	\$500,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Village of Williamsburg Mayor	24 Months	Emergency Management Action Plan	N/A
9	Install a network of dry hydrants in stock ponds, creeks, and small lakes to increase the supply of water for fire protection.	Village-wide	Reduce risk of wildfires and the spread of wildfire by increasing water access and firefighting capabilities.	Structure and Infrastructure	Wildfire	Safety/Security	Y	M	\$500,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Village of Williamsburg Mayor	24-36 Months	Emergency Management Action Plan	N/A

SECTION 23: MITIGATION ACTIONS

VILLAGE OF WILLIAMSBURG MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
10	Restrict hillside development in wildfire areas; Implement density and setback requirements for structures located in wildfire hazard areas.	Village-wide	Reduce risk of wildfires and the spread of wildfire through improved development practices and building requirements/restrictions.	Local Plans and Regulations	Wildfire	Safety/Security	Y	H	\$5,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Village of Williamsburg Mayor	12 Months	Subdivision Regulations	N/A
11	Install fire danger rating/burn ban signs.	Village-wide	Reduce risk and spread of wildfires through education and awareness programs; Reduce risk of damages and injuries.	Education and Awareness	Wildfire	Communication	N/A	H	\$5,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Village of Williamsburg Mayor	12 Months	Emergency Management Action Plan	N/A

SECTION 23: MITIGATION ACTIONS

VILLAGE OF WILLIAMSBURG MITIGATION ACTIONS														
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Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
12	Upgrade undersized stormwater drains and culverts.	Village-wide	Reduce risk of flood damages through improved drainage capacity	Structure and Infrastructure	Flood	Safety/Security	Y	H	\$3,000,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Village of Williamsburg Mayor	48 Months	Emergency Management Action Plan	Protects communities and reduces risk of flooding.
14	Conduct public education program on fire risks and wildland fire mitigation, with the assistance of the New Mexico Energy, Minerals and Natural Resources Department (EMNRD) Forestry Division.	Village-wide	Reduce risk and spread of wildfires through education and awareness programs.	Education and Awareness	Wildfire	Communication	N/A	H	\$10,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Village of Williamsburg Mayor	12 Months	Emergency Management Action Plan	N/A

SECTION 23: MITIGATION ACTIONS

VILLAGE OF WILLIAMSBURG MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
15	Work with state and local agencies to determine locations to reduce fuel on public and private lands. Implement fuels reduction program.	Village-wide	Reduce risk of wildfires and the spread of wildfire through targeted fuels reduction programs.	Natural Systems Protection	Wildfire	Safety/Security	Y	M	\$500,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Village of Williamsburg Mayor	24 Months	Emergency Management Action Plan	N/A
16	Require standard tie-downs of propane tanks.	Village-wide	Reduce damages to structures and infrastructure.	Local Plans and Regulations	Dam Failure, Earthquake, Flood, High Winds, Tornado	Energy (Power/Fuel)	Y	M	\$5,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Village of Williamsburg Mayor	24 Months	Manufactured Home Restrictions	Promotes public safety.

SECTION 23: MITIGATION ACTIONS

VILLAGE OF WILLIAMSBURG MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
17	Create and Implement a program to initiate controlled burns of grasslands.	Village-wide	Reduce risk of damages and injuries due to wildfire events.	Structure and Infrastructure	Wildfire	Safety/Security	Y	M	\$50,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Village of Williamsburg Mayor	36 Months	Emergency Management Action Plan	N/A
18	Provide surge and lightning protection for computer-reliant critical facilities (e.g., Hall, 911 Center, EOC, Police and Fire stations, water / wastewater treatment plant, public works buildings, and schools).	Village-wide	Reduce damages at critical and public facilities.	Structure and Infrastructure	Lightning	Safety/Security	Y	M	\$50,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Village of Williamsburg Mayor	48 Months	Emergency Management Action Plan	N/A

SECTION 23: MITIGATION ACTIONS

VILLAGE OF WILLIAMSBURG MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
19	Provide lightning warning systems for community public outdoor spaces to include sports areas, pools, golf courses, and parks.	Village-wide	Reduce loss of life or property during lightning hazard events.	Structure and Infrastructure	Lightning	Safety/Security	Y	M	\$150,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Village of Williamsburg Mayor	48 Months	Emergency Management Action Plan	N/A
20	Identify public facilities that can function as heating and cooling shelters during extreme temperature events. Develop protocols to inform the public when shelters are available.	Village-wide	Promote hazard awareness and protect citizens from potential injuries and damages.	Education and Awareness Local Plans and Regulations	Extreme Cold, Extreme Heat	Communication, Food/Hydration/Shelter	N/A	M	\$3,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Village of Williamsburg Mayor	12-24 Months	Emergency Management Action Plan	N/A

SECTION 23: MITIGATION ACTIONS

VILLAGE OF WILLIAMSBURG MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
21	Adopt building codes to provide for greater structural resistance to wind.	Village-wide	Reduce damages to structures and infrastructure; Reduce risk of injuries or fatalities.	Local Plans and Regulations	High Winds, Tornado	Safety/Security	Y	M	\$5,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Village of Williamsburg Mayor	48 Months	Building Codes	N/A
22	Evaluate, upgrade and maintain community-wide outdoor omni-directional siren warning systems.	Village-wide	Reduce risk to citizens through improved communication and early warning.	Education and Awareness Preparedness/Response	Dam Failure, Earthquake, Extreme Cold, Extreme Heat, Flood, Hail, High Winds, Lightning, Severe Winter Storm, Tornado, Wildfire, Human-Caused Hazards	Communication	Y	M	\$175,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Village of Williamsburg Mayor	24 Months	Emergency Management Action Plan	Promotes public safety.

SECTION 23: MITIGATION ACTIONS

VILLAGE OF WILLIAMSBURG MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
23	Acquire and distribute NOAA weather radios for all critical facilities and the public.	Village-wide	Reduce risk to citizens through improved education.	Education and Awareness	Dam Failure, Drought, Earthquake, Extreme Cold, Extreme Heat, Flood, Hail, High Winds, Lightning, Severe Winter Storm, Tornado, Wildfire, Human-caused Hazards	Communication	Y	M	\$50,000	Local Budget; State Grants (OEM, ODAFF, ODOT, OWRB, OCC, ODWC); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Village of Williamsburg Mayor	12 Months	Emergency Management Action Plan	Promotes public safety.
24	Evaluate, upgrade and install flood gauges at low water crossings throughout the jurisdiction.	Village-wide	Reduce risk to citizens through improved communication and early warning.	Structure and Infrastructure	Flood	Safety/Security	Y	H	\$100,000	Local Budget; State Grants (OEM, ODAFF, ODOT, OWRB, OCC, ODWC); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Village of Williamsburg Mayor	24 Months	Emergency Management Action Plan	Promotes public safety.

SECTION 23: MITIGATION ACTIONS

VILLAGE OF WILLIAMSBURG MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
25	Educate community on the dangers of low water crossings through the installation of warning signs.	Village-wide	Reduce risk of injuries, fatalities and damages through education and awareness.	Education and Awareness	Flood	Communication	N/A	H	\$10,000	Local Budget; State Grants (OEM, ODAFF, ODOT, OWRB, OCC, ODWC); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Village of Williamsburg Mayor	12 Months	Floodplain Ordinance	Promotes public safety.
26	Create or Update, adopt, and enforce local ordinances relating to hazard events.	Village-wide*	Reduce loss of life and property.	Local Plans and Regulations	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Cold, Extreme Heat, Flood, Hail, High Winds, Landslides and Rockfall, Land Subsidence, Lightning, Severe Winter Storm, Tornado, Volcano, Wildfire	Communication	Y	H	\$5,000	Local Budget; State Grants (OEM, ODAFF, ODOT, OWRB, OCC, ODWC); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Village of Williamsburg Mayor	12 Months	N/A	Protects infrastructure, reduces cost of reparation, and prevents injury to residents.
* Priority ordinances include: Flood, Stormwater														

SECTION 23: MITIGATION ACTIONS

VILLAGE OF WILLIAMSBURG MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Plan Integration	NFIP
27	Create and implement a program for dam channel restoration.	Village-wide	Reduce risk of flood damages through improved drainage capacity/diversion.	Structure and Infrastructure	Dam Failure, Flood	Water Systems	Y	H	\$1,000,000	Local Budget; State Grants (OEM, ODAFF, ODOT, OWRB, OCC, ODWC); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Village of Williamsburg Mayor	24 Months	Emergency Management Action Plan	Protects communities and reduces risk of flooding.

SECTION 23: MITIGATION ACTIONS

CARRYOVER ACTIONS

CARRYOVER ACTIONS										
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>										
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline
Sierra County										
1	Conduct County-wide community outreach to promote participation in StormReady.	Countywide	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities, improve public outreach	Public Education and Awareness	Severe Storms	H	Staff Time	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Emergency Manager	Continuous
2	Conduct county-wide community outreach to promote participation in Firewise Communities Program.	Countywide	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities, improve public outreach	Public Education and Awareness	Wildfire	H	Staff Time	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Emergency Manager	Continuous

SECTION 23: MITIGATION ACTIONS

CARRYOVER ACTIONS										
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>										
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline
3	Construction or multi-hazard shelters with generators for the general public.	TBD	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities	Property Protection	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms	H	\$500,000 per facility	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Emergency Manager	As Required
4	Construction or multi-hazard shelters with generators for all school buildings.	Schools	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities	Property Protection	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms	H	\$500,000 per facility	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Emergency Manager	As Required

SECTION 23: MITIGATION ACTIONS

CARRYOVER ACTIONS										
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>										
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline
5	On-going operation of Mitigation Planning Committee	N/A	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities	Prevention	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms	H	Staff Time	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Emergency Manager	Continuous
6	Operation and management of Sierra County NFIP activities	N/A	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities	Prevention	Flood	H	Staff Time	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Flood Administrator	Continuous

SECTION 23: MITIGATION ACTIONS

CARRYOVER ACTIONS										
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>										
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline
7	Update of all FEMA FIRMs for populated areas of county.	TBD	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities	Prevention	Dam Failure, Flood	H	Staff Time, \$250,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Flood Administrator	36-60 Months
8	Adopt zoning restrictions in known hazard areas	Countywide	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities	Prevention	Dam Failure, Flood, Wildfire	H	Staff Time	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Emergency Manager	36-60 Months

SECTION 23: MITIGATION ACTIONS

CARRYOVER ACTIONS										
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>										
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline
9	Manage and maintain rural addressing program	Countywide	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities, improve public outreach	Emergency Services, Prevention	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms	H	Staff Time, \$5,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Emergency Manager, GIS Director	Ongoing
10	Digitize data on value, construction and age of buildings in the county to use for risk assessment analysis and zoning maps.	N/A	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities, improve public outreach	Prevention	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms	H	Staff Time, \$5,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Emergency Manager, GIS Director	Ongoing

SECTION 23: MITIGATION ACTIONS

CARRYOVER ACTIONS										
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>										
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline
11	Construct flood mitigation and control measures in the to mitigate against flooding.	Floodplain	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities	Natural Resource Protection, Structural	Dam Failure, Flood	H	Cost if project dependent	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Flood Administrator	36-60 Months
12	Acquire backup generators at critical facilities.	Critical Facilities	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities	Property Protection, Structural	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms	H	\$20,000 per generator	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Emergency Manager	36-60 Months

SECTION 23: MITIGATION ACTIONS

CARRYOVER ACTIONS										
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Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline
13	Purchase fire equipment to augment wildfire response capabilities.	N/A	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities	Emergency Services, Prevention	Drought, Wildfire	H	Equipment Dependent	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Emergency Manager, Fire Chief	36-60 Months
14	Update Community Wildfire Protection Plan	N/A	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities, improve public outreach and enhance communication and coordination	Prevention	Wildfire	H	Staff Time, \$40,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Emergency Manager, Fire Chief	36-60 Months

SECTION 23: MITIGATION ACTIONS

CARRYOVER ACTIONS										
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>										
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline
15	Purchase and install a video surveillance system/security system in all schools.	Schools	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities	Prevention, Property Protection	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms	H	\$100,000 each	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Superintendent	36-60 Months
16	Fund paid positions for first responders in communities in need	TBD	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities	Emergency Services, Prevention	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms	M	\$60,000 per position	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	County Commission	36-60 Months

SECTION 23: MITIGATION ACTIONS

CARRYOVER ACTIONS										
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>										
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline
17	Reduce fuel loads and create defensible spaces near all critical facilities and residential areas	TBD	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities	Natural Resource Protection, Property Protection	Wildfire	M	\$15,000 per site	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Fire Chief(s)	Continuous
18	Inventory all fire suppression resources, personnel, and water facilities	Countywide	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities	Emergency Services, Natural Resource Protection, Prevention	Wildfire	M	Staff Time	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Fire Chief(s)	Continuous

SECTION 23: MITIGATION ACTIONS

CARRYOVER ACTIONS										
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>										
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline
19	Educate residents about driving in winter storms and handling winter-related health effects.	Countywide	Improve public outreach to include education, awareness and partnerships	Public Education and Awareness	Winter Storm	M	Staff Time, \$20,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Emergency Manager	Continuous
20	Purchase emergency generators and/or transfer switches to provide backup power for all school buildings and supporting facilities.	Schools	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities	Structural	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms	M	\$50,000 each	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Superintendent	36-60 Months

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CARRYOVER ACTIONS										
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>										
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline
21	Educate residents about water usage and smart practices during times of drought.	Countywide	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities	Public Education and Awareness	Drought	L	Staff Time, \$10,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Emergency Manager	Continuous
22	Purchase and install an audio emergency communication system in all schools.	Schools	Improve public outreach to include education , awareness and partnerships	Prevention	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms	L	\$30,000 each	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Superintendent	36-60 Months

SECTION 23: MITIGATION ACTIONS

CARRYOVER ACTIONS										
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>										
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline
23	Create, adopt and enforce a water conservation ordinance	Countywide	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities	Prevention	Drought	H	Staff Time	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Emergency Manager	36-60 Months
City of Elephant Butte										
1	Conduct jurisdiction-wide community outreach to promote participation in StormReady.	City of Elephant Butte	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities, improve public outreach	Public Education and Awareness	Severe Storms	H	Staff Time	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Emergency Manager	Continuous

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CARRYOVER ACTIONS										
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>										
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline
2	Construction or multi-hazard shelters with generators for the general public.	TBD	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities	Property Protection, Structural	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms	H	\$10,000 per facility	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Emergency Manager	As required
3	Construct flood mitigation and control measures to mitigate against flooding.	TBD	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities	Natural Resource Protection, Structural	Dam Failure, Flood	H	Cost is project dependent	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Flood Administrator	36-60 Months

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CARRYOVER ACTIONS										
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>										
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline
4	Acquire backup generators at critical facilities.	Critical Facilities	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities	Structural	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms	H	\$20,000 per generator	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Board of Trustees	36-60 Months
5	Update of all FEMA FIRMs.	N/A	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities	Prevention	Dam Failure, Flood	H	Staff Time around \$250,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Flood Administrator	36-60 Months

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CARRYOVER ACTIONS										
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>										
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline
6	Create, adopt and enforce a water conservation ordinance.	City of Elephant Butte	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities	Natural Resource Protection, Prevention	Drought	H	Staff Time	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Board of Trustees	36-60 Months
7	Deliver public awareness classes, in conjunction with state and local experts, on water conservation for homeowners, businesses, and industry.	TBD	Improve public outreach to include education, awareness and partnerships and enhance communications and coordination	Public Education and Awareness	Drought	M	\$30,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Board of Trustees	Yearly

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CARRYOVER ACTIONS										
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>										
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline
City of Truth or Consequences										
1	Conduct jurisdiction-wide community outreach to promote participation in StormReady.	City of Truth or Consequences	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities, improve public outreach	Public Education and Awareness	Severe Storms	H	Staff Time	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Emergency Manager	Continuous
2	Construction or multi-hazard shelters with generators for the general public.	TBD	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities	Property Protection, Structural	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms	H	\$10,000 per facility	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Emergency Manager	As Required

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CARRYOVER ACTIONS										
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>										
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline
3	Provide a continuous active member for the Mitigation Planning Committee to provide jurisdictional input.	N/A	Enhance communication and coordination	Prevention	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms	H	Staff Time	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Board of Trustees	Continuous
4	Operation and management of jurisdictional NFIP activities.	Floodplain	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities	Prevention	Dam Failure, Flood	H	Staff Time	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Floodplain Administrator	Continuous

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CARRYOVER ACTIONS										
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>										
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline
5	Adopt zoning restrictions in known hazard areas.	City of Truth or Consequences	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities	Prevention	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms	H	Staff Time	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Board of Trustees	36-60 Months
6	Construct flood mitigation and control measures to mitigate against flooding.	TBD	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities	Natural Resource Protection, Structural	Dam Failure, Flood	H	Cost is project dependent	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Floodplain Administrator	36-60 Months

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CARRYOVER ACTIONS										
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>										
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline
7	Acquire backup generators at critical facilities.	Critical Facilities	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities	Structural	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms	H	\$20,000 per generator	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Board of Trustees	36-60 Months
8	Update of all FEMA FIRMs.	N/A	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities	Prevention	Dam Failure, Flood	H	Staff Time around \$250,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Flood Administrator	36-60 Months

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<i>*Reduces risk to new and/or existing buildings and infrastructure</i>										
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline
9	Fund paid positions for first responders in communities in need.	TBD	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities	Emergency Services	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms	M	\$60,000 per position	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Board of Trustees	Yearly
10	Create, adopt and enforce a water conservation ordinance.	City of Truth or Consequences	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities	Natural Resource Protection, Prevention	Drought	H	Staff Time	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Board of Trustees	36-60 Months

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CARRYOVER ACTIONS										
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>										
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline
11	Deliver public awareness classes, in conjunction with state and local experts, on water conservation for homeowners, businesses, and industry.	TBD	Improve public outreach to include education, awareness and partnerships and enhance communications and coordination	Public Education and Awareness	Drought	M	\$30,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Board of Trustees	Yearly
Village of Williamsburg										
1	Conduct jurisdiction-wide community outreach to promote participation in StormReady.	Village-wide	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities, improve public outreach	Public Education and Awareness	Severe Storms	H	Staff Time	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Emergency Manager	Continuous

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CARRYOVER ACTIONS										
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>										
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline
2	Operation and management of jurisdictional NFIP activities.	Floodplain	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities	Prevention	Dam Failure, Flood	H	Staff Time	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Floodplain Administrator	Continuous
3	Construct flood mitigation and control measures to mitigate against flooding.	TBD	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities	Natural Resource Protection, Structural	Dam Failure, Flood	H	Cost is project dependent	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Flood Administrator	36-60 Months

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CARRYOVER ACTIONS										
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>										
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline
4	Acquire backup generators at critical facilities.	Critical Facilities	Reduce Risk to people and property, protect vulnerable populations, structures and critical facilities	Structural	Dam Failure, Flood, Severe Storms, Wildfire, Winter Storms	H	\$20,000 per generator	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Board of Trustees	36-60 Months
5	Deliver public awareness classes, in conjunction with state and local experts, on water conservation for homeowners, businesses, and industry	TBD	Improve public outreach to include education, awareness and partnerships and enhance communications and coordination	Public Education and Awareness	Drought	M	\$30,000	Local Budget; State Grants (DHSEM, NMED, EDD, ORD, NMFA, OSE, NMDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Board of Trustees	Yearly



Section 24

Plan Maintenance

SECTION 24: PLAN MAINTENANCE

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Continued Public Involvement	6

PLAN MAINTENANCE PROCEDURES

The following is an explanation of how the participating jurisdictions within Sierra County, and the general public will be involved in implementing, evaluating, and enhancing the Plan over time. When the Plan is discussed in all maintenance procedures, it includes mitigation actions and hazard assessments. The sustained hazard mitigation planning process consists of four main parts:

- Incorporation
- Monitoring and Evaluation
- Updating
- Continued Public Involvement

INCORPORATION

Participating jurisdictions within Sierra County will be responsible for further development and implementation of mitigation actions. Each action has been assigned to a specific department within the participating jurisdictions. The following describes the process by which participating jurisdictions will incorporate elements of the mitigation plan into other planning mechanisms.

PROCESS OF INCORPORATION

Once the Plan Update is adopted, participating jurisdictions within Sierra County will implement actions based on priority and the availability of funding. The planning area currently implements policies and programs to reduce loss of life and property from hazards. The mitigation actions developed for this Plan Update enhance this ongoing effort and will be implemented through other program mechanisms where possible.

The potential funding sources listed for each identified action may be used when the jurisdiction seeks funds to implement actions. An implementation time period or a specific implementation date has been assigned to each action as an incentive for completing each task and gauging whether actions are implemented in a timely manner.

Participating jurisdictions within Sierra County will integrate implementation of their mitigation actions with other plans and policies, such as construction standards and emergency management plans, and ensure that these actions, or proposed projects, are reflected in other

SECTION 24: PLAN MAINTENANCE

planning efforts. Coordinating and integrating components of other plans and policies into the goals and objectives of the Plan Update will further maximize funding and provide possible cost-sharing of key projects, thereby reducing loss of lives and property and mitigating hazards affecting the area.

Upon formal adoption of the Plan Update, Planning Team members from each participating jurisdiction will work to integrate the hazard mitigation strategies into other plans and codes as they are developed. Participating team members will conduct periodic reviews of plans and policies, once per year at a minimum, and analyze the need for revisions in light of the approved Plan. The Planning Team will review all Comprehensive Land Use Plans (applicable jurisdictions only), Capital Improvement Plans (applicable jurisdictions only), annual budget reviews, Emergency Operations or Management Plans (applicable jurisdictions only), and Transportation Plans (applicable jurisdictions only) to guide and control development. Participating jurisdictions will ensure that capital improvement planning (applicable jurisdictions only) in the future will also contribute to the goals of this Hazard Mitigation Plan Update to reduce the long-term risk to life and property from all hazards. Within one year of formal adoption of the Hazard Mitigation Plan Update, existing planning mechanisms will be reviewed by each jurisdiction.

Sierra County is committed to supporting the participating jurisdictions as they implement their mitigation actions. Planning Team members will review and revise, as necessary, the long-range goals and objectives in strategic plan and budgets to ensure that they are consistent with this Hazard Mitigation Action Plan Update. Additionally, the planning area will work to advance the goals of this Hazard Mitigation Plan through its routine, ongoing, long-range planning, budgeting, and work processes.

Table 24-1 identifies types of planning mechanisms and examples of methods for incorporating the Plan Update into other planning efforts. The team members, listed in Table 24-2 below, will be responsible for the review of these planning mechanisms and their incorporation of the Plan, with the exception of the Floodplain Management Plans; the jurisdictions who have a Floodplain Administrator on staff will be responsible for incorporating the plan when Floodplain Management Plans are updated or new plans are developed.

Table 24-1. Methods of Incorporation of the Plan

PLANNING MECHANISM	DEPARTMENT / TITLE RESPONSIBLE	INCORPORATION OF PLAN
Annual Budget Reviews	Sierra County – Emergency Management: Emergency Services Administrator City of Elephant Butte – Fire: Fire Chief City of Truth or Consequences – Police: Chief of Police Village of Williamsburg – Administration: Village Clerk	Various departments and key personnel that participated in the planning process will review the Plan and mitigation actions therein when conducting their annual budget review. Allowances will be made in accordance with grant applications sought, and mitigation actions that will be undertaken, according to the implementation schedule of the specific action.

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PLANNING MECHANISM	DEPARTMENT / TITLE RESPONSIBLE	INCORPORATION OF PLAN
Capital Improvement Plans	Sierra County – Emergency Management: Emergency Services Administrator City of Elephant Butte – Fire: Fire Chief Village of Williamsburg – Administration: Village Clerk	Several participating jurisdictions within Sierra County have a Capital Improvement Plan (CIP) in place or under development. Prior to any revisions to the CIP, County, City, and Village departments will review the risk assessment and mitigation strategy sections of the HMAP, as limiting public spending in hazardous zones is one of the most effective long-term mitigation actions available to local governments.
Comprehensive Plans	Sierra County – Emergency Management: Emergency Services Administrator City of Elephant Butte – Fire: Fire Chief	Several participating jurisdictions within Sierra County have a Comprehensive Land Use Plan in place or under development. Since Comprehensive Plans involve developing a unified vision for a community, the mitigation vision and goals of the Plan will be reviewed in the development or revision of a Comprehensive Plan.
Community Wildfire Protection Plans	Sierra County – Emergency Management: Emergency Services Administrator City of Elephant Butte – Fire: Fire Chief City of Truth or Consequences – Police: Chief of Police Village of Williamsburg – Administration: Village Clerk	Community Wildfire Protection Plans (CWPPs) include preventative and corrective actions to address a community's risk of damage from wildfire. Information found in Section 20 of this Plan Update discussing the people and property at risk to wildfire will be reviewed and revised when the County, City, and/or Village updates their CWPP.
Floodplain Management Plans	Sierra County – Floodplain Administrator City of Elephant Butte – Floodplain Administrator City of Truth or Consequences – Floodplain Administrator Village of Williamsburg – Floodplain Administrator	Floodplain Management Plans include preventative and corrective actions to address the flood hazard. Therefore, the actions for flooding and information found in Section 11 of this Plan Update discussing the people and property at risk to flood will be reviewed and revised when participating jurisdictions within Sierra County update their Floodplain Management Plan or develop new plans.

SECTION 24: PLAN MAINTENANCE

PLANNING MECHANISM	DEPARTMENT / TITLE RESPONSIBLE	INCORPORATION OF PLAN
Grant Applications	Sierra County – Emergency Management: Emergency Services Administrator City of Elephant Butte – Fire: Fire Chief City of Truth or Consequences – Police: Chief of Police Village of Williamsburg – Administration: Village Clerk	The HMAP will be evaluated by participating jurisdictions within Sierra County when grant funding is sought for mitigation projects. If a project is not in the Plan Update, a Plan Revision may be necessary to include the action in the Plan.
Regulatory Plans	Sierra County – Emergency Management: Emergency Services Administrator City of Elephant Butte – Fire: Fire Chief Village of Williamsburg – Administration: Village Clerk	Currently, several jurisdictions within Sierra County have regulatory plans in place or under development, such as Emergency Management Action Plans, Continuity of Operations Plans, and/or Land Use Plans. The Plan Update will be consulted when County, City, and/or Village departments review or revise their current regulatory planning mechanisms, or in the development of regulatory plans that are not currently in place.

MONITORING AND EVALUATION

Periodic revisions of the Plan are required to ensure that goals, objectives, and mitigation actions are kept current. When the Plan is discussed in these sections, it includes the risk assessment and mitigation actions as a part of the monitoring, evaluating, updating, and review process. Revisions may be required to ensure the Plan is in compliance with federal and state statutes and regulations. This section outlines the procedures for completing Plan revisions, updates, and reviews. Table 24-2 indicates the department and title of the party responsible for monitoring, evaluating, updating, and reviewing the Plan.

Table 24-2. Team Members Responsible for Monitoring, Evaluating, Updating, and Reviewing the Plan

ORGANIZATION / DEPARTMENT	TITLE
Sierra County – Emergency Management	Emergency Services Administrator
City of Elephant Butte – Fire	Fire Chief
City of Truth or Consequences – Police	Chief of Police
Village of Williamsburg – Local Government	Mayor

MONITORING

Designated Planning Team members are responsible for monitoring, evaluating, updating, and reviewing the Plan, as shown in Table 24-2. Individuals holding the title listed in Table 24-2 will be responsible for monitoring the Plan on an annual basis. Plan monitoring includes reviewing

SECTION 24: PLAN MAINTENANCE

and incorporating into the Plan other existing planning mechanisms that relate or support goals and objectives of the Plan; monitoring the incorporation of the Plan into future updates of other existing planning mechanisms as appropriate; reviewing mitigation actions submitted and coordinating with various County, City, and Village departments to determine if mitigation actions need to be re-evaluated and updated; evaluating and updating the Plan as necessary; and monitoring plan maintenance to ensure that the process described is being followed, on an annual basis, throughout the planning process. The Planning Team will develop a brief report that identifies policies and actions in the plan that have been successfully implemented and any changes in the implementation process needed for continued success. A summary of meeting notes will report the particulars involved in developing an action into a project. In addition to the annual monitoring, the Plan will be similarly reviewed immediately after extreme weather events, including but not limited to state and federally declared disasters.

EVALUATION

As part of the evaluation process, the Planning Team will assess changes in risk; determine whether the implementation of mitigation actions is on schedule; determine whether there are any implementation problems, such as technical, political, legal, or coordination issues; and identify changes in land development or programs that affect mitigation priorities for each respective department or organization.

The Planning Team will meet on an annual basis to evaluate the Plan, identify any needed changes, and assess the effectiveness of the Plan in achieving its stated purpose and goals. The team will evaluate the number of mitigation actions implemented along with the loss reduction associated with each action. Actions that have not been implemented will be evaluated to determine if any social, political, or financial barriers are impeding implementation and if any changes are necessary to improve the viability of an action. The team will evaluate changes in land development and/or programs that affect mitigation priorities in their respective jurisdictions. The annual evaluation process will help to determine if any changes are necessary. In addition, the Plan will be similarly evaluated immediately after extreme weather events, including but not limited to state and federally declared disasters.

UPDATING

PLAN REVISIONS

At any time, minor technical changes may be made to update the Sierra County Hazard Mitigation Action Plan Update 2026. Material changes to mitigation actions or major changes in the overall direction of the Plan or the policies contained within it must be subject to formal adoption by the participating jurisdictions.

The participating jurisdictions within Sierra County will review proposed revisions and vote to accept, reject, or amend the proposed change. Upon ratification, the Revision will be transmitted to the New Mexico Department of Homeland Security and Emergency Management (NM DHSEM).

In determining whether to recommend approval or denial of a Plan Revision request, participating jurisdictions will consider the following factors:

- Errors or omissions made in the identification of issues or needs during the preparation of the Plan Update;

SECTION 24: PLAN MAINTENANCE

- New issues or needs that were not adequately addressed in the Plan Update; and
- Changes in information, data, or assumptions from those on which the Plan Update was based.

FIVE (5) YEAR REVIEW

The Plan will be thoroughly reviewed by the Planning Team at the end of three years from the approval date to determine whether there have been significant changes in the planning area that necessitate changes in the types of mitigation actions proposed. Factors that may affect the content of the Plan include new development in identified hazard areas, increased exposure to hazards, disaster declarations, increase or decrease in capability to address hazards, and changes to federal or state legislation.

The Plan review process provides the participating jurisdictions within Sierra County an opportunity to evaluate mitigation actions that have been successful, identify losses avoided due to the implementation of specific mitigation measures, and address mitigation actions that may not have been successfully implemented as assigned.

It is recommended that the full Executive and Advisory Planning Team (Section 2, Tables 2-1 and 2-2) meet to review the Plan at the end of three years because grant funds may be necessary for the development of a five-year update. Reviewing planning grant options in advance of the five-year Plan update deadline is recommended considering the timelines for grant and planning cycles can be in excess of a year.

Following the Plan review, any revisions deemed necessary will be summarized and implemented according to the reporting procedures and Plan Revision process outlined herein. Upon completion of the review, update, and revision process the revised Plan will be submitted to NM DHSEM for final review and approval in coordination with FEMA.

CONTINUED PUBLIC INVOLVEMENT

Public input was an integral part of the preparation of this Plan and will continue to be essential for Plan updates. The public will be directly involved in the annual evaluation, monitoring, reviews, and cyclical updates. Changes or suggestions to improve or update the Plan will provide opportunities for additional public input.

The public can review the Plan on the participating jurisdictions' websites, where officials and the public are invited to provide ongoing feedback, via email.

The Planning Team may also designate voluntary citizens from the planning area or willing stakeholder members from the private sector businesses that were involved in the Plan's development to provide feedback on an annual basis. It is important that stakeholders and the immediate community maintain a vested interest in preserving the functionality of the planning area as it pertains to the overall goals of the mitigation plan. The Planning Team is responsible for notifying stakeholders and community members on an annual basis and maintaining the Plan.

Media, including local newspapers and radio stations, will be used to notify the public of any maintenance or periodic review activities during the implementation, monitoring, and evaluation phases. Additionally, local news media will be contacted to cover information regarding Plan updates, the status of grant applications, and project implementation. Local and social media outlets will keep the public and stakeholders apprised of potential opportunities to fund and implement mitigation projects identified in the Plan.

Appendix A

Human-Caused Hazards



APPENDIX A: HUMAN-CAUSED HAZARDS

Appendix A is **For Official Use Only (FOUO)** and may be exempt from public release under the Freedom of Information Act (FOIA).



Appendix B

Planning Team



APPENDIX B: PLANNING TEAM

Planning Team Members	1
Stakeholders	2

PLANNING TEAM MEMBERS

The Sierra County Hazard Mitigation Action Plan Update 2026 was organized using a direct representative model. An Executive Planning Team from the participating jurisdictions, shown in Table B-1, was formed to coordinate planning efforts and request input and participation in the planning process. Table B-2 reflects the Advisory Planning Team, consisting of area organizations and departments that participated throughout the planning process. All Executive and Advisory Planning Team members are involved in hazard mitigation activities; those with the authority to regulate development are identified within Tables B-1 and B-2 with an (R) after their title. Table B-3 is comprised of stakeholders who were invited to provide Plan Update input. Table B-4 reflects a list of the representatives for the High Hazard Potential Dams (HHPDs) in the planning area. Public outreach efforts and meeting documentation is provided in Appendix F.

Table B-1. Executive Planning Team

ORGANIZATION / DEPARTMENT	TITLE
Sierra County – Emergency Management	Emergency Services Administrator
City of Elephant Butte – Fire	Fire Chief
City of Truth or Consequences – Police	Chief of Police
Village of Williamsburg – Local Government	Mayor (R)

Table B-2. Advisory Planning Team

ORGANIZATION / DEPARTMENT	TITLE
Sierra County – Administration	County Clerk (R)
Sierra County – Administration	County Manager
Sierra County – Emergency Management	Deputy Emergency Services Administrator
Sierra County – Flood Commission	Commissioner (R)
Sierra County – Local Government	Chairman (R)
Sierra County – Local Government	Commissioner (R)
Sierra County – Local Government	Vice-Chair (R)
Sierra County – GIS	GIS Coordinator
Sierra County – Regional Dispatch Authority	911 Director
Sierra County – Roads	Director

APPENDIX B: PLANNING TEAM

ORGANIZATION / DEPARTMENT	TITLE
Sierra County – Sheriff	Sheriff (R)
City of Elephant Butte – Administration	City Clerk (R)
City of Elephant Butte – Administration	City Manager
City of Elephant Butte – Fire	Administrative Assistant
City of Elephant Butte – Local Government	Board of Directors – City Council Representative (R)
City of Elephant Butte – Local Government	Mayor (R)
City of Elephant Butte – Public Works	Field Operations Supervisor
City of Truth or Consequences – Administration	City Clerk (R)
City of Truth or Consequences – Administration	City Manager
City of Truth or Consequences – Administration	Executive Assistant to the City Manager
City of Truth or Consequences – Community Development	Director
City of Truth or Consequences – Facility Management	Supervisor
City of Truth or Consequences – Fire	Fire Chief
City of Truth or Consequences – Service Center	Director
City of Truth or Consequences – Streets	Manager
City of Truth or Consequences – Streets	Supervisor
City of Truth or Consequences – Utilities	Electric Department Director
Village of Williamsburg – Administration	Village Clerk (R)

STAKEHOLDERS

The following groups listed in Table B-3 represent a list of organizations invited to stakeholder meetings, public meetings, and workshops throughout the planning process and include members of community groups, non-profit organizations, private businesses, utility providers, neighboring counties, schools, state and federal agencies. Those that participated in the public meetings are identified with a plus symbol (+) next to their stakeholder type. The public was also invited to participate via e-mail throughout the planning process. Many of the invited organizations and

APPENDIX B: PLANNING TEAM

stakeholders participated and were integral to providing comments and data for the Plan. For a list of attendees at meetings, please see Appendix F.¹

Table B-3. Stakeholders

AGENCY	TITLE	STAKEHOLDER TYPE
American Red Cross	Area Representative	Non-Profit / Community Organization / Regional Agency
American Red Cross	Community Disaster Program Manager	Non-Profit / Community Organization / Regional Agency
American Red Cross	Senior Disaster Program Manager	Non-Profit / Community Organization / Regional Agency
Arrey Elementary Schools	Principal	Academia
Arrey Elementary Schools	Schools Coordinator	Academia
Catron County	Emergency Manager	Neighboring Jurisdiction
Columbus Electric Cooperative	Executive Vice President / General Manager	Utility Provider
Copper Flat Corporation THEMAC	Senior Vice President of Project Development	Private Organization
Dona Ana County	Emergency Manager	Neighboring Jurisdiction
Environmental Protection Agency (EPA), Region 6	Director of Emergency Management Division	Federal Agency
Federal Emergency Management Agency (FEMA)	Hazard Mitigation Branch Director	Federal Agency
Forest Stewards Guild	Forest Health Specialist	State Agency
Garfield Mutual Water Systems	Supervisor	Utility Provider
Gila Landscape Collaborative	Director	State Agency
Grant County	Emergency Manager	Neighboring Jurisdiction
Habitat for Humanity	Executive Director	Non-Profit / Community Organization / Regional Agency
Lincoln County	Chief Procurement Officer	Neighboring Jurisdiction
Lincoln County	County Sheriff	Neighboring Jurisdiction

¹ Information contained in Appendix F is exempt from public release under the Freedom of Information Act (FOIA).

APPENDIX B: PLANNING TEAM

AGENCY	TITLE	STAKEHOLDER TYPE
Luna County	Emergency Manager	Neighboring Jurisdiction
Matthew 25 Food Pantry	General Representative	Non-Profit / Community Organization / Regional Agency
National Oceanic and Atmospheric Administration (NOAA)	Western Regional Contact	Federal Agency
National Weather Service (NWS)	General Representative	Federal Agency
New Mexico Acequia Association	Executive Director	State Agency
New Mexico Aging and Long-Term Services	Cabinet Secretary	State Agency
New Mexico Bureau of Land Management	District Fire Management Officer	State Agency
New Mexico Bureau of Land Management	Fuels Specialist	State Agency
New Mexico Bureau of Minerals and Geology	Director and State Geologist	State Agency
New Mexico Cattle Growers Association	President	State Agency
New Mexico Department of African American Affairs	Communications and Marketing Coordinator	State Agency
New Mexico Department of African American Affairs	Deputy Director	State Agency
New Mexico Department of Agriculture	Biosecurity Program Specialist	State Agency
New Mexico Department of Agriculture	Director	State Agency
New Mexico Department of Agriculture	Southwest Board and Emergency Preparedness Director	State Agency
New Mexico Department of Energy, Minerals, and Natural Resources	Communications Coordinator	State Agency
New Mexico Department of Energy, Minerals, and Natural Resources	Pancho Villa State Park Manager	State Agency (+)
New Mexico Department of Health	Communications Coordinator	State Agency

APPENDIX B: PLANNING TEAM

AGENCY	TITLE	STAKEHOLDER TYPE
New Mexico Department of Health	Emergency Manager	State Agency
New Mexico Department of Health	Preparedness and Response Section Manager	State Agency
New Mexico Department of Health	Public Information Officer (PIO)	State Agency
New Mexico Department of Homeland Security and Emergency Management (NM DHSEM)	Mitigation Specialist	State Agency (+)
New Mexico Department of Homeland Security and Emergency Management (NM DHSEM)	Response, Recovery, and Mitigation Bureau Chief	State Agency
New Mexico Department of Indian Affairs	Cabinet Secretary	State Agency
New Mexico Department of Transportation, NMDOT-D1	Public Information Officer (PIO)	State Agency
New Mexico Department of Transportation, NMDOT-D1	Supervisor	State Agency
New Mexico Drought Task Force	Water Use & Conservation Department Representative	State Agency
New Mexico Environmental Department	Environmental Specialist	State Agency
New Mexico Environmental Department	Incident Response Coordinator	State Agency
New Mexico Gas Company	Operations Manager	Utility Provider (+)
New Mexico Gas Company	Operations Supervisor	Utility Provider (+)
New Mexico Gas Company	Safety Auditor	Utility Provider (+)
New Mexico Livestock Bureau	Deputy Director	State Agency
New Mexico Office of the State Engineer – Dam Safety	Bureau Chief	State Agency
New Mexico Office of the State Engineer – Dam Safety	Public Information Officer (PIO)	State Agency
New Mexico State Parks	Superintendent	State Agency
New Mexico Water	Operations Manager	Utility Provider (+)
New Mexico Water and Wastewater Association	Executive Manager	State Agency

APPENDIX B: PLANNING TEAM

AGENCY	TITLE	STAKEHOLDER TYPE
Otero County	County Manager	Neighboring Jurisdiction
Public Service Company of New Mexico (PNM)	Community Manager	Utility Provider
Roadrunner Food Bank	General Representative	Non-Profit / Community Organization / Regional Agency
Sierra County Arroyo Flood Control District	Chairman	Utility Provider
Sierra Electric Cooperative	Line Superintendent	Utility Provider
Sierra Soil and Water Conservation District	Natural Resource Director	Utility Provider (+)
Sierra Vista Emergency Medical Services	Emergency Medical Services (EMS) Administrative Supervisor	Healthcare Agency
Sierra Vista Emergency Medical Services	Emergency Medical Services (EMS) Director / Emergency Management	Healthcare Agency
Sierra Vista Hospital and Clinics	Marketing / Public Relations / Procurement	Healthcare Agency
Socorro County	Emergency Manager	Neighboring Jurisdiction
Synergy	Director of Planning	State Agency
Truth or Consequences Library	Library Director	Community Organization
Truth or Consequences Municipal Airport	Airport Manager	Regional and Local Agency
Truth or Consequences Municipal Schools	Chief Finance and Operations Officer	Academia
Truth or Consequences Municipal Schools	Safety & Security Director	Academia
Truth or Consequences Municipal Schools	Superintendent	Academia
United Way of Southwest New Mexico	Community Engagement Specialist	Non-Profit / Community Organization / Regional Agency
United Way of Southwest New Mexico	County Representative	Non-Profit / Community Organization / Regional Agency
United Way of Southwest New Mexico	Grant Coordinator	Non-Profit / Community Organization / Regional Agency

APPENDIX B: PLANNING TEAM

AGENCY	TITLE	STAKEHOLDER TYPE
United States Army Corps of Engineers	Engineer	Federal Agency
United State Army Corps of Engineers	Southwest Region – Emergency Management	Federal Agency
United States Bureau of Reclamation	Facility Manager – Elephant Butte Dam	Federal Agency
United States Fish & Wildlife	Southwest Region Representative	Federal Agency
United States Forest Service	District Ranger	Federal Agency (+)
United States Forest Service	Public Affairs Officer	Federal Agency
United States Department of Agriculture (USDA) / Rural Partners Network	Community Liaison	Federal Agency

HHPD CONSIDERATIONS

The county and participating jurisdictions are encouraged to collaborate with local, private, state, and federal dam owners throughout the planning process to maintain the safety of high-hazard potential dams. Table B-4 below reflects a list of the High Hazard Potential Dams (HHPDs) in the planning area. Please refer to Section 5 for a detailed risk assessment pertaining to all dams within the planning area, including HHPDs.

Table B-4. Sierra County High Hazard Potential Dams

DAM NAME	RESPONSIBLE ENTITY
Caballo Arroyo Dam No. 1	Local Government
County Line Detention Dam	Local Government
Green Canyon Dam	Local Government
Marie Street Dam	Local Government
Sibley Green Site 4	Local Government
Sibley Green Site 5	Local Government
St. Anne's Dam	Local Government
T Or C Site 8c Dam	Local Government



Appendix C

Public Survey Results

APPENDIX C: PUBLIC SURVEY RESULTS

Overview.....	1
Public Survey Results	2

OVERVIEW

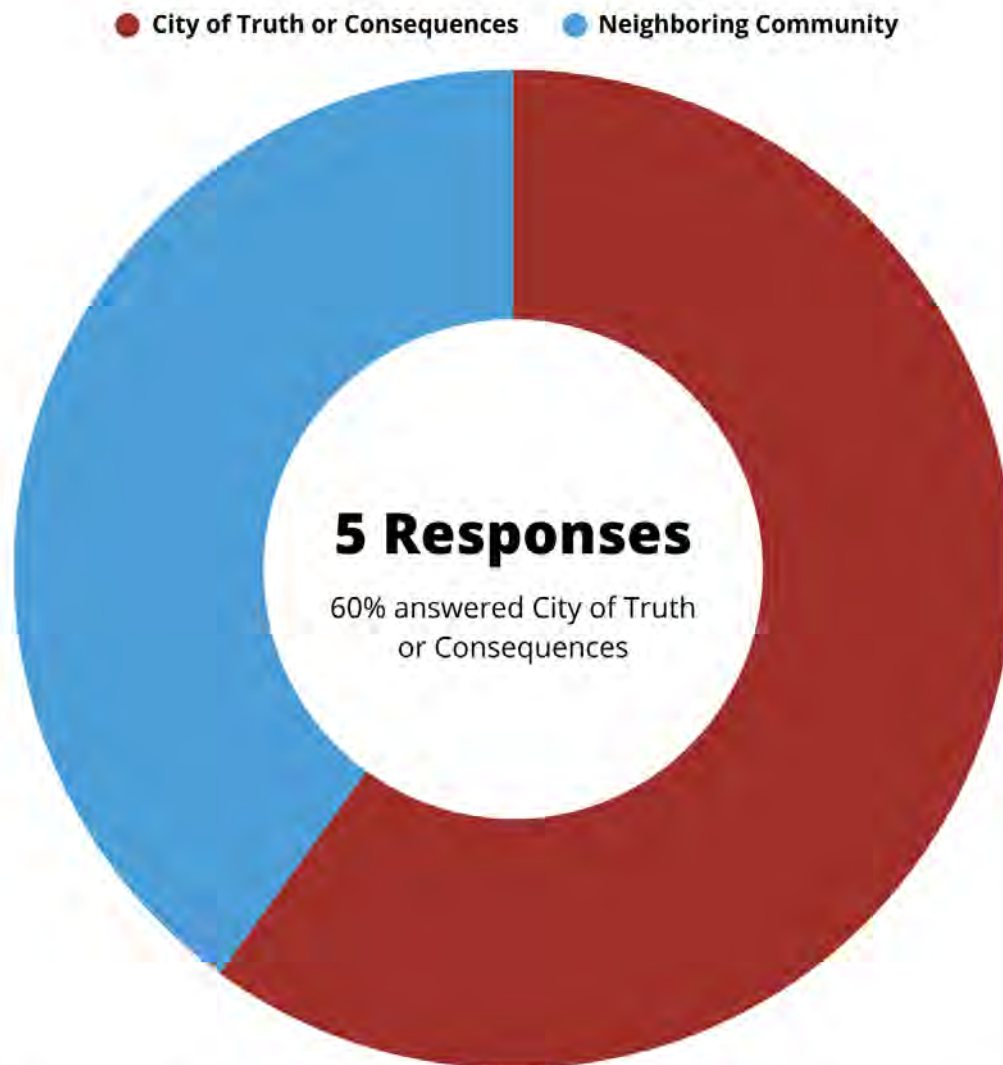
Sierra County prepared a public survey that requested public opinion on a wide range of questions relating to natural hazards. The survey was made available via the participating jurisdictions' websites. The survey link was also distributed at public meetings and stakeholder events throughout the planning process.

A total of 5 surveys were collected, and the results are presented in this appendix. The purpose of the survey was twofold: 1) to solicit public input during the planning process, and 2) to help the jurisdictions identify any potential mitigation actions or problem areas.

All public survey results were discussed and shared with the Planning Team during the Mitigation Strategy Workshop. These results are also provided below. The survey results provide information regarding the public's experience with natural hazards, their perceived hazards of concern, recommended mitigation actions, and additional valuable insights. Overall, the survey enhances the mitigation planning process by ensuring the Plan Update properly represents the community, is informed through local knowledge, and promotes equity.

APPENDIX C: PUBLIC SURVEY RESULTS

PUBLIC SURVEY RESULTS



Survey responses were not provided from the other participating jurisdictions. Some respondents were in neighboring counties, and due to their proximity to the planning area, their responses were included in the survey results. Responses were received from Grant County.

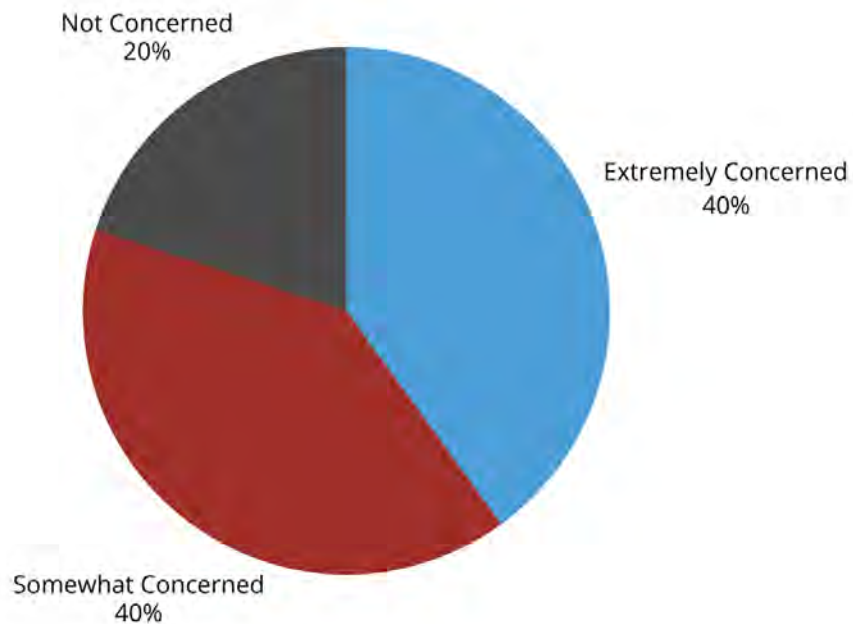
APPENDIX C: PUBLIC SURVEY RESULTS

Have you ever experienced or been impacted by a disaster?

40% Responded 'Yes'

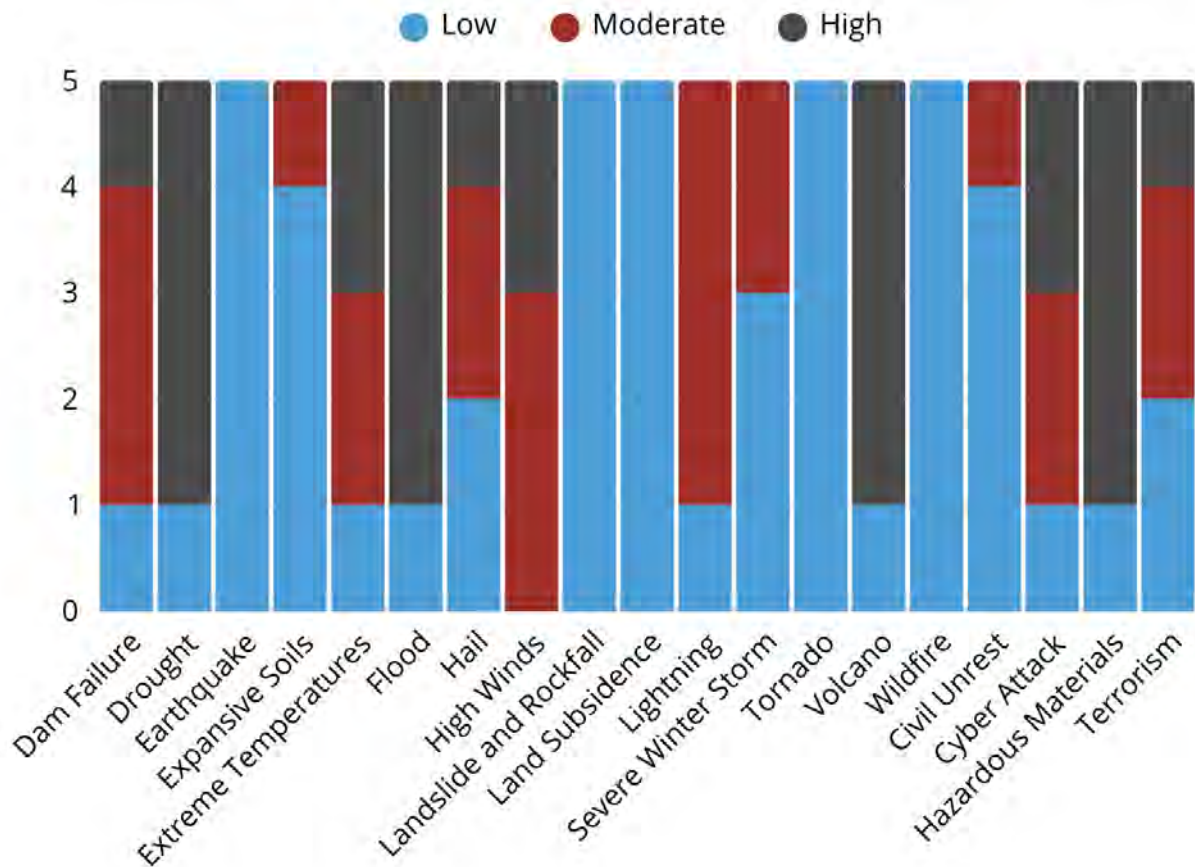


Concern level for the possibility of their community being impacted by a disaster.



APPENDIX C: PUBLIC SURVEY RESULTS

With the consideration of frequency of occurrence and potential impact severity, please indicate your concern level for each of the following hazards:



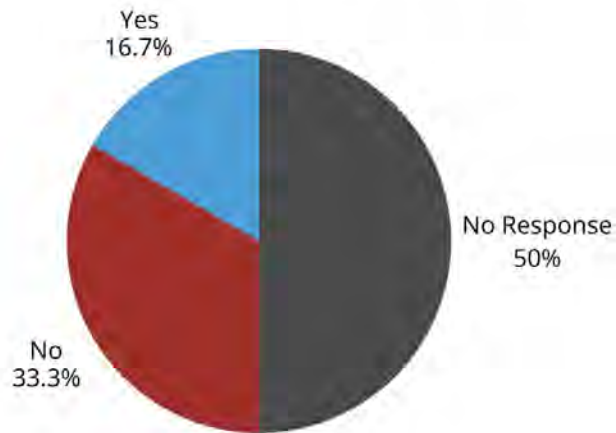
To your knowledge, is your home located in any high hazard risk zones?



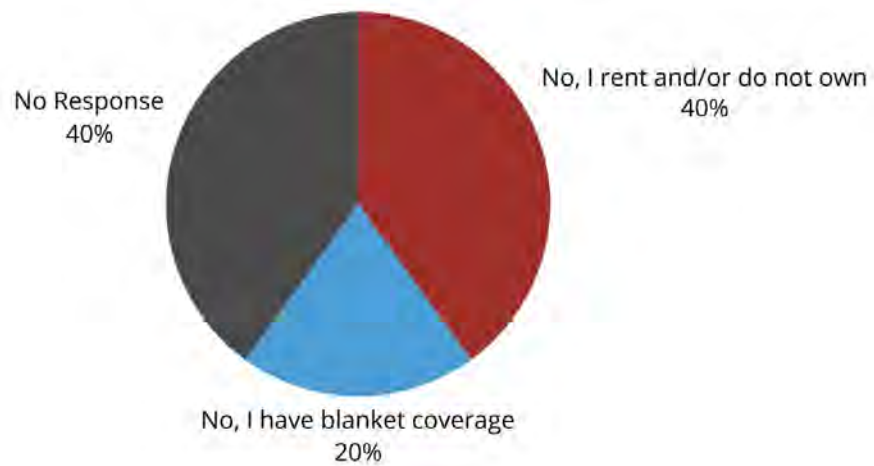
60% Responded 'Yes'

APPENDIX C: PUBLIC SURVEY RESULTS

Have you had any issues getting homeowners or renters insurance due to risks of hazardous events?



**Do you have any hazard specific insurance?
If not, why?**

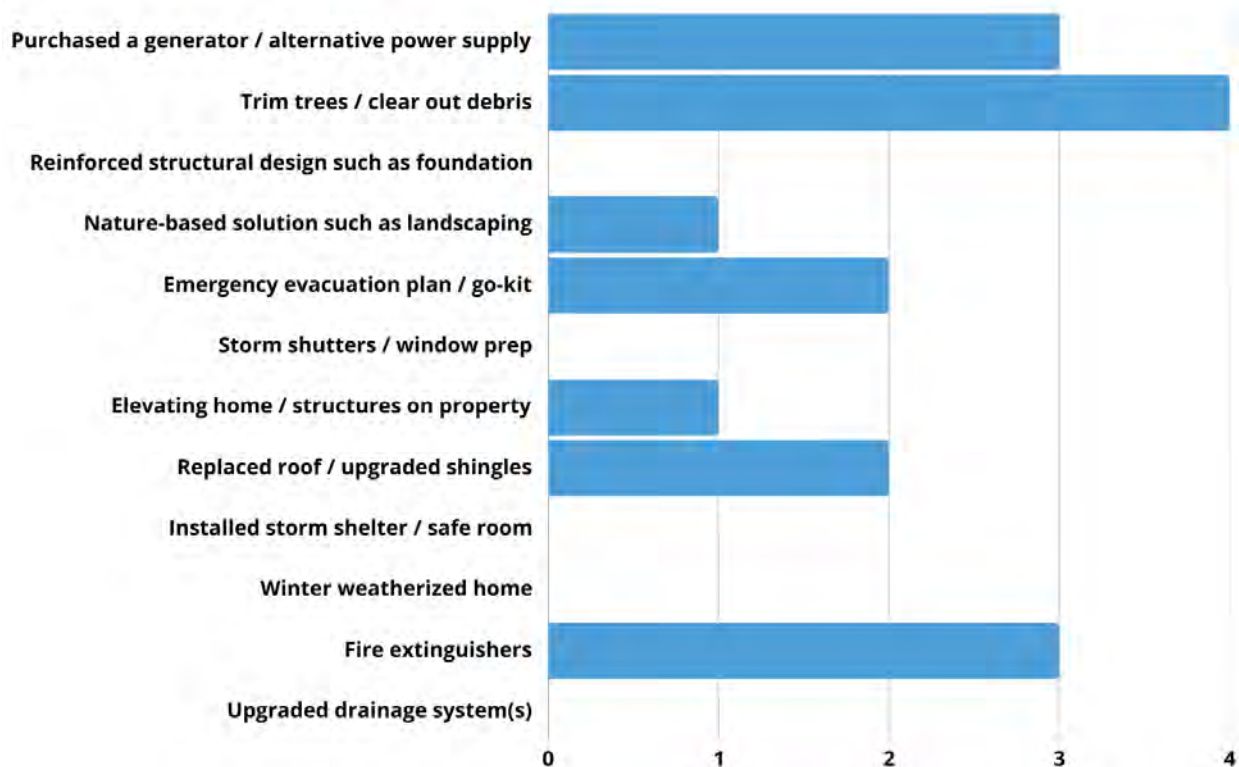


APPENDIX C: PUBLIC SURVEY RESULTS

Have you taken any actions to make your home or neighborhood more resistant to hazards?

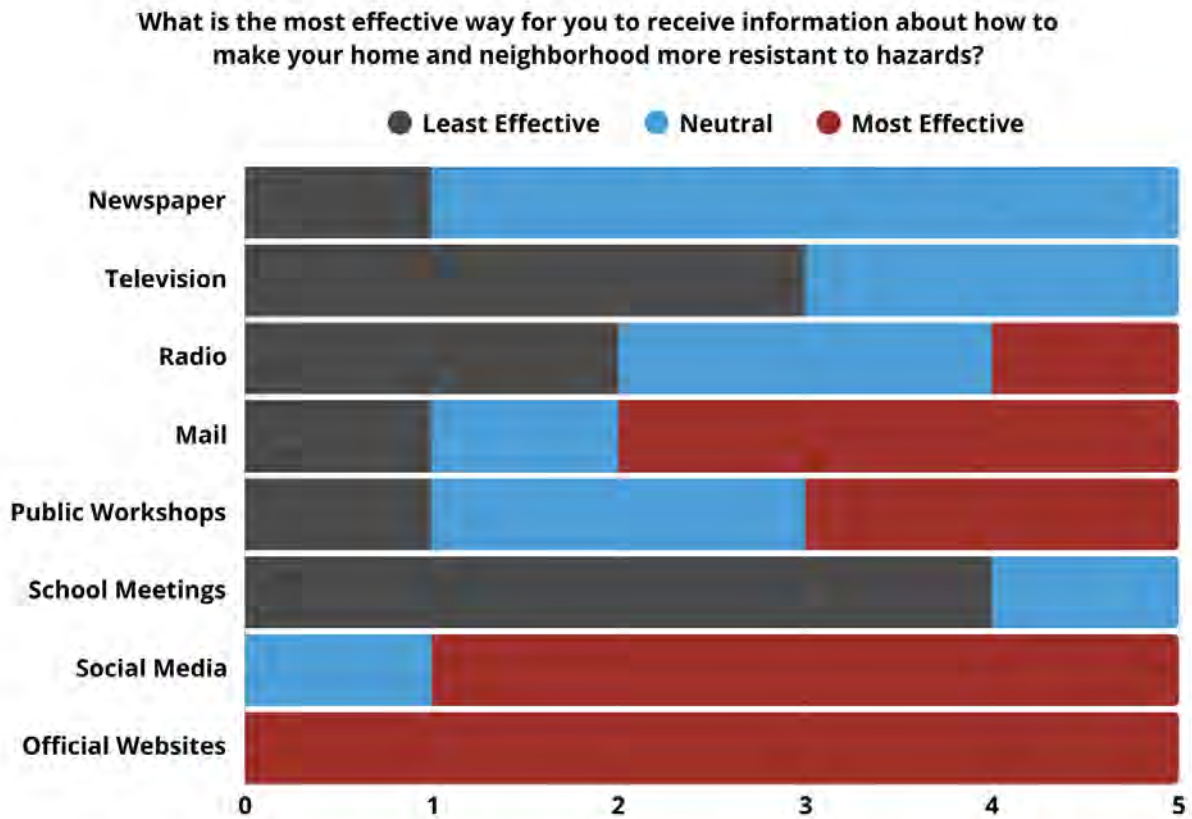


80%
Responded
'Yes'



80% of survey responders are
interested in making their homes or
neighborhoods more resistant to
hazards.

APPENDIX C: PUBLIC SURVEY RESULTS



Most effective form of communication method for receiving information



Official Websites

Additional communication methods recommended:



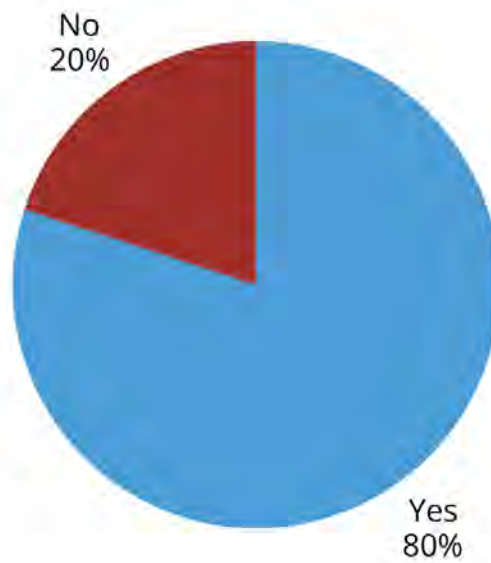
Text / Alert



Email

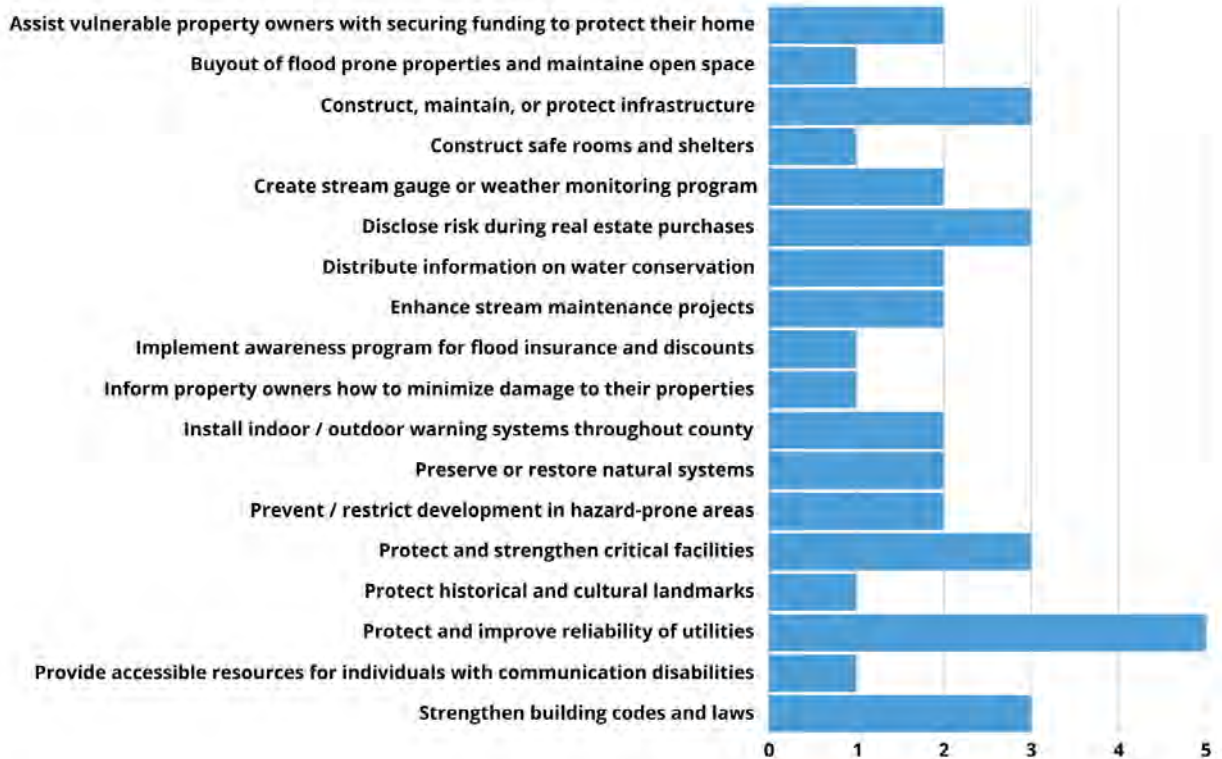
APPENDIX C: PUBLIC SURVEY RESULTS

Would you support regulation (restrictions) on land uses within known high hazard areas?



APPENDIX C: PUBLIC SURVEY RESULTS

In your opinion, please select steps your local government should prioritize to reduce or eliminate the risk of future hazard damages in your neighborhood.



Are there any other projects you would like to see implemented to protect your community from hazardous events?



**Stream / Arroyo
Restoration**



**Emergency Alert /
Communication**

APPENDIX C: PUBLIC SURVEY RESULTS

A number of community-wide activities can reduce our risk from hazards. In general, these activities fall into one of the following six broad categories.

Emergency Services - Actions that protect people and property during and immediately after a hazardous event. Examples include warning systems, evacuation planning, emergency response training, and protection of critical facilities or systems.

Natural Resource Protection - Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. Examples include floodplain protection, habitat preservation, slope stabilization, riparian buffers, and forest management.

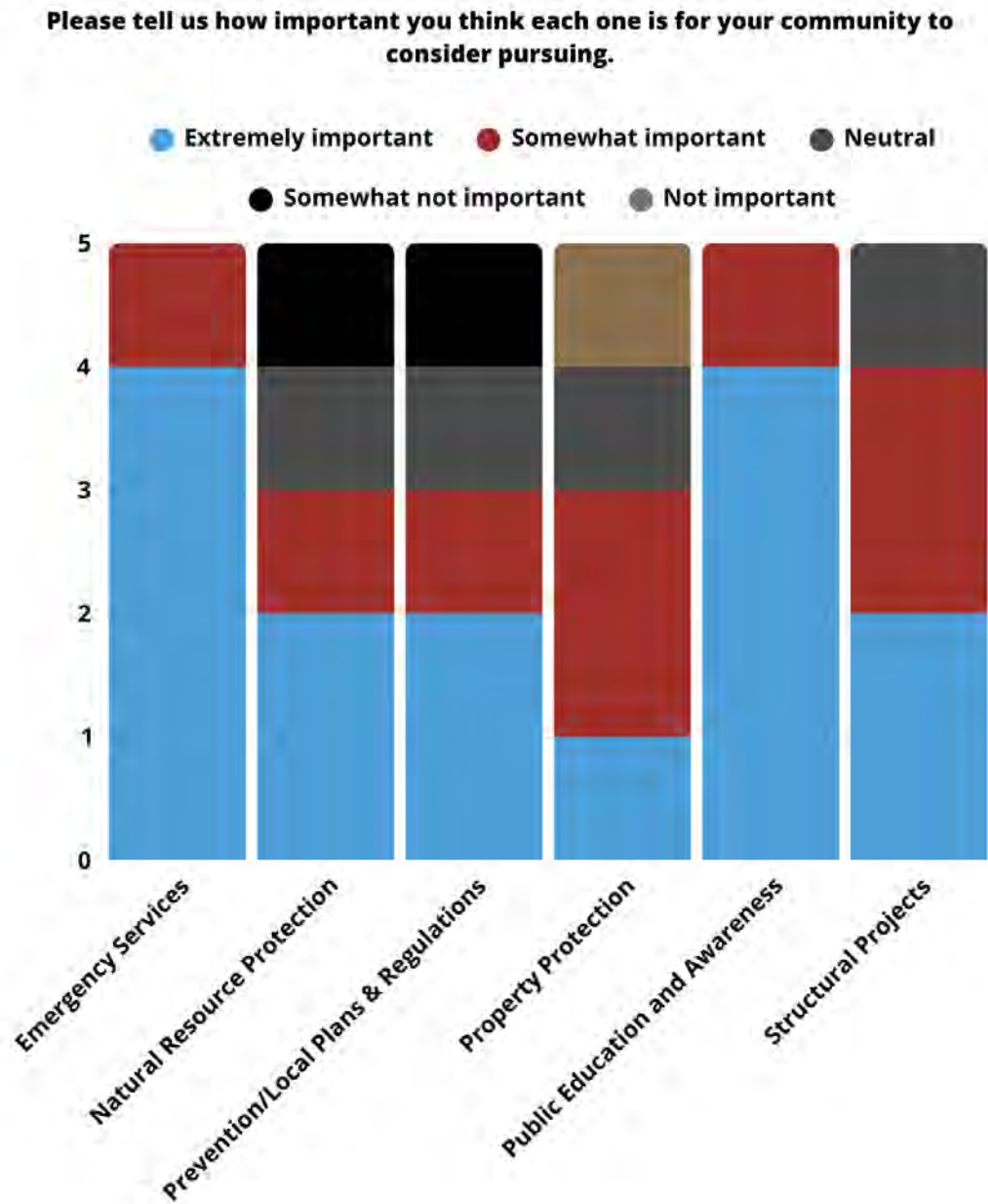
Prevention/Local Plans & Regulations - Administrative or regulatory actions that influence the way land is developed and buildings are built. Examples include planning and zoning, building codes, open space preservation, and floodplain regulations.

Property Protection - Actions that involve the modification of existing buildings to protect them from a hazard or removal from the hazard area. Examples include acquisition, relocation, elevation, structural retrofits, and storm shutters.

Public Education & Awareness - Actions to inform citizens about hazards and techniques they can use to protect themselves and their property. Examples include outreach projects, school education programs, library materials, and demonstration events.

Structural Projects - Actions intended to lessen the impact of a hazard by modifying the natural progression of the hazard. Examples include dams, levees, seawalls detention/retention basins, channel modification, retaining walls, and storm sewers.

APPENDIX C: PUBLIC SURVEY RESULTS





Appendix D

Critical Facilities



APPENDIX D: CRITICAL FACILITIES

Appendix D is **For Official Use Only (FOUO)** and may be exempt from public release under the Freedom of Information Act (FOIA).

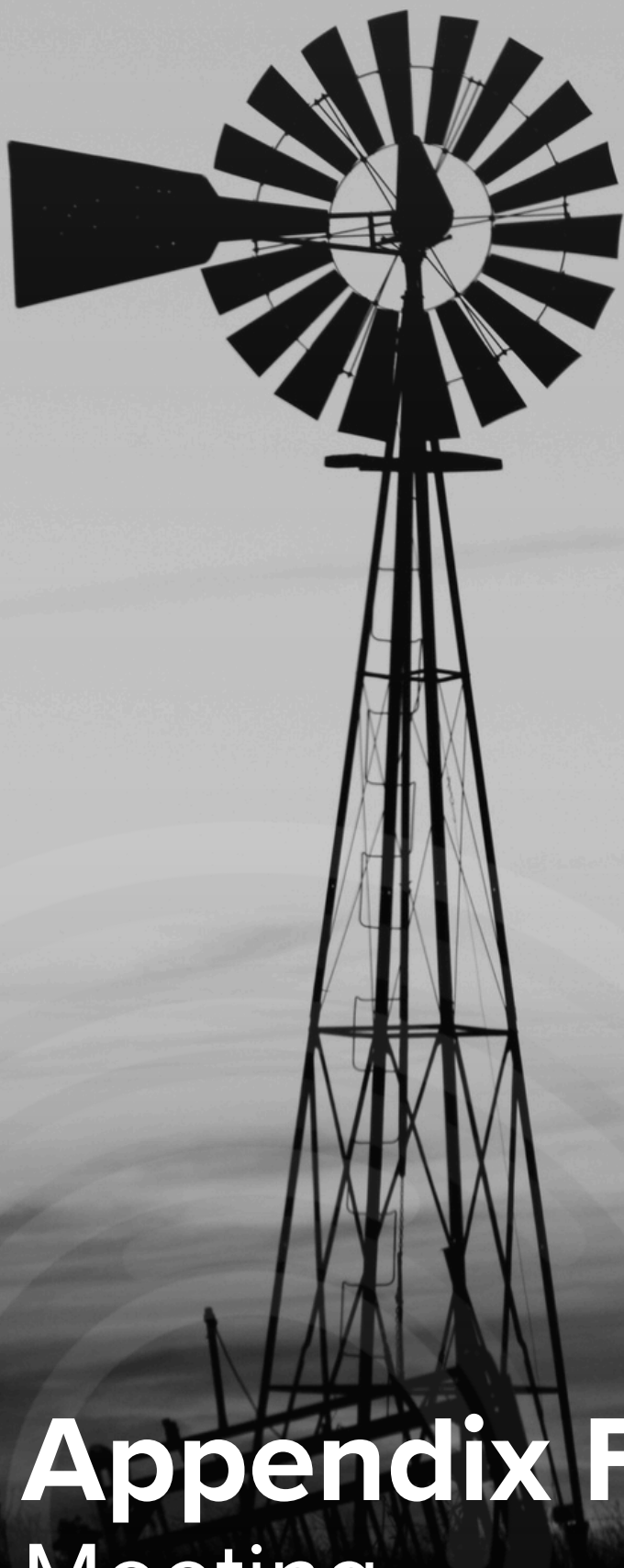
Appendix E

Dam Locations



APPENDIX E: DAM LOCATIONS

Appendix E is **For Official Use Only (FOUO)** and may be exempt from public release under the Freedom of Information Act (FOIA).



Appendix F

Meeting Documentation



APPENDIX F: MEETING DOCUMENTATION

Appendix F is **For Official Use Only (FOUO)** and may be exempt from public release under the Freedom of Information Act (FOIA).



Appendix G

Capability Assessment



APPENDIX G: CAPABILITY ASSESSMENT

Appendix G is **For Official Use Only (FOUO)** and may be exempt from public release under the Freedom of Information Act (FOIA).

Appendix H

State and Federal Funding Opportunities



APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

Overview.....	1
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OVERVIEW

New Mexico utilizes state funds to improve statewide hazard mitigation capabilities and advance their hazard mitigation goals to help identify, understand, and manage various risks associated with natural hazards. State funds also provide funding for state facility and infrastructure upgrades, hazard mapping, mitigation planning, and other mitigation programmatic activities. Table H-1 describes varied loan and grant programs offered by state agencies for which mitigation activities may be eligible.

Table H-1. Summary of State Funded Mitigation Programs

AGENCY	FUNDING PROGRAM
Department of Finance and Administration	Community Development Block Grant (CDBG)
Department of Homeland Security & Emergency Management (DHSEM)	- Annual Emergency Management Performance Grant (EMPG) Sub-Grant Application - Community Assistance Program-State Support Services Element (CAP-SSSE) - Community Development Block Grant – Disaster Recovery (CDBG-DR) - Emergency Management Performance Grant (EMPG) - Non-Profit Security Grant Program (NSGP) - Fire Management Assistance Grants (FMAG) - Flood Mitigation Assistance (FMA) - Hazard Mitigation Grant Program (HMPG) - Hazard Mitigation Grant Program-Post Fire (HMPG-PF) - Hazardous Materials Emergency Preparedness Grant (HMEP) - Homeland Security Grant Program (HSGP) - Non-Profit Security Grant Program (SHSGP) - Off Cycle EMPG American Recovery Act Plan (EMPG-ARPA) - Operation Stonegarden Grant (OPSG) - Public Assistance (PA) - State and Local CyberSecurity Grant Program (SLCGP)
Economic Development Department (EDD)	- Business Retention & Expansion Program - Collateral Assistance Program (CAP) 2.0 - Commercial Property Assessed Clean Energy Program (C-PACE) - Local Economic Assistance & Development Support (LEADS) - Local Economic Development Act (LEDA) - New Mexico MainStreet (NMMS) - Rural Efficient Business Program (REBP) - State Small Business Credit Initiative (SSBCI) - Science & Technology Business Start-Up Grants - Small Business Innovation Research (SBIR) Matching Grant

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

AGENCY	FUNDING PROGRAM
Energy, Minerals, and Natural Resources Department Forestry Division	• Community Forestry Assistance Grant • Community Wildfire Defense Grants (CWDG) • Conservation Seedling Program • Forest and Watershed Planning and Facilitation Services • Forest Legacy Assistance Program • Hazardous Fuels Treatments on Non-Federal Lands (NFL) Grants • Invasive Plant Program Grant • Landscape Scale Restoration (LSR) Grants • National Heritage Conservation Act Program • Private Land Hazardous Trees Mitigation • Urban and Community Forestry Program • Volunteer Fire Assistance Grant (VFA) • Wildland Urban Interface (WUI)
Environmental Department (NMED)	• Brownfield Clean-up Resolving Loan Fund • Clean Diesel Program (CDP) • Clean Water State Revolving Fund (CWSRF) • Corrective Action Fund (CAF) • Drinking Water State Revolving Fund (DWSRF) • Drinking Water and Wastewater Investments • Liquid Water Assistance Fund (LWAF) • Recycling and Illegal Dumping Fund • Overflow Sewer Grants • Rural Infrastructure Program • Solid Waste Facility Grant Fund • Stormwater Reuse Municipal Grants Program
Financial Authority (NMFA)	• Colonias Infrastructure Fund • Local Government Planning Fund • Public Project Revolving Fund
New Mexico Tourist Department	• Destination Forward Grant Program • Route 66 Centennial Grant Program
Office of the State Engineer (OSE)	• WaterSMART: Planning and Project Design Grants • WaterSMART: Water and Energy Grants • EQIP WaterSMART Initiative • Lower Rio Grande (LRG) Groundwater Conservation Program
Outdoor Recreation Division (ORD)	• Outdoor Equity Fund • Outdoor Recreation Trails + Grant • Outdoor Marketing Grant

In addition to State funded programs, many local jurisdictions benefit from federal mitigation funding opportunities. FEMA'S Hazard Mitigation Assistance is a primary source for the implementation of mitigation projects throughout the Nation. Table H-2 describes additional Federal, State, Local, and Non-Profit mitigation funding sources specifically within the State of New Mexico.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

Table H-2. Federal, State, Local and Non-Profit Mitigation Funding Sources in New Mexico

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Agricultural Conservation Easement Program (ACEP)	Federal	NRCS	EMNRD	Provides financial and technical assistance to help conserve agricultural lands and wetlands and their related benefits.
Agricultural Management Assistance (AMA)	Federal	USDA, NRCS	NMDA	Provides financial and technical assistance to agricultural producers to voluntarily address issues such as water management, water quality, and erosion control by incorporating conservation methods into their farming operations.
Agricultural Water Enhancement Program (AWEP)	Federal	USDA, NRCS	NMED	Voluntary conservation initiative that provides financial and technical assistance to agricultural producers to implement water enhancement activities on agricultural land to conserve surface and ground water and improve water quality.
AmeriCorps – Corporation for National & Community Service (CNCS)	Federal	AmeriCorps		Provides funding for volunteers to serve communities, including disaster prevention. AmeriCorps/Vista has assisted local communities with wildfire mitigation projects.
American Recovery and Reinvestment Act (ARRA)	Federal	DOT Federal Transit Administration	NMED	The American Recovery and Reinvestment Act (ARRA), commonly referred to as the Recovery Act, is a stimulus package enacted by the 111th U.S. Congress and signed into law by President Barack Obama in February 2009. Designed in response to the Great Recession, the primary goal of the Act was to preserve existing jobs and generate new employment opportunities as quickly as possible. Additional objectives include providing temporary relief to individuals most affected by the recession and investing in infrastructure, education, healthcare, and renewable energy.
Aquatic Ecosystem Restoration	Federal	DOD-USACE	NMDGF	Direct Support for carrying out aquatic ecosystem restoration project that will improve the equality of the environment.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Assistance to Firefighters Program - Fire Prevention & Safety (FP&S) Grants	Federal	FEMA	DHSEM	Provides Fire Prevention & Safety (FP&S) Grants support projects that enhance the safety of the public and firefighters from fire and related hazards.
Assistance to Firefighters Grants (AFG)	Federal	FEMA	DHSEM	The Assistance to Firefighters Grant (AFG) Program provides financial assistance directly to eligible fire departments, nonaffiliated emergency medical service (EMS) organizations and State Fire Training Academics for critical training and equipment.
Beneficial Uses of Dredged Materials	Federal	DOD-USACE	NMED	Direct Assistance for projects that protect, restore, and create aquatic and ecologically related habitats, including wetlands, in connection with dredging and authorized Federal navigation project.
Bridges Replacement and Rehabilitation	Federal	US DOT Federal Highway Administration FHWA	NMDOT	Funding for eligible bridges on any public road that require replacement or rehabilitation.
Carbon Reduction Program (CRP)	Federal	USDOT	NMDOT	Provides funds for projects that are designed to reduce transportation emissions (CO2). This program can fund a wide range of projects designed to reduce carbon dioxide emissions from on-road highway sources.
Center for Integration of Natural Disaster Information	Federal	DOI/USGS, The Center for Integration of Natural Hazards Research	DHSEM	Technical Assistance: Develops and evaluates technology for information integration and dissemination.
Clean School Bus Program	Federal	EPA	NMED	Provides assistance in replacing existing school buses with zero-emission and low-emission models.
Clean Water Act Section 319 Grants	Federal	EPA	NMED	Provides grants for a wide variety of activities related to non-point source pollution runoff mitigation.
Clean Water Act Section 604(b)	State	NMED	NMED	Provides funding to regional planning organizations for planning activities.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Clean Water State Revolving Fund (CWSRF)	Federal	EPA	NMED	Provides low-cost financing for a wide range of wastewater, stormwater, reuse, and other pollution control projects.
Climate Pollution Reduction Grant	Federal	EPA	NMED/ EMNRD	Supports the state in creating two climate action plans (i.e., one priority plan and one comprehensive plan) for implementing effective greenhouse gas reduction strategies while ensuring the benefits of these actions are delivered to New Mexicans, especially Low Income or Disadvantaged communities (LIDAC) as defined by US EPA. This grant will give New Mexico communities the opportunity to collaborate with the state to build projects and programs that provide high-quality jobs, improve health, and keep families safe where they live.
Community Assistance Program (CAP)	Federal	FEMA, NFIP	EDD	Product-oriented financial assistance program directly related to the flood loss reduction objectives of the National Flood Insurance Program (NFIP).
Community Development Block Grant (CDBG)	Federal	HUD	DFA	The primary objective is to develop viable communities by providing decent housing and suitable living environments and expanding economic opportunities principally for persons of low- to moderate- income. Eligible applicants are non-entitlement cities under 50,000 in population and non-entitlement counties that have a non-metropolitan population under 200,000 and that are not eligible for direct CDBG funding from HUD may apply for funding through any of the New Mexico CDBG programs.
Community Development Block Grant – Disaster Recovery (CDBG-DR)	Federal	HUD	DFA	Often following a disaster, the state may receive a CDBG-DR Supplement intended for mitigation and disaster recovery projects in the affected areas. Funding can be used to acquire properties in hazard prone areas. Since CDBG funds lose their federal identity they can also be used to supplement state or local match requirements on other funds such as FEMA HMA grants. Funding also supports public facilities including water and wastewater.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Community Development Block Grant – Entitlement Communities Program	Federal	HUD	DFA	Grants to entitled cities and urban counties to develop viable communities (e.g., decent housing, a suitable living environment, expanded economic opportunities), principally for low- and moderate-income persons.
Community Fire Protection Program	Federal	USDA	EMNRD	Mitigation delivered via USDA Forest Service and Private Forestry Coop Fire Program.
Community Rating System (CRS)	Federal	FEMA	DHSEM	A voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. CRS not only assists communities in reducing flood risks, but also enhances public safety, reduces damage to property and public infrastructure, avoids economic disruption and losses, reduces human suffering, and protects the environment. Technical assistance in designing and implementing some activities is available at no charge. Participating in the CRS provides an incentive to maintain and improve a community's floodplain management program over the years. Implementing some CRS activities can help the project qualify for certain other Federal assistance funds.
Community Wildfire Defense Grant	Federal	USFS	EMNRD-Forestry	Offers financial assistance to at-risk local communities with planning for and against the risk of catastrophic wildfire. This program is authorized in Public Law 117-58, the Infrastructure Investment and Jobs Act. Two primary objectives: The development and revision of Community Wildfire Protection Plans (CWPP), and the implementation of projects described in a CWPP that is less than ten years old. Prioritizes at-risk communities that are in an area identified as having high or very high wildfire hazard potential, are low-income, and/or have been impacted by a severe disaster with no minimum federal funding limit for projects.
Conservation Contracts	Federal	USDA-FSA		Debt reduction for delinquent and non-delinquent borrowers in exchange for Conservation contracts placed on environmentally sensitive real property that secures FSA Loans.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Conservation Innovation Grants (CIG)	Federal	USDA, NRCS		A voluntary program intended to stimulate the development and adoption of innovative conservation approaches and technologies while leveraging federal investment in environmental enhancement and protection, in conjunction with agricultural production.
Conservation Technical Assistance (CTA) Program	Federal	USDA-NRCS		Technical assistance for run-off retardation and soil erosion prevention to reduce hazards to life and property.
Decision, Risk, and Management Science Program	Federal	NSF	RMD	Funding for research and related educational activities on risk, perception, communication, and management (primarily technological hazards).
Disaster Mitigation Planning and Technical Assistance	Federal	DOC, EDA	DHSEM	Technical and planning assistance grants for capability building and mitigation project activities focusing on creating disaster resistant jobs and workplaces.
Division of Homeland Security Financial Assistance	Federal	US Department of Homeland Security	HSD	Supports a wide variety of funding and financial assistance programs that support preparedness, resilience, and post-disaster relief.
Drinking Water State Revolving Fund (DWSRF)	Federal	EPA	NMED	Provides funding for infrastructure improvements to drinking water systems. The program also emphasizes providing funds to small and disadvantaged communities and for programs that encourage pollution prevention as a tool for ensuring safe drinking water.
Economic Development Administration Grants and Investments	Federal	U.S. DOC, EDA	EDD	Provides grants and investments for community construction projects, including mitigation activities.
Economic Injury Disaster Loan	Federal	SBA	EDD	The COVID EIDL program ceased accepting applications on December 31, 2021, however, the disaster EIDL program continues to be available to businesses impacted by other publicly declared disasters.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Emergency Community Water Assistance Grants	Federal	USDA	NMED	Provides funding to rural communities with populations over 10,000 to prepare, or recover from an emergency that threatens the availability of safe, reliable drinking water including drought.
Emergency Management / Mitigation Training	Federal	FEMA	DHSEM	Training in disaster mitigation, preparedness, planning.
Emergency Management Performance Grant (EMPG)	Federal	FEMA	DHSEM	Provides a yearly allocation of funding to support state and local emergency management programs. This has included providing funding for local mitigation plans, mitigation-oriented studies, and related activities.
Emergency Relief (ER) Program	Federal	US DOT - FHWA	DHSEM	Provides funds for roads and bridges on Federal-aid highways that are damaged as a direct result of a natural disaster or catastrophic failure from an external cause.
Emergency Watershed Protection Program (EWPP)	Federal	USDA, NRCS	NMDA	Provides funding and technical assistance for emergency measures, including floodplain easements in impaired watersheds. Funding is available through Simplified Acquisition Procedures (SAP), typically ranging from \$25,000 to \$100,000. Support is provided through contracts between project sponsors and the Natural Resources Conservation Service (NRCS); grants are not offered under this program. The NRCS covers up to 75 percent of total project costs.
Environmental Justice Government-to-Government Program (EJG2G)	Federal	EPA	NMED	Provides funding to support government activities that lead to measurable environmental or public health impacts in communities disproportionately burdened by environmental harms.
Environmental Justice Collaborative Problem Solving Program	Federal	EPA	NMED	Provides funding directly to community-based organizations to address environmental injustices.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Environmental Quality Incentives Program (EQIP)	Federal	USDA, NRCS		Provides funding and technical assistance to farmers and ranchers to promote agricultural production and environmental quality as compatible goals.
Farm Ownership Loans	Federal	USDA-FSA		Direct loans, guaranteed / insured loans, and technical assistance to farmers so that they may develop, construct, improve, or repair farm homes, farms, and service buildings, and to make other necessary improvements.
Federal Land Transfer / Federal Land to Parks Program	Federal	DOI-NPS		Identifies, assesses, and transfers available federal real property for acquisition for use in state and local parks and recreation, such as open space.
Fire Management Assistance Grants (FMAG)	Federal	FEMA	DHSEM	Provides fire suppression support to states when loss of life and property is imminent. Wildfire mitigation is also eligible under emergency protection if life is in imminent danger.
Fire Prevention and Safety Grant Program	Federal	US Fire Administration	DHSEM	Provides funding for projects that enhance the safety of the public and firefighters from fire and related hazards. The primary goal is to target high-risk populations and reduce injury and prevent death.
Firewise USA Program	Federal	USDA, DOI, NASFF, NFPA	EMNRD	Provides a collaborative framework to help neighbors in a geographic area organize and enhance ignition resistance of their homes and community to reduce wildfire risks at the local level.
Flood Mitigation Assistance (FMA) Program	Federal	FEMA	DHSEM	Repetitive flood loss property reduction and projects that mitigate losses to NFIP-insured properties.
Floodplain Management Services	Federal	DOD-USACE	DHSEM	Provides technical and planning assistance at the local, regional, or national level needed to support effective floodplain management.
Forest Land Enhancement Program	Federal	USDA, NRCS	EMNRD	Provides educational, technical, and financial assistance to help landowners implement sustainable forestry management objectives.
Forest Legacy Program	Federal	USFS	EMNRD	Provides funding to protect private forest lands that are environmentally, economically, and socially critical, thereby reducing development in the wildland-urban interface.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Greenhouse Gas Reduction Fund (GGRF)	Federal	EPA	NMED	The program is designed to combat the climate crisis by mobilizing financing and private capital for greenhouse gas- and air pollution-reducing projects in communities across the country.
Grid Resilience Program (GRIP)	Federal	DOE	EMNRD	Enhance grid flexibility and improve the resilience of the nation's power grid against threats of extreme weather and climate change.
Hazard Mitigation Grant Program (HMGP)	Federal	FEMA	DHSEM	Post-disaster multi-hazard mitigation funding for federally declared disasters. HMGP Post Fire funds are available for FMAG declarations.
Hazardous Materials Emergency Preparedness (HMEP) Grant Program	Federal	DOT	SHSEM	Funding is available to help facilitate preparedness in transporting hazardous materials. The program recognizes Local Emergency Planning Committees (LEPCs) as applicants to maximize funding impact through regional partnerships.
Healthy Forests Reserve Program (HFRP)	Federal	NRCS	EMNRD	Assist landowners, on a voluntary basis, in restoring, enhancing and protecting forestland resources on private lands through various means, including conservation easements and cost-sharing agreements.
High Hazard Potential Dam Program (HHPD)	Federal	FEMA	OSE	Provides assistance for technical, planning, and design activities related to the repair, removal, and/or structural or nonstructural rehabilitation of eligible non-federal high hazard dams classified as high hazard potential by the state/territory dam safety agency, with an approved Emergency Action Plan (EAP) and rated in poor condition, through a pre-disaster or annual cycle.
Highway Bridge Replacement and Rehabilitation Program	Federal	FHWA	NMDOT	Provides funding to enable states to improve the condition of highway bridges through replacement, rehabilitation, and systematic preventive maintenance. Also includes the National Historic Covered Bridge Preservation Program.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
HOME Disaster Relief	Federal	HUD	DHSEM	The HOME Disaster Relief Program is a long-term housing initiative designed to help eligible organizations assist income-qualified households affected by disasters. Funds are available for federal or state-declared disasters, as well as other natural or man-made events. It is the Department's practice to maintain a HOME Disaster Relief Fund balance of \$1 million whenever possible. These funds may be used to support affected households located outside communities that receive HOME funds directly from the U.S. Department of Housing and Urban Development (HUD).
HOME Investments Partnership Program	Federal	HUD	MFA	Provides grants to States, local government and consortia for permanent and transitional housing (including support for property acquisition and rehabilitation) for low-income persons.
Homeland Security Grant Program (HSGP)	Federal	Department of Homeland Security	DHSEM	Funding supports homeland security activities identified in state and local strategic plans, including threat and hazard risk identification for natural, technological, and human-caused hazards.
Hospital Preparedness Program (HPP) Cooperative Agreement	Federal	HHS	DOH	The HPP is the primary source of federal funding for health care system preparedness and response. In collaboration with public health, it prepares health-care delivery systems to save lives through the development of health care coalitions (HCCs). Under the direction of the HPP providers, the HCCs develop plans, provide training, and coordinate regional exercises.
Hydrologic Research Grants	Federal	NOAA	NM WRRI	Offers up to \$125,000 to conduct joint research and development on pressing surface water hydrology issues common to national, regional, and local operational offices. Eligible applicants include federally recognized agencies of state or local governments, quasi-public institutions such as water supply or power companies, hydrologic consultants and companies involved in using and developing hydrologic forecasts.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Indian Housing Assistance - Housing Improvement Program (HIP)	Federal	DOI-BIA		The Housing Improvement Program (HIP) is a home repair, renovation, replacement and new housing grant program administered by the Bureau of Indian Affairs (BIA) and federally recognized Indian tribes. It is designed to assist American Indian and Alaska Native (AI/AN) individuals and families who lack immediate standard housing resources.
Individual Assistance (IA)	Federal	FEMA	DHSEM	Following a disaster, funds can be used to mitigate hazards when repairing individual and family homes.
In-Lieu Fee Program Mitigation Projects	Federal	USACE	Community Applicants	Supports the restoration, establishment, enhancement, and/or preservation of aquatic resources through funds paid to a governmental or non-profit natural resources management entity to satisfy compensatory mitigation requirements for Department of the Army permits.
Land Acquisition	Federal	DOI-FWS	NMDGF	Acquires high-quality lands and waters, or easements thereon, for inclusion in the National Wildlife Refuge System.
Landowner Incentive Program	Federal	USFWS	EMNRD	Collaborates with the Forestry Division and private landowners to protect the habitats of at-risk species on private lands. Landowner involvement is voluntary.
Mapping Standards Support	Federal	DOI/USGS	DHSEM	Provides mapping and digital data standards expertise in support of the National Flood Insurance Program (NFIP).
Mitigation Banks	Federal	USACE	Community Applicants	Mitigation Banks are Corps-approved sites that sell compensatory mitigation credits for projects that cause unavoidable impacts to waters of the U.S. When a permit requires compensatory mitigation, it specifies the number of credits to be purchased from an approved mitigation bank.
National Dam Safety Program	Federal	FEMA	OSE	Provides technical assistance, training, and grants to enhance state dam safety programs.
National Digital Orthophoto Program	Federal	DOI-USGS	MRCOG	Develops topographic quadrangles for use in mapping of flood and other hazards.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
National Earthquake Hazards Reduction Program (NEHRP)	Federal	FEMA; DOI-USGS	NMED	Provides funding to support enhanced earthquake risk assessments in local hazard mitigation plans, as well as other earthquake hazard mitigation and preparedness activities.
National Earthquake Hazard Reduction Program (NEHRP) in Earth Sciences	Federal	NSF	OSE	Conducts research on basic and applied earth and building sciences.
National Flood Insurance Program (NFIP)	Federal	FEMA	DHSEM	Provides affordable insurance to property owners and encourages communities to adopt and enforce floodplain management regulations.
National Flood Insurance Program: Technical Mapping Advisory Council	Federal	DOI-USGS	DHSEM	Provides technical guidance and advice to coordinate FEMA's map modernization efforts for the National Flood Insurance Program (NFIP).
National Training and Education (NTE)	Federal	FEMA	NMPED	Offers educational and training programs through online course catalog, which provides searchable, integrated information on courses provided or managed by FEMA's Center for Domestic Preparedness (CDP), Emergency Management Institute (EMI), and National Training and Education Division (NTED).
National Weather Service (NWS)	Federal	NOAA - NWS		The National Weather Service (NWS) offers storm spotter training as well as weather and flood safety guides. It may also provide funding to support severe weather signage in parks and other public areas.
National Wildlife Wetland Refuge System	Federal	USFWS	NMDFG	Provides funding for the acquisition of land for inclusion in the National Federal Wildlife Refuge System.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Non-Structural Alternatives to Structural Rehabilitation of Damaged Flood Control Works	Federal	DOD-USACT	DHSEM	Provides planning and construction grants for non-structural alternatives to the rehabilitation of flood control works damaged by floods or coastal storms.
North American Wetland Conservation Fund	Federal	USFWS	NMED	Provides funding for wetland conservation projects.
NRCS Conservation Programs	Federal	USDA, NRCS	Community Applicants	Provides funding through various programs for the conservation of natural resources.
Partners for Fish and Wildlife	Federal	USFWS		Provides financial and technical assistance to landowners for wetland restoration projects in “focus areas” of the state.
Physical Disaster Loans and Economic Injury Disaster Loans	Federal	SBA		Provides disaster loans to non-farm, private sector owners of disaster damaged property for uninsured losses.
Planning Assistance to States	Federal	USACE		Aids states in planning for development, utilization, and conservation of water and related land resources.
Pollution Prevention Grant: Environmental Justice in Communities	Federal	EPA	NMED	Provides technical assistance to businesses aiming to improve human health and the environment in disadvantaged communities.
Pollution Prevention Grant: Environmental Justice Through Safer and More Sustainable Products	Federal	EPA	NMED	Provides technical assistance to businesses to increase the supply, demand, and use of safer, more sustainable products.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Post-Disaster Economic Recovery Grants and Assistance	Federal	DOC-EDA	DHSEM	Provides technical assistance to businesses to increase the supply, demand, and use of safer, more sustainable products.
Pre-Disaster Mitigation Loan Program	Federal	SBA	DHSEM	Provides funding to assist with the long-term economic recovery of communities, industries, and firms adversely impacted by disasters.
Pre-Disaster Mitigation (PDM)	Federal	FEMA	DHSEM	Congressionally directed funding for local governments, tribes and states to plan for and implement sustainable cost-effective measures designed to reduce risk to individuals and property from future natural hazards.
Preparedness (Non-Disaster) Grants	Federal	FEMA	DHSEM	Provides financial assistance to state and local governments for preparedness programs. Funding is allocated to enhance the capacity of emergency responders to prevent, respond to, and recover from terrorism incidents involving weapons of mass destruction—chemical, biological, radiological, nuclear, and explosive devices—as well as cyber-attacks.
Project Modifications for Improvement of the Environment	Federal	DOD-USACE	NMED	Provides funds for ecosystem restoration by modifying structures and/or operations of water resources projects constructed by the U.S. Army Corps of Engineers (USACE), or by restoring areas where a USACE project contributed to environmental degradation.
Protection of Essential Highways, Highway Bridge Approaches, and Public Works	Federal	USACE	NMDOT	Provides technical assistance to ensure bank protection for highways, highway bridges, essential public works, churches, hospitals, schools, and other nonprofit public services endangered by flood-caused erosion.
Public Assistance	Federal	FEMA	DHSEM	Funds are allocated to states and communities to repair damaged infrastructure and public facilities, and to help restore government or government-related services.
Public Assistance (PA) Section 406 funds	Federal	FEMA	DHSEM	Following a disaster, funds can be used to mitigate hazards while repairing damages to public structures or infrastructure. Wildfire mitigation is also eligible under emergency protection if lives are in imminent danger.

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NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Public Health Emergency Preparedness (PHEP) Cooperative Agreement	Federal	CDC	DOH	Aids health departments in building and strengthening their ability to effectively respond to a range of public health threats, including infectious diseases, natural disasters, and biological, chemical, nuclear, and radiological events. Preparedness activities funded by the PHEP Cooperative Agreement specifically target the development of emergency-ready public health departments that are both flexible and adaptable.
Public Housing Capital Fund	Federal	HUD	MFA	Funding available towards public housing agencies for modernization needs resulting from natural disasters including elevation, flood proofing, and retrofitting.
Repetitive Flood Claims Program	Federal	FEMA	DHSEM	Provides funds to assist states and communities reduce flood damages to insured properties that have had one or more claims under the National Flood Insurance Program (NFIP).
Risk MAP Program	Federal	FEMA, NFIP	DHSEM	Establishes or updates floodplain mapping and multi-hazard risk products.
Rural Development Grants	Federal	USDA-Rural Development		Provides grants and loans for the development and enhancement of infrastructure and public safety in rural areas, offering up to \$100,000 or 75 percent of the total project cost, whichever is less.
Rural Fire Assistance Grant	Federal	NIFC	EMNRD	Funds fire mitigation activities in rural communities.
Rural Utilities Service (RUS)	Federal	USDA-Rural Development		Programs designed to provide needed infrastructure or infrastructure improvements to rural communities, including water and wastewater treatment, electric power, and telecommunications services.
Section 108 Loan Guarantee Program	Federal	HUD	MFA/DFA	Provides loans to public entities for community and economic development projects, including mitigation measures.
Section 502 Loan Guaranteed Loan Program	Federal	USDA-RHS		Provides loans, loan guarantees, and technical assistance to very low- and low-income applicants seeking to purchase, build, or rehabilitate homes in rural areas.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Section 504 Loans for Housing	Federal	USDA-RHS	MFA	Provides repair loans, grants, and technical assistance to low-income senior homeowners in rural areas to address home repairs and eliminate health and safety hazards.
Silver Jackets	Federal	USACE	EMNRD	Provides funding for flood-related studies, public awareness efforts, risk analysis, flood response plans, and the construction of small flood control projects.
Small Business Administration Disaster Loans	Federal	SBA	NMED	Provides financial assistance through low interest disaster loans to businesses of all sizes, private non-profit organizations, homeowners, and renters to repair or replace real estate, personal property, machinery and equipment, inventory and business assets that have been damaged or destroyed in a declared disaster.
Small Business Administration Disaster Loans	Federal	USACE		Authorizes the U.S. Army Corps of Engineers (USACE) to conduct feasibility studies and construct small flood control projects.
Societal Dimensions of Engineering, Science, and Technology Program	Federal	NSF	OSST	Provides funding for research and educational activities on topics such as ethics, values, risk assessment, communication, risk management, and risk perception.
Soil Survey	Federal	USDA-NRCS		Maintains soil surveys of counties or other areas to assist with farming, conservation, mitigation or related purposes.
Staffing for Adequate Fire and Emergency Response (SAFER)	Federal	FEMA	DHSEM	Provides funding directly to fire departments and volunteer firefighter interest organizations to assist in increasing the number of firefighters to help communities meet industry minimum standard, to attain 24-hour staffing to provide adequate protection from fire and fire-related hazards and to fulfill traditional missions of fire departments.
State Water Resources Research Act Program	Federal	USGS	NM WRRI	The U.S. Geological Survey (USGS), in cooperation with the National Institutes for Water Resources (NIWR), issues an annual call for proposals that address water challenges and concerns of regional or interstate significance, or that relate to a specific program priority identified by the Secretary of the Interior and the Institutes.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Stream Gauging and Flood Monitoring Network	Federal	DOE-USGS	OSE/ISC	Operation of a network of over 7,000 stream gauging stations that provide data on river flooding characteristics.
Surface Transportation Program	Federal	USDOT/ FHWA	NMDOT	Provides funding for activities such as safety-related construction and transportation enhancements. These enhancements include a broad range of initiatives, from safety education to environmentally and historically focused activities.
Transfers of Inventory Farm Properties to Federal and State Agencies for Conservation Purposes	Federal	USDA-FSA	NMDA	Transfers the titles of certain inventory farm properties owned by the FSA to federal and state agencies for conservation purposes, including the restoration of wetlands and floodplain areas to reduce future flood potential.
Transportation Enhancement program	Federal	FHA	NMDOT	This program supports non-traditional transportation-related activities that extend beyond standard infrastructure initiatives. Eligible projects must demonstrate thoughtful integration with the surrounding environment, contributing meaningfully to community vitality, environmental quality, and the visual character of transportation corridors. Reimbursement of up to 80 percent of allowable costs is available for qualifying enhancement activities.
Urban & Community Forestry Program Cost Share Grants	State	DEC	EMNRD	Assistance to communities to comprehensive planning, management, and education to create healthy urban and community forests. Street tree planning, one eligible project type, may fit will with the green infrastructure projects.
Urban Waters Small Grants	Federal	EPA		Funding is allocated to improve urban water quality through activities that also support community revitalization and other local priorities, which may include the implementation of green infrastructure.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
USDA Conservation Programs	Federal	USDA/FSA		These programs ¹ work to address a large number of farming and ranching related conservation issues including drinking water protection, soil erosion reduction, wildlife habitat preservation, the preservation and restoration of forests and wetlands, and aiding farmers whose farms have been damaged by natural disasters.
Volcano Hazards Program	Federal	DOS-USGS	NMBGMR	Provides technical assistance through volcano hazard warnings and operation of four volcano observatories to monitor and assess volcano hazard risk.
Water Conservation Field Services Program	Federal	HUD	NMACD	Encourage beneficiaries of federal water projects to conserve water and assists agricultural and urban water districts in developing and implementing water conservation plans in accordance with the Reclamation Reform Act (RRA) of 1982. Through the WCFSP, cost-shared financial assistance is available for developing water conservation plans, identification of water management improvements through System Optimization Reviews (SORs), design of water management improvements, and promotion of water conservation techniques through demonstration activities. WaterSMART also supports Reclamation's priorities to increase water reliability and resilience, advance racial and economic equity, and enhance water conservation, ecosystem health, and climate resilience.
Water2025 Challenge Grant Program for Western States	Federal	Bureau of Reclamation		Provides up to \$25,000 in funding for projects that enhance water use efficiency and promote improved water management practices.
Water and Waste Disposal Direct Loans and Grants	Federal	USDA	NMED/ NMFA	Provides financial assistance through grant programs to develop water and waste disposal systems in rural areas and towns with a population not in excess of 10,000.

¹ Programs include Conservation Reserve Program, Conservation Reserve Enhancement Program, Emergency Conservation Program, Emergency Forest Restoration Program, Farmable Wetlands Program, Grassland Reserve Program, Source Water Protection Program.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Water Quality Improvement Project (WQIP) Program	State	DEC	NMED	Competitive, reimbursement grant program for projects that reduce polluted runoff, improve water quality and restore habitat.
Watershed Processes and Water Resources	Federal	Bureau of Reclamation	NMED	Promotes up to \$250,000 for projects that can be completed within 24 months and that reduce conflicts through water conservation, efficiency, and markets.
Watershed Processes and Water Resources – National Research Initiative Standard Research (Part T)	Federal	USDA	NMED	Provides \$100,000 in funding to support research in two key areas: (1) understanding fundamental watershed processes; and (2) developing technologies and management practices that enhance the efficient use of water—both consumptive and non-consumptive—while protecting or improving water quality for agricultural and forestry production.
Watershed Protection and Flood Prevention Program	Federal	USDA-NRCS	NMED	Provides technical and financial assistance for installing works of improvement to protect, develop, and utilize land or water resources in small watersheds under 250,000 acres.
Watershed Surveys and Planning	Federal	USDA-NRCS	NMED	Provides technical assistance and funding for local and state governments to protect watersheds, and conduct surveys and planning studies for appraising water and related resources, and service formulating alternative plans for conservation use and development.
WaterSMART – Drought Response Program	Federal	USDA	OSE	Provides \$500,000 to support innovative research focused on: (1) understanding the fundamental processes that influence the quality and quantity of water resources across diverse spatial and temporal scales; (2) improving water resource management in agricultural, forested, and rangeland watersheds; and (3) developing appropriate technologies to achieve these objectives.
Wastewater Infrastructure Engineering Planning Grants	State	DEC	NMED	Provides funding for municipalities to help pay for initial planning of water quality projects eligible for the Clean Water State Revolving Fund.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Wetlands Protection – Development Grants	Federal	EPA	NMED	Provides funding to support the development and enhancement of state and tribal wetlands protection programs.
Wetlands Reserve Program	Federal	USDA, NRCS		Provides financial and technical assistance to protect and restore wetlands through the use of easements and restoration agreements.
Wildlife Habitat Incentive Program (WHIP)	Federal	USDA, NRCS		A voluntary program for conservation-minded landowners seeking to develop and improve wildlife habitat on agricultural land, nonindustrial private forest lands, and tribal lands.



Adoption Resolutions

