



# Chapter 17

## NATURAL HAZARDS

A place where all citizens enjoy opportunities to thrive in a safe, healthy, and productive community.  
- The Tuolumne County Vision

### Introduction

Section 65302(g) of the California Government Code requires that the General Plan include a Safety Element for the protection of the community from any unreasonable risks associated with the effects of seismically induced surface rupture, ground shaking, ground failure, tsunami, seiche, and dam failure; slope instability leading to mudslides and landslides; subsidence and other geologic hazards known to the legislative body; flooding, and wildland and urban fire, and climate change. The Natural Hazards Element addresses the information required by Section 65302(g).

Geologic hazards in Tuolumne County are associated with potential seismic activity along the Foothills fault zone and associated ground shaking. Hazardous situations could also result from development on unstable slopes within the County. Development on erosive soils, without proper environmental protection could result in significant soil loss, siltation of water bodies and visual impacts. The Natural Hazards Element aims at reducing death, injuries, property damage, and the economic and social dislocation resulting from natural hazards, thereby improving the quality of life within the County.

### Purpose

Recognize that the County's identity, economy, and attraction are rooted in its rural nature, and as a result, establish policies to protect the public from increased hazards and promote the safety of existing and future development.

### Overarching Vision

OAV1. Promote development in Tuolumne County that reflects the values and vision of the community and implement the latest legal, statutory, scientific, and technical changes and advances.

OAV2. Achieve, enable and preserve maximum flexibility within the constraints of state and federal law and an ever-evolving legal, cultural and environmental landscape.

OAV3. Recognize that the County has a unique role to collaborate with special districts/stakeholders within the County to promote the delivery of efficient and cost effective public services.



## **GOAL 17A:**

**Avoid the exposure of people and structures to potential substantial adverse effects, including the risk of loss, injury or death involving natural hazards.**

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### **POLICIES & IMPLEMENTATION PROGRAMS**

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**Policy 17.A.1:** Increase Tuolumne County’s capabilities to mitigate the effects of natural hazards.

**Implementation Program**

**17.A.a** - Implement the Tuolumne County Multi-Jurisdictional Hazard Mitigation Plan to protect life, safety, and property by reducing the potential for future damages and economic losses that result from natural hazards.

**Policy 17.A.2:** Enhance existing policies that will reduce the potential damaging effects of hazards without hindering other County goals.

**Implementation Program**

**17.A.b** - Update the County’s General Plan and Ordinance Code as new Federal and State laws regarding geologic hazards and requirements are enacted.

**Policy 17.A.3:** Protect Tuolumne County’s most vulnerable populations, buildings and critical facilities through the implementation of cost-effective and technically feasible mitigation projects.

**Implementation Program**

**17.A.c** - Maximize the use of hazard mitigation grant programs to protect the most vulnerable populations and structures.

**Policy 17.A.4:** Protect public health, safety and welfare by increasing the awareness of existing hazards and by fostering both individual and public responsibility in mitigating risks due to those hazards.

**Implementation Program**

**17.A.d** - Increase the level of knowledge and awareness for Tuolumne County residents on the hazards that routinely threaten the area. Educate property owners on the affordable, individual mitigation and preparedness measures that can be taken before the next hazard event.

**Policy 17.A.5:** Enhance the County’s capability to conduct hazard risk assessments, demonstrate funding needs, and track mitigation activities.

**Policy 17.A.6:** Ensure that all new construction is completed in a way most resistant to loss or damage from natural hazards.

**Implementation Programs**

**17.A.e** - Through the development review process, ensure that projects located in or near areas that may pose public health and safety hazards are designed to minimize potential impacts on people and property.



**17.A.f** - Locate vital/critical facilities where they are protected from natural hazards, such as fault zones, flooding and inundation areas.

## **GOAL 17B:**

**Protect structures and land uses from flood hazards in order to minimize loss of life, injury, damage to property, and economic and social dislocations**

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### **POLICIES & IMPLEMENTATION PROGRAMS**

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**Policy 17.B.1:** Reduce the potential for future damages and economic losses that result from flood hazards by implementing the Tuolumne County Multi-Jurisdictional Hazard Mitigation Plan.

**Policy 17.B.2:** Reduce the potential for damage to property within the 100 year floodplains as designated on the Federal Emergency Management Agency, Flood Insurance Rate Maps and other areas prone to flooding due to rain or dam failure, through limitations on land use.

#### **Implementation Programs**

**17.B.a** - Implement and enforce the Flood Damage Prevention Ordinance, Chapter 15.24 of the Tuolumne County Ordinance Code, as it pertains to designated "special flood hazard areas", as identified on the Flood Insurance Rate Maps.

**17.B.b** - Review and notify FEMA of errors or other information to correct or update FIRM maps.

**Policy 17.B.3:** Solve flood control problems in areas where existing development has encroached into a floodplain.

#### **Implementation Programs**

**17.B.c** - Encourage property owners with existing structures within areas subject to flooding, whether identified on the Flood Insurance Rate Maps or not, to conform to the requirements of the Flood Damage Prevention Ordinance.

**17.B.d** - Based upon the Flood Insurance Rate Maps, provide notification to the owners of property within designated floodplains of the consequences of constructing within the floodplain.

**17.B.e** - Encourage owners of land and improvements within floodplains not identified on the Federal Insurance Rate Maps (FIRM), to develop the property to meet the requirements of the Flood Damage Prevention Ordinance by implementing appropriate measures, such as:

- Identify owners of land and improvements within floodplains not identified on FIRMs.
- Develop and implement an outreach program to coordinate with these stakeholders.
- Prepare and distribute to the owners informational literature describing the requirements of the Flood Damage Prevention Ordinance.

**17.B.f** - Continue to provide flood hazard information to the public. Information available includes flood zones, requirements of the Flood Damage Prevention Ordinance, and how to floodproof existing structures through relocation, or "dry" or "wet" floodproofing.

**Policy 17.B.4:** Projects proposed within areas identified on the dam failure inundation maps designated by the Office of Emergency Services and evacuation policies on file with the County Office of Emergency



Services shall not be approved if a project presents a direct threat to human life or structures. Projects should be modified to ensure public safety.

#### **Implementation Program**

**17.B.g** - Regularly update the Emergency Operations Plan for Tuolumne County, which addresses dam failures in the Flood Annex. In the event of a dam failure, the Emergency Operations Plan refers to the Emergency Action Plan of the owner agency of the dam. The County will notify and assist in evacuation along federally designated flood plains.

**Policy 17.B.5:** Prohibit the construction of facilities essential for emergencies and large public assembly in the 100-year floodplain, unless the structure and access to the structure are free from flood inundation.

**Policy 17.B.6:** Consult with local, regional, State and Federal agencies to achieve adequate flood protection. Cooperate with the Tuolumne Utilities District, surrounding jurisdictions, the City of Sonora, and other public, State and Federal agencies in planning and implementing regional flood control improvements.

## **GOAL 17C:                    Manage floodplains for their natural resource value.**

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### **POLICIES & IMPLEMENTATION PROGRAMS**

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**Policy 17.C.1:** Minimize the risk from flood hazards through land use planning and the avoidance of incompatible structural development in floodplains.

#### **Implementation Programs**

**17.C.a** - Utilize regulatory methods of flood control, such as designating identified floodplains and drainage easements as Open Space, where possible, rather than construction-related methods of flood control. Regulatory methods reduce the need for flood control projects, minimize losses in areas where flooding is inevitable, and attempt to notify those who own property in flood hazard areas of the risks and that they should assume responsibility for their actions.

**17.C.b** - Maintain stream carrying capacity by continuing to regulate new fill, grading, dredging, and other new development which may increase flood damage by increasing sedimentation in streams and watercourses, or by constricting water courses with structures for roads and driveways. Encourage owners of land and improvements within floodplains to maintain the stream carrying capacity by allowing thinning of dense vegetation, subject to approval of the Community Resources Agency.

**Policy 17.C.2:** Continue to require evaluation of potential flood hazards prior to approval of development projects and require on-site mitigation to minimize off-site flows.

#### **Implementation Programs**

**17.C.c** - Proponents of new development shall submit accurate topographic and flow characteristics information and depiction of the 100-year floodplain boundaries under fully-developed, unmitigated conditions.



**17.C.d** - Review policies and available data concerning development in floodplains to ensure lives and property are not at risk from future flood conditions.

**17.C.e** - Require new development to mitigate impacts on downstream drainages if new development results in increased peak flows due to project-generated stormwater runoff. Measures necessary to mitigate impacts will be attached to development entitlements issued by the County, which may include retention/detention facilities, permeable surfacing materials, greywater systems, and green roofs.

**Policy 17.C.3:** Strive to maintain natural conditions within the 100-year floodplain of rivers and streams in order to maintain stream capacity except under the following circumstances:

- a. Where work is required to restore the stream's drainage characteristics and where such work is done in accordance with the Tuolumne County Water Quality Plan, County Flood Damage Prevention Ordinance, California Department of Fish and Wildlife regulations, and Clean Water Act provisions administered by the U.S. Army Corps of Engineers; or
- b. When facilities for the treatment of development generated runoff can be located in the floodplain provided that there is minimal destruction of riparian vegetation, and such work is done in accordance with the County Flood Damage Prevention Ordinance and California Department of Fish and Wildlife regulations.

**Implementation Program**

**17.C.f** - Maintain essential public facilities, such as culverts and drainage facilities along County maintained roads and eliminate logjams and other obstructions from bridges.

**GOAL 17D:**

**Protect new and existing structures and land uses from geologic hazards in order to minimize loss of life, injury, damage to property, and economic and social dislocations.**

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**POLICIES & IMPLEMENTATION PROGRAMS**

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**Policy 17.D.1:** Direct development away from areas with known seismic and geologic hazards as required by local, state, and federal codes.

**Implementation Program**

**17.D.a** - Designate areas within 100 feet of capable faults as non-urban, including, but not limited to, Open Space, Agriculture or Parks and Recreation on the General Plan land use diagrams and zone these areas for open space preservation, agriculture, recreation or other non-urban uses. For lands owned by a public agency, the designation of Public is also compatible.

**Policy 17.D.2:** Map areas determined to be potentially seismically active or otherwise subject to geologic hazardous and apply restrictions to development within the affected areas.

**Implementation Programs**

**17.D.b** - Apply zoning and other land use controls to regulate development in known hazardous areas capable of seismic activity.

**17.D.c** – Require as part of the application review process when a potential hazard exists, a geologic, seismic, and/or geotechnical engineering report to be provided by the applicant.



**17.D.d** - Establish a program for geologic, seismic, and geotechnical engineering reports required for proposed developments to be reviewed by a technically qualified consultant under contract to the County of Tuolumne.

**17.D.e** - Identify the public costs which would be incurred if emergency or remedial actions became necessary in populated areas where seismic hazards exist.

**17.D.f** - Review contingency plans for major disasters and emergencies and update as necessary to verify that the potential for damage and destruction due to earthquakes and geologically induced dam failure with accompanying flooding continues to be addressed.

**17.D.g** - Use the General Plan's Geotechnical Interpretive Maps, which show the approximate boundaries of various hazard and resource zones (such as fault zones, erosive soil areas, limestone deposits, etc.) as a basis for future planning.

**17.D.h** - Update the Geotechnical Interpretive Maps on a periodic basis to reflect new geologic and seismologic information.

**17.D.i** - Increase public awareness of geoseismic hazards, their location, and their severity by making the Geotechnical Interpretive Maps readily available to the public.

**Policy 17.D.3:** Incorporate criteria into the design for dams and other important structures possibly affected by capable fault zones that provide an acceptable level of safety.

#### **Implementation Programs**

**17.D.j** - Require developers of dams and critical-use and high occupancy structures within 100 feet of capable fault zones to submit plans to the County of Tuolumne demonstrating that the proposed design and construction can accommodate the expected fault offset of the design earthquake and the structure can continue to function. The capable fault zones are defined along presently identified capable faults on the Geotechnical Interpretive Maps.

**17.D.k** - Establish design review procedures that address safety issues for structures proposed for human occupancy which are to be located within 100 feet of a capable fault zone.

**17.D.l** - Apply special requirements to critical use and high occupancy structures proposed within 100 feet of capable fault zones. These requirements should:

- Require special geologic and seismic studies to accurately locate all capable fault traces.
- Establish requirements for existing critical use and high occupancy structures within the capable fault zones and initiate a special building inspection program whose purpose is to locate existing critical-use and high occupancy structures within 100 feet of the capable fault zones and to evaluate the safety of such structures under expected seismic conditions.
- Require necessary training for building inspectors to evaluate the safety (under probable earthquake accelerations) of critical-use and high occupancy structures.

**17.D.m** - Consider developing a hazardous structures mitigation program and enforcement regulations for critical-use and high occupancy buildings located within 100 feet of a capable fault zone.

**Policy 17.D.4:** Ascertain that existing or proposed structures, particularly critical-use and high occupancy structures, can withstand the ground motion of the design earthquake without catastrophic failure or loss of critical services.



### **Implementation Programs**

**17.D.n** - Review plans for existing and proposed structures to see that they are designed and built in accordance with the California Building Code standards for Seismic Category C or D.

**17.D.o** - Require that critical-use and high occupancy structures be designed and built to retain their structural integrity when subjected to probable ground accelerations generated by the design earthquake.

**17.D.p** - Prior to approval of proposed critical-use and high occupancy facilities, require that the plans demonstrate that the proposed building can withstand, without collapse, the probable ground acceleration generated by the design earthquake. Require development plans to show that critical facilities, such as utilities and access roads, for critical-use and high occupancy structures are adequately designed and constructed to withstand the design earthquake. Also require plans to show that, in the event of the failure of these structures, potential hazards created by the loss of utilities, roads, etc. have been identified and mitigated.

**17.D.q** - Periodically inspect existing critical-use and high occupancy buildings within the County to identify and require correction of potential hazards in the event of a major earthquake.

**17.D.r** - Develop a hazardous structures mitigation program and enforcement regulations for critical-use and high occupancy buildings. This shall include a database of the identified critical-use and high occupancy buildings existing in the County that do not meet modern standards for earthquake safety, and are, therefore, considered "hazardous". Descriptions of the buildings shall be included along with possible hazard mitigation measures.

**Policy 17.D.5:** Monitor development to see that construction in landslide or unstable slope areas is accomplished safely.

### **Implementation Program**

**17.C.s** - Require detailed engineering studies in unstable slope or landslide areas, including, but not limited to those areas delineated on the Geotechnical Interpretive Maps, prior to approval of urban development. The studies should identify the extent of instability or potential for landsliding, and recommend design alterations, considerations or other features which could reduce the potential hazards to an acceptable level. The feasible recommendations from the study(s) shall be required as part of the project approval process.

**Policy 17.D.6:** Reduce the potential for erosion and sedimentation from earthmoving and construction activities.

### **Implementation Programs**

**17.D.t** - Apply Chapter 12.20 of the Tuolumne County Ordinance Code, the Grading Ordinance, in order to protect soil stability and natural topography and to prevent soil erosion and creation of unstable slopes. Areas identified as having erosive soils, either by the Geotechnical Interpretive Maps or by other means, shall receive special consideration related to the erosive potential of grading and earthmoving activities.

**17.D.u** - Apply Chapter 12.20 of the Tuolumne County Ordinance Code, the Grading Ordinance, to address the impacts of earth-disturbing development activities on any slope, whether or not it is shown as potentially unstable on the geotechnical maps.



## **GOAL 17E:**

**Provide protection to County residents and natural resources from the losses associated with wildland fire.**

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### **POLICIES & IMPLEMENTATION PROGRAMS**

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**Policy 17.E.1:** Reduce the exposure to risk from wildland fire to an acceptable level by only allowing development in high or very high fire hazard areas if it can be made safe by planning, construction, or other fire safety measures.

#### **Implementation Programs**

**17.E.a** - Utilize the CAL FIRE Forest and Resource Assessment Program "Fire Hazard Severity Zone Map", including revisions thereto, as a basis for determining the significance of fire hazards when reviewing development applications.

**17.E.b** - New development in very high fire hazard zones in local or state responsibility areas shall meet California Building and Fire Codes, including Wildland-Urban Interface Building Codes. For new development proposed in very high fire hazard zones, the County will consult with the State fire agency (CAL FIRE) to determine that all feasible wildfire mitigation measures are included and that safe ingress/egress criteria are met. Developments in either high or very high fire hazard zones may be required to provide and maintain additional off-site fire defense improvements.

**Policy 17.E.2:** Require the maintenance of defensible space setbacks in areas proposed for development if wildland fire hazards exist on adjacent properties.

**Policy 17.E.3:** Require new development to have adequate fire protection and to include, where necessary, design and maintenance features that contribute to the protection of the County from the losses associated with wildland fire.

#### **Implementation Programs**

**17.E.c** - Require new development to mitigate wildland fire hazards in such a manner that it minimizes the chance of wildland fire originating outside the development from entering the development and minimizes the chance of fire originating within the development escaping to adjoining property and adjacent wildland.

**17.E.d** - Require developers to incorporate fire protection improvements into project designs where determined necessary by the Tuolumne County Fire Department and require maintenance of these improvements. Fuelbreaks, green belts, long-term comprehensive fuel management programs, access to developed water sources, strategic helispots (with water supply), and perimeter road systems can all serve to reduce the fire hazard on project sites as well as adjacent property.

**17.E.e** - Require new development in areas subject to wildland fire to provide safe ingress and egress in accordance with Chapter 11.12 of the Tuolumne County Ordinance Code. Encourage new development that complies with Chapter 11.12 to provide multiple access routes, especially in very high fire hazard severity zones or where one access route is susceptible to closure by landslide, loss of a bridge or other cause.

**17.E.f** - Support the efforts of the Tuolumne County Fire Department to prevent loss of life, property and resources. Refer land development applications which would permit structures in



areas subject to wildland fire to the Tuolumne County Fire Department/CAL FIRE for review and identification of measures necessary to mitigate the fire hazard.

**17.E.g** - Consult the U.S. Forest Service, National Park Service and other federal land management agencies regarding applications for development on privately owned lands located adjacent to or within these agencies' boundaries to obtain comments regarding the impact of the project on the wildland fire protection mission of that agency.

**17.E.h** - Revise and enforce County fire protection regulations such that new development in areas subject to wildland fire provides for clearing adjacent to access roads in order to reduce radiant heat received by vehicles on the roadway and thereby facilitate safe evacuation of residents and response by emergency vehicles in the event of wildland fire.

**17.E.i** - Periodically update the County's fire protection standards to reflect new information and technology concerning fire prevention in wildland areas.

**17.E.j** - Locate new essential public facilities including, but not limited to, hospitals, health care facilities, emergency shelters, emergency operations centers and emergency communications facilities, outside very high fire hazard severity zones if feasible. If essential public facilities must be located in high or very high fire hazard severity zones, incorporate design, construction or other measures to minimize damage in the event of a wildland fire.

**Policy 17.E.4:** Promote public awareness of wildland fire hazards present within the County, as well as proper fire prevention and protection practices.

#### **Implementation Programs**

**17.E.k** - Actively seek funding to develop fire prevention public awareness and education programs.

**17.E.l** - Educate residents in forested areas about wildfire hazards and the steps to avoid excessive risk.

**17.E.l.1** - Evaluate safety deficiencies in existing structures that were constructed prior to contemporary fire safe standards and assess, where feasible, improving infrastructure in these areas, including possible physical renovations to structures.

**17.E.l.2** - Work with Federal, State, and local agencies to improve road infrastructure to residential areas in the County which have been identified as having deficient emergency access. This could include the development of new secondary access roads, maintenance or clearing of existing secondary roads which do not meet Title 11 standards, implementing projects identified within a Community Wildfire Protection Plan (CWPP) such as fuel break development or vegetation clearing, or the development of a Temporary Refuge Area.

**Policy 17.E.5:** Maintain firefighting assets within the County at necessary levels.

#### **Implementation Programs**

**17.E.m** – Support the operation of a fully-staffed CAL FIRE Columbia Air Attack Base at the Columbia Airport.

**17.E.n** - Continue to make County airports available to facilitate fire suppression aircraft operations.

**Policy 17.E.6:** Encourage rapid post-fire assessment and rehabilitation of burned lands to limit soil erosion, protect water quality, minimize flooding and restore damaged landscapes.



### **Implementation Program**

**17.E.o** - Support the efforts of fire protection organizations and property owners to develop burn area recovery plans that include rapid post-fire assessment and implementation actions that encourage salvage of burned trees and reforestation activities, create resilient and sustainable landscapes and restore functioning ecosystems.

**Policy 17.E.7:** Protect natural resources from the effects of wildland fire.

### **Implementation Programs**

**17.E.p** - In the event of major wildland fires that exceed the capability of local fire protection resources to control, implement the Wildland Fire Plan contained in the *Emergency Operations Plan for Tuolumne County*.

**17.E.q** - Coordinate revisions of the *Tuolumne County Community Wildfire Protection Plan* and individual community wildfire protection plans with the current version of the CAL FIRE *Strategic Fire Plan for the Tuolumne/Calaveras Unit* to include projects to reduce the wildland fire in the County.

**17.E.r** - Utilize the *Tuolumne County Community Wildfire Protection Plan*, the *Highway 108 Strategic Plan*, the CAL FIRE *Strategic Fire Plan for the Tuolumne/Calaveras Unit* and other adopted fire prevention, protection and response plans to identify the maximum acceptable wildfire size and acceptable initial attack success rate for protection of wildland areas and provide the resources necessary to achieve these standards.

**Policy 17.E.8:** Require property owners to maintain wildlands in a fire resistant manner consistent with Section 4291 of the Public Resources Code. Assist fire protection agencies in their efforts to enforce Section 4291.

### **Implementation Programs**

**17.E.s** - Maintain the County's policies concerning development in the Tuolumne County Ordinance Code in the wildland urban interface area to further reduce the risk of life and property loss from future wildfires.

**17.E.t** - Require property owners to remove trees killed by drought, disease, insects and other pests to utilize the timber value and reduce the wildland fire hazard consistent with Section 4291 of the Public Resources Code unless a tree is determined to have significant wildlife habitat value by a qualified biologist.

**Policy 17.E.9:** Consider effects on cultural resources, wildlife habitat and special status species when developing wildfire prevention, protection and recovery plans.

### **Implementation Programs**

**17.E.u** - Evaluate the effects on wildlife habitat and special status species when developing wildfire prevention, protection and recovery plans. Incorporate measures to mitigate potentially significant impacts into adopted plans.

**17.E.v** - Incorporate the habitat needs of native wildlife species into wildfire prevention, protection and recovery plans. Utilize plant species native to the area when designing revegetation plans.



**17.E.w** - Evaluate the effects on cultural resources when developing wildfire prevention, protection and recovery plans. Incorporate measures to mitigate potentially significant impacts into adopted plans.

**Policy 17.E.10:** Identify assets that require protection from wildland fire and prioritize their protection needs.

**Implementation Program**

**17.E.x** - When updating the *Tuolumne County Community Wildfire Protection Plan* or updating or preparing other community wildfire protection plans, include the following:

1. A prioritization of physical assets that require protection from wildland fire; and
2. Fire defense strategies that provide fire protection without dependence on air attack and could serve as safety zones for the public or emergency support personnel.

**Policy 17.E.11:** Encourage resolution of conflicts between wildland fire protection and habitat conservation for wildlife.

**Implementation Program**

**17.D.y** - Coordinate with CAL FIRE, the Tuolumne County Fire Department and the California Department of Fish and Wildlife to identify acceptable levels of wildland fuel reduction in areas conserved for biological resources to mitigate impacts of development.

**Policy 17.E.12:** Acknowledge that wildland areas provide natural resource values to the citizens of the County, visitors and other persons throughout the State, including watershed resources, timber resources, visual resources, carbon sequestration, wildlife habitat and special status species habitat.

**GOAL 17F:**

**Plan, prepare for, and adapt to significant drought impacts on the water supply.**

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## POLICIES & IMPLEMENTATION PROGRAMS

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**Policy 17.F.1:** Educate the public regarding droughts.

**Implementation Programs**

**17.F.a** - Educate the public on preparedness, planning, and response for drought and other emergencies affecting the water supply. Consider conducting annual water forums as public outreach.

**17.F.b** - Effectively communicate the procedures and available resources information to the community in the event of drought.

**Policy 17.F.2:** Minimize the impacts of drought on residents by developing short-term and long-term approaches to drought preparedness, response and recovery.

**Implementation Programs**

**17.F.c** - Closely monitor drought conditions and assist water agencies to implement the least drastic mitigation measures required.

**17.F.d** - Work with water agencies to develop a Drought Preparedness Plan.

**17.F.e** - Consider updating the Tuolumne County Multi-Jurisdictional Hazard Mitigation Plan to specifically address preparedness for short-term and long-term droughts.



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