

9.0 HAZARDS

9.1 OVERVIEW

LEGAL BASIS AND REQUIREMENTS

California Government Code Section 65302(g) describes the subject matter of a Safety Element, which is one of the seven mandated elements of a general plan. A general plan shall 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, liquefaction and other seismic hazards identified pursuant to Chapter 7.8 (commencing with Section 2690) of the Public Resources Code, and other geologic hazards known to the legislative body; flooding; and wild land and urban fires. The safety element shall include mapping of known seismic and other geologic hazards. It shall also address evacuation routes, military installations, peakload water supply requirements, and minimum road widths and clearances around structures, as those items relate to identified fire and geologic hazards.

Tehama County, in cooperation with the Cities of Corning, Red Bluff and Tehama, adopted a Safety Element and a Seismic Safety Element in 1974.

This section addresses hazard and safety element issues relevant to Tehama County, in consideration of the update of the County's General Plan.

9.2 PURPOSE AND METHODOLOGY

The last major update of the Safety Element occurred in 1974. Although State planning law does not establish a required schedule for updating the Safety Element, the Office of Planning and Research (OPR) encourages regular review and revision of general plan elements as new information becomes available and as community needs and values change (OPR, 1998). New information on safety related issues and potential hazards not addressed in the current element, such as naturally occurring asbestos, are discussed below.

9.3 EXISTING SETTING

Information for this section was gained from existing public documents from County or other governmental agencies and from contacts with County staff and others as shown in the Bibliography.

FIRE PROTECTION ENVIRONMENTS

Tehama County has a diversity of environments in which structure fire protection must be provided. Large areas of Tehama County are rural in nature and include scattered residences and out-buildings with large separations between properties. Tehama County's rural area includes small rural community centers such as Bowman, Manton, Mineral, Paynes Creek, Paskenta, Ponderosa Sky Ranch, and Mill Creek where communities have formed and densities of structures have increased. These rural centers normally include small commercial/neighborhood businesses and services. With the exception of Paskenta and Ponderosa Sky Ranch, all of these rural community centers have TCFD fire stations located in or near them.

Tehama County also has many existing and proposed residential developments which span from rural to suburban in nature. The three most prominent developments are Rancho Tehama, Lake California and the Surrey Village/Wilcox area. These three developments are large in size, but represent very different structure fire protection environments. Rancho Tehama is typified by five-acre parcels, in most cases providing good separation between residences (predominately mobile homes) but often having nearby out-buildings. Rancho Tehama does not have a water supply system. With the terrain in Rancho Tehama being rolling hills with continuous grass vegetation, the potential for a summer time structure fire spreading to the wildland and threatening other structures is great.

Lake California is typified by small suburban sized lots and greater residential density with clearance between residences as little as fifteen feet. All residences are normal site constructed wood frame buildings. Some multi-family residences are scattered throughout the area. While there is less clearance between residences fewer out buildings exist. Both Lake California and Rancho Tehama have community commercial businesses and airports. Lake California also has a large community meeting and recreation hall. Lake California has a rated water system throughout the community.

The Surrey Village/Wilcox area is an upscale residential area with conventionally constructed homes on one half to one acre size parcels. While the Surrey Village/Wilcox area has much the same terrain and vegetation as Rancho Tehama and Lake California it does not have a commercial/business area. Residential structure size in this development is greater than either those typically found in Lake California or Rancho Tehama. This area does not have a rated water system for fire protection.

Tehama County also includes areas of suburban, urban, and small town environments such as Antelope, Los Molinos, Vina, Proberta, Richfield, the City of Tehama, and areas surrounding the Red Bluff and Corning City limits. These areas have greater density and often as little as thirty feet separation of structures or less. Some of these areas have rated water systems such as Los Molinos and the City of Tehama, while areas of Antelope and near the Corning City limits benefit from being near city water system lines. Most of these areas have significant numbers of community sized commercial structures and services such as schools.

Within Tehama County are pockets of heavy industrial/commercial developments. These include industries in the Vina area, Richfield area, Corning area, and the south Red Bluff area. In most cases these industries have private water systems rated to provide required fire flows for the facilities. Most also include fire suppression sprinkler systems. While these facilities account for a small number of TCFD responses each year, they represent a major community investment in jobs and tax revenue. The addition of Rolling Hills Casino has created a "complex" of a large assembly occupancy and R-1 occupancies. Providing fire protection for these facilities is a specialized and often complex task.

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The unincorporated areas of the county are protected by the California Department of Forestry and Fire Protection (CDF). As reported in the *Tehama County Agency Incident Count Report*, the CDF responded to 8,524 incidents in 2005. This included 122 structure fires, 252 vegetation fires, and 666 fires of other types, including vehicle fires. It also included 5,638 medical emergencies and 1,735 other calls.

A *Fire Management Plan 2005* has been prepared for the Tehama-Glenn Unit as recognized by the CDF in cooperation with Tehama Fire Councils. This plan was adapted from the original

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Tehama-Glenn Unit Fire Management Plan 2000 and subsequent versions. The Tehama-Glenn Unit includes areas in both Tehama and Glenn Counties. (Much of the following discussion, unless otherwise noted, is derived from this plan.)

The intent of the Fire Management Plan is to document the findings of a fire plan assessment process, assist stakeholders with pre-fire management decision-making, and communicate the fire problem and subsequent solutions to stakeholders and citizens. The fire plan systematically evaluated the existing level of wildland fire protection variables, including protection service, and identified high-risk and high-value areas where potential exists for costly and damaging wildfires. The plan ranks these areas in terms of priority needs and prescribes what can be done to reduce future costs and losses. The fire plan assessment system has four components: Level of Service; Assets at Risk; Hazardous Fuels; and Historic Fire Weather.

According to the Tehama-Glenn Unit Fire Management Plan, the plan is the instrument by which pre-fire planning activities are identified, prioritized and implemented through the cooperative efforts of local fire agencies and fire safe councils. Moreover, through the cooperative efforts of local fire agencies, fire safe councils, and county land use planners, progress has been made in identifying and effecting changes in fire safe regulations, pre-development standards, evacuation planning, fuel hazard reduction and defensible space standards.

The Tehama-Glenn Unit, as recognized by CDF, consists of four geographical "Battalions". Each Battalion consists of a distinct mix of geography, fuels, access issues, values at risk and fire causes.

The Manton Battalion lies in the northeast corner of the Unit entirely within Tehama County. It runs from the eastern foothills on the east side of the Sacramento Valley to the Lassen National Forest boundary on the east, and from the Butte County line in the south to the Shasta County line in the north. Topography has a predominate volcanic influence and includes rolling foothills in the west to mountain terrain in the east. This area includes several major drainages that run generally east to west including Deer Creek, Antelope Creek, Mill Creek and Battle Creek. These drainages form steep canyons, which present substantial access problems and promote rapid fire spread. Values at risk include several rural communities and hundreds of isolated structures, extensive timber, rangelands, watershed and associated fisheries. The communities of Paynes Creek, Manton, Ponderosa Sky Ranch and Mineral have historically suffered damage to homes and property during periodic fires in these areas.

The Sacramento River Battalion lies primarily within the Sacramento Valley and covers a large area of Local Responsibility Area. It includes the communities of the Vina Plains area, Los Molinos, City of Tehama, Dairyville, Proberta, City of Red Bluff and Bend. The Sacramento River and the valley floor with large areas of relatively flat river bottomland providing good access dominate the topography of this area. The topography along the eastern edge of the Battalion rises into the foothills towards the Manton Battalion in the east with restricted access due to volcanic rock. North of Red Bluff this area covers the rolling hills of the Bend area with some areas of difficult accessibility due to gullies and draws. Values at risk include the greatest concentration of residential, commercial and industrial structures in Tehama County. Intermixed with this development are extensive areas of agricultural improvements such as orchards, cultivated fields and associated outbuildings. Fast moving wind-driven fires in this area do minimal damage to the agricultural products but often threaten or involve the associated residences and outbuildings.

The Red Bank Battalion lies in the northwest portion of Tehama County and includes the communities of Lake California, Bowman, Dibble Creek, R-Wildhorse Ranch, Ridgeway and Red

Bank. The valley floor forms much of the eastern boundary with the western boundary formed by the Mendocino National Forest and the Shasta-Trinity National Forest. Topography and fuels within the Battalion are predominantly rolling hills with grass/oak woodland fuels changing to brush and foothill or gray pine further to the west and, along the National Forest boundaries, has mixed conifer forests. Access is varied with fair to good access existing in most of the eastern portion and fair to poor access in the west due to less development and steeper terrain with heavier fuel loading and poor access. Typical fires include moderate to fast moving grass fires. Values at risk include a large number of residential and associated structures on large-lot or ranchette parcels. There is occasional occurrence of high-intensity large fires in the transition area from rolling hills to mountain terrain with heavier fuel loading and poor access.

The Paskenta Battalion includes the Local Responsibility Area of Tehama County near Richfield, Corning and to the Tehama-Glenn County line south of Corning on the west side of the Sacramento River, and extends into Glenn County. This area is similar in topography and fuels to the Red Bank Battalion and shares many of the same types of fires and causes. Tehama County communities within the Paskenta Battalion include Richfield, Corning, Rancho Tehama and Paskenta. These communities, along with scattered ranch houses and residences along with rangeland, form the primary values at risk. Fires within this Battalion are, historically, often fast-moving grass fires that may grow to 200 acres or more in size. Frequent fires along Interstate 5 in southern Tehama County provide a threat to CDF jurisdiction lands.

In a review of "fire threatened communities", the Tehama-Glenn Unit Fire Management Plan recognized the following Tehama County communities as having either a moderate or a high threat. The list also indicated if some or all of the wildland fire threat was related to federal lands. This list is derived from the National Registry as reported in the fire management plan.

**TABLE 9-1
FIRE THREATENED COMMUNITIES IN TEHAMA COUNTY**

COMMUNITY	FEDERAL THREAT	HAZARD LEVEL
Bend	X	2
Bowman	X	3
Corning		3
Dairyville		2
Los Molinos	X	2
Manton	X	3
Mill Creek	X	3
Mineral	X	3
Paskenta	X	3
Paynes Creek	X	3
Red Bluff	X	3

¹ Federal Threat indicates some or all of the wildland fire threat to that community comes from federal lands (e.g., US Forest Service, Bureau of Land Management).

² Hazard Level code indicates the fire threat level. A rating of 2 denotes moderate threat and 3 denotes high threat.

Source: Tehama-Glenn Unit Fire Management Plan 2004.

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Other communities in Tehama County are not listed on the National Registry but may still be at risk. These include, but are not limited to, communities such as Flournoy, Gerber, Lake California, Proberta, Rancho Tehama, Red Bank, Richfield, Vina and Tehama.

The California Department of Forestry and Fire Protection (CDF) notes on the Tehama County Natural Hazard Disclosure (Fire) map that most of the non-federal land outside the valley floor of Tehama County is classified as a "wildland area that may contain substantial forest fire risks and hazards", pursuant to Public Resources Code Section 4125. It is noted on this map that the owners of property in this area are subject to the maintenance requirements of Section 4291 of the Public Resources Code. Additionally, it is noted that, "It is not the state's responsibility to provide fire protection services to any building or structure located within wildland unless the Department of Forestry and Fire Protection has entered into a cooperative agreement with a local agency for those purposes pursuant to Section 4142 of the Public Resources Code.

The CDF advocates that "fire hazard zoning" is one of the first steps in a comprehensive land use plan. Fire hazard zoning is defined as a planning and regulatory activity, typically conducted by a local agency such as a county, to provide criteria for what kinds, how many and under what conditions development or other activities should be regulated in areas of various fire hazard classifications. Several state laws pertain to this issue. (See regulatory framework below). The *Fire Hazard Zoning Field Guide*, published by CDF in 2000, clarifies and discusses fire hazard zoning.

The *Fire Hazard Zoning Field Guide* observes that rural and wildland development has continuously and increasingly impacted wildland fire protection in interface areas where development has encroached into outlying areas of grasslands, woodlands and forests. Historically, the state has taken responsibility for wildland fire protection, while local agencies govern land use planning and development. Partly because of this separation of authority, areas known today as the "Urban-Wildland Interface" have continued to grow and the increase in the number of dwellings intermingled with wildland vegetation has created wildfire problems of statewide significance. Much of this area is located in "State Responsibility Areas" (SRA), which are areas of the state in which the financial responsibility of preventing and suppressing fires has been assigned by the State Board of Forestry to be primarily the responsibility of the state.

The U.S. Forest Service staffs a number of engines and hand crews during the fire season located within and adjacent to Tehama County. U.S. Forest Service fire protection resources are located in Mineral, Chester, Butte Meadows. In addition the National Park Service operates one engine and a fire prevention hand crew during the fire season. The engine and hand crew are both located in Mineral within Tehama County.

The Cities of Red Bluff and Corning each maintain their own fire departments. A complete map detailing the fire hazard and fire responsibilities within Tehama County is included as **Figure 9-1**.

WILDLAND FIRES

Wildland fires in Tehama County may be divided into two categories and each has a distinct environment in which they take place:

- 1) Vegetation fires in urban and agricultural areas (LRA, valley floor).
 - a. The spread of these fires is ultimately limited by their surroundings, usually manmade barriers and changes in fuel type. Response times are relatively short.

- b. On scene attack time is relatively short.
 - c. The main challenge in the suppression of these fires is to limit their immediate impact on citizens, structures, and economic values.
 - d. Most of these fires can be extinguished by standard fire fighting apparatus and do not require specialized equipment. Off road mobile attacks increase wear on municipal types of engines.
 - e. These fires are normally suppressed by TCFD resources and are sometimes supplemented by CDF resources.
 - f. Physical demands on personnel are generally moderate and of short duration.
 - g. The most threatening fires in this area are wind driven and those that burn in fields of twenty acres in size or greater. These types of fires occur primarily in the south county/Corning area of the county and along the I-5 corridor.
- 2) Wildland fires in rural and remote areas during fire season (SRA, above the valley floor).
- a. The spread of these fires is usually unlimited. If not suppressed these fires may spread until a combination of weather and natural barriers combine to contain them.
 - b. Response times may be long.
 - c. On scene attack time can be extended and may last days.
 - d. Terrain is often more difficult.
 - e. Vegetation type often has a higher resistance to control.
 - f. The principal goal in the suppression of these fires is to limit their size so that large tracts of land are not consumed, minimizing the impact to natural resources while reducing the threat to remote farms, ranches, and small rural communities.
 - g. TCFD resources are often assigned structure protection.
 - h. Many wildland fires require not only specialized engines but a coordinated and combined attack by engines, aircraft, bulldozers, and hand crews.
 - i. If the fire requires a sustained attack, large logistical and support functions are required.
 - j. TCFD resources normally supplement CDF resources and are released as soon as possible.

The most threatening fires in this type occur in the McCoy Road, Surrey Village, Wilcox Road, Bowman, Lake California, Rancho Tehama, Manton, and Ponderosa Sky Ranch areas due to the mix of structures, flashy fuels and difficult terrain.

Tehama County is no different than most other parts of California; residential growth in urban interface areas is and will continue to be the greatest impact on wildland fire protection. TCFD

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resources will be called upon more often with increasingly long periods of time to protect structures from wildland fires.

Every five years, CDF reviews the boundaries of SRA and LRA lands. Those lands which continue to be developed upon in the SRA will be considered for conversion to LRA lands. At that point, and until these lands become built upon enough to reduce wildland vegetation mixed with the developments, these areas will become a major risk for wildland/urban interface fires and structural losses. If converted to LRA, this will become a TCFD responsibility and cost.

Continued urban/interface development throughout California and Tehama County will increase the likelihood of resource requests for out-of-county assignments. During this period of time, TCFD engines may be deployed out of Tehama County for extended periods of time. Reserve engines will be utilized to fill in behind such assignments. In return, under the state wide master mutual aid agreement, TCFD will have access to out-of-county resources when large wildfires threaten Tehama County.

Fire Safe regulations and development conditions will become increasingly important in the mitigation of the impacts from urban/interface development.

STATE RESPONSIBILITY AREAS

The State Board of Forestry has adopted "fire safe" regulations for counties with State Responsibility Areas, or SRAs (Title 14, Section 1270 *et seq.*, California Code of Regulations) as a means of reducing pre-fire fuel loads. SRAs are identified by the State Board of Forestry as areas in which the primary financial responsibility for preventing and suppressing fires rests with the state. Tehama County contains SRAs. The statewide fire safe regulations include:

- Road standards for emergency access and evacuation, including width, surface and grade.
- Standards for signs identifying streets, roads and buildings.
- Minimum water supply reserves for emergency fire use.
- Fuel breaks (i.e., "defensible space") around structures and greenbelts around new subdivisions.

With certain exceptions, after July 1, 1991 all new construction and subdivisions within SRAs must meet the Title 14 standards or equivalent local requirements that have been certified by the State Board of Forestry. Health and Safety Code Section 13143.5 allows local fire officials to change or modify the statewide minimum standards when findings are reasonable and necessary because of local climate, geological or topographical conditions. Any changes cannot be less restrictive than the minimum state standard.

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Tehama County is exposed to minimal seismic hazards due to its geographic location. The 1994 *Fault Activity Map*, prepared by the California Division of Mines and Geology (now the California Geological Survey), indicates no active or potentially active faults within Tehama County. Geologic hazards associated with seismic activity, such as liquefaction and seiche (earthquake generated waves), also have a low probability of occurring within Tehama County. Although no active faults are mapped in the county there exists the potential for minor, localized earth shaking events as precursors to eruptive activity of Mount Lassen.

The region of Tehama County may experience earth-shaking activity from seismic events that occurs outside the county. A review of seismic activity over the past 100 years is included in the 1974 Seismic Safety Element and states the following: "The planning area (Tehama County) has experienced only minor earthquakes within the area and secondary impacts from earthquakes centered out of the area. Projections of future impacts from seismic activity are from low to moderate."

FLOOD HAZARDS

Flooding can be a major problem in almost any part of the County, and is most predominant throughout the Central Valley region along the Sacramento River corridor. Heavy rains can be the most frequent cause of flooding in the lower areas. The basis for determining flood hazards is the "base flood; or the "100-year flood"- a flood level that has a one percent chance of being equaled or exceeded in any given year. The land area subject to inundation by the base flood is referred to as the "100-year floodplain." Typically, the 100-year floodplain is delineated on Flood Insurance Rate Maps prepared by the Federal Emergency Management Agency (FEMA) for regulatory purposes concerning flood insurance. Generally, development within a floodplain is discouraged, as it not only subjects structures and other development to flood waters, but the increase in surface runoff generated by more impervious surfaces may actually increase the frequency of flooding.

Rivers and streams where FEMA has prepared detailed engineering studies may have designated "floodways." The floodway is typically the area where the water is likely to be deepest and flow fastest, usually adjacent to the stream channel. Placing fill or buildings in a floodway may block the flow of water and increase flood heights. Therefore, development within the floodway is strongly discouraged or limited, or requires engineering analysis.

Figure 9-2 depicts areas in Tehama County within a 100-year floodplain, as delineated on Flood Insurance Rate Maps. Most of the floodplains in the County are located along the Sacramento River corridor and its associated tributaries. The areas within the County most prone to flooding, as identified in **Figure 9-2** include the following:

- Sacramento River Corridor, including the cities of Red Bluff and Tehama
- Sacramento River tributary corridors

Dam failure, the collapse or failure of an impoundment that causes significant downstream flooding, is a potential hazard for Tehama County. Flooding of the area below the dam may occur as a result of structural failure of the dam, overtopping, or a seiche (earthquake generated waves). The collapse and structural failure of a dam may be caused by a severe storm, earthquakes, or internal erosion of piping caused by embankment and foundation leakage. Larger dams that would inundate significant portions of the county include the Shasta Dam (in Shasta County), Red Bluff Diversion Dam on the Sacramento River and Black Butte Dam on Stony Creek. The areas within the County most threatened by dam inundation are the incorporated and unincorporated areas along the Sacramento River corridor, including Red Bluff and Tehama.

There are also a number of small dams, ponds, canals and two federal levees associated with agricultural uses throughout the county which cannot be discounted as threats. Although on smaller scale, if such dams break, they could cause damage to structures, roads, utilities or other infrastructure.

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OTHER GEOLOGIC HAZARDS

Volcanic Activity

Tehama County lies adjacent to Lassen Peak, an active volcano of the Cascade Range. The U.S. Geological Survey (USGS) has identified volcanic activity within the Mount Lassen area for the past 600,000 years with the most recent eruptions occurring between 1914 and 1917. Volcanic activity included at least two blasts that devastated areas to the east of the peak and produced mudflows that inundated the valley floors to the north and east of the mountain.

Mount Lassen is expected to endure repeated small eruptions in the future including pyroclastic flows (high-density mixtures of hot, dry rock fragments and hot gases that move away from the vent at high speeds), small to moderate size debris flows, formation of cinder cones, small volumes of tephra (volcanic ash, pumice and dense rock material emitted from an eruption), and lava flows.

The hazard of mud and debris flows associated with volcanic activity is a realistic risk in Tehama County. Volcanic mudflows, called Lahars, can be triggered by eruptions when large quantities of snow melt and water mixes with ash, volcanic debris and existing geologic material such as boulders and cobbles. Small lahars associated with volcanic activity in 1915 traveled more than 18 kilometers down the flanks of Lassen Peak (USGS).

Most volcanic activity is preceded by a number of warnings before eruptions begin. Warning signs could include detectable earthquakes, ground deformations, steaming activity and heat flow or changes in the temperature and chemistry of ground and spring waters.

Landslides/Slope Stability

Landslides in Tehama County are an active part of the natural erosion process. The climate (with wet winters and dry summers), the mountainous terrain, areas of weak bedrock conditions, and commonly thick unconsolidated soil and rock all contribute to the development of landslides. Human activities that affect vegetation, slope gradients, and drainage processes can also contribute to slope instability and erosion.

The California Geological Society (CGS) has identified a number of landslide and slope instability types, of which the following may occur in Tehama County: debris flows, earthflows, rock falls, creep and slumps. *Debris flows* (also referred to as mudslides, mudflows, or debris avalanches) are a highly fluid, high velocity mixture of sediment and water that generally occurs during intense rainfall on water-saturated soil. Mudflows associated with volcanic eruptions are referred to as lahars. An *earthflow* is a slow velocity landslide resulting from flowage of saturated soil and debris in a relatively coherent mass. Earthflows usually remain active for long periods of time and are composed of clay-rich materials that swell when wet. *Rock falls* occur on steep slopes or cliffs and typically involve failure of weathered rock material. A rock fall may be a single rock or a mass of rocks. *Creep and slump* landslides involve the continuous gradual movement of earth material down slope. Slumps and creeps can be isolated or may occur in large complexes. The triggering mechanisms for these types of slope instability typically include introduction of water from rainfall, surface flow, seepage, or other possibly artificial means. Seismic shaking and volcanic activity can also be triggering mechanisms.

The risk of slope instability is highest in the Coast Range of western Tehama County and coincides with climatic, topographic and geologic environments that induce landslides (**Figure 9-3**). In general the Coast Range is associated with a wet climate, steep terrain and the

Franciscan Geologic Formation, which is known to have poor slope stability characteristics. In contrast, the metamorphic and volcanic rocks of eastern Tehama County exhibit much better slope stability characteristics, but may contain localized areas where poor slope stability conditions are apparent.

Naturally Occurring Asbestos

Asbestos is the general name for a group of minerals that consist of extremely strong and durable fibers. It has been used extensively in the past as fireproofing and thermal insulation. However, it has been discovered that asbestos poses a health risk. When disturbed, asbestos fibers are released into the air, where they remain for a long period of time. These fibers pose a serious health threat if inhaled, as they can become permanently lodged in the body tissues. Exposure to asbestos has been shown to cause cancer of the lung and stomach and other cancers, as well as asbestosis (a severe form of lung disease). There has been no safe level of exposure established for asbestos. The California Air Resources Board has adopted an Airborne Toxic Control Measure (ATCM) for *Naturally Occurring Asbestos (NOA) and Construction, Grading, Quarrying, and Surface Mining Applications*.

Asbestos mineral groups can be found in naturally occurring rock formations. The presence of ultramafic rock indicates the possible existence of naturally occurring asbestos. Ultramafic rocks contain a high percent of dark-colored (iron-magnesium-silica) minerals and are formed in high temperature environments well below the earth's surface. By the time they are exposed at the surface by uplift and erosion ultramafic rocks may be partially or completely altered to a metamorphic rock known as serpentinite, commonly called serpentine. Asbestos fibers are released when serpentine rock is disturbed, such as by grading and construction activities. The Tehama County Air Pollution Control District has adopted policies to reduce the effects of NOA by reducing the use and sale of serpentine materials in the county.

Expansive Soils

Expansive soils are common in western and central California, particularly where clay-rich parent material are present or within seasonally wet basin area. Near-surface expansive clays shrink and swell where subject to seasonal soil moisture variations. Expansive soils can be recognized by the appearance of soil cracks that open during the dry season and close during the rainy season. Structures, pavements, concrete slab and other improvements can experience significant damage from this seasonal shrinking and swelling process if not designed to address the presence of expansive soils. Expansive soils can also accelerate landslides and the process of soil creep on slopes.

The USGS *Swelling Clays Map Of The Conterminous United States, Soil Map of California* identifies regions of expansive soils to exist within Tehama County. In the Coast Range region of western Tehama County soils with high swell potential exist. In the Central Valley region and low Sierra Foothill region of central Tehama county soils with slight to moderate swell potential exist, while the eastern part of the county consists of soils with little or no shrink-swell clays.

Land Subsidence

Land subsidence exists extensively throughout the Central Valley as a result of excessive ground water withdrawal, compaction of peat and hydrocompaction (compaction of saturated soils). Of these, excessive ground water withdrawal has caused the most widespread and severe subsidence in California. The US Geological Society has mapped significant land subsidence in California. No areas of subsidence have been identified within Tehama County although

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potential subsidence areas within the county have been identified in the 1977 Seismic Safety Element. Land subsidence can cause damage to buildings, aqueducts, bridges, well casings and highways.

HAZARDOUS MATERIALS

A hazardous material is defined in Title 22 of the California Code of Regulations (CCR) as follows:

“A substance or combination which, because of its quantity, concentration, or physical, chemical or infectious characteristics, may either (1) cause or significantly contribute to, an increase in mortality or an increase in serious, irreversible, or incapacitating reversible, illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of or otherwise managed” (CCR, Title 22, Section 66260.10)

Use, Storage, and Transport of Hazardous Materials

Various commercial and industrial activities within the County use and/or store hazardous materials for their operations. Businesses that require the storage of hazardous materials must submit a Hazardous Material Business Plan to the County Environmental Health Department.

Emergency Management Organization

Tehama County's emergency management organization operates under the Standardized Emergency Management System (SEMS). SEMS is the system required by the State for managing responses to multi-agency and multi-jurisdictional emergencies in California (Government Code Section 8607). It requires emergency response agencies to use basic principles and components of emergency management to provide for a multiple level emergency response organization. SEMS is intended to structure and facilitate the flow of emergency information and resources within and between the organizational levels. Five organizational or response levels are defined in the SEMS, which are activated as needed to respond to an emergency. They are as follows:

- Field response level
- Local government level
- Operational area
- Regional level
- State level

The California Master Mutual Aid Agreement has been adopted by the SEMS and is designed to ensure that adequate resources, facilities and other support are provided to jurisdictions whenever their own resources are insufficient to cope with the needs of a given emergency situation. The State has been divided into six mutual aid regions in an effort to more effectively serve all regions of the state adequately. Tehama County lies in Region 3 along with 12 other northern California counties. The State Office of Emergency Services at Red Bluff serves the mutual aid region that encompasses Tehama County.

Critical Facilities and Services

The Tehama Interagency Mass Casualty Mobile Unit has become a critical element of Tehama County and Region 3 disaster preparedness and mutual aid response efforts. This Mobile Unit is equipped to support medical, fire, and/or hazardous material teams respond to incidences with as many as 50 victims

9.4 REGULATORY FRAMEWORK

Land use planning and decision making conducted by Tehama County must comply with applicable State and Federal laws. Compliance with the California Government Code requires the County to conduct a review and analysis of potential hazards to life and property.

The following describes Federal, State, and local environmental laws and policies that are relevant to the CEQA review process for biological resources, including CEQA significance criteria.

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California Public Resources Code (PRC) Sections 4201-4204 were enacted in 1985. These sections required that the California Department of Forestry and Fire Protection (CDF) classify all State Responsibility Area (SRA) lands into fire hazard severity zones. The purpose of this requirement was to identify measures to retard the rate of wildfire spread and to reduce the potential intensity of wildfires that could destroy resources, life and property. The fire hazard severity ratings are based on fuel loading, slope, fire weather and other relevant factors. (CDF, 2000).

In 1991, Senate Bill 1075 passed, enacting minimum fire safety regulations in the SRA through PRC Section 4290. This was an attempt to mandate fire safe land use planning where fire protection was under state jurisdiction. The regulations address several major elements of land use, development and construction including: vegetation clearance around structures; road and access standards; signage and building identification, fuel break and greenbelt standards; and private water supplies for residential development. The detailed fire safety standards adopted by the State Board of Forestry pursuant to PRC 4290 can be found in Title 14 of the California Code of Regulations, especially Sections 1270-1276.

In 1992, Assembly Bill 337 was adopted, which mandated fire hazard assessments and zoning, and included related minimum fire safety standards for vegetative clearance and structural requirements, to be adopted at the local level for "Local Responsibility Areas" (LRA). The provisions of AB 337 were codified under the California Government Code, Sections 51175-51189.

AB 3819 increased the roofing requirements via Health and Safety Code Section 13132.7.

AB 747 in 1995 and AB 423 in 1999 introduced additional roofing regulations. Requirements for roofing in California are found in Health and Safety Code Sections 13108.5 and 13132.7.

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The Alquist-Priolo Act was enacted in 1972 (Public Resources Code Section 2621, et seq.) to provide that structures for human occupancy are not built on active faults. The Act requires a geological investigation before a local government can approve most development projects in the vicinity of known earthquake faults.

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The State Geologist maps earthquake fault zones along the traces of known potentially and recently active major faults. These maps are periodically revised to designate new zones as studies identify hazardous faults.

The Seismic Hazards Mapping Act (Public Resources Code Section 2690, et seq.) complements the Alquist-Priolo Act by requiring the State Geologist to compile maps identifying "seismic hazard zones". Seismic hazard zones are areas that are susceptible to ground shaking, landslides or liquefaction during an earthquake. According to the California General Plan Guidelines, where official seismic hazard maps exist, cities and counties must require that the developer prepare a geotechnical report delineating any seismic hazard and proposing mitigation measures before they may approve any project in a seismic hazard zone (Public Resources Code Section 2697). The minimum level of mitigation for a project should be to reduce acceptable risk of ground failure in an earthquake to a level that does not cause the collapse of buildings for human occupancy. Furthermore, before real estate may be sold, the seller must disclose to the prospective buyer the existence of a seismic hazard zone. (To view official seismic hazard maps, see the website for the Seismic Hazards Mapping Program within the Department of Conservation's California Geological Survey at www.conservation.ca.gov/cgs).

FLOOD HAZARDS

The Coby-Alquist Floodplain Management Act encourages local governments to plan, adopt and enforce floodplain management regulations (California Water Code Section 8400, et seq.). Where a federal flood control project report has been issued designating floodway boundaries, the Department of Water Resources or the State Reclamation Board will not appropriate money in support of the project unless the applicable agency has enacted floodplain regulations. Those regulations must provide that:

- Construction of structures in the floodway that may endanger life or significantly reduce its carrying capacity shall be prohibited.
- Development will be allowed within the "restrictive zone" between the floodway and the limits of the floodplain as long as human life and the carrying capacity of the floodplain are protected. (Water Code Section 8410)

Tehama County has adopted the PF, Primary Floodplain, District (Tehama County Zoning Code, Chapter 17.42). Section 17.42.010 describes the purpose of the PF District:

The PF, primary floodplain district, is intended to be applied by the county to properties which lie within a primary floodway which, for the purposes of this title, shall be construed to be a stream channel, and the portions of the adjacent floodplain as are required to efficiently carry the flood flow of the stream and on which properties special regulations are necessary for the minimum protection of the public health and safety and of property and improvements from hazards and damage resulting from floodwaters.

Uses permitted in a PF district are primarily crop and tree farming, truck gardening, viticulture, livestock grazing and other agricultural uses which are of the same or a closely similar nature, as well as public utility wire and pipelines for transmission and local distribution purposes (Section 17.42.020). Uses permitted upon issuance of use permits, per Section 17.42.030, include:

- A. *Buildings and structures when it is found by the Planning Commission that such buildings and structures will be so constructed or placed or will be so protected by levees or other*

flood proofing that they will not be appreciably damaged by flooding, will offer a minimum obstruction to the flood flow, and will resist flotation;

- B. *Buildings and structures accessory to agricultural use for the storage of goods and equipment and the shelter of animals and/or fowl, but not residences of any type;*
- C. *Public utility buildings and structures other than wire and pipelines;*
- D. *Public parks and recreation areas and facilities including boat ramps, docks, parking areas, picnic tables and fireplaces and private and commercial recreation developments and facilities, campgrounds and recreation vehicle parks; provided, that restroom facilities shall be located and constructed in accordance with health department requirements;*
- E. *Commercial excavation of natural materials, filling of land areas, construction of levees, dikes, or other structures designed to divert or obstruct the flow of floodwaters.*

OTHER GEOLOGIC HAZARDS

California Government Code Section 65302 (g) discusses hazards required to be discussed in the General Plan. Included are seismic and other geologic hazards defined as "a geologic condition that is a potential danger to life or a property. Geologic hazards include, but are not limited to, earthquake shaking, landslide, erosion, expansive soil, fault displacement, and volcanic eruption" (California Public Resources Code Section 2009).

Naturally Occurring Asbestos

The Tehama County Air Pollution Control District has adopted policies to reduce the effects of NOA by reducing the use and sale of serpentine materials in the county.

Land Subsidence

Tehama County Flood Control and Water Conservation District addresses water conservation issues and concerns, including overdraft of ground water.

HAZARDOUS MATERIALS

Hazardous materials transport, storage and disposal are subject to a variety of Federal, State and local regulations. The Federal Hazardous Materials Transportation Act (49 USC Section 1801 *et seq.*) aims to ensure the safe transport of hazardous materials via water, rail, highway, air or pipeline. The Resource Conservation and Recovery Act (42 USC Section 6901 *et seq.*) Subtitle C addresses hazardous waste generation, storage, treatment and disposal. Subtitle I requires monitoring and containment systems for underground storage tanks that hold hazardous materials.

The State Health and Safety Code (Chapter 6.5) regulates the transport, treatment and disposal of hazardous wastes. Chapters 6.67 and 6.75 respectively deal with aboveground and underground petroleum storage tanks, while Chapter 6.7 regulates underground storage of other hazardous substances. The Department of Toxic Substances Control issues policies and regulations concerning hazardous materials. The County Department of Environmental Health is the local enforcement agency for issuing permits and regulating hazardous material operations.

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EMERGENCY PREPAREDNESS

The California Emergency Services Act (California Government Code, Title 2, Division 1, Chapter 7) sets forth basic procedures for the management of emergencies within the State. Among its provisions are the establishment of the SEMS, mutual aid regions and mutual aid procedures. The Master Mutual Aid Agreement further specifies the State and local duties.

The Tehama County Sheriff's Department Office of Emergency Services (TESA) is responsible for the disaster planning, assistance and coordination of all jurisdictions within Tehama County. A comprehensive program should include disaster preparedness and response plans, modification of local building codes, and encouragement to use the Neighborhood Emergency Services Team (NEST). Review of individual projects should include an assessment of risk from natural and manmade hazards, evacuation routes and response plan, appropriate land use density, intensity, design, development, and building standards and other mitigation to reduce risk and facilitate disaster preparedness and response.

Tehama County Health Services Agency (TCHSA), Public Health Division has developed working plans to be implemented should a bioterrorism emergency occur. These plans have been approved by the Center for Disease Control and Prevention (CDC). The TCHSA is working to develop an All Hazards Disaster Plan to strengthen emergency preparedness and recovery capabilities.

EXISTING GENERAL PLAN GOALS AND OBJECTIVES

The Tehama County Safety and Seismic Safety Elements of 1974 state the following objectives that relate to the safety of life and property within Tehama County.

- To add safety consideration to the active planning processes in order to reduce loss of life, injuries, damage to property, economic loss and social disrupting resulting from environmental hazards.
- Goals for reducing safety and seismic hazards are those levels of safety at or below acceptable risk which may reasonably be achieved, and at the earliest possible dates.
- To reduce risks so far as possible to the "Acceptable Risk" level, which is a level which may be reached without the imposition of drastic new laws or regulations in order to ensure reasonable public safety.
- The placement and construction of future structures be carefully monitored not only with respect to existing codes and regulations, but also in consideration of safety and seismic safety factors contained herein and new safety plans and regulations which may become effective.
- Priorities for abatement of hazards are set dependent upon the type and quantity of property, human life, economic value or transportation access at risk. Priorities are set for five, ten, and fifteen years and longer dependent upon the level of risk and resources required for correction or abatement.
- The Safety and Seismic Safety Elements shall be considered as dominant elements which impose their effects upon and within other General Plan elements to promote and protect the public health, public safety, and the general welfare.

9.5 ISSUES AND OPPORTUNITIES

It is in the County's interest to disclose potential hazards and regions most likely to be effected by such hazards in an effort to protect the safety of citizens and visitors to Tehama County. Policies addressing development activities within regions of a known hazard(s) should be addressed and evaluated to reduce risk to an acceptable level, as defined by the County. Emergency response plans and evacuation routes should be addressed in an effort to streamline response efforts and reduce further exposure of human life to hazards.

9.6 IMPLICATIONS FOR THE GENERAL PLAN

The primary component of a general plan in addressing hazards is the safety element. The purpose of the safety element is to reduce the potential risk of death, injuries, property damage and economic and social dislocation resulting from fires, floods, earthquakes, landslides and other hazards. According to the California General Plan Guidelines:

The safety element must identify hazards and hazard abatement provisions to guide local decisions related to zoning, subdivisions, and entitlement permits. The element should contain general hazard and risk reduction strategies and policies supporting hazard mitigation measures. Policies should address the identification of hazards and emergency response, as well as mitigation through avoidance of hazards by new projects and reduction of risk in developed areas. Communities may use the safety element as a vehicle for defining "acceptable risk" and the basis for determining the level of necessary mitigation.

The General Plan update process affords the opportunity to evaluate the extent of safety and hazard risks and the effectiveness of the County's emergency preparedness.

Fire Hazards

The California General Plan Guidelines state that the safety element must identify urban fringe and rural-residential areas that area prone to wildland fire hazards. It must also analyze systems such as adequate evacuation routes and peak load water supplies that can reduce fire hazards. The policies of the safety element should form the basis for adopting fire safe ordinances and strategic fire defense system zoning.

Seismic Hazards

The safety element needs to establish policies to minimize the loss of property and life as a result of earthquakes. The Alquist-Priolo Earthquake Fault Zoning Act, the Seismic Hazards Mapping Act, the Unreinforced Masonry Law, and associated maps and regulations of the State Board of Geologists and Geophysicists and the State Mining And Geology Board offer important information for development of local policies.

As referenced in the California General Plan Guidelines, the Alquist-Priolo Act states that its purpose is to provide for "the adoption and administration of zoning laws, ordinances, rules, and regulations by cities and counties in implementation of the general plan." (Public Resources Code Section 2621.5). The Act's provisions should be reflected in the plan's land use, safety, and open space elements. The data on the State Geologist's maps, including the approximate location of the faults and the boundaries of the earthquake fault zones, should be transferred to the hazard maps included in the general plan. The general plan should incorporate Alquist-Priolo Act policies restricting building within fault zones. A city or county may also establish

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policies and criteria more restrictive than those of the Act or adopted by the State Mining and Geology Board. Implementation may occur through disclosure requirements as well as through zoning and subdivision requirements.

The Seismic Hazards Mapping Act specifically requires cities and counties to take into account the information available in seismic hazard maps when preparing safety elements and when adopting or revising land use planning regulations such as zoning (Public Resources Code Section 2699). According to the California General Plan Guidelines, policies may also be included in the open space and land use elements when not redundant.

Flood Hazards

The general plan safety element needs to identify flood hazard areas and establish policies to avoid unreasonable flood risks. The California General Plan Guidelines state that a comprehensive approach should include mapping floodplains, establishing general policies to keep intensive new development out of floodplains or to mitigate and protect against flood impacts if development is to be located in such areas, and to minimize impacts on existing development where possible. The safety element may also establish policies regarding capital improvements or acquisitions necessary to ensure flood protection and establish flood management policies which may include both structural and non-structural approaches to flood control using a multi-objective watershed approach.

Other Geologic Hazards

In addition to seismic hazards the safety element needs to identify other geologic hazards including, but not limited to volcanic hazards, slope instability leading to mudslides and landslides, naturally occurring asbestos, land subsidence, expansive soils and liquefaction.

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